

New methods in Tele-cardiology¹

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The paper is focusing on new methods aimed to improve the inadequate accessibility of diagnostics-related information (and expertise) for the competent members of the co-operating professional medical community. An intensive application of modern information technology can effectively alleviate this problem. Our goal is to apply proven and new methods of exact and applied natural sciences to this problem, with a special emphasis on the preventive and curative health care of cardiovascular diseases. In our work we would like to present the system overview and the first experiences of a government-funded pilot project of co-operating Hungarian research and industrial institutions. Among others, the project aims to improve preventive cardiac care, design better diagnostic methods for cardiovascular diseases, and support post-treatment remote monitoring. We would like to describe two, loosely coupled subsystems of the overall effort, i.e. the internet-based risk assessment and advisory system (RAS) and the remote monitoring system (RMS), both specialized in cardiovascular diseases.

With RAS, our goal is to design an internet based interactive information system, which supports risk assessment, health conservation counselling and can generate weekly menus for a healthy lifestyle. We also plan to integrate decision support into the system with a high level medical background. The system aims to avoid the development of a high-risk medical state at the very basic social level, by minimising the effect of the controllable risk factors. The **RAS** system is designed to provide personalized risk assessment and dietary advice with respect to cardiovascular diseases. The emphasis in this system is on prevention by giving the right and realistic advice. The target users of the system are health-conscious middle-age or younger men and women who want to decrease their cardiovascular risks.

Over the last years there has been an enormous development within the field of internet and telecommunications including mobile applications. Remote monitoring is based on these modern solutions. We can use several technologies to monitor physiological parameters such as ECG parameters. The basic motivation of **RMS** is to cut down healthcare-related costs for both the health institution (hospital) and the patient by supporting some examinations (ECG, blood pressure, etc.) to be performed conveniently at home, and the results to be transmitted to a central medical database. These results automatically evaluated by the system. In case of an emergency situation, information is sent directly for human evaluation to the Monitoring Service, available 24 hours a day. The medical doctor at the Service can contact the patient, the ambulance or the nearest competent hospital by phone. In this way all the costs and troubles (such as travel from remote locations) related to routine medical examinations can be avoided. To achieve intelligent monitoring with alarms based on input parameters there is a need for integrated decision support, the aim of which is to provide a medical decision-making diagnostic support. These auto-diagnoses draw the attention of the doctor to the possible problems.

Remote monitoring and interactive remote counselling provide a cost-effective and comfortable means of medical care. We would like present the first experiences of the two of above systems, both in the field of cardiovascular diseases. The prototype medical instruments, the database design and the user interfaces are elaborated.

¹The work has been supported by National Research and Development Program NKFP #2/052/2001