Sick during Vacation ? – Get Help from Berlin by Live Connection into a Turkish, Egyptian, Moroccan, Tunisian or Algerian Hospital

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Abstract

The rapid development of information and communication technologies bears the risk of creating a digital divide in the world. EMISPHER is dedicated to bridge such a digital divide by establishing an equal access for most of the countries in the Euro-Mediterranean region to real-time and on-line services for healthcare. The EMISPHER platform includes a bi-directional satellite network (up to 2 Mbps) between 10 centres of excellence. The EMISPHER network hosts three main areas of application: medical e-learning for the creation of an EMISPHER Virtual Medical University, real-time telemedicine for second opinion and teletraining and medical assistance for continuity of care.

1 Introduction

Becoming sick during a vacation abroad can mean a lot of trouble. One is unfamiliar with the local health system, has to be diagnosed not being able to speak the same language as the medical personal and is treated according to different health care standards. Sometimes even a costly transport to the home country may be required. In this situation, telemedicine can offer help by making available a teleconsultation by a medical doctor from one's home country. Sometimes such a second opinion can be of valuable help. The EMISPHER project described in this article supplies such a medical assistance by connecting hospitals in the Euro-Mediterranean area.

Telemedicine aims at equal access to medical expertise irrespective of the geographical location of the person in need. New developments in information and communication technologies (ICT) have enabled the transmission of medical images in sufficiently high quality that allows for a reliable diagnosis to be formulated by the expert at the receiving site. At the same time, however, these explosive developments in ICT over the last decade bear the risk of creating and amplifying a digital divide in the world. EMISPHER (Euro-Mediterranean Internet-Satellite Platform for Health, medical Education and Research) is dedicated to bridge and avoid such a digital divide by establishing an equal access for most of the countries of the Euro-Mediterranean area to real-time and on-line services for healthcare in the required quality of service.

The Surgical Research Unit OP 2000 has played a prominent role in various telemedicine projects in the last decade [1-4].

2 Materials and Methods

The EMISPHER project (01.09.2002 – 31.10.2004) is co-funded by the EC under the EUMEDIS (Euro-Mediterranean Information Society) programme, launched as part of the Barcelona process to avoid a digital divide between the EU and its Mediterranean partners. EMISPHER provides an integrated internet-satellite platform for the application of various medical services, such as medical e-learning, real-time telemedicine and medical assistance. The platform includes a bi-directional satellite network (up to 2 Mbps) between 10 Centres of Excellence in the Euro-Mediterranean region (Morocco, Algeria, Tunisia, Egypt, Cyprus, Turkey, Greece, Italy, France and Germany) (see **Fig. 1**) and employs ViaSat Linkway technology in combination with WoTeSa / WinVicos as interactive tool for real-time telemedical applications and e-learning [5] (see **Fig. 2-4**).

This bi-directional interactive broadband satellite network is complemented by a receive-only network, that can provide to a larger number of sites a satellite-based broadband internet access that allows for reception of multimedia streams (up to 2 Mbps) at sites where terrestrial internet access is limited.

Fig. 1 Centres of Excellence in the EMISPHER network

The user interface of this integrated internet-satellite platform is service-oriented, where end-users register for those services that closely meet their specific requirements, without the need to deal with the technical problems inherent to the use of this type of technology. Services provided include not only dedicated applications, such as medical e-learning, real-time telemedicine and medical assistance, but also allow for management of the various satellite resources, and financial monitoring of its use.
The platform is deployed and operated under the responsibility of the EMISPHER Consortium members Eutelsat (France) and Telemedicine Technologies (France).

3 Results and Discussion

The following leading medical centers are member of the EMISPHER Consortium: CICE – Centre International de Chirurgie Endoscopique, Clermont-Ferrand, France (Co-Leader); ASU – Aïn Shams University, Cairo, Egypt (Co-Leader); ANDS – Agence National de Documentation de la Santé (Ministère de la Santé), Algiers, Algeria; NIFRT – Nasser Institute for Research and Treatment (Ministry of Health and Population, MOHP), Cairo, Egypt; FMPC – Faculty of Medicine and Pharmacy of Casablanca, Morocco; Tunis – Faculty of Medicine of Tunis, Tunisia; ISTEM – Continuing Medical Education and Research Centre, University of Istanbul, Turkey; SEPELM – Société Européenne pour l'E-Learning Médical, in combination with UMVF – Université Médicale Virtuelle Francophone, Paris, France; IsMeTT – Istituto Mediterraneo per i Trapianti e Terapie ad Alta Specializzazione, Palermo, Italy; and Charité University Medicine Berlin, Germany.

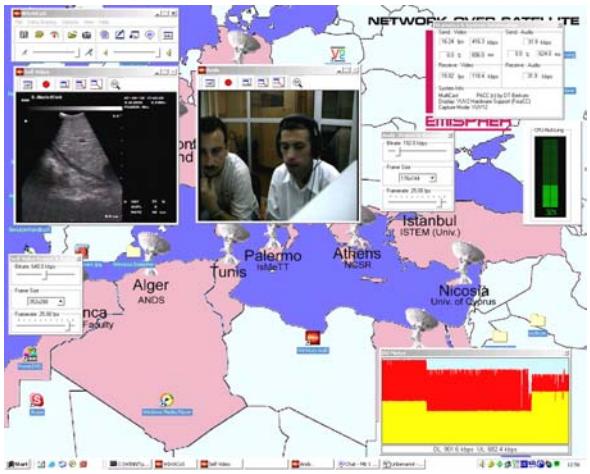

Fig. 2 Teleconsultation between Berlin and Algiers. Live-video from an ultrasound investigation is transmitted

The EMISPHER platform:
a) E-learning: The formation and operation of the EMISPHER Virtual Medical University (EVMU) is one of the main efforts in the project. Each of the leading medical centers provides pedagogical material and modules for synchronous and asynchronous e-learning in their medical specialities: endoscopic surgery, gynaecology-obstetrics, reproductive medicine, infections diseases, interventional radiology, liver transplantation, tumour diagnosis and therapy. The central gateway to EVMU is the project's website: www.emispher.org. From here, users have access to the contents of the various modules and can register for the participation in real-time e-learning events. The exchange and availability of common educational

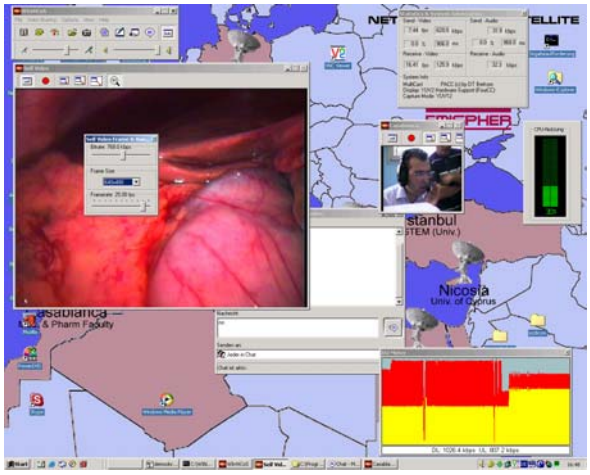

Fig. 3 Teleconsultation between Berlin and Casablanca. Transmission of a video from a laparoscopic investigation. The transmission bandwidth is chosen asymmetrical to allow for a high quality of service.

Fig. 4 Teleconsultation between Berlin and Palermo with transfer of medical data file.

modules allows for improved qualifications of undergraduate and graduate students, hospital staff, general practitioners, healthcare officers and other professionals in the medical field.

b) In the field of real-time telemedicine the following categories of applications are offered: second opinion, teleteaching & teletraining (demonstration and spread of new techniques), telementoring (enhancement of staff qualification), and undergraduate teaching courses and optimisation of the learning curve. The leading medical centers in the project provide expertise in the following medical fields: open and minimally-invasive surgery, multi-organ transplantation, endoscopy, pathology, radiology, interventional imaging, infectious diseases, oncology, gynaecology and obstetrics, reproductive medicine and emergency medicine. These real-time telemedical applications contribute to improved quality of patient care and to accelerated qualification of medical doctors in their respective speciality.

c) The third field of service operated in EMISPHER is medical assistance. As tourism constitutes a substantial economical factor in the Mediterranean region and because of the increasing mobility of the population, continuity of care through improved medical assistance is of major importance for improved healthcare in the Euro-Mediterranean region. Introduction of standardised procedures, integration of the platform with the various local communication systems and training the medical staff involved in medical assistance allow for shared management of files related to medical assistance (medical images, diagnosis, workflow, financial management, etc.) and thus for improved care for travellers and expatriates.

4 Conclusions

EMISPHER fosters cross-Mediterranean cooperation between the leading medical centers by establishing a permanent medical and scientific link. Through the deployment and operation of an integrated internet-satellite communication platform, EMISPHER provides for medical professionals in the whole Euro-Mediterranean area access to the required quality of service, thus bridging and avoiding a digital divide. The services of the EMISPHER Virtual Medical University, the applications in real-time telemedicine and the improved medical assistance contribute to an improved level of healthcare in the whole Euro-Mediterranean region.

5 Literature

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