The Slow Pace of Interactive Video Telemedicine Adoption: The Perspective of Telemedicine Program Administrators on Physician Participation

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ABSTRACT

We conducted semistructured interviews with telemedicine program administrators as part of a national survey of physicians and managers regarding attitudes toward, and knowledge of, telemedicine. Telemedicine administrators were interviewed regarding factors affecting physician adoption of interactive video (IAV) telemedicine. The seven networks with which these managers were affiliated represented “traditional” telemedicine programs, primarily providing specialty teleconsultation via IAV. These programs were located in different geographic regions, and included both consulting and referring sites. We include data only for well-established networks for which multiple administrators responded. Data were analyzed using standard qualitative research methods. We conclude that reimbursement issues are important determinants of the rate of adoption, but that by themselves they do not fully account for the slow diffusion of IAV telemedicine. Likewise, appeals to physicians as rational decision-makers are necessary but insufficient means of increasing the volume of telemedicine within a network. Telemedicine networks and administrators that have been effective in persuading physicians to practice telemedicine or to refer patients demonstrate an emphasis on aggressive recruitment of physicians who will be involved actively in one or the other role. Most efforts to encourage physicians to adopt telemedicine, however, have focused on the supply of specialists, rather than stimulating demand among primary care providers who have patients to refer. Habit was identified as an important, albeit overlooked, factor explaining physician adoption of telemedicine.

INTRODUCTION

TELEMEDICINE has been promoted as a means of addressing imbalances in the distribution of healthcare resources. These patterns of maldistribution, which tend to be geographic or economic in nature, affect the availability of a wide range of health services. Over the past
15 years, telemedicine programs have been implemented in a large number of settings, with a focus on addressing rural–urban discrepancies in healthcare access, yet the rate of adoption has been slow. Over the past decade, many rural telemedicine projects have benefited from funding by multiple federal agencies, and the use of telemedicine by physicians and health care organizations has undergone modest growth. Yet the distribution of that growth has been uneven, skewed toward a minority of well-funded programs and networks having contracts with prisons to provide care to inmates, and toward circumscribed sectors of the health care industry (e.g., home health-care).

Thousands of patients have benefited from telemedicine since the early 1990s, but this number is dwarfed by the hundreds of millions of health care encounters that have occurred during that time. The diffusion of the technology into rural areas and its integration into the health care system has been uneven. It has been argued that the problem lies not with telemedicine per se, but with cultural, economic, political, and human variables that affect the rate of diffusion. Telecommunications technology has yet to drive the transformation of rural health care delivery that has been promised by its proponents, but perhaps this is not unexpected. The rate of adoption of new medical technologies tends to be somewhat slow initially and telemedicine is no exception.

**Barriers to the diffusion and adoption of telemedicine**

It is customary to attribute the slow diffusion of telemedicine to barriers such as coverage and payment policy, interstate licensure issues, nonuniform engineering standards, and concerns over confidentiality and liability. These issues may play a role, but the variables contributing to telehealth’s slow rate of growth also include personal, institutional, and systemic influences. Telehealth networks may comprise multiple organizations and usually rely on physicians and nonphysician providers who are only loosely affiliated with one another. In some cases, networks are little more than conglomeries of organizations, often involving health care facilities with competing interests that have been brought together to take advantage of federal funding opportunities. As a consequence, networks often are not responsive to the needs and constraints of the different participants. The simple installation of equipment and communications infrastructure is no guarantee of provider and administrator satisfaction, effectiveness of healthcare delivery, or high rates of utilization.

The slow diffusion of interactive video (IAV) telemedicine is related to low rates of physician involvement. Barton et al. (2007) reported that administrators found it difficult to convince staff to utilize telehealth, and to some extent, force of habit impairs telemedicine diffusion. Absent a strong motivating influence or disruptive external circumstances, providers appear relatively unmotivated to alter their usual practice to incorporate telehealth technology. The provision of information (e.g., research findings) does little to encourage providers to change their style of practice. Telehealth’s failure to thrive may frustrate those who have invested time, money, and energy in developing programs and applications and who have worked to advance the spread of the medium. Yet, because of insufficient reimbursement rates, the difficulty in convincing providers to change their practice patterns, and the need to reorganize how organizations and practitioners provide care, perhaps this slow pace of development is precisely what should be expected. Like other technological innovations, telehealth requires time to be widely integrated into the healthcare system. Systematic investigation of variables influencing the pace of diffusion may, however, lead to the development of effective means of encouraging adoption of telehealth technology.

The objective of this qualitative research study was to examine factors underlying the slow rate of telemedicine diffusion, using data collected from hospital and telemedicine administrators. Our primary aim was to examine variables influencing the adoption of telemedicine by physicians. Because administrators observe their operations at the network or facility level, they are positioned to know the viewpoints of the full range of participants in the telemedicine encounter: specialist and
primary care physicians (PCPs), nonphysician providers, patients, and support personnel. They typically are the individuals most familiar with efforts to market these services; to recruit, train, and support physicians; and to assess the types and extent of clinical and nonclinical activities that characterize the network.

MATERIALS AND METHODS

This study was conducted using standardized qualitative research methodology. Seventeen well-established telehealth networks that provide IAV teleconsultation were targeted for participation. These networks were geographically diverse and included both consulting and referring sites. For each of the 9 networks that agreed to participate in the survey, at least 1 program administrator was interviewed regarding physician use of and beliefs about telemedicine. For 7 of these programs, we were able to conduct interviews with multiple administrators, allowing a clearer picture of physician attitudes and behavior across each network. In this paper, we discuss findings from interviews with the administrators of these 7 nationally recognized programs.

Table 1 provides descriptive information about the 7 programs discussed in this report. For each network, the number of consulting and referring sites is provided as well as information about the number of administrators interviewed and interviews conducted. These 7 well-established telemedicine networks comprised 18 sites on average, with a range of 9–41. Although each site included both consulting and referring sites, the programs we surveyed used telemedicine primarily to provide remote consultation. Anywhere from 4 to 10 administrators participated in interviews from each site (mean = 8). Among the participants from each program were the network administrator as well as the coordinators of individual referring and/or consulting sites included in the network. These individuals tended to work closely with the physicians at their sites, coordinating telemedicine programs around their clinical needs, conducting training regarding the use of the available technology, and working to establish relationships between referring and consulting physicians. Because of their close connection to the physicians in their networks, the participating administrators were able to provide important insights regarding physicians perceptions of the barriers to the use of telemedicine.

The 7 participating networks had been in operation for several years (range = 6–9 years), and at the time of the interviews, were considered well-established, conventional “hub-spoke” telemedicine programs providing specialty IAV teleconsultation. All but 1 network had hubs located in urban academic medical centers, with links to rural facilities. The seventh program was developed by an urban, non-profit, tertiary-care hospital.

Six of the 7 networks had received significant rural telemedicine grant funding from multiple federal agencies, including the Centers for Medicare & Medicaid Services, the Office for the Advancement of Telehealth (OAT), the National Telecommunications Infrastructure Administration, and the U.S. Department of Agriculture (Rural Utilities Service). Several networks also had received grant money from

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<th>Program</th>
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their states to develop and operate their tele-
medicine programs. Among active programs,
these networks likely are well above the aver-
age in terms of funding and utilization.

Interviews

Interviews were conducted between March
2001 and January 2003. They were tape
recorded, transcribed, and entered into a qual-
itative software program for analysis (NVivo,
v. 1.3, QSR International Pty, Ltd., Melbourne,
Australia).21 The same semistructured inter-
view was used with all respondents. Questions
were open-ended with increasingly focused
follow-up probes. General categories of inquiry
included (1) history of telemedicine at the site;
(2) marketing of services; (3) nonclinical uses of
the network; (4) financing and reimbursement;
(5) clinical services and utilization; (6) user sat-
isfaction; and (7) future plans. In some cases,
more than 1 administrator was present during
a given telephone interview, and more than 1
interviewer participated in most of the inter-
views. The length of respondents’ answers var-
ed greatly, but interviews generally ranged in
length from 1 to 2 hours. Several interviews
were completed over 2 sessions.

Data (in this case specific responses or ex-
changes between respondent and interviewer)
were grouped and coded into relevant cate-
gories. The creation of categories was driven
by the responses, rather than by the structure of
the questionnaire. Passages of text were grouped
together within nodes, in some cases with a hier-
archical tree structure (e.g., multiple subcate-
gories under the main categories), and in other
cases into free or flat categories. The principal cat-
egories included technology, use, adoption, or-
ganization, cost, and revenue. This paper draws
primarily on data from the “adoption” and “use”
categories, which are critical in understanding
the prospects for growth of telemedicine.

The small number of participating networks
limits the generalizability of the findings to the
broader population of telehealth networks.
However, the analysis includes data from some
of the more prominent programs, in an effort to
learn from their histories, their approaches to
working with physicians, and their impressions of
the effectiveness of their efforts over time.

RESULTS

As described below, administrators’ com-
ments regarding adoption of telemedicine
among the physicians in their networks high-
lighted several important themes: economic in-
centives and barriers, physician age, habit as a
barrier to telemedicine adoption, benefits of
telemedicine for referring physicians, and the
coordinating role of telemedicine program ad-
ministrators. Because the incentives for and
barriers to use of telemedicine technology are
asymmetric for referring physicians (i.e., PCPs)
and consulting physicians (i.e., specialists and
subspecialists), with PCPs typically having lit-
tle or no involvement in the actual telemedi-
cine encounter and consultants playing an ac-
tive role, we address the results as they pertain
to these distinct provider groups.

Economic incentives and barriers to the adoption
of telemedicine

Administrators addressed two economic is-
issues seen to be key to physician adoption of
telemedicine: reimbursement and opportunity
costs.

Reimbursement. Most administrators believed
that expansion of telemedicine reimbursement
would have a positive effect on physician par-
ticipation in their networks. Reimbursement
was perceived to be particularly critical for con-
sulting physicians (rather than PCPs), most no-
tably those specialists who must generate their
income from clinical encounters (as opposed
to salaried physicians). Several administrators
noted a lack of available specialists to partici-
pate in their teleconsultation programs and in-
dicated that inadequate reimbursement had
been the key stumbling block to the expansion
of their telemedicine networks and activity.
One participant discontinued established clin-
ics because the lack of reimbursement limited
the participation of consulting physicians.

Although administrators perceived the lack
of reimbursement to be a key barrier to the
adoption of telemedicine, some participants
noted that the availability of reimbursement
often failed to increase levels of utilization as
much as had been anticipated. In these cases,
the participation of consulting physicians was believed to have been limited by other factors as well. One administrator reported limited success in recruiting specialists and subspecialists from the university because they were too busy.

That’s our biggest challenge in all this. It’s not that they don’t agree with [telemedicine] or see how we’re helping out a community, or identifying a need. It’s that they’re already working 80 hours a week.

Many federal grants (especially those from OAT) have enabled telemedicine programs to provide reimbursement for participating specialists. One manager noted that their OAT grant had “been helping [them] get some people on board and some new providers.” However, external funding is not likely to lead to sustainable networks and persistent physician participation. This is particularly true in economically disadvantaged regions where a larger percentage of patients are indigent or dependent upon Medicaid, and in states that are restricting services or tightening Medicaid eligibility requirements (reducing rolls). According to one consulting site manager:

So much of our business is Medicaid, and Medicaid has flat-out said they’re not going to pay. So we have not done a very good job of negotiating with the payers. . . . We haven’t done a good job of attracting the physicians because we’ve been unable to negotiate with the payers.

Opportunity costs. Administrators described the importance of opportunity costs as barriers to participation in telemedicine. The significance of these costs was perceived to be higher for specialist physicians than for PCPs. According to interview participants, the low volume of telemedicine referrals discourages specialists from participating, because clinics have few patients scheduled and represent a poor use of physicians’ time. As one manager observed, “They can’t just pop in for two or three [patients]. They need to have a clinic that’s completely full and they know they’re going to get, first, reimbursed for it, and [second], be able to do it.”

Although opportunity costs were seen as a more significant burden for specialists, administrators noted that such economic barriers exist for PCPs as well. Interview participants indicated that some PCPs may wish to be involved in the teleconsultation process, but find it inconvenient because it takes them away from their offices—a nontrivial opportunity cost. As an administrator at a referring site said, “A lot of [PCPs] would love to present their own patients, but it’s at the wrong time of the day for them, for their practices. It . . . interferes with their practice.”

Convenience is a significant concern for busy physicians. Several administrators emphasized that it is essential to reduce time burdens on specialists by making teleconsultation as simple, quick, and user-friendly as possible. According to administrators, physicians are concerned about the opportunity costs of equipment failures and software glitches. In some cases, these problems may cause participating physicians considerable aggravation. According to an administrator from a referring site:

We had lots of equipment failures . . . we actually went probably about 6 months to where we couldn’t get it to work at all—at least 6 months. And that still is probably the primary, or one of the primary reasons that we are dropping [the use of IAV telemedicine]. Especially . . . for education sessions, if you get doctors in and it fails two or three times, they won’t come again. And they’re upset because . . . their time is valuable.

The situation differs somewhat for PCPs, who are not directly involved in most consults and who therefore can refer patients for consultation without embracing information technology in their own practices.

From the perspective of convenience, asynchronous technology (e.g., store-and-forward) may represent an improvement over IAV. One consulting site administrator stated that:

[Telemedicine] does take more of the physician’s time, most of the time. That’s why dermatology likes store-and-forward. They can do a store-and-forward
case in 3 minutes. They can do an interactive piece in 3 minutes too, if they didn't have to say “Hi” to the patient, ‘How are you?,” “Is it raining out there?” “Is the sun shining?” “Do you like fishing?” “Nice to see you today.”

Despite the importance of the patient–physician relationship, eliminating the necessity of social interaction has the potential of streamlining consultations significantly, assuming the consultant has access to all the relevant information about the patient’s condition.

Physician age

One hypothesis regarding the slow rate of adoption suggests that physicians newly out of training may be more apt to embrace technology, and thus be more amenable to the practice of telemedicine. Although this was not supported in a large survey of physicians, these sentiments were shared by some interview participants in the current study. For example, a rural site administrator stated that, “The younger group [of physicians] . . . they do use the service more than the older physicians. They’re open to it.”

Although some participants believed that younger physicians were more receptive to telemedicine and more likely to view it as simply another means of practicing medicine, the opinion that younger physicians represent the future of telemedicine was not universally held. According to the telemedicine administrator of one tertiary care facility:

Older docs warm up to this slower, but they’re better at it because they have the experience. If the video’s a little bit poor today, they know from the history and their medical records or labs or whatever they’re talking about in the current history that they’re acquiring from the patient and talking to them, they can begin to make an evaluation quicker than the young docs.

Habit as a barrier to telemedicine adoption

Habit may be an important impediment to the adoption of IAV technology. The comments of many respondents suggest that it is common practice for physicians to follow the path of least resistance with respect to participating in telemedicine. They are reluctant to change their current style of practice. Responses from administrators at referring sites suggest that many physicians are accustomed to routines that do not include telemedicine, and that they tend not to even consider making telemedicine referrals. For example:

I think it’s a matter of changing referral patterns, and physicians who have been in the field for a while . . . just don’t think of it.

They have a longstanding relationship with some of the physicians that are 50 miles away and it’s just convenient for them. I think sometimes they forget about the telemedicine unit, even though we do market it . . . They really don’t give you a reason . . . I think they’re comfortable with sending patients to another referral center that’s 50 or 60 miles away and they’re just accustomed to doing that.

Administrators discussed ingrained clinical practice habits among specialists as well. As described by one consulting site administrator, patterns of professional behavior are resistant to change, and the acquisition of new clinical practices is challenging:

[Specialists] aren’t used to doing this. They’re used to walking in the room and assessing a patient 3D. Now we’re working 2D [on a monitor]. And that’s overlooked by a lot of folks. They’re [thinking], ‘What? I just don’t get the feel for this, [I] don’t get the depth.’ Well, of course you don’t. You’re looking at two planes here when you’re used to assessing in 3D . . . It’s a constant re-education. It’s just not second nature now.

One administrator stressed the novelty of the medium and the need for specialists to repeatedly conduct consultations using the available technology before becoming comfortable with telemedicine:
There’s a few in the population that just really like it and the rest of them tolerate it. But I think the majority of them still feel handicapped. Once they’ve done enough of them . . . somewhere after 20 or 25 [telemedicine encounters], they become a whole lot more relaxed with it. And they may become more relaxed after 5, depending on the specialist. But nobody comes in here and feels comfortable right off the bat.

Another interview participant noted that telemedicine program administrators need to acknowledge that telemedicine will be less efficient initially than physicians’ current practice routines, but that greater efficiency may be realized as the physician becomes more accustomed to the medium:

When you first start telemedicine with a different clinician and a specific clinical application [the clinician thinks] that it’s going to be inefficient. It’s just the nature of the beast. So you’ve got to convince the clinician: ‘Yes, per-consult time is going to be . . . higher when we start, but as we ascend the learning curve, we’ll be cutting down on that per-consult time dramatically.”

Benefits of telemedicine for referring physicians

According to participating administrators, the key factors thought to encourage PCPs to make teleconsultation referrals were (1) the enhanced clinical support PCPs receive as a result of telemedicine, and (2) improved timeliness, continuity, and range of clinical options available for their patients. Continuing education was described as an important ancillary benefit, and as a means of educating telemedicine-naïve physicians regarding the capabilities of the telehealth network.

PCPs’ practices may be enhanced by telemedicine in a way that requires little effort on their part, via the improved clinical support telemedicine provides. One rural telemedicine administrator noted that PCPs appreciate the rapid response they receive from consultants—a phenomenon that is more a function of the specialists themselves than of telemedicine per se.

[One consultant] called [the patient’s doctor] himself immediately, to talk to [the PCP]. If there is something they think is an emergency, they will phone right away, or they’ll dictate a letter to the physician telling what they think the diagnosis was, what they’ve done for their treatment, just like a regular referral.

Education is an important potential benefit for PCPs involved in telemedicine. An administrator at a hub facility noted that the site’s consulting psychiatrists and psychologists have an interest in educating “the primary care providers and the mid-levels . . . how to take care of [their patients], because they’re the ones out on the front line.” A remote consultant may be more apt to provide such education than a local consultant who is more directly and readily accessible to the patients.

Professional relationships between referring and consulting providers are crucial to the adoption of telemedicine. As is the case with in-person consultation, a specialist who is responsive to referring PCPs is likely to be appreciated. The professionalism of the teleconsultants may be an important factor in whether PCPs will make subsequent referrals. According to the administrator of a rural referring site, the issue is largely one of developing new professional relationships with which both parties are comfortable.

Respondents also remarked on the importance of timely decisions about patient transfers as an aspect of telemedicine that was viewed favorably by PCPs. In principle, transfer decisions can be made quickly, either allowing patients to stay near their homes, or expediting their transfer to a facility clinically equipped to handle their cases. The manager at one referring site was impressed by the 2-hour turnaround in obtaining a consultation for a patient with necrotizing fasciitis: “It could have meant this lady’s life, if that had not been diagnosed.”

Just as positive telemedicine experiences can encourage the involvement of PCPs, disjointed communication or lack of understanding with remote consultants can discourage adoption of
the technology by referring physicians. Obtaining appropriate prescriptions was an area of concern noted by several program administrators. In response to a question about whether some PCPs had stopped making telemedicine referrals after an initial period of use, one referring site administrator discussed a physician who complained of instances in which a specialist recommended drugs that were not on the Medicare formulary. In another case, PCPs at a rural facility were dissatisfied with the outcome of psychiatric teleconsultation because the psychiatrist would:

...not write a prescription for the patient, and yet our local physicians, having not seen the patient themselves, won't write a prescription either. So we have a real problem there with prescriptions for psychiatric problems. And that is the number one reason why our local primary care mental health people don't use it. That's a key issue for us.

This situation highlights a problem issue that must be addressed in telemedicine. That is, a given specialist may feel that a complete examination and appropriate treatment cannot be provided through teleconsultation, and a PCP may believe that s/he is not adequately knowledgeable to write and monitor a prescription for his or her patient. This may leave the referring physician and patient with a diagnosis and treatment plan, but no way to implement the specialist's plan of care.

The coordinating/communicating role of the telemedicine program administrator

Respondents discussed two particularly important aspects of the program administrator's responsibilities: (1) the role of the administrator as a liaison between referring and consulting physicians, and (2) administrators' efforts to recruit physician participants in the telemedicine network. As noted previously, disjointed telemedicine encounters can discourage PCPs from referring to remote consultants. Several participants suggested that a program administrator can bridge the communications gap that may exist between referring and consult-

We have fed them, we have provided inservices, just in the past year we went to the medical staff meeting and brought (the director) up over the new telemedicine equipment. [We] ... let her speak with them ... [about] how easy it is to use it [telemedicine], how they could use it for education ... it's free, they get [CMEs], all they have to do is call and tell us they want to, they can come over on their lunch hour. We've done everything to try to shout, 'it's easy, it's fair, it's free, use it,' and they don't. It's way underutilized.
Not all telemedicine programs actively reach out to physicians to help them integrate telemedicine into their practice routines. This may be true especially of rural (referring) facilities, which often have few financial incentives to develop an active telemedicine program. The interview with one rural administrator went as follows:

“How successful have you been in persuading PCPs to refer patients to telemedicine?”
“We don’t do that.”
“What kind of incentives, financial or otherwise, have you used to encourage the physicians to use telemedicine?”
“We did do an ER pilot project once, and none of the physicians participated. I think the [tertiary care site] sent them out some information regarding it. We didn’t do anything here.”
“And your physicians there haven’t done any consultations?”
“No. We had one specialist, an oncologist, and he has done about two with patients since I’ve been here.”
“Were the physicians at your facility trained in the use of the telemedicine equipment?”
“I don’t think so, because none of them know how to use it.”

Although utilization of telemedicine may be related to the efforts of the director to integrate the technology into current systems, and to recruit consulting and referring providers, interview respondents reported that resources with which to conduct those activities were scarce. Most administrators described their programs as underfunded and understaffed, and noted that they must rely on personnel borrowed from or shared with other departments or budgets. Understaffing was perceived as severely constraining telemedicine networks’ capacity to promote the technologies and the potential uses of the network.

DISCUSSION

In this survey, program administrators provided their perceptions of factors that influence the adoption of telemedicine among specialists and PCPs. Several common themes emerged.

Reimbursement and opportunity costs

As expected, reimbursement was seen as a crucial factor. As a matter of policy, services provided using information technology should be covered on a par with in-person healthcare, unconstrained by regulations arbitrarily limiting payment to certain care settings or geographic regions. To do otherwise will unavoidably limit the expansion of telemedicine. Regardless of reimbursement, however, administrators emphasized the significance of opportunity costs, particularly for consulting physicians. To the extent that providing care using health information technology (HIT) is more difficult, more time-consuming, or less convenient than providing care in person, enthusiasm for and willingness to embrace telemedicine will be diminished. This holds true not only for ease of use and access, but for coding, billing, payment, and dealings with other participants in the provision of health care.

Physician age

Some respondents believed older physicians were less likely than younger physicians to use HIT in their medical practices. This perception, which was not universally held, is inconsistent with the results of our survey of physicians, which suggested that age per se is not a determinant of whether a physician will use telemedicine. The key issue may be whether recent graduates have used telemedicine during training. To the extent that younger physicians have been exposed to telemedicine in medical school and residency, they may be more interested in using telemedicine themselves.

Habit as a barrier to telemedicine adoption

Previous research has suggested that habit is a more compelling force in human behavior than is reason and that habitual patterns of practicing medicine may limit the rate of expansion of telemedicine. The influence of habit on physician adoption of telemedicine was frequently addressed in these interviews, albeit often indirectly. Habitual behaviors are efficient because they can be performed automat-
ically and with minimal effort or conscious deliberation, and the way a physician’s office handles clinical workflow is typically quite routine. Disrupting these habitual, automatized processes requires effort, and may initially feel uncomfortable. Furthermore, if processes begin to change, the office routine becomes less automatic, and the amount of time spent on different tasks may increase until new habits are acquired.\textsuperscript{23}

Given that most physicians probably perceive their habitual modes of practice to be generally efficient, they may believe that the adoption of telemedicine would require too great an investment of time and energy. Providers’ habits, therefore, are likely to represent a strong inertial force that must be considered when attempting to alter behavior and promote the adoption of new technologies. When providers are satisfied with their existing style of practice and have no strong motivation to change, or when the new technology involves additional work or a steep learning curve, existing care practices may be hard to change.

As suggested by some respondents, recognizing the difficulty of changing care processes may be key to successful recruitment and retention of providers. Administrators must acknowledge that providers’ early telemedicine encounters will be slower and less efficient than their usual practice, but that teleconsultation will become more efficient with repetition. Engaging and sustaining physicians until they reach a threshold of comfort and routine with the technology is critical.

Just as it takes time and effort for individuals to change, institutions also develop a resistance to change that makes the modification of practice a challenging undertaking.\textsuperscript{24–26} Organizational hierarchies can be quite inflexible. Moreover, relationships with other institutions or agencies (e.g., insurers, regulatory bodies, accreditation agencies) may further constrain organizational behavior. Healthcare organizations in particular are bound by myriad laws, regulations, rules, and policies that typically change slowly.

Existing organizational structures and processes, as well as institutional inertia, may retard the adoption of any new initiative or process. Perhaps the more closely telemedicine approximates the in-person practice of medicine, the greater the chances that physicians will incorporate it into their regular practice, because it will not work against processes already in place. Those respondents who spoke of trying to mimic in-person care and build upon established referral practices were in essence working toward the institutionalization of telemedicine with minimal levels of disruption of these habitual organizational processes of care.

Benefits of telemedicine for referring physicians

Program administrators noted a number of benefits that telemedicine may provide for referring physicians, and telemedicine is arguably a means of improving patient care that requires little investment of time or effort for PCPs. Nevertheless, the programs examined in this study struggled with referral volume. In our survey of physicians (as yet unpublished data), most PCPs affiliated with referring sites were classified by their programs as nonusers of telemedicine. Only about one quarter of individuals responding to a PCP questionnaire from these sites characterized themselves as users of telemedicine.

One possible explanation for poor participation on the part of referring physicians may be a failure to recruit PCPs aggressively. As a rule, most of the effort invested in adoption and diffusion of telemedicine among physicians has focused on specialists, rather than on stimulating demand among the PCPs upon whom the system depends for patient referrals. This emphasis on specialists fails to address the need to increase the volume of telemedicine services. Although it is important to have consultants available in sought-after specialties, too few PCPs take advantage of available services. Given that specialists are more likely to identify themselves as amenable to the use of telemedicine than are PCPs,\textsuperscript{17} it seems that if PCP demand were stimulated, specialists can be found who will meet that demand.

A focus on specialists rather than PCPs may be due to specialists’ closer affiliation with the organization that has established the telemedicine program, or to a bias toward urban centers or large institutions. Another possibility is
that some of the economic and organizational issues impeding diffusion of telemedicine among PCPs (especially in rural areas) are perceived as more intractable. The difficulty also may lie in the lack of a relationship between referring and consulting physicians.

Coordinating role of the telemedicine program administrator

A final inference from these data is that some administrators have been more effective than others in persuading physicians to adopt telemedicine. More successful programs appear to have emphasized aggressive recruitment of physicians (especially PCPs). How to recruit physicians effectively remains to be established, but efforts that focus solely on educating providers have proven to be necessary but insufficient means of facilitating the diffusion of telemedicine within networks. Although there may be valid, logical reasons to adopt telemedicine that are related to such factors as quality of care, convenience and economic considerations are likely of greater concern for the average provider. Moreover, physicians as a group will probably continue with habitual practice patterns unless convinced that telemedicine will make their lives better, as well as the lives of their patients.

The diffusion of telemedicine has been slow, and its pace has been frustrating for proponents of the technology. To some extent this rate of implementation may simply be a manifestation of the fact that many technologies are slow to be adopted, irrespective of what appear to be their clear advantages. Several investigators have identified variables that may influence this phenomenon, and this study both confirms and extends those findings and suggestions.

ACKNOWLEDGMENTS

We are grateful for the participation of the individuals and organizations willing to take part in this research project. Funding for this research was provided by the Centers for Medicare & Medicaid Research for cooperative agreement no. 18-C-90617/87 (PI: Jim Grigsby, Ph.D.).

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