

The Electronic Doctor's Bag: a Ubiquitous Communications System for Home-Visit Medical Services

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INTRODUCTION

Japan is becoming a super-aging society and must consider how to suppress the coming inflation of nationwide medical cost. Not only Japan but also major countries with the trend toward nuclear families such as China will inevitably face the same problem. Moreover, concentration of population in urban areas and declination in rural areas are accelerating the disparity of health care services.

A key to solving this problem must become information and communication technology (ICT). Tohoku University established a consortium "The Consortium for Medical Information Communications System in the Mobile Environment" on March 4, 2009. The main purpose of this consortium is to provide the ubiquitous communications system for home-visit medical services, mass examination, emergency care, and disaster areas. The consortium consists of Tohoku University, Sony Co., Fukuda Denshi Co., Ltd., OMRON HEALTHCARE Co., Ltd., HONDA ELECTRONICS Co., Ltd., WILLCOM, Inc., Net One Systems Co., Ltd., and Three Links Co., Ltd.

METHODS

In Japan, the Healthcare Insurance Reform in 2006 newly established the home care support clinic system which intends to spread the clinics operating house visit service. However, in the case of a small clinic, a physician may be forced to work in sleepless and hard working environment and the physician's transportation time to patients' homes reduces the efficiency of medical care.

To improve this situation, the consortium has developed a prototype of a clinical system named "Electronic Doctor's Bag" using the mobile communications environment as shown in Fig.1. Its purpose is that instead of a doctor, a nurse carries the Electronic Doctor's Bag and visits a patient's

home but an equivalent face-to-face communication between the doctor in his clinic and the patient at home can be realized.

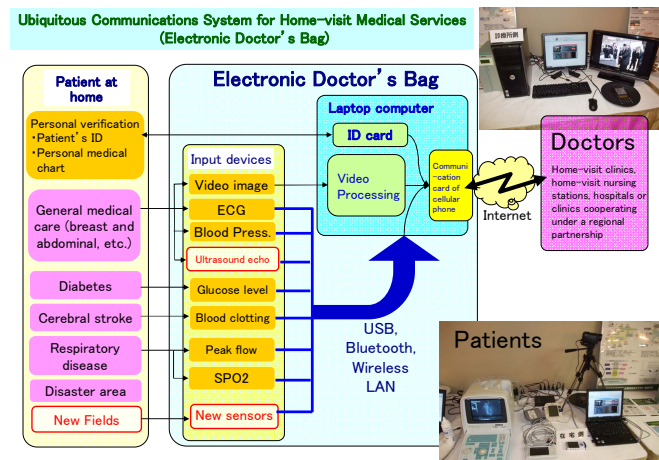


Fig.1 Electronic Doctor's Bag: a ubiquitous communications system for home-visit medical services

RESULTS AND DISCUSSION

The system was tested in two clinics and one hospital with three medical doctors and two nurses. In each facility, a simulated home where a mock patient was lying was prepared. In the patient's home, the Bag accessed the Internet through a data communication card of the cellular phone system (NTT Docomo; FOMA 3.6Mbps max).

It was verified that the transmitted high definition video image was useful for the patient's state from the view point of the medical doctors. The function of almost automatic transmission of biological data: ECG and blood pressure, was highly evaluated by the nurses. However, they assessed that the procedure of setting of the video camera and connection between the main body and the peripheral devices should be improved to be done in a much simpler way.

CONCLUSION

It was shown that further improvement in portability and operability of the Bag is required on the basis of much more opinions of practical medical and nursing professionals. To promote tele-medicine, we need to find a method of overcoming legal and political barriers and, as well, consider psychological problems in patients and their family caused by use of ICT for medical care in stead of a really visiting doctor.

Manuscript received January 29, 2010. The authors thank Prof. Shin-ichi Nitta, Dr. Taro Sonobe, Dr. Yoshiaki Katahira, Dr. Kazuhisa Komatsu, and staffs of ICR Co., Sendai City and Miyagi Prefecture collaborating with the Sendai Area Knowledge Cluster Initiative.

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