Telemedicine is redefining the boundaries of the doctor and patient encounter. No longer do the doctor and patient need to be in the same room. No longer does the doctor have to visually see the patient to develop a diagnosis. New telecommunications infrastructures have created the possibility for a virtual office visit, outside of the constraints of time and space. This radical change in physical boundaries creates a profound transformation of the doctor and patient relationship, the organizational cultures of the healthcare institutions involved, and the administration, management, and reimbursement of services. Debakey (1995) argued that telemedicine, or the use of telecommunications technologies within the field of healthcare, has the potential for having a greater impact on the future of medicine than any other modality. Although the term telemedicine can include a wide variety of applications and technologies, including database management, distance education, and electronic patient records, this chapter will focus the application of telemedicine on delivery of remote electronic clinical consultations. This chapter will discuss telemedicine’s historical development, the transformation of the clinical environment from an external, internal, and individual perspective, and future trends.

TELEMEDICINE’S HISTORICAL DEVELOPMENT

The intersection of communication technology and medicine is not new. In 1877, 21 local doctors built one of the first telephone exchanges to allow easier communication with the local drugstore (Starr, 1982). However, more recent characterizations of “telemedicine” date back over the past three decades. Lovett and Bashshur (1979) divided the development of telemedicine into three stages. The first stage was characterized by pioneering efforts exploring use of telecommunications modalities in the delivery of care across distance with few public or private resources to support them.
The second stage, between 1965 and 1973, was marked by deliberate efforts towards research and development and received short-term federal support. The third stage began in 1973, continuing through 1979, and for the first time, involved evaluation by interdisciplinary teams with social scientists and specialists in medical care organization, planning, and delivery. During this time, the knowledge gained from the space program and the public telecommunications efforts cooperated to form STARPAHC (Space Technology Applied to Rural Papago Advanced Health Care). STARPAHC was a $3.3 million project that used expertise gained from the space program and applied it to the problem of delivering medical care to the Papago Indian reservation. This effort was an exemplary program that integrated designers, users, care providers, and evaluators in determining the system’s objectives, design, criteria for performance, and responsibility for its operation (Lovett & Bashshur, 1979).

Regardless of their success, the majority of the programs started prior to 1986 have not survived due to the lack of federal funding based on the inability to justify the programs on a cost-benefit basis (Perednia & Allen, 1995). Although the data from these early efforts are limited, early reviews and evaluations indicate that the technology that was used was reasonably effective in transmitting the information needed for most clinical uses, and the majority of the patients were satisfied with their treatment (Perednia & Allen, 1995).

What might be considered the fourth stage of telemedicine is occurring in the mid to late 1990s and has several driving factors. These factors include: the strong need for clinical medicine in remote areas, the politics and economics of a managed care approach to medicine, the suppliers of telemedicine equipment and telecommunications carrying capacity (Perednia & Allen, 1995). The 1990s have also witnessed large investments in telemedicine development, with the total amount of money spent by the federal government on grants, contracts, and appropriations for telemedicine in the ‘90s approaching $700 million (Perednia & Grigsby, 1998). Bashshur (1995a) noted, “Unlike the early pioneering efforts of the 1970s in the development of telemedicine systems, which operated somewhat independently and in relative isolation of each other, the current generation of telemedicine systems is emerging as part of a larger social and cultural movement, embedded in the information age” (p. 81).

As attempts were made to mimic the appearance of the doctor and patient traditional encounter, the early approaches to telemedicine focused on technologies that facilitated both visual and audio cues. The doctor and patient could hear and see each other in real time, but were each in distinct locations. The first official telemedicine program review of U.S. programs conducted by Telemedicine Today in 1993 revealed 12 active telemedicine programs, all employing interactive video technology as a means of mediating doctor and patient interaction. The fourth telemedicine program review of U.S. programs revealed a total of 80 telemedicine programs across 38 states, including Washington, D.C. (Grigsby and Allen, 1997). The majority of the programs incorporated interactive television applications, while a few employed store and forward technology. During 1996 and the first four months of 1997, the survey found a total of 21,274 patient-clinical interactions taking place (Grigsby and Allen, 1997).

As the costs of interactive television have decreased with the creation of the CODEC and the improvement of telecommunications infrastructures, expensive room-based videoconferencing systems are being replaced with desktop and Web-based versions. The development and increased use of the Internet has expanded the use of telemedicine in real
Evaluation Methods to Monitor Success and Failure Factors in Health Information System’s Development
www.igi-global.com/chapter/evaluation-methods-monitor-success-failure/49889?camid=4v1a