The Faculty and Their Research

The Department of Medical Informatics & Clinical Epidemiology consists of more than 60 faculty, including faculty with their primary academic appointments in the department, several from other departments with joint appointments in the department, and clinical faculty with informatics/epidemiology expertise who work primarily for companies and institutions outside the university. Faculty expertise areas include: Bioinformatics and Computational Biology, Computerized Provider Order Entry, Data Cleaning and Integration, Information Retrieval, Decision Analysis, Care Management, Clinical Information Systems, Consumer Health Informatics, Evidence-based Medicine, Organizational Behavior, Quantitative and Qualitative Research Methods and more.

Primary Teaching Faculty

William Hersh, MD

Main research interest: Use of knowledge-based information (e.g., scientific literature and content that summarizes it) by health care practitioners and researchers. Present focus: Aiming to build better information retrieval (i.e., search engine) systems and to evaluate their use, as well as an interest in educational technologies, directing the large distance learning program in medical informatics at OHSU, and in the teaching and application of evidence-based medicine.

Joan Ash, PhD

Main research interest: Addressing people and organizational issues in health informatics, especially as they relate to the implementation of clinical systems. Present focus: Computerized physician order entry; especially interested in using qualitative research methods such as observation and interviewing to develop accurate descriptions of clinical system use.

Eilis Boudreau, MD, PhD

Main research interest: Investigating the influence of sleep and circadian rhythms on the development of alcoholism using functional imaging techniques. Present focus: Pharmacological imaging using functional magnetic resonance imaging and optical microangiography techniques.

Lucia Carbone, PhD

Main research interest: investigating sources of genome instability in species evolution and human disease. Developing experimental and analysis approaches that take advantage of next-generation sequencing and its applications (MethylC-seq, ChIP-seq, Mate-pair mapping).

Present focus: studying the possible association between genome instability and epigenetic state of transposable elements.

Michael Chiang, MD

Main research interests: Telemedicine, image analysis, electronic health records, evaluation of clinical information systems, genotype-phenotype correlation.
Present focus: (1) Computer-based image analysis for diagnosis of ophthalmic disease. (2) Telemedicine: implementation and evaluation of systems. (3) Genotype-phenotype correlation in ophthalmic disease. (4) Electronic health records: usability, design, and evaluation. (5) Standards and data representation in clinical information systems.

Aaron M. Cohen, MD, MS

Main research interest: Application of text mining and machine learning techniques to the scientific literature curated databases for aiding researchers in effectively using and exploring the ever-expanding biomedical knowledge base.
Present focus: Application of text classification and extraction techniques for reducing the workload of biomedical database curators and authors of scientific reviews, and exploration of automated question answering and hypothesis generation techniques for biomedical researchers.

Deborah Cohen, PhD

Main research interest: How people in health care organizations, particularly primary care settings, implement and use health information technology, quality improvement in primary care settings, with a focus on designing health care systems that deliver integrated care, and doctor-patient communication.
Present focus: Identifying how unaffiliated, community-based primary care practices use electronic health records, identifying how primary care practices and community mental health clinics achieve the delivery of integrated health care, and understanding how practices and communities can partner to encourage patient health behavior change.

David A. Dorr, MD MS

Main research interest: Use of people and technology to improve quality and safety of care.
Present focus: Improving the care of chronic diseases using best practices for idealized design and teamwork coupled with the ABCs of technology for collaboration: access, best practices, and communication. Special cases for multiple diseases and transitions of care. Improvement of research infrastructure for adverse event reporting and action.

Karen Eden, PhD

Main research interest: The focus of Dr. Eden's research career has been in translating evidence to help patients make informed decisions about their own health. She has extensive experience in translating comparative effectiveness information into patient-friendly interactive decision aids that inform the patients, help them set priorities for the decision and prepare them for a

discussion with a provider. Most of her research has been in women's health e.g., breast cancer screening for women under age 50, safety planning for abused women, or childbirth decisions for women with a prior cesarean.

Dr. Eden currently serves as the Associate Director of Doctoral programs in the OHSU Biomedical Informatics Program. In this role, she oversees recruitment, admissions, evaluation and mentoring of all pre-doctoral and post-doctoral fellows.

Justin Fletcher, PhD

<u>Main research interest</u>: Privacy and security aspects of data and systems in health care settings. <u>Present focus</u>: Currently working to identify issues associated with policy definition and security implementation related to EHR implementation from the executive perspective and to ensure these issues are presented in an educational curriculum.

Paul Gorman, MD

<u>Main research interest</u>: My research concerns the sociotechnical aspects of information technology in healthcare: the interaction and interdependence of health information technology and the clinical settings in which it is used. Most often this involves observational methods to study individuals and groups as they use information to perform real world tasks of patient care. Recent projects include developing systems for collaborative medication management, studying the introduction of information interventions in small practice settings in rural California and Oregon, and workflow assessment and system implementation in primary care.

<u>Present Focus</u>: current projects include developing clinical decision support systems for collaborative medication management, and studying the introduction of information interventions in small practice settings, particularly in rural areas in California and Oregon.

Melissa Haendel, PhD

<u>Main research interest</u>: My research is focused on developing and testing ontologies for classifying and querying biological data and ontological methods for making data interoperable. Ontology-based search allows one to exploit the logical definitions and relations between entities and thereby infer additional information. I am particularly interested in using anatomy ontologies for translational research to link human diseases to model organism data. <u>Present Focus</u>: Most recently I have been working on representation of research resources and their integration into the Linked Open Data landscape.

Michelle Hribar, PhD

<u>Main Research Interest:</u> Usability for medical informatics and high performance computing applications. <u>Present Focus:</u> Usability concerns in electronic patient surveys using touch screens. These include concerns for elderly patients and those with limited vision and dexterity.

Holly Jimison, PhD

Main research interest: Consumer Health Informatics, Computational Neuroscience, Health Monitoring and Coaching Technologies, Medical Decision Making. Present focus: Technology interventions for home health management with a focus on empowering patients and family members to be active and informed participants in their medical care decisions. The largest current project is a Cognitive Health Coaching intervention for older adults in a home environment. The software platform enables us to deliver tailored messaging based on home monitoring of adaptive cognitive computer games, physical exercise, sleep quality, and socialization (Skype, email, phone). This approach provides a low-cost, scalable set of interventions to help seniors retain cognitive function and independence.

Jayashree Kalpathy-Cramer, PhD

Main research interest: Clinical image retrieval, image processing and analysis especially for applications in radiation oncology, survival analysis. Present focus: Understanding the image retrieval needs for clinicians in radiation oncology, developing tools to combine visual and textual information for image retrieval, developing and evaluation of algorithms for image segmentation and registration, survival analysis for cancer using the SEER database.

Judith Logan, MD

Main research interest: Examining factors that affect quality of data collected in healthcare databases and the subsequent uses of that data. Quality of data is affected by the user interfaces for collecting data, by the underlying controlled vocabularies, and by the structure of data in the databases. Present focus: Developing vocabulary for certain procedural reports. Also interested in evidence-based clinical guidelines and have been involved in a project to develop and disseminate these.

Robert A. Lowe, MD, MPH

Main research interest: Health services research regarding access to comprehensive medical care for vulnerable populations. Present focus: Community-based participatory research in collaboration with a community based organization serving homeless, chemically-dependent and chronically ill clients with a comprehensive bio-psycho-social model of care; relationship between emergency department use and access to primary care; training the next generation of emergency medical researchers in translational research; clinical trials for the treatment of neurological emergencies.

Shannon McWeeney, PhD

Main research interest: Working with members of MGED normalization/processing to develop controlled vocabularies and protocols to describe data transformations. Present focus: Focus on statistical analysis of microarray data with emphasis on time series analysis.

Vishnu Mohan MD, MBI, MBCS, FACP

Teaching: I teach three core clinical informatics courses at DMICE - BMI 560/660: Design and Evaluation in Health Informatics, BMI 512/612: Clinical Information Systems, and BMI 513: Electronic Health Record Lab. I also teach ISQA 551: Information Technology for Healthcare course for the PHSU/PSU MBA in Healthcare Management program. As an internist and clinician-educator, I also teach residents and medical students.

Research interests: I am interested in clinical diagnostic reasoning, and how clinicians interact with healthcare IT. We study this interaction in a unique way, using a qualitative, interdisciplinary approach. I'm also interested in using high-fidelity simulation to look at how clinicians interact with technology, in clinical and biomedical informatics education, and in developing curricula for the health IT workforce.

Current research focus: Today, clinicians are deluged with an overabundance of information, and this can increase the likelihood of errors. This is particularly the case in healthcare delivery areas where a large number of decisions need to be made in a relatively short period of time, such as in the ICU. We are using clinical simulations in an innovative new way to identify medical errors and improve both clinician training as well as build better systems.

Homepage: My OHSU web page is at: http://goo.gl/OXAVY

Michael Mooney, PhD

Main research interest: Developing statistical and computational techniques for identifying predictive signatures of disease susceptibility and outcome. I'm especially interested in exploring the combined effects of genomic (e.g. DNA sequence variation) and environmental (e.g. exposures, life style) risk factors. Network-based approaches, and machine learning methods, such as evolutionary algorithms, are a major focus of my work.

Joanne Valerius, MPH, RHIA

Main research interest: Cultural diversity in the workplace, leading and managing as a health informatics professional, human resource management.

Amanda Vinson, PhD

Main research interest: Quantitative genetics and QTL mapping in general pedigrees, systems biology and functional genomics in elucidating genotype-phenotype relationships, family- and population-based statistical genetic methods in atherosclerosis and other complex disease. Present focus: Role of novel inflammatory factors in predicting atherosclerosis in rheumatoid arthritis patients, development of a SNP-based genetic linkage map in the rhesus macaque genome, characterization of the relationship between cholesterol levels, inflammation, and atherosclerosis in rhesus macaques using quantitative genetic and systems biology approaches.

Beth Wilmot, PhD

Main research interest: The focus of her research is on the development and application of statistical and computational methodologies for analysis of genomic data (gene expression, SNP variation and copy number variation) in both unrelated individuals and pedigrees in order to understand the role of genomic variation in disease (cancer, psychiatric disorders, Alzheimer's disease, etc).

Jianji Yang, PhD

Main research interest: Research and Professional Interest: Healthcare quality improvement, web-based disease cohort and population management tool, medical home, information retrieval and extraction, text categorization.

Christina Zheng, PhD

Main Research Interest: Understanding gene regulatory models in relation to disease progression through the use of computational methods for functional genomics.
Present Focus: Analysis of high throughput sequencing data in an effort to model tumor progression.

Primary DMICE Faculty

Richard Appleyard, PhD, Associate Professor

Nancy Carney, PhD, Assistant Professor

Mark Helfand, MD, Associate Professor

David Hickam, MD, M.P.H., Professor

Kathryn Pyle Krages, AMLS, MA, Assistant Professor

Marian McDonagh, PharmD, Assistant Professor

Cynthia Morris, PhD, Professor

Heidi Nelson, MD, Research Professor

Susan Norris, MD, Assistant Professor

Thomas Yackel, MD, Assistant Professor

Joint and External/Clinical Appointments

Joint Appointments	External/Clinical Appointments
Michelle Berlin	Diane Audiss
Dana Braner	Keith Campbell
Terri Bianco	Homer Chin
Roger Chou	Mary Devlin
Bikram Day	Jay Eisenberg
Richard Dykstra	Richard Gibson
Justin Fletcher	Robert Gluckman
Jeanne-Marie Guise	John Haughom
Warren Harrison	Brian Hazlehurst
John Hawkins	Michael Krall
Linda Humphrey	Mark Leavitt
John Kenagy	Michael Lieberman
Dale Kraemer	J.A. Magnuson
Blake Lesselroth	Philip Marshal
Robert Lowe	Brian Martin
Richard Lowensohn	Fred Masarie
Alan Melnik	Jody Petit
Motomi Mori	Tom Riccardi
Jeffery Pentecost	Tom Stibolt
Jere Retzer	Nancy Vukovic
Somnath Saha	Andrew Zechnich
William Smith	
Xubo Song	
Kent Thornburg	
Patricia Tidmarsh	