

Role of Telemedicine in the Health Care Delivery System

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The concept of caring for patients remotely using telemedicine applications has intrigued computer-savvy physicians for years. Although telemedicine implementation remains in its infancy,^{1,2} interest appears to be growing, perhaps fueled by the Internet bubble that led investors into new heights, only to come crashing to the ground within the last year as financial expectations were not met. Though medicine is somewhat sheltered from business and financial trends, the concept of widespread telemedicine use by means of Internet portals was obviously affected. Despite skepticism of widespread applications that involve the delivery of medical care using computer-based technology, the rural base of the telemedicine movement appears to remain afloat. In this issue of the *JABFP*, Norris and colleagues³ provide further evidence that telemedicine consultation is well accepted and generally receives high marks for patient and physician satisfaction.

The study by Norris et al shows high levels of both patient and physician satisfaction in rural settings when consulting with a specialist located in an urban, academic medical center. Another recent study on the introduction of telemedicine in rural communities confirms this satisfaction. Campbell and colleagues⁴ found a greater acceptance of telemedicine by those practices already affiliated with a university academic medical center than by traditional private practices. In both studies there were few participants, a common flaw noted in many telemedicine studies.⁵ In addition, the costs to the patient and physician were not included and could have a major effect on the patient's level of satisfaction.

I would comment that low-bandwidth links with switched 56 (112 kB/s) lines or especially ISDN

(128 kB/s) lines (compared with plain ordinary telephone system, or POTS) are not widely available, and acquiring them would require substantial planning and bandwidth availability. In our areas ISDN (integrated service digital network) is available only in certain locations and is rather expensive (about \$100 per month). Our own experience at the Mayo Clinic leads to the following concerns about widespread telemedicine use in the current environment.

First, the ultimate success of telemedicine will depend heavily on third party reimbursement. Recently, with the passage of the Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000,⁶ some additional provisions have been made promoting telemedicine reimbursement:

1. Eliminating the licensed presenter requirement
2. Restructuring the 75/25 fee splitting reimbursement plan between the consulting physician and the presenting physician, which now allows full payment to the consulting physician and payment of a \$20 facility fee to the originating site
3. Limited "store and forward" reimbursement in the states of Hawaii and Alaska
4. Broadening areas that are eligible for telemedicine services to nonmetropolitan areas from health professional shortage areas
5. Endorsing home health care agencies' use of telemedicine under the prospective pay system
6. Calling for further studies to look at telehealth care

Second, the issue of state licensure is another major hurdle that hinders widespread telemedicine utilization. Limiting telemedicine consultations to physicians licensed in one particular state seriously restricts telemedicine application. Some states now require a designated telemedicine license to deliver telemedicine services, and most require an active medical license in that state as a prerequisite.⁷

Third, no longer having a licensed medical provider as a requirement for federal-based reimbursement opens up the remote site to the possibility of

Submitted 6 December 2001.

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home-based telemedicine (monitoring of chronic diseases, such as diabetes, hypertension, congestive heart failure, and chronic lung disease). Home-based telemedicine most certainly will allow less expensive and more direct use of telemedicine services by patients and might improve disease management outcomes. Well-designed, large-scale studies are needed to substantiate these outcomes.

Fourth, physician satisfaction and acceptance will play a critical role in further acceptance of telemedicine. Advocates of telemedicine must show telehealth care is efficient in a busy office practice and does not sacrifice quality of care, which would place physicians at risk for malpractice in our ever-increasing litigious environment. A recent study on patient interest in e-mail communication with their physicians raises concerns about the ability to meet patient expectations of a timely response time.⁸

Finally, there are important legal issues that must be considered before the widespread acceptance of telemedicine applications. Although no cases of telemedicine malpractice have been reported, the potential nevertheless exists. The standard of care for medical encounters and that which constitutes a physician-patient relationship have yet to be determined by the courts. The medical community has been highly critical of physicians' prescribing medications over the Internet after only a patient questionnaire has been completed. In response to this practice, the American Medical Association (AMA) holds the position that whereas the practice of online medicine is not illegal, it is considered unethical and not "good medicine" when physicians prescribe medications to a person they have not personally examined.⁹ Though the practice of Internet medicine represents an extreme aspect of the field of telemedicine, the medical community remains skeptical that any computer-based examination, even with the assistance of audio and video real-time interactions, is suitable for making medical decisions.

The future of telemedicine in mainstream medical care is full of potential. The future family physician's practice might be dramatically different from what it is today. Physicians' offices, examination rooms, and even the traditional stethoscope might be replaced by private, secure Web sites and digital equipment that records vital signs and physical findings. In the not too distant future, it might be possible for patients to connect in their own home with a health care provider located at a distant site. These patients could be examined, have

their conditions diagnosed, and receive treatment (e-mail prescription sent to an on-line pharmacy) using their personal computer and an Internet-based secure Web site without ever having to leave the bedroom. Physicians might rely on computer-based, best-practice treatment protocols that are developed from up-to-date, evidence-based clinical pathways. Additionally, continuing medical education courses will certainly continue to proliferate as a Web-based activity.

Though many share the opinion that this form of futuristic medicine will be less personable and erode the traditional physician-patient relationship, there are some who believe it will improve patient satisfaction, physician access, and patient outcomes. The field of family practice should objectively (and critically) continue to assess and embrace technology advancement to determine whether it can be used to make the practice of medicine more efficient, more economic, more effective, and it is hoped, more enjoyable. To avoid such advancement might seriously limit our ability to provide superior care in a computerized world of medicine.

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