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DMICE Tracks

From the Chair

Welcome to the fifth issue of DMICE Tracks, the newsletter of the OHSU Department of Medical Informatics & Clinical Epidemiology. As with every issue, we have many accomplishments to report.



In this issue, we describe the ten-year anniversary of our informatics graduate program. The growth and reputation for innovation of this program has been quite gratifying. I recently came across a quote on the Internet from Nelson Mandela, who said, "Education is the most powerful weapon which you can use to change the world."

Earlier in my career, I thought that research was the only way to improve the world in academia, but my experiences in the last decade have taught me that education is equally if not more powerful for improving the lives of people and their capacity to make the world a better place.

Of course, education is not the only successful enterprise of our department. Our research programs continue to grow and prosper. So much, as a matter of fact, that we have had to revise and expand our administrative capability, as also described in this issue. We are excited

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Ten Years of Informatics Degree Programs at OHSU

This fall marks the tenth-year anniversary of the first 10 students enrolling in the first OHSU degree program in biomedical informatics, the Master of Science (MS). Informatics trainees funded by the National Library of Medicine training grant had been present at OHSU since 1992, but 1996 was when the master's degree program and formal coursework offered by the program began. Another story elsewhere in this issue describes the activities of some of the people in the first class to matriculate in the MS program.

In the ten years since the beginning of our degree programs, we have achieved many other successes. In June 1998, the first class of graduates marched in OHSU graduation ceremonies. The following year, our department offered the first online course. By 2000, enough online courses had been implemented to allow launching of the Graduate Certificate program, an eight-course subset of the MS program. A year later, we added our second master's degree, the Master of Biomedical Informatics (MBI), a non-thesis professional master's degree, designed

for those in the distance learning program and for on-campus students who do not desire a research master's degree. In 2003, our first PhD students matriculated.

Since the beginning of our degree programs through this past June, OHSU has awarded 138 informatics degrees and certificates: 50 MS, 32 MBI, and 46 Graduate Certificates. Our graduates have gone on to take a wide variety of positions in academia, industry, and health care settings. Some employers of our graduates include OHSU, Vanderbilt University, Cerner Corp., Lifecom Health Systems, Hospital for Sick Children (Toronto), and Intermountain Healthcare (Utah).

We are not resting on our laurels at ten years, and a number of innovations with the program continue. Most notable this year is a curriculum revision with a partition of our degree programs into two "tracks": medical informatics and bioinformatics. The existing curriculum, with its emphasis on clinical informatics, will become the medical informatics track while a new track is being developed in bioinformatics,

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OREGON
HEALTH & SCIENCE
UNIVERSITY

DMICE Researchers Lead Effective Health Care Centers

As the federal government sponsors research into the comparative effectiveness of different health care treatments, DMICE investigators are serving as leaders in the effort. Through the Agency for Healthcare Research and Quality's (AHRQ) Effective Health Care Program, professors Mark Helfand, MD, MPH, MS, and David H. Hickam, MD, MPH, are directing two centers that work with AHRQ, one to review healthcare evidence and one to communicate that evidence to decision makers in the field.

The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 authorized AHRQ to conduct and support research on outcomes, comparative clinical effectiveness, and appropriateness of pharmaceuticals, devices, and health care services. Using the AHRQ-funded Evidence-based Practice Centers, the agency has commissioned a number of clinical effectiveness reviews (CERs), such as low bone density and treatment for depression. The Oregon Evidence-based Practice Center, led by Dr. Helfand, serves as the scientific resource center for the Effective Health Care Program, providing methodologic guidance and expertise in the development of the CERs. The center also receives nominations for new topics within the current list of priority conditions and, in consultation with stakeholders, makes recommendations for new research topics. Thirteen OHSU investigators and eight staff work in the Resource Center.

In addition, the Oregon EPC produced one of the first CERs, Comparative Effectiveness and Safety of Analgesics for Osteoarthritis, released on September 25, 2006. Authors include Dr. Helfand, Roger Chou, MD, Kim Peterson, MS, Tracy Dana, MLS, and Carol Roberts.

Once CERs are released, another arm of the Effective Health Care Program goes into action. The John M. Eisenberg Clinical Decisions and

Communications Science Center, led by Dr. Hickam, compiles the research results into a variety of useful formats for stakeholders. The Center takes a systematic approach to translate knowledge about effective health care into understandable, actionable language for all decision makers. While the center is based in the Division of General Internal Medicine, several DMICE faculty and staff work on the project.

DMICE faculty and staff on each AHRQ project include:

Scientific Resource Center

Mark Helfand, MD, MPH, MS,

Principal Investigator

Nancy Brown, MLS, Research Librarian

Roger Chou, MD, Investigator

Laurie Hoyt Huffman, MS, Core Leader, Stakeholders

David Hickam, MD, MPH, Investigator

Linda Humphrey, MD, MPH, Investigator

John Kazee, Administrative Assistant
Sarah Lopez, Research Assistant
Marian McDonagh, PharmD, Core Leader, CERS

Heidi Nelson, MD, MPH, Investigator
Susan Norris, MD, MSc, MPH, Investigator

Edwin Reid, Core Leader, Web
Shannon Smith, Sr. Research Assistant
Miranda Walker, Project Manager
Ingrid Williams, Research Assistant

Eisenberg Clinical Decisions and Communications Science Center

David H. Hickam, MD, MPH, Principal Investigator

Roger Chou, MD, Investigator

Karen B. Eden, PhD, Investigator

Jeanne-Marie Guise, MD, MPH, Investigator

Mark Helfand, MD, MPH, MS, Investigator

Somnath Saha, MD, MPH, Investigator

Shannon Smith, Sr. Research Assistant

OHSU Awards 21 Biomedical Informatics Degrees and Certificates

On June 2, 2006, 11 students received master's degrees in biomedical informatics while 10 received graduate certificates at OHSU commencement ceremonies held at the Arlene Schnitzer Concert Hall in Portland. This marks the ninth commencement in which DMICE has had graduates.

Master of Science in Biomedical Informatics

Richard Dykstra

Michelle Lee

Mario Manese

Master of Biomedical Informatics

Glen Blanchard

Jeffrey Jensen

Christopher Morey

Daren Nicholson

Amy Norcom

Marilyn Paterno

Gregorio Sicard

Julito Uy

Graduate Certificate in Biomedical Informatics

David Andersen

Anne Marie Currie

Jennifer Dixon

Michael Minear

Michelle Morgan

Marilyn Schroeder

Teresa Smith

Mary Stanfill

James Stearns

Jim Tague

DMICE Faculty Involved in New OHSU Research Institute

Several DMICE faculty members will play significant roles in the new Oregon Clinical and Translational Research Institute (OCTRI). OHSU and the Kaiser-Permanente Center for Health Research (KPCHR) learned in early October that they were one of the 12 centers selected for funding under this new initiative of the National Institutes of Health (NIH). The OHSU award is for \$55 million over five years, and will focus on accelerating the translation of research findings into clinical practice and disseminating them to the larger community.

The mission of OCTRI is well-aligned with the expertise of DMICE and those they already collaborate with from KPCHR. The disciplines of informatics and clinical epidemiology are already at the forefront of advancing and accelerating the improvement of use of evidence, quality, and safety in health care. The infrastructure support provided by the NIH funding will enable further contributions of DMICE's core disciplines to advancing science and improving health care.

In addition to research, another major activity of OCTRI will be education of the next generation of clinical and translational researchers. To this end, the grant consolidates existing programs and funds development of predoctoral and postdoctoral education, headed by DMICE vice chair Cynthia Morris, PhD, MPH, professor of medical informatics and clinical epidemiology, medicine, and public health and preventive medicine.

A key cornerstone of OCTRI will be biomedical informatics. In the original request for applications, as well as in the press conference led by Dr. Elias Zerhouni, Director of NIH, announcing the awards, biomedical informatics was repeatedly mentioned as a crucial activity for enabling translational

research and its wider dissemination. The OCTRI Biomedical Informatics Program integrates several disparate but successful ongoing efforts, including the electronic health records infrastructure of Kaiser-Permanente Northwest and its related Virtual Data Warehouse project, the bioinformatics advances led by DMICE faculty member Shannon McWeeney, PhD, and OHSU's nationally leading efforts in informatics for general clinical research centers (GCRCs).

The OCTRI Biomedical Informatics Program will be headed by DMICE professor and chair William Hersh, MD. In additional recognition of the importance of informatics, NIH will establish a national steering committee for biomedical informatics, upon which Dr. Hersh and his counterparts from the other 11 programs will serve. Some of his co-panelists on the steering committee will be colleagues who are leaders of other academic biomedical informatics programs around the country.

"While this grant itself does not bring substantial new resources to our department, it does serve as an enabler that will allow our faculty to contribute to clinical research in new and innovative ways. The goals of the new institute are quite comparable with the goals for the research and educational activities of our department," said Dr. Hersh.

He also noted, "The role of informatics in this effort is important and substantial. I am hopeful that the national steering committee will lend its voice to furthering the major goals of our field, which include the promotion of standards and interoperability of information. This voice can be quite complementary to current work promoting this vision by clinical informatics leaders." ■

Ten Years Later, Alumni Reflect on Early Years of Informatics Program

By Kathryn Krages

It was September 1996. Independence Day had been the hot movie of the summer. Bill Clinton was on his way to being elected to a second term. Across the Atlantic, Prince Charles and Diana had just gotten divorced. An article in that month's JAMIA discussed the future of Java in biomedical computing. And on the fifth floor of the BICC building at OHSU, ten people arrived as the first in a long line of physicians, nurses, computer scientists and others who would follow them. This was the first class of medical informatics students at OHSU.

As we celebrate 10 years of medical informatics degree programs this fall, we want to look back on this first cohort of students and see where they are today. They came from different backgrounds. Some were physicians; others were not. What led them to OHSU to seek a master's degree in biomedical informatics?

Calvin Huey, MD, MPH, came as part of the NLM-funded post-doctoral training program, which started in 1992 but did not offer an informatics degree in its first few years. Another physician who entered the program in 1996 was Jon Blackman, MD. "I had a lifetime interest in mathematics and computers. The program seemed like an opportunity to continue to evolve my medical career," he said. Emergency physician Judy Logan, MD, was interested in the use of the electronic health record in emergency care.

According to Bikram Day, "The program fit my career goals accurately

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10x10 Program Completes Successful First Year

In 2004, then-Chairman of the American Medical Informatics Association (AMIA), Dr. Charles Safran, lamented the low capacity of most medical informatics educational programs and called for there to be one physician and one nurse trained in informatics in each of the 6,000 U.S. hospitals. While most program directors indicated they could expand their capacity modestly, DMICE professor and chair William Hersh, MD, noted that OHSU's distance learning program could be scaled up much larger and faster.

Subsequently, Hersh proposed to the AMIA leadership that his OHSU course, *Introduction to Biomedical Informatics*, could be repackaged as a standalone course that would disseminate knowledge in the field to a much wider audience. Borrowing on a phrase developed early in the evolution of the OHSU Biomedical Information Communication Center (5000 by 2000, aiming to get 5,000 Oregon physicians online by the year 2000), Hersh named the program 10x10 (pronounced "ten by ten") and gave it a goal to train 10,000 health care professionals in informatics by the year 2010.

In collaboration with AMIA, the 10x10 program features a slightly expanded version of the introductory graduate course taught by Hersh at OHSU. In addition to the 10 weekly units offered from the OHSU course, there is an additional unit taught by OHSU faculty Joan Ash, PhD, as well as a one-day in-person session where participants meet with each other (after having studied together online for three months) and discuss over-arching issues related to the course and the field.

The first offering of the program began in the summer of 2005, and culminated at the AMIA 2005 Annual Symposium. A second offering, funded in part by the California Health Care Foundation, started in fall 2005, and concluded in February 2006, at CHCF headquarters in Oakland, CA. A third

offering began in the winter of 2006 and culminated at the AMIA 2006 Spring Congress. There is currently another offering underway that will conclude at the AMIA 2006 Annual Symposium. Over 200 people have registered for the course since its inception.

There are already plans in the work for several 10x10 offerings in 2007. In addition to the AMIA collaboration, other offerings will take place with the American College of Physicians, the specialty society for internal medicine, and the Scottsdale Institute, a collection of institutions devoted to innovation and quality in health care.

Another accomplishment for the 10x10 effort has been the development of a Spanish-language version of the course, led by Dr. Paula Otero of Hospital Italiano in Buenos Aires, Argentina. Dr. Otero, a pediatrician and director of the medical informatics residency program at Hospital Italiano, was a graduate of the first 10x10 offering and is now enrolled in the OHSU Graduate Certificate program. She led the translation and conversion of the course to Spanish and oversaw the enrollment of 150 individuals from Latin America in this offering during the summer of 2006. ■

Department Hires New Administrative Director

DMICE welcomed Anne Chisholm, MBA, as department director in July 2006. Formerly a senior financial analyst in OHSU Research Grants and Contracts, Ms. Chisholm brings a wealth of experience to her new role overseeing a department with six educational programs and more than \$6 million in research revenue.

A graduate of Vanderbilt's five-year BA/MBA program, Chisholm has more than 15 years of experience in non-profit research and development administration in Nashville, Boston, and Norfolk, Virginia.

"Our department has grown from a small center to a vibrant yet complex research and educational enterprise," said William Hersh, MD, DMICE professor and chair. "In recent years, we have been a victim of our own success and have outgrown our existing administrative structure. Anne brings the skills and expertise that will allow the department to function more efficiently and maintain compliance with various federal,



Anne Chisholm, MBA

institutional, and other regulations. We hope that this will allow the faculty and their staff to do more of what they do best, namely research and teaching."

An internal audit by the University and a review by the School of Medicine helped to prompt reorganization of administrative staff and functions. In addition to Chisholm, the DMICE has hired a senior fiscal analyst, Dolores Newman, who began work in October. ■

DMICE Chair Contributes to Proposed Health IT Legislation, Participates in National Events

In July 2006, Congressman David Wu (D-OR), whose district includes OHSU, introduced HR 5605, the *10,000 Trained by 2010 Act*. This legislation gets its name from the 10x10 course developed by DMICE professor and chair William Hersh, MD, and his colleagues in the American Medical Informatics Association (see separate article on page 4). Dr. Hersh contributed to the crafting of the legislation, which sets up funding for research and education grants in health information technology to be administered through the National Science Foundation.

Congressman Wu's legislation was unveiled at a press conference at OHSU on May 30, 2006. This event was kicked off by retiring OHSU President Peter Kohler, MD, and featured remarks by, among others, Congressman Wu, Dr. Hersh, and Luis Machuca, President and CEO of Kryptiq Corp. Also in attendance was Oregon Governor Ted Kulongoski, who announced additional federal funding for electronic health records in Oregon as well as the appointment of Jody Pettit, MD, of the Oregon Health

Care Quality Corp. and a clinical assistant professor in DMICE, to serve as Oregon's Health Information Technology Coordinator.

Hersh and several other OHSU faculty also participated in Health Information Technology Week, a week-long series of events in Washington, DC. Hersh was a national spokesperson for Health IT Day on June 7, 2006, a "bridge day" between two events that anchored the week, the Agency for Healthcare Research and Quality (AHRQ) Patient Safety Conference and the Healthcare Information Management Systems Society (HIMSS) Summit. Hersh and DMICE Distance Learning Coordinator Amy Norcom demonstrated the program at the Capitol Hill Technology Demonstration on June 6, 2006. Other DMICE faculty participating in the AHRQ event included Paul Gorman, MD, associate professor and Jeanne-Marie Guise, MD, MPH, associate professor of obstetrics and gynecology and medical informatics and clinical epidemiology. ■



Congressman David Wu (D-OR); William R. Hersh, MD, professor and chair of DMICE; and Oregon Governor Ted Kulongoski met at a press conference, held at OHSU May 30, 2006, to announce Wu's federal legislation for research and education grants in health information technology.

Faculty Update

Awards and Appointments

Professor **Mark Helfand, MD, MPH, MS**, has been elected a Fellow of the American College of Physicians, the second largest physician group in the United States.

A 2005 paper by **Dean Sittig, PhD**, clinical assistant professor, and **Joan Ash, PhD**, associate professor, was selected as a finalist for the 2006 Diana Forsythe Award, sponsored by the American Medical Informatics Association. Sittig DF, Krall M, Kaalaas-Sittig J, Ash JS. Emotional aspects of computer-based provider order entry: a qualitative study. *J Am Med Inform Assoc.* 2005 Sep-Oct;12(5):561-7.

Faculty News

Paul Gorman, MD, associate professor, is featured in a Case Study on the AHRQ National Resource Center for Health Information Technology Web site. The case study focuses on Dr. Gorman's project in Lincoln City to implement a master medication list for patients in nursing facilities and involves hospitals, clinics and pharmacies. The AHRQ-funded study's goal is to improve medication safety for rural elders.

Judy Logan, MD, MS, associate professor, and **Dean Sittig, PhD**, clinical assistant professor, are on the Applications of Informatics Scientific Program Committee for the annual symposium of the American Medical Informatics Association, to be held in Washington, D.C. in November.

Judy Logan, MD, MS, associate professor, is secretary of the AMIA Clinical Trials Working Group for 2006. **Paul Gorman, MD**, associate professor, serves as chair of the AMIA Education Working Group this year.

Presentations

Mark Helfand, MD, MPH, MS, professor, recently led a workshop on critical appraisal of systematic reviews

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Faculty Update

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at the Science for Judges program at Brooklyn Law School in New York.

The program is under the auspices of the Center for Health, Science and Public Policy, Federal Judicial Center, National Center for State Courts, and the Committee on Science, Law, and Technology of the National Academies of Science.

Holly Jimison, PhD, associate professor, presented a poster at the 10th International Conference on Alzheimer's Disease and Related Disorders in Madrid.

Judy Logan, MD, MS, associate professor, participated in a panel at the Harvard Quality Colloquium in Boston August 21, 2006. The panel was entitled Collaboration Technologies to Achieve Transformational Change and Physician Buy-in for Quality Improvement and Pay-for-Performance.

Judy Logan, MD, MS, associate professor, was co-author of a presentation on context-sensitivity clinical data integrations presented at the 2006 Workshop on Information Integration in Healthcare Applications, held in Munich, Germany March 26, 2006. Co-authors were James Terwilliger and Lois Delcambre from Portland State University.

William Hersh, MD, professor and chair, attended the 2006 European Conference on Research and Advanced Technology for Digital Libraries in Alicante, Spain in September.

William Hersh, MD, professor and chair, gave several talks in recent months.

ImageCLEF: Understand and Improving Image Retrieval in Biomedicine - University of Utah Biomedical Informatics Seminar, Salt Lake City, UT, October 24, 2006

The National Health Information Network: What Will It Look Like and How Do We Get There? - Grand Rounds, Bay Area Hospital, Coos Bay, OR, July 20, 2006

Controlled Terminologies in Biomedicine: Rationale, Challenges, and Limitations - Symposium, University of Tokyo, Tokyo, Japan, March 2, 2006

Training the Health and Biomedical Informatics Workforce: Competencies and Approaches - Oregon Health Information Management Association Annual Convention, Clackamas, OR, May 13, 2006, and Assembly on Education, American Health Information Management Association, Nashville, TN, June 26, 2006

Benefits and Challenges for Health Information Technology in Patient Safety

- 2006 Oregon Patient Safety Convocation, Portland, OR, September 29, 2006

Informatics Competencies for an Informed Healthcare Workforce - AAHSL Nina Matheson Lecture, Association of American Medical Colleges Annual Meeting, Seattle, WA, October 30, 2006

Funding Received

Judy Logan, MD, MS, associate professor, received \$28,497 in funding from the Collins Medical Trust for a project, Integration of Clinical Data from Diverse Sources: a "Lazy" Data
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DMICE Highly Visible at AMIA Spring Congress

The OHSU biomedical informatics program had a substantial presence at the 2006 Spring Congress of the American Medical Informatics Association (AMIA), held in Phoenix, Arizona May 15-18, 2006. DMICE professor and chair **William Hersh, MD**, served as Chair of the Scientific Program Committee while assistant professor **Tom Yackel, MD, MS**, was a committee member.

Seven OHSU faculty participated in panel sessions:

Joan Ash, PhD, associate professor, "Is CPOE Helpful or Harmful?"

Aaron Cohen, MD, MS, assistant professor, "Literature Based Discovery"

David Dorr, MD, MS, "Evaluation: Understanding User Needs"

Paul Gorman, MD, associate professor, "EHR: Federally Funded Efforts" and "Grand Challenges for Informatics' Training and Practice"

William Hersh, MD, professor and chair, "Grand Challenges for Informatics' Training and Practice"

Holly Jimison, PhD, associate professor, "Protecting Privacy in the Genomics Age"

Dean Sittig, PhD, clinical assistant professor, "EHR: RHIOs at Age 2 - How are we doing?"

OHSU also featured quite prominently in the poster session, with 13 of the 94 posters coming from OHSU faculty, staff or alumni. Two OHSU posters received Distinguished Poster awards. **David Dorr, MD, MS**, assistant professor, received an award for "Composition of Information systems to Support Collaborative Care of Chronic Illness" while associate professor **Holly Jimison, PhD**, was cited for "PHRs as Health Interventions." **Drs. Sittig and Cohen** also displayed posters. (For student and alumni participation, see Student/Alumni News on page 12.)

Also a highly visible presence at the meeting were the 50 attendees attending the in-person session of the 10x10 course, led by **Dr. Hersh**.

Integration Approach, which funds graduate student James Terwilliger at Portland State University. Dr. Logan works with Mr. Terwilliger and PSU faculty member Lois Delcambre, PhD, on clinical data research projects.

As part of a larger grant awarded to OGI from Intel, associate professor **Holly Jimison, PhD**, is leading a research project to develop modular remote coaching software systems for elders at home to improve their health behaviors. In the study, thirty elders will use the coaching system, which can work with interactive physical exercise and cognitive exercise interventions.

Publications

Tang PC, **Ash JS**, Bates DW, Overhage JM, Sands DZ. Personal health records: definitions, benefits, and strategies for overcoming barriers to adoption. *Journal of the American Medical Informatics Association*. 13(2):121-6, 2006 Mar-Apr.

Carson S, McDonagh MS, Peterson K. A systematic review of the efficacy and safety of atypical antipsychotics in patients with psychological and behavioral symptoms of dementia. *Journal of the American Geriatrics Society*. 54(2):354-61, 2006 Feb.

Cohen AM, Hersh WR, Peterson K, Yen PY. Reducing workload in systematic review preparation using automated citation classification. *Journal of the American Medical Informatics Association*. 13(2):206-19, 2006 Mar-Apr.

Cohen AM, Hersh WR, The TREC 2004 Genomics Track categorization task: classifying full text biomedical documents, *Journal of Biomedical Discovery and Collaboration*, 2006, 1:4, <http://www.j-biomed-discovery.com/content/1/1/4>.

Dorr DA, Wilcox A, Burns L, Bruncker CP, Narus SP, Clayton PD. Implementing a multidisease chronic care model in primary care using people and technology. *Disease Management*. 9(1):1-15, 2006 Feb.

Dorr DA, Phillips WF, Phansalkar
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Argentine Neurotrauma Researchers Study at OHSU

Thanks to a grant from the Fogarty International Center of the National Institutes of Health, two Argentines are now at OHSU studying in DMICE programs. Gustavo Jose Petroni is an intensive care physician and Leandro Oscar Kovalevski a statistician, both from the University of Rosario and Hospital Emergencias de "Clemente Alvarez," which is the adult Level I trauma center for the State of Santa Fe in Argentina. The two are at OHSU for two years as part of the grant's long-term training program designed to produce independent clinical researchers focused on trauma and injury. Petroni and Kovalevski will take courses in both biomedical informatics and the Master in Clinical Research Program and will work with OHSU physicians in neurotrauma research.

The long-term objective of the Neurotrauma Research Training in Latin America program, led by Nancy Carney, PhD, assistant professor, is, through research, education, and the development and dissemination of evidence-based guidelines, to improve treatment and outcomes for people who sustain traumatic brain injury.

In addition to the post-doctoral fellows studying at OHSU, short course modules, designed to educate students, research administrators, and allied health professionals in the technology of trauma research, will be taught by OHSU faculty at University of Rosario over a period of four full school terms.

The grant is part of the Fogarty Center's International Collaborative Trauma and Injury Research Training program (ICTIRT), whose goal is to train future leaders in trauma research in the developing world, and establish sustainable capacity for ongoing trauma research in developing world academic institutions. Other ICTIRT awardees are conducting trauma research and training projects in Mozambique, Iraq, China, Colombia, and Ghana.

Each year the ICTIRT awardees and Fogarty International Center staff gather for an annual networking meeting. Next year the meeting will be hosted at OHSU, chaired by Nancy Carney, and attended by President Joe Robertson and members of the OHSU community. The meeting is scheduled for August 23-24, 2007. ■



Marta Quaglino, PhD, professor of statistics; Fogarty fellows Leandro Kovalevski, MS, and Gustavo Petroni, MD, all from the University of Rosario; and Nancy Carney, PhD, assistant professor, DMICE

From the Chair

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to have a new department director in Anne Chisholm, whose efforts will allow faculty to accomplish their research and educational goals more efficiently. The success of our department reflects the dedication and talent of our faculty, students, and support staff. I know that my own personal success would not be possible without them.

I am also pleased that we will be holding the third DMICE annual giving campaign this year. Our first two campaigns have been modestly successful, but we hope that this year's campaign will be even better. You may ask why we are launching a fund-raising drive at a time of unprecedented success of our research and educational programs. The reasons are many.

Despite our success in obtaining grant revenue and tuition, these monies are earmarked for specific expenses of the research projects and educational programs, respectively. Grant funding, while a cornerstone of our

departmental revenue, is also fiscally challenging. Most of our grants come from federal sources (e.g., NIH, NLM, and AHRQ), which have very explicit regulations on allowable expenses. Furthermore, these grants are time-limited, so that the money must be spent in a specific period and returned if unspent. In addition, the lead time for applying for a grant, having it reviewed, and receiving the award can be up to a year. Grant funding is also highly competitive, with most programs funding only 10-25% of applications received. Although we get funded at a rate higher than the average, we still write many high-quality proposals that do not get funded. The amount of time it takes to put together proposals, plus the long waiting time for their review, puts an additional strain on our resources.

So although our grant and tuition revenues fund the key activities of the department, they are very restrictive in how the money can be spent and provide little money for investment in the future. For example, faculty occasional-

ly wish to pursue new areas of research, which usually requires learning new techniques or generating preliminary data. Or the department may wish to invest in new educational programs. An example of this is our recent work with leaders in the health information management field (the individuals who run medical records departments in health care organizations), where we hope to develop joint course and degree offerings.

Another use for gift funds will be for our students. Having money for things such as travel to scientific meetings and career development activities will improve students' education and increase their competitiveness in the job market, which will in turn attract more students. We also hope to raise funds for student scholarships to allow us to attract more high-achieving students, especially those who have been offered scholarships elsewhere and may not otherwise attend OHSU.

Gift monies will allow us to pursue other opportunities, such as recruiting new faculty and advancing the career development of those already here. They will also allow us to bring in distinguished leaders in the field, who often benefit the entire community by participating in our academia-industry dinners. (We are hoping to have the next dinner in early 2007.)

I hope you will consider investing in DMICE. A form for giving is printed in this newsletter, or you can make your gift on-line at <http://www.ohsu.edu/dmice/giving>. Putting my money where my mouth is, I myself have been giving to the department each month for almost a year.

In closing, I want to express my gratitude for the support DMICE has received from faculty, staff, students, the OHSU leadership, and the community. I hope we can continue our mutually beneficial relationship with all of you, providing leadership and value in our respective fields and being a program you can be proud to be a part of. ■

Bill Hersh

DMICE Faculty, Staff Receive Rose Awards

Five DMICE employees received ROSE Awards in recent months.

The ROSE Award, which was instituted at OHSU 14 years ago, stands for Recognition of Outstanding Service Excellence. Patients, volunteers, and fellow employees can nominate people for ROSE awards.

Emily Campbell, MS, RN, NLM Fellow and PhD student, received a ROSE Award for helping to fix a problem with the Medication Reconciliation process. Thank you for "your quick response will, I'm sure, make our patients safer."

Peggy Cook, Research Assistant, received two awards. Nominator # 1 said, "I feel so lucky to be working with you. Thank you for the tremendous effort and patience you have exhibited on phase II."

The second nominator commented, "Thank you for all of your tremendous dedication to our research and your commitment to our participants. We are very lucky to have you on the team! Thanks!"

Jill Rose, Executive Assistant. Thank you for "always cheerfully answering my questions, troubleshooting my problems and being just generally fabulous in keeping things organized and flowing."

Jeani Crichlow, Administrative Assistant. Thank you for "always solving the conference space crunch issues so promptly!"

Tom Yackel, MD, MS, Assistant Professor. Thank you for "providing invaluable support during our Ortho Epic classes. And the candy!" ■

New Faces



Rachel Burdon



Byron Care



Ashley Jones



Dolores Newman



Shannon Smith



Ingrid Williams

In the past few months, several people have joined DMICE administration and research programs. The smiling face behind the front counter in BICC 504 belongs to **Ashley Jones**, DMICE's new office specialist.

Byron Care, research assistant 2, works with the Evidence-based Practice Center's Drug Effectiveness Review Project. Also with the EPC are research assistant **Ingrid Williams** and senior research assistant **Shannon Smith**, both working with the Scientific Resource Center for

AHRQ's Medicare Modernization Act work.

Research assistant **Rachel Burdon** works with David Dorr, MD, MS, assistant professor, on his project on reporting adverse events to the IRB, a subcontract with Northwestern University.

Finally, on October 9th, **Dolores Newman** joined DMICE as a senior fiscal analyst. Dolores was formerly with Sponsored Projects Administration and was the SPA analyst for DMICE several years ago. ■

DMICE Researcher Develops "Nanotechnology" Tool

You have probably heard of nanotechnology but nanotechnology? That's when Grandma is using the computer for either work or play. For associate professor **Holly Jimison, PhD**, having senior adults play computer games can help detect changes in their cognitive function. Jimison's research project was featured in an August 9th *USA Today* article on nanotechnology. She also presented a poster at 10th International Conference on Alzheimer's Disease and Related Disorders in Madrid in August.

Jimison and her colleague Misha Pavel, PhD, professor of biomedical engineering and computer science and electrical engineering at OGI School of Science & Engineering, studied nine people with an average age of 80. As the seniors played the solitaire game Free Cell, the researchers measured cognitive performance by comparing each user's play efficiency to a game "solver" within the program that calcu-

lates the minimal number of moves to complete the game.

"We discovered that we can take an existing computer game that people already have found enjoyable and extract cognitive assessment measures from it," said Jimison.

"It requires significant planning to play well, and planning is one measure that neuropsychologists attempt to test in clinical situations," Jimison said. "We're trying to replicate that, and we've been able to show that we can, at least in early studies with small numbers of people, show distinctions between cognitively healthy elders and those with even mild cognitive impairment."

The solver is a "dynamic algorithm that is solving the game at every moment in time, and it knows the minimal number of steps you would need to complete it," Jimison said. "We compare this 'optimal slope' to how the individual users are doing."

People with mild cognitive impairment are at high risk of developing dementia, which is most commonly caused by Alzheimer's disease. The discovery could help doctors plan early treatment strategies by detecting subtle cognitive changes over time in the natural setting of an elder's home. ■



Holly Jimison, PhD

Ten Years of Informatics Degree Programs

Continued from Page 1

focusing on informatics applied to biomedical research, especially molecular biology. Led by OHSU faculty member Shannon McWeeney, PhD, the new track will focus on computational biology and involve collaboration with computer science faculty from Portland State University.

A major goal for the coming year is to ramp up recruitment for the new bioinformatics and the on-campus program in general. To this end, the department will host an Open House designed to introduce college students and others to careers in biomedical informatics and opportunities for study at OHSU on November 4th. We are reaching out to undergraduate institutions throughout the Pacific Northwest to invite potential students and their career counselors to attend. We also plan to incorporate efforts aimed at recruiting underrepresented minorities to the program as well.

We also recently received the good news from the National Library of Medicine that our Biomedical Informatics Training Grant will be renewed for another five years. This program, which funds predoctoral, postdoctoral, and librarian fellows, has been operating since 1992, preceding even our degree programs. Being funded by this program places us among the leaders in the field nationally.

OHSU's distance learning programs also continue to thrive and achieve recognition for their innovation. As noted in another article, DMICE chair Dr. William Hersh has led a collaboration with the American Medical Informatics Association in developing the 10x10 program. ■

Ten Years Later

Continued from Page 3

and I was looking around for something precisely like this. It complemented my previous training and provided whatever I needed to fill in the gaps." Sara Raman, MD, was working with Dr. Blackford Middleton at electronic medical vendor MedicaLogic, and he recommended the program to her. As part of the program she worked as a graduate research assistant (GRA) for Holly Jimison, PhD, now associate professor.

For Kathleen Skipper, RN, beginning the informatics program coincided with a promotion at work. In her new position at Providence Medical Center, she needed to learn about "computer science and technology in the acute care environment, how to use data and technology to support best practices."

The expanding role of the Internet was an impetus for others. Said Jeff Stolte, "In 1996, I was eager to pursue a personal interest in the expanding promise of the Internet, particularly as that technology could be applied to healthcare." The local beverage industry contributed to his decision as well. "Although it was actually just prior to my matriculation," he said, "I recall an informational lunch I shared with Bill Hersh and Chris Dubay. I sampled my first Portland microbrew at that lunch, and I think it's safe to say that it was a combination of our interesting conversation and the quality of the beer that cinched my decision to travel from Chicago to the great Northwest for grad school."

Ten years ago the BICC was not so crowded. "The department was only on the top floor," Day noted, "and there was a lot more free space in the cubes." But not all classes were held at OHSU. Judy Logan remembers the computer science course, which was held at PSU, "a year's worth of C++ in 10 weeks. Hazing 101 was what it felt like." Jon Blackman recalled "the

friendly competition as we worked through the syntax and the course."

While computer science may not have been the favorite course, students did find it worthwhile. Calvin Huey noted, "I may have wondered why I was learning how to program but that has given me a real edge in the work place. Everyday, I use skills and concepts I learned at OHSU, ranging from database work, data analysis, database programming, applications development, data processing, and clinical terminology."

And the first class of students learned to work together, both face-to-face and via the Internet. "My fondest memories are of the interactions with my classmates, learning how to work as a group electronically," Blackman said. Logan agreed, "Our group was very cohesive." She recalled a group Jurassic Park presentation for Organizational Behavior with Kelly Chung, Jon Blackman and Bikram Day.

Stolte appreciated the diversity of the student body and the curriculum. "I enjoyed the diversity of student backgrounds and their professional experience, combined with a vibrant faculty and a curriculum that provided ample education in the primary topics underlying biomedical informatics. I felt there was a nice combination of exposure both to the theoretical and practical elements of the field."

"There were fun and challenges in being the first class of a new program," said Skipper. She enjoyed being able to provide input for the future design of the program and advertising the success of the program to those in medicine, nursing and other health care professions. Huey agreed. "OHSU offered a progressive program," he said. "Since it was really in the early stages of development, the students had a chance to really influence the direction of our learning."

Ten years later, this first class of students still extolls the benefits of the program. For Sara Raman, now an instructor in vascular surgery at OHSU,

the medical informatics program provided an “overall understanding of clinical applications of technology.”

Bikram Day, who had a computing background, benefited from “the exposure to clinical workflows that I needed to complement my background in systems and basic sciences. I got a perspective into the major barriers that need to be overcome to create effective clinical informatics systems. The interaction with people in the clinical domain was invaluable, and provided me with insights that I leveraged regularly in my work designing and building clinical systems. Some of my peers had clinical backgrounds and their opinions and contributions based on their work experiences provided a multifaceted perspective to better appreciate the program content.”

Day now works for a health-care startup, Lifecom Inc., which is developing an innovative clinical diagnostic system that uses artificial-intelligence “to provide a real time point-of-care decision support system that has the potential of revolutionizing the clinical IT world. A system like this has been the holy-grail of medical informatics since the inception of the field. We have the ability to use clinical literature and knowledge in a software ‘knowledge engine’ that can triage, diagnose and prioritize clinical symptoms and facts presented by a patient at the point of care. It is a very exciting venture with unlimited potential. We are working with OHSU on a clinical pilot project of our system.”

After graduation in 1998, Jeff Stolte found a position in the Strategic Development Group of Ascension Health, the nation’s largest non-profit, and third largest healthcare system (by revenue). “This team serves several core functions, among which are healthcare industry and technology forecasting, system-wide knowledge management, strategic relationship management, and strategic direction development,” he said. “In my role, I manage projects or relationships germane to each of these

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Department of
Medical Informatics & Clinical Epidemiology

DMICE: Department of Medical Informatics and Clinical Epidemiology

Announcement: DMICE is having an Open House Saturday, November 4. Visit campus and learn about our programs!

Medical informatics is the field concerned with the acquisition, storage, and use of information in health and biomedicine. Clinical epidemiology is the application of the logical and quantitative concepts and methods of epidemiology to problems (diagnostic, prognostic, therapeutic, and preventive) encountered in the clinical delivery of care to individual patients. As technology and information both become more prevalent in society, the ability to quickly and accurately identify, parse, understand, and utilize that information becomes both more critical and more difficult.

The Department of Medical Informatics & Clinical Epidemiology is an academic and research department in the Oregon Health & Science University (OHSU) School of Medicine. The department, founded in 1989, was one of the first of its kind in the world. Our pioneering status in the field and our emphasis on the blend of teaching, research, and service uniquely positions us to be both leaders and innovators in medical informatics and clinical epidemiology.

DMICE is part of OHSU's Biomedical Information Communication Center (BICC) and is housed in the BICC Building on the University's Portland campus. The Department Chair is William Hersh, MD and the Vice Chair is Cynthia Morris, PhD.

Search
Search this site
Search

Info for

- Prospective Students
- Current Students

DMICE Launches New Web Site

Web 2.0 is upon us, and we couldn't be more excited!

In response to recent, dynamic changes with both the Web and the department, we've redesigned our website to better capture the spirit of the two. The current redesign has not only given our site a facelift, but also uses new tools to keep the site more active while giving it the flexibility to expand with the department over time. We've used the award-winning CommonSpot content management system, giving multiple people in the department the ability to keep the site updated with the latest information. And, rather than roll out all our changes at once, we plan to implement new features regularly, including an expanded research section, tools for faculty to upload

course materials more quickly, and informatics news feeds from around the world.

It's not all glamorous, of course. We also felt it was important to strengthen the core of the site – the content. Even the most successful sites must have something worthwhile to say, so we've updated all our information to reflect recent changes to the curriculum. With the help of our users, we reformatted the navigation in a way they felt made the most sense – making the site both easy and enjoyable to navigate. We encourage you to become one of them! Visit the site at <http://www.ohsu.edu/dmice/> and let us know what you think. We look forward to hearing from you. ■

by Alexis Turner

Student and Alumni News

Congratulations to **Emily Campbell, MS, RN**, doctoral student and NLM fellow, who was elected to the student editorial board of JAMIA, the Journal of the American Medical Informatics Association. Emily is the second DMICE student to serve on the editorial board, joining Dr. Laura Fochtmann, a distance master's student from SUNY Stonybrook.

Doctoral student and NLM fellow **Adam Wright** was one of seven authors

of a white paper, A Roadmap for National Action on Clinical Decision Support, commissioned by the U.S. Department of Health and Human Services (HHS) and released June 13, 2006. The plan, which was presented to HHS Secretary Michael Leavitt, is aimed at making health information technology an integral part of clinical decision making in the practice of medicine. Clinical assistant professor Dean Sittig, PhD, was one of more

than 70 experts who participated in panels and meetings to produce the roadmap report.

MBI student **Marguerite Cohen, MD**, is still in the private practice in obstetrics and gynecology and chair of that department at Legacy Portland Hospitals. She gave two presentations at the American College of Obstetricians and Gynecologists, Oregon Section Meeting April 7-9, 2006, in Sunriver, Oregon: "Information Please: Finding What You Want, When You Need It" and "The New Peripheral Brain: PDAs for OB/GYNs."

For the second straight year, a DMICE doctoral student has been accepted into the AMIA Symposium Doctoral Consortium on Organizational Issues in Medical Informatics. This year our accepted student is **Ravi Teja Bhupatiraju**, whose doctoral thesis is on understanding clinical representational transformation. The AMIA Doctoral Consortium, which will be held November 11 in Washington, DC, is a forum in which doctoral students can meet and discuss their work with each other and with a panel of experienced researchers and practitioners. Applicants from a broad range of disciplines were invited to participate. The Consortium aims to support the research done by doctoral students with constructive remarks and feedback from prominent scientists in the information systems field.

Doctoral student and NLM fellow **Emily Campbell, MS, RN**, won the best poster award for division II at OHSU's 23rd Annual Student Research Forum, held May 11th and 12th. Her poster was entitled "Types of Unintended Consequences of Computerized Provider Order Entry."

At the 2006 AMIA Spring Congress, held in Phoenix May 15-18, several DMICE students and alumni presented posters:

Emily Campbell, MS, RN, PhD

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Ten Years Later

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areas. Among other responsibilities, I serve as the primary liaison between Ascension Health's CIO and the Strategy arm of the organization. My education and previous industry experience in medical informatics enable me to speak fluently with both our technology and clinical leadership teams, translating their functional strategic planning work into the overarching Strategic Direction that is maintained by our group."

Jon Blackman is developing clinical content for McKesson Corporation, a healthcare services and information technology company currently ranked 16th on the FORTUNE 500. He noted, "The informatics program was essential in preparing me for that position."

Today Calvin Huey works as a clinical outcomes analyst for a quality and patient safety department in a northern California hospital system. He works with clinical systems (Meditech and STAR), financial systems (Trendstar), APOLLO STS Cardiac outcomes database, and MIDAS data systems (JCAHO and CMS) reporting. His latest project involves data warehousing.

Kathleen Skipper has been in several positions since graduation and now works as nurse manager for short stay, endoscopy and post-anesthesia recovery at Legacy Meridian Park Hospital in Tualatin. The medical informatics program benefited her, she said, in understanding computer applications and how to implement major information systems. "I can use systems more effectively in the acute care environment," she remarked.

And some people, such as Judy Logan, never left. Logan is now an associate professor in medical informatics and teaches the computer science courses. The informatics program "was a stepping stone to a new career for me," she said.

Since the fall ten years ago, several hundred students have matriculated in the various on-campus and on-line programs. Some are master's or certificate students while others have joined the doctoral program. A majority of students are now distance learners but some still come to Portland for their coursework. And we owe it all to the first 10 by 10, the first ten biomedical informatics students who studied here 10 years ago. ■

Student and Alumni News

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student, Types of Unintended Consequences of Computerized Provider Order Entry

Richard Dyrka, MD, MS '06, Using Qualitative Methods for CPOE Evaluation: CPOE and Communication

Peter Embi, MD, MS '02, Early Development of a Clinical Trial Alert System in an HER Used in Small Practices: Toward Generalizability and Responding Rapidly to FDA Drug Recalls: Design and Application of a New Approach for a Consumer Health Website.

Ken Guappone, MD, PhD student, Effects of CPOE on Clinical Workflow: A Qualitative Evaluation

Michelle Lee, MS '06, Evaluation of MyHealtheVet Implementation

Daren Nicholson, MD, MBI '06, Evaluation of Wikipedia's Consumer Health Information

Adam Wright, PhD student, Association Rule Mining Techniques for Corollary Order Generation

Jianji Yan, PhD student, Content Clustering of Medline Abstract Sentences to Find Gene-Gene Relations

Adam Wright, a doctoral candidate in DMICE, spent his summer in Boston, working at Partners Healthcare in the Clinical Informatics Research and Development group as a member of the Enterprise Clinical Services team. His project was a service-oriented architecture for clinical decision support across the Partners system - a topic closely related to his dissertation. Adam reports that "spending the summer in Boston was a great experience. Partners is on the cutting edge of clinical systems research, and it was very instructive to put take some ideas I'd been working on at a theoretical level, and see how they translated into practice."

Doctoral student **Steven Bedrick** spent the month of August in Argentina, with assistant professor Nancy Carney, PhD, and several second-year

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Faculty Update

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Human Investigations Program Marks Sixth Year

This fall marks the sixth year of the Human Investigations Program (HIP), an OHSU-wide effort to promote clinical research education, led by Cynthia Morris, PhD, MPH, DMICE professor and vice chair. Beginning this fall, the HIP program will comprise the education platform of the new Oregon Clinical and Translational Research Institute (CTRI), offering new opportunities to students, fellows, and faculty who pursue clinical or translational research, either from “bench to bedside” or from “clinic to community.” (See related article on page 3.)



*Cynthia Morris,
PhD, MPH*

Curriculum development and expansion over the next five years will focus on developing didactic and experiential courses in 10 major cognate areas:

- Clinical and Translational Research Design
- Bench to Bedside: Basic Research for Clinical Scientists
- Clinical Medicine for Basic Scientists
- Biomedical Informatics
- Management and Leadership Skills
- Basics of Genetics Research
- Evidence Summation and Dissemination
- Biostatistics
- Ethical Conduct of Human Research
- Population Research Methods

This year, HIP will add four new classes to the curriculum. In the winter, Dawn Peters, PhD, adjunct associate professor of public health, will teach

the first in a series of two classes in advanced applied biostatistics, using a small-group learning format to teach the biostatistical methods used in analysis of clinical medicine. This spring, OGI faculty Niki Steckler, PhD, associate professor, and Jim Huntzicker, PhD, department head, both in the department of management in science and technology, will teach a course in academic leadership and project management that will offer opportunities for career advancement for students and trainees in the HIP and Master of Clinical Research (MCR) programs. Earlier this fall, DMICE faculty and Oregon Evidence-based Practice Center investigators Marian McDonagh, PharmD, assistant professor, and Susan Norris, MD, MPH, assistant professor, taught a course in how to design, implement, analyze and report a systematic review. This course was attended by 17 students and is a successful addition to the curriculum.

This year 29 students matriculated into the HIP program with the intention of earning a certificate in human research, and another 24 students are participating in the program. These students join 50 students who are in the second year of the program, plus 20 seeking the MCR degree. About half of the trainees are junior faculty and half are clinical fellows, with a few graduate students and postdoctoral fellows. HIP trainees continue to come from a diversity of disciplines from OHSU and the community, representing all major departments and divisions in medicine, obstetrics and gynecology, emergency medicine, pediatrics, neurology, surgery, dentistry, complementary and alternative medicine, and basic science.

The HIP curriculum will continue to provide a platform for trainees seeking an MCR degree and will grow to provide clinical and translational re-

search training for medical and dental students through a T32 grant, as well as a multidisciplinary K12 program as part of the CTRI. Since its inception in 2001, HIP has trained more than 270 OHSU faculty and fellows; 47 have received a Certificate in Human Investigations and four have received a Master's of Clinical Research degree.

This past June Lisa Silbert, MD, assistant professor of neurology, received a Master of Clinical Research degree. Thirteen people received the Certificate in Human Investigations.

Jason Barker, ND, Complementary and Alternative Medicine,

Thomas Barrett, MD, Medicine, General Internal Medicine

Jennifer DeVoe, MD, DPhil, Family Medicine,

Lyle Fagnan, MD, Family Medicine,
Jessica Gregg, MD, PhD, Medicine,
General Internal Medicine

Sarah Hamilton Boyles, MD, MPH,
Obstetrics & Gynecology, Urogynecology

Aileen Kirby, MD, Pediatrics, Critical Care

Christopher Komanapalli, MD, Surgery, Cardiothoracic Surgery

Yuk, Law, MD, Pediatrics, Cardiology

Patricia Robertson, MD, Obstetrics & Gynecology, Maternal Fetal Medicine

Maria Elena Ruiz, PhD, Nursing

Elizabeth Steiner, MD, Family Medicine, Research

Victoria Warren-Mears, PhD, Medicine, Endocrinology

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Student/Alumni News

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medical students from OHSU as well as a neurosurgical resident from the University of Washington. Bedrick's time was spent studying the workings of the Argentine health system and meeting with informatics staff at both private and public hospitals in the city of Rosario. He also met with Dr. Paula Otero's informatics team at Hospital Italiano in Buenos Aires. Besides learning about Argentine medicine, Bedrick worked on data collection systems for use in Dr. Carney's traumatic brain injury research. He also developed expanded perspectives on such diverse topics as which parts of the cow are edible, general barbecuing technique, and maté consumption.

From October 6-8, **Marilyn Paterno, MBI '06**, a senior medical informatics specialist at Partners Health-Care System, did the Philadelphia Breast Cancer 3-day, a 60-mile walk sponsored by the Susan G. Komen Breast Cancer Foundation. Starting at the Will Grove Park Mall north of Philadelphia, Paterno walked in the rain, slept in a high school one day and a tent the next, and reached the finish line at Villanova University as walker 247. The walk raised over \$6.6 million for the Komen Foundation. Congratulations, Marilyn!

Ron Jimenez, MD, certificate '02, represented public hospitals at the Governor's eHealth Action Forum in October. Jimenez is from the Santa Clara Valley (California) Medical Center.

Student and Alumni Publications

Hersh WR, Muller H, **Jensen JR, Yang J**, Gorman PN, Ruch PR. Advancing Biomedical Image Retrieval: Development and Analysis of a Test Collection. *J Am Med Inform Assoc* 2006; 13: 488-496

Campbell EM, Sittig DF, Ash JS, **Guappone KP, Dykstra RH**. Types of Unintended Consequences Related to Computerized Provider Order Entry. *J Am Med Inform Assoc* 2006; 13: 547-556. ■

20 Begin Masters Program

Welcome to our new Master of Science in Biomedical Informatics students.

Joining the on-campus program this fall are Nathan Bahr, Michael Mooney, and JoAnna Vanderhoef.



Nathan Bahr



Michael Mooney



JoAnna Vanderhoef

In addition, DMICE has 17 new distance learning master's students:
 Thomas Carr, Matthews, NC
 William Claridge, Redmond, OR
 Dan Dalan, Fargo, ND
 Brock Drapkin, New York, NY
 Gregory Griffin, Wilmington, DE
 Tony Hampton, Lexington, NC
 Drew Kelts, Fresno, CA
 Andi Lushaj, Madison, WI

Purvi Mehta, San Mateo, CA
 Sandra Mendel, Springboro, OH
 Jeffrey Merrill, Philadelphia, PA
 TJ Michael, Annandale, VA
 Michelle Morgan, Germantown, TN
 Amit Shah, Portland, OR
 Dean Sharpe, Bend, OR
 Ronald Stevenson, Tigard, OR
 Roy Wilson, Kansas City, KS

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