Executive Summary

Medical Informatics strives to build, implement, tailor, and evaluate systems and knowledge bases to improve health by either discovering new knowledge or optimizing clinical care processes.

A fishing story, REDCap and HERON: two major tools and their integration. If time permits, view the live system. Take home: KUH is a CTSA partner. You can use these tools!

CTSA Grant Awarded. NCI Designated! What’s next? Clinical Informatics!

My question to you: what are the highest needs for KUH at the intersection of clinical care processes where informatics and the EMR might help?

My background: electrical engineer undergrad, US Air Force hospital administrator/clinical engineer, biomedical engineer PhD in perioperative knowledge discovery, faculty in biomedical informatics at Vanderbilt: responsible for developing, operating, tailoring CPOE, responsible for commercialization effort with McKesson, responsible for other inpatient systems (nurse charting, bar code medication administration, developed medication reconciliation, outpatient whiteboards)

Progress

REDCap (Research Electronic Data Capture)
- Fairly easy to implement and allows a self service model
- Over 700 users, over 400 projects (in production and development)
- From simple surveys to extensive registries for Alzheimer’s Disease Center
- Opportunity for hospital use?

HERON (Healthcare Enterprise Repository for Ontological Narration – an integrated data repository)
- Much harder but much larger payoff
- 850 million facts on 1.9 million patients
- Over 100 users, over 6000 queries
  o Great support and collaboration between KUMC, UKP, and KUH with the Data Request Oversight Committee (DROC): Greg Ator, Terry Rusconi, Kay Grasso, Chris Wittkopp, Cathy Gardner, Rick Barohn, Karen Blackwell, Linda Wood, Theresa Neely, Jason Kentner. Oversight tools further insight from Bob Spaniol
  o Faculty and Executives can sponsor students/fellows/residents and staff

Repurposing HERON for Cancer Center NCI Designation
- Tumor Registry (great assistance by Tim Metcalf and Theresa Jackson)
- Biospecimens
- Social Security Death Index (long term mortality)
- Customized Survival Analysis
- REDCap -> HERON Integration for Triple Negative Breast Cancer Registry

Current activities with HERON: balancing general needs with starting to tackle informatics needs
- Brought in UHC data as a source for billing diagnoses (2009Q4 – 2012+)
  - Secondary benefit: quality measures, MSDRG, Service line, etc
- Standardizing medications, later labs
  - Goal: ability to participate in collaboration with top tier medical centers
- Embedded preliminary statistical visualizations
- Services, note titles/concepts, units, and decision support

Medical Informatics and Quality Example: **Warning: correlation does not imply causation**
- AHRQ CHF inpatient mortality (30 numerator; 1019 denominator)
- AHRQ CHF inpatient mortality denominator + BMI + Braden Score Assessed =957 (mortality = 271; 28%)
- CHF+BMI+Braden+ Pressure Ulcer documented = 147 (mortality = 78; 53%)
- CHF+BMI+Braden+ Pressure Ulcer+Aminoglycoside = 23 (mortality = 15; 65%)

**Clinical Informatics possibilities**
Medical Informatics in support of quality at hospital/clinics and informatics research versus general clinical research
- Quality, Efficiency, and Capacity
  - EMR as source of “signals”
    - How rich of a signal do we have as we implement a EMR across inpatient and outpatient?
    - What are high quality signals? Where do we struggle? What do we document that is never used for clinical care and decision making?
    - Flowsheet example, lab ranges.
  - Mining for highest variability in outcomes (Mortality, LOS, Readmission, etc)
- Clinical Decision Support
  - Integrating into HERON to determine effectiveness of the EMR. What works? What doesn’t? What is needed?
- National UHC interest in tools like HERON that integrate UHC data with detailed clinical data

Medical Informatics and the intersection of EMRs and emerging personal digital records
- Google fiber puts us in a unique position
- What are people likely do in their home with video and personal digital records?
- Are there opportunities for home consults and monitoring to dramatically improve outcome or convenience/concierge medicine?
  - For providers as well as patients
- National Science Foundation Grant awarded for: In-Home Monitoring in Support of Caregivers for Patients with Dementia
Frontiers Participant Data Richness Today

*All Frontiers Participants have Diagnosis and Procedure Data.

Frontiers Participants

1832

6768

80913

87512

1424

654

Patients with Medications Data

Patients with Laboratory Results