Extending the IT Infrastructure in Healthcare with Mobile Technology

Case study of the MET System

Szymon Wilk
Poznan University of Technology
University of Ottawa

Jurek Błaszczyński
Poznan University of Technology

Dawid Weiss
Poznan University of Technology

Wojtek Michalowski
University of Ottawa
General Outline

- Emergency triage and need for support
- Required support and available IT infrastructure
- Mobile extension: MET system
- Clinical trial of MET system
- Conclusions and future development
Emergency Triage and Need for Support

Canadian Triage Acuity Scale (CTAS)
- CTAS1 – Immediate
- CTAS2 – ≤ 15 min.
- CTAS3 – ≤ 30 min.
- CTAS4 – ≤ 1 hour
- CTAS5 – ≤ 2 hours

Prioritization (Triage nurse)

Priority categories

Medical assessment and disposition (Physician)

- Discharge
- Observation/further investigation
- Consult
Required Support and Available IT Infrastructure

- Useful and acceptable support implies close fit to the clinical workflow
- Support should be provided when and where it is necessary – directly at the point of care
- Available IT infrastructure turned out to be too limited to provide appropriate support
- It had to be extended with mobile technology to satisfy requirements for the support
Mobile Extension: MET System

MET (Mobile Emergency Triage) is a mobile clinical system for supporting triage of various acute conditions

- MET is available at the point of care
  - Runs on mobile devices
  - Runs in weak-connectivity conditions

- MET is integrated with IT infrastructure – ADT system, EPRS and other HISs
MET Architecture

- Extended client-server architecture for weak-connectivity conditions and integration
MET Operations

Interface Engine
- Patient registered
- Patient data available
- "Hospital-wide" patient data updated

MET Server
- Receive, decode and store patient data
- Synchronize patient data
- Synchronize presentation modules
- Encode and send patient data

MET Client
- Synchronization requested
- Synchronize patient data
- Synchronize presentation modules

Admission message
Observation report
Patient data
Presentation modules
Observation report
MET Interface

- MET client on specific platforms
Clinical Trial of MET System

- Designed to verify the fit into the clinical workflow and compare triage accuracy of MET and clinicians
- Conducted at CHEO (Children’s Hospital of Eastern Ontario) between July 2003 – February 2004
- Functionality of MET limited to the abdominal pain module
Trial Results

- **Fit to the workflow**
  - MET was used 24/7 by more than 100 clinicians
  - Clinicians were satisfied with the system integrated with ADT and available at the point of care
  - Patients did not object to participation in the trial

- **Triage accuracy**
  - Clinicians were slightly more accurate, although not different statistically, than MET (70% versus 65%)
  - Clinicians and MET achieved the same accuracy for discharged patients (72%) and patients requiring consult (70%)
Conclusions

- MET system extended the IT infrastructure of a hospital, worked in clinical setting and fitted into the clinical workflow
- IT infrastructure in healthcare in most cases needs to be better developed to take full advantage of mobile technologies
- IT infrastructure should be designed and developed with the goal of providing necessary support when and where it is required in mind
Future Development

- MET is being redesigned to take full advantage of a complete IT infrastructure
  - Open environment for supporting various patient management activities
  - Support for tablet and desktop computers
  - Thin client-server functionality in strong-connectivity conditions (processing on the server side)
  - “Active” server searching for relevant information and “pushing” it to clients

- We plan a multicenter clinical trial to verify the usability of redesigned MET
Acknowledgment
Thank You

Visit us at:

http://www.mobiledss.uottawa.ca