Medical Care by Modern Telemedicine

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There are many ways to define telemedicine. We like to define telemedicine as the use of electronic information and communication technologies to provide and support health care when distance separates the participants.

Early application of telemedicine was focused on remote populations scattered across islands, mountain areas and artic regions, where physicians could not easily be found. However, most of telemedicine projects failed to survive. Now that the cost of this technology has decreased and the network services, using both satellite link and the ISDN (Integrated Services Digital Network) terrestrial network, have boomed, another wave of interest in telemedicine has prompted a range of new activities.

Medicine has reached a notable technological progress in the last twenty years in the field of bio-images, especially in ophthalmology. In teleophthalmology, bio-images and any kind of medical data are translated into electronic signal in a telemedicine station, transmitted and read after reconstruction into picture and sound in another telemedicine station (ecographies, digital fluorescein angiographies, surgical video...). Experience and familiarity with telemedicine data has teached that diagnosis accuracy is not - or little - affected by the image transfer process. Teleconsultation between ophthalmologists in distant location allows exchange of opinions, a second medical opinion, exams interpretation, to support or guide care of specific patients. Telecommunication allows training ophthalmologists to treat patients as soon as possible with the help of continuous medical education programs delivered by telemedicine. Videoconferencing system allows multi-port videoconferences with permanent visual and acoustic contact, and gives the possibility to exchange documents using a computer-based high resolution graphics system integrated in the PC.

We had the chance to start with the first European pilot project for telemedicine via satellite. This SHARED (Satellite Health Access for Remote Environment Demonstrator) project stems from the cooperation between the European Space Agency, the Italian Ministry of Defense, and the consortium involving the San Raffaele Hospital and Alenia Aereospazio. This project exploits dedicated ground stations and satellite links to conduct medical and ophthalmic consultations, online vitreoretinal surgery mentoring and medical and ophthalmologic training between European hospitals. The initiative is rapidly expanding in many other hospitals using also the terrestrial ISDN network.

Our experience has teached us that a winning telemedicine program has to be addressed mainly to physician-to-physician relations. Besides, a winning telemedicine program should be focused on identifying practical and economic ways to achieve desired results, rather than investigating advanced telemedicine options. The secret of success, according to our experience, depends upon many technical, human and policy factors: marketing, technology, planning physician acceptance, decision-making coordinators, medical data quality of transferred documents.

Current clinical applications of telemedicine are marked by diversity: different medical problems, strategies employed, organization of technical and medical staff, communication systems, decisionmakers' goals. For these reasons it is difficult today to compare and evaluate the efficacy of the telemedicine programs to alternative health care strategies. Patients' satisfaction data appear to be the only data collected, a focus that we consider too limiting. Moreover, the literature in telemedicine is weighted shifted towards nonexperimental studies. Peer-reviewed publications will have to play a role by moving towards standards for systematic reporting of evaluation methods and results.

Therefore, many problems have still to be suitably faced and solved, such as: systematic evaluation of quality of telecare, physicians and patients acceptability, access and cost of the telemedicine programs; overuse or underuse of telemedicine care; legal protection for physicians and patients' privacy; governments reimbursement policies.

In the large countries, like Brazil, one of the major health care's problem is the centralization of physicians in the big metropolis with consequent non optimal distribution of physicians across the country. Telemedicine could represent a new strategy to compensate this centralization. Besides, investments in telemedicine could represent a good profit in the near future, in an era of budgetary retrenchment in health care all over the whole world. Excellent medical centers and consortia are already exploring telemedicine to develop new international markets.

More and more people have personal computers and soft-

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ware to communicate each other. Physicians and patients will interact always more easily. In this context, telemedicine has the potential to radically change the health care and its distribution, and to alter the face to face physician-to-physician and physician-to-patients relationship that has been the model for medical care for generations. In return, patients could be said to have more timely access to appropriate care and thus, better access to care.
