



MET

# ***Triage of Acute Abdominal Pain in Childhood: Clinical Use of a Palm Handheld in a Pediatric Emergency Department***

W. Michalowski (wojtek@management.uottawa.ca)

University of Ottawa

R. Slowinski

Poznan Technical University

Sz. Wilk

University of Ottawa/Poznan Technical University

S. Rubin

Children's Hospital of Eastern Ontario

<http://www.mobiledss.uottawa.ca>



# Outline

- Triage of abdominal pain in Emergency Department
- Developing clinical decision model
- *MET* system: overview and implementation
- Results and clinical trial
- Conclusions



MET

# The Issue

To facilitate Emergency Department triage of abdominal pain condition at the point of care



# Kids and Abdominal Pain

- Common presenting complaint
  - 3300 patient visits per year
  - 8-10 patients/day
  - other patients presenting with other complaints
- Average LOS in ED
  - all abdominal pain patients between 210-270 minutes
  - appendicitis >300 minutes
  - other causes >380 minutes



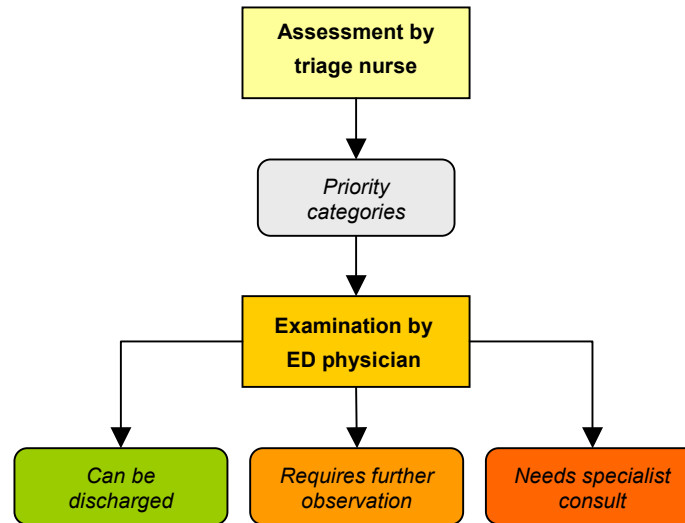
# Why It Is Difficult to Assess Abdominal Pain

- Large differential
  - constipation and gas pains most common
  - associated “tummy ache” with most viral illnesses
  - appendicitis is most common surgical problem
- History and description of pain often incomplete
- Physical exam can be difficult
  - apprehension
  - “ticklish”



MET

# Triage Process





# *Development of the Clinical Decision Model*

**Age:** 0-5 years;  $\geq 5$  years

**Gender:** male, female

**Duration of pain:**  $\leq 24$  hours; 1-7 days,  $> 7$  days

**Location of pain:** right lower quadrant; lower abdomen; other

**Type of pain:** continuous; intermittent

**Vomiting:** yes; not

**Previous visit to ER:** yes; no

**Temperature:**  $< 37^{\circ}\text{C}$ ;  $37\text{-}39^{\circ}\text{C}$ ;  $\geq 39^{\circ}\text{C}$

**Site of tenderness:** right lower quadrant; lower abdomen; other

**Localized guarding:** absent; present

**Rebound tenderness:** absent; present

**White blood cell count:**  $\leq 4000$ ;  $4000\text{-}12000$ ;  $\geq 12000$



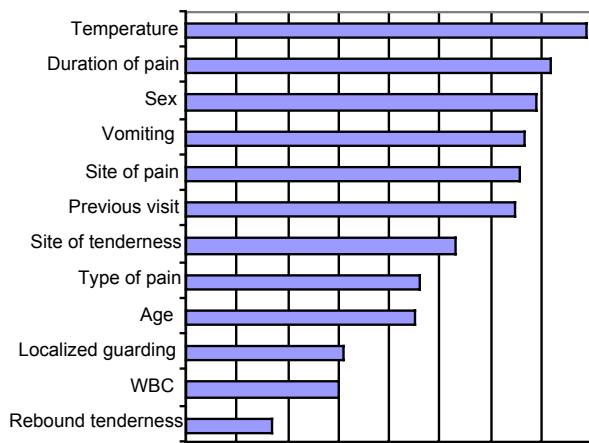
# Retrospective Chart Study

## Evaluation of 606 charts from CHEO for 1997-2002:

- Specification of domains of clinical signs and symptoms;
- Developing understanding of a triage process;
- Developing understanding among triage medical personnel of the objectives and research directions;
- Collecting data for further analysis.



# Selecting Attributes, Developing and Evaluating Rules



Triage	Conditions
<i>FD</i>	age is 5 years or older, and type of pain is intermittent, and temperature is below 37 °C
<i>FD</i>	sex is female, and site of pain is other, and there was no vomiting, and there was previous visit, and temperature is below 37 °C
<i>consult</i>	there was previous visit , and temperature is 39 °C or more, and site of tenderness is RLQ
<i>consult</i>	sex is male, and site of pain is RLQ, and vomiting occurred, and there was no previous visit, and temperature is between 37 and 39 °C, and rebound tenderness is present
<i>observation</i>	sex is female, and duration of pain is 7 days or more, and vomiting occurred, and temperature is below 37 °C, and WBC is between 4.000 and 12.000
<i>observation</i>	age is under 5 years, and vomiting occurred, and there was no previous visit, and temperature is between 37 and 39 °C, and site of tenderness is RLQ, and rebound tenderness is absent

Measure	Value
Sensitivity	86.7%
Specificity	85.7%
Classification accuracy	86.0%

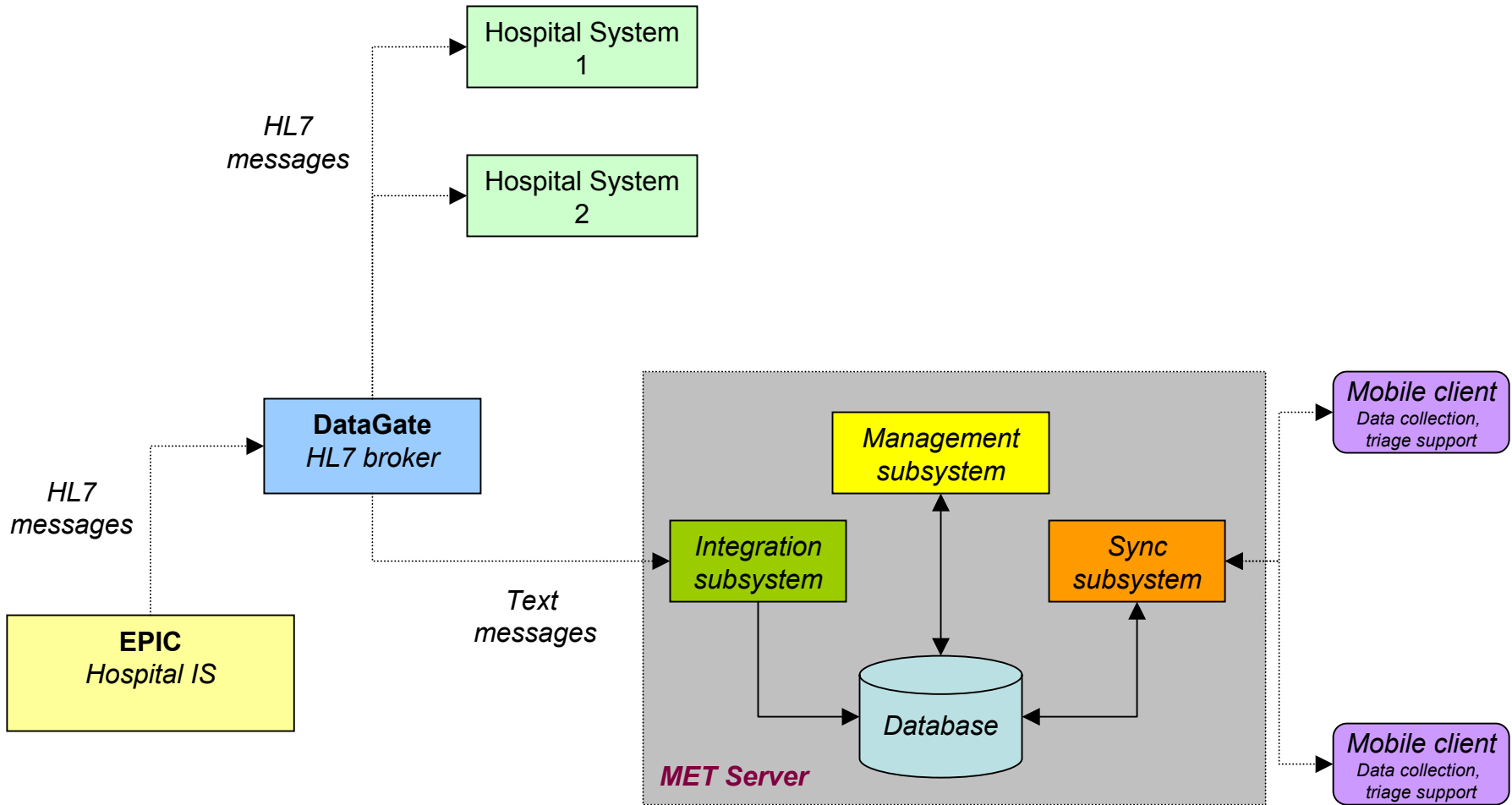


# *M*obile *E*mergency *T*riage system

The *MET* system is a software implementation of a **clinical triage support** decision models that aid 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**

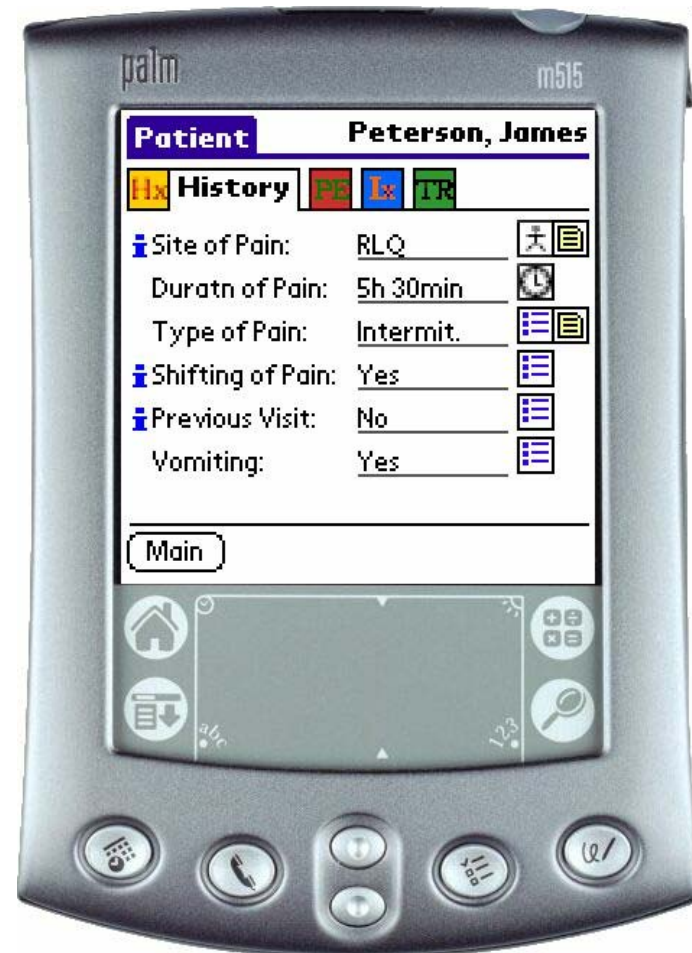
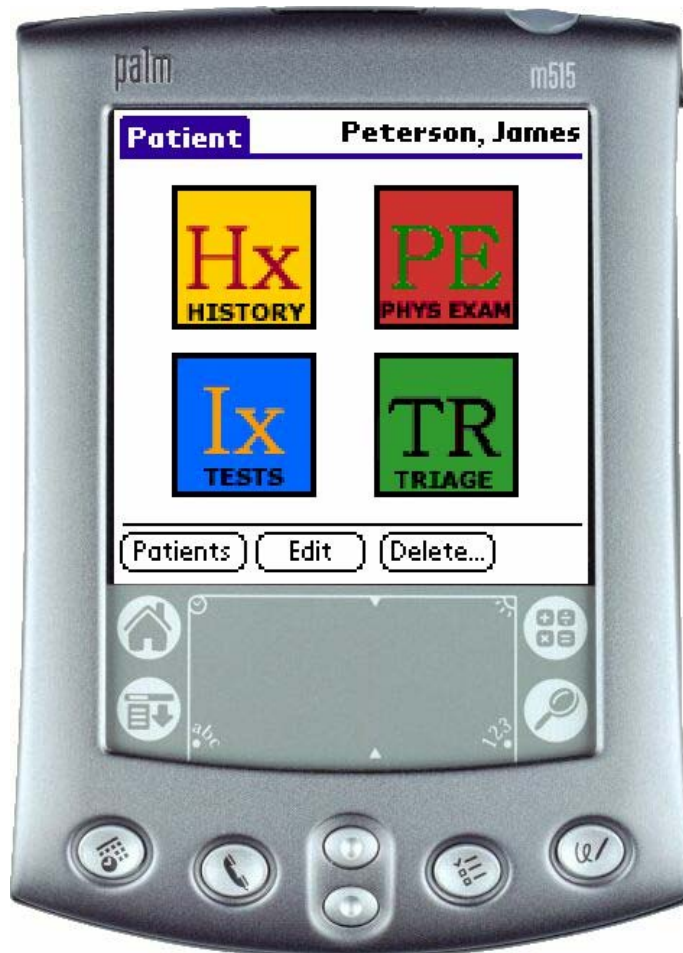


# MET Architecture

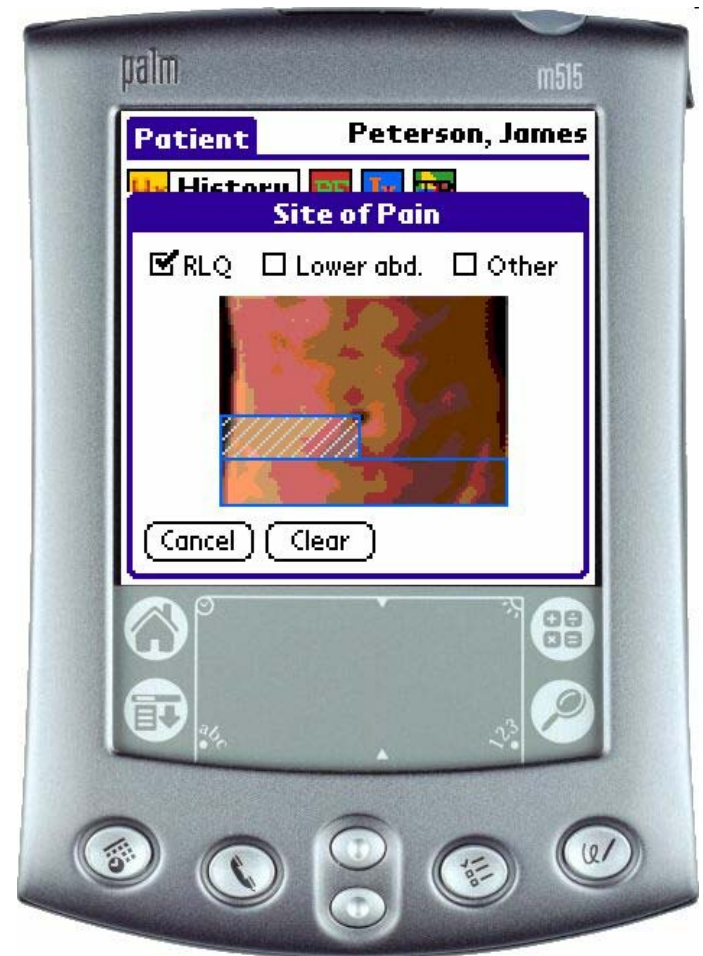




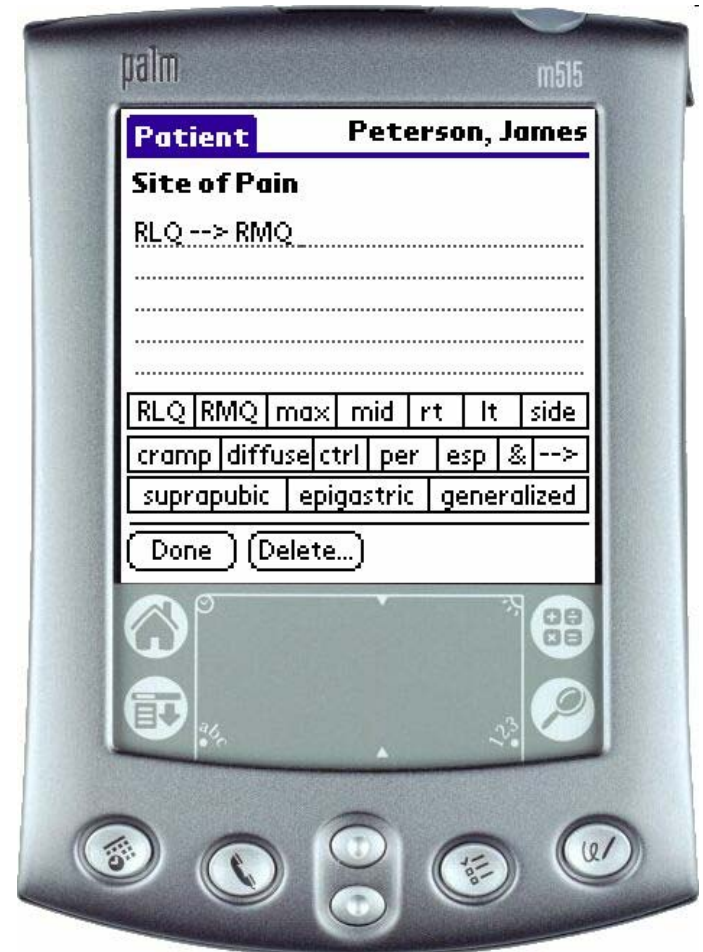
# *MET* in Palm of Physician's Hand



## *MET: Evaluating a Patient*



# *MET*: Data Capture and Notes

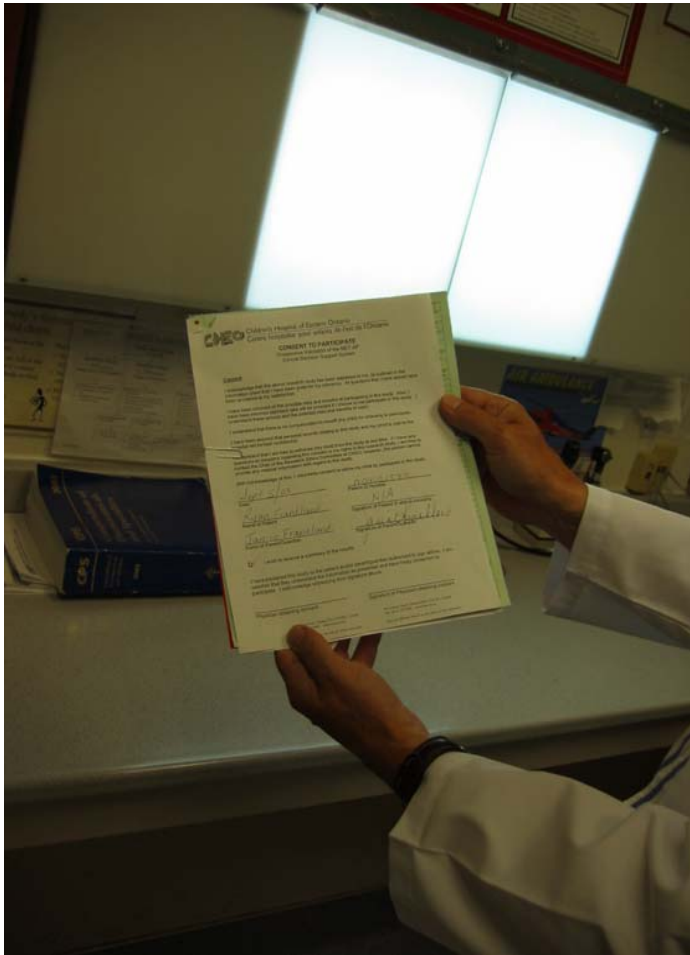




## Clinical Trial in CHEO

- Prospective evaluation of *abdominal pain* module;
- Enrollment of approx. 600 emergency patients;
- System to be used by about 17 FT physicians, 5 fellows, 20 PT physicians, and over 50 residents;
- Rules appropriate for new procedure/drug testing have to be followed;
- Primary/secondary observer and a follow-up for each patient;

# Clinical Trial in CHEO







MET

## *MET* “in Action”



<http://www.mobiledss.uottawa.ca>



MET

# Conclusions

- Triage support provided *at point of care*;
- Structured collection of patient's data;
- New procedures for evaluating and updating clinical decision models;
- Hospital clinical trial in progress.



MET

# Acknowledgements

Rhonda Correll, Research Institute, CHEO

Ken Farion, Division of Emergency Medicine, CHEO

Greg Forestell, Information Services, CHEO

Joanne Ross, Information Services, CHEO

John Pike, Division of Urology, CHEO

Bernard Plouffe, UQ in Outaouais

---

Mathieu Chiasson, *MET* Research Team

Nataliya Milman, *MET* Research Team

Roksana Mottahedi, *MET* Research Team

Leticia Troppman, *MET* Research Team