Submitted for the 2nd International Symposium on Telemedicine, December 15-19, 2002, Gothenburg, Sweden.

The U-R-Safe project : an innovative multidisciplinary approach for an "anywhere" care of the elderly.

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Abstract :
U-R-Safe is the acronym of a two year IST telemedicine project, set *for "Universal Remote Signal Acquisition For hEalth*" and pronounced as "*You are safe*". This project is based on a **multidisciplinary approach** and aims at a **mobile telemedicine care of the elderly**. It was proposed in the 6th IST call and started in January 2002. The basic idea of this project has emerged, taking into consideration that in the EU countries, the cost of health expenses are foreseen to grow as the population is aging. Having patients treated and monitored ***outside*** hospital structures is not only an economical issue but an important aspect in improving the quality of life of the patient. To contribute to these new medical care structures, the U-R-Safe project includes a new global telemedicine service concept and a technology platform. Both are being developed for medical care of elderly people at home and outside their home for regular follow-up and emergency situations, allowing elderly people to be continuously monitored while living a "quasi"normal life. The consortium is composed of partners from a broad spectrum of fields: telemedicine, medicine, telecommunication, signal processing, speech recognition, etc. The concept is to let a patient wear medical measuring devices, all connected via short range Wireless Personal Area Network (WPAN) to a central, portable electronic unit called Personal Base Station (PBS). Electrocardiograms and oxygen saturation will be recorded using wearable **ECG sensors** and a **wrist-portable oxygen saturation sensor**, while a **Shock/Fall detector** will send alarm when patient falls or pushes a button. Thanks to **speech recognition** algorithms, the PBS will also be able to exchange simple sentences with the patient in order to better analyse the patient condition. All information coming from the ECG sensor, from the oxygen saturation sensor and from the shock/fall detector will be gathered, taking into account the results of speech exchange between the patient and the PBS. Based on these data, *preliminary aided diagnosis* will be performed by the PBS. Then, data can be sent to a medical call center. Thanks to the U-R-Safe platform, the patient can **gain mobility but not with a lack of security**. The ability to smoothly move from an indoor wireless network to the global public network ensures that the patient is always and everywhere monitored and within the reach of a medical call center. The WPAN worn by the patient uses Ultra Wide Band (UWB) technology to communicate between the medical measuring devices and the PBS. For short distances indoor, the WPAN can also communicate directly with a Wireless Local Area Network (WLAN) connected to the fixed access network or to a **satellite network** for isolated places. The PBS contains also a GSM/ GPRS or UMTS connection to the public mobile network. When people are moving around and lose the connection to the indoor relay network, intelligent hand-over from indoor WLAN to the public mobile network is achieved. If the patient is out of cellular network coverage, the satellite network can be used for transferring data to the medical call center or for contacting the patient for further information.

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Preferred mode of presentation : no preference.