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AMIA 2013 Annual Symposium

November 15 - 20, 2013

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Friday, November 15, 2013

You have nothing scheduled for this day

Saturday, November 16, 2013

Time	Session Info
8:30 AM-12:00 PM, International Ballroom West (Washington Hilton), **T02: Clinical Decision Support: A Practical Guide to Developing your Program to Improve Outcomes**	
8:30 AM-12:00 PM	**Clinical Decision Support: A Practical Guide to Developing Your Program to Improve Outcomes** R.A. Jenders; J.A. Osheroff; J.M. Teich; D.F. Sittig; R.E. Murphy
1:00 PM-4:30 PM, International Ballroom West (Washington Hilton), **T05: Fundamentals of EHR Usability**	
1:00 PM-4:30 PM	**Fundamentals of EHR Usability** A. Franklin; M.F. Walji; J. Zhang

Sunday, November 17, 2013

Time	Session Info
8:30 AM-12:00 PM, International Ballroom West (Washington Hilton), **T08: The EHR Usability Symposium: Vendor, User, Researcher, and Policy Perspectives**	
8:30 AM-12:00 PM	**The EHR Usability Symposium: Vendor, User, Researcher, and Policy Perspectives** J. Zhang; K. Graves; A. Franklin; M.F. Walji

Monday, November 18, 2013

Time	Session Info
8:30 AM-10:00 AM, International Ballroom East (Washington Hilton), **S11: Featured Presentation - The SHARP Program and the Next Generation of Health Information Technology**	
8:30 AM-10:00 AM	**The SHARP Program and the Next Generation of Health Information Technology** C.P. Friedman; C.G. Chute; J. Goldman; C.A. Gunter; K. Mandl; J. Zhang
1:45 PM-3:15 PM, International Ballroom Center (Washington Hilton), **S28: Papers - Automating Tailored Information**	

1:45 PM-3:15 PM	**Optimized Dual Threshold Entity Resolution For Electronic Health Record Databases – Training Set Size And Active Learning** E. Joffe; M. Byrne; P. Reeder; J.R. Herskovic; C.W. Johnson; A.B. McCoy; E.V. Bernstam
1:45 PM-3:15 PM, Cabinet (Washington Hilton), **S32: Podium Presentations - Meaningful Use**	
1:45 PM-3:15 PM	**EHR Certification and Safety Enhanced Design: The need for robust usability testing scenarios** A. Franklin; K. Graves; M.F. Walji; J. Zhang
5:00 PM-6:30 PM, Columbia Hall (Washington Hilton), **Poster Session I**	
5:00 PM-6:30 PM	**Alert Overrides: The Impact of Chained Events** J. Diaz-Garelli; M.F. Walji; A. Franklin; J. Zhang
5:00 PM-6:30 PM	**Design of an Interactive Laboratory Results Viewer for Critically Ill Patients** P.V. Killoran; J. Zhang
5:00 PM-6:30 PM	**A Systematic Yet Flexible Systems Analysis Framework** E.A. Markowitz; T.R. Johnson; E.V. Bernstam; J.R. Herskovic; H. Thimbleby
5:00 PM-6:30 PM	**Improving Lab Order, Verification, and Follow-Up Processes at UT Physicians** A.B. McCoy; R.P. Khatri; L.J. Anderson; R.B. McDade; D.F. Sittig; E.J. Thomas
5:00 PM-6:30 PM	**Individual Attributes of Behavior Change in an Online Social Network** S. Myneni; A. Franklin; N. Cobb; T. Cohen
5:00 PM-6:30 PM	**Building for the Team: Developing a Model to Support Collective Effort** V. Nguyen; A. Franklin
5:00 PM-6:30 PM	**Topological Visualization Uncovers Novel Clinically Relevant Clusters** R.P. Radecki
5:00 PM-6:30 PM	**Gaps in functionality: Work-centered Design of Medication List in Ambulatory EHRs** Z. Zhang; M.F. Walji; A. Franklin; J. Zhang
5:00 PM-6:30 PM	**User-Centered Design of a Model-Driven Rule Authoring Environment** D. Yauch; B.S. Bradley; M. Ebert; D. Sottara; P. Haug; D.R. Kaufman; R. Greenes

Tuesday, November 19, 2013

Time	Session Info
1:45 PM-3:15 PM, International Ballroom West (Washington Hilton), **S61: Panel - Preparing for Informatics Careers and Trends in the Age of Meaningful Use**	

1:45 PM-3:15 PM	**Preparing for Informatics Careers and Trends in the Age of Meaningful Use** N. Theera-Ampornpunt; K. Zheng; Y. Gong; J. Boehne; D.C. Kaelber; R. Zhang; S. Kaushik; R.J. Shaw; T. Kelley; S. Khairat
3:30 PM-5:00 PM, Lincoln East/Monroe (Washington Hilton), **S74: Podium Presentations - Data Respositories and Secondary Data**	
3:30 PM-5:00 PM	**BigMouth: A Multi-Institutional Dental Data Repository** M.F. Walji; E. Kalenderian; P. Stark; J. White; R.B. Ramoni
5:00 PM-6:30 PM, Columbia Hall (Washington Hilton), **Poster Session II**	
5:00 PM-6:30 PM	**Evaluation of Clinical Decision Support Alerts for Medications Contraindicated in Cancer Patients** E.G. Brune; D.F. Sittig; A.B. McCoy
5:00 PM-6:30 PM	**Characterizing the Effects of a Cognitive Support System for Psychiatric Clinical Comprehension** V. Dalai; D. Gottipatti; T. Kannampallil; T. Cohen
5:00 PM-6:30 PM	**Reflective Random Indexing to Develop a Medication-Problem Knowledge Base** S. Fathiamini; T. Cohen; A.B. McCoy; D.F. Sittig
5:00 PM-6:30 PM	**Ontology-Based Entity Extraction of Quality Metrics from Narrative Texts** S. Madani; D.F. Sittig; H. Xu; P. Mirhaji; K. Dunn; R. Alemy
5:00 PM-6:30 PM	**Comparative Analysis of Association Rule Mining, Crowdsourcing, and NDF-RT Knowledge Bases for Problem-Medication Pair Generation** K. Sethuraman; D.F. Sittig; A.B. McCoy

Wednesday, November 20, 2013

Time	Session Info
8:30 AM-10:00 AM, Jefferson West (Washington Hilton), **S85: Podium Presentations - Decision Support: Development and Implementation**	
8:30 AM-10:00 AM	**Cross-Vendor Evaluation of Key Clinical Decision Support Capabilities: A Preliminary Assessment** D.F. Sittig; A.B. McCoy; A. Wright
8:30 AM-10:00 AM	**Building and Sharing Clinical Decision Support across Institutions: Lessons Learned from the CDS Consortium** B. Middleton; L. Tsurikova; A. Wright; B.E. Dixon; D.F. Sittig; J.L. Erickson

Final ID:

Clinical Decision Support: A Practical Guide to Developing Your Program to Improve Outcomes

R. A. Jenders; [1]; *J. A. Osheroff;* [2]; *J. M. Teich;* [3]; *D. F. Sittig;* [4]; *R. E. Murphy;* [5];

1. Center for Biomedical Informatics, Charles Drew University & UCLA, Los Angeles, CA, United States.
2. TMIT Consulting, LLC, Cherry Hill, NJ, United States.
3. Elsevier Health Sciences, Newton, MA, United States.
4. UT – Memorial Hermann Center for Healthcare Quality & Safety, University of Texas Health Science Center at Houston, Houston, TX, United States.
5. Memorial Hermann Healthcare System , Houston, TX, United States.

Abstract: This tutorial will provide attendees with a practical approach to developing and deploying clinical decision support (CDS) interventions that measurably improve outcomes of interest to a health care delivery organization. The instructors initially will examine in detail the key building blocks of a CDS program, including creating and enhancing organizational structure for CDS success; identifying information systems for providing the data that drive CDS interventions; leveraging clinical workflow to optimize CDS interventions; processes and systems for measuring the outcomes of these interventions; and knowledge management to acquire and maintain the expert knowledge that informs these interventions. The instructors then will show how to leverage these building blocks to address key steps in developing, implementing, managing and evaluating CDS interventions.

Additional discussion will touch on the role of national programs relevant to CDS, including knowledge sharing; structured guidelines; meaningful use; special considerations for CDS for small clinical practices, for hospitals and health systems and for vendors; and medico-legal considerations pertinent to CDS. Further, following interactive presentations by the instructors, attendees will divide into small groups and participate in a highly interactive exercise in planning and designing a CDS project to address a specific clinical target, facilitated by the instructors.

Overall, this systematic approach to CDS implementation will be presented in an interactive, case-oriented fashion, incorporating examples provided by tutorial leaders and participants' experiences. The course content is drawn from the tutorial leaders' popular and award-winning guidebook series on improving outcomes with clinical decision support, the last two volumes of which (in 2009 and 2012) were co-published by AMIA.

Final ID:

Fundamentals of EHR Usability

M. F. Walji; [1, 3]; *A. Franklin;* [1, 2]; *J. Zhang;* [1, 2];

1. National Center for Cognitive Informatics and Decision Making, University of Texas Health Science Center at Houston, Houston, TX, United States.
2. School of Biomedical Informatics, University of Texas Health Science Center at Houston, Houston, TX, United States.
3. School of Dentistry, University of Texas Health Science Center at Houston, Houston, TX, United States.

Abstract: A current and significant challenge in the design and implementation of health information technology (HIT) is to deal with the high failure rate of HIT projects. Most of these failures are not due to flawed technology, but rather due to the lack of systematic considerations of human factors and other non-technology issues in the design and implementation processes. In other words, designing and implementing HIT is not so much an IT project as a project about human-centered computing akin to human-computer interaction, workflow, organizational change, and process reengineering. Due to the complexity and unique features of healthcare, human-centered methods and techniques specifically tailored for this domain are necessary for the successful development of health information systems such as electronic health records (EHRs). Good usable design would engender systems that increase efficiency and productivity, are easy to use and straight forward to learn, increase user adoption, retention, and satisfaction, and decrease medical errors, development time and cost. In this tutorial we will focus on teaching two methods appropriate for assessing EHR usability. After the half-day tutorial, the attendees should have a basic understanding of the usability issues in health IT and have gained skills enabling them to evaluate the usability of EHRs and related products using these methods.

Final ID:

The EHR Usability Symposium: Vendor, User, Researcher, and Policy Perspectives

J. Zhang; [1, 2]; *K. Graves;* [1, 2]; *A. Franklin;* [1, 2]; *M. F. Walji;* [1, 3];

1. National Center for Cognitive Informatics and Decision Making in Healthcare , UT Health Science Center at Houston, Houston, TX, United States.
2. School of Biomedical Informatics, UT Health Science Center at Houston, Houston, TX, United States.
3. School of Dentistry, UT Health Science Center at Houston, Houston, TX, United States.

Abstract: The National Center for Cognitive Informatics and Decision Making in Healthcare (NCCD), funded by the Office of the National Coordinator for Health Information Technology, as part of the Strategic Health IT Advanced Research Program (SHARP), was formed to focus on the urgent and long-term cognitive challenges in Health Information Technology (HIT) adoption and meaningful use. Over the last three years, researchers at the NCCD have focused on addressing the urgent usability, workflow, and cognitive support issues of HIT that can fundamentally remove the key cognitive barriers to HIT adoption and meaningful use. The center generates research findings, tools and guidelines that have a real world impact in order to maximize the benefits of HIT for healthcare quality, efficiency, and safety. This symposium presents an opportunity for the user, vendor and research communities to share progress, ideas, and solutions in improving the usability of EHRs.

Final ID:

The SHARP Program and the Next Generation of Health Information Technology

C. P. Friedman; [1]; *C. G. Chute;* [2]; *J. Goldman;* [3]; *C. A. Gunter;* [4]; *K. Mandl;* [5]; *J. Zhang;* [6];

1. University of Michigan, Ann Arbor, MI, United States.
2. Mayo Clinic, Rochester, MN, United States.
3. Massachusetts General Hospital, Boston, MA, United States.
4. University of Illinois, Urbana, IL, United States.
5. Boston Children's Hospital, Boston, MA, United States.
6. University of Texas at Houston, Houston, TX, United States.

Abstract Body: This session portrays the future of informatics where results of ground-breaking research propel technology to a next level of achievement in promoting individual and population health.

In April of 2010, the ONC awarded cooperative agreements to support research in four key areas where progress is essential to fully realize the benefits of health information technology: 1) security of health information technology, 2) patient-centered cognitive support, 3) health care application and network platform architecture, and 4) secondary use of EHR data. Through what became known as SHARP (the Strategic Health IT Advanced Research Projects), four awards resulted from separate competitions in each area. A fifth award, addressing medical device interoperability and supported by NIH, joined the SHARP family in 2011.

In this session, the SHARP principal investigators will describe the key work done by the projects, its transformational potential, and how the informatics community can engage with this work going forward. The session will close with description of a unique collaborative effort applying the work of all five SHARP sites to the challenging problem of medication reconciliation.

Final ID:

Optimized Dual Threshold Entity Resolution For Electronic Health Record Databases – Training Set Size And Active Learning

E. Joffe; [1]; *M. Byrne;* [1]; *P. Reeder;* [1]; *J. R. Herskovic;* [2, 1]; *C. W. Johnson;* [1]; *A. B. McCoy;* [1, 3]; *E. V. Bernstam;* [1, 4];

1. School of Biomedical Informatics, University of Texas Health Science Center at Houston, Houston, TX, United States.
2. Biomedical Informatics and Computational Biology, MD Anderson Cancer Center, Houston, TX, United States.
3. Center for Healthcare Quality & Safety, Memorial Herman, Houston, TX, United States.
4. Medical School, University of Texas Health Science Center at Houston, Houston, TX, United States.

Abstract: Clinical databases may contain several records for a single patient. Multiple general entity-resolution algorithms have been developed to identify such duplicate records. To achieve optimal accuracy, algorithm parameters must be tuned to a particular dataset. The purpose of this study was to determine the required training set size for probabilistic, deterministic and Fuzzy Inference Engine (FIE) algorithms with parameters optimized using the particle swarm approach. Each algorithm classified potential duplicates into: definite match, non-match and indeterminate (i.e., requires manual review). Training sets size ranged from 2,000-10,000 randomly selected record-pairs. We also evaluated marginal uncertainty sampling for active learning. Optimization reduced manual review size (Deterministic 11.6% vs. 2.5%; FIE 49.6% vs. 1.9%; and Probabilistic 10.5% vs. 3.5%). FIE classified 98.1% of the records correctly (precision=1.0). Best performance required training on all 10,000 randomly-selected record-pairs. Active learning achieved comparable results with 3,000 records. Automated optimization is effective and targeted sampling can reduce the required training set size.

Final ID:

EHR Certification and Safety Enhanced Design: The need for robust usability testing scenarios

A. Franklin; [1, 2]; *K. Graves;* [1, 2]; *M. F. Walji;* [1, 3]; *J. Zhang;* [1, 2];

1. National Center for Cognitive Informatics and Decision Making in Healthcare , University of Texas Health Science Center at Houston, Houston, TX, United States.
2. School of Biomedical Informatics, University of Texas Health Science Center at Houston, Houston, TX, United States.
3. School of Dentistry, University of Texas Health Science Center at Houston, Houston, TX, United States.

Abstract: Summative usability testing as part of 2014 EHR Safety Enhanced Design Certification criteria requires the completion of specified tasks. To support user participants, activities, such as entering an e-prescription, are often embedded in scenarios or descriptions of hypothetical work. While existing NIST test procedures provide valuable materials for evaluation, greater specification into supported roles, workflow, and rich description are necessary to evoke appropriate engagement with test systems. We propose methods for the development and distribution of robust testing scenarios for EHR certification purposes.

Final ID:

Alert Overrides: The Impact of Chained Events

J. Diaz-Garelli; [1]; *M. F. Walji;* [1]; *A. Franklin;* [1]; *J. Zhang;* [1];

1. School of Biomedical Informatics, University of Texas Health Science Center at Houston, Houston, TX, United States.

Abstract: High override rates of drug-drug interaction alerts are well-established1. These studies often only look at total response rate. Here, we explore differences in override behaviors to isolated alerts and chains of repeated notifications. Implications of alert presentation effects, including increases to overrides later in alert chains, may inform display design to reduce alert fatigue and improve appropriate use of such systems.

Final ID:

Design of an Interactive Laboratory Results Viewer for Critically Ill Patients

P. V. Killoran; [1]; *J. Zhang;* [1];

1. School of Biomedical Informatics, University Of Texas Health Science Center - Houston, Houston, TX, United States.

Abstract: Voluminous laboratory data are generated while caring for critically ill patients. Though ubiquitous, temporally ordered tables become representationally inefficient when numerous results are reviewed. Here, we present an interface combining graphical and tabular displays to improve cognitive performance.

Final ID:

A Systematic Yet Flexible Systems Analysis Framework

E. A. Markowitz; [1, 2]; *T. R. Johnson;* [2, 3]; *E. V. Bernstam;* [1, 2]; *J. R. Herskovic;* [2, 4]; *H. Thimbleby;* [5];

1. School of Biomedical Informatics, The University of Texas Health Science Center, Houston, TX, United States.
2. National Center for Cognitive Informatics and Decision Making in Healthcare, Houston, TX, United States.
3. Division of Biomedical Informatics, Department of Biostatistics, University of Kentucky, Lexington, KY, United States.
4. The University of Texas MD Anderson Cancer Center, Houston, TX, United States.
5. FIT Lab - Interaction Laboratory, Swansea University, Swansea, Wales, United Kingdom.

Abstract: We hypothesize that many unintended consequences in healthcare result from a mismatch between system and task flexibility. Systematic Yet Flexible (SYF) systems encourage systematic approaches to tasks that allow flexibility in atypical situations. Despite recognition that SYF systems can improve efficiency, only general design goals for developing SYF exist [1-4]. Thus, we developed SYFSA (Systematic Yet Flexible Systems Analysis), a framework for analyzing and designing Systematic Yet Flexible systems that uses qualitative and quantitative analyses to compare trade-offs between systematicity and flexibility across multiple designs. The qualitative analysis involves comparing an idealized model and its associated constraints, or a lack thereof, to a system that is intended to support the task. Quantitative measures include interface efficiency, task completion rate, and an information-theoretic measure of flexibility. Here we describe SYFSA and show how it can be used to balance systematicity and flexibility for a data entry task.

Final ID:

Improving Lab Order, Verification, and Follow-Up Processes at UT Physicians

A. B. McCoy; [1]; *R. P. Khatri;* [2]; *L. J. Anderson;* [3]; *R. B. McDade;* [3]; *D. F. Sittig;* [1]; *E. J. Thomas;* [2];

1. The University of Texas School of Biomedical Informatics at Houston, Houston, TX, United States.
2. Department of Internal Medicine, The University of Texas Medical School at Houston, Houston, TX, United States.
3. Physician Business Services, The University of Texas Medical School at Houston, Houston, TX, United States.

Abstract: We retrieved electronic health record data on lab order, verification, and follow-up processes at UT Physicians and developed a dashboard to describe metrics for evaluating these processes. A two-month pilot evaluation of one department indicates some room for improvement in standardizing and improving processes to improve quality of care, patient safety, and satisfaction.

Final ID:

Individual Attributes of Behavior Change in an Online Social Network

S. Myneni; [1]; *A. Franklin;* [1]; *N. Cobb;* [2]; *T. Cohen;* [1];

1. School of Biomedical Informatics, The University of Texas Health Science Center at Houston, Houston, TX, United States.

2. The Schroeder Institute for Tobacco Research and Policy Studies, American Legacy Foundation, Washington, DC, United States.

Abstract: Online social networks revolutionized the way people communicate with one another and reinvented the realm of social support and influence with respect to health behaviors. Existing studies of social networks for behavior change do not consider the individual attributes of participants. In this poster, we map the individual stages and processes of change within an online support group with the goal of personalizing and tailoring behavior change support systems that harness social influence.

Final ID:

Building for the Team: Developing a Model to Support Collective Effort

V. Nguyen; [1]; *A. Franklin;* [1];

1. School of Biomedical Informatics, The University of Texas Health Science Center at Houston, Houston, TX, United States.

Abstract: Much of healthcare depends on distributed systems of clinical providers, however, HIT has generally failed to support clinical teams in areas such as communication, collaboration, coordination, and temporal awareness. We focus on an Emergency Department in an ongoing study to increase situation awareness in critical care environments. Through iterative focus groups with five attending ER physicians, we generated a number of potential themes of team-based work in the Emergency Department. From these focus groups, we narrowed our efforts to issues of workload. A survey was designed to capture how attending physicians and charge nurses determine the workload of those under their supervision and the factors influencing their assignment of new duties. Additionally, the survey investigates how residents, nurses, and other physicians ascertain the availability of others as a resource to their own work. Ultimately, such data will be used to hone methods for identifying team-based tasks, team needs, and the potential of HIT to support such work. Improving our understanding of team users' needs will help in the interface design of systems in the healthcare settings. Patient safety and quality will improve through the enhancement of each clinician teams' efficiency, effectiveness, coordination, communication, and acceptance and use of the HIT.

Final ID:

Topological Visualization Uncovers Novel Clinically Relevant Clusters

R. P. Radecki; [1];

1. Emergency Medicine, The University of Texas Health Science Center at Houston, Houston, TX, United States.

Abstract: Clinical research data sets are traditionally interpreted and translated to clinical practice based on univariate and multivariate logistic statistical methods. However, in heterogeneous clinical cohorts, it is intuitive that individual patient characteristics co-occur in non-linear associative distributions. This concept is demonstrated through dimension reduction of clinical data sets using topologic visualization. The implication of this clustered approach to research data includes support for new translational informatics strategies for personalized medicine.

Final ID:

Gaps in functionality: Work-centered Design of Medication List in Ambulatory EHRs

Z. Zhang; [1]; *M. F. Walji;* [2]; *A. Franklin;* [1]; *J. Zhang;* [1];

1. University of Texas School of Biomedical Informatics, Houston, TX, United States.
2. University of Texas School of Dentistry at Houston, Houston, TX, United States.

Abstract: Inaccurate medication lists in ambulatory EHRs may partially result from lack of support for medication management workflows. Medication-related work activities were captured and patient adherence information was found to be missing in medication use documentation in six EHR products. Following a work-centered design approach, user interface mockups were developed to demonstrate an expanded data model.

Final ID:

User-Centered Design of a Model-Driven Rule Authoring Environment

D. Yauch; [1]; *B. S. Bradley;* [1]; *M. Ebert;* [2]; *D. Sottara;* [1]; *P. Haug;* [2]; *D. R. Kaufman;* [1]; *R. Greenes;* [1, 3];

1. Biomedical Informatics, Arizona State University, Scottsdale, AZ, United States.
2. Medical Informatics, Intermountain Healthcare, Salt Lake City, UT, United States.
3. Medical Informatics, Mayo Clinic, Scottsdale, AZ, United States.

Abstract: This research describes the design process for a model-driven rule authoring environment. Clinical decision support rule authoring is a complex endeavor, involving the need for both content domain and technical expertise, and is fraught with the potential for error, as rules are refined and adapted from narrative recommendations to formal statements to setting-specific adaptations. Several prior studies have focused on the usability issues surrounding front-end tools such as electronic health records and computerized provider order entry systems; studies of back-end tools are rare. In addition to facilitating the design of the authoring environment, this study also seeks to extract the important risks and challenges faced by clinical decision support rule authors.

Final ID:

Preparing for Informatics Careers and Trends in the Age of Meaningful Use

N. Theera-Ampornpunt; [1]; *K. Zheng;* [2]; *Y. Gong;* [3]; *J. Boehne;* [4]; *D. C. Kaelber;* [5]; *R. Zhang;* [6]; *S. Kaushik;* [5]; *R. J. Shaw;* [7]; *T. Kelley;* [8]; *S. Khairat;* [6];

1. Faculty of Medicine Ramathibodi Hospital, Mahidol University, Ratchathewi, Bangkok, Thailand.
2. School of Public Health, University of Michigan, Ann Arbor, MI, United States.
3. School of Biomedical Informatics, The University of Texas Health Science Center at Houston, Houston, TX, United States.
4. University of Louisville (KentuckyOne Health), Louisville, KY, United States.
5. Center for Clinical Informatics Research and Education, The MetroHealth System, Case Western Reserve University, Cleveland, OH, United States.
6. Institute for Health Informatics, University of Minnesota, Twin Cities, Minneapolis, MN, United States.
7. Duke University Medical Center, Duke University, Durham, NC, United States.
8. Nexus Consulting Corp, Beverly, MA, United States.

Abstract: In the age of Meaningful Use, the career landscape for informatics students has expanded greatly. It is crucial that the next-generation informatics workforce is well-prepared for the diverse opportunities and the upcoming health information technology (HIT) trends. The AMIA Student Working Group proposes a “Career Panel” of informatics professionals that will offer perspectives and helpful advices to students on their career opportunities and professional development. This year’s panel will feature panelists from both academia and industry, and from different professional backgrounds (e.g., technical vs. clinical or health). Panelists will also discuss upcoming trends on HIT and informatics, and the implications of these trends on students’ careers. The panel will better prepare today’s informatics students for tomorrow’s workforce expectations, which will have a positive impact for the success of the informatics field in the future.

Final ID:

BigMouth: A Multi-Institutional Dental Data Repository

M. F. Walji; [1]; *E. Kalenderian;* [2]; *P. Stark;* [3]; *J. White;* [4]; *R. B. Ramoni;* [2];

1. School of Dentistry, University of Texas Health Science Center at Houston, Houston, TX, United States.
2. Harvard School of Dental Medicine, Boston, TX, United States.
3. School of Dental Medicine, Tufts University, Houston, MA, United States.
4. School of Dentistry, University of California, San Francisco, San Francisco, CA, United States.

Abstract: There is a paucity of high quality large oral health databases that can be used to conduct research and improve the evidence-base in dentistry. The objective of this research was to establish the technical foundation and data governance framework for a group of four dental schools to share data from their EHRs into a centralized repository.

Final ID:

Evaluation of Clinical Decision Support Alerts for Medications Contraindicated in Cancer Patients

E. G. Brune; [1]; *D. F. Sittig;* [2]; *A. B. McCoy;* [2];

1. School of Veterinary Medicine and Biomedical Sciences, Texas A&M University, College Station, TX, United States.
2. The University of Texas School of Biomedical Informatics at Houston, Houston, TX, United States.

Abstract: Computerized provider order entry-based alert systems advise health care providers when prescribing medications to patients. This tool is especially helpful when ordering medications for cancer patients, due to their intensified risk of experiencing drug interactions with cancer therapies. The purpose of the study was to describe alerts for contraindicated medications of cancer patients in order to understand reasons for alert overrides and to provide additional information for further study in improving clinical support systems.

Final ID:

Characterizing the Effects of a Cognitive Support System for Psychiatric Clinical Comprehension

V. Dalai; [1]; *D. Gottipatti;* [1]; *T. Kannampallil;* [2]; *T. Cohen;* [1];

1. Biomedical Informatics, University of Texas School of Biomedical Informatics, Houston, TX, United States.
2. Informatics, NewYork Academy of Medicine, NewYork, NY, United States.

Abstract: Cognitive studies of clinical experts reveal application of “intermediate constructs”, clinically relevant clusters of information, for problem solving. Novice clinicians are less able to recognize these patterns, so a system to augment their comprehension is desirable. In this study, we evaluate a cognitive support system for psychiatric clinical comprehension, using propositional analysis and Latent Semantic Analysis to measure system effects on clinical comprehension. Results indicate the system promotes case interpretation more closely approximating expert emphasis.

Final ID:

Reflective Random Indexing to Develop a Medication-Problem Knowledge Base

S. Fathiamini; [1]; *T. Cohen;* [1]; *A. B. McCoy;* [1]; *D. F. Sittig;* [1];

1. University of Texas, School of Biomedical Informatics, Houston, TX, United States.

Abstract: We evaluated the use of Reflective Random Indexing (RRI) to generate a medication-problem pairing knowledge base. An expert-reviewed list of medication-problem pairs was used as the gold standard. Three different corpora of free text, including Medline abstracts, UpToDate, and clinical notes, were chosen, and RRI was used for constructing the semantic space. Medline abstracts provided better results than the other two corpora.

Final ID:

Ontology-Based Entity Extraction of Quality Metrics from Narrative Texts

S. Madani; [1]; *D. F. Sittig;* [1]; *H. Xu;* [1]; *P. Mirhaji;* [3]; *K. Dunn;* [1]; *R. Alemy;* [2];

1. School of Biomedical Informatics, University of Texas Health Science Center, Houston, TX, United States.
2. School of Health Information Science, University of Victoria, Victoria, BC, Canada.
3. Systems and Computational Biology, Albert Einstein College of Medicine, Bronx, NY, United States.

Abstract: There is an increasing demand from heterogeneous organizations for collection and reporting of comparable healthcare quality metrics. Many of these metrics are captured in narrative format during the process of patient care. Manual abstraction of such entities is time consuming and expensive. We developed an ontology-based concept extraction framework that may increase the precision of existing natural language processing methods.

Final ID:

Comparative Analysis of Association Rule Mining, Crowdsourcing, and NDF-RT Knowledge Bases for Problem-Medication Pair Generation

A. B. McCoy; [2]; *K. Sethuraman;* [1]; *D. F. Sittig;* [2];

1. Department of Bioengineering, University of Pennsylvania School of Engineering and Sciences, Philadelphia, PA, United States.
2. The University of Texas School of Biomedical Informatics at Houston, Houston, TX, United States.

Abstract: Automatic summarization of electronic health records (EHRs) can help compile and organize the growing amount of patient information confronting healthcare providers. Here, we evaluate three different approaches to problem-medication pair generation, an important automatic summarization task, and find that association rule mining and crowdsourcing provide similar problem-medication relations while the National Drug File-Reference Terminology (NDF-RT) provides new relations not encountered in the other two.

Final ID:

Cross-Vendor Evaluation of Key Clinical Decision Support Capabilities: A Preliminary Assessment

D. F. Sittig; [2]; *A. B. McCoy;* [2]; *A. Wright;* [1];

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Abstract: Clinical decision support (CDS) is essential for delivery of high-quality, cost-effective, and safe healthcare. We evaluated the CDS creation, implementation, and evaluation capabilities of four internet-accessible, ONC-ATCB electronic health records (EHRs). All evaluated EHRs lacked some CDS capabilities. Significant improvements in our EHR certification and implementation procedures are necessary.

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Building and Sharing Clinical Decision Support across Institutions: Lessons Learned from the CDS Consortium

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Abstract: In 2008 the Agency for Healthcare Research and Quality (AHRQ) funded the Clinical Decision Support (CDS) Consortium to assess, define, demonstrate, and evaluate best practices for knowledge management (KM) and CDS at scale, across various EHR platforms, in order to enhance care and clinical knowledge delivery. The CDS Consortium (CDSC) collaborated with more than thirty organizations, overcame significant CDS challenges, and delivered all of the AHRQ required products. The CDSC had to develop additional products that neither AHRQ nor the CDSC anticipated, which became pivotal in achieving the AHRQ objectives. CDS Services represent one of the viable approaches for delivering the most up-to-date CDS, including Meaningful Use (MU) required CDS, to an array of clinical users while limiting the costs of knowledge support and maintenance. CDS Services could be one of the channels that accelerate achieving CDS goals nationwide.