IMPACT OF HEALTH CARE DATA ON WORK PRACTICES

Michelle L. Rogers
Associate Professor
Drexel University
TODAY

→ “…the impact of health care data on work practices”
→ “…why and how such information could be implemented in the design process”
DISTRIBUTED COGNITIVE SYSTEM

- Work across
  - multiple agents,
  - part of a stream of activity,
  - embedded in larger organization,
  - phases of ebbs and flows,
  - use of tools everywhere
CONCEPTUAL FRAMEWORK

- **Socio-technical systems**
  - Organizations are complex systems of technology, people and tasks
  - Success or failure lies in understanding the interactions that take place

- **Balance Theory**
  - Understanding the work system as composed: organization, task, environment, person, technology
NEW DATA SOURCES

PATIENTS

<table>
<thead>
<tr>
<th>Time</th>
<th>Meal</th>
<th>BG</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00 am</td>
<td>Fasting</td>
<td>85 mg/dL</td>
<td></td>
</tr>
<tr>
<td>10:00 am</td>
<td>Before Breakfast</td>
<td>155 mg/dL</td>
<td></td>
</tr>
<tr>
<td>12:30 pm</td>
<td>After Breakfast</td>
<td>203 mg/dL</td>
<td></td>
</tr>
<tr>
<td>10:00 am</td>
<td>Before Lunch</td>
<td>155 mg/dL</td>
<td></td>
</tr>
<tr>
<td>01:30 pm</td>
<td>After Lunch</td>
<td>235 mg/dL</td>
<td></td>
</tr>
<tr>
<td>04:30 pm</td>
<td>Before Dinner</td>
<td>109 mg/dL</td>
<td></td>
</tr>
<tr>
<td>08:00 pm</td>
<td>After Dinner</td>
<td>85 mg/dL</td>
<td></td>
</tr>
<tr>
<td>04:30 pm</td>
<td>At Bedtime</td>
<td>109 mg/dL</td>
<td></td>
</tr>
</tbody>
</table>

CLINICIANS

INSTITUTIONS
BAD NEWS

- Patients with multiple chronic conditions are often the most complex to manage
- As of 2012, no fewer than 40,000 health-related apps
- Not much research on the utility, effectiveness and safety of mHealth interventions
- Use of the Internet to access health information is low and tied to events
MULTIDISCIPLINARY TEAMS

- Many skills are needed to build systems that meet users’ needs
- Multidisciplinary teams are needed
- Customers/users/patients, too

- Computer science
- Social and organizational psychology
- Cognitive science
- Human factors & ergonomics
- Industrial design
- Graphic design
- Anthropology
- Management science
- Software engineering
- Technical communication
ELECTRONIC ICU/TELE-MONITORING

Registered nurses Cassie Gregor (from left), Camellia Douglas and Mike Montalto monitor patients in intensive care units scattered around North Carolina.

Kevin McCarthy/Carolinias HealthCare System

**Tasks:**
- Visualization of data
- Physical location of screens
- Interface design

**Organization:**
- Team communication
- Complexity of systems
- Safety Culture

**Human User:**
- Attention issues
- Physical ergonomics
- Role of Fatigue
PEOPLE DEVELOP WAYS OF COPING THAT MAY HAVE UNINTENDED IMPACTS

- Trade accuracy for speed
- Reduce performance criteria
- Deviate from procedures
- Batching/Deferring tasks
- Shedding tasks
- Recruiting additional resources
- Work-around’s
VISUALIZATION/REPRESENTATION TECHNIQUES

- Overcome “keyhole effect” with expanded data views
- Integrated workspace (e.g., longshot displays)
- Overview displays
- Graphically depict data relationships
- Aid event detection
CASE - HEALTH INFORMATION MANAGEMENT IN LOW RESOURCED SETTING
IMPLICATIONS OF FINDINGS

- Need to support current practices:
  - For those within the system
  - For those using the system

- Bridge between traditional and modern practices by negotiating
  - Infrastructure challenges (broadband, wi-fi, power)
  - Human Resource challenges (MD, RN, VHT)
  - Poverty challenges (technology, training)
  - Cultural norms
CHALLENGES

- Clinical, social, behavioral, and environmental factors profoundly affect health outcomes
- Supporting team work – e.g. diagnosis, handoffs
- May be difficult to use more complex health-related applications, such as treatment decision support tools
- Privacy
- Regulation and certification
POTENTIAL & OPPORTUNITIES

- Ability to track and manage conditions in between clinical encounters – key for multiple chronic conditions
- The use of health communications best practices
- Use of social networking to enhance access and communication with health care providers
QUESTIONS?

Michelle L. Rogers
mrogers@drexel.edu