

G. Calcagnini, M. Triventi, E. Mattei, F. Censi, D. Giansanti, G. Maccioni, P. Bartolini V. Macellari. Short message service (SMS) as a practical tool for monitoring of home-care therapeutic or rehabilitative programs in elderly. *Gerontechnology* 2008; 7(2):83. Patients with chronic conditions are heavy users of the health care system. There are opportunities for significant savings and improvements to patient care if patients can be maintained in their homes. The technology of the medical devices provides widely accepted self-measurement methods for various parameters of interest in both chronic and post acute patients. Medical device manufacturers have done much work as to make self-measuring devices easy of use and reliable. However elderly people have usually limited skills and may not be able to use the modern information and communication technology tools available for the transmission of the data. In addition, Internet resource may not be available at their home. Thus fully automated solutions not requiring physical connection to the internet have to be developed. If the data to be transmitted do not require particular bandwidth or transfer rate, the Short Message Service (SMS) of the GSM service can be a convenient, reliable, affordable, and secure mean of telemedicine. Aim of this paper is to develop a fully automatic platform to transmit, using the SMS service, medical data collected at home from automatic devices. **Methods** The medical parameter selected in this study are: systolic and diastolic blood pressure, heart rate, blood glucose level and physical activity (by means of an innovative step counter). The overall platform has two main components: a central server for SMS receiving (Central Receiving Unit, CRU) and the remote unit for data collection and transmission (Home transmitting Unit, HTU). A general scheme of the platform is depicted (*Figure 1*). The data collected remotely are transmitted by the HTU using a single SMS message, each day, to the CRU where they are stored. The CRU is located in a clinical center, and also acts as a server for the database, and for the user applications (data display, trend visualizations, and alarms). The HTU constitutes of an embedded system able to retrieve data using the serial RS232 connection from up to 4 medical devices. In the actual configuration it is connected to commercial meters of arterial pressure (UA767PC, A&D, Japan) and blood glucose (GLUCOCARD G+, Menarini Diagnostic, Italy), and to a step-counter, the gastrocnemius expansion measurement unit (GEMU), a new wearable system for the step counting, based on a force sensing resistor. A GSM modem (TC65, Siemens, Germany) provides the wireless transmission. **Results and discussion** A prototype of the proposed platform (CRU + 1 HTU) has been realized and tested. The HTU integrates the commercial meters selected, and the physical activity monitor (The overall dimension of the HTU were 21x27x6 cm. The total part costs of each HTU did not exceed 350 EUR. During both laboratory and field testing, all the three meters were successfully interrogated and the data were correctly encoded and transmitted via SMS. In conclusion, the main characteristics of the proposed platform are: the low costs associated to the home instrumentation; the facility of use from patients, eventually with the aid of staff without specific formation (relatives, volunteers); the possibility, with affordable costs, to follow the patient also for long periods (months); the use of a network infrastructure (GSM) always available without particular cabling.

## References

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**Keywords:** telemedicine, GSM, self-measurement

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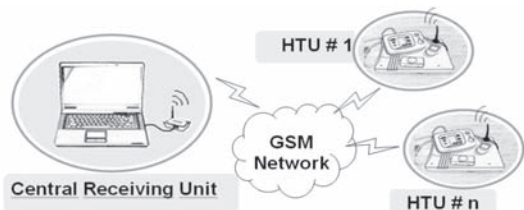


Figure 1 Overview of the system