

TEN YEARS OF A TELE-ECG SYSTEM IN THE STATE OF RIO GRANDE DO SUL/BRAZIL: FROM A REGIONAL PROJECT TO A MULTIPOINT NETWORK

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Introduction: Telemedicine and eHealth were incorporated to almost all areas of health practice. Telecardiology is one of the most important, causing significant impact when implemented in underserved areas of the globe. Since the year 2000, a digital Tele-ECG system operates in the State of Rio Grande do Sul (RS), in south Brazil. Initially it was established around the city of Sao Lourenco do Sul (SLS) - 44,000 inhabitants -. In 2008, coordinated by the eHealth Centre of ICFUC-RS, the method was expanded to more 11 towns. Now, a larger public telecardiology network is under establishment in RS.

Objectives: The telecardiology aims in RS has 2 phases:

(1) Year 2000: the establishment of a regional Tele-ECG system in the city of SLS, for the diagnosis of both urgent and routine cardiac diseases.

(2) From 2008: the implementation of a public multipoint telecardiology network throughout RS.

Methods: The first digital Tele-ECG system of RS started in January 2000, with a point-to-point connection, allowing exams transmission via conventional phone lines, from a urban hospital of SLS to the local cardiologist. During the following years, the method was also implemented in a rural hospital (TDMA mobile phone), in an outpatient care unit (radio based Internet access) and in another urban hospital (DSL Internet). Since 2008, a larger telecardiology network coordinated by the eHealth Centre of ICFUC-RS is under implementation in RS, through a partnership with the State Government. Funded by Federal and State projects, it includes the participation of 2 cardiological referral centres (ICFUC-RS and Hospital de Cardiologia do Rio Grande), a tertiary level regional hospital (in the city of Passo Fundo) and eleven remote Institutions (outpatient care units and small hospitals). The central units of the Tele-ECG system are located in the emergency rooms (24/7 basis) of the two referral centres. Each remote centre was equipped with a digital ECG machine. Desktops, webcams, free video communication software and DSL Internet access of at least 512 Kbps (remote points) and 1 Mbps (central units) were installed in the emergency rooms.

Results: Around 13.000 Tele-ECGs were transmitted and analyzed during 10 years in the region of Sao Lourenco do Sul, from 3 small hospitals and 1 outpatient care unit. The telecommunication method, initially based on point-to-point phone transmission via conventional lines and TDMA mobile phones, has changed to Internet based real time and store-and-forward technology, including 3G mobile Internet access. Based on the

achievements of the SLS regional experience, a public telecardiology network started in RS/Brazil, in 2008, connecting 11 remote Institutions - 6 located in the northwestern and 5 in the southeastern regions – to two referral centres. The system allows real time ECG diagnosis and specialized second opinion for acute and severe cases, including medical advice for the administration of thrombolytic therapy in cases of S-T elevation acute myocardial infarction.

Conclusions: The 10 years of successful Tele-ECG experience in RS, allied to the improvement in technological infrastructure and Internet costs reduction, motivated the ICFUC-RS and the State Secretariats of Health and of Science and Technology to expand the system to more 90 small and remote towns in RS - population less than 50,000 inhabitants -, during 2010/2011. The new system includes a multiseat web conferencing training program in cardiology.

Keywords: Telecardiology, Myocardial Infarction, Multipoint e-learning