MET System: From Academic Laboratory to Clinical Trial in the Hospital Emergency Department

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Outline

• **MET** system overview

• Clinical trial @ CHEO

• Integrating with hospital’s IS infrastructure

• Conclusions

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Mobile Emergency Triage system

The MET system is a software implementation of a clinical triage support decision model that aids physicians in making triage decisions as to whether a child presenting in the Emergency Department of a hospital with a specific pain complaint should be discharged to the family physician, needs to be admitted for further investigation/observation, or requires urgent specialist consult.

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**MET** System Architecture

*Extended* client-server architecture with mobile clients working under *weak connectivity* conditions.

Complex triage *decision models* need to be executed on “lean” mobile clients.

System designed as *flexible* DSS

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Mobile MET Client

Sync Subsystem

Database Subsystem

Dialog Subsystem

Evaluation Subsystem

Interface Subsystem

Patients’ Data

Decision Models

Local replica

MET Server

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MET Interactions: Few Examples

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**MET Interactions:** Few Examples

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Clinical Trial

• Prospective evaluation of *abdominal pain* model;
• Enrollment of approx. 600 emergency patients;
• System to be used by over 50 physicians;
• Rules appropriate for new procedure/drug testing have to be followed;
• Primary/secondary observer and a follow-up for each patient;
• Two stages of a trial: (1) validity of a model, (2) impact of model’s solution on physician’s triage.

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Integrating with Hospital’s IS

Integration subsystem

Sync subsystem

Database

Audit and follow-up web-based applications

Hospital System 1

Hospital System 2

DataGate HL7 broker

EPIC Hospital IS

HL7 messages

Text messages

Mobile client

Mobile client

Mobile client

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Capturing Patient’s Demographic Data

Original HL7 message

MSH|^~\&|EPIC|Epic|||20030
3231628|PRDGUI|ADT^A01|196
3848|D|2.3|||EVN|A01|20030
3231628|||PRDGUI^^^^^^^^SA
^^^^^SAPID|||006542146^^^^2
^EPI||DOE^JOHN^A^^^^||...

Transformed text message

200303231628|A01|1963848|DOE
|JOHN|A|M|19890312|  |  |  | (613)
|234-5876| |

Text messages are transmitted to the MET system using FTP

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Managing Records: Primary Observer

1. Create a new primary record
2. Add a record to the active list
3. Wait for the synchronization
4. Evaluate a patient on a mobile client
5. Check a record after synchronization
6. Create a new secondary record
7. Add a record to the audit list
8. Remove a record from the active list

- A record is expired (6 hrs / 4 hrs)
- A record has no consent or it is ineligible
- A record has consent and it is eligible
- A record is not closed
- A record is closed
Managing Records: Secondary Observer

- Create a new secondary record
- Add a record to the active list
- Add a record to the audit list
- Wait for the synchronization
- Evaluate a patient on a mobile client
- Check a record after the synchronization
- Remove a record from the active list

Synchronization:

A record has no consent, it is ineligible or has been closed

A record is expired (1 hr / 4 hrs)

A record has consent and it is eligible

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“Other” Issues

• Security/privacy of patients’ data;
• Work environment in the Emergency Department;
• Information session for the Emergency Department clerical staff;
• Training/orientation sessions for physicians and residents;
• Deploying a “fool-proof” system that does not require any support.

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Conclusions

• “Side” issues are of significant importance;
• New perspective for theoretical and “academic” modeling;
• End-user’s perception is as important as good modeling practice

Why “MET = model + software” should be evaluated similarly to a drug or a clinical procedure?

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AppForge MobileVB

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