HEART INSTITUTE TELEMEDICINE AND TELEHEALTH INITIATIVES AND PERSPECTIVES

Rosângela Simões Gundim MSc PhD[1,2], Carlos Alberto Pastore MD PhD[1,2]

[1] Heart Institute (InCor) of Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo – São Paulo, Brazil
[2] Zerbini Foundation – São Paulo, Brazil

Abstract

This is a brief report of the telemedicine and telehealth initiatives developed at the Heart Institute (InCor HC FMUSP) since 2009. The challenges to develop, implement and make the service operational are described. Support was received from the Telemedicine University Network of the Ministry of Science, Technology and Innovation, the National Health Fund of Ministry of Health and a private donor to establish this Telemedicine and Telehealth Centre, making it possible for our students, professors and professionals to participate in activities at a distance, such as videoconferences, transmission of surgical procedures, web conferences and online courses. The Centre is also responsible for coordinating all local audio-visual resources available in our classrooms and amphitheatre, as well as producing videos. Although the main focus of the Centre is education, the Centre provides support for the management of tele-ECG contracts, second opinion services and other opportunities for innovation in the field of telemedicine and telehealth. The current infrastructure has extended integration with other Services of the Institute, leading the acquisition of skills by health professionals, but the challenge remains of raising the awareness of collaborative work at a distance, implementing innovative healthcare services for remote monitoring of our patients with chronic conditions, and assessing their impact. It is mandatory to acquire and use new technologies to add value to patient care and, at the same time, get good return on investment.

Keywords: Heart Institute (InCor); telemedicine; telehealth; tele-ECG; distance education; Brazil

Introduction

The Heart Institute (InCor) of the Clinical Hospital of the Faculty of Medicine of University of São Paulo (HC FMUSP) is a public hospital, specialising in high complexity clinical and surgical cardio-pneumonology. It is dedicated to the assistance, teaching, research, promotion of prevention actions and health promotion, dissemination of scientific knowledge, and development of research aimed at acquiring greater knowledge, new techniques and technologies in the cardiac and cardio-pneumonological domains. Administratively, it is linked to the Hospital das Clínicas (HC of the Government of the State of São Paulo, from which it receives an annual budget allocation. In this aspect, it is characterised as a public institution providing health services.

In the areas of teaching, research and as a university extension, InCor is linked to the Faculty of Medicine of the University of São Paulo (Faculdade de Medicina da Universidade de São Paulo - FMUSP). In organisational terms, the Institute is linked to the university academic structure. In this condition, the most qualified professors occupy statutory positions of greater prominence in the managerial structure of the institution.

In addition to this linkage, InCor presents another component of organisational/administrative complexity. The Institute established a non-profit support foundation in 1978, the Zerbini Foundation, which is responsible for acquiring, managing and investing in the physical structure of InCor, as well as in the resources of the Institute to provide assistance, teaching and research in cardiology and pneumonology. The existence of the Foundation enabled the hiring of full-time specialists, acquisition of equipment and

supplies in general, and provision of services at levels that are difficult to be met by a public hospital.

In 2016, InCor had approximately 415 operational beds, distributed in seven units and six high complexity intensive therapy units. The surgical centre, has 14 operating rooms performs an average of 12 operations per day and is one of the most modern in Latin America. The resources installed for the healthcare programmes are based projections of the population potentially at risk for cardiovascular and pulmonary diseases that require high complexity treatments.

The hospital maintains 17 centres, including laboratories and research groups, and a highly complex diagnostic area recognised for its state-of-the-art equipment, with cutting-edge devices such as digital cardio-angiography, positron and multi-slice emission tomography and echocardiography by micro bubbles. Among the diagnostic resources is tele-electrocardiography (tele-ECG) and a specialised cardiac second opinion service, which averaged 15,000 ECG reports per month in 2016. Remote ECG reports have been provided since 1995.[1] In 2009, InCor decided established a Telemedicine and Telehealth Centre (T&TC) in order to manage the tele-initiatives within the hospital with the Adult and Paediatric Electrocardiography Group of Specialists providing the ECG reports through a web-based system, with the support of T&TC. T&TC is also responsible for coordinating all the local audio-visual resources available in the classrooms and the Institute's Amphitheatre, as well as for the filming, editing and finalisation of videos with scientific and educational purposes.

The aim of this paper is to report the institutionalisation of telemedicine and telehealth and the challenges to design, implement and operationalise the service making it possible for our students, teachers and professionals to join activities at a distance, such as the web-based tele-ECG reporting system, videoconferences, transmission of surgical procedures, streaming, web conferences and online courses.

Methods

We used historical narrative and included, as far as possible, description and photographic records to demonstrate the institutionalisation of the T&T Centre, in which some partners played a fundamental role in providing technological and human resources.

Results and Discussion

The InCor Board of Directors, stimulated by the internal demands of the medical and multi-professional staff for technology-mediated activities, decided to formally establish a telemedicine and telehealth centre. The first step was to hire a professional to develop, deploy and manage the centre and its activities. Initially, with the support of the Telemedicine Discipline of the Medical Faculty of the University of São Paulo (DTM-FMUSP), a videoconference system was used for meetings, classes, events and transmission of surgical procedures, and to participate in some Special Interest Groups (SIG) of the Telemedicine Network such as Telenursing, Intensive High Complexity Nursing, Cardiology, Tech-Operational and Research in Telehealth.

In 2010, the Institute submitted complementary proposals for two different Projects, one of the Brazilian Ministry of Science, Technology and Innovation, called University Telemedicine Network, or RUTE in Portuguese (Rede Universitária de Telemedicina), and the second, called National Health Fund (Fundo Nacional de Saúde) of the Brazilian Ministry of Health. Both projects were approved, which was of crucial importance regarding the provision of equipment and hiring of trainees in 2012 and 2013. After the centre was structured, it was officially inaugurated, with four other Telemedicine Units in different parts of Brazil linked simultaneously in the presence of the Minister of Health and representatives of the Ministry of Science and Technology.

This led to an increase in demand for the initial services, such as a) planning and execution of distance courses, b) tele-diagnostic support, c) technical and operational support for the use of interactive media, such as videoconferences and web conferences, also encouraging the implementation of other services, d) a video production section, to provide services for recording, editing and publication of audio-visual materials related to classes, courses and events, e) and an audio and visual on-site operation and activities booking management system.

In 2015 a private donation was made to our T&TC that fortunately allowed renewal of the physical facilities, partial equipment of the technological installations of the Amphitheatre and classrooms, and development of a new studio. During this renewal in 2015 and 2016, the staff was increased from three to seven professionals who are responsible for leading the T&TC service. (Figures 1 and 2)

Figure 1. Live transmission: new techniques course in cardiac surgery.

Figure 2. Scientific event: international symposium of paediatric telecardiology.

In spite of the institutional complexity and the fact that all decisions are traditionally made by a collegiate, with the support of different sources both from inside and outside Incor, T&TC seems to have a sustainable perspective ahead. Although there are some internal controversies over whether the priority should be healthcare or education, the T&TC provides support for the Institute's educational area (both local and at a distance), as well as for tele-diagnosis, without losing sight of the search for new opportunities for development of telemedicine and telehealth activities.

Because of the high routine workload, "tele" research has been limited.[2-6] On the other hand, some of the multi-professional researchers use the available resources to collaborate with their partners, both at the national and international level, for discussions, presentation of results, qualification and presentation of doctoral dissertations.

Conclusions

Our current infrastructure has extended our integration with other services of the Institute, leading the acquisition of skills by health professionals, but there are still challenges of raising awareness on collaborative work at a distance, implementing innovative healthcare services for remote monitoring of patients with chronic conditions, and assessing its impact. It is mandatory to acquire and use new technologies that may add value for patient care, and at the same time to get a good return on investment. There is a lot to learn and a lot to do!

……

Corresponding author:
Rosângela Simões Gundim
Heart Institute (InCor)
Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo
São Paulo
Brazil
eMail: rosangela.gundim@incor.usp.br

Conflict of interest. The authors declare no conflicts of interest.

References

1. Pastore CA et al. FAX-ECG Transmission of electrocardiograms through the facsimile. Brazilian National Experience. International Society of Electrocardiology. Cleveland, Ohio, July, 1996.
2. Gundim RS. [Thesis]. Management of determinant factors for the sustainability of the telemedicine centers. FMUSP, São Paulo-Brazil: Sep. 2009.
3. Gundim RS, Chao LW. A graphical representation model for telemedicine and telehealth center sustainability. *Telemed e-Health* 2011:17(3):164-168.
4. Lopes PRL, Gundim RS, Silva AB. Assessment: an important component of telemedicine. In: Messina LA, Ribeiro Filho JL, Lopes PRL editors. RUTE 100: The first 100 Brazilian telemedicine units and the impact of University Telemedicine Network. 1st. Ed. Rio de Janeiro-Brazil: E-papers, 2014;78-87.
5. Oliveira MT, Canesin MF, Marcolino MS, et al. Telecardiology guideline for care of patients with acute coronary syndrome and other heart diseases. *Arq Bras Cardio* 2015:104(5 suppl 1):1-26. Available at: http://dx.doi.org/10.5935/abc.20150057 accessed 31 January 2017.
6. Gundim RS, Pastore CA. ECG in the Telemedicine. In: Pastore CA et al editors. Eletrocardiografia Atual [Current Eletrocardiography]. 3rd Ed. São Paulo-Brazil: Atheneu Press; 2016;359-373.