A Prototype of Electronic Home Care Visit Platform: Nurse’s e-Bag

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Introduction
- an electronic home care visit platform

- *For enhancing the efficiency and quality care for home visiting nurses:*
  - Nurse's e-Bag integrating popular distributed technologies, mobile hardware, and biosensor
  - based on the service model of the long term care of the home care center at NTCN and become one application part of NTUH U-Care system
  - integrate with a mobile electronic home care records system
  - Light weighted
  - provides tele-consultation

Introduction
- U-Care system

- *Nurse's e-Bag developed in U-care system:*
  - U-Care is an important research project of a Ubiquitous Hospital (u-Hosp) research group in NTU
  - Mobile Hospital is switched to u-Hosp from 2006. m-Hosp/u-Hosp at NTUH
  - many multidisciplinary faculties and researchers from different colleges and also from several hospitals and other universities.
  - Ubiquitous Healthcare focuses on providing healthcare to people anywhere at anytime using broadband and wireless mobile technologies.

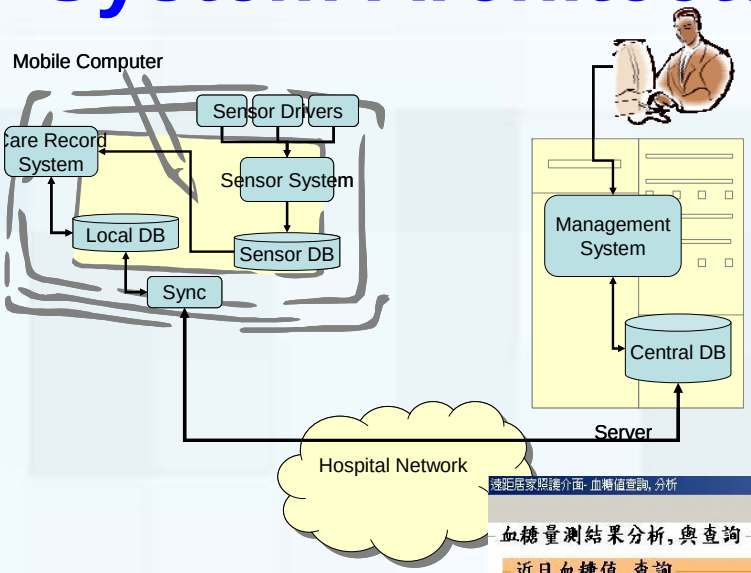
Methods :
Mobile electronic home care records

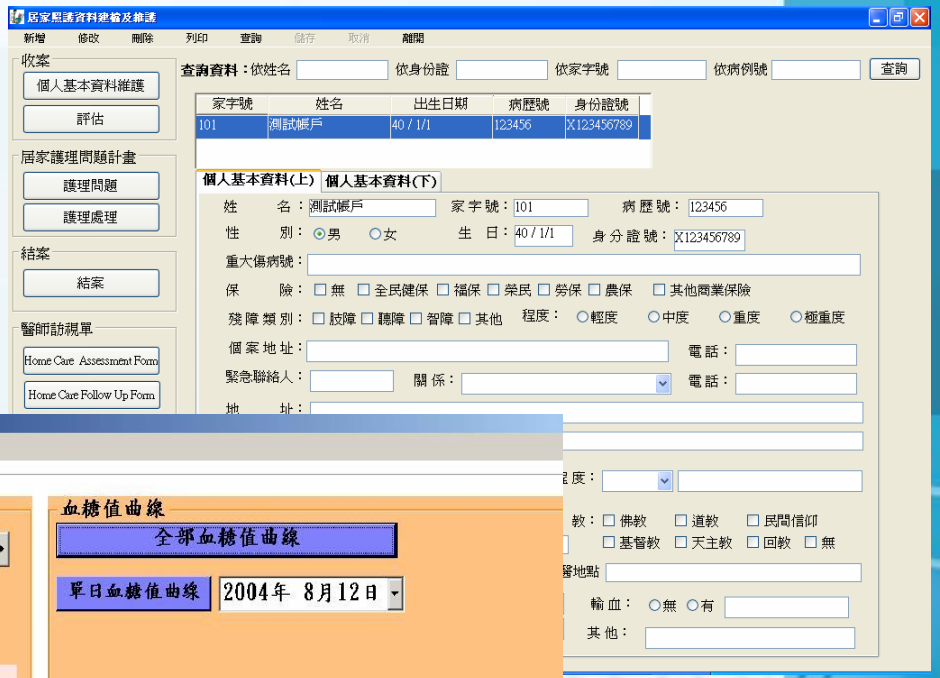
- Mobile electronic home care records system
  - the data can be stored onsite and transmit to a server online
  - or synchronize in batch operation after the nurse return to office everyday.
- A nurse fills new healthcare information and adds them into the home care record in every visit.
- Patient data divided two groups: called '*A forms*' and '*B forms*'.
- '*A forms*' contain data of cardiopulmonary vital sign, nutrition, and others.
- '*B forms*' contain summary data of '*A forms*', and some extra data, plan suggestions, and insurance claims.

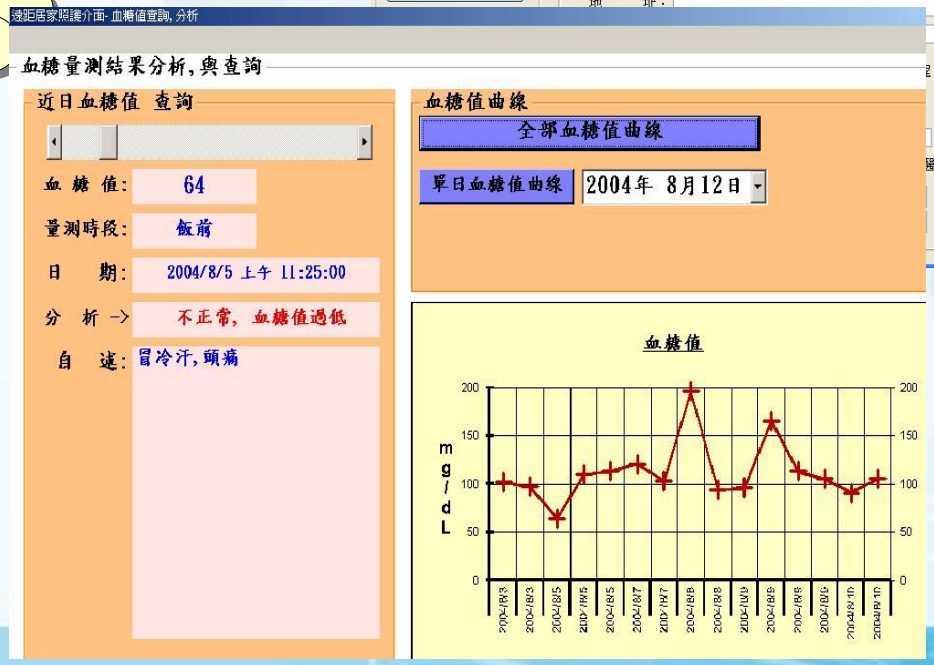
Methods :
Bio-sensor monitoring & Bidirectional Audio-video interaction

- provides measurement and monitoring of bio-signals:
  - temp, blood pressure, glucose, oxygen, respiration, ECG.
- U-Care system
  - record daily health status by the sensor network in the home setting or use the selective portable bio-sensors
- home care record system
  - access results from sensor database into evaluation forms for the home care management
- initiate a videoconference at patient's home
  - interaction among doctor-nurse and doctor-patient
- vital sign transmitted through ADSL, 3G or GPRS
- home visiting nurse can get more support from physicians to enhance the service quality

Results :
System Architecture & User interface







Results : Tele-consultation

Content of home visiting nurse's bag

Home visiting nurse operates Portable ECG connected with Tablet PC

Real-time ECG on Internet at home site

Home visiting nurse

Mr. Wang at home

Discuss with Family doctor by Video Conference

Shared electronic whiteboard on Internet at the family medicine clinic

Video Conference

Discuss with Family doctor by Video Conference

Discussion (1/3)

- Improve traditional nurse home visit
- home visiting nurse and the patient's family doctor can easily collaborate
- Enhance the quality of medical service :home care service be linked to a hospital-based HIS more easily
- based on the service model of the home care center at NCTN Hospital.
- reduces the loading of home visiting nurse's bag
- efficient case management

Discussion (2/3)

- security and privacy issues :
  - such as finger print and Centralized Authentication
- homecare record system is designed workable as off-line
- To reduce the risk of damage, only data of patients assigned to the on duty nurse can be stored to the computer
- data retrieval of biosignal
  - ask sensor providers to export data of standard format from their sensor
  - save them into a JET database

Discussion (3/3)

- the bandwidth is still not enough to show full motion live video to the doctor
- Taiwan will build high speed wireless network environment, such 3.5G HSDPA, WiMAX

Conclusion

- The prototype e-platform, nurse e-bag integrated with :
  - a mobile electronic home care records system,
  - a biosensor measuring,
  - retrieval system,
  - a videoconferencing,
  - consultation system
- cross domain knowledge:
  - nursing, information technology,
  - sensor technologies,
  - the outsourcing vendors
- In the future, we expect more application and service models in long term care can be implemented with this e-platform.

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- **References**

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