Peer Review and Technology Assessment in Medicine

Kathleen N. Lohr, John D. Winkler, Robert H. Brook
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Kathleen N. Lohr, John D. Winkler, Robert H. Brook

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PREFACE

This report was prepared for the Office of Technology Assessment, Congress of the United States. It represents a portion of a larger research effort of the Office of Technology Assessment on methods for doing medical technology assessment and for efficiently communicating information from such assessments to a wide variety of users.

The analysis explores the potential role of Professional Standards Review Organizations in medical technology assessment. PSROs represent the only physician peer review institution with several characteristics presumably important both to efficient and widespread dissemination of information pertaining to medical technology assessment and to the promotion of timely changes in medical practice among physicians. Particular attention is given to (a) the "upward" transfer of data and information pertinent to technology assessment and (b) the "downward" dissemination of information to practicing physicians as part of PSROs' sustained efforts to promote change and improvement in medical practice. Several recommendations are presented regarding PSRO involvement in the technology assessment field, including specific proposals as to how some of these recommendations might be initiated and tested.

The report should be of particular interest to individuals or agencies whose responsibilities include evaluating medical technologies, guarding the quality of medical care, and promoting efficient use of health resources.
SUMMARY

INTRODUCTION

In medicine, the growth of scientific and technical knowledge and the introduction of new clinical procedures occur very swiftly. Demands placed on physicians to understand these changes and to modify their practices are accordingly great. To understand better how physicians stay informed of advances in medical practice, the Congress of the United States requested the Office of Technology Assessment (OTA) to examine, from a largely conceptual perspective, the methods for carrying out medical technology assessment and the mechanisms currently or potentially available for disseminating information from such assessments in an effort to improve medical practice. The study reported in this monograph was commissioned by OTA as part of that larger exercise.

Virtually all experts define medical technology very broadly, as representing all drugs, devices, and procedures used in the prevention, diagnosis, treatment, and rehabilitation of health problems, together with the systems through which they are supplied. Medical technologies can be arrayed along a development-diffusion dimension from emerging to new to established to obsolete, although precise definitions for these stages typically are unavailable.

Technology assessment in medicine includes the entire range of investigations available to both the private and public sectors that provide information on the efficacy, safety, cost-effectiveness, cost-benefit, and social, legal, and ethical impact of medical technologies. Broadly speaking, technology assessment is a form of research intended to inform public policy decisions about the broad implications of introducing a new technology, improving or extending the use of an existing one, or phasing out an obsolete one. The eventual application of results of medical technology assessments—a concept we call assessment application—is intended to modify physician practice toward the adoption of safe and cost-effective technologies (consistent with acceptable legal and ethical standards) and toward the abandonment of obsolete, unsafe, or excessively costly technologies.

This study started with the assumption that practicing physicians are the key recipients of and actors on information from assessments in medical technologies. Thus, formal organizations or institutions composed of practicing physicians are of particular interest. Many such groups might be involved in translating the results of technology as-
essments to practicing physicians—academic centers, professional societies, peer review agencies, and the like. Our focus here is on peer review organizations—namely, Professional Standards Review Organizations (PSROs). These are local voluntary groups of physicians organized (pursuant to federal statute) to do peer review of the care delivered to populations eligible for Medicaid or Medicare benefits.

In this monograph we examine several issues related to the overall objectives of the OTA study. In particular, we ask two main questions:

1. Can PSROs generate and collect data pertinent to the use of medical technologies for relevant agencies that have an ongoing responsibility for conducting such assessments?
2. Can they facilitate the systematic flow of technology assessment information to clinicians?

To arrive at some answers from which specific recommendations might be made we (1) reviewed selected literature on the diffusion of medical innovation, especially the factors that lead from a general awareness of a medical innovation to modification of clinical practice on the basis of that information; (2) reviewed currently available information about the PSRO program; (3) interviewed selected leaders in the medical communications field; (4) convened two panel meetings of medical and nonphysician officials of PSROs selected to represent all 10 PSRO regions and a wide spectrum of PSRO activity and maturity; and (5) synthesized this broad set of information into a set of conclusions and recommendations about technology assessment activities that PSROs could or could not be expected to carry out.

INFORMATION FLOW IN MEDICAL TECHNOLOGY ASSESSMENT

New ideas in medicine go through at least two initial steps before they are accepted in clinical practice: (1) the generation and analysis of research data and (2) the synthesis and dissemination of research results. The information transfer mechanisms involved in these steps are multidimensional and multidirectional; for this study, they are a complex web for which there is no satisfactory analytic framework. To simplify the discussion, therefore, we posited a bidirectional medical technology "loop" in which data on technologies are transmitted "upward" from a researcher or practitioner to a level that is responsible for further analysis and synthesis, and assessment results are interpreted and disseminated "downward" from this level to the practicing physician. The "upward" flow of information from the field includes identify-
ing research problems and gathering data for analysis and interpretation; to date, little thought has been given to this kind of function for PSROs, so there is a paucity of theoretical, conceptual, and empirical literature on this topic.

Somewhat greater attention, however, has been directed to the phenomenon of "downward" communication of assessment results to medical practitioners. This downward communication can be described in a framework in which communication about an innovation is antecedent to the adoption of that innovation by the medical community. Such a framework emphasizes two concepts: Information or recommendations are transmitted via a communication process, and some adoptive response is made. This response can be to take up a new practice, drop one in use, or modify an existing technology or practice, or to ignore the recommendations altogether. The distinction between awareness/knowledge of a medical technology (on the one hand), and the decision, however tentative, to use it (on the other) is important, as is the distinction between communication sources that inform the physician about novel medical technologies, and those that influence physicians to act. With regard to the latter, the types of communication factors that promote implementation of a recommended change (i.e., innovation) in medical practice—so-called "legitimating factors"—are of special interest.

Perhaps the most firmly established finding in research in this area is that physicians hear about new technologies from a variety of sources, but that only selected sources influence change in practice (i.e., legitimize that new knowledge). Although the most important source of new knowledge about improvements in medical technologies is typically considered to be the professional literature, professional colleagues are considered to be the more common source to whom physicians will turn when actual implementation of new procedures is contemplated. In general, professional colleagues are considered more potent legitimizing agents than any other single influence, and the most effective force for physicians' adoption of medical innovations is professional, face-to-face contact with recognized peers.

PROFESSIONAL STANDARDS REVIEW ORGANIZATIONS

This last phenomenon—the legitimizing potential of PSROs as part of their usual review and quality-of-care activities—in part has prompted the closer look at their assessment application potential. PSROs consist of areawide groupings of practicing physicians responsi-
ble for reviewing care delivered to persons eligible for Medicare or Medicaid coverage. They were authorized by 1972 legislation (P.L. 92-603) that makes them responsible for assuring that services provided and paid for by federal beneficiary programs are medically necessary and of a quality that meet locally determined professional standards, and that the services are provided at the most economical level consistent with quality of care. The first of these separate, independent, nonprofit organizations was established in 1974; as of mid-1981, there were 182 funded and 5 unfunded PSROs in 195 designated geographic areas. They are physician-dominated organizations, with varying numbers of nonphysician staff members. Upwards of 50 percent of all practicing physicians in this country nominally belong to the PSRO in their area, although usually only a small fraction of these members participate regularly in PSRO activities.

The most common activities of PSROs involve hospital-based care, including traditional utilization review (UR) intended to reduce the unnecessary use of hospital days, "profile analysis" to highlight patterns of care by provider or patient characteristics, and quality-of-care activities known until recently as Medical Care Evaluations.

Newer activities of more experienced PSROs are quite varied. Some have taken on utilization or quality-of-care review in other facilities or medical settings. The major concerns are ancillary services in hospitals, long-term care, and ambulatory care. As many as one-quarter to one-third of all PSROs have engaged in ancillary-services or long-term-care review; ambulatory-care review is, so far, a less well-developed field. By 1980, perhaps as many as one-quarter of the PSROs (or their separately incorporated analogues) were engaged in "private" review on a contract basis. They reviewed patient care financed by private insurance companies, self-insured corporations, CHAMPUS (Civilian Health and Medical Program for the Uniformed Services), labor unions, and municipal governments. PSROs have also undertaken cooperative research projects, some quite rigorous in study design. These include studies involving technology assessment issues, such as the randomized controlled trial to evaluate different educational interventions to reduce the use of an outdated obstetric practice.

Although the PSRO program pursues many objectives, the most visible are those related to controlling the utilization of hospital care and thus the cost of that inpatient care. However, in its comparatively short history, the PSRO program has not produced the desired or expected reductions in hospital stays or, especially, the costs of federal health programs such as Medicare. It may have saved about as many resources as it has consumed, but by itself has certainly not realized substantial cost savings or reduced the need for additional efforts to lower costs in the medical sector. Furthermore, evaluations of the
PSRO program have emphasized the cost-effectiveness of admission and continued stay review, thus diverting attention from the effects PSROs may have had in other areas, such as the use of ancillary services.

Improvements in quality of care (although rather poorly documented) have ranged broadly across diagnoses and services. Much of the problem in documenting the effects of such peer review activities on quality of care lies in their anecdotal, not easily aggregated nature and in the fact that they do not lend themselves readily to cost-effective or cost-benefit measurement.

Despite the negative aspects of the PSRO program as presently constituted, several organizational factors suggest that PSROs could participate in medical technology assessment under restricted circumstances. These factors include: (1) local orientation to and viable relationships with practicing physicians and medical facilities; (2) among mature PSROs, a multiplicity of skills reflecting experience in education and sanction activities (including personal, face-to-face communication patterns) and in research (including systematic data collection and analysis); and (3) complex financing and administrative relationships reflecting an ability to work in interorganizational environments.

Exploring a PSRO role in technology assessment assumes that the program has a future in the cost-conscious years ahead. Although we recognize that their future is uncertain, we advance several arguments as to why PSROs—or an organizational entity fulfilling the basic peer review functions of PSROs—will probably survive:

1. UR procedures of PSROs do reduce the unnecessary use of hospitals.
2. Through unique combinations of educational and sanction interventions at the local level, PSROs can tailor their approaches to improving physician practices more than other professional or governmental institutions.
3. If changes in medical care delivery and financing mechanisms foster underuse of services, an organization like PSROs may be needed to guarantee a level of care consistent with adequate quality and to ensure that unfair burdens are not placed on the poor and elderly.

CONCLUSIONS AND RECOMMENDATIONS

We originally questioned whether PSROs could serve as a "passive" transmitter of information and data related to medical technologies and to assessments within the program's current structure and mission. We
conclude that no routine "pass-through" function would be of interest to PSROs. Our first recommendation is that no effort be made to use the PSRO program for a simple passive information dissemination or routine data collection purposes related to technology assessments. We recommend that no legislative actions or policy decisions to require the PSRO program to undertake a passive information transfer role be initiated at this time.

Despite this negative finding, we conclude that, under restricted circumstances, PSROs may have potential for both "upward" and "downward" dissemination of information relating to medical technologies and their assignments. Our second and third recommendation below refer to the collection and transmission of information about the potential over-, under-, or misuse of technologies from the medical community upward to agencies or institutions responsible for research or policymaking about medical services. The fourth recommendation below pertains to the dissemination of information about medical technologies (often drawn from formal assessments) downward to clinicians, with the underlying intention of fostering innovation and improvement in the practice of medicine.

Our second recommendation is that, in designing national technology assessments that involve the collection and analysis of clinical data, the agency primarily responsible for the assessment should consider the possibility of direct PSRO involvement in the assessments. For instance, PSROs now collect data for their own needs in quality of care, utilization review, or special studies. These data could contribute to problem identification regarding the use of a given technology before large-scale studies are begun. Additionally, some PSROs could be involved actively in collaborative assessments, supplying systematic data collection procedures and skills now readily available in mature PSROs. PSROs could be solicited directly and provided with supplemental funding or be encouraged to compete for grants or contracts that support such studies.

Our third recommendation is that the advantages and disadvantages of PSROs' data collection and analysis capabilities should be evaluated more thoroughly in comparison with those of other major federal agencies that carry out periodic or ongoing data collection activities. We propose that OTA or another suitable agency initiate a comparative study of data systems, so that recommendations might be forthcoming on how existing federal health statistics systems might be improved, expanded, or modified to suit technology assessment purposes. In doing this, the possibly unique role PSROs might have in generating some types of clinical information that are needed in the technology assessment process would be explored.

On the basis of theories about information dissemination and adop-
tion of medical innovations, existing knowledge about PSRO functions, and the outcomes of the PSRO panel discussions, we also conclude that PSROs could have a significant, perhaps unique, function in transmitting technology assessment information to practicing physicians. For brevity, we refer to this process of applying assessment results in the expectation of changing and improving physician behaviors as assessment application, and change is viewed as reducing the use of poor (unsafe, obsolete, non-cost-effective) technologies, slowing the diffusion of untested or unproven ones, and spurring the use of safe and cost-effective ones. We postulate that legitimizing standards of good medical care through local review and specific targeting of educational and sanction interventions to local physicians are important to the speedy and widespread adoption of medical innovations—where innovation in this context refers to any change leading to higher quality or more efficient care. Our hypothesis is that PSROs could use and apply technology assessment information through modified UR and quality-of-care procedures to foster innovation more quickly and/or more thoroughly than could other information dissemination efforts.

Our fourth recommendation is that a multi-year, multi-PSRO study be undertaken to evaluate the effectiveness of PSROs in assessment application. In this study selected PSROs would be randomly assigned to "experimental" or "control" groups. "Experimental" PSROs would be required to investigate and document the degree to which a specific study technology was poorly used in their areas; set utilization and quality-of-care criteria through modified procedures (explicitly involving development and review by local physicians); and pursue their customary educational and sanction activities. In contrast, "control" PSROs would be expected not to undertake any special studies or educational/sanction efforts with respect to the study technology for the equivalent period of time. The main question to be investigated would be whether the experimental PSROs brought about appropriate changes in the use of the technology more efficiently, quickly, or thoroughly than did the comparison PSROs.

A study of this sort has numerous limitations: difficulty in randomizing units of observations as large as PSROs; inability to answer many interrelated questions about dissemination and application of assessment results, and costs. Nonetheless, we argue that a rigorous evaluation of this potential PSRO activity would be required and that no major responsibility for assessment application could be given to PSROs, or indeed to any peer review institution or agency, in the absence of an evaluation of their capabilities in this endeavor.
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I. INTRODUCTION

The rate of change in clinical practice, arising in part from the explosion in medical technology, is rapid. Growth of scientific and technical knowledge and the introduction of clinical procedures occur at a swift pace. Information accumulates too quickly for some practicing physicians to assimilate. Thus, the demands placed on physicians to understand the changes caused by technological advances and to modify their practices are accordingly great.

To understand better how physicians stay abreast of advances in medical practice, the Congress of the United States requested the Office of Technology Assessment (OTA) to conduct a study of the methods for carrying out medical technology assessments and of the mechanisms currently or potentially available for disseminating information from such assessments. The OTA study was concerned with (among other things) how information from technology assessments is synthesized and disseminated, and how it can be presented so as to influence physician practices in the most effective and timely way possible. This monograph reports on an investigation commissioned by OTA into some of these issues.

PEER REVIEW AND MEDICAL TECHNOLOGY ASSESSMENT

Practicing physicians have a pivotal role as recipients of and actors on information from assessments of medical technologies. A key question, therefore, is what means are at hand both for reaching physicians in a timely and effective manner and also for engaging their interest in and support of such assessments—either in conducting assessments or in applying the results of such assessments, or both. Several physician organizations or institutions might be contemplated as vehicles for communicating to the profession the results of medical technology assessments: academic institutions, professional groups such as specialty board associations or medical societies, health planning agencies, or peer review groups. Our focus in this monograph is only on the last—namely, Professional Standards Review Organizations (PSROs).

PSROs are local voluntary groups of physicians organized to do peer review of the care delivered to populations eligible for Medicaid or Medicare benefits. They are, broadly speaking, representative of all
practicing physicians across all specialties and types of practice and, as such, are a vehicle by which to reach physicians of different political persuasions, personal and practice characteristics, and specialties. PSROs gather data in a variety of formal ways about how medical technologies are used, mainly in hospitals but a few also in ambulatory and nursing home settings. They have in place mechanisms for changing physician behaviors that rely on peer review, face-to-face contact, direct exchange of information, and sanctions and penalties when educational interactions are ineffective.

Although the PSRO program as presently constituted may not survive beyond the next fiscal year or two, or may survive only in a severely truncated form, its basic elements are likely to be present in any viable physician peer review effort aimed at simultaneously reducing (or stabilizing) health care costs and maintaining (or improving) quality of care. In our judgment, therefore, examining PSROs in the context of medical technology assessment is of value regardless of the future of the program per se.

We have deliberately sidestepped several important issues in this broad area of medical information transfer. For example, we were not able to look in depth at sources of information other than PSROs and then evaluate their comparative or complementary effectiveness in reaching the physician community. That would be a separate (and large) study in itself. Nor were we able to look at broader movements or structural changes in the health sector, such as the possible advent of "competition" and its attendant incentives or disincentives to improve the use of medical technologies. Neither did we consider the possibilities of affecting the use of medical technologies by regulatory or market mechanisms (such as a federal ban on new or old products or a voluntary industry withdrawal of a product from the market), all of which could have a notable effect on physician practice. Without doubt, these are critical issues, but they far exceeded our mandate from OTA.

This monograph discusses several issues on the acquisition and transmittal of technology assessment information as they relate to the past or potential activities of the PSRO program. We explore two major questions:

1. Can PSROs generate and collect data pertinent to the use of medical technology for relevant federal agencies or other institutions that are conducting assessments of individual technologies?
2. Can they facilitate the systematic flow of information from medical technology assessments to practicing physicians?

To examine these questions, we undertook several tasks. First, we
reviewed a selected body of literature on information dissemination, with special reference to medicine in general and to factors that lead from general awareness of a subject to modification of clinical practice on the basis of information about that subject. Second, we reviewed selected publications of past PSRO activities and sought information about the current status of the PSRO program (i.e., as of early 1981). Third, we convened two small, highly selective panel meetings of PSRO leaders to explore these topics. Fourth, we conducted a small set of semi-structured interviews with leaders in the medical communications field (e.g., editors of journals), to learn more about where PSROs might (or might not) contribute to information dissemination to practicing physicians. Finally, we subjected drafts of this monograph to review by a number of experts who are associated directly or indirectly with the PSRO program or who have a unique perspective on technology assessment in medicine.

ORGANIZATION OF THIS MONOGRAPH

The remainder of this monograph is organized as follows. Chapter II gives selected background information on medical technology assessment, with attention to selected federal agencies principally responsible for such activities. Chapter III presents a conceptual framework for thinking about information flows in medicine. Although recognizing the multidirectional, multidimensional nature of information transfer in the medical field, we postulate a simplified bidirectional information dissemination model that emphasizes how to transmit the results and interpretations of medical technology assessments to clinicians so as to encourage them to adopt the recommendations that emerge from such assessments. The description of the PSRO program, contained in Chapter IV, emphasizes elements of this peer review effort pertinent to technology assessment in medicine. Chapter V examines ways that PSROs might (or might not) be successful in disseminating technology assessment information to physicians and in providing data relevant to technology assessment to agencies engaged in such evaluations. Appendix A provides material on information transfer mechanisms other than PSROs, particularly the clinical and public health literature and abstracting and indexing services. Appendix B describes the PSRO panel meetings in more detail. Appendix C gives a brief overview of an ongoing multi-PSRO study with features pertinent to technology assessment.
II. TECHNOLOGY ASSESSMENT IN MEDICINE

The evaluation of medical technology, a growing concern of the health field for the past decade, is expected by many to intensify in the 1980s. Experience with the growth and diffusion of medical technologies—some requiring large capital expenditures, some prompting high personnel costs, and some enjoying low unit costs but high volume—has made it clear that the nation does not know yet how best to manage the development, diffusion, and use of medical technologies. One problem that obstructs effective management in this sector is simply insufficient knowledge about the direct and indirect benefits and costs of technology to society. Technology assessment is one mechanism by which health policymakers attempt to gain that knowledge.

DEFINITIONS

Virtually all persons in the field define medical technology broadly, in keeping with a comprehensive concept of physical sciences, biosciences, and engineering applied to specific goals in the health sector. Medical technology is considered to represent the drugs, devices, and procedures used in the prevention, diagnosis, treatment, and rehabilitation of health problems, together with the systems through which they are supplied.

For instance, the legislation creating the National Center for Health Care Technology (NCHCT) defines health care technology as any discrete and identifiable regimen or modality used to diagnose and treat illness, prevent disease, maintain patient well-being, or facilitate the provision of health care services. OTA (1976) had previously defined medical technology as "all elements of medical practice that are knowledge-based, including hardware . . . and software . . ." Specifically, it was taken to be the "set of techniques, drugs, equipment, and procedures used by health-care professionals in delivering medical care to individuals and the systems within which such care is delivered."

Technologies can be arrayed along a development-diffusion dimen-

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1The pertinent literature includes Edgahl and Gertman, 1975; Gordon and Fisher, 1975; Altman and Blendon, 1979; NCHSR, 1979; Russell, 1979; Banta and Behney, 1980; Hanfl and Eichenholz, 1980; Retting, 1980a.
sion from emerging to new to established to obsolete/abandoned, given their stage of development in terms of clinical investigation or trials, consensus as to clinical use, and degree of dissemination in the health care system. Precise definitions for these stages of technologies are typically lacking. NCHCT, for example, poses the following for emerging and new health care technologies: Emerging—"technologies at the stage of applied research before clinical trials have been completed"; New—those "which have passed the stage of clinical trials but are not yet widely disseminated throughout the health care system" (see NCHCT, 1980).

In medicine, technology assessment includes the entire range of investigations available to both the private and public sectors that provide information on the efficacy, safety, cost-effectiveness, cost-benefit, legal implications, and social and ethical impact of medical technologies. It is a form of research intended to inform public policy decisions about the broad implications of introducing a new technology, improving or extending the use of an existing technology, or phasing out an obsolete one.

The major elements with which technology assessment typically have been concerned are efficacy, safety, and cost-effectiveness (see, e.g., OTA, 1978, 1980). The terms are often only loosely applied. Broadly, one can speak of efficacy as benefit from the use of medical technology under ideal conditions, and effectiveness as benefit in average (or actual) conditions. Safety is a measure of the risk or potential harm posed by the use of a technology; "safe" typically means that risk is at or below some level deemed acceptable by the assessors or by the government. Cost-effectiveness is a form of analysis in which the costs of reaching some predetermined outcome (which is not valued in monetary terms) are compared for alternative technologies or programs. Cost-benefit analysis involves comparing the costs of a program with its anticipated returns (benefits), both of which are valued in monetary terms; "cost-benefit ratios" for different technologies or programs can be compared as an aid in determining the preferred choice of technology or program.

PURPOSES AND CONCERNS OF TECHNOLOGY ASSESSMENT

One may question whether governments should have any influence over the use of medical technologies, or whether the rise and fall of new or old technologies should be left to the market and the medical profession. In a world where the federal government had no mandate to
provide access to or improve the quality of care for its citizens and paid none of the nation's medical bills directly (or indirectly through tax incentives), and in a world where consumers of health services faced the true price of their consumption, the question would probably deserve an answer consistent with no government role. None of those conditions holds today, however, and a strong argument can be made that the government has a large and legitimate interest in influencing the use of medical technologies.

Data derived from technology assessments are expected to improve decision-making about whether and how the use of medical technologies should be promoted or curtailed and about whether and how modifications in reimbursement for such medical services should be made. Such data also permit gaps in current knowledge about a technology to be identified, and provide indicators toward the need for further research. Advances or improvements in emerging or existing technologies may render them either better than they had earlier been judged or better than competing technologies. Thus, decisions about reimbursement policies or research emphases are evolutionary, suggesting that the need for technology assessment is ongoing.

Choosing a topic for medical technology assessment—especially given scarce research resources that must be allocated within technology assessments and across a broad research portfolio in health—can be difficult. Medical technologies are rarely, if ever, totally useless or completely safe. Usually, medical innovation can be expected to produce some benefits, for at least some patients, and to have some attendant risks such as discomfort, disability, mental distress, or even death. Nearly every medical technology can be defended as worthwhile (i.e., benefits realized from its use) in some setting or for some patient (Schwartz and Joskow, 1978), however, and thus a just candidate for assessment.

In sum, technology assessment in medicine might be said to have three main objectives. It aspires, first, to constrain the diffusion and use of new technologies of little value and, second, to promote the abandonment of obsolete technologies in favor of ones that are more efficacious, safe, or cost-effective. Third, it also aims to ensure that medical practices, new devices, or new drugs with potential benefits not outweighed by unacceptable levels of risk are brought into the commonly available medical armamentarium with all due speed. Thus, assessment can restrain or stimulate the adoption of medical technologies on the basis of efficacy and benefit considerations, with due attention to important economic, legal, social, and ethical dimensions.
TECHNIQUES OF MEDICAL TECHNOLOGY ASSESSMENT

The numerous techniques available for carrying out technology assessment in medicine cover a wide spectrum of methods, and we note them only cursorily here. Assessments have no standard format and can be very comprehensive or quite limited. The types of assessments done on any given technology can differ according to the nature of the technology, its state of diffusion into common medical practice, what is already known about the technology, and what it is wished to emphasize or learn in a particular study. Technology-specific assessments also change over time, as technologies move along a development-diffusion path.

On one end of the assessment-methods spectrum are "informal" approaches such as simple case reports or case studies, whereby a physician reports on his or her observations about, say, the use of a particular new procedure or drug in one or a small number of patients. This type of anecdotal report could include, for instance, notes about as-yet-unrecognized deleterious side effects of existing drugs or as-yet-unpublicized new and useful applications of long-standing medical devices or procedures. Slightly more formal methods of this sort may involve appeals to—or requirements of—all practitioners who employ a new procedure, drug, or device to report information on the success or failure of it. When done in an organized fashion, these activities are essentially a form of postmarketing surveillance.

At the other more formal (and more costly) end of the spectrum of technology assessment methods are the long-term controlled (or randomized) clinical trials and various types of epidemiologic or quasi-experimental research. (Some preclinical evaluations, which may involve animal testing or chemical analyses, can also be quite sophisticated and costly.) Numerous other types of studies—both retrospective and prospective—fall somewhere between the informal or descriptive approaches and the more rigorous (e.g., experimental) techniques.

The emerging "consensus development" efforts begun in 1977 by the National Institutes of Health (NIH) (see, e.g., "From the NIH," 1978), are yet another means of canvassing expert opinion about the proper role of a specific medical technology and reaching agreement and making recommendations on the risks, benefits, and ethical considerations surrounding the use of the technology. A key point is that this process is supposed to result in a credible consensus about specific indications for use or nonuse of a technology in various situations. These recommendations are then made widely available to the general public, health professionals, regulators, and policymakers. Three "rounds" of NIH consensus development conferences have been held,
and are summarized in annual publications and individual brochures made available by the Office of Medical Applications of Research (OMAR) of the NIH Director's office and in articles published in various clinical journals.  

A significant body of literature highlights the numerous conceptual and technical difficulties of doing technology assessment (see, for instance, reports by OTA in 1976, 1978, 1980; and the publications cited therein). The advantages, disadvantages, and limitations of the major assessment approaches in medicine will be examined in detail in reports forthcoming as a result of the overall OTA study referred to in Chapter I.

Social and ethical dimensions of technology assessment are also receiving greater attention. For instance, Shrader-Frechette (1980) discusses the unintended value judgments that can arise in presumably objective assessments based on economic concepts of costs and benefits. Coburn (1979) claims that technology assessment and related policymaking are faulty to the degree that they rely on the cost-benefit family of approaches; he argues that policy choices should instead proceed from a nonutilitarian, egalitarian basis in which individual freedoms are maximized and (insofar as possible) distributed equally among all members of society. The President's Commission for the Study of Ethical Problems in Medicine (established by P.L. 95-622) is one major public body with an explicit mandate to consider ethical and legal issues on the frontier of biomedical and behavioral research.

AGENCIES RESPONSIBLE FOR TECHNOLOGY ASSESSMENTS

Diverse observers (Tilson et al., 1975; OTA, 1978; Hanft and Eichenholz, 1980; Rettig, 1980a; Perry and Eliastam, 1981) have identified or described the federal agencies most involved in medical

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2To date, the following topics have been covered: breast cancer screening; educational needs of physicians and public regarding asbestos exposure; dental implants; mass screening for colo-rectal cancer; treatable brain diseases in the elderly; indications for tonsillectomy and adenoidectomy; availability of insect sting kits to nonphysicians; mass screening for lung cancer; supportive therapy in burn care; and surgical treatment of morbid obesity (all in the 1979 series); pain, discomfort, and humanitarian care; antenatal diagnosis; transfusion therapy in pregnant sickle cell disease patients; improving clinical and consumer blood pressure measuring devices; treatment of primary breast cancer; steroid receptors in breast cancer; intracocular lens implantation; estrogen use and postmenopausal women; amantadine in prevention and treatment of influenza; microprocessor-based "intelligent" machines in patient care; removal of third molars (the 1979 series); thrombolytic therapy in thrombosis; febrile seizures; adjuvant chemotherapy of breast cancer; the Pap smear in cervical cancer screening; Caesarian sections in childbirth; and endoscopy in upper gastrointestinal bleeding (the 1980 series).
technology assessment. In some instances, agencies have long carried on tasks that they might not identify as technology assessment but that, in the aggregate and in the present context, might qualify as technology assessment. This brief overview cannot convey the rich variety of assessment activities carried on by these agencies.

Apart from NIH's support for clinical trials and consensus development, the major actors in the Department of Health and Human Services (DHHS) have been the Food and Drug Administration, the research arm of the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA), and the National Center for Health Services Research (NCHSR). In past years NCHSR has studied computer applications in health and examined new technologies relevant to the organization and delivery of health services; in the future it may assess a variety of technologies related more directly to patient care.

The Health Care Financing Administration (HCFA), although not directly involved in assessments of technologies such as drugs or devices, has a primary interest in the evaluation of systems through which medical technologies are deployed. It is a primary consumer of information about medical technologies because it is responsible for making decisions about Medicare and Medicaid coverage and reimbursement policies.

The National Library of Medicine provides extensive services for the dissemination of information about medical technologies (NLM, 1980). Of these, Index Medicus and MEDLARS are probably the best known.

Passage of P.L. 95-623 in 1978 (an amendment to the Public Health Service Act) created a more visible federal involvement in this field: the National Center for Health Care Technology. NCHCT has two main purposes: (1) to undertake and support systematic assessments of health care technologies and related research, demonstrations, and evaluations; and (2) to coordinate the diverse DHHS efforts in this field. Its activities encompass both "multifaceted" evaluations of high-priority technologies and limited scientific and medical evaluations (upon request of HCFA) regarding the safety and effectiveness of technologies about which HCFA must make

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3Until 1980, the Department of Health, Education, and Welfare.
4A more detailed discussion of the Library and the MEDLARS system as they relate to technology assessment in medicine will be presented in the final report of the OTA study.
5NCHCT has also begun to sponsor periodic Technology Assessment Forums that examine economic, ethical, legal, and social issues pertaining to specific technologies. To date, Forums have been held on dental radiology, computed tomography scanning, coronary artery bypass surgery, and maternal serum alpha-fetoprotein in the detection of neural tube defects; one is also scheduled for end-stage renal disease (NCHCT, 1980).
reimbursement decisions. At this writing, NCHCT's future as a separate DHHS agency is in some doubt because of possible departmental reorganization and funding cutbacks.

SUMMARY

Technology assessment includes a wide array of investigative activities involving any and all new, existing, and potentially outmoded services used by health professionals in the delivery of medical care. One can specify at least four major elements in medical technology assessment: identifying technologies needing investigation; carrying out the assessments; synthesizing information gained; and disseminating such information to different types of users, including (especially) practicing physicians. Several federal agencies currently participate in technology assessment.

The major emphases of technology assessments in medicine are typically considered to be safety, efficacy (or effectiveness), and cost-effectiveness (or cost-benefit), with growing attention to ethical, legal, and social implications. A principal target of information from such assessments is the medical profession, because clinicians decide whether to employ a new technology or to drop from their practices a technology that evidence shows to be out-of-date or unsafe. Thus, a critical element in efficient and effective medical technology assessment is how information pertinent to such studies is transmitted to and from practicing physicians. Professional institutions and associations, including established medical peer review organizations such as Professional Standards Review Organizations, may play a key role in this information transfer.
III. INFORMATION FLOW IN MEDICAL TECHNOLOGY ASSESSMENT

INTRODUCTION

Before any new idea results in clinical acceptance or use by physicians, several steps must first occur. Broadly speaking, these fall into two classes: the generation and analysis of research data, and the synthesis and dissemination of research results (HEW, 1976; Comroe, 1978). Information pertinent to technology assessment can follow two routes. First, data (inputs into assessments) and related analyses are in a sense transmitted "upward" from the researcher (or practitioner) to a level that is responsible for further analysis and synthesis. Eventually, these assessment results follow a second route of interpretation and dissemination "downward" to the practicing physician. The underlying assumption is, of course, that the information will be understood, internalized, and acted upon so as to change behaviors in ways that improve medical practice (or reinforce good practices).

In theory, then, a medical technology assessment "loop" might be said to exist, one in which the medical community has a pivotal role. This loop, it should be emphasized, is embedded in multidirectional information flows, simultaneously operating communications processes, and a complex social system of medicine. Moreover, little or no theoretical or empirical literature is yet available by which satisfactorily to characterize this broader information system, or the dynamics of information transfer about, innovation in, and diffusion of medical technology. (See Rettig, forthcoming, for an elaboration of these points.)

Our bidirectional model of information dissemination/generation in technology assessment is, thus, greatly oversimplified. However, it will help us examine the potential roles that physician peer review institutions such as Professional Standards Review Organizations (PSROs) might play in the transfer of medical technology assessment information. An "upward" flow of information from the field includes identifying research problems and gathering data for analysis and interpretation, and we have hypothesized that (at least some) PSROs can carry out these tasks in ways that complement or supplement existing data collection activities. To date, little thought has been given to this kind of function for PSROs, so there is a paucity of theoretical or conceptual literature on the topic as it might pertain to PSROs. Concurrent OTA studies on different assessment methods (and atten-
dant data needs) should clarify these issues, and we return to the point in Chapter V.

This chapter examines the "downward" communication of assessment results to medical practitioners and the role that PSROs might play in that process. Dissemination of technology assessment information can be understood within the context of theories related to communication and diffusion of innovation. The remainder of this chapter presents a description of how information about medical technology diffuses to physicians, and highlights the factors that promote implementation of suggested changes in medical practice. Understanding those factors should be useful in understanding what role PSROs might have in effective information transfer.

DISSEMINATION OF TECHNOLOGY ASSESSMENT INFORMATION TO PHYSICIANS

Change in medical practice is an evolutionary process. New technologies evolve, some altering practice in dramatic ways; established ones are discarded. Practicing physicians see many changes made to the corpus of medical knowledge during their medical careers.

Physicians are often left to their own devices for updating their knowledge. In an ideal world, a competent, motivated physician maintains knowledge of the entire field of medicine, keeping up with the advances and revisions of medical techniques. Various forms of continuing education may be an integral part of this effort (McLaughlin and Penchansky, 1965; Stein, 1981).

Unfortunately, reality belies this ideal. Two decades ago, the medical profession was acutely aware of the constraints on physicians' capacities to stay informed of medical advances (Rutstein, 1961). In the intervening period, medicine has become even more specialized, and within specialties, the number and variety of new medical information sources have multiplied. Even today, important new medical facts or recommendations may not reach their intended audience (Stross and Harlan, 1979) or may be, rightly or wrongly, disregarded (Thomson et al., 1981).

One important dimension of this problem of information overload for physicians concerns their ability to assimilate a particular type of medical literature—that concerning the safety, efficacy, and cost-effectiveness of medical technologies. The use of outdated technology diminishes the quality of medical care and wastes money. The diffusion of new technologies into medical practice is believed to be an important (although not necessarily the primary) factor in the spiraling costs of
medical care (see, for example, OTA, 1978; Altman and Blendon, 1979; Fineberg and Hiatt, 1979; Banta and Behney, 1980). For these reasons, it is important to know how knowledge about medical technologies, old and new, reaches practicing physicians and affects their use of those technologies.

Little is known about the specific issue of disseminating technology assessment information to physicians. In part, this is due to the novelty of medical technology assessment itself. In this chapter, we outline a general conceptual framework by which to examine this issue—namely, the communication of and adoptive response to evaluative information. We then examine what the existing literature suggests about the relationship between these two dimensions—i.e., the nature of adoptive changes in medical practice, in response to the communication factors that affect it. Given an understanding of these relationships, we can later evaluate whether and how FSROs might improve the flow of technology assessment information to physicians.

A CONCEPTUAL FRAMEWORK FOR INFORMATION DISSEMINATION IN MEDICINE

Dissemination of technology assessment information to a community of physicians can be thought of as a communication process where the goal is to deepen the understanding of an existing practice and/or to accomplish a substitution or modification of that practice in favor of a different practice. This general framework emphasizes two concepts: information transmitted via a communication process, and some response. The subject of the communication process is a medical technology assessment, which includes implicit, if not explicit, recommendations for medical practice. Reactions to these suggested changes embody an adoptive response; this response can be to take up a new practice, drop one in use, or modify an existing technology (or to ignore the recommendations altogether).

We draw on three separate literatures in applying this simple framework to the problem of dissemination of technology assessment information in medicine. The first comprises sociological research on the diffusion of innovation in social systems (e.g., Katz et al., 1963; Coleman et al., 1966; Rogers and Shoemaker, 1971). This literature integrates multidisciplinary research on the adoption of new technological practices or innovations (e.g., the use of hybrid corn seed among Iowa farmers) to arrive at theoretical distinctions about the adoption of new technologies. However, it is deficient in several ways, mainly in that it gives insufficient attention to the communication process
(Kaluzy, 1974; Greer, 1977). To make up this deficit, we turn to a second literature, which is concerned with the effects of communication variables on attitudes and behavior (McGuire, 1969). While these first two bodies of work can suggest theoretical dimensions of the adoption and the communication processes, the medical context remains to be established. For this we draw on a medically oriented literature consisting principally of descriptive studies of dissemination and adoption of different medical innovations (e.g., Fineberg et al., 1978; Manning and Denson, 1979, 1980; Russell, 1979).

DIMENSIONS OF COMMUNICATION AND ADOPTION OF INNOVATIONS

Factors in Communication

We assume here a model in which communication about an innovation is antecedent to its adoption in the community of medical practitioners. Social psychological theory (e.g., McGuire, 1969) has long been concerned with identifying factors in the communication process that lead to changes in attitudes or behavior. This research has refined an early communications model proposed by Lasswell (Smith et al., 1946), which characterized the communications process as "who says what to whom, how, with what effects." Evolving from this simple model are five critical dimensions in communication and information transfer:

1. A source of communication, which is distinguishable into attributes, such as expertise or credibility.
2. A communication channel; i.e., a medium of communication such as broadcast or print media, or face-to-face communication.
3. A message, which is characterized by such attributes as its two-sidedness or emotional content.
4. An audience, who may differ in personal attributes.
5. Destination factors, which refer to the characteristics of the setting in which the communication is received.

The attributes of each dimension can be distinguished and compared as to their effectiveness in information transfer. For example, one relevant distinction is between sources that are professional (e.g., colleagues, refereed medical journals) and those that are nonprofessional (e.g., detail men or "throwaway" journals). Channels can be personal (e.g., radiologist vis-a-vis cardiologist) or impersonal (e.g., monthly
newsletters from professional associations). Responses to the *message* may depend upon the type of technology referenced; perhaps drug assessments change physicians’ prescribing habits more effectively than, say, surgical assessments change surgical procedures (McDermott, 1977). The point is that distinctions are possible for each of these factors, and as will be discussed shortly, the medical literature identifies communication distinctions that influence adoptive responses.

**Adoptive Responses to Technological Innovation**

Given the dissemination of information about a technology, a number of results are possible. Research on the diffusion of innovations (e.g., Coleman et al., 1966; Rogers and Shoemaker, 1971) has devoted considerable attention to characterizing the process of diffusion and acceptance of innovations—i.e., the nature of the adoption process. This literature has described adoption as occurring in *stages*. Although the names of these stages may differ among theorists, the following sequence is common to all accounts:

1. **Awareness**—in which the adopter first learns of an innovation and acquires some knowledge about it.
2. **Trial**—in which the adopter is persuaded to think about or try out the innovation on a limited basis.
3. **Decision**—when the adopter chooses to adopt or reject the innovation in practice.
4. **Confirmation**—when the adopter seeks reinforcement for his decision, and may reverse his decision if exposed to persuasive counterarguments.

These stages occur sequentially in what can be termed the "innovation-decision process" (Rogers and Shoemaker, 1971). The stage-sequence idea is important because it implies that factors influencing adoption of a new practice may have different effects at each stage. In a classic study relevant to the medical area, for example, Coleman, Katz, and Menzel (1966) found that commercial sources (direct mail; detail men) were named by physicians as sources of first knowledge about a drug, whereas professional sources (colleagues, medical journals) dominated as influential sources in their decision to try the drug.

**COMMUNICATION AND ADOPTION OF INNOVATIONS IN MEDICINE**

Thus far we have considered, on a theoretical level, some general dimensions of the communication of information about technology and
innovation and adoptive responses. This simple framework can be used to organize scattered research that has to do with communication about medical technologies and about their adoption and to expose gaps in our knowledge about these processes.

Medical literature on the dissemination and adoption of innovations is weighted toward studies of single medical technologies that are diagnostic or therapeutic in purpose. A large literature exists on how physicians learn about and adopt new drugs (e.g., Caplow and Raymond, 1954; Coleman et al., 1966; Worthen, 1973; Christensen and Wertheimer, 1979; Manning and Denson, 1980). The literature on specific devices or techniques is growing (e.g., Darrow and Bradford, 1977; Bunker et al., 1978; Fineberg et al., 1978; Manning and Denson, 1979; Russell, 1979). In contrast, little is known about communication about or adoption of complex medical procedures that may not involve drugs or hardware (e.g., psychotherapy). Whether dissemination and adoption patterns differ meaningfully among medical technologies remains an empirical question that may not be answered satisfactorily without prior refinement of the conceptualization of communication and adoption factors.

Among those types of technologies whose dissemination and adoption patterns have been studied, however, there is apparent consistency in the adoption sequences followed by physicians, and in the influence of communication factors on adoption. Researchers agree that there is a visible difference between awareness/knowledge of a medical technology and of the decision, however tentative, to use it (Bauer and Wortzel, 1966; Coleman et al., 1966). In practice, the crucial distinction is between communication outcomes that inform the physician about novel medical technologies, and those that influence physicians to act (Ferber and Wales, 1968; Zaltman et al., 1973).

Given this gross distinction between awareness/knowledge of a technology and the decision to act on that knowledge, one can examine which types of different communication factors promote implementation of a recommended change in medical practice. We might designate those communication factors that produce implementation as legitimizing factors.

Sources of Communication

Perhaps the most firmly established finding in research on dissemination and adoption of medical innovations is that physicians hear about new technologies from a variety of sources, but that only selected sources influence them to make changes in their practice. With pharmaceutical products, for example, both commercial and scientific/pro-
fessional sources make the physician aware of new drugs, but the latter play the predominant role in the actual decision to prescribe (Bauer and Wortzel, 1966; Coleman et al., 1966; Worthen, 1973; Christensen and Wertheimer, 1979). Additionally, while the most important source of new knowledge about improvements in medical techniques is the professional literature, physicians cite professional colleagues more often as sources they turn to when actual implementation of new procedures is contemplated (Fineberg et al., 1978; Manning and Denson, 1979, 1980). This is not to suggest that scientific sources and professional colleagues are entirely adequate or complete for translating research findings into medical practice (Stross and Harlan, 1979; Young, 1980; Kessner, 1981). However, when actual changes in medical practice have been retrospectively analyzed, this generalization holds.

Channels of Communication

Broad channels of communication and more individualistic personal contacts both serve as conduits for information about medical technologies. Face-to-face contacts are evidently more effective in legitimizing the adoption of new techniques, probably because of their greater immediacy and because their potential for actively involving the physician (see, e.g., Caplow and Raymond, 1954; Menzel and Katz, 1955/1956; Coleman et al., 1966; Worthen, 1973; Inui et al., 1976; Christensen and Wertheimer, 1979). Professional colleagues are potent legitimizing agents, and the most effective influence on physicians' implementation of new medical technology is professional, face-to-face contact.

The Communication Message

Little research has focused on the communication message, and its role is not well understood. Awareness of or implementation of an innovation in medical practice may well differ according to the direction of the message—i.e., whether it calls for adoption or rejection of a medical technology. Indirect evidence suggests that new practices are adopted in medicine more rapidly than old practices are discarded. Warner (1975), for example, has chronicled how "desperation/reaction" may lead to blind faith in and premature adoption of proposed medical innovations. Similarly, Chalmers (1974) describes four cases where procedures persisted in the face of discrediting data, such as the use of diethylstilbestrol (DES) for preventing miscarriages.

In addition to its direction, another aspect of the message that may
influence its acceptance may be the type of assessment communicated. Those based on randomized clinical trials, in principle, should be highly persuasive to physicians, yet the literature abounds with examples of how published results of controlled clinical trials failed to have any significant impact on clinical practice (e.g., Chalmers, 1974; Bunker et al., 1978; Fineberg and Hiatt, 1979). By contrast, a colleague’s anecdotal case history may produce a lasting change.

A final message factor concerns the particular technology referenced. For example, OTA (1976) developed a schema for medical technologies, distinguishing between a technology’s physical nature and medical purpose. Physical nature refers to whether the technology is a technique, drug, device, or procedure; medical purpose refers to whether the technology is preventive, diagnostic, therapeutic, organizational, or supportive. Arguably, information on technologies whose physical nature and medical purpose imply direct physician-patient interaction will be acted upon by the medical community more readily than would be the case for information about technologies involving other professionals (e.g., pharmacists) or nonmedical innovations (e.g., small computers). Also, whether the referenced technology is one that is relatively easy to adopt or implement (e.g., in a private office practice versus in a complex organization) will be an important factor.

The Communication Audience

Medical sociologists have given great attention to the "social" aspects of the communication and adoption of medical technologies, and generally conclude that personal characteristics of physicians mediate the influence of other factors on adoptive responses. A physician’s basic reaction to hearing about a medical innovation may be a function of numerous sociodemographic variables, the effects of which, singly or together, remain unclear. Physicians of higher status and greater prestige do tend to hear about innovations sooner (e.g., Coleman et al., 1966). These "cosmopolites" are also mentioned by their fellow professionals as influential sources on others’ medical practice. A more controversial issue is whether those people with greater prominence and prestige in the medical profession are likely to adopt medical innovations sooner than those of lower status or reputation. Although some claim this is not the case (Winick, 1961; Christensen and Wertheimer, 1979), the weight of evidence favors the proposition that higher prestige of practitioners and faster adoption of medical innovations are positively related (Menzel and Katz, 1955/1956; Coleman et al., 1966; Becker, 1970).

Even as physicians of higher professional standing tend to be
among the early adopters of innovations, those on the sociometric fringes tend to be laggard, with a slow and constant rate of adoption. However, these individuals may exhibit some tendency to be among the first to adopt riskier procedures (Becker, 1970). Therein may lie the key to the relationship between sociometry and adoption patterns: "personality" variables may be less interest as "main effects" than in interaction with other factors. In any case, implementation of any assessment-based change in medical practice cannot occur in the absence of awareness; the physician who is out of the mainstream of medical practice may present the best target for interventions intended to improve the use of medical technologies.

Communication Destinations

Variables relating to the situation or environment in which the suggested change is to take place also influence awareness and adoption of medical innovations. With simple diffusion, all evidence suggests that the adoption process is substantially different when the adopting unit is an organization rather than an individual. Even when the basic adopting unit is a single physician (more pertinent to the current context), the dissemination and adoption processes undoubtedly differ when the innovation occurs in a complex environment (such as a hospital) and when it occurs in, say, solo practice. For that matter, these processes differ by the level of complexity of the organization. Exogenous forces such as third party reimbursement or regulatory practices that impinge on the organization’s or the individual’s environment may also affect how quickly the medical community learns about or adopts a technology. Perceived risk may be an important situational variable.

These points suggest that one problem needing further study is how dissemination and adoption differ among practice contexts. Crucial to such study is the identification and better description of situational and environmental variables important to the dissemination and adoption of medical innovations, and a theoretical model within which they can be more thoroughly examined.

1For a broader treatment of situational and environmental factors in medical innovation and diffusion, see Mohr, 1969; Becker, 1970; Zaltman et al., 1973; Kaluzny et al., 1975; Warner, 1975; Greer, 1977; Russell, 1979.
SUMMARY

This chapter focused on the "downward" flow of information on medical innovation to practicing physicians (as differentiated from an "upward" flow of data about medical technologies). We distinguished between a process of communicating technology assessment information and an adoptive response to that information. Our review of selected research on the dissemination and adoption of medical innovations identified variables in communication and adoption germane to the dissemination of medical technology assessment information to practicing physicians.

Some established generalizations are pertinent to the dissemination of technology assessment information to physicians. First, the adoption process occurs in a sequence of stages in response to information about medical innovations; the most critical distinction among these stages is between awareness/knowledge of the innovation and implementation of it, whether on a trial or a more permanent basis.

Second, some communication factors are more influential in affecting the awareness and adoption of medical innovations. Although many sources increase the awareness of medical technologies among physicians, the factors that serve to legitimize adoption are limited. In general, legitimizing influences on the practicing physician must be colleagues of high professional standing, and these sources are most effective when they involve the subject in direct, face-to-face communication.

Third, a physician's personal and professional characteristics are likely to mediate whether a physician will hear about and choose to adopt a medical innovation. Physicians who are in the mainstream of medical practice, who engage in various forms of continuing medical education such as reading journals, attending conventions, and maintaining professional contacts, will be most likely to hear about (if not influenced to adopt) an innovation in medical technology.

Further research is needed, however, on how other factors influence the dissemination and adoption of technology assessment information in medicine. Several questions concern the message: Do dissemination and adoption differ for messages that urge adoption versus those that encourage rejection of a medical innovation? Do they differ by type of assessment methodology? The situational context in which dissemination and adoption occur is another crucial factor—dissemination and adoption patterns may differ in group versus solo practice, or when risk is involved. Thus, although something is known about the role of information sources, channels, and audiences in dissemination and adoption of medical innovations, a full exposition of all factors and their interrelationships requires more conceptual and empirical work.
IV. PROFESSIONAL STANDARDS
REVIEW ORGANIZATIONS

INTRODUCTION

The modern movement toward review and accountability in the practice of medicine is typically said to have begun in the mid-nineteenth century. During the Crimean War, Florence Nightingale studied processes and outcomes of care given to hospitalized British soldiers. At roughly the turn of the century and up to the First World War, Groves in Great Britain and Codman in the United States pioneered systematic efforts to assess outcomes of care for hospitalized patients. Simultaneously, reforms in medical education prompted by the Flexner report had as one purpose improving the quality of care delivered by physicians, although no quality assurance activity per se was built into post-Flexnerian changes in the structure and content of medical education.

After the Second World War, several landmark studies of the delivery of medical care marked a revival of interest in and study of these issues—especially works by Peterson, Clute, Morehead, Payne, and Donabedian. A grassroots movement among individual hospitals and clinics ushered in an era of more organized review activities. Some medical care foundations (pioneered in California in the mid-1950s) reviewed ambulatory and hospital care rendered by participating physicians to determine appropriateness and quality of care before authorizing payment by fiscal intermediaries.

Superimposed on this movement was the requirement built into the 1965 Medicare law that hospital-based utilization review committees be established as a check against overuse of Medicare-reimbursed services. By 1967, state Medicaid agencies were also required to establish equivalent utilization review procedures. Other peer review efforts also developed during the 1960s in the private sector, such as those of the Joint Commission on Accreditation of Hospitals (JCAH).

Another national effort comprised the federally funded Experimental Medical Care Review Organization (EMCRO) demonstration projects, which operated from 1971 to 1975 to determine if foundations

1The body of literature describing and documenting developments in quality assessment and assurance is extensive. Readers are referred to the following selected articles, books, and literature reviews of the past decade for more comprehensive coverage of the subject: Egidi, 1973; Harrington, 1973; Lewis, 1974; Brook and Williams, 1976; Brook and Davies-Avery, 1977; Christoffel and Loewenthal, 1977; Williamson, 1977; Williams and Brook, 1978; Donabedian, 1980; Sanazaro, 1980.
or other physician groups organized on an areawide basis could decrease unnecessary use of services. Roughly halfway through the EMRRO program the legislation establishing the Professional Standards Review Organizations (PSROs) was passed.

The remainder of this chapter describes selected elements of the PSRO program related to technology assessment. It will (1) highlight certain organizational factors that influence PSRO activities; (2) describe common emphases of PSROs; (3) comment on the relative success or failure of activities in those areas; (4) note recent changes in legislation and regulations governing the program; and (5) draw inferences about areas of potential PSRO activity that might be related to technology assessment. Because we recognize the possibility that the PSRO program may be phased out, or at least markedly trimmed and reoriented, we will attempt to emphasize those characteristics of the program that would likely be shared by any viable physician peer review organization.

In tracing the past and future course of PSROs, we assume the following:

1. PSROs may have useful functions to perform, especially in a world preoccupied with cost control.
2. As a condition of their future existence, one could reasonably argue that PSROs be evaluated on how well they maintain or improve the quality of medical care, which includes reducing unnecessary use of services.
3. More innovative use could be made of the strengths of at least the better PSROs, including their close relationship with local physicians and familiarity with local concerns; their access to nearly the entire spectrum of facilities and providers in their areas; their data collection, organization, and management capabilities; their success to date in performing review both within and outside the scope of minimum PSRO responsibility; and the perception among some in the medical community that PSROs are more knowledgeable, objective, and realistic in their expectations than in years past.

GENESIS OF THE PSRO PROGRAM

The PSRO program was established by one of many complex amendments to the Social Security Act (P.L. 92-603) enacted in 1972. Institutionally, PSROs were descendants of private sector peer review efforts such as foundations for medical care and first cousins to public sector organizations such as EMRROs. Their creation had been
prompted in part by the failure of the earlier hospital-based review committees to control adequately the use of inpatient services reimbursed by Medicare.

PSROs are responsible (see Sec. 1155) for assuring that services provided and paid for by federal beneficiary programs (Medicare, Medicaid, Maternal and Child Health) were medically necessary and of a quality that met locally determined professional standards, and that they were provided at the most economical level consistent with quality of care. PSROs were (and are) perceived in some quarters as essentially regulatory mechanisms for control of medical practice (see, e.g., Banta and Behney, 1980; Feldman, 1980; Haug, 1980). The Health Care Financing Administration (HCFA, 1980, p. 141), for purposes of considering the sociological and organizational elements influencing their effectiveness, characterized PSROs as "formalized externally authorized and mandated local physician organizations expected to function as a regulatory system exercising control via performance evaluations tied to financial and professional sanctions."

The PSRO statute itself, the legislative history, and any number of studies over the past few years (see, e.g., Ball, 1973; Havighurst and Blumstein, 1975; Caplow and Bahr, 1977; or Blum et al., 1977) make clear that the Congress primarily intended for the PSRO program to decrease the inappropriate or unnecessary use of services reimbursed through public programs. This goal, of course, has a significant quality-of-care dimension. Nonetheless, the underlying motivation for the PSRO legislation is widely perceived to have been the alarming rise in the cost of medical care at that time secondary to presumed overuse of services.

Even in the early years, however, the federal executive branch emphasized the quality-of-care aspect of the program, for several reasons: (1) To convince the medical profession to cooperate in an activity that essentially relies on voluntary support; (2) to create as favorable an environment as possible for successful implementation of the program; and (3) to reflect the prevailing attitude in the department that quality and cost containment should have co-equal status in the program.

In essence, those responsible for implementing the PSRO program at both the federal and local levels wished to stress quality assurance and yet were accountable to forces that had cost containment as their foremost goal. PSROs were evaluated according to how well they reduced unnecessary services and, especially, saved money—goals not necessarily compatible with obtaining physician cooperation. Congressional intent and subsequent oversight/evaluation (in the form of annual appropriations, if nothing else) led PSROs to emphasize cost containment even when quality assurance might have better reflected
concerns of PSROs' "natural constituency"—patients and physicians. Even recent official evaluations have concentrated more on cost containment (especially for inpatient care) than on PSRO impact on quality of care generally or on use of long term care, ambulatory care, and ancillary services.

STRUCTURE OF THE PSRO PROGRAM

To understand the potential role in technology assessment of peer review organizations in general and PSROs in particular, some knowledge of the organization of the PSRO program is helpful. The more important factors include: local orientation to practicing physicians; differing levels of maturity among PSROs; multiplicity of skills reflecting experience in educational, regulatory, and research activities; and complex financing and administrative relationships.

PSROs as Local, Physician-Oriented Institutions

PSROs consist of areawide groupings of practicing physicians who have taken the initiative to form a PSRO in response to and in accordance with federal statutes and regulations. They are separate, independent, nonprofit organizations currently located in 187 of 195 designated geographic areas of the country. These areas can be as big as a state or as small as a subsection of a city. On average, each PSRO area can cover about 1 million people, about 35 hospitals, and 2000 to 3000 physicians; the range of people and providers covered is quite large.

PSROs are physician-dominated organizations. As of late 1980, membership could be extended (at the individual PSRO's discretion) to nonphysician professionals with independent hospital admitting privileges (mainly oral surgeons). Other professionals and/or consumers may be represented on PSRO boards of directors. To carry out their many tasks, PSROs employ varying numbers of nonphysician staff, including administrators, data managers, review coordinators, abstractors, and the like.

Individual members pay no dues to belong to the PSRO, in contrast to the usual contributions required for membership in other professional groups such as local medical societies or specialty associations. Upwards of 50 percent of all practicing physicians in the country nominally belong to the PSRO in their area. Usually, only a small fraction of these members routinely participate in review or criteria-setting committees and other PSRO activities—a characteristic shared by all physician organizations.
PSROs can delegate some of their legally mandated functions to individual hospitals ("delegated" hospitals) judged to be capable of carrying them out. They must regularly monitor how well delegated hospitals perform, but they usually have no ongoing data collection or abstracting duties in such hospitals. PSROs perform all such tasks directly for nondelegated hospitals. Generally, PSROs have been encouraged (in part by budgetary incentives reflecting severe funding limitations) to delegate hospital review, although hospitals can choose not to be delegated. PSROs can withdraw such delegation from hospitals whose review committees cannot carry out their functions efficiently (within a set cost per review), effectively, and in timely fashion.

Stages of PSROs

Individual PSROs advance through a specified development process from "planning" to "conditional" to "fully designated." To be conditional they must meet numerous requirements established by HCFA (in response to various pieces of PSRO legislation) regarding activities undertaken. PSROs can remain conditional only for 72 months, whereupon they must be converted to full designation or terminated.2

Only a few PSROs were funded by 1974; not until 1977 were as many as half of the PSRO areas funded for review (i.e., in conditional status). As of mid-1981, there were 195 PSRO areas designated, and 182 funded and 5 unfunded PSROs. Of these, about 47 were fully designated and only 3 were still in the planning stage. The full program's history, then, is relatively short.

PSROs vary in the length of time they have been in continuous operation and in the experiences and skills they have acquired over time. We refer in this monograph, for instance, to "more mature" PSROs—meaning those PSROs that have been in operation for some years and have fulfilled the many requirements for continued funding and fully designated status. The point about maturity is important because the less well established PSROs could not in most instances be expected to undertake sophisticated technology assessment activities, whereas the more well established ones might be very interested in, and capable of, doing so. Moreover, if only "effective" PSROs are funded up to or beyond the currently contemplated FY 1983 date, those kept are likely to be these more mature ones.

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2The main difference between conditional and fully designated status lies in the process that would be used to terminate a PSRO. Heretofore, a formal hearing procedure has been needed to terminate a fully designated PSRO, but recent legislative recommendations by HCFA would allow the Secretary of the Department of Health and Human Services (DHHS) to apply conditional termination procedures to fully designated PSROs.
Common and Emerging Concerns of PSROs

**Hospital Utilization Review.** Given their organizational and legislative heritage, PSROs first concentrated on reviewing inpatient care provided in short-stay hospitals (see, e.g., Goran et al., 1975; Goran, 1979a). This emphasis was most likely to meet cost-containment objectives and was the simplest way to begin because hospital review mechanisms were better developed than were those for any other setting or service.

*Utilization review (UR)* in hospitals initially took the form of three main activities (not all of which would be adopted by all PSROs): pre-admission certification for elective hospital admissions; certification of admissions for nonelective admission within 3 days of that admission; and continued stay recertification for admissions that go beyond a certain length. A distinction is made between review done concurrently with an admission and that done retrospectively, as the timing of review can have implications regarding the services for which payment can be denied (and hence for the effectiveness with which PSROs can carry out their mission). The overriding objective of UR is to reduce the unnecessary use of hospital days, usually measured in numbers of admissions, length of stay, or, preferably, days per 1000 Medicare (or Medicaid) individuals.

UR methods have changed and improved greatly over the years that PSROs have been in operation. PSRO staffs have generally become more knowledgeable about how to carry out analyses based on data collected by or provided to PSROs. Some PSROs use fairly modern diagnosis-related groups (DRG) methods for data analysis and case-mix adjustment of such data when comparing the use of inpatient services among facilities.

Experience has shown that 100 percent concurrent or retrospective UR is probably unnecessary. Focused or periodic review may suffice, but the level of review needed to achieve the most cost-effective posture for the program is unknown. Generally, PSROs now “focus out” (i.e., do not automatically review) at least 50 percent of the admissions that in years past they would have reviewed. Part of the motivation to do so is experience with the impact of review, but part is simply a reaction to severe budget constraints that have made 100 percent concurrent review impossible to pursue. Criteria or variables for focusing review “in” or “out” vary widely by PSRO.

**Hospital Discharge Data.** Hospitals make available to PSROs a standardized set of information on all Medicare and Medicaid dis-
charges (when the PSRO is responsible for such review) regardless of
the fraction of those discharges actually reviewed. These data are
reported by the PSRO to the federal government on a quarterly basis by
means of the PSRO Hospital Discharge Data Set (PHDDS) magnetic
tape. The data set is essentially a string of records that reflects an
abstract of the hospital stay from the medical record. At the PSRO level,
this inpatient data base contains information about providers,
diagnoses (coded now according to the International Classification of
Diseases—9th revision—Clinical Modifications), procedures, and
patient characteristics. Provider and patient “identifiers” are not
decodable by the federal government.

For collecting data that are sufficiently complete, reliable, and
valid to meet medical technology assessment requirements, routine
procedures used by PSROs to complete the PHDDS tape are currently
insufficient and/or unsuitable. Some PSROs use their own staffs to
abstract or collect data, but this is unusual and costly. Others use
hospital medical record abstractors to record data on a PSRO form. Still
others accept abstracts done by private abstracting services on behalf
of hospitals, such as those done in coordination with the Professional
Activities Survey.

Continued experience with and refinement of the system and im-
plementation of computerized edits by the central PSRO office may in
time overcome some of these deficiencies. However, the system was
never intended or designed to provide data that might be used, say, to
investigate the cost-effectiveness of a medical technology. Thus, sub-
stantial revisions and upgrading of PHDDS procedures may be needed
to render the system suitable for technology assessment purposes.
Whether such changes would be an improvement from the program
administration perspective is an open question.

Profile Analysis. Profile analysis is a form of retrospective review
done by PSROs in which patient care data (aggregated by type of
service, physician, institution, or patient characteristic) are subjected

3The PHDDS system began in 1975 as part of the PSRO Management Information
System (PMIS); it has been revised and updated from time to time. (See the PHDDS
User’s Guide, July 1978, and PSRO Transmittal Nos. 28, 50, 57, and 90.) It is different
from the MEDPAR (Medicare Provider Analysis and Review) data set developed from
claims submitted by fiscal intermediaries, from which comes the so-called “20 percent
Medicare Discharge File.” The “PHDDS” and “20 percent sample” data systems were
compared several years ago, when PHDDS was not yet completely implemented; the
former appeared to produce lengths of hospital stay “different” from the latter (but not
necessarily erroneous). No major re-abstracting studies have since been done on the
reliability or validity of these data systems. Generally, the Medicare data from inter-
mediaries are believed to be fairly complete but to have very high rates (40 percent or more)
of missing or incorrect diagnostic and procedure codes. By contrast, PHDDS may be less
than a full accounting of Medicare (or Medicaid) admissions, but diagnostic and other
data are believed to be fairly accurate. (Personal communication: Dr. Mark Chassin.)
to analyses that will identify patterns of care. These can then be compared with, for example, past or present patterns in the area or region in which the individual PSRO is located and/or with national patterns. Because profile analysis requires more sophisticated data bases and analytic capabilities than were available in the early years of the program, this review has been a prominent feature of PSRO activity only in the past 2 to 3 years; the ability of PSROs to carry out profile analysis varies greatly. For some PSROs, however, it is a key element in identifying problems in the use of services and in setting objectives for reducing the use of services. Presumably it could be an important tool in PSRO technology assessment activities.

Medical Care Evaluation Studies. A third major type of hospital review activity conducted by PSROs is the so-called Medical Care Evaluation (MCE) studies. Until very recently, the number of MCE studies required of any one hospital in one year was determined by a formula that mainly involved hospital size, and the requirements were coordinated with similar ones for JCAH accreditation.

MCE studies focus more on quality of care than on cost containment. They can be done by a single delegated hospital or by a PSRO for a nondelegated hospital or on behalf of multihospital groupings. They are usually targeted on specific diagnoses or particular technologies (often procedures). Typically, full MCE studies constitute a lengthy process of identifying a problem, developing criteria or standards that specify adequate quality of care, examining relevant medical records, carrying out some educational efforts or sanctions to correct the deficiency, and finally, conducting a followup audit to determine if the problem has been rectified.

MCEs were superseded recently by Quality Review Studies (QRSs) (see PSRO Transmittal No. 100). QRSs have essentially the same purposes as MCEs, but they place more emphasis on documenting impact on quality of care and less on hospitals' fulfilling a rigid number of studies each year. They encourage a broader view of topics and methods and data collection from sources other than medical records. Because of their potential for flexibility in selecting problems for study, choosing data sources, and facilitating cooperative efforts, QRSs may also prove to be a useful tool in PSRO assessment efforts.

Other Review Settings and Emphases. Some PSROs, especially those with long experience in hospital UR, have moved beyond uniform, areawide concurrent review of hospital admissions and length of stay to take on utilization or quality-of-care review in other facilities or medical settings. They contract to do UR or other review for private firms and insurance carriers. Finally, they engage in activities that transcend utilization and quality-of-care review and fall into a category of health services research.
Ancillary services. For PSRO purposes, ancillary services are those related to a hospitalization except for room and board and nursing, dietary, or physician services—including but not limited to radiology, medications, laboratory tests, and so forth (see PSRO Transmittal No. 54). Some observers prefer to think of ancillary services in a broader context, and include those types of procedures, medications, etc. when provided in any setting. Ancillary services review by PSROs, which started as a set of 10 demonstration projects in 1977, has been carried on since by some PSROs as “special initiative” studies. Perhaps as many as one-third of the functioning PSROs have received such special initiative funds to implement ancillary services review within the past year or two, but budget constraints seriously limit this activity now. 4 Currently, HCFA is funding a contract to survey ancillary services utilization and to identify and measure factors that explain differences in ancillary services use among hospitals. The ultimate goal of this survey is to enable PSROs to be more aware of variations in ancillary services use and of the causal factors underlying such use, and to assist them in focusing their review procedures accordingly.

Ancillary services review is considered an important way to reduce the use of unnecessary services; it is also seen as a mechanism by which PSROs can improve quality of care. For example, some PSROs doing such review have looked at the tests routinely performed at the time of an elective hospital admission, for which both overuse and underuse of services can be an issue (see AAPSTRO, 1981). For more experienced PSROs, such ancillary services studies could fairly easily be extended into more formal technology assessments.

Long term care. Reviewing the use of long term care (LTC) facilities has increased substantially in recent years, partly because in 1977 PSROs were required (by P.L. 95-142) to take on LTC review to achieve fully designated status5 and partly because of the growing public awareness of deficiencies in care provided in some LTC institutions under Medicaid auspices.

LTC review is, if anything, more complex than inpatient review of short-stay hospital use. It involves a much larger number of facilities that are themselves quite divergent in character. Moreover, to the degree that persons in LTC institutions are elderly, suffer from complex chronic conditions, and have no family to which to return, they have needs that are notably different from persons in short-stay hospitals. These special requirements of LTC patients are just beginning to be

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4Further reductions in the PSRO budget for FY 1982 and beyond will markedly reduce ancillary services review, because (as explained later) special initiative funding comes from appropriated, not Medicare Trust Fund, dollars.

5This requirement was eliminated in 1980 by P.L. 96-499.
understood and publicly recognized (see, e.g., Kane and Kane, 1980; Vladeck, 1980).

A set of LTC demonstration projects in 15 PSROs was completed in the late 1970s and evaluated by Kane and his colleagues (Kane et al., 1979). In FY 1980, some 55 PSRO LTC projects were under way, but budget cuts have reduced this figure to fewer than 30 at the present writing. Little is known yet about how effective LTC projects can or will be in rationalizing the use of institutional care or improving the quality of that care.

Ambulatory care. Ambulatory care review is, as the term implies, review of the use and quality of services provided in various outpatient settings—mainly physician offices. It can encompass the full range of technologies used in outpatient medical care.

One set of PSRO demonstration projects in ambulatory care review was completed in the mid-1970s, with inconclusive results then as to their effects on the costs of care. Since then, a few PSROs have done various ambulatory care review projects. In FY 1979, an additional six demonstrations were funded to provide information to HCFA on the efficacy and efficiency of various ambulatory care review methods. "Shared health facilities" (sometimes known as "Medicaid mills") have been a particular target of these projects because of concern about serious overutilization of Medicaid services (see FY 1979 PSRO Annual Report to Congress).

Several factors account for the relatively slow progress in ambulatory care review, and some of these would have to be taken into account in any technology assessment function adopted by a peer review or physician organization like PSROs. First, ambulatory review is much harder to do than inpatient review because of the vastly larger number of sites and physician encounters that would need to be reviewed. Second, opportunities for meaningful cost savings in this sector are few because, in comparison with hospitalizations, outpatient care is not associated with large expenditures; thus, PSROs have had little incentive to emphasize such review. Third, at least some PSROs evidently judge review of private physician office records as likely to be threatening and objectionable to physicians. Finally, other constraints include relatively poorly developed methods, inadequate data bases (especially Medicaid), and very low budgets for such reviews. It should be emphasized, however, that with the exception of the second point, all these limitations would apply equally to any other institution or agency setting out to assess medical technologies in the outpatient sector.

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6In 1972, PSROs were not required to undertake ambulatory care review. In 1977, P.L. 95-142 stipulated that, within 2 years of being named fully designated, a PSRO take on ambulatory care review. This was reversed in 1980 by P.L. 96-499.
Private Review. Several PSROs across the country do utilization review for private firms or organizations on a contract basis. The number of PSROs engaged in this "private review" is growing dramatically. Close to one-quarter of the PSROs were engaged in such review as of 1980, and covered patients whose care was financed by private insurance companies, self-insured corporations, CHAMPUS, labor unions, and municipal governments. Anecdotal evidence suggests that the private sector often pays considerably more for such review (per review) than the current $8.70 per review target set for Medicare UR. The success of these PSROs (or separately incorporated analogues) in attracting private capital to do such review is an as-yet little appreciated fact.7

Research Activities. An ongoing multi-PSRO study on x-ray pelvometry provides a good example of how PSROs can and do cooperate in the design and implementation of large research projects, especially ones related to technology assessments. (For a more complete description, see Appendix C.) Pelvometry is an increasingly discredited obstetric procedure whose risks to a mother or fetus are not balanced by its potential benefits. There are only a very few indications for the procedure, but its use is still surprisingly widespread; variations in rates of use are not explained by hospital characteristics.

The central PSRO office initiated and is currently executing an experimental study (i.e., randomized controlled trial) in seven PSROs to evaluate different educational interventions intended to reduce the pelvometry rate in hospitals within each study area. The purpose of the study is to demonstrate in a rigorous fashion that PSROs can reduce the use of this service through a standard educational intervention. PSROs competed for the opportunity to participate in the study, and share responsibility for a variety of study design, administration, data collection, and analysis tasks. An outside contractor is responsible for certain overall design and management activities. Preliminary results are expected in early 1981, and the post-intervention data collection should be done by early or mid-1982.

Two sets of PSROs (Baltimore City (Maryland) and Multnomah Foundation (Oregon); Utah and Central Massachusetts) have also collaborated in studies of variations in hospital use for several conditions

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7The experience of the Area 23 PSRO in Southern California in doing private review for Blue Cross illustrates the impact that private review can have. Between 1979 and 1980, the PSRO reduced the average length of hospital stay by 1 day, with a 17 percent decrease in total Blue Cross hospital days; the hospital days saved more than paid for the review process. Moreover, the net dollars paid for hospital care by Blue Cross in that area decreased by 4 percent while the rise in inpatient payments in the rest of Southern California rose at a rate somewhat higher than the 1980 inflation rate. (Personal communication, Dr. John Waoberman.)
(myocardial infarction (MI), cataract surgery, gall bladder surgery). For the Baltimore City-Multnomah MI study, for instance, the PSROs collaborated closely in developing criteria and fielded a single data collection team that ensured uniform data-gathering methods. Generally, after adjusting for many variables (patient characteristics and severity of condition; hospital characteristics), length of hospital stay was seen to be longer in the eastern hospitals than the western. The differences might be explained in part by physician characteristics, although exactly what physician variables (such as being in a medical rather than a surgical specialty) accounted for the findings still needs investigation.

Other examples of health services research efforts could be cited as well. The point is that numerous PSROs have been and are currently involved in a variety of activities that, with some modifications (or simply changes in definition), could become medical technology assessments.

**PSRO Financing and Administration**

Funding and operational/institutional patterns for PSROs are very complex and have changed over time. The following description highlights only the major elements in their financing and administrative arrangements.

**Financing.** Congress appropriates PSRO monies in several line item categories. The most important line items are direct costs; hospital review (both delegated and nondelegated), concurrent review, and quality assurance; long-term-care review; and special initiatives and ambulatory-care review.

Since 1977, hospital review has been financed separately and directly from the Medicare Trust Funds; the Medicare share of program overhead is handled by a transfer from the Fund to general revenues. A payment to the Fund covers the share of reviews that are Medicaid’s. The remainder of the PSRO funding is thus a congressionally appropriated budget outlay from general revenues. The monies for delegated hospital review flow directly from the Trust Funds to the delegated hospital as part of its allowable cost under Medicare reimbursement; all other funds go to the PSRO.

Fiscal Year 1980 budget appropriations were as follows: direct PSRO costs (including HCFA/PSRO staff), $40.5 million; long-term-care review, $11 million; special initiatives, $3 million; and other line items, $4.1 million. Hospital reviews were just under $96.6 million.

PSROs are funded through grants from the Health Standards and Quality Improvement (HSQR/HCFA/DHHS) to the nonprofit physician
groups. Grant periods are typically one year, and grant reviews and awards are made throughout the fiscal year. Budget allocations are made to each of the 10 federal regions by the central PSRO office partly on the basis of an annual target unit cost for hospital review (currently $8.70/review); this target cost is based on projected annual federal discharges and includes adjustments for very high (or very low) hospital utilization. PSROs in turn negotiate with delegated hospitals regarding the latter's review budget.

PSROs have four-part budgets that differ somewhat from congressional line item appropriations. Part I includes management and support costs and special initiatives or review activities outside short-stay hospitals (e.g., long-term-care, ambulatory-care, and ancillary services review). Part II costs are areawide review expenses (developing criteria, profile analysis, data processing, supervising hospital review). Part III is nondelegated review, including quality review. Part IV is delegated review.

PSROs can tap other sources of funds. The most relevant sources for technology assessment purposes are conventional research grants or contract mechanisms. PSROs (or affiliated organizations) engaged in "private review" are paid directly by firms or intermediaries in the private sector, but those monies would not be commingled with public funds.

This budget pattern has several implications for PSROs' participation in technology assessment. It is not easy, for instance, to characterize in congressional budget terms how program monies are allocated and spent across PSROs, because of the numerous activities that could in theory be supported from more than one source. For example, PSROs presumably could view criteria-setting for special studies of ancillary services done in nondelegated hospitals as related to Parts I, II, or III of their budgets; the relevant budget line items would differ depending on the Part chosen. Given a complex arrangement of this sort (and assuming no changes in budget categories), it is hard to know precisely how much is really spent on UR and how much on other activities (e.g., quality of care). If PSRO efforts in technology assessment were financed in a similar manner, it would be difficult several years from now to evaluate the cost-benefit or cost-effectiveness of those efforts.

Administration. Over the years, administrative responsibilities for PSRO program oversight have been decentralized to the 10 DHHS regional offices. As of mid-1980, these offices were responsible for interpretation and enforcement of program regulations, policies, and guidelines (HSQB, 1980). Their most important authority is to negotiate grant budgets and to evaluate PSRO performance with regard to re-funding. Regional offices can also initiate special studies involving several PSROs—a point that can be important in contemplating multi-PSRO technology assessment studies.
The 10 regional offices have been responsible for markedly different numbers of PSROs, and have developed a variety of methods for evaluating them. Some have used objective and explicit scoring systems; others, site assessments and implicit evaluation criteria. Experience with this decentralization of evaluation has not accumulated for a long enough period to allow any firm conclusions to be drawn as to its effectiveness. It would probably complicate PSRO involvement in technology assessment, especially if national samples of PSROs, standardization of study design, and long-term cooperation are needed in such assessments. If the PSRO program survives in more or less its present form (or with fewer PSROs), more standardized evaluations and better central office direction might overcome these problems.

**Institutional Relationships**

The rather complicated sets of relationships that PSROs have with HCFA, Medicare fiscal intermediaries, state Medicaid agencies, and Medicaid fiscal agents are germane to medical technology assessment. They impinge most directly on the ways that PSROs can have a lasting and meaningful influence on the use of services, especially hospital days, through their UR procedures.

PSROs are evaluated in part on how successfully they curtail the use of unnecessary services. The sanctions they can invoke to prompt changes in, for example, hospital admissions or lengths of stay (a) influence how they will eventually be evaluated and (b) are determined in part by their legal or administrative arrangements with other institutions in the health sector. To the degree that PSROs have become fairly sophisticated in developing viable institutional relationships, they could be expected to be able to participate successfully in medical technology assessments. The brief description below of three important regulatory characteristics of the PSRO program is intended mainly to illustrate that PSROs can operate in a fairly complex world not unlike the one that would be encountered in doing technology assessments.

One important regulatory tool for PSROs is the power to make "binding review" decisions. Binding review essentially means that a fiscal intermediary may not pay a hospital claim (or part of it) when the PSRO denies it on the basis that the services are not medically necessary; conversely, the fiscal intermediary must pay the claim if the PSRO certifies the services were necessary. For Medicare, the fiscal intermediaries are contractors of HCFA, and the decisions PSROs make about Medicare claims are binding on the intermediary (subject to caveats about waivers and coverage explained below). For Medicaid,
the PSRO must have a signed Memorandum of Understanding (MOU) with the state Medicaid agency or fiscal agent before its decisions are binding on the agent. (For other than hospital review, separate MOUs may be needed.) Virtually all PSROs (except some that are mainly in California) have such MOUs for hospital review.8

Traditionally, hospitals have been assumed to have a favorable "waiver of liability" status, such that unless the hospital knew or could reasonably have been expected to know that the care it was providing was unnecessary, the costs of that care would be reimbursed and the hospital was not financially liable. One way to encourage hospitals to attend more carefully to whether they are providing unnecessary care is to revoke this waiver of liability—in the vernacular, to "pull waiver"—thereby putting the hospital at risk financially for unnecessary days of care or services provided to inpatients. Currently, a PSRO can only recommend to a fiscal intermediary that a hospital's waiver be revoked; the authority to do so resides with the intermediary.9 Not all PSROs use this "pull waiver" strategy as fully as they might, but anecdotal evidence from PSROs around the country suggest that they are becoming more aware of its potential and more skilled at invoking it.

"Coverage" potentially conflicts with medical necessity as the governing criterion for payment decisions. Basically, if a service is not covered by Medicaid or Medicare (as determined in the latter case by HCFA, sometimes with medical and scientific information from the National Center for Health Care Technology), the fiscal intermediary cannot pay for it even if it is deemed medically necessary by the PSRO. This policy on resolving the gray zone between coverage and medical necessity seems to be evolving: Payment decisions in which it is possible to say that a particular service is never covered will be administered by the fiscal intermediary, and those in which some medical judgment is to be applied will be handled by the PSRO.

8Strictly speaking, PSROs also obtain MOUs from Medicare fiscal intermediaries, but the relationship is much less politically sensitive with Medicare than with states and fiscal agents in the Medicaid program.
9The waiver of liability pertains to days of care for which payment is denied retrospectively. "Grace" days to allow reasonable discharge arrangements to be made may still be reimbursed. These waiver provisions apply only to the Medicare program, not Medicaid. Analogous wording about holding hospitals "without fault" appears in the PSRO law and is applicable to both Medicare and Medicaid, but the necessary regulations have not yet been published. No waiver provision appears in the Medicaid legislation, meaning that retrospective PSRO denials can, at state option, be converted to payment denials. No distinction is made between decisions by delegated hospitals and those made by PSROs for nondelegated hospitals.
ACCOMPLISHMENTS OF THE PSRO PROGRAM

In its comparatively short existence, the PSRO program has pursued many objectives and tasks, the most visible of which have been those related to utilization and costs of hospital care. Unfortunately, the program has not produced the desired reductions in hospital stays or costs of federal health programs such as Medicare. Evaluations of the UR part of the PSRO program (see, e.g., OPEL, 1977; Chassin, 1978; CBO, 1979, 1981; HCFA, 1980, or GAO, 1980) are in some ways contradictory and incomplete, but they suggest the following conclusions.

In some areas with a PSRO, inpatient use was curtailed slightly (more in the Medicare than the Medicaid program) relative to areas that did not have a PSRO; this was true mainly in the northeast, where the underlying trend in hospital days was upward. Nationally, PSRO review has been associated with between 1.7 and 2 percent fewer days of hospital care per 1000 Medicare eligibles. (The positive effects in some cases, however, occurred in PSRO areas where the secular trend in use of hospital days or length of stay was downward, meaning that it is difficult to know what effect to attribute to PSROs.) A controversy persists as to how to value the hospital days "saved"—i.e., in what context should one estimate a benefit/cost ratio for PSRO review. If the days not used are valued as dollar savings to the Medicare program, for example, the benefit/cost ratio of PSRO review is greater than 1; conversely, valuing those days as dollars saved to society as a whole leads to a ratio less than 1. Whether any meaningful cost containment can be attributed to PSROs remains problematic, and depends on the metric by which PSRO UR activities are judged. In short, the program may have saved about as many resources as it consumed, but by itself has certainly not produced substantial cost savings or reduced the need for additional efforts to lower costs in the medical sector.

One important point about most PSRO evaluations is that they are, as a class, rather narrowly focused. Despite all the activities that PSROs undertake, the CBO, HCFA, and GAO evaluations of the program devote their attention largely to the cost-effectiveness of admission and continued stay review for the Medicare population. This focus slight the possible impacts that PSRO review may have had on, for instance, use of ancillary services, the intensity of service that the Medicare population receives, or quality of care. It also ignores the possibility that the effect of some PSRO review activities may be to increase (legitimately) the use of previously underused services.10

10This unidimensional approach to evaluating the PSRO program is reflected in the justifications put forth by the present Administration for phasing out the PSRO program by FY 1983 and in the interim for funding "only those PSROs judged most effective in controlling health care costs." See White House, 1981, pp. 8.22-8.23.
The 1979 HCFA evaluation did provide evidence that MCE audits in selected PSROs improved care for diverse conditions such as pneumonia, asthma, and tonsillectomy and adenoidectomy (although for some subjects, MCE audits were associated with unfavorable changes). Some data presented supported the contention that the dollar values of health benefits of MCE studies outweighed the costs of carrying them out.

A report of an American Association of Professional Standards Review Organizations Task Force (AAPSRO, 1981) described the effectiveness of the PSRO program with narrative presentations that highlight multiple examples of specific impacts of PSROs on quality of care across the nation. These include impacts in acute hospital care, in the ambulatory and long-term-care settings, and in the use of ancillary services. Examples included reducing services provided by truly substandard physicians (e.g., hospitalizations, surgical procedures) and increasing the provision of necessary services that had previously been slighted (e.g., preoperative visits by anesthesiologists; more complete use of appropriate diagnostic tests for various conditions). Improvements in quality of care ranged broadly: better diagnosis and treatment of acute myocardial infarction (heart attack); reduction of inappropriate use of blood transfusions; provision of correct antibiotics.

Much of the problem in documenting these types of effects lies in their anecdotal, not-easily-aggregated nature, a difficulty that is somewhat exacerbated by relative inattention to quality-of-care evaluation on the part of central authorities and the relatively undeveloped state of quality-of-care assessment compared to the field of health economics. Furthermore, quality-of-care variables do not lend themselves readily to evaluation by a cost-effective or cost-benefit metric.

Existing PSRO program reviews also tend to ignore the program's effects on the Medicaid population, mainly because of the relatively poor quality of data available on Medicaid patients in the past. These data problems can be expected to improve, however, as Medicaid program and data systems studies now contemplated by HCFA come to fruition.

FUTURE ISSUES FOR PSROs

National Quality-of-Care Criteria

There has been little or no movement toward establishing formal national quality-of-care criteria in the program, although the topic has
been hotly debated for years. Some observers assert that the medical profession would be quite hostile to federal government standards or criteria, for various reasons: (1) Such criteria might impose practices and procedures not in keeping with local custom. (2) They might not be flexible enough to take into account either local factors (such as the availability of nursing home beds) or individual patient characteristics. (3) Alternatively, if they were detailed enough to encompass many such factors and characteristics simultaneously, they might be so complex and cumbersome as to be wholly impractical to apply. (4) They might be used as grounds for malpractice suits, or have the perverse effect of promoting overuse of services in a "defensive medicine" mode. (5) They might provoke physicians to opt out of providing care under Medicaid or Medicare auspices. (6) They might tend toward a "homogenized" lowest-common-denominator level of medicine. (7) Criteria that are sponsored or promulgated by the federal government may be viewed as abridging professional rights and obligations in the practice of medicine.

Other evidence suggests that the medical community welcomes guidance from professionals who have a reputation for sustained high quality work regarding widely accepted standards for good medical care. The existence and popularity of numerous special publications (e.g., the Medical Letter) and privately marketed abstracting services, and efforts on the part of professional organizations such as specialty associations to investigate appropriate modes of medical care, all confirm that practicing physicians do seek up-to-date and authoritative information about good medical practices. These sources (such as the diagnosis-specific criteria sets of the American Medical Association) give cues or guides to improving medical care; in some cases, they provide detailed criteria for appropriate use of particular procedures or tests or the appropriate management of specific diagnoses. The important point, however, is that physicians are more willing to accept "national" criteria that appear to come from within the profession than those that appear to come from government sources.

The issue is not likely to be resolved by or within the PSRO program or, indeed, by any large medical peer review institution any time soon. As discussed in Chapter V, one argument against any role for PSROs as a routine "pass-through" of "national" recommendations for good medical practice (based on technology assessments done under government auspices) is precisely the hostility of the medical profession to criteria viewed as arising from the federal government. By implication, the fate of national criteria that are promulgated as the result of sophisticated technology assessments without review or legitimization by practicing physicians would appear to be rather dim.
More Emphasis on Quality of Care

Whether PSROs have had or can have positive effects on quality of care has yet to be thoroughly examined. Sanazaro (1980) argues that MCE studies have not had much impact on the quality of care delivered, which he links partly to overuse of the medical audit approach and partly to the need to meet external requirements for such studies. Goran (1979b), although more positive about the future payoffs of MCE studies, echoes some of these points. Whether QRSs will answer some of these concerns is yet to be determined. As noted above, however, PSROs have undoubtedly had more beneficial effects in the quality-of-care arena than is usually recognized.

Relatively little attention has been given to whether and to what degree not providing certain services constitutes a serious deficiency in quality of care. Although numerous PSRO studies end up recommending more care, little is known about whether quality of care has thereby been substantially improved. Too little utilization may become a difficult issue in the future. For instance, prospective hospital reimbursement may have inherent incentives for providers to economize on services, and where economizing becomes underservice is an empirical question. The point is that that question may be an important future concern of PSROs. In a related vein, virtually nothing is yet known as to whether the substitution of more sophisticated and technologically advanced services (even if more costly) for traditional or obsolete services may eventually be, from a systemwide perspective, both efficiency- and quality-enhancing.

Five points can be made in favor of PSROs' taking on more responsibility for quality-of-care activities and their being evaluated on those grounds as well as on cost-savings grounds. These points, we would argue, also apply to the health sector generally and would be pertinent to health policymaking even if the PSRO program were to be abolished forthwith.

First, the ambulatory sector is the one through which most persons enter the health care system and in which most care is delivered. Countless studies have documented deficiencies in outpatient medical care even for common conditions (see Sanazaro, 1980; Covell, 1980; Lohr et al., 1980). Little, if any, immediate or demonstrable cost savings to the Medicaid or Medicare programs could be expected if ambulatory care were subjected to a UR-type program, but some, if not a great deal, of improvement in quality can be anticipated from pertinent quality assessment efforts in the outpatient setting. Simply knowing more

\[\text{\textsuperscript{11}}\text{The ability of peer review organizations to improve care given to disadvantaged populations is arguably a meaningful accomplishment from a social and ethical point of}\]
about what is happening in outpatient care would be an important beginning.

Second, society’s concerns with costs of medical care will persist. If the PSRO program (or a PSRO-like organization) continues to exist, there is no reason to believe that expanding their efforts in inpatient UR will have any greater effect on the net cost of services in the future than they had in the past, and other mechanisms will have to be tried. PSROs could be expected to continue to reduce the use of unnecessary services, however, and they may prove an important bulwark against serious underuse of services. Both of these functions have significant quality-of-care implications.

Third, the growing interest in more competition in medical care delivery—as one, if not the primary, means of controlling health care costs—is perhaps the most visible development on the health policy scene today. Market forces for health care may prove successful, over the long run, in controlling health care costs. Some schemes may have, however, inherent incentives to reduce the use of services to levels below what is optimal (e.g., if providers were to compete partially on price and skimp on services), even if packages of basic services are mandated. If this trend does emerge at least for the Medicaid and Medicare programs, quality of care may perforce have to be the dominant concern of many medical organizations in the years ahead (Brook and Lohr, 1981). In a recent article on future directions for PSROs, Smits (1981, p. 258) argued that PSROs could “become validators of the quality of care actually being provided to consumers . . . ,” a step that she views as a “sensible way to regulate ‘approved’ health-care plans” in a pro-competitive system such as that envisioned by various proposals before Congress that is also “most compatible” with the intention of legislation to reduce federal regulation.

Fourth, the general state-of-the-art of quality assessment and assurance continues to improve (see, e.g., Williams and Brook, 1978; Lohr, 1980; Donabedian, 1980). Data bases in both the inpatient and outpatient sectors are more complete, reliable, and accessible than was the case 5 to 10 years ago. In particular, data sets based on insurance claim forms have improved. We are more accustomed to using computers in such work, thereby extending both the analytic capabilities for quality-of-care studies and the generalizations derivable from them. Methods for evaluating both processes and outcomes of care have been improved and validated. Finally, achievements of some PSROs in curtailing the use of unnecessary services, disciplining substandard physi-

view. This achievement does not, on first analysis anyway, appear to have "redistribu-
tional" properties—i.e., care is not made better for the poor or elderly to the detriment of care for the nonpoor or nonelderly.
cians, mounting numerous approaches to the review of use of services, and acquiring access to local physicians have provided the experience necessary to take on quality review.

Finally, in the years since PSROs were first begun, the “field” of technology assessment, as applied to medicine, has become a force hardly contemplated in 1972. Its main concerns—safety, efficacy, cost-effectiveness—can be translated into "appropriate use of medical technology"; that concept is difficult to differentiate from the usual connotations associated with "good quality of care." Thus, by maintaining their historical concerns with reducing use of unnecessary services, controlling costs of care, and (especially) improving quality of care, PSROs (or future peer review institutions) can participate in the technology assessment movement to a degree not heretofore understood or exploited.

SUMMARY

PSROs have shown themselves capable of reducing the use of hospitals and other services in the Medicare program. They have at best been only modestly successful in reducing the costs of care to the federal government net of program costs, and it appears doubtful they have saved society any money. However, the evidence is growing that PSROs have been able to improve the quality of medical care. Achievements in this area have not yet received systematic evaluation using either national perspectives or cost-effectiveness criteria.

Technology assessment in medicine is inextricably grounded in quality-of-care concepts, even though it has a central concern with costs. One could argue, then, that PSROs have before them a notable opportunity simultaneously to contribute to medical technology assessment and to realize their own institutional goals to a degree not yet achieved. PSROs range broadly in their degree of maturity and the skills they bring to traditional activities such as hospital UR or quality-of-care review. Thus, they vary in the extent to which they might be able to participate in medical technology assessment efforts. The favorable prospects for PSRO involvement in technology assessment, and the limitations to that involvement, are taken up in the next chapter.
V. MEDICAL TECHNOLOGY ASSESSMENT
AND PHYSICIAN PEER REVIEW

MOTIVATIONS FOR THE STUDY

Medical technology assessment is concerned with the safety, efficacy, cost-effectiveness, and social, legal, and ethical implications of procedures, drugs, and devices used in the practice of medicine. Its goals are to further the use of appropriate medical technologies and to impede the use of inappropriate ones. Practicing physicians are the important audience for information from technology assessments, for they decide whether to employ a new medical technology in their practice, or to stop using a marginal or costly technology with which they may be comfortable. A better understanding is needed of how physicians learn about new technologies and stay informed about old ones, and about what persuades them to act in a timely and rational manner in response to such information.

Communication about medical technology is a complex, multidirectional process involving numerous sources of information to physicians, feedback loops among the medical and policymaking community, and many-faceted relationships among academic and practicing physicians and industry. For the purposes of this analysis and to simplify the discussion, we have described the process as essentially bidirectional: Information about customary practices and data on the costs and effects of medical technologies flow "upward" from the practicing physician to a level at which it can be analyzed, summarized, and used in making health policy, planning for medical research, issuing regulations, and the like. Information from technology assessments can be transmitted "downward" to the medical practitioner, as part of the process of continual assessment of and improvement in the delivery of health care.

In this monograph, we explore some ways in which an extant physician peer review organization—Professional Standards Review Organizations (PSROs)—might participate in this process. Several features of the more mature PSROs motivated such an examination. They have demonstrated an ability to change the practice behaviors of physicians. They have in place systems by which physicians can be reached in both impersonal and face-to-face contacts. They have substantial experience in implementing a variety of educational activities, in collecting and synthesizing program and research data, in negotiating working relationships with each other and with other agencies in the health sector,
and in communicating with local medical providers. Many have been increasingly successful at attracting private sector money for review activities similar to those now done on behalf of Medicare and Medicaid.

Considering the role that PSROs might have in technology assessment assumes that they have a future in the cost-conscious decade ahead. That future is admittedly uncertain. PSROs have not been judged successful in one important mission, large cost savings to the federal government. Within the past year, legislation to phase out the program, or to limit its funding to "effective" PSROs, has been proposed in Congress with executive branch support. The climate is not congenial to regulation, and PSROs are widely perceived as basically regulatory in purpose and effect.

Several arguments might be advanced as to why PSROs, or an analogous peer review effort, may nonetheless continue to exist. First, the UR procedures of PSROs have reduced unnecessary use of hospitals. Second, this change in utilization has saved the federal health programs (particularly Medicare) some money, although not as much as was initially anticipated. Third, through combining the use of sanctions and educational interventions at the local level, PSROs can tailor their approaches to improving physician practices more than other professional or governmental institutions can. Fourth, as pressures grow to control health costs through new, market mechanisms, a physician organization like PSROs might be needed to serve as a bulwark against underuse of services, to guarantee a level of care consonant with adequate quality, and to ensure that new forms of medical care financing and delivery do not place an unfair burden on the poor and elderly. Finally, even if the PSRO program were terminated, Medicare and/or Medicaid would probably still need a hospital utilization review effort. Thus, it seems reasonable to assume that PSROs, or organizations performing their functions, will remain on the scene.

METHODS OF THE STUDY

In our investigation, we reviewed the literature on information dissemination to physicians; obtained current descriptive information on the PSRO program; convened two intensive, two-day panel meetings of PSRO leaders from around the country; and held semi-structured

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1The panel meetings were held in the Washington, D.C., and Santa Monica, California, offices of The Rand Corporation in January 1981. They were organized around three broad topics: (1) opportunities for or limitations to PSRO involvement in technology assessment; (2) PSRO participation in downward dissemination of information derived from medical technology assessments to the physician community; (3) PSRO participation in upward dissemination of information relevant for technology assessments from
Interviews with leaders in the medical communications field. The remainder of this chapter synthesizes our findings and conclusions and presents four recommendations, three of which are program initiatives related to technology assessment that might be tested.

The discussion and recommendations presented later in this chapter maintain the distinction between downward and upward information transfer introduced in earlier chapters. Before turning to our positive conclusions and proposals, however, we comment briefly on the future of the PSRO program and discuss why certain "general" communication activities are not viable options for the program at the present time.

GENERAL ROLES FOR PSROs IN MEDICAL TECHNOLOGY ASSESSMENT

Recommendation No. 1: No Passive Role for PSROs

If PSROs continue to exist in some form, might they assume additional responsibilities, such as technology assessment activities? Based on results of the panel discussions and a consideration of the strengths and limitations of the program today, the answer is only a qualified yes.

A useful starting point is to consider if PSROs, within their current structure and mission, can or should (a) routinely disseminate government-generated information downward to practicing physicians, or (b) routinely collect and transmit clinical or other assessment-relevant data upward to the government. These propositions can be confidently rejected. According to PSRO panel representatives, neither the general dissemination of research results nor the simple gathering of research data would be of interest to PSROs; from the point of view of the needs of local medical communities, neither task would be practical for them to perform as a routine activity.

Our first recommendation, therefore, is that no effort be made to use the PSRO program for routine, passive information dissemination or data collection purposes related to technology assessments. No legislative actions or policy decisions to require the PSRO program to undertake a general information transfer role should be initiated at the present time. The main arguments for this recommendation are noted below.
First of all, many enterprises disseminate medical technology assessment information. PSROs have little comparative advantage as one more voice in an overcrowded arena of refereed journals, review publications, and compendia of reprinted information. (Appendix A discusses topics related to how the medical literature handles technology assessment information.) Second, PSROs would not be willing to act as a simple conduit by which other agencies or researchers could send information to physicians. Simple presentation of information (for instance, in the old "continuing medical education" mode) is viewed as a not-very-successful means of changing physicians' behaviors. Furthermore, medical information coming directly from federal sources is often seen by clinicians as insensitive and unresponsive to local needs, occasionally inapplicable to a physician's own practice, and a "cookbook" approach to medicine. PSROs do not wish their educational efforts to be similarly labeled. Finally, given restricted financing, PSROs have virtually no incentive or desire to allocate very scarce resources to an activity considered marginal to their continued success.

Using present PSRO systems for routinely gathering, synthesizing, or reporting data relevant to technology assessment is also not a viable option. The PSRO Hospital Discharge Data Set (PHDDS) (a major component of the PSRO Management Information System), for instance, does not provide data of the detail needed for national assessments of specific procedures. (Neither, for that matter, does any other extant national data system.) Moreover, Medical Care Evaluations (MCEs) or Quality Review Studies (QRSs), as presently conducted, are also unlikely sources of steadily reliable and valid information pertinent to technology assessment. QRSs and MCEs are done on local initiative, targeted to specific community problems, and involve highly individualized approaches to dealing with those problems. Further, PSROs currently have no program-wide, systematic mechanism for routinely collecting reliable and valid information from physicians' offices or other ambulatory care settings. (Again, except possibly for certain of the periodic surveys carried out by the National Center for Health Statistics (NCHS) and some data files of insurance claims submitted by physicians to fiscal intermediaries, there are no ongoing national data systems capable of providing information suitable for technology assessment of services delivered in private offices or other outpatient locations.) Finally, current PSRO budget constraints are a prominent obstacle to improving the present situation; most PSROs believe that program funding should be used for addressing their primary missions—expanding or improving utilization and quality-of-care review and building up capacities for review in long term and ambulatory care settings.

Difficulties in federal data systems are not unique to the PSRO
program. A recent OTA report (1979) described a wide range of deficiencies in federal health statistical systems, including duplication, fragmentation, and gaps in data; inability to link data systems; and unresponsiveness of data projects designed for one health program to needs of other potential users. Rettig (1980b) documented the lack of a coherent and reliable data base for the End-Stage Renal Disease program—a program that involves fewer than 100,000 patients. Some periodic surveys (such as the NCHS Health Interview Survey) do meet rigorous data collection and aggregation specifications; they do not, however, readily lend themselves to technology assessment per se, and they are not at all a mechanism for communicating information to physicians.

SPECIALIZED ROLES FOR PSROs IN MEDICAL TECHNOLOGY ASSESSMENT

As just discussed, routine data collection mechanisms used by PSROs are not in their current form a viable tool by which to do national technology assessment surveys or studies. Because of certain program features (described in Chapter IV), however, we concluded that (a) PSROs, especially the more mature ones, could under certain circumstances be a significant resource for technology assessment and that (b) their skills and capabilities could be exploited when national assessment activities are designed. These capacities include long-standing experience with medical record abstracting and audit procedures; long-term relationships with local physicians and facilities, including paraprofessional and administrative staffs; relatively easy access to computer facilities; familiarity with following standardized research protocols and analytic methods; collecting data in ways that fulfill rigorous specifications of reliability and validity; and experience in reporting research results. Not all PSROs, even the more sophisticated, are highly qualified along all these dimensions, of course, but neither are all of the physician organizations or associations (such as medical schools or specialty societies) that might be considered for this enterprise.

The barriers to adequate data collection from noninstitutional settings are formidable. To overcome them, PSROs may have one advantage not shared by most other governmental or professional agencies: the perception that they are oriented toward and concerned with the needs of the local practicing community. To the degree this is true, PSROs may be able to gain access to physician offices much more readily than, say, academic researchers or government officials. Nu-
numerous PSROs (such as the statewide PSROs) are quite large, and cannot be said to represent a cohesive "local" constituency. Even the statewide PSROs, however, share a perception that they would enjoy relatively better access to physician office records than would any other group able to undertake large data collection efforts in ambulatory care settings (including especially academic medical centers and government agencies).

One interesting observation of the panel members was that physicians active in PSROs would willingly take on such technology assessments in part because they would find them an important and interesting challenge. This is particularly true of the more experienced PSROs, which have in many cases already initiated various studies (generally as special initiatives or ancillary services review) that they believe fall well within the rubric of technology assessment. The multi-PSRO studies cited as examples in Chapter IV (which do not exhaust the list of such collaborative efforts) are strong evidence of this interest and capability.

Based on the foregoing considerations, then, our second and third recommendations are the following:

In designing national technology assessments that involve the collection and analysis of clinical data, the agency primarily responsible for the assessment should consider explicitly involving PSROs in the endeavor. Specific attention should be given to the expected strengths and weaknesses of the assessment if PSROs were given a significant role in it. The advantages and disadvantages of PSROs' data collection and analysis capabilities specific to technology assessment should be evaluated in comparison with those of major federal agencies that carry out periodic or ongoing data collection activities. These points are discussed briefly below.

Recommendation No. 2: PSROs in National Technology Assessments

Problem Identification and Screening. Despite our reservations about routine pass-through of PSRO data to technology assessment efforts, we judge that data now collected by PSROs could serve at least one crucial purpose for national efforts in technology assessment—that of problem identification. PSROs wishing to participate could provide an excellent mechanism by which to investigate whether problems exist in the use of a given technology at the level of local community physicians, or whether the problems that do exist appear to have any health or economic significance, before large-scale studies are begun. These PSROs could, in other words, serve as a screening mechanism for
identifying "problem technologies" and for helping other agencies to place priorities on what to study.

We are not suggesting that PSROs are the only or even the main source by which problem identification can take place. Appropriate analysis of data collected by other agencies through ongoing surveys could highlight patterns of use of technologies that might trigger more extensive assessments. Specialty societies could be canvassed; expert panels could be convened. Any number of other approaches could be considered. Our point is that many PSROs now have fairly systematic methods by which to uncover problem areas on the basis of data obtained on the practice of medicine in the community. One part of our second recommendation, then, is that their ability to contribute to problem identification, and to do so more efficiently and more quickly than many other organizations, be carefully examined.

Collaborative Assessments. Not all PSROs are either desirous or capable of implementing technology assessment projects. Some have been in operation for too short a time, and do not yet have the necessary staff capabilities. Others must concentrate on more pressing problems such as continued high hospital use. Still others may be terminated or consolidated with stronger PSROs if the national program is continued.

Nonetheless, based on the panel discussions and reports of PSRO capabilities in various publications, we estimate that between 40 and 60 PSROs today are in a position to contribute to various data collection or research activities related to technology assessment. Within the past 2 or 3 years, for example, 60 or more PSROs initiated one or more special initiative projects, often ones directly relevant to technology assessment topics, and 4 collaborated in two different cross-country studies of specific problems. Seven PSROs are currently engaged in the randomized controlled pelvimetry experiment. In short, perhaps 20 to 30 PSROs around the country could be regarded as an institutional nucleus with the capacity to carry out technology assessments meeting the most rigorous scientific specifications, and an equal number would be able to contribute to many types of studies initiated by, e.g., other PSROs, regional or central offices, or other health-related agencies. If the effectiveness of a given technology under ordinary conditions of practice (instead of under ideal conditions) is increasingly the concern of assessments, an institutional base that commonly deals with usual medical practice should be an advantage.

The second part of our second recommendation about PSRO partici-

3In the spring 1981 reevaluation of the PSRO program by HCFA, about 46 of 182 currently funded PSROs were found not to meet "minimum" organizational, management, or review criteria and were thus slated for termination. Our estimate of 40 to 60 represents about 30 to 40 percent of the remaining, nonterminated PSROs.
pation in medical technology assessment, then, is that the participation of selected PSROs in various assessment efforts be directly solicited. Alternatively, they might be encouraged to compete for grants or contracts underwriting the cost of such studies. In either format, PSRO participation in an assessment might be counted towards fulfillment of QRS obligations.

Recommendation No. 3: Comparative Study of Data Systems

In the present economic climate, large-scale data collection efforts strictly for medical technology assessment purposes seem improbable, especially when existing data systems often seem to be underfunded and understaffed. Even in an environment where significant resources are available, allocating them to data collection might be inefficient and undesirable. Thus, there are reasons for exploring the degree to which data already collected for other purposes might also serve technology assessment needs, recognizing, of course, that collecting data for one use and putting them to another carries a potential cost of lower reliability and validity.

Our third recommendation is that OTA (or another suitable agency) initiate a comparative study of data systems, so that suggestions might be made as to ways that existing systems might be improved, expanded, or modified to suit technology assessment purposes more effectively without undue harm to their original purposes. This proposed study would supplement and extend the earlier OTA study of federal health statistics systems, paying special attention to the issues of reliability and validity of data for assessment purposes.

Briefly, a comparative study might involve the following steps:
1. Identify the agencies that now routinely acquire national data on medical care practices and medical technologies. This would presumably include, at a minimum, the Health Care Financing Administration (apart from PSROs), National Institutes of Health, the National Center for Health Statistics, and the National Center for Health Services Research.
2. Determine the nature of the data collection activities and what potential exists for using them in technology assessments. Special emphasis could be given to comparison of the Medicare "20 percent sample" and the PHDDS file on Medicare beneficiaries, because they cover similar areas but have never been thoroughly compared. Attention could also be given to PSRO capabilities for collecting information from ambulatory settings as compared with, e.g., the NCHS Office Visit Survey or the National Ambulatory Medical Care Survey.
3. Design a special study to sample data relevant to technology assessments from these sources, and to evaluate them in terms of reliability, validity, comprehensiveness, timeliness, and other factors. Attention would be given to components such as diagnosis, specificity with which technologies could be identified, and provider and patient characteristics (but not "identifiers"). The evaluation would be conducted solely in terms of the needs and requirements of technology assessments in medicine.

In proposing such a study, we make three assumptions. The first is that top policymaking levels have some incentive to obtain high quality data for assessment purposes. The second is that a policy control mechanism is in place to convey the sense of need for good data downward to all relevant operational levels of government. The third is that, whatever means are finally adopted for obtaining systematic national data, a data quality control mechanism will be set in motion at the same time.

These assumptions, we recognize, can be vigorously attacked. The record of federal agencies in the area of the Medicare, Medicaid, and End-Stage Renal Disease data bases suggests that neither researchers nor policymakers should be sanguine about the validity of such assumptions. If the policy and operational commitment inherent in such assumptions is lacking, we see little value to implementing any data collection mechanism as an outgrowth of a study such as the one we have recommended.

On the basis of theories about information dissemination and adoption of medical innovations (Chapter III), existing knowledge about PSRO functions (Chapter IV), and outcomes of the PSRO panel discussions, we conclude that PSROs could transmit medical technology information to practicing physicians and affect their use of medical technologies, in circumstances where the PSROs actively participate in deciding how and what information is to be transmitted. Given that "legitimizing" influences are important to the speedy and widespread adoption of medical innovation—where innovation refers to any change leading to higher quality or more efficient and rational care—we postulate that "local" review efforts, including targeting educational interventions or sanctions, can legitimate standards of good medical care. Specifically, our hypothesis is that PSROs or similarly constituted physician peer review organizations could selectively apply technology assessment information through modification of their usual utilization-review and quality-of-care procedures to improve the use of medical technologies faster and more thoroughly than other information dissemination mechanisms presently accomplish.

The reasoning behind this hypothesis is discussed below, followed by the outlines of a proposed scheme by which it might be tested. The
discussion is oriented toward PSROs as they are currently constituted (or would be constituted if the number of PSROs were simply decreased); we recognize that if the program is restructured or terminated, this discussion would be less pertinent to the future health scene. But to the degree that some standardized peer review mechanisms continued to function across the nation, perhaps building on the present PSRO format, the points made below are relevant even in the absence of PSROs per se.

In general terms, we envision PSROs as having a capability for applying the results of technology assessments toward the following ends: eliminating the use of poor (unsafe, obsolete, non-cost-effective) technologies, slowing the diffusion of untested ones, and spurring the use of safe and cost-effective ones. This process of applying assessment results with the expectation of changing physician behaviors is referred to hereafter as assessment application.

In our view, assessment application has several components: (1) selecting technologies for assessment; (2) collecting and analyzing data about specific problems in the use of technologies in a local area (or in the entire country); (3) obtaining, synthesizing, and using technology assessment information (from federal, medical, and industrial sources) pertinent to those problems; (4) incorporating such information into locally developed medical practice criteria that are intended to improve the quality and/or efficiency of care; (5) carrying out those steps judged necessary by the PSRO to correct identified problems, which in all probability will include various information dissemination activities (particularly face-to-face meetings between PSRO and community physicians); and (6) performing monitoring and followup activities to ensure that problems are corrected in a timely and efficient way.

First, perhaps the most important reasons for suggesting that PSROs would be successful in assessment application are that their procedures permit them to identify specific providers (ranging from hospitals to individual doctors) who would be likely to benefit most from it, and that they can tailor their intervention strategies to those providers. Obviously, mechanisms other than PSROs exist for identifying problems in the use of medical technologies or for devising broad guidelines for use: Expert panels provide advice to many health agencies, for instance, and specialty societies develop diagnosis-specific criteria for good care. PSROs, however, carry out a more complex set of tasks.

They can (and do) identify problems in the use of technologies, set criteria for appropriate use that are accepted by the local medical community, implement relevant educational interventions, and, if necessary, invoke sanctions against poor or recalcitrant providers. They do so, moreover, by examining data on the local practice of medicine. No other organization has this data gathering and analysis capa
bility, which seems to us necessary for making at least some types of technology assessments. In changing medical practice, diffuse or impersonal methods of communication are likely not to be as effective as targeted, personal (often face-to-face) encounters that meet the needs and characteristics of different physicians.

Second, when local physicians review and synthesize technology assessment information, PSROs have a highly credible and powerful tool for encouraging physicians to improve their practices. PSROs are then in a position to argue directly to offending providers that their peers have developed guidelines for the use of a technology that are acceptable to the general medical community; by implication, a physician not observing such guidelines would be viewed as practicing in a manner inconsistent with how the community believes the technology should best be used.

Third, PSROs reach the great majority of practicing physicians (members or not) directly or through hospital staffs. PSROs can communicate with virtually all physicians in their areas (with the possible exception of doctors practicing in very unusual or individualized settings such as industrial or corporate practices). Thus, PSROs are in the best position to reach the physician who is out of the mainstream—the practitioner who is less likely to be aware of new developments and less likely to abandon a discredited medical practice or to adopt in a timely fashion a new or improved medical practice.⁴

Recommendation No. 4: An Evaluation of "Assessment Application"

Our fourth recommendation is that the feasibility of PSRO "assessment application" to modify physicians' use of medical technologies be evaluated in selected PSROs. Such evaluation research would permit the potential capability of PSRO efforts in this specialized form of technology assessment activity to be empirically assessed. The following 10 points outline a possible agenda for such research, reflecting ideas that PSRO panel members believed were feasible for a majority of currently operating PSROs to carry out. Following them is a brief discussion of the limitations to, and rationale for, such an evaluation.

⁴We recognize that most physicians in practice probably have ties to their local medical societies and/or specialty associations, from whom they may receive information related to medical technology and innovations. The point is that information from medical societies is likely to be of a very general nature, and information from specialty associations to be highly specific to that specialty. In neither case are these more traditional mechanisms likely to reach the isolated or outlier practitioner.
Research Plan: A Brief Outline

1. An organization can be established (or an existing entity selected) to serve as a coordinating committee, including (but not necessarily limited to) representatives from federal health agencies, PSROs, specialty societies, other physician associations, and third-party payors. Its budget and staff would come from funds other than routine PSRO budget outlays. This committee, or some other group, could serve as the overall "principal investigator" directing the study. An outside contractor would probably be needed for overall day-to-day management of the study. PSRO input into all phases of study design, data analysis, and reporting of results is assumed.

2. The coordinating committee and staff would survey major sources of information about recent changes in the status of medical technologies (e.g., within the previous year). These sources could include (but not be limited to) major specialty and general medical journals, abstracts submitted for presentation at research and clinical meetings, annual reports of medical centers doing basic exploratory or developmental work in emerging medical technologies (e.g., nuclear magnetic resonance), and materials from private industries that market medical devices or drugs. On the basis of such information and syntheses, the committee will identify a number of medical technologies as potential topics for study. Selection criteria would include a potential or known large effect on the costs of care or on health status. Priority could be given to topics already identified by other agencies such as the National Institutes of Health, the National Center for Health Care Technology, the Office of Technology Assessment, or the Institute of Medicine.

3. PSROs in conditional or fully designated status would then be recruited to participate in an evaluation of the effects of assessment application of specific technologies on local medical practice. PSROs that volunteer to participate in this effort would be asked to rank these "identified technologies" according to criteria of interest and feasibility of application. PSROs would rank these technologies with the provision that they might be selected to investigate several of them as part of a research study. Participation in the study in any one year might be viewed as partial completion of QRS requirements.

4. Based on PSRO rankings, the coordinating committee would select a subset of medical technologies (say, two or three) as subjects of an initial round of assessment application evaluation. These technologies can be selected according to several attributes of interest concerning the type of technology and where it is located along the diffusion-development continuum. Examples include an outmoded procedure, a new diagnostic technique that assessments suggest should be
more widely adopted, or a new drug that does not appear to have any meaningful comparative advantage over established drugs. At first, technologies that PSROs rank high with respect to interest in and feasibility of studying might be selected. Such a restriction would permit evaluation of PSRO capabilities under a set of favorable circumstances. Should PSROs prove successful in influencing medical practice under these conditions, later rounds of research might be conducted to evaluate assessment application under more varied circumstances.

5. Participating PSROs would then be randomly assigned to a control or a treatment group. Some stratification could be done on the basis of organizational and demographic characteristics (as was done in the PSRO pelvimetry study, for example). PSROs assigned to the treatment group would receive a detailed synthesis of existing information on the appropriate use of the technologies selected for study, complete with whatever formal recommendations about its use might have been made by professional or governmental bodies. This synthesis could be part of the materials developed by the coordinating committee. PSROs assigned to the control group would receive no such material from the coordinating committee.

6. A survey of how physicians acquire information about medical innovation should be independently conducted in the treatment and control PSROs. Such a survey could provide: (1) direct empirical evidence on how physicians learn about medical technologies and technology assessments; (2) some indication about the comparative effectiveness of impersonal sources (such as the medical literature) and personal sources (such as professional colleagues) in changing physician attitudes about the use of a technology; (3) data by which differences in physician information-gathering habits between treatment and control PSRO areas could be statistically controlled, allowing the effects of PSRO assessment application to be measured independent of these influences.

7. PSROs in the treatment group would be expected to carry out studies of the appropriateness of use of these technologies. They would (a) investigate and document the degree to which these technologies were under-, over-, or misused in their areas, using information either readily available or specially collected; (b) set utilization and quality-of-care criteria through a modification of their usual procedures, explicitly involving development and review by local physicians, and (c) pursue their customary educational and sanction activities.

Control PSROs would not undertake any special efforts directed at the study technologies over the period of the study, except that a "baseline" data collection effort analogous to that conducted by treatment PSROs would be performed. Of course, information of various sorts on the study technologies will reach physicians in the control PSRO areas,
in the numerous ways that information reaches them now. We do not view this as a serious contamination of the results of the study, however, because the question of interest is whether PSRO assessment application has a measurable effect on changing physician behavior over and above usual mechanisms of information dissemination about medical technology.

8. At the end of a specified period of time (probably 9 to 12 months), an independent data collection effort would be carried out in both treatment and control PSROs. This could be done by a consortium of nonparticipant PSROs, by an outside contractor, or by a federal agency. The object will be to obtain data on actual use of the technologies within the local physician community. In particular, data would be collected that would allow conclusions to be drawn about whether treatment PSROs did or did not cause significant changes in the desired direction in the use of the study technologies, compared to control PSROs that had neither received special information nor engaged in any efforts with respect to those technologies. Also, data would be collected within treatment PSROs that would independently validate the extent to which they had engaged in assessment application activities. Special attention would be given to the costs of these activities.

9. One problem with PSRO participation in technology assessment in this way is that treatment PSROs may develop and apply "local" criteria in widely varying ways. To control for any differences, data should be collected within treatment PSROs on: (a) what "original" criteria, if any, existed on use of the technologies under study; (b) how much PSRO-reviewed criteria differed from the "original," and (c) how much criteria differed among PSROs. Such data would indicate what aspects of criteria were significant in terms of the medical practices affected. They would also permit an analysis of the degree to which the local criteria ratification process affects the success of the assessment application enterprise.

10. Some observers contend that even if PSROs have little advantage over other organizations or communications media in influencing the "typical" physician to adopt medical innovations, they are still likely to have substantial influence over "outlier" physicians. (Outlier typically refers to physicians practicing seriously substandard or unorthodox medicine, not to those who happen to be located in remote geographical areas.) Additional information in the treatment PSROs would be collected on potential outliers—e.g., providers who are "focused in" for 100 percent prior authorization or concurrent review of selected procedures or hospitalizations, or physicians who appear to be out of the mainstream of medical practice as judged by the PSRO, by the degree to which they read medical journals, interact with colleagues, and so forth. An internal analysis could then be conducted
within treatment PSROs to compare the effects of assessment application on outlier and nonoutlier physicians.

Limitations to the Research Agenda

Perhaps the most critical question is whether the costs of such a study are outweighed by the expected benefits. Such an investigation, if done well, could be costly. An estimate of perhaps as much as $2 million annually (equivalent to 1 to 2 percent of the current annual PSRO budget including hospital review) might not be unreasonable.

Expenditures of this magnitude are very difficult (but not impossible) to justify in a period of deep budget cuts. Balanced against these costs is the argument that, for a programmatic decision about a modification of the program's mission of this magnitude to be made confidently, a thorough and well-designed study is necessary. Precisely because of the need to spend program monies as wisely as possible, we see no justification for a large investment in PSRO assessment application in the absence of a good test of their capacities in this regard. Precisely because a valid test assumes a high degree of scientific rigor, we have proposed a complex, and hence relatively expensive, experiment that involves a number of PSROs, several technologies, and a multi-year commitment. Given the paucity of information available to the health policy world regarding effective means of disseminating information and changing physician practice behaviors, an evaluation study of PSROs and assessment application, if done carefully and thoroughly, seems to be a sensible way to begin to explore these broader issues.

One basic assumption and two caveats to this proposal should be acknowledged. First, we do assume that the PSRO program will continue to exist beyond FY 1983, albeit perhaps with markedly fewer areas (i.e., individual PSROs) because of terminations and consolidations. Second, a study of this sort has numerous limitations, some of which are listed below. It could not answer all the questions a federal agency might have about options for implementing technology assessment activities. Various compromises to a rigorous study design would be necessary, simply because the unit of analysis will be complex organizations comprising many individuals whose goals may differ. There are, as well, inherent problems in the data to be collected. Third, a study of PSRO assessment application effects would require cooperative planning among PSROs, the Central PSRO Office, and DHHS Regional offices, and between the PSRO program and other agencies. Therefore, organizational coordination would be difficult and require sustained attention.

Other limitations of the research are clear. As previously described, PSROs would self-select for participation in the evaluation study, and
perform their activities on a subset of technologies they collectively judge to be feasible to pursue and of more than passing interest. This means that there are limits to generalizability from the initial round of research. The benefit of this exclusion, however, is that should PSROs fail to be effective under these restrictive, highly favorable conditions, then one can safely be skeptical about the capabilities of less mature PSROs to alter the practice of medicine and about PSRO assessment application when implementation is difficult and local interest low.

Additionally, treatment effects are to be contrasted with effects in PSROs where measurement, but no active intervention, occurs. By virtue of the data collection activities alone, however, some "Hawthorne effect" might occur in control PSROs. Should this happen, it would produce a conservative test for PSRO assessment application, because such effects would tend to diminish differences brought about by the active interventions in the treatment PSROs.

These limitations in the brief research design offered above could be overcome, at least in part, but only with additional resources. For example, PSROs could be more broadly sampled. Alternatively or additionally, data could be gathered contrasting the attributes of volunteering and nonvolunteering PSROs, or on customary practice in nonparticipant PSROs. Similarly, a wider range of technologies could be investigated than the small number currently recommended. Several rounds of these assessment application projects could be carried out, over a period of time. A program of research of greater magnitude could reasonably be expected to provide policymakers with ample evidence on the likelihood that PSROs, or analogous physician peer review groups, can influence the use of major medical technologies. In a period of fiscal austerity, of course, pursuit of an expanded research program does not seem likely, but its short-run costs might well be more than recouped by long-run improvements and greater efficiency in the provision of quality medical care.

SUMMARY

In this monograph, we presented a conceptual framework outlining factors that prompt physicians to adopt a medical innovation (noting especially the legitimizing role of personal contact with respected peers), examined the past and current successes and problems of the PSRO program, and discussed a variety of functions that PSROs might (or might not) be able to perform in medical technology assessment. For the analysis, we assumed the following: (1) PSROs, or an organizational
entity fulfilling PSRO functions, are likely to continue to exist even in a very cost-conscious environment. (2) The twin functions of PSROs—utilization review and quality-of-care review—are both relevant to medical technology assessment. (3) The objectives of PSROs can be described in technology assessment terms: to rationalize and improve the delivery of medical care by promoting the use of safe and cost-effective technologies and discouraging the use of those judged to be unnecessary, excessively risky, and overly expensive. (4) The ultimate target of information drawn from technology assessments and of PSRO activities is the practicing physician—i.e., the person who finally adopts a medical innovation.

On the basis of discussions by two expert panels, and consideration of strengths and weaknesses of the current PSRO program, we drew several conclusions and proposed several related recommendations:

First, PSROs would not be willing to act as routine, passive disseminators of technology assessment results or recommendations to the practicing community. They have no comparative advantage over other extant mechanisms as a simple "pass-through" of information. We recommended that no legislative or programmatic initiatives be undertaken to add any passive information dissemination role to the PSRO mission.

Second, experienced PSROs have several advantages over other organizations in their ability to participate actively in certain types of technology assessments, especially those necessitating collection of clinical data at the community level and those attempting to develop baseline information about the extent of problems in the use of medical technologies prior to a full-scale investigation. We recommended that deliberate efforts be made to obtain the collaboration of these PSROs so that their skills and capabilities could be most effectively used in technology assessments.

Third, mature PSROs have data collection and analysis capabilities that could be usefully exploited for some national technology assessment purposes. We recommended that those capacities be rigorously evaluated in comparison with other routine or periodic data collection and analysis activities carried on by federal agencies, to clarify (a) what relative or unique strengths the PSRO system might have for medical technology assessment, and (b) the deficiencies in reliability and validity of these various data bases that would need to be overcome before any were suitable for large-scale assessment efforts.

Finally, in restricted circumstances, selected PSROs can contribute to or participate in technology assessment in several ways, largely because they have a comparative advantage over other existing organizations and communication mechanisms for disseminating assessment information to local practicing physicians in ways that will more
quickly or more fully influence the use, costs, and quality of care delivered. We recommended that this organizational characteristic be evaluated by a multi-site, multi-year study in which PSROs randomized to a treatment group would be compared with control PSROs on the extent to which they change and improve local physician use of specific technologies.
Appendix A

INTERVIEWS WITH EDITORS OF MEDICAL PUBLICATIONS

This appendix summarizes the results of informal, semistructured interviews that we conducted with editors of selected medical publications and compendia. As discussed in Chapter III of this monograph, the professional literature is one of the main sources from which doctors hear about changes in medical technology, as well as one source that serves to legitimize that information. Given our concern with the dissemination of technology assessments downward to physicians, we wished to determine more directly the role that the medical literature plays in publishing medical technology assessments and the implications of that role for activities of Professional Standards Review Organizations (PSROs).

MEDICAL PUBLICATIONS SURVEYED

The medical literature has been characterized by information scientists as consisting of discrete sets of publications arrayed along a basic/applied dimension (Narin et al., 1976). Sets of publications each constitute a field, such as a medical specialty (e.g., anesthesiology), a particular disease (e.g., arthritis), or patient group (e.g., children). The journals in each field range in research level from most fundamental (e.g., basic biomedical research) to most applied (e.g., clinical observation). Using citation analysis (cf. Garfield, 1972), Narin et al. (1976) further distinguished research level into two major subdivisions—clinical observation and biomedical research. While any particular journal may contain a mix of such articles, journals may differ in relative orientation. For example, the Journal of the American Medical Association (JAMA) and the New England Journal of Medicine were designated as clinically oriented journals, whereas the Journal of Clinical Investigation and the Journal of Biological Chemistry represented examples of research-oriented journals.

Evidence suggests that the clinical journals are becoming more research-oriented (Fletcher and Fletcher, 1979), but the relative research level of a journal is still important, because journals of different research levels are likely to have different editorial objectives and
different target audiences. For example, the applied, clinically oriented publications are likely to be aimed at practitioners and health service professionals, and the more basic-research-oriented publications are likely to be directed toward academic researchers and teachers. Thus, there is likely to be similar variance among publications in subject matter, including their interest in publishing medical technology assessments.

To learn more about how and where assessments are being published in the medical literature, and the likely policies of medical editors toward the future publication of assessments (including material available through federal channels or from PSRO technology assessment activities), we surveyed the editors of 14 leading medical publications (see Table A.1). They varied in research orientation, target audience, frequency of publication, number of subscribers, and format. For instance, some were standard refereed journals, some were reviews published on a calendar basis, and others were compendia that provide abstracts of or references to research published elsewhere.

Table A.1

**Medical Publications Surveyed**

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<th>Compendia and Referencing Services</th>
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<tr>
<td><em>Facts and Comparisons</em></td>
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<tr>
<td><em>Internal Medicine Alert</em></td>
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<td><em>Key Work Index</em></td>
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<td><em>Medical Letter</em></td>
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<th>Refereed Journals</th>
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<tr>
<td><em>American Journal of Public Health</em></td>
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<td><em>Annals of Internal Medicine</em></td>
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<td>*Journal of the American Medical Association</td>
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<tr>
<td><em>Journal of Community Health</em></td>
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<td><em>Medical Care</em></td>
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<td><em>New England Journal of Medicine</em></td>
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<th>Reviews and Textbooks</th>
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<tr>
<td><em>Advances in Internal Medicine</em></td>
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<tr>
<td><em>Annual Review of Medicine</em></td>
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<tr>
<td><em>Scientific American Medicine</em></td>
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<td><em>Yearbook of Medicine</em></td>
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In January 1981 we wrote to the editors of these publications, saying we wanted to talk with them informally about their editorial policies toward the publication of medical technology assessments. We included an earlier draft of this report for background. The actual interviews were conducted by telephone in mid- to late February 1981.

INTERVIEW CONTENT

In the interviews, we followed a semistructured format of both open- and closed-ended questions and pursued three themes. First, we asked about editorial policies toward the publication of medical technology assessments, including the editors’ perceptions of the need for technology assessments, the role the publication might play in publishing assessments, and what priorities they assign to which types of assessments. Second, we queried them as to actual technology assessment publication activities, such as whether the publication had been active in sponsoring or commissioning assessments or reviews of assessment studies, and whether the publication had ever taken assessment-based advocacy positions or had attempted to highlight or draw reader attention to assessment results.

Third, we inquired about the size and scope of their publication’s readership—e.g., to what extent the publication reached practicing physicians, and whether their physician readership tended to be in primary care or specialized practice. Fourth, we asked about the publication’s relationships with federal agencies responsible for medical technology assessment (such as the Office of Technology Assessment (OTA), National Institutes of Health (NIH), and Food and Drug Administration (FDA)) and their willingness to publish material made available by these agencies. Finally, we sought their views on whether they foresaw any relationship between their publication and PSROs, in light of the “upward” and “downward” information transfer distinction made in our preliminary report.

INTERVIEW RESULTS

We did not attempt to sample the domain of medical publications exhaustively; rather, we contacted a small sample of medical publications known to us that represent some points along a basic/applied dimension. The following results should be taken as illustrative, although the editors’ responses to readership questions indicated that these publications do reach a diverse audience of physicians and health care professionals.
Except for the health service research journals and a compendium intended to deliver drug information to pharmacists, the respondents estimated that the majority of their readers were practicing physicians; with two exceptions, they estimated that most of their physician readers were in primary care practice (i.e., internal medicine, pediatrics, or family practice). Individual publications, however, varied greatly in their judgment of the number of physicians they reached—estimates ranging from a low of 500 to a high of 180,000 (of about 297,000 practicing physicians in the United States). They also differed in the relative proportion of their physician readers within primary or specialty categories and in the extent to which their clinician readership was located in academic settings (the more research-oriented journals expected a more substantial academic readership).

With this background, the following generalizations emerged about the editorial policies and practices of medical publications toward medical technology assessments.

Editors of publications recognized the need for assessment of medical technologies. All but one of the editors we surveyed agreed that both the premature adoption of unevaluated medical technologies and the continued use of demonstrably outmoded technologies were problems of concern. About a third of the editors who recognized these problems felt that the continued use of outmoded technologies was a greater problem than the premature adoption of new technologies. One editor noted that the inappropriate application of a new technology was the root problem with medical innovations, not simply whether the technology should be used or not. Another pointed out that technologies must be used before problems can become apparent. An additional point regarding new technologies was spontaneously identified by three editors—that some new technologies were not being adopted soon enough. FDA barriers to the use of new drugs currently used in Europe was offered as an example.

Most editors saw a role for their publications in improving the use of medical technology, but this role tends to be passive. All but the most basic-research-oriented publications envisioned some role in improving the use of medical technology. However, this role was described as informational, to "draw attention to new developments" or to "offer sound advice when technology is ripe," in the words of two respondents. Consistent with this informational role, the journals' past practices have been largely passive. Less than one-third of the publications have ever actively identified a technology in need of assessment. Some respond to informal inquiries from potential authors as to the publication's interest in an article on a given topic; some, e.g., the compendia, attempt to report comprehensively on published assessment results.
relevant to their readers. Similarly, over two-thirds of the publications had never commissioned either an assessment article or a review of assessment studies. Two publications do so aggressively, but the remaining editors expressed some qualms about commissioning reports.

Publications have also been passive in providing feedback mechanisms by which physicians can get further information about an assessment or obtain advice about how to better use a technology. Although just under half of the publications surveyed said they provided a direct way for physicians to get further information, in fact only a third of these supplied feedback actively, such as by publishing a question and answer section on clinical practice. Most feedback mechanisms consisted of such practices as supplying reprint request addresses or cards, or listing references where further information could be obtained.

Editors had mixed feelings about assuming advocacy roles. When editors were asked about past practices, about two-thirds reported having taken an editorial position urging physicians to (a) stop using an existing medical technology, (b) adopt the use of a new technology, or (c) pay attention to the results of a current assessment or review of assessment studies; over one-third reported having done all three. When asked whether the publication had ever attempted to highlight or synthesize assessment results, editors expressed more ambivalence; no more than one-third of the respondents said their publication had even done so, or would do so in the future. Some editors expressed concern that such editorializing might be seen by their readers as an abuse of power. Thus, while publications have taken stands on the use of medical technologies on occasion, it appears that they do so only selectively and infrequently.

Editorial policies toward future publication of technology assessments will not be uniform among these publications. When asked whether they would devote more space to cost-benefit or cost-effectiveness studies, the publications least likely to change current policies were those at the two ends of the basic-research or clinical-application continuum: the former because they do not publish such studies and do not plan to; the latter because they already publish assessments and plan to continue doing so. The remaining publications expected to give more space to cost studies, but only within the bounds of their accustomed editorial practice, and only when these studies do not conflict with what the publication perceives as its mission. Some of the compendia, for example, are most interested in efficacy and safety information, and will not likely publish cost information in lieu of those topics; where cost information is also available, however, they will publish it.

Editors also differed on whether they would favor publishing evaluations of new or of outmoded technologies. Over half of the editors who expected to publish technology assessments in the future were
equally favorable to these subjects; the remainder were divided equally between favoring articles about new or obsolescent technologies.

Thus, publications are likely to differ in how they will accord priority to medical technology assessments, but in general, one can expect to see, eventually, any and all assessment results appearing in one or more medical publications. Different kinds of assessments will be of interest to different publications, however, and the timeliness of the appearance of such information may vary widely. The most important consideration for these editors was how such studies would complement their customary editorial purpose and practice.

*Most publications will entertain material made available by federal agencies responsible for technology assessment.* Nine of the 12 publications open to technology assessment studies have published original or summarized material from a federal agency. FDA, NIH, and OTA were frequently cited sources. Similarly, most editors expressed interest in material made available by federal sources (when complementary to the publication's mission), with the proviso that this material pass their usual review procedures. An implicit (and occasionally explicit) concern was that federally generated material was of lower quality or credibility than privately authored material subject to peer review.

*Editors can foresee relationships between their publication and future PSRO activities in medical technology assessment.* Only one-fifth of the editors surveyed could imagine no potential relationship between their publication and PSRO assessment activities, and these tended to be the most basic-research-oriented publications. However, those editors who responded affirmatively imagined the PSRO role to be one of "upward" flow of technology assessment information, and their opinions tended to be qualified. Some editors foresaw a more or less direct role for PSRO members and staff to collect data and publish the results of their research; others saw a more "academic" role for PSROs as a problem identifier and generator of evaluation criteria. At the same time, editors expressed concern about the quality of PSRO data bases. Thus, while editors could foresee relationships with PSROs in the service of medical technology assessment, they did so with reservations.

**CONCLUSIONS**

The medical publications we surveyed vary in their editorial mission and in their research orientation. Some present original research in a journal format, some are reviews, and some compile or abstract reprinted information. Some publications are primarily intended for an academic audience; others are read primarily by health service profes-
sionals other than physicians in private practice. However, all number at least some practicing physicians among their readership, and most such readers are primary care physicians.

Within this diversity could be found surprising consistency among publications' medical technology assessment activities and policies. Except for the publications that are strongly oriented toward basic research and biomedical researchers, these publications do disseminate medical technology assessment information. Among them, a wide array of topics and audiences is covered. The editors are sympathetic to the need to improve medical practice through communication of information about all technologies (new, established, or old), but they tend to think that use of outmoded technologies is the more serious aspect of the problem. They tend to be cautious in making editorial recommendations for physician practice, preferring to leave the medical decisions to the individual physician. They plan to address problems of appropriate use of medical technology through their customary role of information-giver, although their priorities as to what types of assessments to feature vary according to editorial mission; they plan to maintain equal standards of quality for all of the material they publish, regardless of its source. Within these guidelines, these publications are interested in information from federal sources responsible for medical technology assessment, including PSROs, but they typically see little chance of a direct formal relationship with the PSRO program emerging in the years ahead.
Appendix B

PSRO PANEL MEETINGS

The central feature of this project was to convene two panel meetings of PSRO officials from around the country to explore in greater depth the practical constraints on and implications of PSRO participation in a variety of technology assessment activities. To provide a framework within which to conduct the discussions, a background paper containing the following chapters was prepared: (1) technology assessment (with particular emphasis on the federal government's role); (2) theories of information dissemination applicable to medical practice (with particular emphasis on dissemination to practicing physicians); (3) the PSRO program (with an evaluation of the program's past impact on hospital admission, length of stay, and quality of care), together with a set of suppositions about new directions for PSROs; and (4) two sets of propositions and questions involving the possible role of PSROs in (a) "downward" dissemination of medical technology assessment to practicing physicians and (b) "upward" dissemination of information and data about present uses of medical technologies.

As the background paper was being prepared, plans were put into final form for the two PSRO panels.1 Because we wanted to keep the groups relatively small, the number of invitees to each panel was held to seven. We arbitrarily divided the country in half and held one panel in the East Coast (Washington, D.C.) office of Rand (on January 15-16, 1981) and the other in the West Coast (Santa Monica, California) office (on January 22-23, 1981). The background document was mailed to the attendees by mid-December.

PSRO officials were selected as possible invitees according to several criteria: First, each of the 10 PSRO regions was to have at least one representative. A range of PSROs along the following dimensions was desired: geographic size (state, metropolitan area, subcity); level of maturity (old (6-8 years) to relatively new (1-2 years)). In addition, fairly equal representation of executive directors and nonphysician

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1Initially, the plans had been to convene one panel of PSRO officials and another panel of non-PSRO practicing physicians. Because of preferences of the sponsoring agency (the Office of Technology Assessment) and advisory panel for the overall medical technology strategies study for de-emphasizing issues relating to individual practicing physicians and emphasizing PSROs, the initial proposal was modified to convene two panels of PSRO officials.
officials (on the one hand) and medical directors (on the other) was desired.

Suggestions as to possible participants were solicited from Lyla Hernandez, executive director of the American Association of Professional Standards Review Organizations (AAPSRO) and from Mark Chassin, then deputy director of the PSRO program, HCFA/DHHS. Of the original list of invitees developed after these consultations, all but two accepted our invitation; we then invited two other persons from the same area as those who had declined.

The final list of invitees is given in Table B.1, identified by region and PSRO area.\textsuperscript{2} Other attendees are also noted. As it happened, the PSRO officials who participated in the panels represented the entire spectrum of PSROs ranked by HCFA later in the spring of 1981 (see "The Blue Sheet," June 24, 1981). The agency carried out an evaluation of its 182 then currently funded PSROs according to several performance criteria, and ranked them from 1 to 182. PSROs represented at the Rand panels included the top- and bottom-ranked PSROs; 10 of the 14 PSROs were in the top half of the HCFA ranking. We judge the panels (admittedly ex post facto) to have reflected fairly well the basic strengths and weaknesses of the entire program.

The panel meetings were conducted around three major issues: (1) future opportunities for PSROs in technology assessment; (2) downward dissemination of information from technology assessments to the physician community, with emphasis on delivering information to physicians and improving medical practices; and (3) upward dissemination of information relevant to technology assessments from the physician community, with emphasis on questions of whether PSROs should be a major source of data to federally sponsored technology assessments in medicine and what the major practical considerations would be for PSROs if they were to engage in technology assessment activities. The detailed agenda is given in Table B.2.

Dr. Brook presided over the meetings; Dr. Lohr acted as rapporteur. The discussions were conducted so as to obtain as much input as possible from all PSROs represented, to gain some appreciation of the generalizability of observations from the represented PSROs to other PSROs or the program as a whole, and, most importantly, to reach some consensus on the major questions raised in the background paper. Our interpretations of that consensus are given in the Chapter V recommendations and discussions.

\textsuperscript{2}Dr. Harry Weeks of Region III was unable at the last moment to attend the East Coast panel; he provided a lengthy set of comments by telephone on issues raised in the background paper.
<table>
<thead>
<tr>
<th>Name</th>
<th>Title/Region</th>
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*Unable to participate directly in the meetings.*
<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
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### Table B.2

**AGENDA FOR PSRO PANEL MEETINGS**

**THURSDAY**

6:00—7:30  
DINNER

7:30—10:00  
INTRODUCTORY SESSION

I. **OVERVIEW OF STUDY AND PANEL**

II. **FUTURE OPPORTUNITIES FOR PSROS IN TECHNOLOGY ASSESSMENT**

A. What opportunities appear to exist for PSROs to participate in medical technology assessment activities?

B. What are the major limitations to any such participation?

   1. Budget: What are the constraints on or opportunities for technology assessment in current PSRO budgets?

   2. Regulatory versus educational/service functions: How much are PSROs perceived as a regulatory agency?

   Does such perception obstruct PSRO activities in technology assessment?

   Could such a perception be changed?

   Would PSROs be more accepted if seen as educational, not regulatory?

   3. What are negative side effects/consequences for PSRO program of engaging in technology assessment?

**FRIDAY**

8:00—8:15  
CONTINENTAL BREAKFAST

Overview of agenda and housekeeping details. Review of discussions of the previous evening.

8:15—8:30  
MORNING SESSION: DOWNWARD DISSEMINATION OF INFORMATION FROM TECHNOLOGY ASSESSMENTS TO THE PHYSICIAN COMMUNITY

I. **DELIVERING INFORMATION TO PHYSICIANS**

A. Recapitulation of the Problem: What are the information needs of physicians, and what mechanisms are currently available to meet those needs?
Table B.2—continued

B. What are the unique aspects of PSROs that reflect advantages of PSRO involvement in information dissemination activities?

C. What are the unique aspects of PSROs that put PSROs at a disadvantage in information dissemination activities?

10:00—10:15 BREAK

10:15—12:00 II. IMPROVING MEDICAL CARE PRACTICES

A. How effective can PSROs be in changing physician behaviors in accordance with information taken from medical technology assessment activities?

B. Can and should PSROs develop national criteria that are drawn from medical technology assessments?

C. What are the unique characteristics of PSROs that would enhance or impede their effectiveness in changing physician behaviors (e.g., in persuading physicians to abandon familiar procedures or to adopt new/innovative/unfamiliar procedures)?

12:00—1:00 LUNCH AND INFORMAL DISCUSSIONS

AFTERNOON SESSION: UPWARD DISSEMINATION OF INFORMATION RELEVANT FOR TECHNOLOGY ASSESSMENTS FROM THE PHYSICIAN COMMUNITY

1:00—2:15 I. SHOULD PSROS BE A MAJOR SOURCE OF DATA TO FEDERALLY SPONSORED TECHNOLOGY ASSESSMENTS IN MEDICINE? WHAT WOULD BE THE CONSEQUENCES FOR PSROS IF THEY TOOK ON SUCH RESPONSIBILITIES?

2:15—3:00 II. WHAT ARE THE MAJOR PRACTICAL CONSIDERATIONS FOR PSROS IF THEY ENGAGE IN TECHNOLOGY ASSESSMENT ACTIVITIES?

A. How can data be made comparable across PSROs?

B. What is the turnaround time in which data could be made available?

C. How comprehensive can PSRO data be (e.g., Medicare and/or Medicaid and/or private)?

D. How can reliability and validity of PSRO data be assessed/guaranteed?

3:00—3:15 BREAK

3:15—4:00 WRAP-UP: CONCLUSIONS AND MAJOR ISSUES FOR FUTURE RESEARCH AND POLICY ANALYSIS
Appendix C

PSRO PELVIMETRY STUDY

As noted in Chapter IV, the experimental x-ray pelvimetry study is intended to measure the effect of a standardized PSRO educational intervention on the inappropriate use of an outmoded medical technology that is still in fairly widespread use in obstetrics. This appendix provides some details about the study's design and early findings.

In two large statewide PSROs, hospitals were allocated to experimental or control groups in a stratified random design; four smaller PSROs were divided into two pairs according to demographic and other characteristics and assigned to the experimental or control category according to a flip of a coin. In the experimental sites, a single physician specializing in obstetrics and gynecology will give a standardized educational intervention to study hospitals. In the seventh site (a statewide PSRO), hospitals in urban areas will receive the standardized intervention, and hospitals in rural areas will receive a media-oriented one.

Data have already been collected for a three-year baseline period. They show no difference in monthly pelvimetry rates between study and control hospitals over that time. Four PSROs had slightly declining pelvimetry rates; three had stable rates. The average PSRO pelvimetry rate ranged from 4.3 to 8.1 percent of deliveries.

The PSRO educational interventions were applied in early 1981, completed in March, and monitored for three months. Data on pelvimetry rates were collected and given back to hospital administrators and obstetrics and radiology departments. At the end of a nine-month "nonactive" period, several post-intervention data collection activities will take place. One will focus on all deliveries and look for use of both pelvimetry per se and "substituted" technologies such as ultrasound or electronic fetal monitoring. Information on variables such as infant or maternal morbidity and mortality, Caesarian sections, and the newborn's "APGAR" score will be obtained. A second data collection effort will concentrate on women undergoing pelvimetry, to see if indications for the procedure are documented in the medical chart and to see if those indications are more compatible with justifications for pelvimetry than they were in the past.

Data collection will be done at individual hospitals by the same

\footnote{An 11-point scale measuring heart rate, respiration, muscle tone, reflex irritability, and color.}
individuals who collected the initial baseline data. Medical records abstracting will be done by an outside contractor. At the end of the study, the materials and general approach of the educational intervention will be made available to PSROs not presently in the study.
REFERENCES


Brook, R. H., K. N. Williams, and J. E. Rolph, "Controlling the Use and Costs of Medical Services: The New Mexico Experimental Medical
Care Review Organization—A Four-Year Case Study," Medical Care, 16:No. 9 (Supplement), September 1978.
REFERENCES


Goran, M. J., "The Evolution of the PSRO Hospital Review System," Medical Care, 17:No. 5 (Supplement), May 1979a.


OTA (Office of Technology Assessment, Congress of the United States),


Stein, L. S., "The Effectiveness of Continuing Medical Education: Eight