

Experience with Healthcare Telematics in Cyprus

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Introduction

In this paper a review of three healthcare telematic applications in Cyprus are presented. These include a medical system for emergency telemedicine (AMBULANCE and EMERGENCY-112 projects), a diagnostic telepathology network in gynaecological cancer (TELEGYN), and a collaborative virtual medical team for home healthcare of cancer patients (DITIS). The problems associated with the deployment of the former two in routine clinical practise as well as the reasons of success of the third project will be briefly discussed.

Ambulance and Emergency-112 Projects [1]-[3]

The AMBULANCE and EMERGENCY-112 projects were sponsored by the EU and Cyprus actively participated. The objective of these projects were the development and testing of a portable device allowing emergency telemedicine services between ambulance vehicles and distanced expert physicians via wireless communication. The ultimate goal was to produce a marketable system that will significantly enhance pre-hospital care. The diagnosis at the scene of an emergency, as well as the handling of the case, were substantially improved through on-line access to medical specialists, which decreased the time to make the first diagnosis and start the appropriate treatment. Severe or multiple trauma patients were better assessed, while the electronic registration of the patient's data freed the ambulance personnel of any paper work and helped devoting more time on real emergency care. The system can be further used in directing the management of stacked victims and setting priorities in cases of major incidents (TRIAGE). It can also contribute to directing the transport of victims, thus reducing the time of arrival at the hospital. Although the system was evaluated successfully, both in Cyprus and in other EU countries in 2000, it has not yet been set in routine operation except being partly used in one private hospital in Greece. In Cyprus there are attempts now in collaboration with the Ministry of Health to revitalize this project.

TELEGYN: Telepathology in Gynaecological Cancer [1]

Gynaecological cancer (breast, ovarian, endometrial, cervical) consists of a large number of tumors with variable presentation and often unpredictable malignant potential, making patient management demanding but also challenging. Surgery plays a significant role in the management of most gynaecological benign and malignant tumours. However, even the most experienced surgeon is totally reliant on intraoperative histopathological evaluation for distinguishing between malignant and benign disease. In practice, expert histopathologists with experience in each human body system cannot be found next to each surgeon. As a result in most cases, therapy is based on postoperative histopathological diagnosis including second opinions, such as consultations from experts at remote sites. The main objective of this initiative is to establish a telepathology network in gynaecological cancer which will offer online dynamic intraoperative and postoperative consultations between a panel of experts using the network to transmit video (laparoscopic scenes), still images (histopathologic specimen images), and clinical data. The network is currently in operation after 3 years of surpassing several problems but it is used only for histopathology. Problems solved included, budgeting for buying a microtome, technical (one of the imaging vendors did not support the functionality -as originally quoted- that used to transfer files from the digital camera of the microscope to the PC, and problems with using 4 ISDN connections), training of the medical and paramedical staff, and turnover of physicians.

DITIS: Home Healthcare of Cancer Patients [4]

DITIS (ΔΙΤΗΣ, in Greek, stands for: Network for Home HealthCare Collaboration) is a system that supports Virtual HealthCare Teams dealing with the home-healthcare of cancer patients in Cyprus. DITIS was originally developed with a view to address the difficulties of communication and continuity of care between the home health care multidisciplinary team (PASYKAF) and between the team and the oncologist often

over 100kms away. DITIS has through its database and possibility of access via mobile or wire line (computers) offered much more than improved communication. Its flexibility of communication and access to the patient's history and daily record at all times and from anywhere (e.g. home, outpatients, or even during emergency admission) has offered the team a continuous overall assessment and history of each symptom. It supports the creation, management and co-ordination of virtual healthcare teams, for the continuous treatment of the patient at home. DITIS has thus offered improved quality of life to the patient, for example by offering the nurses the possibility of immediate authorisation to change prescription via mobile devices and the oncologist the possibility of assessment and symptom control without necessarily having to see the patient. The system is currently successfully implemented due to the pragmatic approach that it follows in supporting the home health care team and due to a highly motivated team. DITIS was ranked among the best 25 e-Health projects (out of 179 EU projects), was presented in the e-Health Ministerial conference 2003, as well as received the 7th place in 2003 World Summit Award (out of 89 entries in e-health).

Concluding Remarks

Some recommendations that will help the wider spread of medical informatics, incorporating health telematics in Cyprus follow: i) High level political decision, commitment and leadership for the immediate promotion and application of medical informatics technology in all operations of the Ministry of Health, incorporating all hospitals and regional health centres. ii) Adoption of electronic patient health records for all Cypriot citizens. iii) Training of the physicians, the paramedical and administrative staff.

Cyprus should accelerate its pace in medical informatics and healthcare telematics to benefit the whole of the health care sector thus enabling the offering of a better service to the citizen.

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References

- [1] C.S. Pattichis, C.N. Schizas and A. Andreou, Healthcare Telematic Applications in Cyprus, *Methods of Information in Medicine*, 41 (2002), 376-381.
- [2] C.S. Pattichis, E. Kyriacou, S. Voskarides, M.S. Pattichis, R. Istepanian and C.N. Schizas, Wireless Telemedicine Systems: An Overview, *IEEE Antennas & Propagation Magazine*, 44, No. 2, (2002), 143-153.
- [3] E. Kyriacou, P. Sotiris, A. Berler, M. Neophytou, A. Bourka, A. Georgoulas and A. Anagnostaki, D. Karayiannis, C. Schizas, C. Pattichis, A. Andreou, D. Koutsouris, Multi-purpose HealthCare Telemedicine Systems with mobile communication link support, *BioMedical Engineering OnLine*, <http://www.biomedical-engineering-online.com/start.asp>, 2, No. 7, (2003).
- [4] A. Pitsillides, B. Pitsillides, G. Samaras, M. Dikaiakos, E. Christodoulou, P. Andeou, D. Georgiades DITIS: A COLLABORATIVE VIRTUAL MEDICAL TEAM FOR HOME HEALTHCARE OF CANCER PATIENTS, in: *M-Health: Emerging Mobile Health Systems*, R. H. Istepanian, S. Laxminarayan, C. S. Pattichis, ed., Kluwer Academic/Plenum Publishers, to be published in 2004.