An Application to Provide Views of the EHR to Cardiology Patients

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Collaborators:  
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Hospital patients and their loved ones are starving for information.
Information delivery to patients

ED patients disoriented, anxious
[Byrne 97] [Dahlen, Janson 02]

Anxiety correlated to negative outcomes
[Moser 07, Huffman et al. 07, Bruggemann, Nixon, Cavenett 07, Austin, Tully & Parker 07, Jones et al 07]

Increasing amount of information a patient receives in the clinical setting can help
[Björvell, Stieg 91]
Welcome to Springfield Hospital

Room 7

Your Profile
Reason For Your Visit
Chest Pain

Your Health Profile
We've reviewed your medical history.
We've reviewed the medications you take at home.
You're allergic to ACE inhibitors.

Vitals at Triage (2:20 PM)
Heart rate: 72
Blood pressure: 172/108
Temperature: 98.0
Respiratory Rate: 18.0

Your Visit
Current Status
Dr. Morris is waiting for your EKG results.

What's Next
Dr. Morris will call Dr. Tan to discuss next steps.

We've Completed
Physical Exam
Dr. Collins
Bloodwork
Hematocrit is normal

Pending
EKG (Approx. 1.5 hours)
Chest X-Ray Review (Radiologist reviewed, consulting with Dr. Morris)
CT Scan Review (Approx. 2.5 hours)
Additional Labs (Approx. 4 hours)
D-Dimer
Cardiac Enzymes

Your Medications
Nitroglycerin (to improve delivery of oxygen to the heart)

My Care Team

Attending Physician
Susan Restaino, MD

Senior Resident
Tracy Andrews, MD

Nurse
Erica Simonich, RN

Clinic Fellow
Nasif Tamim, MD

Consulting Physician
David Vawdrey, MD

Resident
Cathy Lambert, MD

Yesterday, Wednesday April 6th

Wilcox, Liu, Collins, Feiner, Restaino, Vawdrey (Forthcoming)

Vawdrey, Wilcox, Collins, Bakken, Feiner, Boyer, Restaino (Forthcoming)
Patient-Facing Views of the EHR

Do patients benefit from electronic displays of health info in the clinical setting?

How should we structure information for a patient-centric information display?

What technological problems do we need to solve?
Preliminary Studies

Emergency Department  Cardiology Step-Down
Preliminary Studies: Emergency Department

18 Patients (11 female, 7 male)
11 Visitors (8 female, 3 male)
(age range 29–84, mean = 54)

Large Display Prototypes
Some 8.5 x 11 Handouts
Preliminary Studies:
Emergency Department - Results

Benefits:
• Communication
• Archive
• Summarization
• Calming Effect
• Needed memory aids in the ED
Preliminary Studies: Emergency Department

18 Patients (11 female, 7 male)
11 Visitors (8 female, 3 male)
(average age: 29–84, mean = 54)

22 Attending Physicians

Large Display Prototypes

Some 8.5 x 11 Handouts
Preliminary Studies: Cardiology Step-Down

11 Patients (2 female, 9 male)
(age range 23–79, mean = 53)

6 Nurses
(2 – 12 yrs experience)

Semi-Structured Interviews:
Medication Info Needs
Explanation Strategies
Preliminary Studies: Cardiology Step-Down - Results

(Results in forthcoming paper)
Patient Application:
Cardiology Step-Down

Usage Sessions

5 Patients (5 male)

Mean age= 55.4

Avg hospital stay = 5.4 days
Usage Session Flow: Cardiology Step-Down
Usage Session Flow: Cardiology Step-Down

Active Medications

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<th>Dosage</th>
<th>Frequency</th>
<th>Last Given Time</th>
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</table>
Usage Session: Cardiology Step-Down - Results

(Results in forthcoming paper)
Your Medications
Nitroglycerin (to improve delivery of oxygen to the heart)
Next Steps – Data Browsing

1. **Associate multiple attributes of data in representations of the data**
   - Bade et al. ‘04, Plaisant et al. ‘96, Wang et al. ‘08

2. **Browse several levels of detail**
   - Bade et al. ‘04, Chen et al. ‘04, Lam et al. ‘06, Pieczkiewicz et al. ‘07, Plaisant et al. ‘96, Powsner & Tufte ‘94, Wang et al. ‘08

3. **Show qualitative scales**
   - Bade et al. ‘04, Powsner & Tufte ‘94

4. **Show relationships to other data over time**
   - Bade et al. ‘04, Plaisant et al. ‘96, Wang et al. ’08

5. **Allow browsing on small screens (mobile views)**
   - Chen et al. ‘04, Lam et al. ‘06
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