Advance Program
AMIA 35th Annual Symposium on
Biomedical and Health Informatics
“Improving Health: Informatics and
IT Changing the World”

October 22-26, 2011
Washington Hilton
Washington, DC

AMIA designates this educational activity for a maximum of 27.75 AMA PRA Category 1 Credits™.
Physicians should only claim credit commensurate with the extent of their participation in the activity.
Dear Colleague,

Whether you are new to informatics or have been long engaged in biomedical and health informatics, the 2011 Annual Symposium will provide content you won’t want to miss! AMIA’s 35th Annual Symposium on Biomedical and Health Informatics will cover research areas breaking new ground in translational bioinformatics and biomedicine, data mining, natural language processing, new approaches to knowledge representation and clinical decision support, plus the use of computers in public health and health education. Throughout the Symposium, a key theme will be apparent: Improving Health: Informatics and IT Changing the World.

This year, we expect to meet a new corps of informatics professionals trained with support from the U.S. Office of the National Coordinator on Health Information Technology. Be prepared to extend a warm AMIA welcome to lots of new people who are discovering the critical needs that informatics meets. Come to the center of informatics science activity. Meet and mix with all the healthcare professionals and allied health professionals involved in it. Expect AMIA 2011 to keep you well informed and linked into the richest leadership community working in the field today.

We had a record number of submissions this year—979—and I’d like to especially thank the members of the Scientific Program Committee and the numerous reviewers who have volunteered many hours of service to make this meeting a success.

I look forward to meeting you at the Washington Hilton, Washington, DC, from Oct. 22-26, 2011!

R. Scott Evans, PhD
AMIA 2011 Chair
Intermountain Healthcare
University of Utah
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### Program at a Glance - AMIA 2011

#### Friday, October 21

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<th>Time</th>
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<tbody>
<tr>
<td>8:30 am – 4:30 pm</td>
<td>The EHR Usability Symposium 2011: “Usability Present and Future”*</td>
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<tr>
<td>8:30 am – 4:30 pm</td>
<td>2011 Doctoral Consortium on Sociotechnical Issues in Biomedical Informatics*</td>
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#### Saturday, October 22

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8:00 am – 4:00 pm</td>
<td>AMIA Board of Directors Meeting</td>
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<tr>
<td>8:30 am – 4:30 pm</td>
<td>Workshop on Interactive Systems in Healthcare/WISH 2011*</td>
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<tr>
<td>8:30 am – 4:30 pm</td>
<td>NIWG Symposium: Human Factors, Modeling, and Workflow: Methods for Implementing Health Information Technology*</td>
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<tr>
<td>8:30 am – 4:30 pm</td>
<td>Tutorials*</td>
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<tr>
<td>1:00 – 8:00 pm</td>
<td>CMIO Informatics Workshop* (Part 1)</td>
</tr>
<tr>
<td>1:00 – 5:00 pm</td>
<td>10x10 at University of Minnesota In-person session</td>
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<tr>
<td>5:00 – 7:30 pm</td>
<td>Workshops</td>
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#### Sunday, October 23

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<th>Time</th>
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<tr>
<td>8:00 am – 12:00 pm</td>
<td>10x10 at OHSU In-person Session</td>
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<tr>
<td>8:00 am – 12:00 pm</td>
<td>10x10 at UAB In-person Session</td>
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<tr>
<td>8:00 am – 12:00 pm</td>
<td>10x10 UIC In-person Session</td>
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<tr>
<td>8:00 am – 12:00 pm</td>
<td>10x10 at Kansas University In-person Session</td>
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<td>8:00 am – 12:00 pm</td>
<td>10x10 at University of Texas In-person Session</td>
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<tr>
<td>8:00 am – 12:00 pm</td>
<td>Nursing Informatics WG Special Event</td>
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<tr>
<td>8:00 am – 12:00 pm</td>
<td>Student Paper Competition</td>
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<tr>
<td>8:30 am – 12:00 pm</td>
<td>Tutorials*</td>
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<tr>
<td>8:30 am – 12:00 pm</td>
<td>CMIO Informatics Workshop* (Part 2)</td>
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<tr>
<td>1:00 – 3:00 pm</td>
<td>Opening Session and Keynote Presentation</td>
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<tr>
<td>3:30 – 5:00 pm</td>
<td>Scientific Sessions</td>
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<tr>
<td>5:00 – 7:00 pm</td>
<td>Exhibition Hall Opens</td>
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<td>5:00 – 7:00 pm</td>
<td>Welcome Reception in the Exhibition Center</td>
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<tr>
<td>5:30 – 10:00 pm</td>
<td>Working Group Business Meetings</td>
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#### Monday, October 24

<table>
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<tr>
<th>Time</th>
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<tr>
<td>7:00 – 8:15 am</td>
<td>Committee Meetings</td>
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<td>7:00 – 8:30 am</td>
<td>Academic Forum Meeting</td>
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<td>8:30 – 10:00 am</td>
<td>Keynote Address</td>
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<tr>
<td>10:00 am – 2:00 pm</td>
<td>Exhibition Hall Open</td>
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*Additional fee required*
MONDAY, OCTOBER 24

10:30 am – 12:00 pm  Scientific Sessions
10:30 am – 2:00 pm  Poster Session I Preview
12:00 – 1:30 pm  Committee Meetings
12:15 – 1:30 pm  Unconferences
1:45 – 3:15 pm  Scientific Sessions
3:30 – 5:00 pm  Scientific Sessions
4:00 – 7:00 pm  Exhibition Hall Open
5:00 – 6:30 pm  Committee Meetings
5:15 – 7:00 pm  Poster Session I (authors present)
5:00 – 6:30 pm  Committee Meetings
5:30 – 10:00 pm  Working Group Business Meetings
6:00 – 8:00 pm  JAMIA Editorial Board Meeting

TUESDAY, OCTOBER 25

7:00 – 8:15 am  Committee Meetings
8:30 – 10:00 am  Semi-plenary Sessions
10:00 am – 2:00 pm  Exhibition Hall Open
10:30 am – 12:00 pm  Scientific Sessions
10:30 am – 2:00 pm  Poster Session II Preview
12:15 – 1:15 pm  Closing Keynote Address
12:15 – 1:15 pm  State of the Association Meeting
1:45 – 3:15 pm  Scientific Sessions
3:30 – 5:00 pm  Scientific Sessions
4:00 – 7:00 pm  Exhibition Hall Open
5:00 – 6:30 pm  Committee Meetings
5:15 – 7:00 pm  Poster Session II (authors present)
5:30 – 7:00 pm  Working Group Business Meetings
7:30 – 9:00 pm  Chair’s Reception
9:00 – 11:00 pm  AMIA Lounge
9:00 pm – 12:00 am  Dance Party

WEDNESDAY, OCTOBER 26

8:30 – 10:00 am  Scientific Sessions
10:30 am – 12:00 pm  Scientific Sessions
12:15 – 1:15 pm  Closing Keynote Address
The Doctoral Consortium is a forum in which doctoral students can meet and discuss their work with a panel of experienced researchers. We welcome applicants from a broad range of disciplines and approaches that inform biomedical informatics, including the social sciences, humanities, computer and information sciences, clinical sciences, law, and related fields. Applicants should be past the candidacy stage and near their thesis proposal defense. If you would like to apply but do not meet this criteria, please contact the Consortium Chair. The Consortium committee will select approximately 10-12 participants who will be expected to give short, informal presentations of their work during the Consortium.

http://faculty.ist.psu.edu/reddy/amia

Saturday, October 22, 8:30 am - 4:30 pm

Workshop on Interactive Systems in Healthcare/WISH 2011

With growing emphasis on adoption and impact of Health IT (HIT), HIT researchers and practitioners are increasingly focusing on the design of interactive systems, human factors, and human–computer interaction. Despite this progress, however, there is largely untapped potential to create deeper and more profound connections among the biomedical, informatics, human–computer interaction, human factors, medical sociology and anthropology communities that would lead to the development of new methods, approaches, and techniques for removing the barriers to the adoption of HIT.

To address this limitation, the Association of Computing and Machinery (ACM) Conference on Human Factors in Computing Systems (CHI’2010) hosted the 2010 Workshop on Interactive Systems in Healthcare (WISH 2010 external link), which attracted over 150 participants from

Doctoral Consortium on Sociotechnical Issues in Biomedical Informatics

The AMIA People and Organizational Working Group, along with the International Medical Informatics Association’s (IMIA) Organizational and Social Issues Working Group is proud to sponsor the 2011 Doctoral Consortium on Sociotechnical Issues in Biomedical Informatics.

Friday, October 21, 8:30 am - 4:30 pm

The EHR Usability Symposium 2011, “Present and Future of EHR Usability”

EHR usability is a major barrier to the adoption and meaningful use of EHR. AMIA members are invited to attend a collaborative discussion to learn about the science of EHR usability, the methods to improve the status quo, the innovations that could radically improve EHR usability, the policy implications of EHR usability, and the perspectives of EHR vendors.

By the end of the symposium, participants will be able to:

• Understand usability as a science.
• Learn about the implications of EHR usability for the adoption and meaningful use of EHR.
• Learn about the current and future approaches to EHR usability.
• Learn about the perspectives of federal agencies and EHR vendors.

Participants will have ample opportunity to interact with usability experts, representatives from industry, federal agencies and researchers from the ONC-sponsored SHARPC project.

You are a prospective attendee if you are a consumer, vendor, usability professional, academic, researcher or practitioner. For more information please visit www.sharpc.org

The Doctoral Consortium is a forum in which doctoral students can meet and discuss their work with a panel of experienced researchers. We welcome applicants from a broad range of disciplines and approaches that inform biomedical informatics, including the social sciences, humanities, computer and information sciences, clinical sciences, law, and related fields. Applicants should be past the candidacy stage and near their thesis proposal defense. If you would like to apply but do not meet this criteria, please contact the Consortium Chair. The Consortium committee will select approximately 10-12 participants who will be expected to give short, informal presentations of their work during the Consortium. http://faculty.ist.psu.edu/reddy/amia

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To address this limitation, the Association of Computing and Machinery (ACM) Conference on Human Factors in Computing Systems (CHI’2010) hosted the 2010 Workshop on Interactive Systems in Healthcare (WISH 2010 external link), which attracted over 150 participants from
a variety of disciplines and institutions. Building on the success of last year’s workshop, AMIA is hosting WISH 2011 and co-locating it with the Annual Symposium. The workshop will feature invited talks, panels and a peer-reviewed technical program.

**NIWG Symposium: Human Factors, Modeling, and Workflow: Methods for Implementing Health Information Technology**

Gregory L. Alexander, Sinclair School of Nursing; University of Missouri; Thomas Clancy, School of Nursing; University of Minnesota; Mical DeBrow, Siemens Medical Solutions; Rosemary Kennedy, Thomas Jefferson University School of Nursing

This activity explores three major areas: (1) the use of human factors science as a method to evaluate care delivery workflow and automation within health information technology (HIT); (2) the use of care delivery process modeling as a practical tool to optimize workflow efficiency and quality when implementing HIT; and (3) the application of best practices when implementing electronic workflow systems to streamline processes. Participants will learn methods to represent interprofessional care delivery processes and decision-making within the design and implementation of electronic workflow. Through hands-on exercises, participants will apply modeling principles to clinical scenarios such as bar-code medication management, clinical documentation, and transfer of responsibility of care. In addition to capturing data and providing decision support, HIT can facilitate the flow of information and completion of care activities, thereby improving quality and safety. Participants will learn how to maximize use of HIT to optimize workflow and decision-making covering the following objectives:

- Provide a step-by-step understanding of human factors science in planning, designing, and implementing workflow solutions, process improvement, and HIT.
- Demonstrate use of computational modeling and simulation as tools to represent workflow processes within HIT.
- Review methods for understanding and representing interprofessional workflow within HIT.
- Demonstrate tools, methods, roles and processes, used in the implementation of electronic workflow systems.

Attendees should be clinicians, informaticians, and engineers, involved in the development, design, and implementation of HIT.

**Saturday, October 22, 1:00 - 8:00 pm and Sunday, October 23, 8:30 - 12:00 pm**

**CMIO Informatics Workshop**

Program Committee: Paul Fu, Jr., Harbor-UCLA Medical Center; Gilad Kuperman, NewYork Presbyterian Hospital; Joseph Kannry, Mount Sinai Medical Center; Richard Schreiber, Holy Spirit Hospital

Program Faculty: Paul Fu, Jr., Harbor-UCLA Medical Center; Joseph Kannry, Mount Sinai Medical Center; Richard Schreiber, Holy Spirit Hospital; David Bates, Brigham and Women’s Hospital

The CMIO community is an important segment for AMIA outreach. AMIA provides a combination of personal experience and anecdote with firm grounding in evidence-based biomedical informatics literature, informatics theory, foundational knowledge, and proven best practices, in a thoughtful and coherent educational setting. The following activity is designed as a precursor to the more in-depth, AMIA CMIO Boot Camp held annually over four days.

This event introduces new and established CMIOs and others who play similar roles (such as Medical Directors for Information Systems, CNIOs, clinical leadership) to a
set of topics that will help them carry out their professional responsibilities, and also provide them with a deeper understanding of the field of informatics. This activity will help assure that their organizations realize the potential benefits that health IT can bring and also assure that the organizations will meet their meaningful use requirements. The activity focuses on maximizing value from your clinical systems/EHR implementation with the following objectives:

- Link back to something practical that attendees can bring home and use, especially for the CMIO in the community hospital.
- How to advance in academic medicine when what you’re doing is “operations.”
- Obtain up-to-date practical information on selected biomedical informatics topics.

If you are a new CMIOs seeking new skills, an established CMIO seeking to develop new skills and build knowledge, or an individual aspiring to serve in the role of CMIO and seeking to understand the position and its challenges, this activity is appropriate for you with sessions focused on CMIO career development, clinical decision-support systems, quality reporting, meaningful use, and informatics. The schedule:

Saturday, October 22
- 1:00–4:30 pm, CMIO Challenges
  - The Dynamic Role of the CMIO
  - Implementing Clinical Decision Support
- 5:00–8:00 pm, Dinner Session
  - Common mistakes in EHR implementation from the vendor perspective that every CMIO should know (and know how to avoid)

Sunday, October 23
- 8:30 am –12:00 pm, CMIO Best Practices
  - Quality Reporting, Meaningful Use, and building the link to Informatics
  - Health IT Policy
  - Workshop Wrap: How can AMIA best support the continuing education needs of new and of established CMIOs?
**Keynote Presentations • AMIA 2011**

**Opening Keynote Speaker**

**Dr. Francis S. Collins**  
Director, National Institutes of Health  
**Sunday, Oct. 23, at 1 pm**

As Director of NIH, Dr. Collins, MD, PhD, oversees the work of the world’s largest supporter of biomedical research, spanning the spectrum from basic to clinical research. A physician-geneticist noted for his landmark discoveries of disease genes, Dr. Collins’ leadership of the international Human Genome Project culminated in the completion of a finished sequence of the human DNA instruction book. His own research laboratory has discovered a number of important genes, including those responsible for cystic fibrosis, neurofibromatosis, Huntington’s disease, a familial endocrine cancer syndrome, and most recently, genes for type 2 diabetes and the gene that causes Hutchinson-Gilford progeria syndrome, a rare cause of premature aging.

**Keynote Speaker**

**Dr. Gregory Abowd**  
Distinguished Professor, School of Interactive Computing  
Georgia Tech  
**Monday, Oct. 24, at 8:30 am**

Gregory D. Abowd, PhD, currently serves as the Director of the Health Systems Institute, a joint Georgia Tech/Emory University research institute investigating the impact of technologies on healthcare delivery. In this position, Dr. Abowd extends his own work over the past decade on information technologies and autism: his research interests concern how advanced information technologies of ubiquitous computing (or ubicomp) impact ordinary life when they are seamlessly integrated into our living spaces. Dr. Abowd’s work has involved schools and homes, with a recent focus on healthcare delivery. Dr. Abowd also directs the Ubiquitous Computing Research Group in the School of Interactive Computing. This effort started with the Future Computing Environments research group in 1995, and has since matured into a collection of research groups, including a major research effort that Dr. Abowd initiated called the Aware Home Research Initiative.
Dr. Farzad Mostashari
National Coordinator for Health Information Technology
U.S. Department of Health and Human Services

Wednesday, Oct. 26, at 12:15 pm

Dr. Farzad Mostashari first joined ONC as Deputy National Coordinator in July 2009. During his tenure, he developed a series of grant programs to promote EHR adoption, furthered development of health information exchange, and helped construct the workforce development program. His vision was instrumental in formulating the ONC’s Health IT Strategic Plan, and the creation of ONC’s Authorized Testing and Certification Bodies. Previously, Dr. Mostashari served at the New York City Department of Health and Mental Hygiene, where he facilitated the adoption of prevention-oriented health information technology by more than 1,500 providers in underserved communities. He also led the CDC-funded NYC Center of Excellence in Public Health Informatics and an AHRQ-funded project focused on quality measurement at the point of care. He conducted graduate training at the Harvard School of Public Health and Yale Medical School; served his internal medicine residency at Massachusetts General Hospital; and completed the CDC’s Epidemic Intelligence Service program. He was a lead investigator of West Nile Virus and anthrax outbreaks in New York City, and among the first developers of real-time nationwide electronic disease surveillance systems.
**R. Scott Evans**  
Intermountain Healthcare/University of Utah  
**AMIA 2011 SPC CHAIR**

**Christoph Lehmann**  
Johns Hopkins University, Division of Neonatology  
**Vice Chair, Applications**

**Wanda Pratt**  
University of Washington  
**Vice Chair, Foundations**

**William Hersh**  
Oregon Health & Science University, School of Medicine  
**AMIA 2012 SPC Chair**

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**Members of the Scientific Program Committee**

- **Patricia Abbott**  
  Johns Hopkins University Schools of Nursing & Medicine

- **Martha Adams**  
  Duke University Health System

- **Elske Ammenwerth**  
  University for Health Sciences, Medical, Informatics and Technology Hall in Tirol

- **Timothy Bickmore**  
  Northeastern University

- **Atul Butte**  
  Stanford University School of Medicine

- **Aaron Cohen**  
  Oregon Health & Science University, School of Medicine

- **Jonathan DeShazo**  
  Virginia Commonwealth University

- **Jason Doctor**  
  University of Southern California

- **Brian Gugerty**  
  Gugerty Consulting, LLC

- **Gillian Hayes**  
  University of California Irvine

- **Eric Horvitz**  
  Microsoft Research

- **David Kaelber**  
  The MetroHealth System and Case Western Reserve University

- **Joseph Kannry**  
  Mount Sinai Medical Center

- **Gail Keenan**  
  University of Illinois-Chicago

- **George Kim**  
  Johns Hopkins University

- **Philippe Kolh**  
  University Hospital of Liège

- **David Paik**  
  Stanford University

- **Shobha Phansalkar**  
  Partners HealthCare, Brigham and Women’s Hospital, and Harvard Medical School

- **Gretchen Purcell Jackson**  
  Vanderbilt Children’s Hospital

- **Fernán Quirós**  
  Hospital Italiano

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**Madhu Reddy**  
Pennsylvania State University

**Yuval Shahar**  
Ben Gurion University of the Negev

**Katie Siek**  
University of Colorado at Boulder

**Heiko Spallek**  
University of Pittsburgh, School of Dental Medicine

**Ravensara Travillian**  
European Bioinformatics Institute

**Chunhua Weng**  
Columbia University

**Johanna Westbrook**  
University of New South Wales

**Adam Wright**  
Brigham & Women’s Hospital

**Melih Yetisgen-Yildiz**  
University of Washington

**Mary Regan**  
University of Maryland School of Nursing, serves as the Nurse Planner on the committee for this activity
See detailed descriptions of each tutorial in chronological listings on p. 23 and p. 39

T01: Do You Believe in Angels? Intellectual Property, Entrepreneurship, and Early-Stage Funding

T02: Transforming & Visualizing Clinical Data for Research

T03: Practical Modeling Issues Representing Coded and Structured Patient Data in EHR Systems

T04: Best Practices for Teaching Informatics

T05: Personal Health Records, Patient Portals & Consumer-Facing Health IT

T06: An Introduction to Clinical Natural Language Processing (Sponsored by AMIA Natural Language Processing Working Group)

T07: Clinical Classifications and Biomedical Ontologies: Terminology Evolution, Principles, and Practicalities

T08: Introduction to Biomedical and Health Informatics

T09: Connecting States to HIT: Health Information Exchange & Beacon Communities

T10: Sociotechnical Design and In-Situ Evaluation for Health Information Technology (Sponsored by AMIA Academic Forum)

T11: The Role of Informatics in New Healthcare Delivery Organizations: Medical Homes, ACOs

T12: Knowledge-based Decision-support Systems for Implementing Clinical Practice Guidelines

T13: Advanced Natural Language Processing (Sponsored by AMIA Natural Language Processing Working Group)

T14: Introduction to R for Bioinformatics and Biomedicine

T15: Embracing Healthcare IT Standards in the World of Meaningful Use

T16: Developing Successful Informatics Research Grant Applications

T17: Making Your Point: Effective Presentation and Visual Design Skills

T18: An Introduction to Data Mining Principles and Practice

T19: Introduction to Translational Bioinformatics

T20: Clinical Decision Support: A Practical Guide to Developing Your Program to Improve Outcomes

T21: Evolving privacy and security under HITECH

T22: Clinical Research Informatics: Theory, Methods, and Best Practices (Sponsored by AMIA Clinical Research Informatics Working Group)

T23: Ontology-oriented Resources from the National Center for Biomedical Ontology

T24: Potential Informatics Interventions in the Complex Adaptive System of Health Care
Clinical Decision Support, Outcomes, and Patient Safety: Design, development, and implementation of state-of-the-art clinical decision support and its effects on clinical quality and patient safety outcomes.

Clinical Research Informatics (CRI): Highlights information management to address challenges facing clinical research and rapidly evolving biomedical informatics methods specifically designed to address CRI management requirements.

Clinical Workflow and Human Factors: Examines how many aspects of human factors in clinical information system implementation and use revolve around the clinician’s and clinic’s workflow.

Consumer Informatics and Multimedia Personal Health Records PHRs: Explores the consumer perspective in the use of health information science designed to improve patient engagement, medical outcomes, and the healthcare decision-making process.

Data Integration and Exchange: Methods organizations have undertaken to develop and implement various clinical data integration and exchange activities, including use of standard data formats (e.g., continuity of care document or HL7) and vocabularies (e.g., SNOMED, LOINC, ICD-9).

Data Mining, NLP, Information Extraction: Research and application of data mining, natural language processing, information extraction to all areas of biomedicine to increase the amount of usable data and information that can be accessed from existing clinical patient databases.

EHRs and Achieving Meaningful Use: How to promote the successful and effective development, implementation, and evaluation of Electronic Health Records as the nation works toward ‘meaningful use’ of these systems.

Global eHealth: Approaches to Global eHealth challenges and the need for scalable HIT solutions, a global informatics workforce, and a scholarly network to support current and future leadership around the world.

Informatics Education and Workforce Development: Efforts to create a trained HIT workforce and to support the national build-out of clinical information systems and the informatics contributions embedded in this movement.

Informatics in Clinical Education: The application of information technology in health professional education and promotion of teaching informatics as a discipline.

Interactive Systems: Human-computer interaction (HCI) research, compelling designs, or innovative interactive technologies, including those that improve our understanding of the social and human elements of health technologies.

Policy and Ethical Issues: Unprecedented national HIT activity and ethical considerations are posed as more practitioners and the public interface with these technologies.

Public Health Informatics and Biosurveillance: Leading-edge approaches to disease detection, communications, workforce development, standards and interoperability, and best practices to combine the domains of health information science and technology with the practice and science of public health.

Imaging Informatics: The intersection of imaging science, biomedical engineering and biomedical informatics, including imaging ontologies, methodologies and techniques of image processing, standards for image information sharing, content-based image retrieval, decision support in image detection and interpretation, integration of genomic and drug information, computer-aided systems, and evaluations of image-based systems.

Simulation and Modeling: Computer-based simulation and modeling methodologies and tools as they can be applied within the field of biomedical informatics to help researchers and clinicians explore complex healthcare interactions.

Terminology and Standards: Complex issues surrounding standard syntax, semantics, and pragmatics of design, development and use of various application-specific and general purpose clinical terminologies.

Translational Bioinformatics and Biomedicine: Opportunities in biomedical informatics arise from the storage, retrieval, analysis, and dissemination of molecular and genomic information in a clinical setting.
AMIA is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

AMIA designates this educational activity for a maximum of 27.75 AMA PRA Category 1 Credits™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Nursing contact hours will be provided by the University of Maryland School of Nursing Office of Professional Development. Total number of hours for tutorials, workshops and the Symposium is 27.75 The University of Maryland School of Nursing Office of Professional Development and Continuing Education is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center (ANCC) Commission on Accreditation.

The objectives of the AMIA 2011 Annual Symposium are to:
• Demonstrate and discuss issues related to the development, application, and evaluation of information technologies in medicine and health care.
• Provide a comprehensive portfolio of presentations that detail work, progress, and challenges in theoretical and applied information systems development.
• Improve knowledge and skill of attendees with respect to using, developing, and managing information technologies as they relate to medicine and health care.
• Present research and applied methodologies and results in the broad field of medical informatics.
• Promote information exchange among attendees.

Attendees of AMIA Symposia come from a variety of venues, notably from some of the most technologically innovative healthcare facilities in the world. Participants will include physicians, nurses, dentists, pharmacists, and other clinicians; health information technology professionals; computer scientists and systems developers; policy-makers; biomedical engineers and bioinformaticians; consultants and vendor representatives; medical librarians; academic researchers and scientists; and other professionals involved in the collection and dissemination of health information.

As a sponsor accredited by ACCME, AMIA requires that everyone who is in a position to control the content of an educational activity disclose all relevant financial relationships with any commercial interest prior to the educational activity. ACCME considers relationships of the person involved in a CME activity to include financial relationships of a spouse or partner. Faculty and planners who refuse to disclose relevant financial relationships will be disqualified from participating in CME activity. An individual with no relevant financial relationship(s) must inform CME participants that no conflicts of interest or financial relationship(s) exist.

A special website will be set up to assist you in claiming your continuing education credits. Specific instructions will be printed in the onsite program.
Please join us for the State of the Association Meeting on Tuesday, October 25, from 12:15 to 1:30 pm. Some AMIA award presentations will be announced and presented at this session! Don’t miss the opportunity to cheer for your colleagues and students and their accomplishments.

Nancy Lorenzi, AMIA Board Chair, and Edward H. Shortliffe, AMIA President and CEO, will co-chair this session, designed to provide AMIA members and attendees with a state of the association overview. Topics will include work of the Board of Directors, new and continuing initiatives, and an update on AMIA’s strategic directions, finances and the election results.

AMIA is the center of action for more than 4,000 health care professionals, informatics researchers and thought leaders in biomedicine, health care and science. AMIA serves as an unbiased, authoritative source within the informatics community and the health care industry. Through trusted science, education and practice in biomedical and health informatics, AMIA and its members are transforming health care.

AMIA connects a broad community of professionals and students interested in informatics. AMIA is the bridge for knowledge and collaboration across a continuum, from basic and applied research to the consumer and public health arenas. The association supports five domains:

- Translational Bioinformatics
- Clinical Research Informatics
- Clinical Informatics
- Consumer Health Informatics
- Public Health Informatics

As the voice of the nation's top biomedical and health informatics professionals, AMIA members play a leading role in:

- moving basic research findings from bench to bedside
- evaluating interventions across communities
- assessing the affect of health innovations on health policy
- advancing the field of informatics
The Signature Awards program recognizes AMIA members who have made significant contributions to the field at various stages of their careers.

**AMIA New Investigator Award**
Recognizes an individual’s early informatics contributions and significant scholarly contributions on the basis of scientific merit and research excellence. The criteria for nomination include significant scientific productivity in informatics prior to eligibility for fellowship in the College of Informatics, multiple significant scientific publications, and demonstrated commitment to AMIA.

**Virginia K. Saba Informatics Award**
Recognizes a distinguished career with significant impact permeating the care of patients and the discipline of nursing. The Virginia K. Saba Informatics Award recipient demonstrates the use of informatics to transform patient care, visionary leadership, impact, enduring contribution to professional practice, education, administration, research, and/or health policy, and demonstrated commitment to AMIA.

**Donald A.B. Lindberg Award for Innovation in Informatics**
Recognizes an individual at any career stage for a technological, research, or educational contribution that advances biomedical informatics. Dr. Lindberg’s continuous commitment to the field dramatically altered the scope and extent of informatics practice and research. The recipient of this award will have earned recognition for work conducted in a non-profit setting. Adoption of the particular informatics advancement will be on a national or international level.

**Don Eugene Detmer Award**
Recognizes an individual who has made a significant singular contribution or series of contributions over the course of a career, exemplifying the expertise, passion, and spirit that Dr. Detmer has for health policy.

**Morris F. Collen Award of Excellence**
In honor of Morris F. Collen, a pioneer in the field of medical informatics, this prestigious award is presented by the American College of Medical Informatics (ACMI) to an individual whose personal commitment and dedication to medical informatics has made a lasting impression on the field. The award is determined by ACMI’s Awards Committee.
AMIA presents a number of awards each year for research work submitted to the Annual Symposium.

The Martin Epstein and Student Paper Awards
The Martin Epstein and Student Paper Awards recognize the best student papers at the Annual Symposium. Student papers, selected by the Annual Symposium Scientific Program Committee, are forwarded to the Student Paper Advisory Committee (SPAC) which nominates eight finalist papers for presentation at the Student Paper Competition. Based on the combined excellence of both the written paper and oral presentation, the judges select a first-, second-, and third-place paper. If the first-place paper is truly extraordinary, the SPAC awards the Martin Epstein Award.

Distinguished Paper Awards
The Awards Committee recognizes five notable and distinguished papers from the Annual Symposium. Distinguished papers are awarded at the Annual Symposium but contain no ordinal designation. Student Paper Competition finalists are not eligible.

Distinguished Poster Awards
The Awards Committee recognizes between two and 10 distinguished posters with an award presented at the Symposium’s Closing Session. Posters, selected by the Annual Symposium Poster Committee, are forwarded to a committee that judges nominated posters.

Homer R. Warner Award
The Homer R. Warner Award is eponymously named for a physician who was a pioneer in the field of informatics and the founder of the Department of Medical Informatics at the University of Utah. The award is given with a cash prize for the paper that best describes approaches to improving computerized information acquisition, knowledge data acquisition and management, and experimental results that document the value of these approaches. Papers are recommended by the AMIA Annual Symposium Scientific Program Committee, and the selection of the final award is made by the University of Utah Department of Medical Informatics.

Working Group Awards

Diana Forsythe Award
Honors either a peer-reviewed AMIA paper published in the Proceedings of the Annual Symposium, or a peer-reviewed article published in JAMIA, or in another journal that publishes informatics-related content that exemplifies the spirit and scholarship of Diana Forsythe’s work at the intersection of informatics and social sciences. Selection is determined by a subcommittee of the AMIA Awards Committee and the AMIA People and Organizational Issues Working Group. The award is presented annually at the AMIA Annual Symposium with a cash prize.

Nursing Informatics Working Group Award
Honors a student who demonstrates excellence in nursing informatics and who has the potential to contribute significantly to the discipline of nursing and health informatics.

Harriet H. Werley Award
Presented to the nurse who has authored a paper presented at the AMIA Annual Symposium and judged as making the greatest contribution toward advancement of nursing informatics. Papers are recommended by the AMIA Annual Symposium Scientific Program Committee; selection of the recipient is made by a special committee within the AMIA Nursing Informatics Working Group.
The transformation of the American healthcare system and the future of the biomedical and health informatics profession are dependent on workforce education and development. AMIA is committed to the education and training of a new generation of clinical, public health, research and translational bioinformatics professionals who will lead the deployment and use of advanced clinical computing systems.

Founded in 2005, AMIA’s 10x10 program originally aimed to train at least 10,000 healthcare professionals in applied health and medical informatics during the ensuing 10 years. Now, having trained nearly 2,000 students, this distance-learning program is geared to train “next-generation informatics leaders.” 10x10 training is conducted across the United States by AMIA, in collaboration with key academic partners in the biomedical and health informatics education community.

Program Summary

AMIA’s 10x10 courses cover the following topics:
- Clinical or health informatics
- Clinical research informatics
- Translational bioinformatics
- Nursing informatics
- Public Health informatics

In-person sessions for 10x10 courses held earlier this year are convened at the Annual Symposium. These sessions provide additional lectures, panel discussions, project work, and an opportunity for students to interact with faculty and with one another.

Program Objectives

- Provide introductory level informatics knowledge/education for health care professionals who are in a position to advise or apply informatics-rooted solutions to problems encountered in their health care practice settings.
- Raise awareness of the importance and role of informatics in answering the health information technology training challenge across the clinical informatics, public health/population informatics, and translational bioinformatics domains.
- Promote information exchange about AMIA’s member institutions currently providing education and training opportunities in informatics.
- Prepare individuals for further professional training.

10x10 Partners

Kansas University Medical Center (KU)
Nova Southeastern University (NSU)
Oregon Health & Science University (OHSU)
Stanford University
The Ohio State University (OSU)
University of Alabama at Birmingham (UAB)
University of Illinois at Chicago (UIC)
University of Minnesota School of Nursing (UMN)
University of Texas Health Science Center at Houston (UTH)
University of Utah (Utah)
American Dietetic Association (ADA)
American College of Emergency Physicians (ACEP)

Upcoming Courses:

10x10 with UMN – October 10, 2011

The School of Nursing at the University of Minnesota will offer its ninth Interprofessional Health Informatics 10x10 Course on October 10, 2011. This course provides both a generic overview of nursing and health informatics and the specific application of information and communication technologies in the clinical area. The primary focus is on analysis, modeling, standardization, development and deployment of the electronic health record and safe exchange of patient data.
10x10 with OHSU – November 30, 2011 – March 7, 2012
This course provides a detailed overview of informatics to those who will work at the interface of healthcare and information technology. It provides a broad understanding of the field from the vantage point of those who implement, lead, and develop IT solutions for improving health, health care, public health, and biomedical research.

10x10 with OSU – January 6 – March 16, 2012
The Department of Biomedical Informatics at The Ohio State University will offer its Introduction to Clinical Research Informatics (CRI) starting January 6, 2012. The course provides students with a survey of the rapidly emerging field of clinical research informatics. In addition to defining the CRI domain and highlighting the key challenges and opportunities facing CRI, students will be exposed to key models, approaches, tools, regulatory/ethical issues and initiatives driving CRI developments and practice. Registration will open October 2011.

10x10 with University of Utah
February 1 – May 28, 2012
Public Health Informatics (PHI)
Offered through its Department of Biomedical Informatics, an introductory survey course on PHI. This course introduces public health, IT, and informatics practitioners to informatics principles and their application. Targeted to individuals in population/public health informatics, in clinical or public health settings. Directed by Catherine Staes, PhD, MPH.

Registration
Please see www.amia.org/education/10x10-courses to register online, view full course descriptions, and to view additional course dates.
AMIA’s Industry Advisory Council (IAC) brings together AMIA’s Corporate Partners on Industry Day to exchange information, improve communication and build partnerships and collaborative opportunities on a pre-competitive basis. The IAC is an objective, professional, and ethical forum, where AMIA and industry collaborate on issues of mutual interest to bring an essential and influential industry perspective to AMIA and its Board. IAC membership is currently open to all Corporate Partners. Industry Day represents a demonstrated commitment to furthering discussion on important Informatics issues that have an impact on the marketplace.

SPECIAL EVENTS

8:30 – 10:00 am  Keynote Address – Gregory Abowd (reserved seating for corporate guests)

5:00 – 6:30 pm  Industry Advisory Council Meeting

6:30 – 7:30 pm  Corporate Reception

SCIENTIFIC SESSIONS

10:30 am – 12:00 pm  S12: Common Framework for Secondary Use of Data: Next-generation Models for Sharing Real-world Evidence

1:45 – 3:15 pm  S22: mHealth Innovations: The Impact of Remote Monitoring and Adherence Devices on Care Delivery and Healthcare Research

3:30 – 5:00 pm  S33: Desperately Seeking Informaticians: How Today’s Employers are Building the Global Informatics Workforce
**BUSINESS MEETINGS • AMIA 2011**

**COMMITTEE MEETINGS**

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<thead>
<tr>
<th>Committee</th>
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<tr>
<td>Awards Committee</td>
<td>Tuesday, Oct. 25</td>
<td>7:00 – 8:15 am</td>
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<td>Bylaws Committee</td>
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<td>5:00 – 6:00 pm</td>
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<td>Education Committee</td>
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<td>Ethics Committee</td>
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<td>Finance Committee</td>
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<td>International Affairs Committee</td>
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<td>Meetings Committee</td>
<td>Monday, Oct. 24</td>
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<td>Membership Committee</td>
<td>Tuesday, Oct. 25</td>
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<td>Public Policy Committee</td>
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<td>Publications Committee</td>
<td>Monday, Oct. 24</td>
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<td>Working Group Steering Committee</td>
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**SCIENTIFIC PROGRAM COMMITTEES**

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<tr>
<th>Program Committee</th>
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<td>2012 Summit on Clinical Research Informatics</td>
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<td>2012 Summit on Translational Bioinformatics</td>
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<td>AMIA 2012</td>
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**OTHER BUSINESS MEETINGS**

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<th>Meeting</th>
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<tr>
<td>ACMI Business Meeting</td>
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<tr>
<td>Industry Advisory Council</td>
<td>Monday, Oct. 24</td>
<td>5:00 – 6:30 pm</td>
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<tr>
<td>JAMIA Editorial Board</td>
<td>Monday, Oct. 24</td>
<td>6:00 – 8:00 pm</td>
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<td>ACMI Executive Committee</td>
<td>Monday, Oct. 24</td>
<td>12:00 – 1:30 pm</td>
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<td><strong>Biomedical Imaging Informatics</strong></td>
<td><strong>Ethical, Legal, &amp; Social Issues</strong></td>
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<th><strong>Evaluation</strong></th>
<th><strong>People &amp; Organizational Issues</strong></th>
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<th><strong>Knowledge in Motion</strong></th>
<th><strong>Primary Care Informatics</strong></th>
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<th><strong>Knowledge Representation and Semantics</strong></th>
<th><strong>Public Health Informatics</strong></th>
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<th><strong>Education</strong></th>
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The EHR Usability Symposium 2011, “Present and Future of EHR Usability”

EHR usability is a major barrier to the adoption and meaningful use of EHR. AMIA members are invited to attend a collaborative discussion to learn about the science of EHR usability, the methods to improve the status quo, the innovations that could radically improve EHR usability, the policy implications of EHR usability, and the perspectives of EHR vendors.

By the end of the symposium, participants will be able to:
• Understand usability as a science.
• Learn about the implications of EHR usability for the adoption and meaningful use of EHR.
• Learn about the current and future approaches to EHR usability.
• Learn about the perspectives of federal agencies and EHR vendors.

Participants will have ample opportunity to interact with usability experts, representatives from industry, federal agencies and researchers from the ONC-sponsored SHARPC project.

You are a prospective attendee if you are a consumer, vendor, usability professional, academic, researcher or practitioner. For more information please visit www.sharpc.org

Doctoral Consortium on Sociotechnical Issues in Biomedical Informatics

The AMIA People and Organizational Working Group, along with the International Medical Informatics Association’s (IMIA) Organizational and Social Issues Working Group is proud to sponsor the 2011 Doctoral Consortium on Sociotechnical Issues in Biomedical Informatics.

The Doctoral Consortium is a forum in which doctoral students can meet and discuss their work with a panel of experienced researchers. We welcome applicants from a broad range of disciplines and approaches that inform biomedical informatics, including the social sciences, humanities, computer and information sciences, clinical sciences, law, and related fields. Applicants should be past the candidacy stage and near their thesis proposal defense. If you would like to apply but do not meet this criteria, please contact the Consortium Chair. The Consortium committee will select approximately 10-12 participants who will be expected to give short, informal presentations of their work during the Consortium. http://faculty.ist.psu.edu/reddy/amia

3:00 – 6:00 pm Registration Open
**Saturday, October 22 • AMIA 2011**

**Pre Symposium Events and Tutorials**

7:00 am – 6:00 pm Registration Open

8:00 am - 4:00 pm Business Meeting

AMIA Board of Directors Meeting
(Board members only)

8:30 am - 4:30 pm

NIWG Symposium: Human Factors, Modeling, and Workflow: Methods for Implementing Health Information Technology (see page 6)

Workshop on Interactive Systems in Healthcare/WISH 2011 (see page 5)

8:30 am - 12:00 pm Tutorials
(Half-day tutorials are T01-T06)

8:30 - 4:30 pm
(Full-day tutorials are T07-T14)

T01: Do You Believe in Angels? Intellectual Property, Entrepreneurship, and Early Stage Funding

Travis Good, HISTalkMobile, access.health, access. mobile, CarePilot; Seth Watkins, Steptoe & Johnson, Duke University; Whitney Winston, Steptoe & Johnson; Warren Hogarth, Sequoia Capital

Covers the entire venture creation process, from idea generation to business organization, with special emphasis on the unique perspective of the Informatician. Whether attendees have already launched a successful venture, and need to think critically about next-generation opportunities, or have ideas that require further evaluation and development, all will learn how to protect IP and fund a start-up in an engaging, interactive experience. Participants will learn about different types of money, the difference between angel investors and VCs and how to find both, at what stage and under what circumstances entrepreneurs should consider seeking investment. Tactics from our expert faculty will focus on:

- Exploring market opportunities surrounding your ideas and your research.
- The tools to communicate the broader potential of your research and develop a presentation pitch about your idea.
- Immersing in professional networks in the biomedical and health informatics fields.

By the end of the tutorial, participants will be able to:

- Deconstruct tech transfer and the process of translating opportunities and solutions into something of value.
- Understand the differences in evidence requirements in the peer-reviewed world and the marketing world.
- Articulate why entrepreneurship is valuable to their healthcare organizations and should be encouraged.

Outline of Topics:

- The Entrepreneurial Career Path
- Identifying potential opportunities
- Gaining the right to use and protect the key resources
- Developing strategies to generate market interest
- Building organizations
- Protecting your Intellectual Property and Avoiding Legal Risk
- How to Win Financing (and Influence People)

Intended Audience: Scientists; researchers; physicians, nurses, and other healthcare professionals; and computer scientists, system developers, and programmers.

Content level: 20% basic; 30% intermediate; 50% advanced
T02: Transforming & Visualizing Clinical Data for Research

Shawn Murphy, Massachusetts General Hospital

Using data collected in the clinical care domain for clinical research poses many challenges. Clinical data is diverse in structure and reliability. It is generated in truly massive quantities, but for consumption mostly by human eyes, not by machines. To be useful for clinical research, the data must usually be transformed to a machine-readable format. Considerations of sensitivity and specificity must be considered when performing these transformations. One then needs a systematic approach to organizing the data such that queries can be generated against seemingly disparate data. This usually translates into finding a suitable “atomic fact” and organizing the data into these discrete pieces. Finally, the data must be shown to clinical researchers and allowed to be queried in a format that provides insights into and hypothesis-testing of the data.

By the end of the tutorial, participants will be able to:

• Understand the complexities of using clinical data for research and be given methods and approaches for which to solve local problems.
• Understand the concept and value of structuring clinical data such that queries against disparate data can be performed.
• Understand the various solutions that currently exist for querying and visualizing clinical data.

Outline of Topics:

• Principles and methods for transforming clinical data for use in clinical research
• Organizing clinical data into databases for use in clinical research
• Visualizing and querying clinical data to test hypothesis
• Insights and solutions from querying and visualizing clinical data
• Limitations in using this data for clinical research

Intended Audience: scientists, clinical researchers, people working in safety and quality research, biomedical engineers and workers in bioinformatics, and programmers.

Content level: 100% Intermediate

T03: Practical Modeling Issues Representing Coded and Structured Patient Data in EHR Systems

Stanley Huff, Intermountain Healthcare

This tutorial provides models for flexible representation of patient data; the proper roles for standard terminologies like LOINC, SNOMED CT, First DataBank, and RxNORM; approaches to handling pertinent negative findings and negation; support for pre-coordinated data entry, while storing the data in a post-coordinated database; and storage of data that belongs to another patient in the patient record.

The tutorial describes the need for formal data models for the EHR and how standard terminologies are used in the models. Starting with use cases encountered while developing EHR systems at Intermountain Healthcare, the instructors will discuss the basic name-value pair paradigm for flexible representation of patient data; the proper roles for standard terminologies like LOINC, SNOMED CT, First DataBank, and RxNORM; approaches to handling pertinent negative findings and negation; support for pre-coordinated data entry, while storing the data in a post-coordinated database; and storage of data that belongs to another patient in the patient record. There are no absolute prerequisites for this tutorial. However, those who have experience in designing, developing, configuring, and implementing EHR systems will find the tutorial more meaningful. Experience in modeling of medical data and knowledge of
standard coded terminologies like SNOMED CT, LOINC, and RxNORM will also be very helpful.

By the end of the tutorial, participants will be able to understand:

• The assumptions and motivation for formal definitions of detailed clinical models.
• How standard coded terminologies are referenced by detailed clinical models, and the different roles that SNOMED CT and LOINC play in the models.
• The various alternative logical models for implementing clinical models related to diagnoses, allergies, problems, procedures, orders, and observations.
• The importance of adhering to terminology and modeling standards in developing or purchasing interoperable EHR systems.
• National and international activities for sharing models that enable interoperability of EHR systems.

Outline of Topics:

• What are detailed clinical models?
• Why are detailed clinical models important?
• What are the requirements for defining and using detailed clinical models?
• Name-value pair (NVP) and entity-attribute-value (EAV) strategies for representing clinical data
• What are the proper roles for use of LOINC, SNOMED CT, drug codes (First Data Bank, RxNorm) and classifications in the models
• The necessity of supporting both pre- and post-coordinated models in a clinical system
• Approaches to the representation of negation and pertinent negative findings
• Storing data that belongs to another person (relative, family member, donor) in the patient record
• Specific alternatives for modeling including observations, diagnoses, problems, procedures, allergies
• Open candid discussion of ideas that the participants have about ways that the modeling issues can be addressed
• Importance of supporting open consensus standards for EHR systems that are purchased or developed
• Brief discussion of various national and international activities related to formal clinical data models

Intended Audience: designers, developers, implementers of EHR systems, scientists, educators, researchers, and biomedical engineers interested in clinical data modeling and interoperability of EHR systems.

Content level: 50% Intermediate, 50% Advanced

**T04: Best Practices for Teaching Informatics**

Sponsor: Academic Forum

Vimla L Patel, School of Biomedical Informatics, UTHealth; Mark Carroll, Health Informatics, University of California, Davis; Judith J. Warren, University of Kansas School of Nursing; Michael F. Chiang, Oregon Health & Science University

The practices of teaching and learning are intimately related. The best practices in teaching relate to the best learning outcomes, and they follow from a combination of activities: encouraging faculty development as teachers; engaging students with high levels of thinking in their studies, using most current instructional methods available; and implementing regular, thoughtful, and periodic assessment procedures to provide ongoing feedback: to students about the progress of their learning, and to program faculty about how well their program is meeting its objectives. The best teaching, just like the best science and the best medicine, is a moving target and so the process of pursuing best practice is just a process, something fluid and dynamic that we all try to stay actively involved with as much as we possibly can.
Informatics is a multidisciplinary field and it lives equally in both the world of practice and the world of science. This is what makes the field complex in terms of training. As a science, it is concerned with the structuring and representation of knowledge and models of information processing in human beings and computers. Practice in informatics focuses on the design and implementation of systems and tools that facilitate the delivery of information, such as health care, and can be used to train practitioners as well as to support research.

This tutorial will attempt to capture the current status of the field in terms of instruction in Informatics, and the nature of what makes a successful training program, successful. Lectures and discussions will be lead by four faculty members, who have expertise in teaching and learning in informatics from variety of perspectives.

By the end of the tutorial, participants will be able to:

- Identify the relationship between the theoretical foundation and the evaluation of practical problems in informatics.
- Identify and approach challenges related to teaching introductory biomedical informatics courses to diverse groups of students.
- Describe the selection of content and assignments for informatics courses and curricula.
- Structure their program to the population of interest: researchers, IT professionals, clinicians, industry, and population health.

Outline of Topics:

- Overview of concepts from learning and cognitive sciences
- Informatics as a diverse discipline
- Informatics as science and as practice
- Basic understanding of best practices in teaching
- Lessons from teaching introductory biomedical informatics
- Challenges in teaching to diverse students
- Open-ended discussions with audience about problems in teaching Informatics course
- Review of principles of good practice in education.
- Approaches for selecting courses, assignments and evaluation strategies
- Demonstrate the assignments for teamwork as mentioned in the IOM reports
- Learning and evaluating informatics knowledge, skills, and abilities
- Similarities and differences: Training for Industry, academia and practice

Intended Audience: Informatics educators; Training directors, Industry with interest in informatics, health care professionals, informatics researchers

Content level: 80% basic; 10% intermediate; 10% advanced

**T05: Personal Health Records, Patient Portals & Consumer-Facing Health IT**

Patricia Flatley Brennan, University of Wisconsin-Madison; Jonathan Wald, Partners HealthCare System; Stephen Ross, University of Colorado Denver
As the HIT landscape continues to differentiate, consumer-facing health information technology solutions are assuming increasing importance in engaging people in self-care and disease management. Personal health-information tools provide lay people with access to subsets of their clinical records and with the health-information management tools needed for self-care and effective healthcare utilization. Taking on many forms, including PHRs, iPhone apps, patient portals, stand-alone applications, and Web 2.0 services, these innovative IT tools may also enable better access to healthcare systems resources, including health information, appointment scheduling, and provider communication, and personal health-tracking. Through case studies, this tutorial will introduce clinicians, systems administrators, and IT developers to critical issues regarding the design and deployment of PHRs and other personal health information management tools. During the tutorial, participants will have an opportunity to examine and critically evaluate existing tools & applications, explore patient portals, and discuss technical, ethical and policy considerations related to the deployment of personal health records tools. An update of the national environment and trends enabling (or interfering with) deploying IT tools for direct-to-consumer will be provided: meaningful use, privacy policies, payment schemes, and health reform. Participants are encouraged to appraise their institutions’ current plans for deploying consumer facing HIT and to come prepared to engage in discussions regarding implementation challenges and anticipated benefits.

By the end of the tutorial, participants will be able to:

- Determine how consumer-facing health information technologies, including PHRs and patient portals could achieve practice and agency goals.
- Pose solutions to the clinical and usability challenges of effective consumer-facing health information technologies.
- Evaluate the technical requirements, ethical considerations and social value of personal health records.

Outline of Topics:

- Personal health information management tools
- Personal Health Records, patient portals, iPhone apps for health
  - Web 2.0, social media & health 2.0—What does it offer personal health information management?
  - Microsoft HealthVault and Google Health—Where do they fit in?
- Clinical Uses
  - Self-management—observations in daily living
  - Care coordination
  - Life-long records
- Design
  - Technical Considerations and Challenges
  - Platforms and Devices
  - Integration with clinical information systems
  - Human-computer interaction
  - Clinical considerations
  - Fostering health goals with PHRs and patient portals
  - Personal health monitoring
- Health Education
  - Communication with professionals
- Policy and the View from the National Scene
  - View from the National Scene
  - Meaningful Use
  - Privacy
  - Policy: Payment schemes and health care reform
  - Ethical Issues
  - Social benefits & challenges of consumer-facing health IT
- Public Health
  - Surveillance
  - Public Health Education
- Health Services Research
Intended Audience: clinicians, managers of patient portals, health educators, public health practitioners, engineers and computer scientists who work with distributed information systems, integration of disparate databases or network-level authorization, authentication, or privacy policies.

Content level: 50% Basic, 30% Intermediate, 20% Advance

**T06: An Introduction to Clinical Natural Language Processing, “Part 1” (Sponsored by AMIA Natural Language Processing Working Group)**

Leonard D’Avolio, VA Boston Healthcare System, Harvard School of Medicine; Dina Demner-Fushman, National Library of Medicine; Wendy Chapman, University of Pittsburgh; John Pestian, Cincinnati Children’s Hospital Medical Center, University of Cincinnati

Natural language processing (NLP) is the umbrella term used to describe the automated structuring and extraction of information formatted as free text. The demand for NLP technologies in medicine will grow significantly in the coming years. This growth will be fueled by the continuing adoption of the electronic medical record, increasing emphasis on quality measurement and improvement initiatives, and the growing need for evidence to be used as part of evidence-based medicine. This half-day tutorial is designed to introduce clinicians and informaticians to the practice, tools, techniques, and science of clinical NLP. Instruction will be hands-on, interactive, and case-driven. The tutorial will focus primarily on clinical NLP, although related uses and methods such as literature-based NLP and text mining will be discussed to lend context. Topics covered include: an overview of clinical NLP and its uses in medicine; a brief history of clinical NLP and the evolution of NLP methods; the challenges to NLP; the number of approaches used to process natural language, and the strengths and weaknesses of each; implementation considerations; creating annotated corpora as training/test sets; evaluation of NLP; and a review of open-source tools for NLP. Demonstrations and in-class exercises will be used to help tie the theory of NLP to every-day research problems addressed by these technologies. The tutorial will be taught by four instructors who are experienced as researchers, developers, and users of a variety of tools and approaches to clinical NLP. Users will also be exposed to several open-source technologies for clinical NLP, including the Unstructured Information Management Architecture (UIMA) and Knowtator for manual annotation. They will also experience, first-hand, the challenges of clinical NLP through manual annotation of de-identified patient records.

Outline:

- Overview: What is NLP and how is it being used in medicine?
  - Literature
  - Clinical reports
  - Applied to bioinformatics
- What makes clinical NLP so difficult?
  - Overview of policies affecting NLP
  - Characteristics of the clinical documentation environment
- Different approaches to clinical NLP
  - Simple rules-based (information extraction)
  - Statistical
  - Symbolic or grammatical
  - Hybrid approaches
- The clinical NLP process
  - The various components of clinical NLP
  - Annotated corpora for training/testing
  - The pipeline for clinical NLP software
  - Evaluation (its role in the process)
- Available open-source tools and components
- Implementation considerations
- Evaluating clinical NLP (in greater detail)
By the end of this tutorial, attendees should be capable of:

- Describing current uses of clinical NLP.
- Describing the relationship between clinical NLP and related techniques such as text and data mining.
- Understanding the challenges to clinical NLP.
- Describing the various approaches to clinical NLP and their strengths and weaknesses.
- Understanding the process of clinical NLP and its various components.
- Finding available open-source clinical NLP components, frameworks, and packages.
- Identifying potential implementation concerns and challenges.
- Understanding the process of creating and using annotated corpora.
- Interpreting the performance of published clinical NLP research.

Intended Audience: any clinician or medical informatician with an interest in learning more about clinical NLP.

Content Level: 70% Basic, 30% Intermediate

**CMIO Informatics Workshop**
1:00 - 8:00 pm (see page 6)

**T07: Clinical Classifications and Biomedical Ontologies: Terminology Evolution, Principles, and Practicalities**

Christopher G. Ghute, Mayo Clinic; James J. Cimino, National Institutes of Health; Mark Musen, Stanford University

Standardized terminologies and classification systems are an essential component of the information infrastructure that supports healthcare delivery and evaluation. Despite significant advances and increased motivation for the use of terminology systems, widespread integration of standardized terminologies into computer-based systems has not yet occurred. In this tutorial, we provide an overview of the state of the science related to terminologies and classification systems and demonstrate application of selected terminologies to a patient case study to highlight the strengths and weaknesses of various terminologies. Standardized terminologies alone are insufficient to achieve semantic interoperability. Consequently, the tutorial will include content designed to elucidate the relationships among standards for terminologies, information models, messages, and document and record structures. In addition, we will demonstrate the use of advanced terminology tools that facilitate the use of standardized terms in computer-based systems and provide an overview of significant international and national initiatives related to terminology systems.

By the end of the tutorial, participants will be able to:

- Understand the origins and evolution of terminologies and ontologies.
- Appreciate the present state of the art in health terminology development and deployment.
- Articulate the dependencies within Meaningful Use standards on ontologies and vocabularies.
- Demonstrate practical access methods to many terminologies and ontologies.

Outline of Topics:

- Historical appreciation of the evolution and development of terminology and ontologies
- An overview of current terminologies and ontologies used in clinical practice
- The relationship of terminologies and ontologies to Meaningful Use Standards
- Speculations about the future trends and current developments in health related terminologies and ontologies
- A laboratory practicum on accessing and using clinical terminologies
Desiderata for practical and effective terminologies and ontologies
Practical examples and demonstrations about current terminologies and ontologies

Intended Audience: scientists; researchers; physicians, nurses, and other healthcare professionals; computer scientists, system developers, and programmers.

Content level: 75% Basic; 25% Intermediate

**T08: Introduction to Biomedical and Health Informatics**

Dominic Covvey, University of Waterloo; Christopher Cimino, Albert Einstein College of Medicine

This tutorial gives the 30,000-foot view of healthcare informatics through a combination of presentations and audience discussions. Experts in the field will describe the general principles, jargon, and major problems in each of a half-dozen healthcare informatics domains. The audience will be given a chance to struggle with some of these problems to gain a sense of the underlying intricacies.

The session will orient participants as to the content of the major healthcare informatics domains and how they interact. While participants should not expect to be able to start solving informatics problems based on this tutorial, they should have an understanding of what the problems are, which ones are attractive to them, and how they can acquire more knowledge and training to enter into the domain.

By the end of the tutorial, participants will be able to:

- Attend any of the AMIA scientific sessions and have a basic understanding of what is being presented and why it is important.
- Make an informed choice of a healthcare informatics domain which they would like to learn more about.

**T09: Connecting States to HIT: Health Information Exchange & Beacon Communities**

Description to be posted online soon.

**T10: Sociotechnical Design and In-Situ Evaluation for Health Information Technology**

Sponsored by the Evaluation and the Ethical, Legal, and Social Issues (ELSI) Working Groups

Bonnie Kaplan, Yale University; Annette L. Valenta, James G. Anderson, University of Illinois–Chicago

Successful implementation depends on understanding how health information technologies actually are used

**Outline of Topics:**

- Human and Social Aspects of Systems and Usability
- Evaluation
- Nature and Structure of Health Information
- Bioinformatics
- Information Retrieval
- Public Health Informatics
- The Electronic Health Record
- Workflow Analysis

Intended Audience: anyone new to healthcare informatics who is looking for a broad overview of the field. Informatics workers who are familiar with one domain but are looking to become familiar with other domains.

Content level: 90% Basic; 10% Intermediate

**10:00 – 10:30 am  Coffee Break**

**1:00 - 4:30 pm Tutorials**

**T09: Connecting States to HIT: Health Information Exchange & Beacon Communities**

Description to be posted online soon.
in practice. Sociotechnical approaches are grounded in theory and are evidence-based. They provide a way to analyze what people actually do when working with these technologies and why they do it. They assess how an application and workflow influence each other, how clinical and patient roles relate to system use, and what unintended consequences, patient safety issues, or user responses might occur. On-going, in situ sociotechnical evaluation can identify and forestall problems. The methods also can help prevent difficulties through better system design and implementation practices.

The tutorial will address how to identify challenges associated with designing and implementing both clinician-facing and patient-facing health information technologies. The presenters will draw on their own work and the experience of participants to engage participants in designing in situ evaluation for application development, implementation, and continued use. After some introductory didactic presentation, presenters and participants will discuss and design sociotechnical evaluations.

The tutorial presenters, Dr. Kaplan and Dr. Valenta, each have many years of experience in sociotechnical evaluation. Both are past chairs of the People and Organizational Issues Working Group. Dr. Kaplan authored chapters on qualitative evaluation in they key evaluation books and has published seminal methodological papers as well as evaluation studies. She has presented evaluation tutorials at AMIA, Medinfo, and other conferences. Dr. Kaplan currently is chair of the Ethical, Legal, and Social Issues Working Group. Dr. Valenta co-published the seminal paper on “Q,” which introduced this method to study human subjectivity to the biomedical and health informatics discipline. She created and has taught the course on “Social and Organizational Issues in Health Informatics” in UICs graduate curriculum for nearly 20 years. Dr. Valenta leads the AMIA 10x10 at UIC, for which Dr. Kaplan is a co-facilitator, and covers both sociotechnical theory and evaluation. Dr. Anderson has edited three books on evaluating the organizational impact of healthcare information systems and co-authored a book on ethics and information technology. He is a past chair of the Ethical, Legal and Social Issues Working Group and past chair of the Quality Improvement Working Group. He has been a member of the editorial board of the Journal of the American Medical Informatics Association since 2000. He has presented tutorials at six previous AMIA conferences.

Topics will include:

- Sociotechnical theory
- Why do evaluation
- Sample evaluation designs and what was learned from them
- Frameworks for evaluation
- Sociotechnical approaches to HIT design and on-going evaluation

Objectives:

By the end of the tutorial, participants will be able to:

- Describe key concepts in sociotechnical theory
- Employ sociotechnical evaluation frameworks
- Articulate the importance of on-going, in situ evaluation
- Design HIT projects and evaluations that include people, organizational, social, and ethical issues

Intended Audience: Clinicians, designers, researchers, scientists, managers, health care professionals, executives, and others involved in research, development, or deployment of information systems in health care.

Content level: 40% basic; 40% intermediate; 20% advanced

Intended Audience: Clinicians, designers, researchers, scientists, managers, health care professionals, executives, and others involved in research, development, or deployment of information systems in health care.

Content level: 40% basic; 40% intermediate; 20% advanced
T11: The Role of Informatics in New Healthcare Delivery Organizations: Medical Homes, ACOs

David W. Bates, Brigham and Women’s Hospital and Partners Healthcare; Theresa Cullen, US Department of Health and Human Services; Judy Murphy, Aurora Health Care and Alliance for Nursing Informatics

Succeeding as an Accountable Care Organization (ACO) or Medical Home will require healthcare organizations to build an infrastructure capable of supporting care delivery and cost management across the continuum. This tutorial will examine the key components of these new healthcare delivery and cost models, highlighting the importance of health IT systems to support ongoing patient management, knowledge management and performance monitoring. Hear about obtaining NCQA Patient Centered Medical Home recognition by following their designated standards to organize care around patients, work in teams and coordinate and track care over time. This partnership between the patient and their healthcare team is facilitated by registries, information technology, and health information exchange to assure that patients get the indicated care when and where they need and want it in an appropriate manner. Similarly, ACOs create incentives for health care providers to work together to treat an individual patient across care settings – including ambulatory settings, hospitals, and long-term care facilities. The Medicare Shared Savings Program will reward ACOs that lower growth in health care costs while meeting performance standards on quality of care and putting patients first and at the center of all care. Again, hear how this is facilitated through the use of registries, information technology, and health information exchange. The proposed ACO regulation from CMS/HHS published in March 2011 will also be discussed.

Objectives:

By the end of the tutorial, participants will be able to:

- Discuss the characteristics, key components, and costs of new healthcare delivery models.
- Describe the importance of health IT systems that support patient management, knowledge management and performance monitoring.
3. Explain the Medical Home partnership and its emphasis on providing patient-centered care.
4. Understand ACOs and the proposed regulatory framework from CMS.

Outline of Topics:

- Review agenda; introduction of faculty and participants (All) – 15 minutes
- Medical Home (DWB) – 60 minutes
  - Overview
  - Medical Home and HIT
    - Clinical Decision Support
    - Registries
    - Team Care
    - Personal Health Records
    - Care Transitions
    - Telehealth
    - Measurement
- Break – 15 minutes
- Chronic Disease Management and HIT (TC) – 45 minutes
  - Key Elements
  - Making it Work / Experiences
- Accountable Care Organizations (JM) - 45 minutes
  - Incentives for treatment
  - Regulatory and policy issues
  - Medicare shared savings program
- Health IT systems to support
  - Patient management
  - Knowledge management
  - Performance monitoring
- Bringing it all together – group discussion / Q & A (All) – 30 minutes
**T12: Knowledge-based Decision-support Systems for Implementing Clinical Practice Guidelines**

Samson Tu, Stanford University; Mor Peleg, University of Haifa

This tutorial gives an overview of the issues involved in, methods for, and examples of implementing clinical decision-support systems for guideline-based care. Clinical practice guidelines, or more generally clinical recommendations, are summaries of evidence-based best practices. In recent years, there has been an explosion of published guidelines. Computer-based decision-support tools can enhance the implementation of these guidelines by bringing focused recommendations to care providers at the point of decision-making.

This tutorial will first give a general introduction to the history and practice of clinical decision-support systems, and then look at alternative methods for representing and delivering clinical recommendations.

We will use examples of guideline-based knowledge-based systems that have been implemented to illustrate both technical aspects of system development and organizational aspects of deployment and integration into clinical workflow. The technical aspects will include the steps and problems involved in formalizing guideline recommendations in computable format, system architecture, and technical challenges of integrating an external application into a continually-changing IT environment. The organizational aspect will address successful strategies for implementing the system into multiple medical centers of a large healthcare network. Presentation will be mixed with exercises and demonstrations of actual clinical systems that can provide decision support to primary-care clinicians.

By the end of the tutorial, participants will be able to:

- Discuss characteristics of CDSS that help or hinder their acceptance.
- Describe alternative methods for representing computable CPGs.
- Understand the steps and issues involved in encoding guideline knowledge.
- Outline the issues involved in deploying, integrating, and maintaining a knowledge-based DSS for implementing guidelines.

Outline of Topics:

- Introduction to CDSS
- Alert and reminder systems
- Alternative computable models of CPG
- The roles of standards
- Knowledge acquisition and maintenance for guideline-based CDSS
- Sociotechnical issues of deploying CDSS

**T13: An Introduction to Clinical Natural Language Processing, Part 2: Interactive Demonstrations of Fundamental Concepts With Available Open-source Tools**

Sponsored by the Natural Language Processing (NLP) Working Group

Intended Audience: researchers; physicians, nurses, and other healthcare professionals; computer scientists, system developers, and programmers.

Content level: 20% Basic, 60% Intermediate, 20% Advanced
INTRODUCTION TO CLINICAL NLP

Leonard W. D’Avolio, Massachusetts Veterans Epidemiology Research and Information Center (MAVERIC) and Harvard Medical School; Wendy W. Chapman, University of California San Diego; Dina Demner-Fushman, U.S. National Library of Medicine; Guergana Savova, Children’s Hospital Boston, Harvard Medical School; Brett R. South, VA Salt Lake City Health Care System, University of Utah; Scott L. DuVall, VA Salt Lake City Health Care System, University of Utah

In “Introduction to Clinical NLP” Part 1, fundamental concepts of NLP are described. Part 2 advances attendees’ understandings by walking through each fundamental concept as part of performing end-to-end applications using available open-source NLP tools. The tutorial will follow a single clinical use case with variations provoking the use of several approaches to NLP. Demonstrations will be step-by-step and taught by NLP developers and researchers, including creators of some tools demonstrated.

Tasks in the exercise will include:

- Creation and annotation of training and test sets using eHOST.
- Development and use of regular expressions for rules-based information extraction.
- Use of UMLS knowledge bases & tools.
- Creation and deployment of a grammatically-based concept-mapping pipeline using cTAKES.
- Creation and deployment of machine learning-based document and concept-level extraction using ARC.
- Discussion of evaluation of results, and pros and cons of various approaches.

By the end of this tutorial, attendees should be capable to:

- Understand the different types of NLP tools available.
- Choose the appropriate tool for the clinical NLP task at hand.
- Understand the process of creating and using annotated corpora.
- Understand the process of clinical NLP and its various components.
- Find available open-source clinical NLP components, frameworks, and packages.
- Describe various approaches to clinical NLP and their strengths and weaknesses.
- Identify potential implementation concerns and challenges.
- Interpret the performance of published clinical NLP research.

This session is not designed to train on any specific tool, but will give users a solid foundation for participating in projects that employ NLP.

Intended Audience: Any clinician or medical informatician with an interest in learning more about clinical NLP. Anyone who previously attended the Introduction to Clinical NLP tutorial is likely to benefit from this extension. This is not a training session on any one tool.

Content Level: 50% basic, 50% intermediate

T14: INTRODUCTION TO R FOR BIOINFORMATICS AND BIOMEDICINE

This tutorial is about analyzing multiple and different genomic-data types. Bioconductor, a package repository for bioinformatics, contains 467 packages in addition to the 3,128 general-purpose packages from R. The wide array of possibility makes R a platform particularly suited for translational bioinformatics research. However, like other statistical software, the learning curve can be steep for some of us less versed in computer science. This tutorial is based on the successful workshop “Introduction to R programming” taught at Stanford. Participants will be introduced to the basics of the R language through practical examples from actual biomedical research projects. We will show advanced techniques.
on how different resources can be plugged into R to perform an analysis and to produce publication-ready graphics.

At the end of this tutorial, participants will be able to:

• Import and export data from different resources, including databases.
• Use R to transform and manipulate their data and perform exploratory statistical graphs.
• Pre-process raw DNA microarray data and extract genes significantly regulated.
• Explore their gene list using supervised and unsupervised clustering algorithms.
• Interpret their results using metadata from KEGG database.

Outline of topics:

• Introduction to the R console and interactivity concept
• How R represents objects
• Using the help function
• Producing publication-grade, quality graphics easily
• Directly downloading raw data from public microarray repositories
• Quality assessment of DNA microarray
• Clustering solution available in R
• Knowledge database and metadata accessible through R package repositories

Intended audience: academics and professionals who want to gain hands-on skills to analyze biomedical or clinical data, as well as an overview of R possibilities; translational scientists and students interested in analyzing their genomic data and learning how to integrate them with external resources.

Content level: 30% Basic, 50% Intermediate, 20% Advance

1:00 – 5:00 pm

10x10 at University of Minnesota In-person Session

2:30 – 3:00 pm Coffee Break

5:00 - 7:30 pm Workshops

Workshop 1: Just a Spoonful of Sugar: Improving Technology Change Success in Healthcare IT
B. Magda, V. Grady, George Washington University

In 2004, the White House mandated that medical facilities implement technology required to maintain electronic patient health information by 2014. The unique dynamics of the healthcare environment will challenge the timeline of the federal mandate. Magda (2009) notes that it is not only those implementing the new information systems that need to be technologically proficient, but it also will be crucial for employees maintaining health records to understand the comprehensive long-term objectives. In addition to the aforementioned technical challenges, many employees within these organizations will be confronted with organizational culture shifts in daily process and data flow within their respective organizations. With organizational change, failure rates approach 70% (Standish, 2009). It is critical, therefore, for the healthcare environment to embrace technology transformations, while maintaining a tight critical path to maximize potential for successful technology transition. This workshop will introduce the LOE Index (Grady, 2005), a quantitative diagnostic tool that identifies organizational symptoms typically experienced during a technology change, that unrecognized, can lead to an Organizational loss of effectiveness (LOE). Subsequently, utilizing the unique results of the LOE Index, the participants will be introduced to a qualitative process that creates a customized formula of leadership, communication, end-user involvement, and education.
Workshop 2: The Five-minute Hour: Online Clinical Interactions in the Era of Social Media
J. Reider, Twistle, Inc; M. Stuart, RWJ School of Medicine; H. Rippen, Westat; T. Agresta, University of Connecticut; H. Chueh, Massachusetts General Hospital; M. Weiner, University of Pennsylvania; S. Morgan, Partners HealthCare

Since the publication of the AMIA Guidelines for Clinical Use of Electronic Mail with Patients in 1998, e-mail has given way to Facebook, Twitter, and Skype, yet patients and clinicians remain separated by a chasm of legacy technology and clinician fears of an avalanche of uncompensated work. How can the clinical team provide true connected patient-centered care, while keeping their heads above water? The same tools that helped a generation of primary-care physicians to compress a therapeutic hour into fifteen minutes can now provide a virtual compression of time, space, and presence. The BATHE framework helps physicians achieve shared understanding, ownership, and direction in their relationships with patients. This model can guide online clinical interactions to become fluid, ongoing relationships - rather than a barrage of “extra work” for the harried clinician. The workshop will present a White Paper and a tool set. We will review the rationale for enhanced connectivity and collaboration among providers and patients, and introduce tangible processes that will enable participants to turn online interactions into a delightful component of the modern care-delivery environment.

Workshop 3: Security and Privacy
M. Gaynor, Saint Louis University

As we move from paper to Electronic Medical Records (EMRs), the technology of security and privacy has morphed from mostly physical to mostly electronic. Managers and practitioners must understand emerging security and privacy technologies to protect patient data and comply with federal regulations, such as HIPAA. Medical professionals, administrators of healthcare-related organizations, lawyers, and policy-makers require updated skills to protect patient privacy. Health care managers who have a basic understanding of privacy and security of health care information are vital to the success of EMRs. Without understanding how to protect and ensure accurate medical information, the public will not have confidence to allow their medical information to benefit public health. This workshop will consist of a simulation-based role-playing game allowing workshop participants to engage in the conceptual aspects of protecting EMRs. This hands-on approach provides workshop attendees with: an understanding of security; the ability to manage security and privacy infrastructure; an understanding of the basic concepts of privacy; an understanding of the unique aspects of privacy and security and its management in the health care industry; and an understanding of how to comply with HIPAA security and privacy regulations.

Workshop 4: i2b2/VA/Cincinnati Workshop on Natural Language Processing
O. Uzuner, University at Albany, SUNY; J. Pestian, University of Cincinnati; B. South, VA Salt Lake City Health Care

In 2011, i2b2 and the VA teamed with Cincinnati Children’s Hospital Medical Center, University of Cincinnati in organizing a two-track challenge on natural language processing. The i2b2/VA track of the challenge is focused on co-reference resolution on clinical records; the Cincinnati track is on data mining of emotions found in suicide notes. Both tracks are supported by annotated data that is provided by the organizers. This workshop will present the two tracks of the 2011 challenge, the results and evaluation of the systems developed for these challenges, and the state of the art in objective and subjective natural language processing.

Workshop 5: An Introduction to Agent Based Modeling (ABM) for the Health Sciences
J. Schindler, Northrop Grumman Corporation; J. Holmes, University of Pennsylvania
This workshop will provide attendees with an overview of the modeling process and the application of agent-based modeling (ABM) to the health sciences. We will: compare and contrast deterministic and ABM generative modeling approaches, examining how each can provide benefit to the modeler or researcher; provide an overview of the ABM model development process, looking at model concept development, model construction, model testing, and model dissemination; explore a sample of health science and public health models that have been developed using an ABM approach; give attendees who bring laptops (Windows or MacOSX) an opportunity to install and practice using a well-known ABM software tool, NetLogo; share a variety of online resources (tutorials, software tools, papers, journals, professional organizations) that can assist independent learners in developing their modeling skills.

**Workshop 6: Electronic Health Record Facilitated Performance Measurement/Reporting**

A. Jain, S. Hayden, Cleveland Clinic

Performance measurement and subsequent reporting of outcomes is critical in the current healthcare climate and a central focus of the EHR-incentive programs from CMS. The EHR and EHR-derived data are essential for efficient measurement and reporting of patient-specific process and outcomes measures. Governance issues, workflow consistency and technical challenges remain obstacles for institutions that have implemented an EHR for clinical purposes and that are now challenged with supporting local, regional and national quality initiatives. We illustrate the use of a multidisciplinary group at our institution to leverage our EHR-based clinical data repository for rapidly collecting, aggregating and validating patient-specific performance measures and outcomes. We will use local, regional and national reporting obligations, such as our Aligning Forces for Quality community, and the “meaningful use” EHR-incentive program to demonstrate our process. Finally, we will focus on overcoming governance and clinical workflow challenges, extending investments already made in the health IT infrastructure and developing a team to manage the complexity of secondary use of EHR data to measure quality.

**Workshop 7: Standards in Clinical Decision Support: Activities in Health Level Seven and Beyond**

R. Jenders, National Institutes of Health; R. Jenders, Georgetown University; G. Del Fiol, University of Utah; K. Kawamoto, Duke University

Health Level Seven (HL7) is the principal international HIT standards development organization (SDO). Prominent among its suite of standards are formalisms related to clinical decision support (CDS), including the Arden Syntax, GELLO, Infobutton, and Decision Support Service (DSS) standards. Continuing improvement of these standards and ongoing development of future decision-support standards require wide participation in order to maximize their success. Accordingly, the purpose of the workshop is twofold. First, the instructors will convey the latest developments regarding existing CDS standards and related efforts to develop new standards. Second, the instructors will solicit feedback so that attendees who do not participate in HL7 can have input into the standards activities of that organization while placing them in the context of other SDOs and harmonization efforts. The instructors of this workshop, who are co-chairs of the CDS Work Group of HL7, will review progress in these areas. They will present details of ongoing development of the extant HL7 standards and planned future ones, including an Order Set and Virtual Medical Record (vMR) standard. Finally, they will solicit discussion regarding the future direction of standards development in these areas.

**Workshop 8: Should AMIA Revise Its Code of Ethics?**

R. Hsiung, dr-bob.org

The AMIA Board of Directors approved a Code of Ethics in 2007. As its authors stated when it was published, “the code ... is a dynamic document. It will evolve as the
field itself evolves.” In 2011, the AMIA Board approved a Conflict of Interest Policy. It is now considering revisions or updates to the Code of Ethics. The Conflict of Interest Policy will be enforced. One issue to consider is whether the Code of Ethics should also be enforced. The authors of the Code also stated, “adoption of a code of ethical conduct naturally raises the questions of compliance. What are the consequences of violating the code? How is the code enforced? The authors have suggested to the AMIA Board that these are issues best decided by the AMIA membership itself. In future forums, AMIA will initiate a dialog with its membership to seek consensus on this important topic.” This workshop is such a forum. Hypothetical scenarios involving possibly unethical conduct, including conflicts of interest, are discussed. Half of the time is reserved for dialog. The session concludes with an informal vote to assess progress toward consensus and to provide feedback to the AMIA Ethics Committee and Board of Directors.
Tutorials

7:00 am – 6:00 pm Registration Open

7:30 – 11:30 am Nursing Informatics WG Special Event

The AMIA Nursing Informatics Working Group (NIWG) is holding an informational and networking event. Internationally known nursing informatics experts will provide interactive discussions about NIWG-supported nursing informatics accomplishments and future initiatives, both within the United States and abroad. Updates on NI 2012, AMIA NIWG policy initiatives, nursing informatics scholarship, the History Project, AMIA 10x10, and the Alliance for Nursing Informatics. This is an opportunity to share knowledge, network, and generate ideas for future AMIA NIWG activities.

8:00 am - 12:00 pm Special Events

10x10 at OHSU In-person Session
10x10 at UAB In-person Session
10x10 at UIC In-person Session
10x10 at Kansas University In-person Session
10x10 at University of Texas In-person Session
Student Paper Competition

8:30 am - 12:00 pm Tutorials

T15: Embracing Healthcare IT Standards in the World of Meaningful Use

Charles Jaffe, HL7; Rebecca Kush, CDISC; Dixie Baker, SAIC; Blackford Middleton, Harvard-Partners; Chris Chute, Mayo Clinic; Stanley Huff, Intermountain Healthcare; and Robert Dolin, Semantically Yours, LLC

Healthcare IT Standards often have been viewed with only passing interest in the medical informatics community. The HITECH provisions of the ARRA legislation have brought their importance to the fore. These standards are essential if we are to achieve any of the regulatory provisions that require reuse of healthcare data. At the top of anyone’s list, the essential elements would include decision support, vocabulary binding, privacy and security, quality measurement, and clinical research integration. In the end, successful implementation of any solution is predicated on collaboration across standards developers, realizing both quality improvement and cost effectiveness.

By the end of the tutorial, participants will be able to:

- Identify the key standards specified in the ‘meaningful use’ final rule.
- Define the standards requirements for security and privacy.
- Understand the specific vocabulary standards and their binding to transmission specifications.
- Establish metrics underlying the business case of standards requirements.
- Recognize the value of standards development for the integration of patient care and clinical research data.
- Leverage the underlying HL7 standards for messaging and the key components of Clinical Document Architecture.
- Appreciate the value basis of international standards development.
- Integrate the key components of the National Health Information Network.
- Develop a comprehensive view of the standards required for (semantic) interoperability.

Outline of Topics:

- Standards for healthcare as keystone for interoperability
- Standards for security and privacy
- Vocabulary standards
- Return on investment for standards adoption and deployment
Intended Audience: scientists; researchers; physicians, nurses, and other healthcare professionals; computer scientists, system developers, programmers, and CFOs.

Content level: 30% Basic; 40% Intermediate; 30% Advanced

T16: Developing Successful Informatics Research Grant Applications

Valerie Florance, National Library of Medicine; Eneida A. Mendonca, University of Wisconsin Madison; Justin B. Starren, Northwestern University

Success in obtaining research funding depends on many things, but especially an understanding of the priorities of the funding agency and preparing an application that addresses those priorities effectively. This tutorial will provide a broad overview on the grant process, from topic development to application submission to peer review and award decisions. Topics will include fundamentals of good grant writing, interpretation of a funding announcement (RFA), preparation of a grant application, different funding mechanisms, roles and responsibilities of a principal investigator and key personnel, how to interpret and respond to reviewers’ comments, communication with grant program officers, analysis of reviews and strategies for response and re-application. The tutorial will cover general aspects of federally funded grants as well as grant opportunities provided by Foundations, but NIH will be the source of many examples. Faculty will share thoughts derived from their own experiences and from what they learned over the years writing and reviewing grant proposals. The faculty bring together many years experience spanning the roles of grant writer, grant reviewer, and NIH grant program officer.

By the end of the tutorial, participants will be able to:

• Understand the fundamental components of a research grant application.
• Identify pitfalls to avoid in the application process.
• Identify proposal format used by the majority of public funding agencies and how to use them.
• Identify the best funder and funding mechanism for a proposal.
• Prepare a budget and budget justification.
• Identify key resources available to researchers (online tools, databases, etc.).
• Understand the funding announcement and criteria that will be used for review of scientific merit.
• Identify issues appropriate to discuss with Program Directors and how to approach them.
• Discuss ways to frame an informatics research project.

Outline of Topics:

• Overview of funding mechanisms (grants, contracts, cooperative agreements) and announcement types
• Overview of research grant structure
• Grant preparation steps
• Personnel, budget and budget justification
• Grant review criteria—understanding “review speak”
• Communication with funding agency
• Useful links for grant related information

Intended Audience: scientists; researchers; physicians, nurses, and other healthcare professionals; Fellows and graduate students.

Content level: 80% basic; 20% intermediate
T17: Making Your Point: Effective Presentation and Visual Design Skills

Daniel Z. Sands, Cisco Internet Business Solutions Group, and Harvard Medical School

An important part of any career is giving presentations, yet many do it poorly, either ineffectively communicating the message, boring the audience, or both. And yet, presentation skills can be learned. Participants in this tutorial will learn effective presentation skills, learn best practices for slide design, and have the opportunity to try out skills. At some point, everyone needs to present their work, either orally or in written form. And surveys show that public speaking is a common phobia, and in some is more feared than death itself. Although writing for publication is taught at many stages of our careers, oral presentation skills get little attention. These skills are especially important since many people present more than they write for publication, and subsequently have many more opportunities to make an impression (either good or bad) and convey ideas. As a result, even many experienced veterans in the field give poor presentations. Yet presentation skills can be taught, practiced, and learned. The purpose of this tutorial is to raise the quality of presentations in our field, which will benefit both presenters and their audiences.

The format of the seminar will be a lecture and demonstration consisting of concrete advice, real-world examples and opportunities for attendee interaction. The presentation itself will incorporate principles being discussed, so the participants can better understand their application. After discussing presentation skills, there will be a discussion of the technologies that can be used, including some comments related to slide design and layout. Also in this tutorial, participants will be invited to do exercises to try what they have learned in a non-threatening environment. Finally, those who wish to bring their PowerPoint presentations can receive constructive critique from the instructor and class.

By the end of the tutorial, participants will be able to:

- Explain three parallels between oral presentation and performance.
- Feel greater comfort speaking before audiences, both large and small.
- States three ways people hide when they present.
- Explain the most important factor in connecting with your audience.
- Describe three principles of effective use of slides.

Outline of Topics:

- Why talk about this?
- Essential Elements
  - You!
  - Content
  - The show
- Audience interaction
- The medium
- Humor
- Handouts
- Design:
  - Fonts
  - Format
  - Color
  - Charts and Diagrams
- Animation
- Projectors
- Digital Video
- Student exercises
- Tips and final comments

Intended Audience: scientists; researchers; physicians, nurses, and other healthcare professionals.

Content level: 50% basic; 50% intermediate
T18: An Introduction to Data Mining Principles and Practice

John H. Holmes, University of Pennsylvania

This interactive tutorial introduces attendees to the theory, tools, and techniques for discovering knowledge in biomedical data. Using a well-known data mining life cycle as a conceptual framework, attendees will experience first-hand, thorough demonstration and direct participation, the techniques of mining clinical data. These techniques include data preparation, description and visualization, feature selection, mining association, classification, prediction rules, and clustering. A variety of mining algorithms will be explored with each technique. The capstone of the tutorial will be the application of mined data to informing traditional statistical analysis. The tutorial will include hands-on experience in using Weka, a well-known open-source data mining software suite. Although not required, attendees will get the most out of the tutorial if they bring a laptop to the session to participate in the hands-on sessions. Instructions for downloading and installing Weka will be sent to registrants approximately one week prior to the tutorial.

By the end of the tutorial, participants will be able to:

- Understand the basic principles of data mining.
- Apply appropriate data-mining techniques in clinical research.
- Interpret data-mining results and how they inform statistical analysis.

Outline of Topics:

- Biomedical databases
- Data visualization
- Intelligent data analysis
- Explanatory data-mining
- Predictive data-mining
- Data-mining software
- Applications of data mining in biomedical domains
- Data preparation: methods for cleaning, reduction, and coding
- Association rule discovery
- Classification and prediction
- Clustering and visualization
- When to data-mine
- Evaluating data-mining software
- Ethical concerns in data-mining

Intended Audience: scientists; researchers; physicians, nurses, and other healthcare professionals; computer scientists, system developers, and programmers.

Content level: 70% Basic, 30% Intermediate

T19: Introduction to Translational Bioinformatics

Atul Butte, Stanford University

In 2005, Dr. Elias Zerhouni, Director of the National Institutes of Health (NIH), wrote “It is the responsibility of those of us involved in today’s biomedical research enterprise to translate the remarkable scientific innovations we are witnessing into health gains for the nation... At no other time has the need for a robust, bidirectional information flow between basic and translational scientists been so necessary.” Clearly evident in Dr. Zerhouni’s quote is the role biomedical informatics needs to play in facilitating translational medicine. AMIA now hosts the Joint Summits on Translational Science; the Summit on Translational Bioinformatics is one of its two components. This tutorial is designed around the successful curriculum used in Stanford’s course in Translational Bioinformatics, one of the first courses to be offered in this field. This tutorial is designed to teach the basics of the various types of molecular data and methodologies currently used in bioinformatics and genomics research, and how these can interface with clinical data. This tutorial will address the hypotheses one can start with by integrating molecular biological data with clinical data,
and will show how to implement systems to address these hypotheses. The tutorial will cover real-world case studies of how genetic, genomics, and proteomic data has been integrated with clinical data.

By the end of the tutorial, participants will be able to:

- Understand why biologists and clinicians use each measurement technology, and the advantages of each.
- Be able to explain which genomic and genetic methods are most appropriate for studying diseases.
- Be able to list high-level requirements for an infrastructure relating research and clinical genetic and genomic data.

Outline of Topics:

- Basic understanding of various genome-scale measurement modalities: sequencing, polymorphisms, haplotypes, proteomics, gene expression, metabolomics, and others
- Crucial difference between genetic and genomic data
- Nature and format of expression, polymorphism, proteomics, and sequencing data
- Overview of the most commonly used structured vocabularies, taxonomies, and ontologies used in genomics research
- Description of the most frequently used analysis and clustering techniques
- How the genetic predisposition to disease is studied
- Use of genetic information across medical specialties
- How to find clinical genetic tests
- Genomic and clinical data to study patient disease-free status and survival
- How informatics can be used to identify potential drug targets
- Types of biomarkers
- Parallels between research methods in medical informatics and bioinformatics
- Relating clinical measurements with molecular measurements

Intended Audience: academic faculty or professionals setting up bioinformatics facilities and/or relating these to clinical data repositories, or to data from General Clinical Research Centers or Clinical and Translational Science Awards; health information professionals responsible for clinical databases or data warehouses, and tying these to researchers; informaticians, clinicians, and scientists interested in genetics, functional genomics, and microarray analysis; physicians interested in how medicine is advancing through the use of genomics and genetics; and students.

Content level: 20% Basic, 50% Intermediate, 30% Advance

**T20: Clinical Decision Support: A Practical Guide to Developing Your Program to Improve Outcomes**

Robert A. Jenders, National Library of Medicine and Georgetown University; Jerome A. Osheroff, TMIT Consulting, LLC and University of Pennsylvania; Jonathan M. Teich, Elsevier Health Sciences and Harvard University; Dean F. Sittig, UT – Memorial Hermann Center for Healthcare Quality & Safety, University of Texas Health Science Center at Houston; Robert E. Murphy, Memorial Hermann Healthcare System and University of Texas Health Science Center at Houston

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 healthcare delivery organization. The following key steps, including overcoming barriers, will be examined in detail: initiating an overall CDS program, including selecting appropriate CDS goals and enhancing organizational structures needed for CDS success in the context of current healthcare drivers.
and enablers; selectively implementing CDS technology to achieve a specific goal, with a focus on stakeholder and process analysis; knowledge management; and following up and monitoring CDS interventions. The role of national programs relevant to CDS, including knowledge-sharing, structured guidelines, and meaningful use, also will be explored. Special considerations in CDS for small clinical practices, for hospitals and health systems and for vendors will be explored. The systematic approach to CDS implementation will be presented in an interactive, case-oriented fashion, incorporating examples provided by tutorial leaders and participant’s experiences. The course content is drawn from the tutorial leaders’ popular and award-winning guidebook series on improving outcomes with clinical decision support, with newly revised material published this year.

By the end of the tutorial, participants will be able to:

- Follow a systematic process for developing, implementing and analyzing the effect of a clinical decision support program.
- Understand the types of CDS technology available for realizing desired outcomes.
- Detail factors both external and internal to a healthcare organization that drive CDS initiatives.

Outline of Topics:

- Selection of CDS goals.
- National programs relevant to CDS, including knowledge-sharing, clinical guidelines, and meaningful use.
- Developing organizational structures for implementing a CDS program.
- Selective implementation of goal-directed CDS interventions.
- Monitoring CDS interventions.

Intended Audience: clinicians and administrators interested in quality improvement and patient safety; physicians, nurses and other health care professionals; computer scientists, system developers and programmers interested in understanding applications of health information technology to clinical decision support.

Content level: 60% basic; 40% intermediate

**T21: Evolving privacy and security under HITECH**

Soumitra Sengupta, Columbia University, New York-Presbyterian Hospital, and Columbia University Medical Center

Privacy and security of healthcare information were originally proposed under HIPAA, and were then revised under the HITECH Act in 2009. In parallel, information technology and threats to the information have evolved significantly with the advent of mobility, cloud-computing, wireless and healthcare systems and devices. This tutorial considers these modern regulations and threat concerns, discusses associated risks, and proposes balanced and practical methods to address them. Examining information system components and divided but shared responsibilities of all stakeholders, an approach to privacy and security management is presented that is both reasonable and flexible.

By the end of the tutorial, participants will be able to:

- Understand the privacy and security principles.
- Express risk management concepts and framework for information security.
- Identify information systems’ stakeholders and their responsibility.
- Classify information assets, threats, risks, and controls.
- Learn from examples of security incidents; develop procedures to address them.

Outline of Topics:
TutOriaLS

• Federal regulations and governance of privacy and security
• Healthcare privacy and security principles
• Risk management framework
• Security management organization and stakeholder responsibility
• Information assets, classification, threats, controls
• Risk-assessment methodology (HITRUST)
• Examples of security incidents
• Security controls

Intended Audience: healthcare operations professionals; privacy and security professionals; researchers; physicians.

Content level: 25% basic; 50% intermediate; 25% advance

T22: Clinical Research Informatics: Theory, Methods, and Best Practices (Sponsored by AMIA Clinical Research Informatics Working Group)

Philip Payne, The Ohio State University; Peter Embi, University of Cincinnati

This tutorial provides participants with a unique opportunity to increase their knowledge and understanding of core Clinical Research Informatics (CRI) theories and methods, as well as recent policy and funding developments, in the context of a rapidly growing and increasingly high-demand informatics practice domain.

Clinical research is critical to the advancement of medical science and public health. Conducting such research is a complex, resource-intensive endeavor comprised of a multitude of actors, workflows, processes, and information resources. Recent national-level research and policy efforts have explicitly focused on increasing the clinical-research capacity of the biomedical sector, largely through fostering improvements in both workflow and information management infrastructure. These efforts have served to increase attention on clinical research throughout the governmental, academic, and private sectors. In the specific context of the intersection between biomedical informatics and clinical research, the emergence of both a notable body of literature and a set of targeted funding mechanisms such as the National Cancer Institute’s (NCI) Cancer Biomedical Informatics Grid (caBIG) and National Center for Research Resources (NCRR) Clinical and Translational Science Award (CTSA) programs have served as significant catalysts for the emergence of a robust sub-discipline of informatics focusing on clinical research applications, known as CRI.

In this tutorial, we provide researchers, technical leaders, and technical staff with an overview of core definitions and informatics theory that collectively contribute to the successful practice of CRI. We use a set of research vignettes to illustrate common challenges and opportunities in the CRI space and best-practice approaches to such scenarios, including: 1) the design and implementation of integrative clinical research information management systems; 2) the query of disparate enterprise and research information systems to support clinical research activities and information dissemination/reporting; and 3) the identification and recruitment of clinical research participants via multiple retrospective and prospective modalities.

By the end of the tutorial, participants will be able to:

• Define CRI and understand its relationship with other biomedical informatics sub-disciplines, as well as the clinical/translational sciences.
• Synthesize the role of current healthcare and informatics policy and standards setting developments relative to the practice of CRI.
• Identify and apply core informatics theories, methods, and best practices in order to analyze and plan solutions to common clinical research information management challenges.
• Plan for and implement complex information man-
agement architectures in order to support a full spectrum of clinical research activities.

Outline of Topics:

- CRI definition and relationship(s) to other biomedical informatics sub-disciplines and the clinical/translational sciences
- Current CRI-relevant funding, policy, and standards-setting efforts or initiatives
- Enterprise architectures for integrative clinical research information management
- Semantic interoperability and knowledge-engineering in the clinical research domain
- The relationship of human factors and/or workflow optimization to the effective deployment and utilization of clinical research information management systems
- Common CRI challenges and their solutions:
  - Integrating enterprise systems and CRI platforms
  - Querying disparate data sources in support of clinical research-related analyses and/or information dissemination
  - Clinical research participant identification and recruitment

Intended Audience: scientists; researchers; physicians, nurses, and other healthcare professionals; computer scientists, system developers, and programmers.

Content Level: 20% Basic; 50% Intermediate; 30% Advanced

**T23: Ontology-oriented Resources from the National Center for Biomedical Ontology**

Nigam H. Shah and Mark A. Musen, Stanford University

The National Center for Biomedical Ontology (NCBO) offers a range of Web services that allow users to access biomedical terminologies and ontologies, to use ontology terms to create pick lists and lexicons, to identify terms from controlled terminologies and ontologies that can describe and index the contents of online data sets (data annotation), and to recommend particular terminologies and ontologies that would be appropriate for data-annotation tasks. An ontology repository, known as BioPortal, provides a Web-based interface that allows users to visualize ontologies, to map the terms in ontologies to one another, and to provide public comments on ontologies that can guide ontology developers and that can offer assistance to ontology users. This tutorial will provide hands-on experience in using the NCBO’s resources, and will offer participants in-depth understanding of how ontologies and terminologies are used to solve problems in biomedical informatics. The tutorial will demonstrate the use of NCBO resources to facilitate tasks such as semantic data integration, information retrieval, structured data entry, and knowledge management.

By the end of the tutorial, participants will be able to:

- Understand the biomedical ontology landscape.
- Understand the national infrastructure available for data annotation and knowledge management.
- Conceive workflows that utilize NCBO Web Services to solve their own data entry and integration problems.

Outline of Topics:

- Overview of NCBO key activities
- Ontologies available in Biomedicine
- Web-based tools for Ontology search, visualization and review
- Tools and Web services for data annotation and semantic integration
- Design of custom workflows to utilize national ontology resources

Intended Audience: scientists and researchers seek-
Tutorials

T24: Designing Informatics Interventions for the Complex Adaptive System of Health Care

E. Coeira, Australian Institute of Health Innovation; D. Covvey, National Institutes of Health Informatics, University of Waterloo; R. Kolodner, Collaborative Transformations, LLC., Open Health Tools, Inc.; H. Lehmann, Johns Hopkins University

Introducing ehealth into our health system is a world-class challenge and a heavy investment. The activity increases the risk that we are pursuing a rate of change that our health system cannot safely attain, especially given a limited complement of competent informatics human resources, the possible underestimation of needed effort and investment, and our understanding of the complexity of the health system. This could set the stage for failure.

One challenge for informatics solutions is that healthcare delivery systems are complex adaptive systems. To appreciate the implications of this, we will explore the nature of complexity and what it implies for developing, introducing, and managing informatics interventions. In particular, we will question the current assumption that health care is a linear, non-interacting, predictable system and we will explore how complexity impacts our interventions. Then, we will provide aids that will better equip us to deal with the challenges we face.

On completing this tutorial, participants will be able to:

• Understand the nature of complex adaptive systems and incorporate the lessons of Complexity Theory into their work.
• Conceptualize and implement new approaches to planning, development, implementation, management, and budgeting that are sensitive to the true nature of complex adaptive systems.
• Avoid the dead ends, traps, and failure modes that derive from misconstruing that health care is a linear, predictable system.
• Refocus further study so as to more deeply appreciate and apply Complexity Theory to their work.

Selected topics addressed in this Tutorial:

• The nature of complexity and of complex adaptive systems.
• Nonlinearity and its implications.
• Human health and the health system as dynamic complex adaptive systems.
• Comparison of the nature of health care to the nature of other industries, regarding complexity.
• Aids for dealing with complexity.
• The implications of complexity related to developing, deploying, and managing ehealth solutions.
• What we have learned about planning, development, implementation and management of complex adaptive systems and how this applies to health care.
• Lessons that we can draw from studies that change our view of what we currently do.
• Seeing where our implicit assumptions of low complexity come back to bite us.
• Better equipping ourselves to address the true nature of the challenges we face in incorporating ehealth into the health system.

Intended Audience: health/biomedical informaticians, scientists, researchers, physicians and other healthcare professionals, system developers, management professionals and CIOs.
10:00 – 10:30 am Coffee Break

1:00 – 3:00 pm Opening Session and Keynote Presentation

Dr. Francis S. Collins, Director
National Institutes of Health

(For more information on Dr. Collins, please see page 8.)

3:30 - 5:00 pm Scientific Sessions

S01 - Featured Presentation
Theme: Policy and Ethical Issues

The Policies and Politics of Meaningful Use: A View from the Health IT Policy Committee Meaningful Use Workgroup
P. Tang, Palo Alto Medical Foundation; G. Hripcsak, Columbia University; D. Bates, Partners HealthCare; J. Murphy, Aurora Health Care

The Health IT Policy Committee (HITPC) makes recommendations to the National Coordinator for Health IT on policy matters related to the meaningful use EHR incentive program, health information exchange, privacy and security, nationwide health information network governance, EHR adoption, ONC strategic plan, and other HIT-related issues. Seven HIT Policy Committee workgroups have been formed as sub-committees to the parent FACA. These workgroups meet periodically to discuss their topics, present their findings at HIT Policy Committee meetings, and make recommendations to the HIT Policy Committee. The HITPC Meaningful Use (MU) Workgroup makes recommendations to the HIT Policy Committee on how to define meaningful use in the short- and long-term; the ways in which electronic health records (EHRs) can support meaningful use; and how providers can demonstrate meaningful use. Several AMIA members and leaders serve as volunteers on the HITPC and/or its Work Groups. The panel presentation will provide insights into the status of MU deliberations, recommendations, and implementation.

S02 – Panel
Theme: Clinical Decision Support, Outcomes, and Patient Safety

Infobuttons for Clinical Decision Support
H. Strasberg, Wolters Kluwer Health; G. Del Fiol, University of Utah; T. Yosick, Epic; C. Curtis, Department of Veterans Affairs

The HL7 context-aware knowledge retrieval (Infobutton) standard became an official, normative standard in June 2010. We will discuss this standard and its implementation from various perspectives. First, we will describe the standard itself, its history and its future direction. Standards are only successful if they are implemented, and in this case, the standard has been implemented by both electronic health record system vendors, healthcare organizations, and knowledge vendors. Each of these types of organizations will give a perspective on how they implemented the standard, what challenges they faced in doing so, and what future enhancements they would like to see. The standard allows for an optional knowledge-broker component called an Infobutton Manager. The Veterans Health Administration has developed an open-source Infobutton Manager called OpenInfobutton. The VHA will describe this project, its rationale and the vision for its future. Attendees will learn the details of the standard, the issues involved in implementing it and the role of an Infobutton Manager.
S03 - Panel
Theme: Clinical Workflow and Human Factors

Dimensions of Hand-off Communication and Documentation: Implications for Patient Safety
J. Abraham, University of Texas, Houston; D. Kaufman, Columbia University; M. Reddy, The Pennsylvania State University; R. Koppel, University of Pennsylvania; N. Staggers, University of Maryland

Patient hand-off is a vital communication event that has increasingly been the subject of scrutiny with regard to matters of patient safety. Hand-off refers to transfer of care from one care provider to the next and involves three aspects: a transfer of information, responsibility, and authority. Despite its importance in the care-delivery process, hand-off practice varies considerably within and across care settings, and is sometimes considered an informal process. For example, hand-off is not routinely documented as a core part of the patient record. The four panelists will present current research on the different types of patient hand-offs, in terms of hand-off strategies adopted and their related challenges. Within hospitals, hand-offs occur at both individual (e.g. between nurses during shift reports) and collaborative (e.g., between teams during rounds) levels. The unifying theme across all the presentations will be on how the hand-off method influences the nature of clinical communication. This is a multidisciplinary panel of experts that draws on a wide range of perspectives including those derived from organization systems, computer-supported cooperative work (CSCW), sociology, and human-computer interaction (HCI). Using these unique perspectives, panelists will discuss their experiences and lessons learned in studying healthcare communication behaviors.

S04 - Panel
Theme: Data Mining, NLP, Information Extraction

Shared Annotated Resources for the Clinical Domain
G. Savova, Children's Hospital Boston/Harvard University; W. Chapman, University of California San Diego; N. Elhadad, Columbia University; M. Palmer, University of Colorado at Boulder

Natural Language Processing (NLP) of the clinical narrative has been a major effort within medical informatics. Advances, however, have been hampered by the lack of shared, large annotated corpora to be leveraged for methods development and system evaluations. In the general domain, the gold standard annotated Penn Treebank (PTB) fostered truly revolutionary advances. Within the clinical domain, there are several recent, complementary initiatives to create shared annotated resources - the Shared Annotated Clinical Resource project, Strategic Health Advanced Research Project Area 4, Multi-source Integrated Platform for Answering Clinical Questions, the Temporal Relations in the Clinical Domain, Ontology Development and Information Extraction, and the Integrating Informatics and Biology to the Bedside initiatives. In each, care was taken to ensure common annotation schemas and guidelines, all compatible with PTB. The combined resources will contain 1.5 million tokens and will be available to the research community. Their availability is expected to energize the clinical NLP community as well as involve the general NLP community into porting best methods and practices to health care. The panel will report on progress on these efforts, discuss the use of existing community-adopted conventions and domain-specific types of annotations, as well as the implications of making the annotated corpus publicly available.
**S05 - Papers: Clinical Education on Steroids**
Theme: Informatics in Clinical Education

**Right Diagnosis, Wrong Care: Therapeutic Reasoning Errors in Emergency Care Computer-based Case Simulations**
G. Schauer, D. Robinson, V. Patel, The University of Texas Health Science Center at Houston

**Approaching the Limits of Knowledge: The Influence of Priming on Error Detection in Simulated Clinical Rounds**
E. Razzouk, T. Cohen, K. Almoosa, V. Patel, The University of Texas Health Science Center at Houston

**Family Physicians’ Completion of Scoring Criteria in Virtual Patient Encounters**
W. Sumner, Washington University School of Medicine; T. O’Neill, G. Roussel, J. Xu, H. Fu, D. Ivins, University of Oklahoma; M. Hagen, American Board of Family Medicine

**A Student-Authored Online Medical Education Textbook: Editing Patterns and Content Evaluation of a Medical Student Wiki**
C. Thompson, W. Schulz, T. Adam, University of Minnesota

**S06 – Papers: Imaging/NLP**
Theme: Data Mining, NLP, Information Extraction

**A Generative Model-Based Approach to Retrieving Ischemic Stroke Images**
T. Dinh, T. Silander, National University of Singapore; T. Lim, National Neuroscience Institute; T. Leong, National University of Singapore

**Automatic Identification of Critical Follow-up Recommendation Sentences in Radiology Reports**
M. Yetisgen-Yildiz, M. Gunn, F. Xia, T. Payne, University of Washington

**Critical Finding Capture in the Impression Section of Radiology Reports**
E. Gershanik, R. Lacson, R. Khorasani, Brigham and Women’s Hospital

**Leveraging Terminologies for Retrieval of Radiology Reports with Critical Imaging Findings**
G. Warden, R. Lacson, R. Khorasani, Brigham and Women’s Hospital

**Feasibility and Potential Benefit of Collecting Complementary and Alternative Medicine Data through a Computerized Patient Interview**
L. Scarton, Q. Zeng-Treitler, B. Bray, University of Utah

**Leveraging Standards to Support Patient-centric Interdisciplinary Plans of Care**
P. Dykes, Brigham and Womens Hospital; R. DaDamio, Partners HealthCare; D. Goldsmith, Brigham and Womens Hospital; H. Kim, University of California, San Diego; K. Ohashi, Brigham and Womens Hospital; V. Saba, SabaCare

**A Dynamic Classification Approach for Nursing**
N. Hardiker, University of Salford; T. Kim, A. Coenen, K. Jansen, University of Wisconsin-Milwaukee

**Representation of Nursing Terminologies in UMLS**
T. Kim, A. Coenen, University of Wisconsin-Milwaukee; N. Hardiker, University of Salford; C. Bartz, University of Wisconsin-Milwaukee
S08 – Papers: Use of Translational Bioinformatics & Biomedicine
Theme: Translational Bioinformatics and Biomedicine

Exploring Schizophrenia Drug-gene Interactions through Molecular Network and Pathway Modeling
D. Putnam, J. Sun, Z. Zhao, Vanderbilt University School of Medicine

Drug Repositioning for Cancer Therapeutics Based on Selective Multi-targeting to Biologically Relevant Cavities Associated with Cancer Signaling Pathways
X. Peng, Regenstrief Institute

Evaluating De Novo Locus-disease Discoveries in GWAS Using the Signal-to-Noise Ratio
X. Jiang, M. Barmada, M. Becich, University of Pittsburgh

The Effect of Reference Datasets and Software Tools on Genotype Imputation
K. Nho, Regenstrief Institute/Indiana University School of Medicine; L. Shen, S. Kim, S. Swaminathan, S. Risacher, A. Saykin, Indiana University School of Medicine

S09 – Papers: SNOMED Evaluation
Theme: Terminology and Standards

Comparison of SNOMED CT® versus Medcin® Terminology Concept Coverage for Mild Traumatic Brain Injury
D. Montella, S. Brown, Department of Veterans Affairs; S. Brown, Vanderbilt University; P. Elkin, Mount Sinai School of Medicine; J. Jackson, S. Rosenbloom, Vanderbilt University; D. Wahner-Roedler, G. Welsch, Mayo Clinic School of Medicine; B. Cotton, University of Texas Medical School; O. Guillamondegui, Department of Veterans Affairs; H. Lew, Virginia Commonwealth University; K. Taber-Maier, L. Tupler, Department of Veterans Affairs; L. Tupler, Duke University School of Medicine; R. Vanderploeg, T. Speroff, Department of Veterans Affairs; T. Speroff, Vanderbilt University School of Medicine

SNOMED CT Revisions and Coded Data Repositories: When to Upgrade?
W. Ceusters, New York State Center of Excellence in Bioinformatics & Life Sciences

Can SNOMED CT Fulfill the Vision of a Compositional Terminology? Analyzing the Use Case for Problem List
J. Campbell, University of Nebraska Medical Center; J. Xu, K. Fung, National Library of Medicine

Lexically Suggest, Logically Define: Quality Assurance of the Use of Qualifiers and Expected Results of Post-Coordination in SNOMED CT
A. Rector, L. Iannone, University of Manchester

S10 - Theater-style Demonstrations: Consumer Health Informatics
Theme: Consumer Informatics and Multimedia Personal Health Records PHRs

From 10 communities to 1,000: Scaling PatientsLikeMe
P. Wicks, PatientsLikeMe

Since its formation in 2005, PatientsLikeMe has hosted around 15 distinct and siloed disease communities for patients with life-changing conditions, such as ALS, MS, or epilepsy. In 2011, PatientsLikeMe underwent a transformational series of upgrades that expanded the platform to allow patients with any medical condition to join the site, for all patients to be able to see one another’s profiles, and for patients to access features for multiple comorbidities e.g. a patient with both MS and epilepsy. In this presentation, site architect Dr Paul Wicks will discuss the motivation behind this series of
upgrades (from patient, research, and business points of view), additional features that the upgrade has permitted (better understanding of complex patients), and will share data on the reaction of the site’s users (new and old) to the upgraded system.

MONAHRQ: Reporting to Consumers about Quality of Healthcare
C. Sniesgoski, A. Elixhauser, Agency for Healthcare Research and Quality

Consumer health applications aim to help people make better healthcare choices. This can mean tools to better understand your own health. But it also means tools to better understand the state of our healthcare system. How good is the quality of our healthcare? Does it vary by region or provider? What can people do to obtain good quality care? Today, we see increasing efforts to measure and report healthcare quality information to the public. But healthcare organizations can find that producing good reports is challenging, time-consuming, and expensive. To help make healthcare quality reporting easier, the Agency for Healthcare Research and Quality (AHRQ) has created a new free software tool, MONAHRQ, that makes it easier to quickly generate a fully functional, semi-customizable, user-friendly reporting website. MONAHRQ aims to help local organizations report healthcare quality information to consumers in a way that is consistent and easy to understand. First released in June 2010, MONAHRQ is already used in four states for statewide reporting. Learn more and see a demonstration of the latest MONAHRQ website that provides consumers with information about the quality of our healthcare.

LB1 - Late Breaking Session: To be announced
7:00 - 8:15 am Committee Meetings
Education Committee Meeting
Meetings Committee Meeting
Publications Committee Meeting

7:00 - 8:30 am Business Meetings
Academic Forum Meeting

7:00 - 8:30 am Affiliate Meetings
Journal of International Medical Informatics Editorial Board Meeting (Board Members only)
VA Breakfast Meeting

7:30 - 8:30 am Business Meetings
Nursing Informatics Working Group Leadership

7:00 am – 7:00 pm Registration Open

8:30 - 10:00 am Plenary Session
S11 – Keynote Address
Dr. Gregory Abowd
Distinguished Professor, School of Interactive Computing, Georgia Tech
(For more information on Dr. Abowd, please see p. 8).

10:00 – 10:30 am Coffee Break

10:00 am – 2:00 pm Exhibition Hall Open

10:30 am -12:00 pm Scientific Sessions

S12 - Featured Presentation
Theme: Data Integration and Exchange
Confirmed: J. Easter, GlaxoSmithKline; D. Foltz, CSC.
Invited: J. Cimino, National Institutes of Health; D. Fridsma, Office of the National Coordinator on Health Information Technology; G. Hripcsak, Columbia University

Multi-stakeholder collaborations are emerging as an important vehicle for research using healthcare data for wide-ranging uses, including comparative effectiveness research, safety monitoring, disease modeling, protocol feasibility testing and patient recruitment. While collaborative research is not new, what is different now is the emergence of new operating models that employ a standard approach to data management and analysis across a federated network of partners. These new models seek to enable a systematic and efficient approach to leveraging data and expertise across many partner organizations, while providing incentives for participation from multiple stakeholder groups. This panel will discuss the utility of and identify weaknesses and gaps in existing standards, reveal effective strategies for generating public awareness and gaining consent, and analyze the roles and responsibilities of all participants in the health information supply chain, including pharma companies, as the need for new sharing models becomes more acute.

S13 - Panel
Theme: Clinical Decision Support, Outcomes, and Patient Safety
International Perspectives on Patient Safety and Health Information Technology
R. Kaushal, Weill Cornell Medical College; D. Sittig, University of Texas Health Sciences Center;
A decade ago, the Institute of Medicine (IOM) published the landmark report, “To Err is Human,” effectively highlighting problems in patient safety. Health Information Technology (HIT) has been identified as a pivotal solution to improving patient safety, although there is also growing evidence of unintended consequences and risks from HIT. With the anticipated accelerated adoption of HIT from the $27 billion dollars in incentive payments for providers to adopt electronic health records (EHRs), it is critical to continue to evaluate and understand the risk and benefits to patients. In this panel, national and international experts will provide an overview of current national efforts to evaluate benefits and risk of HIT, including a recently commissioned IOM consensus study, provide a summary of the literature on HIT benefits and risks, and review a three-year Australian observational case study of the implementation of a clinical information system that highlighted unintended consequences and risks.

**S14 – Panel**
Theme: Clinical Workflow and Human Factors

**The Role of Usability, Workflow, and Patient-centered Cognitive Support in Improving Health Information Technology**
J. Zhang, The University of Texas; M. Walji, University of Texas Dental Branch at Houston; K. Butler, University of Washington; K. Butler, National Center for Cognitive Informatics & Decision Making; Y. Xiao, Baylor Health Care System; M. Haselkorn, University of Washington

HIT has great potential to increase care quality, reduce care cost, and improve patient safety through its wide adoption and meaningful use. However, there are huge gaps between the status quo and the potential of HIT. Patient-centered cognitive support has been identified as an overarching research grand challenge for HIT. In this panel, the presenters will discuss how usability and workflow are important cognitive support factors that contribute to the success or failure of HIT projects.

**S15 – Panel**
Theme: Data Mining, NLP, Information Extraction

**Can Network Visualization and Analysis Accelerate Medical Discoveries? Theoretical, Applied, and Funding Perspectives**
S. Bhavnani, University of Texas Medical Branch; K. Bassler, University of Houston; I. Sarkar, University of Vermont; A. Gundlapalli, University of Utah & VA Salt Lake City Health Care System; A. Shaikh, National Institutes of Health

The exponential increase of biomedical data provides new opportunities for the prevention, diagnosis, and treatment of diseases. Several fields like bioinformatics and social networking have exploited this opportunity through the use of networks to discover, verify, and validate patterns and their underlying mechanisms in molecular and social data. However, network-based approaches have not yet been fully exploited to analyze the wide range of medical information that is becoming available through electronic health records. This panel brings together theoretical, applied, and funding perspectives to discuss the opportunities and challenges of using networks to analyze medical data. Learning objectives include: research questions that are amenable to network analysis; strengths and limitations of different network representations; domain-dependent and -independent network concepts; complementary relationship between network analysis and biostatistics; skills required for effective network analysis; and funding opportunities for exploratory network analysis. This multi-perspective discussion will be aimed towards defining an agenda for the application of networks to accelerate discoveries in medical data.
S16 – Papers: Clinical Text Analysis
Theme: Data Mining, NLP, Information Extraction

It’s About This and That: a Description of Anaphoric Expressions in Clinical Text
Y. Wang, G. Melton, S. Pakhomov, University of Minnesota

Automated Non-alphanumeric Symbol Resolution in Clinical Texts
S. Moon, S. Pakhomov, J. Ryan, G. Melton, University of Minnesota

Part-of-speech Tagging for Clinical Text: Wall or Bridge Between Institutions?
J. Fan, Kaiser Permanente Southern California; R. Prasad, University of Pennsylvania; R. Yabut, R. Loomis, D. Zisook, J. Mattison, Y. Huang, Kaiser Permanente Southern California

Evaluating Measures of Redundancy in Clinical Texts
R. Zhang, S. Pakhomov, B. McInnes, G. Melton, University of Minnesota

S17 – Papers: The Eyes Have It: Imaging Informatics
Theme: Imaging Informatics

A Pilot Prospective Study Using Target Contour Testing/Instructional Computer Software (TaCTICS), a Training and Evaluation Platform for Radiotherapy Target Volume Delineation
J. Kalpathy-Cramer, S. Bedrick, Oregon Health & Science University; K. Boccia, Harvard University; C. Fuller, University of Texas Health Science Center at San Antonio

Studying Visual Behaviors from Multiple Eye-Tracking Features Across Levels of Information Representation
B. Anderson, C. Shyu, University of Missouri

Early Prediction of the Response of Breast Tumors to Neoadjuvant Chemotherapy Using Quantitative MRI and Machine Learning
S. Mani, Y. Chen, L. Arlinghaus, X. Li, A. Chakravarthy, S. Bhave, E. Welch, M. Levy, T. Yankeelov, Vanderbilt University

Teleretinal Screening for Diabetic Retinopathy in Six Los Angeles Urban Safety-Net Clinics: Initial Findings
O. Ogunyemi, E. Terrien, A. Eccles, Charles Drew University of Medicine and Science; L. Patty, University of California Los Angeles; S. George, A. Fish, S. Teklehaimanot, R. Ilapakurthi, O. Aimiuwu, R. Baker, Charles Drew University of Medicine and Science

S18 – Papers: Classification Methods
Theme: Clinical Decision Support, Outcomes, and Patient Safety

Modeling Patient Safety Incidents Knowledge with the Categorial Structure Method
J. Souvignet, INSERM; C. Bousquet, J. Rodrigues, B. Trombert, P. Lewalle, CHU Université Jean-Monnet

Toward a Two-tier Clinical Warning System for Hospitalized Patients
G. Hackmann, M. Chen, O. Chipara, C. Lu, Y. Chen, Washington University in St. Louis; M. Kollef, T. Bailey, Washington University School of Medicine

Integrating Machine-Learning and Physician Knowledge to Improve the Accuracy of Breast Biopsy
I. Dutra, University of Porto; H. Nassif, D. Page, J. Shavlik, R. Strigel, Y. Wu, M. Elezaby, E. Burnside, University of Wisconsin - Madison

Evaluation of the Use of Electronic Health Data to Classify Four-Year Mortality Risk for Older Adults Undergoing Screening Colonoscopies
M. Synnestvedt, M. Weiner, University of Pennsylvania
**S19 – Papers: Policy & Ethical Issues**
Theme: Policy and Ethical Issues

**Attribute Utility Motivated k-anonymization of Datasets to Support the Heterogeneous Needs of Biomedical Researchers**
H. Ye, E. Chen, University of Vermont

**Progress and Challenge in Meeting Meaningful Use at an Integrated Delivery Network**
W. Bowes, Intermountain Healthcare & University of Utah

**Ethics of Implementing Electronic Health Records in Developing Countries: Points to Consider**
M. Were, Regenstrief Institute, Inc. and Indiana University; E. Meslin, Indiana University School of Medicine

**A Legal Framework to Enable Sharing of Clinical Decision Support Knowledge and Services Across Institutional Boundaries**
T. Hongsermeier, S. Maviglia, Partners HealthCare System and Harvard Medical School; L. Tsurikova, D. Bogaty, Partners HealthCare System; R. Rocha, H. Goldberg, Partners HealthCare System and Harvard Medical School; S. Meltzer, Partners HealthCare; B. Middleton, Partners HealthCare System and Harvard Medical School

**S20 – Papers: Terminology & Evaluation**
Theme: Terminology and Standards

**Testing Three Problem-list Terminologies in a Simulated Data-Entry Environment**
K. Fung, J. Xu, U.S. National Library of Medicine; S. Rosenbloom, Vanderbilt University; D. Mohr, Mayo Clinic; N. Maram, Intermountain Healthcare

**Graphical Methods for Reducing, Visualizing, and Analyzing Large Data Sets Using Hierarchical Terminologies**
X Jing, J. Cimino, National Library of Medicine, & NIH

**An Evaluation of the UMLS in Representing Corpus-Derived Clinical Concepts**
J. Friedlin, M. Overhage, Regenstrief Institute and Indiana University School of Medicine

**Comparative Analysis of the VA/Kaiser and NLM CORE Problem Subsets: An Empirical Study Based on Problem Frequency**
A. Wright, J. Feblowitz, Brigham & Women’s Hospital; A. McCoy, D. Sittig, University of Texas Health Science Center

**S21 - Theater-style Demonstrations: Clinical Research Informatics**
Theme: Clinical Research Informatics

**SWEETInfo: a Web-based Tool for Querying and Visualization of Longitudinal Clinical Data**
M. O’Connor, M. Uehara-Bingen, A. Richards, S. Martins, S. Tu, Stanford University; S. Tu, A. Das, Stanford University

We will present SWEETInfo (Semantic Web-enabled Exploration of Temporal Information), a tool to support querying and visualizing of time-oriented clinical data. SWEETInfo is based on an open-source Web-based infrastructure that allows clinical investigators to import data and to perform operations on their temporal dimensions. The architecture combines Semantic Web standards, such as OWL and SWRL, with advanced Web development software, such as the Google Web Toolkit. User interaction with SWEETInfo creates OWL-based specifications of (1) data operations, such as filtering, grouping, and visualization, and (2) data pipelines for...
Quadri: A Question Answering System for HIV Drug Resistance Information
R. Waldinger, SRI International; A. Das, Stanford University; D. Bobrow, K. Richardson, C. Condoravdi, Palo Alto Research Center

We present a demo of an intelligent interface for answering English-language clinical queries. Although our approach is domain-independent, we focus on the needs of clinical researchers who are identifying cohorts of patients based on HIV drug-resistance patterns. Such questions are transformed into an unambiguous logical form by natural language technology (Bridge), which is then sent to a theorem prover (SNARK) that operates over an axiomatic theory of the subject domain. Symbols in the theory are linked to relations in one or more knowledge resources, such as databases, and an answer is obtained from the proof. Answers may be deduced or computed if they are not represented explicitly in a resource. We will describe the design of our prototype system, called Quadri, and show how the components interact in the demo. We conclude with additional challenges that need to be addressed to support anaphoric references and complex temporal conditions.
A Randomized Controlled Trial of a Computerized Asthma Management System in a Pediatric Emergency Department
J. Dexheimer, D. Arnold, K. Johnson, Y. Shyr, N. Patel, T. Abramo, D. Aronsky, Vanderbilt University

Performance-measure Reporting Foundation for Veterans Health Administration

A Comparison Between a Combined Diagnostics Model and the Framingham Risk Score for the Prediction of Hypertension Development
G. Fung, S. Yu, B. Krishnapuram, Siemens Healthcare; T. Itterman, M. Nauck, R. Rettig, S. Felix, H. Kroemer, H. Volzke, Greifswald University; R. Rao, Siemens Healthcare

Validation of Computerized Automatic Calculation of the Sequential Organ Failure Assessment (SOFA) Score
A. Harrison, R. Cartin-Ceba, H. Yadav, B. Pickering, A. Hanson, D. Korc, V. Herasevich, Mayo Clinic

Evaluation of Anesthesia Providers’ Perceptions of Patient Safety Improvement After Implementation of an Anesthesiology Electronic Record
K. Heermann-Do, Department of Defense-U.S. Army

Pharmacy and Prescriber E-prescribing Experience Reporting (PEER)
A. Hincapie, University of Arizona; R. Snead, T. Modisett, National Alliance of State Pharmacy Associations; T. Warholak, University of Arizona

Usability Testing on a Voluntary Medical Incident Reporting Prototype
L. Hua, Y. Gong, University of Missouri, Columbia

Health Information Technology to Improve Healthcare Quality: Lessons from the VA
D. Hynes, E. Whittier, M. Browning, R. Perrin, J. Humensky, T. Weddle, D. Atkins, Department of Veterans Affairs

A Systematic Approach for Testing Complex Clinical Decision Algorithms Implemented Through Web Services
E. Johns, Duke University Medical Center; M. Cooley, B. Halpenny, T. Saunders, J. Abraham, Dana-Farber Cancer Institute; K. Kawamoto, Duke University; G. Del Fiol, University of Utah; D. Lobach, Duke University Medical Center

OpenCDS: Enabling Clinical Decision Support at Scale through Open-source, Standards-based Software and Resources
K. Kawamoto, D. Shields, G. Del Fiol, University of Utah

“Cloud-based” Decision Support: Enabling Decision Support for a Commercial Electronic Health Record System Using Web Services
D. Lobach, Duke University Medical Center; J. Ramsey, R. Harman, Religent, Inc.; A. Muthiyan, Patagonia Health, Inc.

Visual Mapping of Patient Medical Profile to Clinical Guideline
K. Mane, P. Owen, C. Schmitt, C. Bizon, UNC-Chapel Hill; K. Gersing, Duke University Medical Center

Usability Testing to Refine a Pharmacogenomic-Guided Warfarin Clinical Decision Support System
B. Melton, Purdue University; A. Zillich, Purdue University/ Roudebush VA Medical Center/Indiana University; J. Saleem, Veterans Health Administration/ Regenstrief Institute; A. Russ, Roudebush VA Medical Center; J. Tisdale, B. Overholser, Purdue University/Indiana University School of Medicine
Achieving Meaningful Use of Electronic Medication Lists
K. Nanji, Massachusetts General Hospital; S. Pollard, Partners HealthCare; D. Williams, Brigham & Women’s Hospital; D. Bates, Harvard Medical School/Brigham & Women’s Hospital/ Partners HealthCare

Framework for Characterization of Heuristics Used in Critical-Care Settings
V. Payne, V. Patel, University of Texas Health Science Center

Using Clinical Decision Support to Foster Collaborations: The Views of Community-based Physicians
J. Richardson, Weill Cornell Medical College; J. Ash, Oregon Health & Science University

Importance of Complete Documentation of Home Medications as First & Most Important Part of Electronic Medication Reconciliation & CPOE
K. Saxena, Adventist Health System - Information Services

Centralized Use of a Tracking Tool for Missed Colonoscopies: A Clustered Semi-randomized Controlled Trial
L. Siegel, Brigham and Women’s Hospital; S. Pollard, L. Newmark, J. Fiskio, T. Gandhi, Partners HealthCare

The Diabetic Foot Vital Signs: A Clinical Score to Summarize the Diabetic Foot Exam and Facilitate Comprehensive Diabetes Care Management in an EHR
L. Smith, CHW-Woodland Healthcare

Diagnosis Switches Associated with Asthma in Emergency Claims Data
W. Sumner, Washington University School of Medicine; P. Asaro, Washington University in St. Louis; M. Hagen, American Board of Family Medicine

Systematic Screening for Depression in Primary Care: Will Electronic Medical Records Outperform Paper-based Systems in Better Health Greater Cleveland?
T. Swales, MetroHealth System

An Electronic Evidence-based Checklist of Interventions for the Postoperative Management of Obstructive Sleep Apnea
B. Gammon, Duke University School of Nursing; V. Mittal, Boston University School of Public Health; K. Whiting, University of California at Los Angeles

Diabetes Registry Usage at the Portland VA Medical Center (PVAMC)
J. Yang, J. McConnachie, L. Winterbottom, Portland VA Medical Center

Computer-assisted Medication and Patient Information Interface (CAMPII) is Accurate and Acceptable for Medication and Hypoglycemia Detection
D. Ziemer, Emory University; G. Ryan, Mercer University College of Pharmacy and Health Sciences; J. Caudle, C. Barnes, Emory University School of Medicine; J. Hickman, Southern Polytechnic State University; C. Tsui, Emory University

Theme: Clinical Research Informatics

RPE: a Process Approach to Linking Researchers, Providers, and Patients
M. Arratano, GE Healthcare; L. Bain, R. Kush, CDISC; J. Aerts, XML4Pharma

A Suite to Manage and Communicate Genetic Results to Research Participants
C. Cassa, S. Savage, E. Kerwin, Children’s Hospital Boston; K. Mandl, Harvard Medical School
ASTEC: A System for Automatic Selection of Clinical Trials
M. Cuggia, Université Rennes; J. Dufour, Université Aix-Marseille; P. Besana, O. Dameron, R. Duvaufier, Université Rennes; D. Fieschi, Université Aix-Marseille; C. Bohec, Oncobretagne; A. Bourde, Université Rennes; L. Charlois, Université Aix-Marseille; C. Garde, ENOVACOM; I. Giaud, Syndicat Interhospitalier de Bretagne (SIB); J. Laurent, O. Zekri, CRLCC E. Marquis; M. Fieschi, Université Aix-Marseille

Conceptual Data-driven Lung Cancer Cohort Data Portal
V. Fiodosau, P. Li, Mayo Clinic

A Closely Integrated Tool that Employs Automated NLP to Validate Use Cases in i2b2.
V. Gainer, S. Goryachev, L. Phillips, Partners HealthCare; Q. Zeng-Treitler, University of Utah; K. Liao, S. Churchill, I. Kohane, Children’s Hospital; S. Murphy, Partners HealthCare

Envisage: a Tool for Graphing Research Knowledge
M. Harris, Mayo Clinic; L. Gerstley, PSMI Consulting; C. Thompson, University of Nebraska Medical Center; J. Graves

A Sustainable Platform for Data-Sharing in Multi-institutional Population-based Clinical Research
A. Jain, Cleveland Clinic; D. Kaelber, The MetroHealth System/Case Western Reserve University; J. Gilder, D. Meil, C. Lougheed, Explorys, Inc.

DCU: A Data Correction Utility to Correct Clinicopathologic Data in the Data Warehouse for Translational Research
L. Kvecher, W. Wu, J. Kohr, C. Shriner, R. Mural, H. Hu, Windber Research Institute

A Solution for Monitoring the Extract, Transform and Load (ETL) Processes Status in a Near Real-time Clinical Translational Database in a Timely Manner
M. Li, A. Hanson, B. Pickering, V. Smith, G. Ognjen, V. Herasevich, Mayo Clinic

Heuristic Evaluation of a Health-Coaching Application
A. Lushaj, H. Jimison, Oregon Health & Science University

Going FURTHeR with i2b2
S. Narus, N. Schultz, O. Livne, R. Bradshaw, J. Mitchell, University of Utah

iConnect: a Web-based ‘Do-it-yourself’ Patient Recruitment Registry and Platform
C. Patel, S. Khan, Applied Informatics Inc; A. Atreja, Cleveland Clinic

Translating Informatics Innovations: From Prototype to Production
P. Payne, P. Embi, T. Borlawsky, The Ohio State University; J. Frost, P. Teater, The Ohio State University Medical Center

i2b2-NCBO Collaboration to Extract Ontologies for Use Within i2b2
L. Phillips, S. Murphy, Partners HealthCare; N. Shah, Stanford University; I. Kohane, Children’s Hospital

Implementation of an Enterprise Master Person Index for Clinical Research
P. Reeder, M. Byrne, S. Guerrero, J. Herskovic, E. Bernstam, The University of Texas Health Science Center at Houston

Survey Security: Yes, There Is an App for That!
K. Riordan, L. Quarles, C. Cowansage, B. Boden-Albala, A. Wilcox, Columbia University
Analyzing CPOE-related Medication Errors: New Insights from Qualitative Review of the MEDMARX Error-Reporting Database
A. Seger, D. Bates, G. Schiff, J. Boehne, D. Whitney, Brigham and Women’s Hospital; R. Elson, Clinical Systems Design, LLC; M. Amato, Massachusetts College of Pharmacy and Health Sciences; A. Rashidee, Quantros. Inc

Integrating Metabolomic and Physiological Data Using Informatics Tools in Interdisciplinary Research Environment
P. Tokachichu, K. Mulier, G. Beilman, University of Minnesota

Expanding the WorkWeb Portal to Enhance Research Collaboration Between Investigators from Community-based Organizations and the University

Measuring Document Quality: a Systematic Review
C. Weir, University of Utah; J. Garvin, A. Hall, R. Barrus, SLC VA

Health Research Economics of Patient Recruitment: Probabilistic Modeling of Multi-center Clinical Trial Recruitment for Cost Forecasting
L. Yang, ClinSolver, M. Kao, Stanford University Medical Center; K. Shem, Santa Clara Valley Medical Center; C. Koo, Stanford University

Theme: Clinical Workflow and Human Factors

Analyzing Information Needs in Critical Care Hand-offs
J. Abraham, V. Nguyen, V. Patel, University of Texas Health Science Center at Houston

The Care-coordination Capability Maturity Model: Understanding HIT Adoption
N. Behkami, D. Dorr, Oregon Health & Science University; T. Daim, Portland State University

A Qualitative Comparison of Problem-based and Concept-based Design Metaphors of the Electronic Health Record Upon Nurse Information-Seeking
E. Borycki, University of Victoria

Perioperative Transitions in Care: Integrating Patient Flow, Information Flow, and Clinical Workflow
M. Burton, Indiana University School of Medicine; P. DeLaurentis, Regenstrief Institute, Inc.; H. Ekbia, Indiana University; E. Wiebke, Indiana University School of Medicine; M. Lawley, Purdue University; B. Doebbeling, Regenstrief Institute, Inc.

Benefits of a Paper Cognitive Artifact Used by Pediatric Nurses to Support Nursing Workflow
R. Colligan, E. Bass, University of Virginia

Information Demands and Consumption of Clinical Documents by Clinicians in Electronic Health Record Systems
O. Farri, S. Pakhomov, T. Adam, D. Pieczkiewicz, G. Melton, University of Minnesota

Information Integration Model in Critical-Care Setting: Role of Electronic Health Records
D. Gottipati, V. Nguyen, S. Myneni, K. Almoosa, University of Texas Health Science Center at Houston; T. Kannampallil, University of Texas; V. Patel, UTHealth

Categorizing Outpatient Data: a Cognitive Approach to EHR Design
M. Janes, Partners HealthCare Systems, Inc.; H. Ramelson, A. Kirk, Partners HealthCare; J. Horsky, Brigham & Women’s Hospital
Can We Improve Clinical Software Based on Users’ Personal Values? Identification of Potentially Beneficial Software Features
S. Koch, R. Proynova, B. Paech, T. Wetter, University of Heidelberg

A Framework for Comparing Paper and Electronic Interoperability
C. Kuziemsky, University of Ottawa; K. Keshavjee, InfoClin Inc./University of Victoria

Estimating Task Execution Time in EHRs Using the Keystroke-Level Model
L. Lee, M. Walji, Y. Li, J. Zhang, The University of Texas Science Center at Houston

A Preliminary Study to Explore Effective Decision Support for Treatment of Heart Failure
M. Nakayama, Tohoku University Hospital/Tohoku University Graduate School of Medicine; Y. Kondo, Tohoku University Hospital; H. Shimokawa, Tohoku University Graduate School of Medicine

Clinicians’ Usability Feedback on a Novel Interface for Communicating Genetic Results
P. Neri, S. Pollard, L. Volk, L. Newmark M. Varugheese, S. Baxter, S. Aronson, Partners HealthCare; H. Rehm, Partners HealthCare/Harvard Medical School; D. Bates, Brigham & Women’s Hospital/Partners HealthCare

An Extended Usability Framework to Support Clinical Information System Design for Collaborative Care Delivery
L. Peyton, D. Langayan, B. Mcleod, V. Mallur, C. Kuziemsky, University of Ottawa

Development of a Collaborative Patient-Discharge Documentation Module
L. Selvitella, M. Carty, R. Boxer, Brigham and Women’s Hospital; C. Pelletier, M. Cardito, Partners HealthCare; P. Fraser, D. Goldsmith, Brigham and Women’s Hospital

Time Analysis Performance of Manual and Computerized Registry of the Nursing Care Systematization in Intensive Care and Surgery Unit
V. Silva, C. Betta, E. Nishio, C. Barsottini, J. Wainer, Federal University of São Paulo – UNIFESP; J. Wainer, UNICAMP

Evaluation of a Sign-out Checklist Tool to Support Individual and Team Task Management in an Electronic Health Record
D. Stein, S. Bakken, P. Stetson, Columbia University Medical Center; D. Vawdrey, Columbia University

Interactive Variance Analysis Method for Improving Clinical Pathways

Problem List: Exploring a Navigation Mechanism to Access Long-term Medical Information
X. Zhou, Rutgers, The State University of New Jersey; M. Ackerman, D. Hanauer, K. Zheng, The University of Michigan

Theme: Consumer Informatics and Multimedia PHRs

User-interface Design of the Smartphone Device for Elder People in Nutrition Self-Management
Y. Chen, P. Chang, National Yang-Ming University

Patient Information Needs and Desired Features of an Aid to Facilitate Decision-Making Related to Temporal Lobe Epilepsy Surgery
Presenting Tailored Clinical Trials Information Within the Patient Portal
J. DeShazo, L. Penberthy, R. Brown, Virginia Commonwealth University

Use of the Internet for Health-related Purposes in U.S.: Prevalence, Predictors, and Impact
J. Finkelstein, E. Cha, Johns Hopkins University School of Medicine

Development of the Smartphone Application for Counseling with Hospital Pharmacists about Medications
H. Han, Y. Park, P. Pak, J. Kim, J. Kim, D. Shin, Asan Medical Center; W. Kim, J. Lee, University of Ulsan College of Medicine

iPhone Application and an Allied Server System for Ubiquitous Learning of Biomedical Science
T. Hishiki, Toho University; T. Tamura, Bits Co., Ltd.

Developing QR Code-based Smartphone Medication Safety Support System for Children
H. Lee, P. Chang, National Yang-Ming University

Social Computing for Health Organizations: Some Preliminary Findings
R. Leung, K. Pasupathy, University of Missouri

Clinical Validation of an Unobtrusive Method for Detecting Cognitive Decline in the Elderly
J. McKanna, H. Jimison, M. Pavel, Oregon Health & Science University

Learning from the Disparate Many
F. Nicolalde, T. Patton, K. Johnson, P. Brennan, University of Wisconsin-Madison

Toward a Spoken Web-enabled Personal Health Record Technology
R. Padman, Carnegie Mellon University; A. Nanavati, IBM; P. Khera, C. Banke, IBM Research; J. Damir, Carnegie Mellon University

Family Health History for Nontraditional Families
J. Peace, Duke University

Integrating Avatars into a Symptom Management System for PLWH
R. Schnall, Columbia University; D. Wantland, Rutgers; O. Velez, Columbia University; P. Yen, OSU; K. Cato, S. Bakken, Columbia University

A New Approach to Healthcare Monitoring and Management for Elderly People in Japan Using a Mobile Phone-based System
A. Shibuya, Nihon University School of Medicine/Tohoku University Graduate School of Medicine; R. Inoue, Tohoku University Hospital; T. Yamada, The Medical Information System Development Center; Y. Maeda, Y. Umesato, Y. Kondo, Nihon University School of Medicine

When Physicians Control Access to PHRs They Variably Restrict Patient Options
Y. Tamrat, B. Crotty, Beth Israel Deaconess Medical Center; S. Reti, Harvard Medical School; H. Feldman, Beth Israel Deaconess Medical Center; B. Landon, C. Safran, Harvard Medical School

Design and Development of a Computer-assisted Self-interviewing Kiosk for Low-literacy Patients to Ensure Medication Safety
C. Tsui, J. Caudle, Emory University; G. Ryan, Mercer University; C. Barnes, Emory University; J. Hickman, Southern Polytechnic State University; A. Franklin, UTHealth; D. Ziemer, Emory University; D. Ziemer, Emory University
Creating Composite Pictograms Based on Composite Rules: a Feasibility Test
F. Vineet, San Diego State University; H. Kim, E. Aronoff Spencer, V. Muhlen; L. Ohno-Machado, University of California, San Diego

Theme: Data Integration and Exchange

A Data Mart to Streamline De-identified Bio-specimen Distribution
J. Chen, J. Liu, D. Xu, J. Kamal, The Ohio State University Medical Center

Web Portal for Cohort Studies and Later Data-Cluster Analysis
F. Cohrs, F. Sousa, J. Tenorio, L. Ramos, I. Pisa, Universidade Federal de Sao Paulo

Early Findings from the Evaluation of the State HIE Cooperative Agreement Program
P. Dullabh, C. Nye, NORC at the University of Chicago; J. Adler-Milstein, Harvard University; A. Moiduddin, NORC at the University of Chicago; V. Patel, Office of the National Coordinator for Health Information Technology; L. Virost, E. Babalola, A. Mahmud, J. Goldwter, NORC at the University of Chicago; M. Swain, Office of the National Coordinator for Health Information Technology; A. Jha, Harvard School of Public Health

PGRN Ontology Network Resource
R. Freimuth, J. Pathak, D. Sharma, M. Durski, C. Chute, Mayo Clinic

Development of Provenance-aware Cloud-based Semantic Web Data Services
A. Grueneberg, Furtwangen University; H. Deus, Digital Enterprise Research Institute; W. Maass, Furtwangen University; J. Almeida, University of Alabama at Birmingham

Generalizable Session-dependent De-identification Methods
S. Kahmann, The Ohio State University, S. Erdal, J. Liu, J. Kamal, OSU Medical Center; B. Clymer, The Ohio State University

Identifying the List of Drugs Currently Available for Sale in the U.S.
J. Kilbourne, National Library of Medicine

Using Security and Fault Tolerance Within Informatics for Integrating Biology and the Bedside (i2b2)
M. Mendis, L. Phillips, R. Kuttan, J. Donahoe, Partners HealthCare; S. Churchill, I. Kohane, Harvard University; S. Murphy, Partners HealthCare

Comparison and Reconciliation of Tuberculosis Data Elements
M. Parker, Duke University School of Nursing; A. Walden, M. Nahm, Duke University

Governance Structures in State Health Information Exchange
A. Phillips, Columbia University School of Nursing; R. Kaushal, Weill Cornell Medical College; J. Merrill, Columbia University

Validation of a Shared Toolkit Approach for Facilitating Adoption of Care Transition Exchange Standards
S. Renly, J. Timm, IBM Almaden Research Center

Integrating Lightweight Web Application Technologies and caGrid Web Services
W. Stephens, The Ohio State University; T. Nguyen-Pham, M. Barrett, UCSD Moores Cancer Center; S. Wang, J. Pierce, The Ohio State University; A. Greaves, University of California San Diego; P. Payne, The Ohio State University
A Hospital-led, Multi-specialty Health Information Exchange as the Framework for an Accountable Care Organization
J. Wong, Adventist HealthCare

Theme: Data Mining, NLP, Information Extraction

Toward Dynamic Phenotyping with Clinical Data
D. Albers, N. Elhadad, G. Hripcsak, Columbia University; E. Tabak, New York University

Electronic Monitoring of Antimicrobial Use as a Component of Antimicrobial Stewardship: Development of an Antimicrobial Datamart
V. Bubelev, J. West, J. Santangelo, K. Stevenson, The Ohio State University Medical Center

A Natural Language Processing Algorithm for Improving Efficiency of Breast Cancer Surveillance Abstraction
D. Carrell, S. Halgrim, D. Tran, Group Health Research Institute

Linguistic Differences of Depressed Patients in an Online Health Forum
B. Chee, PatientsLikeMe

Identifying Collaborators in Emerging Research Topics
C. Cowansage, D. Fort, K. Riordan, A. Wilcox, Columbia University

Extracting Sources of Admission and Discharge Destinations from Discharge Summaries
D. Demner-Fushman, S. Abhyankar, F. Callaghan, C. McDonald, U.S. National Library of Medicine

Relationship Identification Model: How Do Medical Concepts Relate in Patient Records?

Using String Distance to Detect Structure in Medical Documents
D. Finch, University of South Florida/James A. Haley Hospital

G. Gobbel, R. Reeves, T. Speroff, S. Brown, M. Matheny, Department of Veterans Affairs/Tennessee Valley Health System/Vanderbilt University Medical Center

Applications of Network Analysis to Clinical Data
J. Klann, Regenstrief Institute; J. Klann, Indiana University

ResearchIQ: Technical Architecture of an Ontology-Anchored Knowledge and Resource Discovery Tool
O. Lele, The Ohio State University; R. Dhaval, Center for Clinical and Translational Science, The Ohio State University; T. Borlawsky, P. Payne, The Ohio State University

Converting Unicode Lexicon and Lexical Tools for ASCII NLP Applications
J. Lu, A. Browne, U.S. National Library of Medicine

TrANEMap: a Fast Tree-based Named-Entity Recognition Engine
J. McCart, J. Jarman, James A. Haley Veterans Hospital; M. Matheny, Vanderbilt University
POSTERS

Mining Significant Partial Order Patterns in Electronic Medical Records
D. Patnaik, N. Ramakrishnan, Virginia Polytechnic Institute and State University; B. Keller, Eastern Michigan University; D. Hanauer, University of Michigan

Health Assessment Using Sensor-Sequence Alignment and EHR Data
M. Popescu, Z. Zeng, M. Skubic, University of Missouri

An Informatics Approach to Methicillin-resistant Staphylococcus Aureus Surveillance in the Department of Veterans Affairs
M. Rubin, VA Salt Lake City Health Care System; M. Rubin, University of Utah School of Medicine; J. Garvin, Salt Lake City VA Medical Center; B. Doebbeling, M. Merchant, Roudebush VAMC; R. Martinello, P. Mutalik, VA Connecticut Healthcare System/Yale School of Medicine; M. Goldstein, VA Palo Alto Health Care System; S. Luther, James A. Haley Veterans Hospital; M. Samore, B. South, VA Salt Lake City Health Care; S. Gullans, Roudebush VAMC

i2b2 and Keyword Search of Narrative Clinical Text
E. Scheufele, D. Housman, Recombinant Data Corp.; J. Wasser, S. Pauker, Tufts Medical Center; M. Palchuk, Recombinant Data Corp.

Identification of SNPs Increasing the Risk of Cardiovascular Diseases
A. Shashkin, Moscow State University

Multi-labeling Health Web Pages: an Approach Based on Category Relevance
F. Sousa, F. Mancini, F. Teixeira, F. Nunes, I. Pisa, Universidade Federal de São Paulo

Minnow: a Flexible Web-based Tool for Support of Systematic Literature Reviews
K. Unertl, T. Coffman, Vanderbilt University

Mining Electronic Health Records to Repositioning Drugs: a Feasibility Study
L. Yao, P. Agarwal, GlaxoSmithKline

Theme: EHRs and Achieving Meaningful Use

Return on Investment from Electronic Health Records in Community Practices
J. Adler-Milstein, Harvard University; C. Green, D. Bates, Brigham & Women’s Hospital

Using Personas to Increase Provider Awareness, Engagement, and Acceptance
D. Chase, J. Rote, M. Brush, D. Borbolla, T. Gamble, J. Ash, Oregon Health & Science University

A Newly Established Disaster-Supply Management System: Focus on the Concept of Physical Distribution
P. Cheng, P. Chang, National Yang-Ming University; P. Cheng, S. Hung, T. Wang, Shin-Kong Wu Ho-Su Memorial Hospital

An Event-centric Ontology (ECO) for Electronic Health Records (EHR)
J. Fan, W. DeSmedt, Y. Sharma, R. Adams, Booz Allen Hamilton; R. Chatterjee, One Preserve Pkwy; M. Keller, J. Klenk, Booz Allen Hamilton, Inc.; R. Taylor, St. John’s Mercy Medical Center

Integration of Medical and Dental Information of HIS Has Led to Improving Quality of Clinical Results and Medical/Dental Research
S. Kasahara, R. Inoue, Tohoku University Hospital; M. Nakazawa, Tomiwa Chuo Hospital; M. Kamata, Tohoku University Hospital; A. Shibuya, Nihon University; C. Sato, Tohoku University Hospital; J. Urushihara, GC Limited; Y. Kondo, Nihon University
MONDAY, OCTOBER 24 - AMIA 2011

POSTERS

Analysis of a Mobile Electronic Medical Record Usage Pattern: a University Hospital Experience
J. Kim, Asan Medical Center; W. Kim, University of Ulsan College of Medicine; G. Lee, T. Kwon, Asan Medical Center; J. Lee, University of Ulsan College of Medicine

Minnesota Clinical Laboratory Survey of Readiness and Needs for Electronic Health Information Exchange
V. Kuruchittham, Centers for Disease Control and Prevention; K. Guida, C. Brueske, P. Snippes Vagnone, P. Schlichter, C. Wolf, M. LaVenture, Minnesota Department of Health

Automated Inference of Patient Problems from Medications using NDF-RT and the SNOMED-CT CORE Problem List Subset
J. McCoy, A. McCoy, The University of Texas Health Science Center at Houston; A. Wright, Brigham and Women’s Hospital; D. Sittig, University of Texas Health Sciences Center

The Space In-between: a Rigorous Algorithm to Detect Inaccurate Height Within EMRs
A. Muthalagu, J. Pacheco, Northwestern University; A. Kho, Feinberg School of Medicine

Data Entry Support for Improving Data Quality in Electronic Health Records
S. Quaglini, G. Lanzola, G. Leonardi, University of Pavia; G. Micieli; A. Cavallini, IRCCS Foundation C. Mondino

Normalized Representation of Data Elements for Phenotype Cohort Identification in the Electronic Health Record
C. Tao, Mayo Clinic; S. Welch, Intermountain Health Care; W. Wei, Mayo Clinic; T. Oniki, C. Parker, Intermountain Health Care; J. Pathak, Mayo Clinic; S. Huff, Intermountain Healthcare; C. Chute, Mayo Clinic

A Metric for Measuring Cognitive Transparency of EHR User Interfaces
Z. Zhang, Y. Li, M. Walji, A. Franklin, J. Zhang, University of Texas School of Biomedical Informatics, Houston

Theme: Global eHealth

Successful Implementation of a Web-based Medical Record for Non-communicable Diseases Follow-up in Rural Rwanda
B. Akimana, C. Amoroso, E. Ball, G. Bukhman, M. Cunderlik, H. Fraser A. Kidder, J. Ngiruwera, Inshuti Mu Buzima, D. Thomas, Partners In Health

Ubiquitous Health Service for the Patients with Chronic Obstructive Pulmonary Disease to Improve Knowledge, Skill and Attitudes
J. Kim, S. Kim, S. Yang, K. Kim, H. Kim, Seoul National University; C. Lee, Seoul National University/Seoul National University Bundang Hospital

The Informatics Infrastructure for the National Clinical Research Network in Ethiopia
E. Tsegaye, Johns Hopkins University; D. Fekade, Addis Ababa University; A. Abebe; E. Lemma, Ethiopian Health and Nutrition Research Institute; T. Gidey, Defense University; T. Hagos, Mekelle University; A. Getachew, Gondar University; M. Demena, Haramaya University; A. H/Amlak, Jimma University; Y. Berhan, Hawassa University; E. Hassen, R. Adamu, N. Simmons, W. Weiss, A. Ruff; H. Lehmann, Johns Hopkins University

Theme: Imaging Informatics

Assessment of Pulmonary Hypertension from Semi-automated Geometric Analysis of Computed Tomography Images
H. Berty, University of Pittsburgh; B. Chapman, University of California, San Diego
An Ontology of Normal Tissue Effects in Radiation Therapy
Y. Ge, Wake Forest University Health Sciences; T. Minta, Wake Forest University; L. Yuan, Q. Wu, Duke University

Modeling Medical Imaging and Molecular Biology Correlates from Literature
W. Hsu, J. Sayre, A. Bui, R. Taira, University of California, Los Angeles

Remote Interactive Volume Visualization Infrastructure for Researchers
A. Lai, The Ohio State University; D. Stredney, P. Calyam, B. Hittle, T. Kerwin, Ohio Supercomputer Center; D. Reed, Capital University; K. Powell, The Ohio State University

Content-based Image Retrieval Using Feature Density Estimates
W. Speier, C. Arnold, W. Hsu, A. Bui, UCLA Medical Imaging Informatics

Health Information Technology on Nursing Graduation in Brazilian Public Institutions
L. Sanches, Universidade Federal de Pernambuco; R. Jensen, M. Monteiro, M. Lopes, Universidade Estadual de Campinas

Theme: Informatics in Clinical Education

Increasing Patient Empowerment by Utilizing a Computer-based Patient “Power Page”
C. Barnes, C. Tsui, J. Caudle, A. Herron, N. Kluz, D. Ziemer, Emory University

Health Informatics Teaching in Brazil: a Brief Review
T. da Costa, A. Hummel, A. Falcao, I. Pisa, H. Marin, Universidade Federal de Sao Paulo

A Pilot Usability Evaluation of Computerized Long-term In-dwelling Catheterization Instructional Program
Y. Li, National Hsinchu University of Education; Z. Lin, Tzu-Chi College of Technology; H. Jih, National Hsinchu University of Education

Using Social Networking Resources to Search MEDLINE/PubMed, a Practice Guidelines Database and Journal Club
F. Liu, P. Fontelo, U.S. National Library of Medicine

Theme: Interactive Systems

Voice Recognition for a Point-of-Care, History-taking Tool Written for iOS and Implemented on the Apple iPad
W. Bennett, W. Sumner, Washington University School of Medicine

Use of Commodity Video Game Controllers in Disaster Response Systems
P. Blair, W. Griswold, University of California San Diego
A Framework Proposal for Developing 3D Graphical User Interfaces on Telehealth Systems
F. Ferreira, A. Filho, M. Novaes, Federal University of Pernambuco

Factors that Affect Interpretation of Data Displayed in Treemaps
A. Hugine, E. Bass, S. Guerlain, University of Virginia

Evidence of Using a Mobile Device for Communication with Children with Autism: Lessons Learned and Critical Obstacles
G. Leroy, J. Gutierrez, Claremont Graduate University; H. Seung, California State University Fullerton

Design and Evaluation of a Problem-oriented View for OpenVista EHR using UFuRT Framework
M. Mohammad, G. Espinosa, D. Murphy, J. Zhang, University of Texas

Language Fluency and Other Predictors of International Use of PubMed and MedlinePlus
L. Sheets, University of Missouri; A. Gavino, P. Fontelo, U.S. National Library of Medicine

Theme: Policy and Ethical Issues

Do the Brazilian Health Websites Have Suitability to the HON Code? A Study Based on Web 2.0 Approach
A. Falcao, K. Aureliano, F. Cohrs, D. Sigulem, I. Pisa, UNIFESP

Health IT and Disparities after HITECH
A. Moiduddin, J. Bushar, NORC

Application of Social Theory to Health Information Technology Support Programs
S. Rizk, RTI

Theme: Public Health Informatics and Biosurveillance

MyMedEffects: Improving Drug Safety by Enabling Self-reporting of Adverse Events and Side Effects using Social Microblogging
S. Ahmed, K. Johnson, Vanderbilt University

Does Electronic Death Registration Improve Physician Reporting Timeliness?
J. Duncan, B. Nangle, Utah Department of Health; W. Xu, Utah Office of Public Health Informatics

Reviewing Age-group Based H1N1 Incidence Rates to Understand the Relationship Between Public Health Policy and Outcomes
R. Gamache, Indiana University; P. DeLaurentis, S. Grannis, Regenstrief Institute

An Automated Rule-based Decision Tool for Improving Public Health Reporting Logic
E. Han, University of Utah; J. Duncan, Utah Department of Health; C. Staes, University of Utah

Expanding Environmental Public Health Tracking Through an Ontological Approach for Content Management
J. Jellison, C. Kassinger, Centers for Disease Control and Prevention

Using Contextual Inquiry to Validate and Extend a Tool for Public Health Disease Outbreak Investigations
H. Kramer, Y. Livnat, University of Utah; W. Pettey, University of Utah School of Medicine; J. Reid, University of Utah; R. Dzierzon, University of Utah School of Medicine; M. Samore, University of Utah
Use of the Bayesian Skyline Plot to Inform a Prediction Model of Zoonotic Infection in Animal and Human Hosts  
P. Ortiz, M. Scotch, J. Taylor, J. Taylor, Arizona State University

Integration of Disparate Genomic Sequences for Phylogeography of Influenza  
A. Singraur, M. Scotch, Arizona State University

Theory-based Evaluation of Public Health Information Systems  
S. Tandon, Centers for Disease Control & Prevention; C. LeRouge, School of Public Health, Saint Louis University; S. Ganesan, Northrop Grumman Corporation

The Texas Teen Birth Mapping Tool: From Raw Data to Policy Change  
N. Tucker, University of Texas

Reportable Conditions Interoperability Information Gateway (RCIIG)  
M. Winarsky, Centers for Disease Control and Prevention; M. Pray, S. Ganesan, S. Keller, V. Fernandez, Northrop Grumman

What Are People Saying About Physical Activity in Tweetdom?  
S. Yoon, S. Bakken, Columbia University

Theme: Simulation and Modeling

A Proposal for a Telehealth Service Platform Architecture  
D. Silva, F. Ferreira, I. Costa, A. Campos, M. Novaes, UFPE

Theme: Terminology and Standards

Pioneers of Nursing Informatics: a Qualitative Study of Nurse Leaders  
A. Branchini, University of Connecticut; A. Branchini, Three Rivers Community College

An Ontological Exploration of Medication Propositions in Clinical Records  
S. Essaid, Oregon Health & Science University

Taiwan ICNP V2 Translation and Validation Project  
I. Hou, National Taiwan University Hospital

An Ontology-driven Approach to Improve the OpenSocial Standard  
E. Meeks; L. Yuan; M. Kahlon, University of California, San Francisco; G. Weber, Harvard Medical School and Beth Israel Deaconess Medical Center

MED to SNOMED-CT Mapping via ICD-9-CM and the UMLS  
C. Morrey, NewYork-Presbyterian Hospital/Utah Valley University; D. Baorto, NewYork-Presbyterian Hospital

Practical Issues in Mapping a Local Medication Terminology to a National Standard  
M. Weiner, University of Pennsylvania; K. Haynes, P. Gabriel, M. Massary, B. Moore, University of Pennsylvania School of Medicine; L. Lau, 3M Health Information Systems

Theme: Translational Bioinformatics and Biomedicine

VIVO: Discovery through Linked Open Data  
M. Conlon, University of Florida; K. Holmes, Washington University School of Medicine; M. Tennant, University of Florida
An Ontology-anchored Post-coordination Approach for Hypothesis Discovery
S. James, T. Borlawsky, P. Payne, The Ohio State University

Using a Locally Adaptive Distance Metric to Relief Algorithms
M. Stokes, S. Visweswaran, University of Pittsburgh

12:00 - 1:30 pm Committee Meetings
ACMI Executive Committee Meeting

12:00 – 1:30 pm Special Event
Policy 101: What Public Policy Is and How to Help Shape It
(bring your lunch)

D. Bates, AMIA Public Policy Committee; M. Bloomrosen, AMIA Public Policy and Government Relations; D. Peddicord, Washington Health Strategies Group

This session will provide information about the processes of health policy development and implementation and an overview of federal and state regulatory programs effecting the healthcare industry in general and biomedical and health informatics in particular. Participants will gain an understanding of the purpose of policy advocacy and AMIA’s role in educating and influencing policy-makers. This session will present the big picture of federal budgeting, its players, and the formal and informal budget processes, as well as how budgets influence policy and how tax cuts and budget deficits drive the policy agenda. Other topics include the role of the White House in health policy-making; the Congressional timetable and processes, as well as the role of Congressional and federal agency staff. This session will also provide pointers for communicating effectively with decision-makers.

Providing pertinent information about health policy in order to help participants:
• Expand their capacity to address and catalyze action on crucial biomedical and health informatics issues.
• Bolster their skills to play a more influential role in shaping and creating health policies that are relevant.
• Understand how AMIA engages in health policy discussions.
• Gain skills to help shape public policy.

12:15 – 1:30 pm Unconferences
You asked for programming that is not top-down! You’ve got it! A series of “Unconferences” will debut on Monday, Oct. 24, from 12:15 to 1:30 pm. What should you expect?
• Facilitated, participant-driven conferences centered on a theme or purpose.
• A collaborative learning event that is organized and created by and for its participants.
• Spontaneous events with little structure, where attendees drive the agenda and freely form new discussions and sub-groups as ideas emerge.
“Unconferences” will be facilitated by a group of “Un-chairs” in each of the five domains plus one topic that won’t be announced until the Symposium is underway:
• Translational Bioinformatics (TBI)
• Clinical Research Informatics (CRI)
• Clinical Informatics (CI)
• Consumer Health Informatics
• Public Health Informatics
• Wild Card

Registration? If you are already registered for the conference - don’t bother. Just turn up at the Unconference of your choice!

1:45 - 3:15 pm Scientific Sessions
Recent work in telemedicine has aimed at developing solutions to support the management of chronic diseases and delivery of home care services. The latest developments in microsystems and nanotechnologies as well as in information processing and communication technologies allow miniaturization and non-invasive smart monitoring of physiological and physical data. Ongoing cutting-edge multidisciplinary research in biomedical sensors and wireless and mobile telecommunications, integrated with telemedicine, aims at developing technologies that support personalized management of health and diseases at point of need and at any time. This panel will discuss the impact of these new technologies on delivery systems and clinical research as providers shift to broader use of decentralized, technologically enabled care networks.
in evaluating HIE systems. The panel will also discuss important aspects of HIE systems that should be studied in an evaluation endeavor, the use of relevant theories, and strategies to overcome the aforementioned challenges. This panel will contribute to research and practice by discussing the strengths and weaknesses of evaluation strategies in the context of five HIE systems implemented in Wisconsin, New York, Texas, and Minnesota.

S25 - Panel
Theme: EHRs and Achieving Meaningful Use

Using EHRs to Transform Clinical Care: Successfully Implemented Innovations That Go Beyond Established Uses of EHRs
A. Compton-Philips, The Permanente Federation/Kaiser Permanente; M. Kanter, Southern California Permanente Medical Group/Kaiser Permanente; M. Goldstein, VA Palo Alto Health Care System/Stanford University; D. Sands, Cisco Internet Business Solutions Group/Harvard Medical School

While much attention has been given to how EHRs provide benefits by enabling clinical decision support (CDS), improving patient safety, and enabling health information exchange, less attention is paid to how the EHR can transform the way clinical care is delivered to individuals and populations. New models of care delivery, enabled by EHR technology, have achieved robust traction in a number of healthcare organizations. This panel will highlight programs in leading organizations that have used EHRs to support care transformation, including reliably delivering bundles of care for acute and chronic conditions, proactive population care through outreach to patients, maximizing office visits through comprehensive in-reach in primary and specialty care, clinical decision support and just-in-time education at the point of care, and patient engagement through the use of HIT. The organizations featured are Kaiser Permanente, the Veterans Health Administration of the U.S. Department of Veterans Affairs, and Cisco Systems. Panelists will talk about the goals and principles of these new care-delivery methods, the organizational change management required to implement these programs, changes in staff roles and incentives, and the improvements in care coordination and clinical outcomes that have resulted. The experience and results presented in this panel are designed to stimulate innovative thinking and audience discussion about other potential areas where EHRs can transform clinical care.

S26 – Papers: Controlled Terminologies & Mining
Theme: Data Mining, NLP, Information Extraction

Using UMLS Lexical Resources to Disambiguate Abbreviations in Clinical Text
Y. Kim, J. Hurdle, S. Meystre, University of Utah

Voice-dictated versus Typed-in Clinician Notes: Linguistic Properties and the Potential Implications on Natural Language Processing

Leveraging Rich Annotations to Improve Learning of Medical Concepts from Clinical Free Text
S. Yu, F. Farooq, B. Krishnapuram; B. Rao, Siemens Medical Solutions USA, Inc.

Parenthetically Speaking: Classifying the Contents of Parentheses for Text Mining
K. Cohen, T. Christiansen, University of Colorado School of Medicine

S27 – Papers: Information Extraction for Translational Bioinformatics & Biomedicine
Theme: Translational Bioinformatics and Biomedicine
**Drug Repositioning Using Disease-Associated Biological Processes and Network Analysis of Drug Targets**
D. Dinakarpandian, S. Mathur, University of Missouri-Kansas City

**Similarity-based Disease Risk-Assessment for Personal Genomes: Proof of Concept**
J. Woo, Columbia University; A. Lai, The Ohio State University; C. Weng, Columbia University

**A Vector Space Model-based Approach to Identify Genetically Similar Diseases**
I. Sarkar, University of Vermont

**Complex Disease Networks of Trait-associated SNPs Unveiled by Information Theory**
H. Li, Y. Lee, J. Li, J. Chen, E. Rebman, K. Regan, Y. Lussier, University of Chicago

**Implementation of a Platform Dedicated to the Biomedical Analysis Terminologies Management**
S. Cormont, AP-HP; P. Vandenbussche, INSERM UMRS 872; A. Buemi, AP-HP; J. Delahousse, Mondeca; E. Lepage, AP-HP; J. Charlet, INSERM UMRS 872

**Race and Medication Adherence and Glycemic Control: Findings from an Operational Health Information Exchange**
V. Zhu, W. Tu, D. Marrero, M. Rosenman, M. Overhage, Regenstrief Institute and Indiana University School of Medicine

**Technical Architecture of ONC-approved Plans for Statewide Health Information Exchange**
R. Barrows, J. Ezzard, Deloitte Consulting LLC

**Health Information Exchange, Health Information Technology Use, and Hospital Readmission Rates**
S. Jones, RAND Corporation; M. Friedberg, RAND Corporation/Brigham and Women’s Hospital; E. Schneider, RAND Corporation/Brigham and Women’s Hospital/Harvard School of Public Health

**Impact of Health Disclosure Laws on Health Information Exchanges**
I. Adjerid, R. Padman, Carnegie Mellon University

**Unexpected Effects of Unintended Consequences: EMR Prescription Discrepancies and Hemorrhage in Patients on Warfarin**
A. Turchin, Partners HealthCare; M. Shubina, Brigham and Women’s Hospital; S. Goldberg, Massachusetts General Hospital
Revisiting the EBM Decision Model to Formalize Non-compliance with Computerized CPGs: Results in Management of Breast Cancer with OncoDoc2
J. Bouaud, AP-HP; B. S’eroussi, UPMC, UFR de M’edecine and Hopital Tenon, D’epartement de Sant’e Publique

Reconciling Pairs of Concurrently Used Clinical Practice Guidelines Using Constraint Logic Programming
S. Wilk, Poznan University of Technology; M. Michalowski, Adventium Labs; W. Michalowski, M. Mainegra Hing, K. Farion, University of Ottawa

GEM at 10: a Decade’s Experience with the Guideline Elements Model
N. Hajizadeh, N. Kashyap, G. Michel, R. Shiffman, Yale Center for Medical Informatics

S31 – Papers: Biomedical Literature and Text Mining Theme: Data Mining, NLP, Information Extraction

SEACOIN—an Investigative Tool for Biomedical Informatics Researchers
H. Lee, Georgia Institute of Technology; A. Quarshie, Morehouse School of Medicine; E. Lee, Georgia Institute of Technology

Exploring the Use of Social Media to Measure Journal Article Impact
P. Evans, M. Krauthammer, Yale University School of Medicine

A Bottom-up Approach to MEDLINE Indexing Recommendations

Semantic Characteristics of NLP-extracted Concepts in Clinical Notes vs. Biomedical Literature
S. Wu, Mayo Clinic; H. Liu, Mayo Clinic College of Medicine

S32 – ACMI Senior Member Presentation: Clinical Decision Support Theme: Clinical Decision Support, Outcomes, and Patient Safety

Clinical Decision Support: The State of the Art and the Next Steps
J. Teich, Elsevier and Harvard University

From the earliest days of informatics and electronic health records, a fundamental goal has always been to use computer technology to improve the quality and safety of healthcare by using clinical decision support (CDS) to deliver relevant information, filtered to the current situation and organized for greatest impact. CDS takes many forms, from simple alerts to complex predictive analytic systems, multi-dimensional displays, tailored reference information and care-plan guidance tools. New technologies have advanced both the usability and the intelligence of CDS systems, allowing them to be used in more complex and subtle situations. At the same time, the adoption and impact of CDS have been uneven; some clinical organizations have achieved marked reductions in adverse events, improvements in quality metrics and cost savings, while others have had poor acceptance or unintended consequences, or have avoided implementation altogether for fear of both. This presentation reviews the current state of CDS and the newest developments in CDS technologies, applications, and methods. It explores current local and national efforts to improve implementability, usability, scope, and dissemination, and touches on some of the grand challenges for CDS in an age of genomics, social media, and universal access to computing.
A Research-in-Progress Report from the Clinical Decision Support Consortium
B. Middleton, Partners HealthCare System

The goal of the CDS Consortium is to assess, define, demonstrate, and evaluate best practices for knowledge management and clinical decision support in healthcare information technology at scale—across multiple ambulatory care settings and EHR technology platforms. This project team is comprised of a diverse array of academic and industrial collaborators and is mid-course in a five-year project timeline. Key questions posed in the original proposal will be addressed in light of lessons learned, and findings from the research and development efforts. New research questions and issues that must be addressed to achieve the vision of accelerating the translation of knowledge into practice will be highlighted.

3:30 – 5:00 pm Scientific Sessions

S33 - Featured Presentation
Theme: Informatics Education and Workforce Development

Desperately Seeking Informaticians: How Today's Employers are Building the Global Informatics Workforce
J. Leviss, Microsoft Health Solutions Group; S. Labkoff, AstraZeneca; M. Dente, GE Healthcare; L. Dimitropoulos, RTI International

Given the projected addition of approximately 50,000 informatics positions in the next decade to satisfy global healthcare workforce demand, the perception is that there has never been a better time to leap into the informatics jobs marketplace. Curiously, it is still challenging for many practicing clinicians to make career transitions into informatics roles in industry and for employers to find the right candidates to fill critical positions. This panel is designed to help mid-career clinicians and informatics professionals better understand available career paths in different sectors, such as pharma, product development, and strategic consulting. Each panelist will provide anecdotes from their personal and industry experiences, discuss what their companies are doing to recruit qualified candidates into their global enterprise, and explain how a formal education in informatics is invaluable for success in these new and emerging industry roles.

S34 – Panel
Theme: Clinical Decision Support, Outcomes, and Patient Safety

Lessons from Evaluating the Implementation of New Informatics in an Integrated Healthcare Delivery System: the Veterans Health Administration
R. Perrin, D. Hynes, Department of Veterans Affairs; M. Goldstein, VA Palo Alto Health Care System; C. Achtmeyer, A. Young, Department of Veterans Affairs

The Veterans Health Administration’s comprehensive healthcare system has an EHR system that supports patient safety and quality of care with applications such as computerized provider order entry, bar code medication administration, and clinical decision support (CDS). The implementation of new health information technology (HIT) to further advance safety and quality can meet with varying degrees of success in any organization, depending on many factors related to the informatics and the healthcare organization. The purpose of this panel is to present and discuss lessons learned from evaluations of the implementation of interventions that include informatics solutions within the VA healthcare system. These interventions range in scale and complexity from a comprehensive CDS system to disease-focused clinical reminders. This panel will identify important barriers and facilitators to implementation along with examples of unintended consequences.
The challenges the VA faces to meet the demand for healthcare quality improvement are not unlike those facing other large- and small-scale institutions. We hope to share lessons that are applicable to other public and private sector healthcare systems undertaking programs that utilize healthcare informatics in improving the quality of patient care.

S35 - Panel
Theme: EHRs and Achieving Meaningful Use

Quality Reporting from Health Information Technology: Challenges, Opportunities, and Insights
L. Kern, Weill Cornell Medical College; P. Tang, Palo Alto Medical Foundation and Stanford University; J. Weiner, Johns Hopkins University; M. Honour, R. Kaushal, Weill Cornell Medical College

The federal government is investing up to $27 billion in incentives for meaningful use of EHRs. Demonstrating meaningful use involves reporting quality measures electronically from EHRs. This represents a significant shift from current methods of measuring healthcare quality from administrative claims and/or manual record review. This panel brings together perspectives from the academic and vendor communities to discuss challenges, opportunities and insights on electronic quality reporting. Specifically, the panel will explore topics including: adapting claims-based measures for EHRs, reporting meaningful use measures from EHRs, the validity and reliability of electronic reporting compared to manual review, advancing novel measurement of aspects of quality that cannot be captured by claims (for example, utilizing laboratory values, medications lists and/or problem lists), case mix adjustment from EHRs, collaboration with vendors, and implications for research. The learning objectives for these presentations are for participants to: a) gain a greater appreciation for the conceptual and technical complexities involved in electronic quality reporting; b) recognize opportunities for the development of novel quality measures; and c) understand future directions of the meaningful use program and other national efforts to advance quality measurement.

S36 - Panel
Theme: Interactive Systems

Tablets in Healthcare: Not Just for Pills Anymore
H. Feldman, L. Nathanson, J. Halamka, Beth Israel Deaconess Medical Center; J. Meyers, Hospitals Corporation of America

Second-generation tablets such as the Apple iPad, are causing a groundswell of new applications in medicine. These are being driven heavily from the ground up, as providers bring their personal devices and expectations of adopting them into large and small healthcare organizations. These devices present unique opportunities for bedside care, as well as challenges for HIT. At our hospital, iPads have been in use since the first day of release in clinical care across multiple departments, and use is rapidly expanding. The addition of competing tablets will likely drive performance and price drops and further raise integration and security issues. These devices are making location much less relevant as one can literally practice in the palm of your hand regardless of where you are, while location and spatial awareness services are making local location a new asset for care-providers.

S37 – Paper: Information Retrieval & Text Mining
Theme: Data Mining, NLP, Information Extraction

Search Filter Precision Can be Improved by NOT-ing Out Irrelevant Content
N. Wilczynski, K. McKibbon, R. Haynes, McMaster University
**Scientific Sessions**

**An Investigation Into the Feasibility of Spoken Clinical Question Answering**  
T. Miller, K. Ravaz, University of Wisconsin - Milwaukee; J. Cimino, U.S. National Library of Medicine; H. Yu, University of Wisconsin - Milwaukee

**The MiPACQ Clinical Question-Answering System**  
B. Cairns, R. Nielsen, University of Colorado at Boulder; J. Masanz, Mayo Clinic College of Medicine; J. Martin, M. Palmer, W. Ward, University of Colorado at Boulder; G. Savova, Children’s Hospital Boston and Harvard Medical School

**NeuroLOG: Sharing Neuroimaging Data Using an Ontology-based Federated Approach**  
B. Gibaud, INSERM; G. Kassel, Univ. de Picardie Jules Verne; M. Dojat, Univ. Joseph Fourier Grenoble; B. Batrancourt, Univ. Pierre et Marie Curie; F. Michel, A. Gaignard, J. Montagnat, UNS, I3S Lab

**Methods to Identify Standard Data Elements in Clinical and Public Health Forms**  
N. Abernethy, University of Washington; P. Small, Institute of Systems Biology; K. DeRimer, University of California, Davis

**Quantifying the Longitudinal Value of Healthcare Record Collections for Pharmacoepidemiology**  
M. Sperrin, Lancaster University; S. Thew, University of Manchester; J. Weatherall, AstraZeneca Pharmaceuticals; W. Dixon, University of Manchester; I. Buchan, University of Manchester

**S38 – Papers: Use and Reporting of Public Health Information**  
Theme: Public Health Informatics and Biosurveillance

**Development and Evaluation of a Prototype Search Engine to Meet Public Health Information Needs**  
J. Keeling, Columbia University; E. Allen, S. Rowe, Syracuse University; A. Turner, University of Washington; J. Merrill, Columbia University; E. Liddy, H. Turtle, Syracuse University

**S39 – Papers: Assessing Order Entry**  
Theme: Clinical Decision Support, Outcomes, and Patient Safety

**Determining Reasons for Medication Prescriptions in the EHR Using Knowledge and Natural Language Processing**  
Y. Li, H. Salmasian, R. Harpaz, H. Chase, C. Friedman, Columbia University

**SRCAST-diagnosis: Understanding How Different Members of a Patient-care Team Interact with Clinical Decision Support System**  

**Improving Patient Safety by Modifying Provider-ordering Behavior Using Alerts (CDSS) in CPOE system**  
K. Saxena, B. Lung, J. Becker, Adventist Health System–Information Services

**Evaluation of HL7 v2.5.1 Electronic Case Reports Transmitted from a Healthcare Enterprise to Public Health**  
D. Rajeev, C. Staes, University of Utah; R. Evans, University of Utah/Intermountain Healthcare; A. Price, M. Hill, Salt Lake Valley Health Department; S. Mottice, Utah Department of Health; I. Risk, Salt Lake Valley Health Department; R. Rolfs, University of Utah/Utah Department of Health

**The Effect of Computerized Provider Order Entry (CPOE) on Ordering Patterns for Chest-pain Patients in the Emergency Department**  
T. Adam, University of Minnesota; R. Waitman, I. Jones, D. Aronsky, Vanderbilt University
S40 – Papers: New Methodologies in Text Mining
Theme: Data Mining, NLP, Information Extraction

A Cloud-based Approach to Medical NLP
K. Chard, M. Russell, Y. Lussier, The University of Chicago; E. Mendonca, University of Wisconsin-Madison; J. Silverstein, NorthShore University HealthSystem

Graph-based Methods for Discovery: Browsing with Semantic Predications
B. Wilkowski, Technical University of Denmark; M. Fiszman, C. Miller, National Library of Medicine; D. Hristovski, University of Ljubljana; S. Arabandi, G. Rosemblat, T. Rindflesch, U.S. National Library of Medicine

Improving Predictions in Imbalanced Data Using Pairwise Expanded Logistic Regression
X. Jiang, R. El-Kareh, L. Ohno-Machado, University of California, San Diego

Statistical Machine Translation for Biomedical Text: Are We There Yet?
C. Wu, F. Xia, University of Washington; L. Deleger, I. Solti, Cincinnati Children’s Hospital Medical Center

S41 – Papers: Usability & Use Challenges in Consumer Health Informatics
Theme: Consumer Informatics and Multimedia Personal Health Records PHRs

Development and Early Usage Patterns of a Consumer-facing Family Health History Tool

Who Are Portal Users vs. Early E-Visit Adopters? A Preliminary Analysis
C. Jung, R. Padman, Carnegie Mellon University; G. Shevchik, S. Paone, University of Pittsburgh Medical Center

A Tablet Computer Application for Patients to Participate in Their Hospital Care
D. Vawdrey, L. Wilcox, S. Collins, S. Bakken, S. Feiner, Columbia University; A. Boyer, NewYork-Presbyterian Hospital; S. Restaino, Columbia University & NewYork-Presbyterian Hospital

Usability Evaluation of a Personal Health Record
N. Segall, Duke University Medical Center; J. Saville, P. L’Engle, B. Carlson, Duke University Health System; M. Wright, Duke University Medical Center; K. Schulman, Duke Clinical Research Institute; J. Tcheng, Duke University Medical Center

S42 - Partnerships in Innovation: Research Informatics, Data Intergration and Exchange
Theme: Data Integration and Exchange

The Pediatric Heart Network Portal - A Collaboration of Pediatric Heart Centers, Academia, Government and Industry to Improve Image Workflow for Pediatric Cardiac Multi-site Studies
G. Pearson, National Heart, Lung, and Blood Institute; S. Tennstedt, New England Research Institutes; R. Winslow, Johns Hopkins University; M. Keller, A. Fernandez, Booz Allen Hamilton

We will present collaborative efforts among pediatric heart centers, academic centers, government and industry to apply bioinformatics methodology and open-source technologies to enhance the multisite clinical study management of the Pediatric Heart Network (PHN). The PHN was created and funded by the National Heart, Lung, and Blood Institute (NHLBI) in 2001 to improve outcomes and quality of life in
children with congenital and acquired heart disease. The network consists of pediatric heart centers, a data coordinating center (New England Research Institutes, NERI) and core labs to capture, store and analyze clinical data. Booz Allen Hamilton conducted a community analysis to identify areas for workflow improvement and develop a bioinformatics strategy. Priority areas were identified in image study workflow, security, and infrastructure improvements. A web-based portal system that integrates image storage, security and semantics is being developed, in collaboration with PHN sites, as well as incorporating common infrastructure from the NHLBI’s Cardiovascular Research Grid (CVRG). Together, these groups have brought clinical and bioinformatics technology perspectives and efficient solutions to improve the clinical study management of the PHN today. The bioinformatics infrastructure will provide the backbone to add additional data types in the future to enable sharing within PHN sites.

Clinical Results Clearinghouse—a Collaboration Model that Addresses Challenges to Meaningful Use and Data Interoperability
G. Elhanan, Halfpenny Technologies, Inc and NJIT; T. Thornburg, Health Sciences South Carolina

Interoperable data are essential to the HITECH initiative. Despite standardization efforts, much of the clinical laboratory data pushed into ambulatory electronic health records (EHRs) are not stored in compliance with a standard code set. Similarly, certified EHRs vary in their capabilities to produce discrete, normalized data. Such deficiencies interfere with providers’ ability to achieve meaningful use (MU) and limit the benefits that can be realized through the use of modern EHRs and health information exchanges (HIEs). To overcome such limitations, the South Carolina regional extension center (REC) and HIE collaborated with a neutral vendor to adopt an economically sustainable model of a clinical results clearinghouse. This model overcomes the limitations of traditional point-to-point interfaces, facilitates MU by ambulatory providers, offers bidirectional connectivity for lab results, and ensures the availability of discrete, standardized clinical lab results within EHRs and the SC HIE. This presentation describes a pilot project: a collaboration between South Carolina’s HIE, REC, and Halfpenny Technologies that offers a middleware approach that simplifies the burden of implementation on the community physicians and the hospital labs, while providing a sustainability option to the HIE. Business and design drivers are discussed as well as scale-up feasibility and potential secondary uses.

Distributed Interoperable Research Experts Collaboration Tool (DIRECT)
G. Weber, Harvard Medical School; W. Barnett, University of Indiana; M. Conlon, University of Florida; D. Eichmann, University of Iowa; W. Kibbe, H. Falk-Krzesinski, Northwestern University; M. Halaas, Stanford School of Medicine; L. Johnson, University of Minnesota; E. Meeks, University of California, San Francisco; D. Mitchell, Stanford University School of Medicine; T. Schleyer, University of Pittsburgh, School of Dental Medicine; S. Stallings, University of Colorado Denver; M. Warden, Elsevier; M. Kahlon, University of California, San Francisco

Research networking tools use data-mining, social networking, and semantic web approaches to enable expertise discovery, matchmaking, and more. Several platforms have been built, such as the commercial product Elsevier’s SciVal Experts (formally ‘Collexis’), U.Pittsburgh’s DigitalVita, Harvard Catalyst Profiles, U.Florida’s VIVO, U.Iowa’s Loki, Northwestern’s LatticeGrid, Indiana’s HUB, and Stanford CAP; and, many additional institutions have also deployed at least one of these products. In August, 2010, the Clinical and Translational Science Award (CTSA) Research Networking Group launched an initiative, which included the leads of major research networking tools, to explore interoperability between products and to design a pilot
for a federated national network that connects both CTSA and non-CTSA institutions. Over the subsequent months, this group expanded to 29 institutions representing more than 50,000 researchers, established a set of guidelines for participation, and built a prototype federated site at http://direct2experts.org. This presentation will primarily review the technical architecture of the network, provide a live demonstration of how to locate expertise across the country, and illustrate the various user interfaces different institutions have developed for the network. We will also briefly present preliminary results of the pilot network, point out future challenges, and explain how others can participate in the national network.

**Rapid Identification of Toxic Chemicals During Emergencies: Integrating Search with Visual Analytics**

S. Bhavnani, University of Texas; A. Ganesan, University of Michigan; C. Weber, Washtenaw County Hazardous Materials Response Team

First responders have a critical need for rapidly identifying toxic chemicals during emergencies. However, current first-responder systems require a large number of inputs before a chemical can be identified. Here we demonstrate a novel system which significantly reduces the number of inputs required to identify a toxic chemical, and provides a visualization of the identification process to help first responders make sense of complex information during stressful situations. The system has been evaluated and demonstrated to first responders in the field. Current development efforts are focused on refining the prototype for deployment, and generalization to other datasets.

**5:00 – 6:00 pm Special Event**

AMIA Mentorship Meeting

AMIA Mentorship Program participants are invited to a meet-and-greet where mentor and mentee pairs can get together in person and kick-off what we expect to be a terrific year of mentoring. Please join us—many participants have found this face-to-face event to be rewarding and worthwhile.
7:00 - 8:15 am Committee Meetings

Awards Committee Meeting
Ethics Committee Meeting
Finance Committee Meeting
Working Group Steering Committee Meeting

7:00 am – 6:00 pm Registration Open

8:30 - 10:00 am Semi-plenary Sessions

S44 - Featured Presentation
Theme: Clinical Research Informatics

Informatics Year in Review
Daniel Masys, University of Washington

This popular review session presents notable events that have occurred in the past twelve months. Included will be new findings from the published literature, achievements in operational applications of informatics, changes in public policy and government, and emerging technologies. Implications of these events on the future of bioinformatics, clinical informatics and healthcare will be addressed. Dr. Masys is Affiliate Professor in the Department of Medical Education and Biomedical Informatics at the University of Washington Seattle.

S45 - Panel
Theme: Policy and Ethical Issues

The IOM ‘Future of Nursing’ Report: Informatics Implications
B. Westra, University of Minnesota; D. Alexander, GE Healthcare Information Technologies; Y. Bolla, AMIA; C. Delaney, University of Minnesota; S. Bakken, Columbia University; R. Kennedy, Thomas Jefferson University

The Institute of Medicine (IOM) completed a two-year study funded by the Robert Wood Johnson Foundation (RWJF) that examined evidence to answer the question, “What roles can nursing assume to address the increasing demand for safe, high-quality and effective healthcare services?” There are significant healthcare reform changes in process; however, the goals of reforming healthcare cannot be achieved without strengthening the largest segment of the workforce—nurses—as full partners and leaders in improving health and healthcare delivery. The IOM report had four high-level recommendations to improve and empower the future of nursing: 1) ensure that nurses practice to the full extent of their education and training; 2) improve nursing education; 3) provide opportunities for nurses to assume leadership positions and serve as full partners in healthcare redesign and improvement efforts; and 4) improve data collection for workforce planning and policy-making. The purpose of this panel is to relate the implications of this report for informatics practice, education, research, health policy, and alignment with AMIA’s strategic planning.

S46 - Featured Presentation

Introducing Watson into Clinical Practice: How Elementary Will It Be?
H. Chase, Columbia University, College of Physicians and Surgeons; D. Condek, IBM, Watson Strategy Team; E. Siegel, University of Maryland School of Medicine; E. Shortliffe, AMIA (Moderator)

“Chronic kidney disease for $500 please!” Although providers are unlikely to utter these words as they search for appropriate medical information and clinical guidelines to diagnose and manage patients with CKD, they may soon have an advanced computer system reading their notes and listening to their conversations with patients. IBM’s wunderkind, Watson, who decisively bested the two greatest champions in Jeopardy! history in February 2011, is now being reconfigured to be used in
healthcare. Think of the possibilities: answering providers’ medical questions in a split second, diagnosing diseases from the EHR that are unrecognized by providers, or identifying treatments that are guideline-based and modified for the individual patient. The panelists will focus on three aspects of Watson’s potential to reduce the information gap between provider and what is “actually known.” Herbert Chase will provide an overview of current information needs and how Watson might be used to satisfy them; David Gondek will describe the science behind Watson and how Watson decides what is the best information; and Eliot Siegel will discuss the process of taking Watson through “medical school” and potential gaps and challenges associated with realization of its full potential in healthcare.

10:00 – 10:30 am Coffee Break

10:00 am – 2:00 pm Exhibition Hall Open

10:30 am -12:00 pm Scientific Sessions

S47 - Featured Presentation
Theme: Translational Bioinformatics and Biomedicine/ Clinical Research Informatics

The Joint Summits on Translational Science: Reflections and Aspirations
P. Payne, The Ohio State University; I. Sarkar, University of Vermont

The 2011 Joint Summits on Translational Science, held in San Francisco in March of 2011, was the second time that the Summit on Translational Bioinformatics (TBI) and the Summit on Clinical Research Informatics (CRI) were co-located. It was, however, the first time that the two meetings were purposely melded together with a number of events that spanned both meetings, including ‘Bridge Day’ that consisted of presentations and keynotes that spanned the content of both. Combining the TBI and CRI summits into a single event, along with cooperatively functioning Scientific Program Committees, is concomitant with the ultimate goal of crossing the often-described “translational barriers” in biomedicine. This panel will provide an overview of major topics that have been areas of emphasis in TBI and CRI since the first Summits, followed by a more detailed exposition of topics discussed at the 2011 Joint Summits, and concluding with discussion of how the convergence of TBI and CRI initiatives may help usher in a new era of biomedicine.

S48 - Panel
Theme: Clinical Workflow and Human Factors
Visualizing Change: The Role of Data Visualization in Health IT
B. Hesse, National Cancer Institute; B. Shneiderman, University of Maryland; M. Kreuter, Washington University; B. Rabin, Kaiser Permanente

Significant advances in high-throughput computing, interoperability, storage, and adoption of health information technologies may be heralding an era of “Big Data” in medicine. According to projections by the Institute of Medicine, these same advances can—and ought to—be used to enable “rapidly learning health systems” with data structures optimized for shortening the gap between discovery and practice. Understanding how to present data effectively in a rapidly learning health environment, however, will be a crucial step needed to avoid confusion, paralysis, and a sense of “data smog” among users. This panel will present the results of focused research funded by the National Cancer Institute (NCI) aimed at (a) understanding the information environment surrounding patients and clinicians within a data-intensive environment, (b) understanding the cognitive and behavioral constraints surrounding the consumption and use of health data, and (c) developing the scientific knowledge needed to improve presentation of large-scale data sets in both clinical and public health settings in the future. Such a basic investment
Advances in Clinical Question Answering: Watson Meets Healthcare
J. Hurdle, University of Utah; G. Savova, Harvard University; M. Kohn, IBM Research; D. Demner-Fushman, U.S. National Library of Medicine; R. Nielsen, University of Colorado at Boulder; H. Yu, University of Wisconsin–Milwaukee

This panel offers a thought-provoking discussion on a topic that stirred up an unprecedented amount of chatter in the AMIA Natural Language Processing Working Group community. Our goal is to review the state of the art of clinical question answering systems (cQA) in light of the brilliantly showcased achievement of IBM’s Watson QA system on the Jeopardy! game show. We take a nontraditional approach to this panel’s format by briefly describing three important cQA tools, followed by three perspectives on the clinician’s view of cQA in the world of life-after-Watson. Setting the stage, a lead IBM scientist will provide an overview of IBM’s Watson technology and their healthcare plans. The panel will leave 20 minutes for discussion with the audience.

Learning objectives for the panel: 1) Attendees will be able to describe the special nature of clinical question asking at the point of care; 2) Attendees will understand how to compare and contrast three state-of-the-art clinical question answering systems; 3) Moving beyond the recent publicity, attendees will leave with an understanding of how IBM’s technology is being repurposed for healthcare. This panel is sponsored by the AMIA NLP WG.

Education for the Clinical Informatics Subspecialist
W. Hersh, Oregon Health & Science University; C. Friedman, Office of the National Coordinator for Health IT; B. Munger, University of Arizona; R. Gardner, University of Utah

The clinical informatics subspecialty is likely to become a reality for physicians in the next one to two years. In addition to rigorous on-the-ground training, clinical informatics specialists will need comprehensive educational programs covering the knowledge base of the field. This panel will bring together four individuals involved in the subspecialty’s educational efforts and related areas to discuss the educational needs of future specialists and how related programs, such as the ONC University-based Training Program (and other programs) can adapt to meet these needs.

Federating Clinical Data from Six Pediatric Hospitals: Process and Initial Results from the PHIS+ Consortium
S. Narus, R. Srivastava, R. Gouripeddi, O. Livne, P. Mo, University of Utah; J. Bickel, Children’s Hospital Boston; D. de Regt, Seattle Children’s Hospital; J. Hales, University of Utah/Intermountain Healthcare; E. Kirkendall, Cincinnati Children’s Hospital Medical Center; R. Stepanek, Child Health Corporation of America; J. Toth, Children’s Hospital of Pittsburgh; R. Keren, Children’s Hospital of Philadelphia
SCIENTIFIC SESSIONS

The Department of Veterans Affairs, Department of Defense, and Kaiser Permanente Nationwide Health Information Network Exchange in San Diego: Patient Selection, Consent, and Identity Matching
O. Bouhaddou, J. Bennett, T. Cromwell, G. Nixon, J. Teal, R. Smith, M. Davis, L. Fischetti, Department of Veterans Affairs; D. Parker, Department of Defense; Z. Gillen, J. Mattson, Kaiser Permanente

Cross-mapping Clinical Notes Between Hospitals: an Application of the LOINC Document Ontology
L. Li, C. Morrey, D. Baorto, NewYork-Presbyterian Hospital

Electronic Laboratory Data Quality and the Value of a Health Information Exchange to Support Public Health Reporting Processes
B. Dixon, Regenstrief Institute & Indiana University; J. McGowan, Indiana University School of Medicine; S. Grannis, Regenstrief Institute

Comparison of OWL and SWRL-based Ontology Modeling Strategies for the Determination of Pacemaker Alerts Severity
O. Dameron, P. Van Hille, L. Temal, Université de Rennes/INSERM; A. Rosier, Université de Rennes/INSERM/Institut Catholique Lillois; L. Deleger, C. Grouin, P. Zweigenbaum, LIMSI-CNRS; A. Burgun, Université de Rennes/INSERM

A Discriminative Approach to EEG Seizure Detection
A. Johnson, Georgia Institute of Technology; D. Sow, A. Biem, IBM Research

Sample-efficient Learning with Auxiliary Class-label Information
Q. Nguyen, H. Valizadegan, A. Seybert, M. Hauskrecht, University of Pittsburgh

A Surveillance Tool to Support Quality Assurance and Research in Personalized Medicine
N. Khan, Vanderbilt University; J. Peterson, Vanderbilt University/VA Tennessee Valley Healthcare System

OpenMRS, a Global Medical Records System Collaborative: Factors Influencing Successful Implementation
N. Mohammed-Rajput, Regenstrief Institute/Indiana University School of Medicine; D. Smith, Regenstrief Institute; B. Mamlin, P. Biondich, Regenstrief Institute/Indiana University School of Medicine; B. Doebbeling, Regenstrief Institute/Indiana University School of Medicine/Center for Implementing Evidence-based Practice

How Can a Computer be Useful to You? A Feasibility Study to Elicit Perceptions of Computers in Rural India
S. Bhavnani, University of Texas Medical Branch; A. Chavan, Human Factors International, Inc.; S. Maroo, Indian Institute of Technology; I. Jain, Mphasis BFL, Ltd

Evaluation of an Android-based mHealth System for Population Surveillance in Developing Countries
Z. Rajput, Regenstrief Institute; S. Mbugua, D. Amadi, V. Chepng’eno, USAID-AMPATH Partnership; J. Saleem, Veterans Health Administration; Y. Anokwa, C. Hartung, G. Borriello, University of Washington; B. Mamlin, Regenstrief Institute; S. Ndege, USAID-AMPATH Partnership; S. Ndege, Moi University; M. Were, Regenstrief Institute, Inc. and Indiana University School of Medicine
Beyond Regional Health Information Exchange in China: a Practical and Industrial-Strength Approach
S. Liu, B. Zhou, G. Xie, J. Mei, H. Liu, IBM Research-China; C. Liu, L. Qi, IBM China Software Development Lab

S54 – Papers: Text Mining Drugs
Theme: Data Mining, NLP, Information Extraction

PASTE: Patient-centered SMS Text Tagging in a Medication Management System
S. Stenner, K. Johnson, J. Denny, Vanderbilt University School of Medicine

Using Medical Text Extraction, Reasoning and Mapping System (MTERMS) to Process Medication Information in Outpatient Clinical Notes
L. Zhou, Partners HealthCare/Brigham and Women’s Hospital/Harvard Medical School; J. Plasek, L. Mahoney, Partners HealthCare; N. Karipineni, Partners HealthCare/Brigham Medical School; F. Chang, Partners HealthCare; X. Yan, Brigham and Women’s Hospital; F. Chang, D. Dimaggio, D. Goldman, Partners HealthCare; R. Rocha, Partners HealthCare/Brigham and Women’s Hospital/Brigham Medical School

Variability in Drug Formularies and Implications in Decision Support
M. Stephens, J. Finnell, L. Simonaitis, M. Overhage, Regenstrief Institute/Indiana University

Modeling Drug Exposure Data in Electronic Medical Records: an Application to Warfarin
M. Liu, M. Jiang, V. Kawai, C. Stein, D. Roden, H. Xu, Vanderbilt University; J. Denny, Vanderbilt School of Medicine

S55 – Papers: Health Care Quality & Delivery
Theme: EHRs and Achieving Meaningful Use

Assessing the Motivation of MDs to use Computer-based Support at Point-of-Care in the Emergency Department
D. O’Sullivan, Aston University; J. Doyle, Dundalk Institute of Technology; W. Michalowski, University of Ottawa; S. Wilk, Poznan University of Technology; K. Farion, University of Ottawa/Children’s Hospital of Eastern Ontario; C. Kuziemsky, University of Ottawa

All Health Care is Not Local: an Evaluation of the Distribution of Emergency-Department Care Delivered in Indiana
J. Finnell, M. Overhage, S. Grannis, Regenstrief Institute & Indiana University

Reducing Missed Laboratory Results: Defining Temporal Responsibility, Generating User Interfaces for Test Process Tracking, and Retrospective Analyses to Identify Problems
S. Tarkan, C. Plaisant, B. Shneiderman, University of Maryland; A. Hettinger, MedStar Institute for Innovation & Washington Hospital Center

From Simply Inaccurate to Complex and Inaccurate: Complexity in Standards-based Quality Measures
D. Dorr, A. Cohen, M. Williams, Oregon Health & Science University; J. Hurdle, University of Utah

S56 - Theater-style Demonstrations: Informatics and Open-Source Systems
Theme: Interactive Systems

The Regenstrief G3 System: a User-Centered CPOE Built on an Open-source Framework
J. Duke, B. Mamlin, D. Martin, Regenstrief Institute & Indiana University School of Medicine
The Regenstrief Institute, a pioneer in physician order entry and clinical decision support systems, is currently in the midst of deploying a new platform built on open-source technologies. The centerpiece of this effort is G3, a CPOE designed to support advanced research in clinical decision support, usability, physician workflow, and patient safety. We will be demonstrating this new system, with a focus on its interface design, CDS architecture, natural language processing capabilities, and provider communications. We also will be discussing our user-centered design process, opportunities for collaboration, and future development plans.

Open-source, Standards-based Software to Enable Decision Support
G. Del Fiol, K. Kawamoto, University of Utah; J. Cimino, U.S. National Institutes of Health–Clinical Center

Open-source, standards-based clinical decision support (CDS) could catalyze significant improvements in health and healthcare. In this panel, co-chairs of the HL7 CDS Work Group and leaders of multi-institutional initiatives to develop open-source, standards-based CDS software will discuss this promising approach to developing highly scalable CDS. The panelists will demonstrate a suite of open-source CDS software, including: (1) a reference implementation of the HL7/OMG Decision Support Service standard (OpenCDS); (2) a reference implementation of the HL7 Infobutton standard (OpenInfobutton); and (3) a knowledge-management tool that enables users with no programming background to create and maintain HL7-compliant infobutton- manager knowledge bases (LITE; Librarian Infobutton Tailoring Environment).

LB3 – Late-breaking Session: to be announced

10:30 am – 2:00 pm Posters

Poster Session 2 Preview
Attendance by authors is optional in this session, which allows registrants to browse posters at their leisure. The poster session, with authors present, takes place from 5:15 to 7:00 pm.

Theme: Clinical Decision Support, Outcomes, and Patient Safety

Prevalence of Drug-drug Interaction Alerts and Override by Type
E. Ahn, H. Kam, R. Park, Ajou University

A Naive Bayes Classifier to Estimate Mandibular Growth by the Cervical Vertebral Maturation Method
R. Baptista, C. Quaglio, L. Mourad, C. Ortolani, I. Pisa, Universidade Federal de São Paulo

Automated Creation of Clinical Progress Notes with Machine Learning
M. Cham, Blenderhouse

Designing an Integrated Dynamic Display of Health Data for Aging in Place
A. Chandra, University of Missouri-Columbia; Y. Gong, University of Missouri

A Survey on Nurses’ Interpretations of the Braden Scale Parameters
J. Choi, University of Massachusetts Amherst; J. Choi, Spaulding Rehabilitation Hospital; H. Kim, University of California San Diego

Evaluating Clinical Decision Support for Population Health Management
E. Eisenstein, R. Edwards, Duke Clinical Research Institute; K. Kawamoto, Duke University; K. Anstrom, J. Willis, Duke University Medical Center; J. Simo, Duke University; S. Yaggy, NC Foundation for Advanced Health Programs; D. Lobach, Duke University Medical Center
TUESDAY, OCTOBER 25 • AMIA 2011

POSTERS

Nursing Non-pharmacologic Interventions in Post-operative Pain Management
F. FitzHenry, Department of Veterans Affairs
Tennessee Valley Healthcare System and Vanderbilt University School of Medicine; J. Doran; M. Dietrich, Vanderbilt University Medical Center; S. Littlejohn; Y. Chen; M. Matheny, Vanderbilt University; J. Ehrenfeld, N. Wells, Vanderbilt University Medical Center

Decision Support System in Diagnoses and Prescription of Physical Activity
E. Gomes, Federal University of São Paulo; C. Barsottini, J. Wainer, Federal University of São Paulo–UNIFESP

Transitioning from Adverse Drug Event Surveillance to Prevention
K. Heard, K. Faulkner, P. Milligan, BJC HealthCare; P. Milligan, Washington University School of Medicine

Information Needs for Rapid Response Team (RRT) Mobile Application.
V. Herasevich, S. Caples, J. Jensen, O. Gajic, B. Pickering, Mayo Clinic

Evaluation of Documentation of Delirium in the VA Electronic Health Record
C. Hope, SLC VA IDEAS Center; N. Estrada, VASLCHCS; A. Gundlapalli, University of Utah; J. Garvin, Salt Lake City VA Medical Center; M. Lincoln, Veterans Health Affairs; C. Weir, B. Sauer, University of Utah; B. Sauer, SLC IDEAS Center

Clinical Decision Support System Applied to Kidney Transplantation Using Feature Selection
A. Hummel, R. Maciel, R. Baptista, P. Schor, I. Pisa, Universidade Federal de São Paulo

Collaborative Knowledge Acquisition by Eye Tracking for the Design of Context-Aware Alert Systems: a Feasibility Study
E. Joffe, O. Havakuk, Tel Aviv Medical Center, V. Patel, UTHealth

Using Clinical Decision Support to Identify Sepsis Outside the Intensive Care Unit in a Community-based Hospital
T. Jukes, Sutter Health and UC Davis School of Medicine; M. Daly, M. Larrabee, Sutter Health

Reasoning with Effects of Clinical Guideline Actions Using OWL
G. Leonardi, S. Quaglini, Università di Pavia, M. Peleg, University of Haifa, S. Tu, Stanford University, P. Russo, G. Palladini, G. Merlini, IRCCS Policlinico San Matteo Foundation and University of Pavia

Performance of Automated Adverse Drug Event (ADE) Triggers Designed for the Ambulatory Setting

The Greasemonkey Firefox Add-On for Altering Display of Data in a Web-based Electronic Medical Record
A. McCoy, The University of Texas Health Science Center at Houston (UTHealth) and UT-Memorial Hermann, J. Peterson, Vanderbilt University Medical Center and Vanderbilt University School of Medicine

Classification of Clinical Trial Eligibility Criteria to Support Semantic Linkage of Research and Clinical Care Data
K. Milian, A. Teije, F. Harmelen, Vrije Universiteit, A. Bucur, Philips Research
An Analysis of Clinical Decision Support for Repetitive Urine Culturing
A. Noto, Case Western Reserve University; P. Greco, The MetroHealth System; D. Kaelber, The MetroHealth System/Case Western Reserve University

Physician Prescribing Experiences Over Time After Transitioning from an Older to a Newer Electronic Health Record
E. Pfoh, V. Patel, E. Abramson, S. Malhotra, S. Osorio, A. Cheriff, R. Kaushal, Weill Cornell Medical College

The Association of Electronic Health Record-based Reminders with Hypertension Screening and Blood Pressure Control at U.S. Primary Care Visits
L. Samal, Brigham and Women’s Hospital, J. Linder, S. Lipsitz, L. Hicks, Brigham and Women’s Hospital/ Harvard Medical School

A Personal Health Record Module Improves Documentation of Family History
J. Schnipper, Brigham and Women’s Hospital; L. Volk, Partners HealthCare, J. Wald, Harvard Medical School; T. Gandhi, D. Williams, Partners HealthCare, B. Middleton, Partners HealthCare System

Automatic Calculation of Low-Risk Monitoring Based on TISS Score
R. Smairat, B. Pickering, Y. Dong, A. Hanson, V. Herasevich, Mayo Clinic

Computer-Assisted Diagnosis in Dysmorphology: from Compendiums to Diagnostic Systems
F. Suarez-Obando, S. Viswesvaran, University of Pittsburgh

Toward a Decision Basis of Breast Reconstruction: Defining the Alternatives
C. Sun, D. Wang, J. Lee, The University of Texas at Austin; G. Reece, M. Fingeret, M. Crosby, E. Beahm, The University of Texas MD Anderson Cancer Center; M. Markey, The University of Texas at Austin

Do Copied Electronic Notes Reflect Patient Care? A Study of Lifestyle Counseling Documentation in Patients with Diabetes
A. Turchin, Partners HealthCare; S. Goldberg, Massachusetts General Hospital; E. Breydo, Partners IS; M. Shubina, Brigham and Women’s Hospital; J. Einbinder, Partners HealthCare System

Nursing Perceptions of Electronic Health Record (EHR) Alerts
T. Winden, Allina Hospitals and Clinics

Identifying Invalid Childhood Vaccinations Among Patients in an Inner-City Health Care System
V. Zhu, S. Grannis, W. Tu, M. Rosenman, S. Downs, Indiana University School of Medicine & Regenstrief Institute

Theme: Clinical Research Informatics

Techniques for Federating Queries Across Different “Ontologies” in i2b2
A. Abend, A. Mandel, M. Palchuk, Recombinant Data Query Chains for Dynamic Generation of Value Sets
J. Brinkley, L. Detwiler, University of Washington

The Use of an Electronic Workflow Solution in Community-based Research
M. Co, Jr., Y. Lee, R. Lucero, Columbia University
Leveraging a Regional Health Information Exchange (HIE) to Accelerate a Population-based Epidemiology Study
P. Embi, The Ohio State University; K. Alwell, C. Moomaw, P. Hoskins, R. Witzke, University of Cincinnati; J. Khoury, Cincinnati Children’s Hospital Medical Center; D. Kleindorfer, B. Kissela, University of Cincinnati

Using the OpenMRS Open-source EMR Platform to Support a Large Study of TB Epidemiology
H. Fraser, D. Thomas, Partners In Health; J. Tomaylla, N. Garcia, L. Lecca, Socios En Salud, M. Murray, Brigham and Womens Hospital; M. Becerra, Harvard

Computerized Patient Interviews: Complexity Scoring
M. Gnieski, S. Reti, Beth Israel Deaconess Medical Center; C. Safran, Harvard Medical School, H. Kowaloff, E. Kaldany, Beth Israel Deaconess Medical Center; W. Slack, Harvard Medical School; H. Feldman, Beth Israel Deaconess Medical Center

GluHMap: A Novel Visualization of Continuous Glucose-Monitoring Data Using Heatmaps
J. Hubbard, Beth Israel Deaconess Medical Center and Harvard Medical School; S. Reti, Harvard Medical School; H. Feldman, Beth Israel Deaconess Medical Center; H. Wolpert, Joslin Diabetes Center and Joslin Clinic; C. Safran, Harvard Medical School

Impact of a Patient Portal to Improve Quality of Care in an Autism Clinic
S. Kleinfelder, J. O’Rourke, C. Ferron, A. Zai, D. Berkowicz, J. Chung, A. Neumeyer, Massachusetts General Hospital

Cognitive Walkthrough Evaluation of an Investigator Profiles Directory

A Step Against Re-identification: Keep Low Volume Query Result Inside Your Data Source
J. Liu, OSU Medical Center; S. Erdal, OSUMC; J. Kamal, OSU Medical Center

Understanding Behavioral Intent to Participate in Shared Decision-making in Medically Uncertain Situations
R. Maffei, UT Health Science Center

Identifying Patients with High Hospitalization Cost Using Psychosocial Characteristics
J. O’Rourke, J. Weilburg, A. Zai, Massachusetts General Hospital

The Linked Clinical Data Project: Applying Semantic Web Technologies for Phenomics Using Electronic Medical Records
J. Pathak, R. Kiefer, C. Chute, Mayo Clinic

Simplifying High Throughput Electronic Phenotyping
P. Peissig, A. Miller, N. Yoder, J. Starren, L. Rasmussen, Marshfield Clinic Research Foundation

Improving NLP Throughput Through Multi-threading
D. Redd, Q. Zeng-Treitler, University of Utah

Developing a Middleware to Collect Minimum Data Set for Cross-institutional Lymphedema Research
J. Reneker, University of Missouri; S. Xu, J. Armer, B. Stewart, University of Missouri-Columbia; C. Shyu, University of Missouri

Trends in Genetic Testing Using Electronic Health Records (EHRs)
J. Ronquillo, W. Lester, Massachusetts General Hospital & Harvard Medical School; R. Sakai, Juntendo University School of Medicine; C. Li, Harvard School of Public Health
Heat Maps as a Tool for Large, In-hospital Database Visualization for Rapid Hypothesis Generation  
G. Simon, P. Li, V. Fiadosau, Mayo Clinic; P. Sampathkumar, Infectious Diseases; A. Hanson, V. Herasevich, B. Pickering, Mayo Clinic

VA Informatics and Computing Infrastructure’s VINCI Workspace  
T. Trautman, J. Nebeker, L. Derby, V. Barrett, H. Saoudian, J. Scehnet, VA Salt Lake City Health Care System

Monitoring and Improving Mental Health Treatment Outcomes Using REDCap  
T. Weigel, T. Idiculla, A. Laband, A. Busch, McLean Hospital

Applying Diffusion of Innovations Theory to Implementation of a Clinical Trials Management System  
A. Wilcox, J. Weiss, B. May, M. Paulson, Columbia University

Integrating a Web-based Geographic Information System for Lymphedema Stakeholders  
S. Xu, J. Armer, B. Stewart, University of Missouri-Columbia; C. Shyu, University of Missouri

Effective Information Management in Cancer Registries: Evaluating and Addressing the Needs for Cancer Research and Data Collection  
I. Zachary, University of Missouri; J. Thompson, Missouri Cancer Registry, M. King, N. Cole, University of Missouri

Theme: Clinical Workflow and Human Factors

Systematic Collection of Patient-Reported Outcomes Within an EHR-based Clinical Workflow  
C. Bae, M. Speck, I. Katzan, Cleveland Clinic

Developing and Evaluating a Nursing Hand-off Tool for the iPadTM  
J. Blaz, S. Kapsandoy, University of Utah, N. Staggers, University of Maryland

Structured Data Availability in New Ambulatory EHR Implementations: the Case for/against Manual Data Abstraction and Preloading  
M. Brunelle, A. Bempong, Northwestern University/CHITREC; Z. Rahman, University of Illinois

Using a Novel Method to Reveal Language Patterns Used by Nurses to Communicate Patient Status Associated with a Clinical Event  
J. Carrington, University of Colorado

Workflow Considerations of a Computerized Asthma Management System in the Pediatric Emergency Department  
D. Aronsky, J. Dexheimer, Vanderbilt University

Automated Triaging Method of Telereferral Service in the Philippines  
R. Fernandez, I. Cardenas, M. Pedrena, R. Gavino, A. Wee, University of the Philippines Manila National Telehealth Center; A. Gavino, National Library of Medicine; P. Fernandez-Marcelo, A. Marcelo, University of the Philippines Manila National Telehealth Center

The Feasibility of Using Cycle Feedback to Fit the Operating Room System Implementation  
F. Huang, Armed Forces Taichung General Hospital

Bringing Narrative Data into the Oncology Clinic Workflow: Pilot Testing  
K. Johnson, P. Brennan, University of Wisconsin-Madison
Clinician Information Needs for Data Visualization-based Diabetes Risk-assessment and Guideline Compliance
A. Joshi, L. Levine, S. Jaladi, R. Padman, D. Neill, Carnegie Mellon University; C. Harle, University of Florida; F. Solano, University of Pittsburgh Medical Center; J. Zgibor, University of Pittsburgh

A Methodology for Reducing the Occurrence of Technology-induced Error in Health Information Systems
A. Kushniruk, University of Victoria

Integrated Electronic Documentation in Maternal-neonatal Nursing and Indicators Collection for Baby-friendly Hospital Initiative
Y. Lee, T. Chien, F. Hsu, S. Hsu, Chi Mei Medical Center

Application of Laboratory Testing and Simulation to Assess the Usability of Integrated Clinical Prediction Rules in an Electronic Health Record
A. Li, Mount Sinai School of Medicine; D. Mann, Boston University School of Medicine; A. Kushniruk, University of Victoria; T. McGinn, North Shore-LIJ Health System; Hofstra North Shore-LIJ Medical School; D. Edonyabo, L. Romero, J. Arciniega, Mount Sinai School of Medicine; D. Chrimes, University of Victoria, J. Kannry, Mount Sinai Medical Center

PsychVACS (v.2.0): A System for Asynchronous Telepsychiatry (ATP) Across Cultural Barriers
A. Odor, P. Yellowlees, D. Hilty, A. Riedl, N. Than, M. Burke, University of California Davis Health System; A. Iosif, University of California Davis

Analysis of Triage Workflow in the Pediatric Emergency Department (ED): Implications for Development of a Clinical Decision Support System (CDSS)

Software Supporting the Certification of an IVD-Point-of-Care Testing Service According to ISO-15189 and ISO-22870 and Its Linkage to an ASTM-E2369-05 Continuity-of-Care Record
B. Spyropoulos, Technological Education Institute of Athen; E. Oikonomi, M. Botsivaly, TEI Athens

Cognitive Engineering Approach to Visualizing Clinical Data
T. Thyvalikakath, M. Dziabiak, M. Torres-Urquidy, University of Pittsburgh; A. Acharya, Marshfield Clinic Research Foundation; T. Schleyer, University of Pittsburgh, School of Dental Medicine

Evaluation of Medication Alerts for Compliance With Human Factors Principles: a Multi-Center Study
M. Zachariah, S. Phansalkar, Partners HealthCare; S. Phansalkar, Brigham & Women’s Hospital; H. Seidling, University of Heidelberg and University Hospitals of Geneva; L. Volk, Partners HealthCare; M. Bloomrosen, AMIA; D. Bates, Partners HealthCare and Brigham & Women’s Hospital

Comparative Analysis of Diagnostic Test-ordering Procedures in Emergency Departments
A. Ricksecker, T. Pressler, A. Wagner, P. Payne, The Ohio State University
**POSTERS**

**Theme: Consumer Informatics and Multimedia PHRs**

**Use of Real-Time Geographic Information Systems in Health Promotion**  
U. Backonja, P. Brennan, University of Wisconsin-Madison

**Weekly Lapse Prediction in mHealth Intervention for Alcoholism**  
M. Chih, University of Wisconsin; T. Patton, University of Wisconsin–Madison; D. Gustafson, University of Wisconsin

**Physician Variation by Specialty in Personal Health Record Use**  
B. Crotty, Y. Tamrat, Beth Israel Deaconess Medical Center; S. Reti, Harvard Medical School; H. Feldman, Beth Israel Deaconess Medical Center; B. Landon, C. Safran, Harvard Medical School

**Satisfaction With Care Among Patients in Practices Undergoing Patient-centered Medical Home Transformation**  
R. Dhopeshwarkar, R. Kaushal, A. Edwards, L. Kern, Weill Cornell Medical College

**A Colorectal Cancer Survivor’s Personal Health Record**  
D. Haggstrom, VA HSR&D Center on Implementing Evidence-based Practice and Indiana University; H. Xiao, J. Leventhal, Regenstrief Institute; M. Walsh, Indiana University; K. Norton, Regenstrief Institute; M. Weiner, VA HSR&D Center on Implementing Evidence-based Practice and Indiana University

**Enhancing Communication After Treatment: What Cancer Patients Want From a Quality-of-Life Dashboard**  
A. Hartzler, K. Olson, B. Dalkin, J. Gore, University of Washington

**Probabilistic Model-based Dynamic Elicitation and Personalized Recommendation of Preventive Health Services**  
M. Kao, Stanford University Medical Center; C. Chen, UCSF School of Medicine; S. Yu, A. Tam, K. Ng, A. Brodeur, The FreeHealth Team

**A Framework of CHI-related Consumer Health Outcome Expectations**  
C. LeRouge, C. Van Slyke, Saint Louis University; G. Deckard, Florida International University; S. Joshi, R.O.C.

**The Development of a Computer-based Fall Prevention Intervention in a Predominately Latino Population**  
R. Lucero, B. Sheehan, Columbia University; D. Nobile-Hernandez, 2ARC XVI Ft. Washington Senior Center; P. Yen, Ohio Sate University; O. Velez, S. Bakken, Columbia University

**Communication Networks in Online Breast Cancer Support Groups**  
K. Namkoong, University of Wisconsin-Madison; M. Chih, University of Wisconsin; D. Shah, University of Wisconsin-Madison; D. Gustafson, University of Wisconsin

**Effect of a Promotional Video on Patient Portal Registrations**  
F. North, B. Hanna, S. Crane, S. Smith, S. Tulledge-Scheitel, R. Stroebel, Mayo Clinic

**“Personal Theories” from Observations of Daily Living**  
T. Patton, P. Brennan, University of Wisconsin–Madison

**Assessing Patients’ Attitudes Concerning Medication Management Through Personalized Health Records**  
J. Philips, T. Pressler, P. Payne, The Ohio State University
Home Telemonitoring: Comparing Cognitive Reactions to Receiving Risk Measures
K. Shea, Arizona State University

Developing a Smartphone-based Peak Flow Meter
Y. Su, C. Lin, P. Chang, National Yang-Ming University

Impact of Outreach Efforts on an Untethered PHR: myNYP.org
V. Tiase, S. Fatalevich, A. Boyer, NewYork-Presbyterian Hospital

Mom-O-Meter: A Self-help Pregnancy Android App
B. Tulu, E. Agu, Worcester Polytechnic Institute

Theme: Data Integration and Exchange

FURTHeR Federation of Clinical Trials
R. Bradshaw, B. LaSalle, S. Narus, University of Utah

LOINC Learns to Speak Italian: Translation and Mapping of LOINC in Italy
M. Chiaravalloti, Università degli Studi della Calabria, D. Vreeman, Indiana University School of Medicine; D. Vreeman, Regenstrief Institute, Inc

Geospatial Enhancement of a Health Information Exchange
B. Dixon, Regenstrief Institute; K. Comer, The Polis Center at IUPUI; A. Martin, Regenstrief Institute; N. Devadasan, The Polis Center at IUPUI; S. Grannis, Regenstrief Institute

Secondary Data Reuse in Comparative Effectiveness Research: a Model Framework
D. Fort, K. Riordan, C. Cowansage, A. Wilcox, Columbia University

The UICollaboratory: Expanding Social Networking for Research
M. Garrett, J. Byelick, A. Garcia, P. Tej, D. Hynes, University of Illinois at Chicago

Distributed Interoperable Research Experts Collaboration Tool (DIRECT)
M. Kahlon, University of California, San Francisco; W. Barnett, University of Indiana; M. Conlon, University of Florida; D. Eichmann, University of Iowa; W. Kibbe, H. Falk-Krzesinski, Northwestern University; M. Halaas, Stanford School of Medicine; L. Johnson, University of Minnesota; E. Meeks, University of California, San Francisco; D. Mitchell, Stanford University School of Medicine; T. Schleyer, University of Pittsburgh, School of Dental Medicine; S. Stallings, University of Colorado Denver; M. Warden, Elsevier; G. Weber, Harvard Medical School

Integrating Genomic Risk Reports Into an EMR Through a Data Warehouse
J. Kamal, J. Liu, OSU Medical Center; J. Ding, The Ohio State University Medical Center; D. Newman, K. Sweet, A. Sturm, C. Link, S. Gecse, C. Marsh, OSU Medical Center

Design of Data-visualization Techniques for Integrated Assessment of Wellness
T. Le, K. Wilamowska, H. Thompson, G. Demiris, University of Washington

Integrated Access to Disease Information: the PubMed Disease Sensor

SRIEG: Secure Regional Images Exchange Gateway
M. Petru, G. Springer, M. Harris, C. Shyu, University of Missouri, Columbia
Developing Adoption-use Cases for a Statewide Master-person Index
G. Rehwoldt, University of Utah; J. Duncan, W. Xu, Utah Department of Health; S. Narus, University of Utah

Continuity of Care Document (CCD) Provides Medications and Laboratory Results to Drools Decision-support Engine
L. Simonaitis, Regenstrief Institute

Geographic Distribution of Patients Visiting a Health Information Exchange in New York City
S. Vaidya, NYCLIX, J. Shapiro, A. Onyile, Mount Sinai School of Medicine/NYCLIX Inc.; G. Kuperman, New York-Presbyterian Hospital/NYCLIX Inc.

Using REDCap to Administer a Delphi Study
A. Wyckoff, M. Cummins, B. Crouch, B. Wong, J. Abramson, P. Gesteland, University of Utah

Mining Optional Nursing Documentation Finds Links to Mortality
S. Collins, D. Albers, D. Vawdrey, Columbia University

A GATE Plug-in for Tagging French Medical Texts with UMLS concepts
T. Delbecque, P. Zweigenbaum, LIMSI-CNRS

A Medical Document Text Element Ontology
G. Divita, University of Utah; D. Finch, James A. Haley Veterans Hospital; B. South, VA Salt Lake City Health Care; S. Shen, University of Utah; J. Jarman, VISN 8 Falls Clinic–James A. Haley VAMC (118M); Q. Zeng-Treitler, University of Utah

Analysis of UMLS Terms Occurrence in Renal Biopsy Reports
A. Falcao, A. Reis, F. Nicolas, UNIFESP; E. Ruiz, Universidade de Sao Paulo; I. Pisa, Universidade Federal de Sao Paulo

Clinical Note Type Analysis
S. Fodeh, C. Brandt, Yale University, Q. Zeng-Treitler, D. Redd, G. Divita, University of Utah

Assessing Disease Co-occurrences Using Association Rule-mining and Public Health Data Sets
R. Kost, Fletcher Allen Health Care, E. Chen, B. Littenberg, University of Vermont

Theme: Data Mining, NLP, Information Extraction
Exploring Predictive Models of ACS Outcomes with a Longitudinal, Multi-institutional Patient Database
W. Black, E. Horvitz, University of Washington; E. Horvitz, Microsoft Research; M. Yetisgen-Yildiz, J. Gennari, University of Washington

Use of Association Rule-mining to Assess Diabetes Risk in Patients with Impaired Fasting Glucose
P. Caraballo, M. Castro, S. Cha, P. Li, G. Simon, Mayo Clinic

Integrating i2b2 and R to Identify and Evaluate Potential Adverse Drug Reactions Using Secondary Use EMR Data
V. Castro, V. Gainer, Partners HealthCare, S. Murphy, Harvard/Partners

Assessing Disease Co-occurrences Using Association Rule-mining and Public Health Data Sets
R. Kost, Fletcher Allen Health Care, E. Chen, B. Littenberg, University of Vermont

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Assigning Brand Names to Drug Monographs in PubMed Health
J. Li, Z. Lu, U.S. National Library of Medicine

Temporal Information Extractor: Identifying Symptom Onset Date from Emergency Department Notes
D. Mahalingam, R. Medlin, D. Travers, S. Haas, University of North Carolina at Chapel Hill

Creation of a Gold Standard for EHR-based Information Retrieval
K. Natarajan, H. Chase, N. Elhadad, Columbia University

An Application Programming Interface for NDF-RT
L. Peters, T. Nguyen, O. Bodenreider, U.S. National Library of Medicine

Automated Classification of Death Events: Using Natural Language Processing in Public Health
A. Riedl, K. Anderson, University of California Davis Health System; E. Geraghty, University of California Davis; M. Hogarth, UC Davis School of Medicine

An Informatics Approach to Methicillin Resistant Staphylococcus Aureus Surveillance in the Department of Veterans Affairs
M. Rubin, VA Salt Lake City Health Care System and University of Utah School of Medicine; J. Garvin, Salt Lake City VA Medical Center; B. Doebbeling, S. Gullans, R.L. Roudebush VAMC, HSR&D; M. Merchant, Roudebush VAMC; R. Martinello, P. Mutalik, VA Connecticut Healthcare System/Yale School of Medicine; M. Goldstein, VA Palo Alto Health Care System; S. Luther, James A. Haley VMAC; M. Samore, B. South, VA Salt Lake City Health Care System

Diagnostic Delay in Graves’ Disease

Coverage of Manual De-identification on VA Clinical Documents
S. Shen, B. South, University of Utah & VA Salt Lake City Health Care; J. Friedlin, Regenstrief, S. Meystre, VA Salt Lake City Health Care

Statistical Approach for Categorizing Content in Medical Informatics, Computer Science and Health Domains
F. Teixeira, Universidade Federal de Sao Paulo; A. Hummel, E. De Domenico, UNIFESP; L. Araujo, USP, I. Pisa, Universidade Federal de Sao Paulo

Combined Bootstrap Approach for Correcting Conflated Terms Error in Radiology Reports
R. Wilson, University of Pittsburgh; B. Chapman, University of California San Diego

Extraction of Pneumonia Cases From Free-text Intensive Care Unit Reports
M. Yetisgen-Yildiz, B. Glavan, F. Xia, University of Washington; L. Vanderwende, Microsoft Research; M. Wurfel, University of Washington

Theme: EHRs and Achieving Meaningful Use

Mapping the Data Deluge to LOINC®—Tsunami, Downpour or Drought?
P. Banning, 3M Health Information System

Developing and Embedding a Pediatric Pain Management Clinical Informatics System—a Preliminary KBNI Project
K. Chen, C. Hsu, M. Chang, Taipei Medical University–Wan Fang Hospital

Analyzing the Prevalence of Hedges in Electronic Health Record-oriented Phenotyping Algorithms
M. Conway, J. Pathak, Mayo Clinic
Qualitative Analysis of End-user Challenges Encountered During a Large-scale Outpatient EMR Implementation at an Academic Medical Center
S. Hom, J. Lyman, B. Sullivan, Z. Maclsaac, N. Ellero, W. Cohn, J. Harrison, Jr., S. Borowitz; University of Virginia Health System

Electronic Health Records and Ambulatory Quality of Care
L. Kern, Y. Barr, R. Dhapeshwarkar, R. Kaushal, Weill Cornell Medical College

Lessons Learned from Designing Clinical Data Modeling for National Surveillance of Intractable Disease in Japan
E. Kimura, S. Kobayashi, K. Ishihara, Medical School of Ehime University

Evaluation of Medical Safety in an e-Health Information System Through Incident Reports Management System
T. Matsumoto, Nagasaki University Hospital

Existence and Content of Academic Hospital Policies That Address Physician Documentation in Electronic Health Records
J. McGreevey III, S. George, C. Hanson III, University of Pennsylvania Health System

Physician Readiness to Respond to the HITECH Act: EHR Adoption from 2008–2010
V. Patel, M. Buntin, Office of the National Coordinator for Health IT; E. Jamoom, National Center for Health Statistics; C. Hsiao, National Center for Health Statistics

The Impact of Ambulatory Electronic Health Records on Healthcare Costs
C. Salzberg, Brigham & Women’s Hospital; J. Adler-Milstein, Harvard University; C. Franz, Eastern Research Group; J. Orav, D. Bates, Brigham & Women’s Hospital

An Evaluation of the Impact of Additional Longitudinal Data on an EMR-Based Phenotype Algorithm for Identifying Type 2 Diabetes Mellitus Subjects
W. Wei, University of Minnesota Twin Cities & Mayo Clinic; C. Chute, C. Leibson, Mayo Clinic

Extracting and Inserting Meaningful Use Concepts into UFuRT Models
M. Zhu, University of Texas at Houston; M. Walji, University of Texas Dental Branch at Houston; J. Zhang, The University of Texas

Theme: Global eHealth

Global OpenELIS: Progress on an Open-source Laboratory Information System in Haiti and Cote d’Ivoire
J. Flowers, B. Lober, L. Nixon, University of Washington

Identifying Needs for Informatics Solutions in Latin America
J. Puyana, University of Pittsburgh, P. Ordonez, University of Maryland; C. Gomez, Pontificia Universidad Javeriana; C. Rojas, Oak Ridge National Laboratory; A. Ruiz, J. Ruiz, Pontificia Universidad Javeriana; J. Camacho, G. Douglas, University of Pittsburgh

Information Needs and Technical Self-efficacy of Midwives in Rural Ghana

Theme: Imaging Informatics

Proxy PACS Servers for Image Delivery Through an Information Warehouse
S. Erdal; J. Liu, C. Key, J. Kamal; The Ohio State University Medical Center; B. Clymer, The Ohio State University
**Multi-channel Image Browser for Feature Analysis of Smooth Muscle Cells**
M. Grasso, University of Maryland School of Medicine

**Improving Image Quality in Cine Phase-contrast MRI Using Constrained Reconstruction with a Temporal Constraint**
J. Hulet, D. Parker, J. Facelli, University of Utah

**A Novel Masking Technique for Pulmonary Vasculature Segmentation**
X. Song, University of California, San Diego

**Medical Imaging Informatics Bench to Bedside**
Y. Wang, S. Murphy, Partners HealthCare; D. Marcus, T. Olsen, Washington University St. Louis; C. Herrick, D. Sack, T. Wang, Partners HealthCare; R. Gollub, Massachusetts General Hospital; S. Pieper, Isomics, Inc.; W. Plesniak, Brigham and Women’s Hospital, Harvard Medical School; J. Wei, Radiology Informatics; K. Andriole, Brigham and Women’s Hospital; P. Lamonica, W. Tellier, Children’s Hospital

**Theme: Informatics Education and Workforce Development**

**Where do Biomedical Informaticians Live? Analysis of Geographic Distribution of AMIA Annual Symposium Attendees 2008-2010**
A. Hanson, V. Herasevich, Mayo Clinic; W. Hersh, Oregon Health & Science University; B. Pickering, R. Rader, AMIA

**Preliminary Findings and Early Lessons Learned from IT Professionals in Health Care (‘Workforce’) Program**
K. Lowell, C. Markovitz, NORC at the University of Chicago; M. Swain, Office of the National Coordinator for Health Information Technology; J. Kronstadt, S. Brown, E. Zurawski, L. Rosenberger, NORC at the University of Chicago; M. Silver, JBS International

**EMR Practicum at University of Wisconsin-Milwaukee**
T. Patrick, E. Dohman, C. Lindell, N. Tabesh-Saleki, N. Rahming, University of Wisconsin-Milwaukee

**Native versus Non-native English-speaking PubMed Users: an Interactive Study**
K. Vanopstal, University College Ghent; R. Vander Stichele, G. Laureys, Ghent University; J. Buysschaert, University College Ghent

**Theme: Informatics in Clinical Education**

**The Biomedical Information and Informatics Curriculum Thread: a Partnership Between Biomedical Informatics and a Health Sciences Library**
D. Beaudoin, University of Utah; J. Le Ber, A. Honisett, J. Shipman, Spencer S. Eccles Health Sciences Library; J. Mitchell, University of Utah

**Information-seeking Practices of Medical Professionals and Students in Low- and Middle-income Countries**
A. Gavino, U.S. National Library of Medicine; B. Ho, P. Wee, A. Marcelo, University of the Philippines Manila-National Telehealth Center; P. Fontelo, U.S. National Library of Medicine

**Technology-based Cooperative Learning to Enhance Critical Thinking and Skill Acquisition**
Z. Lin, Tzu-Chi College of Technology; M. Lee, National Dong Hwa University

**Experience of Using Online Second Opinion in the Brazilian Public Primary Healthcare System**
M. Novaes, L. Sanches, Universidade Federal de Pernambuco; M. Lopes, State University of Campinas; D. Alves, J. Machiavelli, Universidade Federal de Pernambuco
**Theme: Interactive Systems**

**More Than Looks Alone: Cognitive Support in an Emergency Department Information Display System**  
B. Berster, Y. Liu, M. Zhang, V. Patel, J. Zhang, D. Robinson, A. Franklin, University of Texas Health Science Center at Houston

**A Platform for the Recruitment and Enrollment of One Million Veterans for Genomic Medicine**  

**Using the UMLS as a Semantic Priming Mechanism for Co-reference Resolution in Annotation of Clinical Texts**  
T. Forbush, VA Salt Lake City Healthcare System; S. Shen, J. Thibault, C. Weir, University of Utah; O. Uzuner, University at Albany, SUNY; B. South, VA Salt Lake City Health Care

**Radical Redesign of the Electronic Medical Record Using a Hybrid Design Framework**  
K. Keshavjee, InfoClin Inc., University of Victoria; J. Goss, OCAD University and University of Toronto; J. Cafazzo, University Health Network, University of Toronto

**Building a Smartphone-based EMR: From Concept to Design to Prototype**  
R. Lu, MGH Institute of Health Professions

**Dart Hits Its Mark**  
J. Scehnet, L. Derby, G. Larimer, VA Salt Lake City Health Care System/University of Utah; T. Trautman, VA Salt Lake City Health Care System; L. Kok, VA Information Resource Center (VIReC); V. Barrett, VA Salt Lake City Health Care System; J. Nebeker, VA Salt Lake City Health Care System/University of Utah

**Theme: Policy and Ethical Issues**

**Proposed Evaluation Methodology for the SMArt Adoption**  
J. Baran, E. Ramly, L. Hu, N. Chan, P. Brennan, University of Wisconsin-Madison

**Analysis of the Workflows, Resources, and Barriers in Public Health Law Research and Practice**  
J. Keeling, J. Merrill, Columbia University

**Workspace Crossover and Partnership Tension in Informatics Innovation**  
W. Petey, University of Utah School of Medicine; J. Reid, Utah Office of Public Health Informatics; Y. Livnat, University of Utah; M. Samore, University of Utah, VA Salt Lake City Health Care System; W. Xu, Utah Office of Public Health Informatics

**National Initiatives to Implement Health Information Technology in the United States: Perspectives of Key Policy Experts**  
E. Zimlichman, R. Rozenblum, C. Salzberg, Y. Jang, R. Tamblyn, D. Bates, Brigham & Women’s Hospital

**Theme: Public Health Informatics and Biosurveillance**

**Improved Automated Encoding of Death Certificates to Identify Pneumonia and Influenza Deaths**  
K. Davis, C. Staes, J. Facelli, University of Utah; J. Duncan, Utah Department of Health; R. Price, S. Igo, University of Utah

**A Month in the Life of an Automated Public Health Notifiable Condition Detector**  
J. Friedlin, R. Gamache, S. Grannis, Regenstrief Institute, Indiana University School of Medicine
A Framework for Novel Population Health Decision Support Technology for the Bidirectional Transmission of Clinician Case-reporting

S. Grannis, Regenstrief Institute; R. Gamache, Indiana University; J. Friedlin, Regenstrief; D. Revere, University of Washington

Impact of Two-dimensional Barcoding of Vaccine Product Labels on Data Exchange: Stakeholder Perspectives and Preliminary Review of Standards


Applying Standards to Public Health: an Information Model for a Global Rare-diseases Registry


OCEANS: Observational Cohort Event Analysis and Notification System

M. Matheny, Vanderbilt University, TVHS Veterans Administration; L. Nookala, S. Eden, Vanderbilt University Medical Center; U. Govindarajulu, Brigham & Women’s Hospital, Harvard Medical School; S. Normand, Harvard Medical School; R. Cope, Brigham & Women’s Hospital, Coping Systems, Inc.; L. Ohno-Machado, University of California San Diego; F. Resnic, Brigham & Women’s Hospital, Harvard Medical School

Spatial Distribution of Viral Hepatitis Hospitalizations in the State of Sergipe, Brazil

M. Santos, K. Arajo, Universidade Federal de Sergipe-UFS; P. da Silva, Federal University of Sergipe

Best Practices in Implementing and Integrating Health IT Infrastructure: Lessons Learned from 10 Case Studies of Local and State Public Health Agencies

P. Soper, NORC at the University of Chicago

Visualizing Influenza Activity Using the iPhone Platform

M. Torres-Urquidy, E. Neuhaus, L. Finelli, U.S. Centers for Disease Control and Prevention

Systematic Approach to Analysis of Immunization Information Systems Operations and Processes

W. Williams, U.S. Centers for Disease Control and Prevention (CDC); D. Lyalin, Northrop Grumman Corp.

The New National Hospital Care Survey and Use of Electronic Data Collection

M. Wolford, C. DeFrances, S. Williams, U.S. Centers for Disease Control and Prevention/NCHS; B. Gugerty, Gugerty Consulting, LLC

Theme: Simulation and Modeling

Addressing Errors in a Retrospective Observational ICU Database

F. Callaghan, D. Demner-Fushman, S. Abhyankar, C. McDonald, National Institutes of Health

Theme: Terminology and Standards

Telehealth Second-Opinion Archetypes for Case-study Standardized Shared Information in Brazil

M. Bernon-Hegray, ISIS, UFPE-NUTES; F. Silva, A. Campos, M. Novaes, UFPE

SNOMED CT® Content-request System for the United States

Results of an ICD-10-CM Coding Pilot Study Related to Clinical Documentation
S. Fenton, J. Moczygemba, Texas State University; K. Mechler, R. Morrow, Texas A&M Rural and Community Health Institute

Data Warehousing Resources to Support VA Research: VA/CMS Data for Research Project
L. Kok, K. de Groot, M. Brown, D. Hynes, D. Kan, K. Stroupe, G. Brown, Department of Veterans Affairs; S. Eisen, Veterans Health Administration

The Development in Use of Nursing Classifications in a Psychogeriatric Ward
T. Meum, Tromsø Telemedicine Laboratory

Bringing Cancer Registry Data in NAACCR Format to i2b2
M. Palchuk, Recombinant Data, T. Jatkar, A. Mandel, Recombinant Data Corp.; J. Chubak, G. Hart, Group Health Research Institute

Theme: Translational Bioinformatics and Biomedicine

Harvard Catalyst Profiles: Using VIVO’s Semantic Web RDF Ontology for Research Networking
G. Weber, Harvard Medical School

12:15 – 1:30 pm Business Meeting
State of the Association Meeting

1:45 - 3:15 pm Scientific Sessions

S57 - Featured Presentation
Theme: EHRs and Achieving Meaningful Use

AMIA Informatics Vendor Consortium
C. Lehmann, Johns Hopkins University; B. Byrnes, Edward Hospital; S. Downs, Regenstrief Institute; S. Weinberg, Vanderbilt University Medical Center

There is significant demand from pediatricians for child health-specific clinical decision support to be integrated into electronic health records (EHRs). To achieve this critical milestone, the American Academy of Pediatrics (AAP) is interested in partnering with the vendor community to explore and discuss creative approaches to providing AAP clinical content. As such, the AAP hosted a Vendor Consortium on Monday June 6, 2011, to investigate ways in which to partner with the vendor community to distribute AAP knowledge and expertise in an electronic format that can be linked to, or embedded within electronic health records (EHRs). The one-day consortium provided an opportunity for vendors to: learn more about the pediatric community and their needs relative to EHR system usage; learn more about AAP content and explore market opportunities for the dissemination of pediatric content through EHR systems; and provide feedback on how the AAP could best serve the EHR-vendor community.

The Use of ICD-9 Codes in Genetic Association Studies
L. Bastarache, J. Denny, Vanderbilt University School of Medicine

Characterizing Error and Uncertainty of Centroid-based Genomic Predictors
M. Ebbert, J. Facelli, University of Utah; R. Bastien, ARUP Institute for Clinical and Experimental Pathology; P. Bernard, University of Utah Huntsman Cancer Institute

A Formal Representation of Phenotyping Algorithm Elements
G. Jiang, J. Pathak, C. Tao, H. Solbrig, C. Chute, Mayo Clinic College of Medicine
and its pediatrician clients. A series of pre interviews were conducted prior to the consortium to provide background information and to begin solicitation of each vendor’s perspective on potential uses of clinical information in their systems and solutions. Findings from these calls indicated that while there was quite a bit of variability amongst vendor needs and knowledge, there were some shared themes around standardization and guideline consensus.

**S58 - Panel**  
Theme: Clinical Decision Support, Outcomes, and Patient Safety

### Legal and Ethical Issues of Computer Decision Support and Order-Sets

R. Koppel, University of Pennsylvania; J. Daniel, Office of the National Coordinator on HIT; S. Hoffman, Case Western Reserve University, E. Zych, Geisinger Health System; J. Boehne, Brigham and Women’s Hospital; B. Kaplan, Kaplan Associates

Concern is increasing about liabilities associated with Computer Decision Support. These concerns are reflected in several over-arching questions: 1. Will hospitals, agencies, and companies offering CDS alerts or other forms of computer-mediated information be held responsible for errors that might arise from use of that information? 2. If a clinician acts according to an alert, but the outcome is bad, will the designers or approvers of the alert be held liable? 3. Will a clinician be able to use CDS guidance as a defense, or might there be liability because he/she naively followed the guidance when he/she should have known it was inappropriate for that patient? 4. On the other side of the equation, what liability concerns are associated with ignoring or overriding CDS alerts or order-sets suggestions—especially in light of the reality that most alerts are ignored or overridden? This panel provides a new and comprehensive taxonomy of computer-assisted information. Then it will review the policy implications, including liability, risk managers, IT leaders, the role of attorneys and other non-clinicians in affecting these decisions. We also discuss the structure of vendor–provider relationships in establishing alerts, order-sets, menus, and information displays.

**S59 - Panel**  
Theme: Data Integration and Exchange

### Allergies: Issues Related to Interoperability for Patient Care and Research

E. Ayres, J. Cimino, National Institutes of Health–Clinical Center; R. Leftwich, State of Tennessee; S. Huff, Intermountain Healthcare; C. Jaffe, Health Level 7

The management of drug, food and environmental allergy information within any healthcare practice is essential for patient safety. With the implementation of electronic healthcare systems documentation, practices for recording allergies and other reactions remain inconsistent. Primary allergy documentation must support drug-allergy alerts, clinical decision support, adverse event reporting, secondary use for research and interoperability. This panel explores the issues related to the primary documentation of allergies and other reactions in the electronic health record, factors necessary to meet meaningful use core measures for allergies, and proposed models to enable interoperability for patient care and research.

**S60 – Panel**  
Theme: Consumer Informatics and Multimedia Personal Health Records PHRs

### The Role of the Clinician in a Patient Power Context

C. Safran, W. Slack, Harvard Medical School; P. Brennan, University of Wisconsin–Madison; S. Okun, Patients-LikeMe; D. deBronkart, e-patient Dave

One of the goals of the HITEH act of 2009 is to engage patients and their families in their health care. In 1970,
Warner Slack coined the term “Patient Power” and since then, many have developed tools and conducted research to make this a reality with or without clinician participation. Our panel focuses on the role of the clinician to enable patient and family participation. Dr. Slack will discuss his work on patient-computer dialogue and describe a current approach to patient-entered, Internet-based medical histories. Dr. Brennan will discuss the evolution of personal health technologies in Project HealthDesign, a $10-million national program of the Robert Wood Johnson Foundation (RWJF) designed to stimulate innovation in personal health information technology by using PHRs as springboards for action and improved health decision-making. Dr. Safran will discuss the use of eHealth among populations thought to lack access to the Internet and experience with eHealth applications. Sally Okun will discuss the role of health-related social networking sites such as PatientsLikeMe to empower patients and to enable patients to enter health related data, and from the patient’s perspective. “ePatient Dave”— Dave deBronkars—will respond to the clinician-centric view of patient empowerment.

S61 – Papers: Clinical Research Informatics & Text Mining
Theme: Data Mining, NLP, Information Extraction

Predicting Adverse Drug Events from Personal Health Messages
B. Chee, R. Berlin, B. Schatz, University of Illinois at Urbana-Champaign

Pattern Mining for Extraction of mentions of Adverse Drug Reactions from User Comments
A. Nikfarjam, G. Gonzalez, Arizona State University

Extracting Temporal Constraints from Clinical Research Eligibility Criteria Using Conditional Random Fields
Z. Luo, S. Johnson, C. Weng, Columbia University, A. Lai; The Ohio State University

Automated Plan-recognition of Chemotherapy Protocols
H. Bhatia, M. Levy, Vanderbilt University School of Medicine

S62 – Papers: Collection & Simulation of Public Health Informatics
Theme: Public Health Informatics and Biosurveillance

Linking Supermarket Sales Data to Nutritional Information: an Informatics Feasibility Study
K. Brinkerhoff, P. Brewster, E. Clark, K. Jordan, M. Cummins, J. Hurdle, University of Utah

Wireless Data Collection of Self-administered Surveys Using Tablet Computers
K. Singleton, M. Lan, C. Arnold, M. Vahidi, L. Arangua, L. Gelberg, A. Bui, University of California Los Angeles

Simulation Analysis Platform (SnAP): a Tool for Evaluation of Public Health Surveillance and Disease-control Strategies
D. Buckeridge, C. Jauvin, A. Okhmatovskaia, A. Verma, McGill University

A Cloud-based Simulation Architecture for Pandemic Influenza Simulation
H. Eriksson, M. Raciti, M. Basile, A. Cunsolo, A. Froberg, O. Leifler, J. Ekberg, T. Timpka, Linköping University

S63 – Papers: Medication Adverse Events & Alerts
Theme: Clinical Decision Support, Outcomes, and Patient Safety

Integration of Heterogeneous Clinical Decision Support Systems and Their Knowledge Sets: Feasibility Study with Drug-drug Interaction Alerts
H. Kam, Samsung Advanced Institute of Technology; R. Park, Ajou University, J. Kim; Kwandong University; I. Cho, Inha University; Y. Kim, Seoul National University
A Successful Model and Visual Design for Creating Context-aware Drug-drug Interaction Alerts
J. Duke, Regenstrief Institute; D. Bolchini, Indiana University School of Informatics

Structured vs. Unstructured: Factors Affecting Adverse Drug Reaction Documentation in an EMR Repository
S. Skentzos, M. Shubina, J. Plutzky, Brigham and Women’s Hospital; A. Turchin, Partners HealthCare

A Drug-adverse Event Extraction Algorithm to Support Pharmacovigilance Knowledge Mining from PubMed Citations
W. Wang, K. Haerian, H. Salmasian, R. Harpaz, C. Friedman, Columbia University

Identifying Certification Criteria for Home Care EHR Meaningful Use
P. Sockolow, Drexel University; M. Adelsberger, University of Pennsylvania Health System; K. Bowles, University of Pennsylvania

Analyzing the Heterogeneity and Complexity of Electronic Health Record-oriented Phenotyping Algorithms
M. Conway, Mayo Clinic; R. Berg, Marshfield Clinic Research Foundation; D. Carrell, Group Health Cooperative; J. Denny, Vanderbilt University; A. Kho, Northwestern University; I. Kullo, Mayo Clinic; J. Linneman, Marshfield Clinic; J. Pacheco, Northwestern University; P. Peissig, L. Rasmussen, Marshfield Clinic Research Foundation; N. Weston, Group Health Cooperative; C. Chute, J. Pathak, Mayo Clinic

Automatically Detecting Problem-list Omissions of Type 2 Diabetes Cases Using Electronic Medical Records
J. Pacheco, W. Thompson, A. Kho, Northwestern University

The Role of the Electronic Medical Record in the Assessment of Health-related Quality of Life
S. Pakhomov, University of Minnesota; N. Shah, H. Van Houten; P. Hanson, S. Smith, Mayo College of Medicine

Patient Safety Problems Associated with Healthcare Information Technology: an Analysis of Adverse Events Reported to the U.S. Food and Drug Administration
F. Magrabi, M. Ong, University of New South Wales; W. Runciman, Australian Patient Safety Foundation, University of South Australia; E. Coiera, University of New South Wales

Evaluation of Medication List Completeness, Safety, and Annotations
M. Owen, N. Chang, D. Vawdrey, Columbia University

Using RxNorm and NDF-RT to Classify Medication Data Extracted from Electronic Health Records: Experiences from the Rochester Epidemiology Project
J. Pathak, S. Murphy, B. Willaert, H. Kremers, Mayo Clinic; B. Yawn, Olmsted Medical Center; W. Rocca, C. Chute, Mayo Clinic

An Approximate Matching Method for Clinical Drug Names
L. Peters, T. Nguyen, O. Bodenreider, U.S. National Library of Medicine; J. Kapusnik-Uner, First DataBank
**Identifying Symptom Groups from Emergency Department Presenting Complaint Free Text Using SNOMED CT**
A. Wagholikar, M. Lawley, D. Hansen, The Australian e-Health Research Centre; K. Chu, Royal Brisbane and Women’s Hospital

**Anomaly and Signature- filtering Improve Classifier Performance for Detection of Suspicious Access to EHRs**

**Role Prediction using Electronic Medical Record System Audits**
W. Zhang, Vanderbilt University, C. Gunter, Univeristy of Illinois at Urbana- Champaign, D. Liebovitz, Northwestern University, J. Tian, B. Malin, Vanderbilt University

**Query Log Analysis of an Electronic Health Record Search Engine**
L. Yang, Q. Mei, K. Zheng, D. Hanauer, University of Michigan

**A Bill of Rights for Physician–users of Electronic Health Records**
D. Sittig, University of Texas Health Sciences Center

The U.S. Government has made a multi-billion dollar investment in electronic health record (EHR) infrastructure in an attempt to transform healthcare delivery systems. This initiative is experiencing significant challenges, often related to the poor fit between technology and clinical workflow. Assurances must be provided that EHRs will deliver the features and functions physicians’ require and that the regulatory environment will support them. This presentation describes ten “rights” which, if turned into reality, will help overcome many of these challenges and provide these basic assurances to physician-EHR users. These rights represent not merely desirable, but the minimum, essential set of EHR features, functions, and user privileges that physicians require to provide the highest quality, safest, and most cost-effective care.

**The Emergence of the Informatics Practitioner: Occupational and Educational Perspectives**
W. Hersh, Oregon Health & Science University

The field of biomedical and health informatics has changed profoundly over the years. One of the most substantial recent changes is emergence of professionals who play the role of informatics “practitioner” in healthcare organizations, research institutions, companies, and academic centers. In this ACMI Senior Member Presentation, a senior leader in the field will share his perspective of this change from the standpoint of an academic department leader and educational program director. He will review the research about the informatics workforce and describe educational programs and other activities that have emerged to meet those needs.
**S69 - Panel**  
Theme: Clinical Research Informatics

**The Open-source Software Development Process in the Informatics Community for Integrating Biology and the Bedside (i2b2)**  
S. Murphy, M. Mendis, Partners HealthCare; A. McMurry, Harvard Medical School; G. Weber, Beth Israel Deaconess Hospital

The i2b2 software developed over the past five years provides clinical investigators with tools necessary to integrate medical record- and clinical research-data in the genomics age, using a software suite to construct and integrate the modern clinical research chart (CRC). Since the first complete release of the i2b2 software platform in November of 2007, there has been a remarkable adoption rate by hospitals and clinical research centers worldwide. The interest arises from the uniqueness of the platform to allow exploration of healthcare data from the Electronic Medical Record (EMR) to approach certain types of research questions. i2b2 software enables the enterprise’s research community to find sets of interesting patients from electronic patient medical record data, while preserving patient privacy through a query tool interface. This has simulated a great deal of interest and support from the software industry which is heavily involved with many of the implementation sites at the enterprise level. The ways in which this complex platform can be maintained as open-source software will be discussed and critiqued in this panel.

**S70 - Panel**  
Theme: EHRs and Achieving Meaningful Use

**Meaningful Evaluation of Large-scale Health Informatics Interventions**  
R. Hibberd, N. Barber, A. Takian, The School of Pharmacy–University of London; A. Sheikh, The University of Edinburgh

Substantial investments made in electronic health record (EHR) systems across the world, including through the U.S. Health Information Technology for Economic and Clinical Health (HITECH) Act have resulted in adoption of national dimensions. Meaningful evaluation of HIT initiatives, however, is necessary to inform successful adoption. We will explore the lessons that can be drawn from two independent, longitudinal, in situ national evaluations done by the English National Health Service (NHS) National Programme for IT. Our panel will explore lessons for evaluation that can be drawn from evaluations of the implementation of England’s Electronic Health Record (EHR) in secondary care, the NHS Care Records Service (CRS), and the Electronic Prescription Service (EPS) in primary care. We will focus on the design and conduct of meaningful evaluation of Health Information Technologies (HIT), evaluation that supports development, use, and ‘working out’ of HIT by stakeholders over a technology’s life.

**S71 - Panel**  
Theme: Interactive Systems

**Four Steps to Using Research Networking Effectively at Your Institution**  
G. Weber, Harvard Medical School; A. Chatterjee, E. Meeks, L. Yuan, University of California, San Francisco

Research networking software tools are rapidly being adopted by many academic healthcare centers across the country, providing investigators with a new means of finding collaborators and facilitating the formation of multi-disciplinary, multi-institutional studies. This panel will present four short talks that provide institutions with important steps that will guide them in implementing a research networking tool: (1) Learn about cutting-edge features of research networking tools, such as linked open data and social network analysis; (2) Use standard APIs, such as OpenSocial, to leverage a community of developers. (3) Incentivize usage and understand your audience; (4) Use data, tools, and strangers to measurably improve user interfaces.
S72 – Papers: CRI: Aggregation & Clustering
Theme: Clinical Research Informatics

Using RxNorm for Cross-institutional Formulary Data Normalization Within a Distributed Grid-computing Environment
R. Wynden, P. Lakshminarayanan, University of California San Francisco; N. Anderson, University of Washington; M. Casale, T. Thimman, University of Rochester; K. Anderson, L. Errecart, University of California Davis Health System; J. Prosser, University of Washington; A. Livshits, M. Weiner, University of Pennsylvania

The SHARPn Project on Secondary Use of Electronic Medical Record Data: Progress, Plans, and Possibilities
C. Chute, C. Beebe, K. Bailey, L. Hart, J. Pathak, Mayo Clinic; G. Savova, Harvard University; M. Schor, IBM T.J. Watson Research Center; S. Huff, Intermountain Healthcare

MiDas: Automatic Extraction of a Common Domain of Discourse in Sleep Medicine for Multi-center Data Integration
S. Sahoo, C. Ogbuji, L. Luo, X. Dong, L. Cui, G. Zhang, Case Western Reserve University; S. Redline, Harvard Medical School

Alignment and Clustering of Breast Cancer Patients by Longitudinal Treatment History
W. Lee, VA Healthcare System at Palo Alto & Stanford University; W. Bridewell, A. Das, Stanford University

S73 – Papers: Getting it Done: Vendors & Workforce
Theme: Informatics Education and Workforce Development

Developing an Online and In-person HIT Workforce Training Program Using a Team-based Learning Approach
F. Morrison, J. Zimmerman, M. Hall, H. Chase, Columbia University; R. Kaushal, J. Ancker, Weill Cornell Medical College

How Communities are Leveraging the Health Information Technology Workforce to Implement Electronic Health Records
J. Richardson, E. Abramson, E. Pfoh, R. Kaushal, Weill Cornell Medical College

Studying the Vendor Perspective on Clinical Decision Support
J. Ash, Oregon Health & Science University, D. Sittig, University of Texas Health Sciences Center; C. McMullen, The Center for Health Research, Kaiser Permanente Northwest; J. McCormack, Oregon Health & Science University; A. Wright, Brigham and Women’s Hospital; A. Bunce, J. Wasserman, V. Mohan, D. Cohen, M. Shapiro, Oregon Health & Science University; B. Middleton, Partners HealthCare

Characteristics Associated with Hospital Health IT Vendor Switching and Dropping
E. Lammers, K. Zheng, University of Michigan

S74 - Clinical Narratives: Text Mining
Theme: Data Mining, NLP, Information Extraction

Applying Active Learning to Assertion Classification of Concepts in Clinical Text
Y. Chen, S. Mani, H. Xu, Vanderbilt University
Determining Word Sequence Variation Patterns in Clinical Documents Using Multiple-sequence Alignment
F. Meng, C. Morioka, S. El-Saden, VA Greater Los Angeles Healthcare System

Detecting Abbreviations in Discharge Summaries Using Machine-learning Methods
Y. Wu, S. Rosenbloom, Vanderbilt University; J. Denny, Vanderbilt School of Medicine; R. Miller, S. Mani, D. Giuse, H. Xu, Vanderbilt University

Knowledge-based Method for Determining the Meaning of Ambiguous Biomedical Terms Using Information Content Measures of Similarity
B. McInnes, S. Pakhomov, University of Minnesota; T. Pedersen, University of Minnesota Duluth; Y. Liu, G. Melton, University of Minnesota

ADEpedia: A Scalable and Standardized Knowledge Base of Adverse Drug Events Using Semantic Web Technology
G. Jiang, H. Solbrig, C. Chute, Mayo Clinic College of Medicine

S76 – Papers: Patient Needs: Challenges & Opportunities
Theme: Consumer Informatics and Multimedia Personal Health Records PHRs

Sharing Is Caring, but not Error-free: Transparency of Granular Controls for Sharing Personal Health Information in Social Networks
A. Hartzler, M. Skeels, M. Mukai, C. Powell, P. Klasnja, W. Pratt, University of Washington

Drama and Danger: The Opportunities and Challenges of Promoting Youth Sexual Health Through Online Social Networks
T. Veinot, The University of Michigan, T. Campbell, YOUR Center; D. Kruger, A. Grodzinski, S. Franzen, University of Michigan

Use of Topic Modeling for Individualized Recommendation of Education Material to Patients
S. Kandula, D. Curtis, MIT, B. Hill, Q. Zeng-Treitler University of Utah

Supporting Cancer Patients’ Unanchored Health Information Management With Mobile Technology
P. Klasnja, A. Hartzler, C. Powell, W. Pratt, University of Washington

S77 - Partnerships in Innovation: Clinical Decision Support
Theme: Clinical Decision Support, Outcomes, and Patient Safety
Using Clinical Decision Support to Ensure Ordering of Appropriate High-tech Diagnostic Imaging Scans
J. Trevis, Institute for Clinical Systems Improvement

The use of high-tech diagnostic imaging (HTDI) scans was increasing 8 percent annually in Minnesota. This potential overuse contributed to patient exposure to unnecessary radiation, and unsustainable increases in healthcare costs. The Institute for Clinical Systems Improvement (ISCI) collaborated with medical groups, health plans and the Minnesota Department of Human Services to set up a three-year pilot in five medical groups. The pilot showed that using American College of Radiology standards embedded into an EHR could ensure more appropriate scans. Using decision support, it is estimated these five groups prevented 50 people from getting cancer, saved $84 million in three years, and significantly improved clinic efficiencies. There has been 0 percent growth in HTDI scans in Minnesota over the past three years. ICSI then aligned with Nuance Communications to provide a “common set of appropriateness criteria” that can be embedded into an EHR or accessed via the Web. This enabled ICSI to make this approach available to all medical groups in Minnesota. ICSI and Nuance are collaborating with health plans and medical groups to design and integrate the Nuance tool and to provide a back-end analysis tool that will enable medical groups to ultimately link their HTDI orders to patient outcomes.

Innovation Lab: Evidence-based Order-sets Tools from a Dynamic Hospital–Vendor Partnership
S. Claypool, Wolters Kluwer Health, K. Moidu, Orlando Health

Orlando Health had amassed a sizable library of order-sets within its Allscripts (Eclipsys) EHR, and built CPOE compliance of over 80 percent at its seven hospitals. As the situation matured, there was an urgent need—but no efficient way—to consolidate order-sets to conform to standards, meet quality protocols and guidelines. They turned to ProVation Order Sets, powered by UpToDate Decision Support, from Wolters Kluwer Health (WKH) to maintain and streamline development and consolidation of more than 500 order-sets. Leveraging the solution’s automated update capabilities required that existing order-sets be imported into its authoring tool, and a process established for identifying order-sets within the EHR for updating, then revising, consolidating, and returning to the system with embedded links to knowledge resources. Rather than attempting manual reconstruction, Orlando Health joined WKH’s “Innovation Lab,” where hospitals and WKH’s clinical informatics experts partner together to design solutions to problems hindering utilization of CDS tools. Innovation Lab developed tools that mapped order-sets from Orlando Health’s EHR and recreated them within ProVation Order Sets. They were then mapped to structured orderables in the software’s order catalog so they could be updated and integrated back into the EHR with limited manual intervention.

LB4 – Late-breaking Session: to be announced

4:00 – 7:00 pm Exhibition Hall Open

5:00 - 6:30 pm Business Meetings
Member Committee Meeting
Public Policy Committee Meeting

5:15 - 7:00 pm Poster Session
Poster Session 2
Authors are present at this session. Posters and authors are listed on page 87.

5:30 - 6:30 pm Business Meeting
ACMI Business Meeting
AMIA Board of Directors, JAMIA Board Members, and Working Group Chairs and members. Come to revel or to tip your hat and lend a round of applause for your peers and colleagues. All members are welcome. Not a member? Join today! Cash bar.

9:00 – 11:00 PM AMIA Lounge

You asked for an alternative to the jazz and high energy of the Dance Party. AMIA now offers Plan B—a mellower, gentler, more relaxed conclusion to the last full day of the Symposium. Enjoy free wi-fi, comfy furnishings, and a cash bar—perfect for connecting with your peers for drinks, conversation, and relaxation.

9:00 PM - 12:00 AM Dance Party

After the prolonged intensive concentration of the Scientific Sessions, here is the time and place to kick back and release your inner dance star! This party gets revved up with high velocity energy, a popular DC deejay, a nightclub vibe and cash bar. Get your dance on!
International Perspectives on Evaluating Large-scale Community-based Health Information Technology Projects

M. Honour, L. Kern, Weill Cornell Medical College; P. Dullabh, NORC University of Chicago; M. Bainbridge, University Victoria

Globally, health information technology is no longer primarily concentrated in academic medical centers, but is more widely adopted at the community level. With this proliferation of systems and settings, evaluation research has the potential to be more broadly generalizable and transferable than ever, while being more complex. This panel will bring together researchers in the field to discuss the potential value of evaluation research in these new settings, and examples of large-scale evaluation research. Panelists have designed and conducted multi-year, mixed-method evaluations with both formative and summative components. Dr. Kern will discuss methods and challenges associated with evaluation of the largest state investment in the U.S. in interoperable HIT and HIE, with focus on quantitative assessments of healthcare quality and efficiency. Dr. Dullabh will present considerations and challenges associated with evaluating the federally funded State Health Information Exchange (HIE) Cooperative Agreements Program. Dr. Bainbridge will present perspectives on telehealth and telecare from the UK and Canada.
The AMIA Student Working-Group (ST-WG) proposes a panel of representatives from the policy, academic, medical, and industry sectors that will provide insights and perspectives on careers in the new era of HITECH, which created the Health IT Workforce Program to assure a labor force properly trained and equipped to support the adoption and meaningful use of electronic health records. The Office of the National Coordinator of Health IT (ONC) foresees increasing demand for skilled health IT experts to support providers as the nation’s healthcare system becomes more technologically advanced.

**S80 - Panel**
Theme: Imaging Informatics

**Secondary Use of Medical Images: Opportunities for Informatics**
E. Siegel, University of Maryland; B. Chapman, University of California; S. Antani, National Library of Medicine; J. Kalpathy-Cramer, Massachusetts General Hospital. Moderator: W. Hsu, University of California, Los Angeles

In today’s clinical environment, patient care is largely dependent upon imaging to understand disease processes and to establish tangible evidence of response to treatment. Effective integration of imaging data and related patient information is a necessity. The Biomedical Imaging Informatics Working Group presents a panel of four experts who will discuss late-breaking research touching upon computational methods in data storage and sharing, information extraction, knowledge representation, and indexing and retrieval. The primary objectives of this panel are: 1) to learn about current research topics in imaging informatics, 2) to foster a discussion on how to address some of these challenges, and 2) to identify common needs shared across research topics. A period of free-form discussion will be allotted following the presentations to identify potential areas of collaboration between imaging informatics and the broader informatics community.

**S81 - Panel**
Theme: Informatics Education and Workforce Development

**Outlook for Student Informaticists in the Era of HITECH**
P. Sockolow, P. Dalrymple, Drexel University; D. Fridsma, Office of the National Coordinator for Health IT; D. Kaelber, Metro Health System; C. Underwood, Siemens Health Care

SNOMED CT is now mandated for use in the U.S. and in several other countries. However, SNOMED CT is known to contain errors of various sorts, particularly in the published hierarchies, and to lack any standard binding to Electronic Health Record data. Potentially such errors and lack of standardization make retrieval, post-coordination, and formulation of generic rules for patient care unreliable. How serious are these issues in practice? Now? In the future? What should be done about them? Do recent advances in description logic technologies and other techniques help? What are the priorities? Might the UMLS Core Problem Subset provide a focus? Other subsets or modules? What is already under way in the SNOMED organization, the IHTSDO? This panel explores these issues in relation to practical applications and standards development. The goal is to stimulate a wider discussion of the priorities for quality assurance of SNOMED CT to achieve meaningful use.
Wednesday, October 26 • AMIA 2011

**Scientific Sessions**

**S83** — Papers: If It Isn’t Important to You Now, It Will be: Interactive Systems for Elderly & Emergency Response
Theme: Interactive Systems

**Assessing the Usability of a Telemedicine-based Medication Delivery Unit for Older Adults through Inspection Methods**
F. Ligons, K. Romagnoli, S. Browell, H. Hochheiser, S. Handler, University of Pittsburgh

**Empowering Older Patients to Engage in Self-care: Designing an Interactive Robotic Device**
P. Tiwari, J. Warren, K. Day, University of Auckland

**Modeling the Oldest Old: Personas to Design Technology-based Solutions for Older Adults**
B. Reeder, O. Zaslavsky, K. Wilamowska, G. Demiris, H. Thompson, University of Washington

**Achieving Reliable Communication During Dynamic Emergency Responses**
O. Chipara, A. Plymoth, F. Liu, R. Huang, B. Evans, P. Johansson, R. Rao, W. Griswold, University of California San Diego

**S84** — Papers: Phenotype Risk Assessment
Theme: Data Mining, NLP, Information Extraction

**Automatic Computation of CHA2DS2–Vasc Score: Information Extraction From Clinical Texts for Thromboembolism Risk Assessment**
C. Grouin, L. Deleger, LIMSI-CNRS, A. Rosier, Faculté Libre de Médecine, L. Temal, O. Dameron, P. Van Hille, U936, A. Burgun, Laboratoire d’Informatique Medicale; P. Zweigenbaum, LIMSI-CNRS

**Evaluation of Semantic-based Information Retrieval Methods in the Autism Phenotype Domain**
S. Hassanpour, M. O’Connor, A. Das, Stanford University

**Medical Record and Imaging Evaluation to Identify Arterial Tortuosity Phenotype in Populations at Risk for Intracranial Aneurysms**
K. Diedrich, D. Parker, J. Roberts, R. Schmidt, University of Utah; L. Cannon-Albright, George E. Wallen Department of Veterans Affairs Medical Center; A. Yetman, Primary Children’s Medical Center

**Naïve Electronic Health Record-based Phenotype Identification for Rheumatoid Arthritis**
R. Carroll, Vanderbilt University School of Medicine; A. Eyler, Vanderbilt University Medical Center; J. Denny, Vanderbilt School of Medicine

**S85** — Papers: Implementing Usable Systems
Theme: Clinical Workflow and Human Factors

**Developing National eHealth Infrastructures—Results and Lessons from Europe**
K. Stroetmann, J. Artmann, V. Stroetmann, empirica GmbH

**Using a Unified Usability Framework to Dramatically Improve the Usability of an EMR Module**
C. Harrington, R. Wood, J. Breuer, O. Pinzon, R. Howell, M. Pednekar, M. Zhu, J. Zhang, University of Texas at Houston

**Implementation of an Electronic Referral System for Outpatient Specialty Care**
S. Straus, RAND, A. Chen, H. Yee, M. Kushel, UCSF/San Francisco General Hospital and Trauma Center; D. Bell, RAND/UCLA Department of Medicine

**The Knowledge Program: an Innovative, Unique Comprehensive Electronic Data Capture System and Warehouse**
I. Katzan, M. Speck, C. Dopler, J. Urchek, K. Bielawski, C. Dunphy, L. Jehi, C. Bae, A. Parchman, Cleveland Clinic
Automated Medication Reconciliation and Complexity of Care Transitions
P. Bozzo Silva, E. Bernstam, J. Herskovic, E. Markowitz, J. Zhang, The University of Texas Health Science Center at Houston; T. Johnson, The University of Texas Health Science Center at Houston/University of Kentucky College of Public Health

Application of a Temporal Reasoning Framework Tool in Analysis of Medical Device Adverse Events
K. Clark, University of Minnesota; D. Sharma, C. Chute, C. Tao, Mayo Clinic

A Prototype Knowledge Base and SMART App to Facilitate Organization of Patient Medications by Clinical Problems
A. McCoy, The University of Texas Health Science Center at Houston; A. Wright, Brigham and Women’s Hospital; A. Laxmisan, H. Singh, Baylor College of Medicine; D. Sittig, University of Texas Health Sciences Center at Houston

RxNav: Browser and Application Programming Interfaces for Drug Information Sources
L. Peters, U.S. National Library of Medicine (NLM)

Developed at NLM, RxNav was originally designed for displaying graphically and navigating the relations among various kinds of drug entities (ingredient, brand name, clinical drug, branded drug, etc.) in RxNorm. The entry module supports auto-completion and spelling correction. In addition to drug names, RxNav provides access to the National Drug Codes (NDC codes) for clinical and branded drugs, as well as external links to resources, such as DailyMed. RxNav was recently extended to provide access to additional drug information sources, including RxTerms and the Veterans Health Administration (VHA) National Drug File-Reference
Terminology (NDF-RT). The three datasets are updated monthly (with additional weekly additions to RxNorm). RxNav always displays the most recent releases of the datasets (from our servers) and does not require users to maintain local copies of the datasets. RxNav is a standalone Java Web Start application and requires an Internet connection. RxNav can be used behind a proxy server and is available at: http://rxnav.nlm.nih.gov/.

**Development and Implementation of Distributed Health Data Networks: Lessons from Medical Product Safety, Public Health Surveillance, and Comparative Effectiveness Research**

J. Brown, Harvard Pilgrim Health Care Institute; R. Rosen, Lincoln Peak Partners

This presentation will describe the development, implementation and selected uses of an open-source software platform (PopMedNet™) for the creation of distributed health data networks. A distributed health data network advances the secondary use of electronic health information by creating standardized and reusable data sources in multiple sites, as well as tools to use it. In a distributed system, each data-holder maintains physical control of their data behind their firewalls, protected by their security processes and rules. A distributed network allows data partners to assess, track, and authorize query requests, or categories of requests, on a case-by-case basis, thus facilitating participation. Several health data networks currently use or are planning to use this distributed data and analysis platform to support comparative effectiveness research, public health surveillance, and medical product safety studies. The presentation will highlight approaches for data standardization, capabilities for creating and distributing simple and complex queries, query result aggregation and management, and fine-grained control over query execution and transmission of results. Planned enhancements to the system will be described, including scheduling of queries for routine automated execution, enhanced role-based access control options, querying and aggregation capabilities, and privacy-preserving analytic and technical approaches for fully distributed multi-variate analysis.

**10:00 – 10:30 am Coffee Break**

**10:30 am - 12:00 pm Scientific Sessions**

**S89 - Panel**
Theme: Clinical Research Informatics

**Cross-boundary Collaboration on Secondary Use of Healthcare Data for Clinical Research**

Z. Cai, AstraZeneca Pharmaceuticals; J. Brownstein, Children’s Hospital Informatics Program; R. Robison, University of Utah School of Medicine; T. Yeatman, Moffitt Cancer Center; J. Weatherall, AstraZeneca Pharmaceuticals

Secondary use of healthcare data as real world evidence has become a forefront for clinical research areas, such as comparative effectiveness research, translational medicine, personalized healthcare, and proactive pharmacovigilance. Multiple healthcare stakeholders, such as regulatory agencies, healthcare providers, payers, patients, and pharmaceutical companies are all realizing the importance of demonstrating the effectiveness and long-term safety of a new medical treatment against other treatment options in real world settings. Such research is a natural and critical complement to the more familiar instrument of clinical research—the randomized, controlled trial. A variety of collaborations have been developed in this key emerging area, including industry–academia, government–academia, and industry–industry (e.g. pharma–payer/vendor) collaborations or partnerships. This panel will focus on these cross-boundary collaborations using real world examples presented by collaboration leaders from academia and industry.
development process using the Health Metrics Network (HMN) framework and the Public Health Informatics Institute (PHII) Business Process Matrix. Description of a focus group of experts representing major stakeholders (conducted after PHIN 2009, Atlanta) will be shared. The panel also will describe the GPHG use cases being considered as pilot projects. The pilot ‘global health information exchange’ aims to query various publicly available WHO data sources and provide mechanism of analysis, reporting and visualization. The session will conclude by describing the overall collaborative approach taken by the GPHG, phased plans, and immediate plans.

S92 - Panel
Theme: Terminology and Standards

Privacy Standards: Looking Beyond the HIPAA Privacy Rule
S. Vinterbo, University of California San Diego; B. Malin, Vanderbilt University; K. El Emam, CHEO Research Institute; S. Murphy, Partners HealthCare; L. Sweeney, Harvard University

Problems with the HIPAA Privacy Rule have been presented in the literature. The voiced criticism of the Privacy Rule focuses mostly on three issues, the discrepancy with other privacy regulations and the complications this creates, the lack of useful information left in the data after applying the ‘safe harbor’ for de-identification, and the insufficiency of the ‘safe harbor’ rule for providing credible de-identification. This panel will discuss whether de-identification in general is sufficient as a privacy criterion, and contrast re-identification risk assessment strategies for validation of de-identification with theoretical considerations. The panel also will explore an alternative formulation of what should constitute a privacy standard based on independence of disclosed information from individuals data. Come to discuss whether de-identification should be the focus of a future privacy standard.
SCIENTIFIC SESSIONS

S93 - Panel
Theme: Translational Bioinformatics and Biomedicine

In Silico Approaches to Drug Discovery

Despite increasing investments in pharmaceutical R&D, a paucity of new drugs are approved. Drug discovery continues to be a lengthy and resource-consuming process in spite of all the advances in genomics, life sciences, and technology. There is an ever-growing effort to apply computational power to improve the effectiveness and efficiency of drug discovery. With the emergence of new sciences such as systems biology and unprecedented volumes of high-throughput data in this post-genomic era, a new set of methods are being developed to expedite and facilitate drug discovery and reuse by examining and constructing networks of drug-target association and drug off-target effects at a systems level. These approaches include systematic analysis of chemical structures, transcriptional responses after drug treatment, and both apparent and hidden knowledge from the biomedical literature. The objective of the panel is to showcase new resources and computational methods for streamlining drug discovery and to discuss its challenges and opportunities. This discussion consists of a panel of experts from academia, government, and pharmaceutical industry, who have been actively involved in development of computational tools and resources for drug discovery.

S94 – Papers: Making Clinical Research Easier: Tools and Methods
Theme: Clinical Research Informatics

Evaluating Effectiveness of Clinical Alerts: a Signal Detection Approach
M. Ong, E. Coiera, University of New South Wales

Improving Adherence to Research Protocol Drug Exclusions Using a Clinical Alerting System
J. Cimino, L. Farnum, G. DiPatrizio, B. Goldspiel, National Institutes of Health

Expressing Observations from Electronic Medical Record Flowsheets in an i2b2-based Clinical Data Repository to Support Research and Quality Improvement
L. Waitman, J. Warren, E. Manos, D. Connolly, University of Kansas

S95 – Papers: Hand-offs & Transitions of Care
Theme: Clinical Workflow and Human Factors

The Promise of the CCD: Challenges and Opportunity for Quality Improvement and Population Health
J. D’Amore, University of Texas School of Biomedical Informatics; D. Sittig, University of Texas Health Sciences Center; A. Wright, Brigham and Women’s Hospital; S. Iyengar, R. Ness, University of Texas Health Science Center at Houston

In Search of Common Ground in Hand-off Documentation in an Intensive Care Unit

Falling Through the Cracks: Information Breakdowns in Critical Care Hand-off Communication
J. Abraham, V. Nguyen, K. Almoosa, B. Patel, V. Patel, University of Texas Health Science Center at Houston
An Analysis and Recommendations for Multidisciplinary Computerized Hand-off Applications in Hospitals
S. Hunt, N. Staggers, University of Maryland School of Nursing

Using Digital Crumbs From an Electronic Health Record to Identify, Study and Improve Healthcare Teams
J. Gray, H. Feldman, S. Reti, L. Markson, X. Lu, R. Davis, C. Safran Beth Israel Deaconess Medical Center

The EpiCanvas Infectious Disease Weather Map: an Interactive Visual Exploration of Temporal and Spatial Correlations
P. Gesteland, University of Utah School of Medicine; Y. Livnat, N. Galli, Scientific and Computing Imaging Institute; M. Samore, A. Gundlapalli, University of Utah School of Medicine

Social Network Analysis of Physician Interactions: the Effect of Institutional Boundaries on Breast Cancer Care
W. Bridewell, A. Das, Stanford University

Practical Challenges in the Secondary Use of Real-World Data: the Notifiable Condition Detector
M. Fidahussein, J. Friedlin, S. Grannis, Regenstrief Institute, Inc.

Root Causes Underlying Challenges to Secondary Use of Data
J. Ancker, A. Edwards, R. Kaushal, Weill Cornell Medical College; S. Shih, M. Singh, A. Snyder, New York City Department of Health and Mental Hygiene
Data Quality and Fitness for Purpose of Routinely Collected Data—a General Practice Case Study from an Electronic Practice-based Research Network (Epbrn)
S. Liaw, University of New South Wales/South West Sydney Local Health Network; J. Taggart, S. Dennis, University of New South Wales; A. Yeo, Ingham Health Research Institute

Demonstrating “Collect Once, Use Many”: Assimilating Public Health Secondary Data Use Requirements Into an Existing Domain Analysis Model
C. Barton, Duke University School of Nursing; C. Kallem, American Health Information Management Association; P. Van Dyke, Delta Dental Companies; D. Mon, American Health Information Management Association; R. Richesson, University of South Florida

Development of a Workflow Integration Survey (WIS) for Implementing Computerized Clinical Decision Support
M. Flanagan, Indiana University; N. Arbuckle, University of Dayton; J. Saleem, Indiana University/Roudebush VA/IUPUI; L. Militello, IU School of Medicine; D. Haggstrom, B. Doebbeling, Indiana University/Roudebush VA/Applied Decision Science

Systematic Refinement of a Health Information Technology Time and Motion Workflow Instrument for Inpatient Nursing Care Using a Standardized Interface Terminology
Y. Zhang, T. Adam, D. Pieczkiewicz, Institute for Health Informatics, University of Minnesota; K. Monsen, Institute for Health Informatics/School of Nursing/University of Minnesota; M. Daman, University of Minnesota Medical Center; G. Melton, University of Minnesota/Department of Surgery

Understanding the Work of Pediatric Inpatient Medicine Teams: Implications for Information System Requirements
C. Lin, J. Gennari, University of Washington

S99 – Papers: It’s all About the People: Clinical Workflow Theme: Clinical Workflow and Human Factors College of Medicine

Workflow Concerns and Workarounds of Readers in an Urban Safety Net Teleretinal Screening Study
A. Fish, S. George, E. Terrien, A. Eccles, R. Baker, O. Ogunyemi, Charles Drew University of Medicine and Science

12:15 – 1:00 pm Closing Keynote Address
Dr. Farzad Mostashari
National Coordinator for Health Information Technology, Department of Health and Human Services

(for more information on Dr. Mostashari, see p. 9)