Telehealth position in healthcare system

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Key words
Telehealth, telemedicine and technology

Method
This study is review article and literature review is performed in libraries and valid electronic environment.

Abstract
Telehealth is generally used as an umbrella term to describe all the possible variations of healthcare services using telecommunications (Brown, 1996). Telehealth is the delivery of health-related services and information via telecommunications technologies (Parendia and Allen, 1995). Telehealth, as other information and communication technologies (ICTs) introduced to support the delivery of health care services, is considered as a means to answer many of the imperatives currently challenging health care systems (Association of telehealth service provider, 2007). Telehealth is an expansion of telemedicine and unlike of telemedicine (which more narrowly focuses on the curative aspect) it encompasses preventive, promotive *and* curative aspects. Originally used to describe administrative or educational functions related to telemedicine, today telehealth stresses a myriad of technology solutions (Parendia and Allen, 1995). However telehealth accompanied many challenges but it is a useful communication tool among patients, care providers and disease management stakeholders.

Introduction
The term 'telehealth' was originally used to describe administrative or educational functions related to telemedicine (Brown, 1996). Telehealth is considered a major innovation at the technological, social, and cultural levels. This technology has the potential to increase access to, and quality of, health care services and to lower health system expenditures. Thus, introducing telehealth as a tool to support the delivery of health care services implies numerous changes for providers, organizations, and the health system as a whole that must be accounted for during the implementation process (Shore and other, 2007).

Common telehealth technologies are clinical and no clinical.

Clinical uses of telehealth technologies include the following:

*Transmission of medical images for diagnosis (often referred to as store and forward telehealth)

The technology is used for transferring digital images from one location to another. A digital image is taken using a digital camera, ('stored') and then sent ('forwarded') by computer to another location(Brown,1996).In store-and-forward telehealth, digital images, video, audio and clinical data are captured and "stored" on the client computer; then at a convenient time transmitted securely ("forwarded") to a clinic at another location where they are studied by relevant specialists. The opinion of the specialist is then transmitted back. Based on the requirements of the participating healthcare entities, this roundtrip could take between Parendia and Allen, 1995 to 48 hours. In many store-and-forward specialties, such as teleradiology, an immediate response is not critical. Dermatology, radiology and pathology are common specialties that are conducive to store-and-forward technologies (Parendia and Allen, 1995).so. This is typically used for non-emergent situations, when a diagnosis or consultation may be made in the next 24 - 48 hours and

Sent back (Brown, 1996). Based on the requirements of the participating healthcare

entities, this roundtrip could take between 2 to 48 hours. (Parendia and Allen, 1995).

*Groups or individuals exchanging health services or education live via videoconference (real-time telehealth)

The other widely used technology, two-way interactive television (IATV), is used when a 'face-to-face' consultation is necessary. The patient and sometimes their provider, or more commonly a nurse practitioner or telemedicine coordinator (or any combination of the three), are at the originating site. The specialist is at the referral site, most often at an urban medical center. Videoconferencing equipment at both locations allow a 'real-time' consultation to take place. The technology has decreased in price and complexity over the past five years, and many programs now use desktop videoconferencing systems(Brown,1996). In real-time telehealth, a telecommunications link allows instantaneous interaction. Video-conferencing equipment is one of the most common forms of synchronous telemedicine. Peripheral devices can also be attached to computers or the video-conferencing equipment which can aid in an interactive examination (Parendia and Allen, 1995). It means that the patient does not have to travel to an urban area to see a specialist, and in many cases, provides access to specialty care when none has been available previously. Almost all specialties of medicine have been found to be conducive to this kind of consultation, including psychiatry, internal medicine, rehabilitation, cardiology, pediatrics, obstetrics and gynecology and neurology. There are also many peripheral devices which can be attached to computers which can aid in an

interactive examination. For instance, an otoscope allows a physician to 'see' inside a patient's ear; a stethoscope allows the consulting physician to hear the patient's heartbeat (Brown, 1996).

With the availability of better and cheaper communication channels, direct two-way audio and video streaming between centers through computers is leading to lower costs (Parendia and Allen, 1995).

Transmission of medical data for diagnosis or disease management (sometimes referred to as remote monitoring) in remote monitoring, sensors are used to capture and transmit biometric data. For example, a tele-eeg device

monitors the electrical activity of a patients brain and then transmits that data to a specialist. This could be done in either real time or the data could be stored and then forwarded.

Examples of remote monitoring include:

*Home-based nocturnal dialysis

*Cardiac and multi-parameter monitoring of remote ICUs

*Home telehealth

*Disease management (Parendia and Allen, 1995)

*Advice on prevention of diseases and promotion of good health by patient monitoring and follow up.

*Health advice by telephone in emergent cases (referred to as teletriage)

Nonclinical uses of telehealth technologies include:

*Distance education including continuing medical education, grand rounds, and patient education

*Administrative uses including meetings among telehealth networks, supervision, and presentations

*Research

*Online information and health data management

athcare system integration *

*Asset identification, listing, and patient to asset matching, and movement

*Overall healthcare system management

*Patient movement and remote admission (Parendia and Allen, 1995).

Benefits of telehealth

Providing healthcare services via telemedicine offers many advantages. It can make specialty care more accessible to underserved rural and urban populations(Brown,1996).Telehealth benefits patients in countries where traditional delivery of health services are affected by distance and lack of local specialist clinicians to deliver services. The rate of adoption of telehealth services in any jurisdiction is frequently influenced by factors such as the adequacy and cost of existing conventional health services in meeting patient needs; the policies of governments and/or insurers with respect to coverage and payment for telehealth services; and medical licensing requirements that may inhibit or deter the provision of telehealth second opinions or primary consultations by physicians (Parendia and Allen, 1995). Video consultations from a rural clinic to a specialist can alleviate prohibitive travel and associated costs for patients. Videoconferencing also opens up new possibilities for continuing education or training for isolated or rural health practitioners, who may not be able to leave a rural practice to take part in professional meetings or educational opportunities. While studies have yet to confirm this, it appears that the use of telemedicine can also cut costs of medical care for those in rural areas (Brown, 1996).

Barriers to Telemedicine

There are still several barriers to the practice of telemedicine. Many states will not allow out-of-state physicians to practice unless licensed in their state. The Centers for Medicare and Medicaid (CMS) still has several restrictions for Medicare telemedicine reimbursement. Many private insurers also will not reimburse, although some states, such as California and Kentucky, have legislated that they must reimburse the same as for face-to-face consultations. Other programs, such as Eastern Montana and Inland Health in Washington, have negotiated with payers for telemedicine reimbursement. Fear of malpractice suits is another consideration for physicians, as is acceptance of the technology and lack of 'hands-on' interaction with patients, although most patient satisfaction studies to date find patients on the whole satisfied with long distance care (Brown,1996).

Many potential telemedicine projects have been hampered by the lack of appropriate telecommunications technology. Regular telephone lines do not supply adequate bandwidth for most telemedical applications. Many rural areas still do not have cable wiring or other

kinds of high bandwidth telecommunications access required for more sophisticated uses, so those who could most benefit from telemedicine may not have access to it.

Many current telemedicine projects side-step these and other problems by obtaining federal funds. However, in the past three to four years, federal funding has become less available for telemedicine. In 2005, the Technology Opportunity Program (TOP) will not receive funds for telemedicine/telehealth, and the Office for the Advancement of Telehealth (OAT) will not be able to fund any new programs. Some legislation and grant appropriations passed in response to 9/Brown,1996Brown,1996 include the use of telehealth, but no direct funding has been made available. Some private corporations and telecommunications companies are stepping in to fill the void, however, pressure on the appropriate government and legislative agencies is needed before more funding will become available(Brown,1996).

Patient's point of view of telehealth

Different studies indicate patient satisfaction when telemedicine is used for clinical consultations. Patient satisfaction data from 495 real-time interactive telemedicine clnical consultations at the Telemedicine Center at East Carolina University School of Medicine in Greenville, NC were collected and evaluated. Patient satisfaction was examined in relation to patient age, gender, race, income, education, and insurance. Overall patient satisfaction was found to be 98.3%. Because so few patients were dissatisfied with their telemedicine consultation, correlation with the sociodemographic variables was limited. Patients are highly satisfied with consultations through telemedicine, and report that care was easier to obtain. In non-telemedicine settings where patient satisfaction has been studied, several significant factors have been correlated with dissatisfaction. These factors include appointment scheduling, travel time, and patient involvement in the physical examination. In telemedicine the same factors may be associated with higher patient satisfaction rates. To determine correlation between demographic factors and satisfaction, additional studies using different constructs relating to patient satisfaction are needed (Gustke,S.S and other .,200).

Physicians and manageress's point of view of telehealth

According to physicians and managers, telehealth benefits include better access to specialized services in remote regions, improved continuity of care, and increased availability of information. Telehealth also improves physicians' practice by facilitating continuing medical education, contacts with peers, and access to a second opinion. At the hospital and health region levels, telehealth has the potential to support the development of regional reference centres, favour retention of local expertise, and save costs. Conditions for successful implementation of telehealth networks include the participation of clinicians in decision-making, the availability of dedicated human and material resources, and a planned diffusion strategy. Interviews with physicians and managers also

highlighted the importance of considering telehealth within the broader organization of health care services in remote and rural regions (Association of telehealth service provider, 2007).

Disease management's point of view of telehealth

The primary goal of any disease management program is to improve the patient's outcomes and quality of life. Not surprisingly, it is most effective in dealing with chronic diseases, which do not have a cure. The disease management model helps patients alter behaviors, manage their health, and control symptoms by providing patient guidance and education. By necessity, successfully managing a chronic disease requires an open avenue of communication between the patient and caregiver, a high degree of patient participation in his/her own care, and vigilance on the part of the clinician.

Given these requirements, telehealth technology is the most appropriate means of implementing an effective disease management program. Today's telehealth technology connects the patient and the homecare provider using an in-home device and an ordinary telephone line. In its most simplistic form, telehealth technology collects patient vital sign readings and transmits rudimentary diagnosis information between the patient and homecare provider. But the technology is capable of much more. Used to its fullest potential, telehealth technology allows the care provider to establish daily, bi-directional communication with the patient and transmit clinical content to patients; and allows the clinician to monitor every aspect of the patient's condition daily and, therefore, more thoroughly than is possible with a traditional in-home visit.

The most important factor in any telehealth-based disease management system is its clinical content. Ideally, the clinical content will provide two-way communication of not just physiological information (i.e. vital signs) but education and compliance information as well. Rich clinical content provides diagnosis-specific information, including programs for co-morbidity diagnoses, that takes patient responses into account when determining the next question. For instance, if a CHF patient does not demonstrate an understanding of the significance of shortness of breath or the importance of taking medications each day, the system uses branching logic to transmit appropriate educational information. This individualizes each encounter the patient has with the telehealth system.

Daily documentation of patient information using telehealth technology allows the care provider to track health patterns over time and detect deviations in patient data that may indicate a decline in health before it becomes acute. A telehealth system can provide alerts that are activated when patient-specific baselines exceed a given parameter -

weight, for instance. This is practically impossible in the traditional care delivery model. Having baselines isn't enough, though. The homecare agency must be able to modify baselines easily to ensure alerts are kept to a minimum and only signify a truly serious situation. Taken together, detailed health tracking and alerts allow agencies to fully understand the overall health of the patient.

Using disease management to benefit patients and providers

By implementing a disease management system delivered using interactive telehealth technology, home healthcare providers can radically enhance their care delivery system. Indeed, the benefits of implementing such a telehealth-based disease management system are significant to both the patient and the care provider.

A successful disease management system using telehealth technology helps patients live healthier lives. In a study conducted by Mercy Healthcare Sacramento, they found that CHF patients using telehealth with extensive disease management programs experienced a 73% reduction in hospitalization and ER visits and an 80% reduction in total bed-days as compared to standard care By compelling patients to answer detailed questions not only about their vital sign readings, but about their symptoms and knowledge of their diagnosis, providers make patients active participants in their own well-being. Educating patients about their diagnosis and providing detailed, interactive information helps them modify behaviors and improve medication compliance. Putting patients in charge of their own care leads to an overall improvement in health and improved outcomes. It also helps them avoid acute episodes with doctor and hospital visits, which are very costly physically, emotionally, and financially. Additionally, going through the motions of answering questions on a daily basis gives patients the comfort of knowing they are being looked after and helps reduce feelings of isolation, which can negatively impact their well-being.

Telehealth technology helps agencies provide thorough care and conserve both personnel and financial resources. It allows one clinician to oversee the health of many more patients than is possible through traditional homecare visits. Patient data is updated daily rather than periodically, which gives the agency far more detailed information not only about the patient's physical well-being, but also his emotional health and level of understanding-two imperative elements to overall well-being that must be addressed if the patient is to maintain an acceptable level of health. Electronic collection of data helps ensure the integrity of data and helps the agency maintain compliance. Using a telehealth monitoring system that automatically ranks patients based on patient-specific baselines allows the agency to track health information and detect changes in the patient's status more quickly. Tracking this information allows case managers to schedule in-home visits only when they are necessary, which helps reduce the cost of providing care and allows the agency to deploy clinicians in a more efficient way. This additional information also

gives the care team more insight into the overall health of the patient and improves coordination of care (Utterback, Karen, 2005,).

Conclusion

According to systematic reviews, evidence of telehealth benefits has been reported for various applications such as teleradiology, telepsychiatry, transmission of echocardiograms, teledermatology, and telehomecare. Results from a majority of the reviewed studies support telehealth over other traditional modes of health services delivery. Other studies have reported telehealth benefits with respect to continuity of patient care and coordination of clinical activities between various health care organizations and levels of care(Shore,Jay,2007). Using telehealth technology to deploy a disease management program can help caregivers deliver more proactive patient care, education, and support that will empower patients and improve the quality of their lives by allowing them to control their symptoms for more stabilized maintenance(Utterback,Karen,2005).

Nevertheless, telehealth implementation still faces major barriers, mostly related to structural, organizational, and professional imperatives. Specifically, structural barriers relate to licensure, reimbursement, policies governing telecommunication and information technologies development, and interjurisdictional collaborations (Shore and other, 2007) Thus, strategies addressing the identified conditions for telehealth success would facilitate the optimal implementation of this technology (Miller and other, 2003)

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