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- **Recap of the Center's Executive Council Meeting**
- **Big Data analytics**
- **Vulnerability testing of computerized physician order entry systems**
- **Global Fellows Corner with Jae-Ho Lee, MD, PhD**
- **Recent publications from Center Researchers**

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Center Updates: a seasonal review

The Center Hosts its Fall Executive Council Meeting

On Oct. 30, BWH's Center for Patient Safety Research and Practice hosted its Fall Executive Council meeting. Focusing on the theme of value-based care, the purpose of the meeting was to discuss how to drive safer patient care, without compromising ethics or cost-effectiveness, in today's rapidly changing healthcare environment. It provided Council members—patient safety scientists and investigators from academia, government, industry and healthcare—an opportunity to visualize the future of healthcare, forecast evolution of needs, and collaborate on quality-assurance strategies that ensure care is administrated quickly, safely, and effectively.

The meeting began with a presentation by Executive Director David W. Bates, MD, MSc on the formation of a Patient Safety Learning Laboratory (PSLL) at BWH. The PSLL aims to improve patient safety and quality care outcomes by engaging healthcare providers, patients, and family caregivers in design of web-based tools. *(for more information on the PSLL, turn to page 2)*

Next, Dr. Bates provided an overview of Big Data analytics strategies and how using computer decision support can improve care quality while reduc-

ing costs. After that, Michael Barnett, MD, Fellow in General Internal Medicine (BWH) discussed *Ginger.io*, a mobile health application which uses a three-part platform (patient smartphone app, behavioral analytics engine, and dashboard) to drive better health outcomes. Then, Jeffrey O. Greenberg, MD, Instructor in Medicine (BWH) discussed Standardized Clinical Assessment and Management Plans (SCAMPs), a new tool for driving iterative quality improvement. SCAMPs are designed to engage front-line clinicians in care improvement and align standardization with a culture of innovation and academic excellence, all the while reducing unnecessary utilization.

The next speaker, Jeffrey A. Linder, MD, MPH, Associate Professor of Medicine (BWH) presented on how to reduce inappropriate antibiotics prescribing for acute respiratory infections. Linder and his team evaluated three behavioral interventions: Suggested Alternatives (offered to clinicians when prescribing antibiotics), Accountable Justification (clinicians were asked to justify each prescription), and Monthly Peer Comparison ("You are/are not a

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Bates Takes On New Role as Chief Innovation Officer

The Center is pleased to announce that its Executive Director, David W. Bates, MD, MSc, was recently appointed BWH's Chief Innovation Officer. In this new role, Bates, who already serves as BWH's Senior Vice President and Chief of the Division of General Medicine and Primary Care, will use his entrepreneurial leadership to breed cutting-edge reform at the hospital and in healthcare more broadly.

Dr. Bates is an ideal fit for this position. Much of his work to date has focused on enhancing healthcare and patient safety culture through innovative means. As BWH's Chief Quality Officer, Bates conducted extensive research and devoted a great deal of effort to improving patient safety and care quality. He is the executive sponsor of the BWH Innovation Hub, developed to inspire and coach

innovators to launch ideas for enriching healthcare toward commercialization, connecting startups with medical professionals to forge clinical partnerships. He is also the external program lead for research in the World Health Organization's Global Alliance for Patient Safety.

Dr. Elizabeth Nabel, President of BWH, commented on Bates' new role for *Boston Business Journal*. "Dr. Bates brings a depth and breadth of experience in this area," said Nabel. "[Under] his leadership, the Brigham will support innovation and collaboration to help solve the important and difficult health care challenges of today and tomorrow."

We at the Center congratulate Dr. Bates on his new position. We wish him success, and are very excited to see what he will achieve.

The PSLL will conduct three core projects over a four-year period, focusing on patient safety, development and enhancement of tools, health care system interventions, and translation into practice.

“To ensure the best quality care for patients, you must take care of the care providers.”

Brigham and Women’s Patient Safety Learning Laboratory: An Exciting New Collaboration by Alexandra Businger, MPH Candidate 2016

The BWH Patient Safety Learning Laboratory (PSLL), led by Principal Investigator David W. Bates, MD, MSc, is an exciting new collaboration between the Center and Northeastern University’s Healthcare Systems Engineering Institute (HSyE), headed by Co-Principal Investigator James C. Benneyan, PhD. The PSLL focuses on developing tools to engage patients, family, and professional care team members in reliable identification, assessment, and reduction of patient safety threats in real time, before they manifest into actual harm. The PSLL will achieve its vision of making acute care more patient-centered by creating systems approaches to integrating health information technology (HIT), stakeholder engagement mechanisms, process design and engineering methods. The PSLL is funded by a grant from the Agency for Health Care Research and Quality.

The PSLL will conduct three core projects over a four-year period, focusing on patient safety, development and enhancement of tools, health care system interven-

tions, and translation into practice. The three core projects of the PSLL are: 1) Patient-centered Fall Prevention Toolkit, led by BWH Co-Investigator Patricia Dykes RN, PhD, which aims to engage patients and their family caregivers in the design of HIT tools to prevent patient falls and related injuries during an acute hospitalization; 2) Design and development of a Patient Safety Checklist Tool, led by BWH Co-Investigators Lisa Lehmann, MD, PhD and Kumiko Schnock, RN, PhD, to improve patient safety and quality outcomes, provider efficiency, and team communication; and 3) My-SafeCare Patient Safety Reporting System, led by BWH Co-Investigator Sarah Collins, RN, MMS, which aims to iteratively develop and evaluate the impact of a patient safety reporting system on patient safety, ultimately fostering a health system focused on collaborative learning.

A Patient Safety Dashboard will integrate information from all three projects of the PSLL to facilitate awareness of the status of patient safety metrics between

members of the health care team and patients and family members. An Administrative Core will provide directorial oversight through methodological, translational and distributional expertise. A Systems Engineering, Usability, and Integration Core, led by BWH Co-Investigator Anuj Dalal, MD, will leverage health systems engineering approaches to develop the three projects at the individual level. In addition, a model known as the Patient SatisfActive® Model will be developed, tested, and refined by Ronen Rozenblum, PhD, MPH to create a culture of patient- and family-centered care. This will provide a system-wide methodology to aid in the successful implementation and improvement of HIT tools on BWH patient care units.

Currently the three projects are in the midst of Phase One, problem analysis, which includes conducting workflow observations, surveys and focus group interviews with clinicians, patients and family members to identify preliminary software and workflow require-

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Fall Executive Council Meeting

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Top Performer”). The Accountable Justification and Peer Comparison groups were associated with decreased inappropriate antibiotics prescribing, suggesting that social motivation appears effective for clinical behavior change.

Council Chair David Feygin, PhD, MBA led an open discussion on Becton Dickinson’s recent merge with Carefusion, explaining how the companies’ complimentary portfolios will create a global leader in medications management and patient safety solutions. This was followed by individual member sharing. Gordon Schiff, MD discussed his recent work in diagnostic errors prevention, research he was applying to a Chicago-based project focusing on opioid overdoses. Mary Beth Navarra-Sirio, RN, MBA discussed how to rethink patient engagement strategies for the global platform. Finally, Lucian L. Leape, MD highlighted the importance of team formation and management in healthcare stating, “To ensure the best quality care for patients, you must take care of the care providers.”

At the close of the meeting, the Council concluded that it will be important to transmit value-based care guidelines across multiple disciplines while maintaining clinical performance transparency. Members foresee a big push towards analytics. They also placed emphasis on the rising role of data linkages, a subject the Center will keep focus on whilst moving forward.

Using Big Data Analytics Can Improve Care and Reduce Costs

The United States healthcare system, though always adapting, is facing a major issue with rising care expenses and substandard treatment of patients. Policy reforms, such as the Affordable Care Act, cannot sufficiently combat increasing costs. Nor can they appropriately satisfy the resulting demand for greater quality care.

In “Big Data In Health Care: Using Analytics To Identify And Manage High-Risk And High-Cost Patients,” a recent article published in *Health Affairs*, lead author, David W. Bates, MD, MSc, Senior Vice President and Chief Innovation Officer (BWH), explores the issue of inadequate and expensive care practices, and how utilizing Big Data analytics can help improve healthcare while reducing costs. Bates partnered on the study with Suchi Saria, PhD (John Hopkins University), Anand Shah, MD (University of Texas-Southwestern), Lucila Ohno-Machado, MD, PhD (University of California-San Diego), and Gabriel Escobar, MD, FAAP (Kaiser Permanente's Northern California Division of Research).

Big Data analytics refers to the high volume, variety, and potential for rapid accumulation of data, and the discovery and communication of patterns within that data. Due to rapid adoption of electronic health records in US healthcare, Dr. Bates and his colleagues argue that the subsequent increase in the amount of clinical data available will offer outstanding potential for cost savings. The authors examine six key areas in which they believe some of the clearest opportunities exist for Big Data to identify, manage, and reduce costs for treatment of patients:

1) High-Cost Patients: Fifty percent of all US healthcare spending is accrued by 5 percent of patients. The authors emphasize that these

high-cost patients need to be more effectively identified and managed. Implementing a predictive analytics system that accurately measures clinical and socioeconomic data from various sources, calculates each patient's overall risk, and identifies the best actions for providers to take would be a monumental advancement to the healthcare system. In order to truly be effective, however, such a system and its predictions must be easily available to clinicians without disrupting current workflow.

2) Readmissions: One-third of hospital readmissions may be preventable. The authors suggest that using predictive algorithms to calculate which patients are likely to be readmitted could significantly lower the frequency of readmission. It will be imperative for these algorithms to tailor interventions to the individual patient and guarantee patients receive the interventions intended for them. They must also monitor specific patients after discharge to ensure they do not deteriorate, and produce a low false positive rate.

3) Triage: Estimating a newly-admitted patient's risk for developing complications is important for managing staff and bed resources, anticipating the need for a transfer to the appropriate unit, and informing overall strategy for managing the patient. The authors explain how modern Big Data techniques that combine routinely-collected physiological measurements make much more accurate triage assessments possible, with a minimal burden of training and implementation. They also explain that, when integrating a triage algorithm into clinical workflow, it is important to have detailed guidelines clarifying how the algorithm will inform care.

4) Decompensation: Patient decompensation (when a patient's condition worsens) is often pre-

ceded by a period in which physiological data can act as a warning of impending deterioration. The authors introduce how analytics systems, developed to monitor multiple data streams, can be used to effectively detect patients at risk for decompensating. The increased true-positive detection rate from such systems has been linked to reduced ICU lengths of stay.

5) Adverse Events: While adverse events are expensive and can cause high rates of morbidity and mortality, many are preventable. The authors provide the examples of renal failure, infection, and adverse drug events as areas where analytics could improve upon current practices. The result is fewer patients who experience adverse events and reduced cost for their treatment.

6) Treatment Optimization for Diseases Affecting Multiple Organ Systems: Diseases that affect multiple organ systems are some of the costliest conditions to manage. To reduce the burden of disease on those patients and on the healthcare system, the authors propose care providers use Big Data approaches that combine the numerous measurements taken as part of routine care. These systems are ideal for helping predict the trajectory of these diseases, identify the best treatment option for each patient, and execute that treatment.

Currently, the extent to which analytics are utilized by many US healthcare organizations focuses on patients with one condition. However, the authors have demonstrated that Big Data analytics approaches, which address multiple conditions, could impact care outcomes and cost savings in a major way. Big Data analytics will most certainly be useful across the healthcare continuum.

Due to rapid adoption of electronic health records in US healthcare, Dr. Bates and his colleagues argue that the subsequent increase in the amount of clinical data available will offer outstanding potential for cost savings.

Bates DW, Saria S, Ohno-Machado L, Shah A, Escobar G. Big data in health care: using analytics to identify and manage high-risk and high-cost patients. Health Aff (Millwood). 2014 Jul; 33(7): 1123-31. doi: 10.1377/hlthaff.2014.0041.

Honors & Awards

Bates Recognized in *Health Affairs*' Most Read List

David W. Bates, MD, MSc was recently recognized in *Health Affairs*' list of Top 10 Most Read Articles of 2014, for his paper "Big Data In Health Care: Using Analytics To Identify And Manage High-Risk And High-Cost Patients." *Health Affairs* is a leading health policy journal, with a mission to promote analysis and discussion on improving health and healthcare, and to address such issues as cost, quality, and access. (for more information on Bates' Big Data publication, turn to page 3)

Schiff Awarded "Paper of the Month" by Swiss Patient Safety Foundation

Gordon Schiff, MD was recently honored by the Swiss Patient Safety Foundation, who selected his paper, "Computerised physician order entry-related medication errors: analysis of reported errors and vulnerability testing of current systems," as its "Paper of the Month." Roughly 4,000 individuals working in the field of patient safety in Switzerland were sent German and French language versions of the study with extended summaries. This is Schiff's second publication to be chosen as the Swiss Patient Safety Foundation's "Paper of the Month." (for more information on Schiff's study, turn to page 5)

BWH, Center Honored with Distinguished Poster Award

Research Assistant, Dianna Stade (BWH) won a Distinguished Poster Award at the American Medical Informatics Association (AMIA) Annual Symposium this past November. Out of the hundreds of posters presented, only 6 were selected by the AMIA Annual Symposium Poster Committee and the AMIA Awards Committee to receive this award. Stade partnered with members of BWH, the Center, and Harvard Medical School on this poster. She will be attending Tufts Medical School this Fall.

Stade's poster (below), entitled, "Developing and Testing a Web-based Interdisciplinary Patient-centered Plan of Care," examines a bedside patient portal designed to engage acute care patients in their plan of care. Since July of 2014, this safe and secure portal has enabled ICU and Oncology patients at BWH to view various clinical data and communicate goals, preferences, and concerns about their care plan with their care team.

For a high-resolution view of the poster, click [here](#)

Introduction
Patients and family caregivers may not be formally involved in developing their plan of care while hospitalized for an acute illness. Diagnoses, problems, goals, and safety measures are often documented in multiple places across disciplines in paper and electronic forms.
We developed and are currently testing patient and provider tools in the acute care setting that serve as an interdisciplinary patient-centered platform to:
• Engage patient/caregivers in developing the plan of care
• Enhance patient and provider communication
• Improve safety by preventing adverse events
• Provide tailored patient education at the bedside
• Improve care plan concordance among patients and providers

Results after Clinician and Patient Engagement
Patient Portal
Goals: Patient identifies individual goals, communicates preferences, and provides feedback. Patients can also view the care team's daily goals
Problems List: Patient is informed of clinical problems with access to educational information via Medicine Plus
Safety: Patient is informed of safety risks associated with their specific conditions and hospital interventions
Provider Tools
Nursing Documentation: The RN documents the plan for the day including problems, goals, interventions, and active lines. The RN designates specific problems and goals for patient view.
Safety Checklist: The patient's care team assesses the status of key safety items at daily morning rounds. This information is updated on the patient portal.

Preliminary Usage Statistics
Patient Portal Usage
Patient Portal Enrollment
• 41% of eligible MICU patients sign up
• 53% of eligible Oncology patients sign up
Contributions to the Plan of Care
Of enrolled patients:
• 61% input their daily goal
• 37% input their overall goal
• 27% communicate their preferences
• 7% contribute to their problem list
Of assigned clinicians:
• 92% of nurses complete their plan of care documentation
• 95% of physicians complete the safety checklist

Research Method
System Development Process
Implementation
Key needs of stakeholders
Patients/Families
• Plan for the day including problems and goals
• Schedule
• Education
• Discharge information
MDs
• Integrated into morning rounds
• Simplify as much as possible
• See patient contributions to plan of care
RNs
• Avoid more documentation
• See patient contributions to plan of care

Study Participation

Forum	Date	Patients/ Caregivers	Clinicians	Frequency
Focus Group	Nov-13 - June-14	0	50	Monthly
Semi-structured Interview	Nov-13 - June-14	12	21	Once per person
Pilot Period	June-14 - Aug-14	49	87	Daily
Implementation Period	Sept-14 - Nov-14	665	334	Daily

Conclusions and Next Steps
• We have successfully used an iterative participatory design method to implement patient-centered plan of care tools and continue to refine them in the acute care setting.
• We need to focus on increasing patient enrollment to use the patient portal as well as optimizing patient engagement in contributing to their plan of care

Contact: Dianna Stade, Brigham and Women's Hospital, Email: dstade@partners.org
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Acknowledgements: The Brigham and Women's Hospital PROSPER project is part of the Innovations supported by the Gordon and Betty Moore Foundation.

Rozenblum, Bates Announce Book Release

Ronen Rozenblum, PhD, MPH and David W. Bates, MD, MSc are pleased to announce the release of their book, *Information Technology for Patient Empowerment in Healthcare*. The book explores the opportunities for using health information technology to engage patients in their own care. The authors describe processes for improving patient engagement and empowerment, providing insight on accomplishments to date, and mapping out what steps to take next. Patients, their families, and all members of health care, policy, industry, and academia should find value in this book.

Information Technology for Patient Empowerment in Healthcare is published by Walter de Gruyter, Inc. and is available for purchase in hardcover and eBook formats.

Computerised Physician Order Entry-related Medication Errors: Analysis of Reported Errors and Vulnerability Testing of Current Systems

Use of medication computerized provider order entry (CPOE) systems is an increasingly common healthcare practice that has led to a considerable decrease in medication errors. However, new research speculates that flaws in these systems are actually making them a potential underlying cause of the errors they are intended to prevent.

In a recent article published in the BMJ Quality and Safety Journal, Gordon Schiff, MD and his associates highlight the growing awareness and increasing concern that CPOE can introduce or facilitate new errors. In order to uncover the vulnerabilities of CPOE systems that may lead to errors and unintended consequences, Schiff's team designed a two-stage approach.

In the first stage, the investigators conducted a qualitative review of over 10,000 medication error reports, gathered from the United States Pharmacopeia MEDMARX system, where CPOE was documented as a "contributing cause." For each report, they used their knowledge of the report (what happened and why), medication safety, and health information technology (HIT) to develop potential strategies for preventing the error. During this review, the researchers also flagged reports whose errors they could attempt to replicate in current CPOE systems.

In the second stage of the study, using the data they collected from their qualitative review, Schiff and his colleagues developed and tested several "use cases" to assess and expose the susceptibility of leading CPOE systems to causing medication errors. Use cases, or recurring error scenarios, were ways in which incorrect use of or faulty ordering of steps in the CPOE could produce the errors that were uncovered in the first stage. The researchers chose to test 21 out of the 338 total cases that were identified based on error frequency, severity, generalizability, and testability. To test each error scenario, the team recruited a group of "typical users," mostly medical residents and primary care physicians, who had at least one year of experience with CPOE. Typical users were instructed to enter various combinations of erroneous or problematic CPOE orders related to wrong units, major overdoses, drug allergies, order element omission errors, wrong frequency, and, among others, drug-disease contraindications. The purpose of this exercise was to determine whether the erroneous orders produced an error, and to observe the ease or difficulty

of entering each order.

A total of 357 erroneous orders were tested on a range of leading and homegrown CPOE systems. Overall, users were able to enter 298 (79.5%) erroneous orders. Of these, 100 (28.0%) were considered "easily" placed (simply accepted by the CPOE with no extra steps or warnings), and another 101 (28.3%) were placed with only "minor workarounds," such as adjusting default dosage. Only 95 (26.6%) erroneous orders generated a warning from the CPOE systems, of which 69% could be easily overridden or ignored, and an additional 29% could be bypassed using workarounds. Thus, the majority of errors tested could be replicated relatively easily, with no warning or blocking of potentially dangerous orders by the CPOE systems.

The findings documented by Schiff and his team demonstrate the value of real-world usability testing for HIT. The investigators uncovered major vulnerabilities in current CPOE systems, which could lead to dangerous errors in medication orders. In order to ensure the safety of patients, the researchers suggest that CPOE systems need to balance ease of ordering with appropriate protections. They propose that developers and users should build protection strategies at multiple levels into their CPOE systems to more effectively prevent prescribing errors. Stronger efforts must be made to continuously improve CPOE systems after adoption, promoting better reporting and awareness of medication errors in the process. The safety benefits of CPOE can only be achieved through careful implementation and ongoing evaluation.

Schiff GD, Amato MG, Egale T, et al. Computerised physician order entry-related medication errors: analysis of reported errors and vulnerability testing of current systems. *BMJ Qual Saf.* 2015 Apr; 24(4):264-71. doi: 10.1136/bmjqs-2014-003555. Epub 2015 Jan 16.

Major vulnerabilities in current CPOE systems could lead to dangerous errors in medication orders.



Global Fellows Corner, Jae-Ho Lee, MD, PhD

For each issue, the Center's Global Fellows are invited to share their experiences in the program, and how working with the Center has influenced their own patient safety initiatives.

Improving patient safety and care quality with health information technology (HIT) has become increasingly popular in recent years. Jae-Ho Lee, MD, PhD, who has participated in BWH's Global Fellows Program since August of 2013, is a long-established leader in patient safety reform. Lee is a doctor of Emergency Medicine and Associate Professor of Emergency Medicine and Biomedical Informatics in his native Seoul, Korea. His expertise in HIT, specifically clinical decision support systems (CDSS) and mobile health applications, has made him an invaluable addition to the Center and its renowned HIT and patient safety work. Now, as his fellowship ends, we have invited him to reflect on his Global Fellows experience.

Dr. Lee has contributed to many notable patient safety initiatives across the globe. His work in this field began in 2005, when he designed an interactive homepage with patient portal functions and rich educational contents for his hospital, Asan Medical Center. He has since engaged in the development of several HIT projects and has managed many homegrown hospital information systems. He worked as a Medical Information Officer at Asan Medical Center. He has also led numerous mobile health application projects, including mobile personal health records (PHRs) and electronic medical records (EMRs). Lee currently serves as Secretary General for the Korean Society of Medical Informatics and as Director of Academic Affairs for the Korean Society for Patient Safety, a small but influential research group he cofounded in 2009.

Many factors influenced Lee's decision to enroll in BWH's Global Fellows Program. "Because my main focus of work and research is related to improving patient safety and quality of care through HIT," Lee explains, "I looked for good places to study about this. Twenty years ago, when I had just received my doctor's license, I spent two and one-half years in Tanzania, East Africa working with the Korea Overseas Volunteer Program. I love to travel, and was interested in a fellowship program that would allow me to work outside of Korea for an extended period again. I'd engaged in research regarding patient safety culture, activities, and reporting systems in Korea, and wanted to have chances to participate in patient safety research and also to attend patient safety educational programs related to HIT. I'd heard about Dr. David Bates and admired his work on CDSS, and learned about BWH, its health information systems, and its patient safety programs while attending conferences like the American Medical Informatics Association Annual Symposium, Medinfo, and the International Society for Quality in Healthcare (ISQua). Lastly, my Korean colleague and former Global Fellow, Insook Cho, strongly recommended I enroll in the program when she heard that I was looking for a post-doctoral fellowship."

As a Global Fellow, Dr. Lee engaged in three major projects. In one project, for the Center for Education and Research in Therapeutics (CERT), he examined human factors principles in the design and implementation of medication-related decision support alerts. In another project, Lee participated in the study design and review of mobile health applications for vulnerable populations. The third involved developing a web-based, patient-centered toolkit for Intensive Care and Oncology patients as part of the PROSPECT Project. PROSPECT stands for "Promoting Respect and Ongoing Safety through Patient-centeredness, Engagement, Communication, and Technology." The study aims to achieve a fundamentally better approach to healthcare, improving quality and safety, reducing costs, and ensuring the dignity and respect of patients and those who serve them.

"The PROSPECT study is my favorite of these projects," Lee reveals. "In the PROSPECT study, I designed a patient-centered discharge checklist. I designed a similar system, a [kind of] mobile inpatient PHR, for my hospital before I came to BWH. Even though the PHR was not meant for ICU or Oncology patients, I was able to redesign it for use in those settings. This valuable work allowed me to identify several issues that arise when developing and implementing such tools, and find their solutions. I want to use what I've learned here to develop an inpatient PHR when I return to Korea."

Although Lee is very proud of his accomplishments to date, and the enriching new information he has been able to share, he believes his work is just beginning. Ever ambitious, Lee seems determined to singlehandedly change the world's patient safety standards and practices. Gifted with an unmatched work ethic and a clear vision for the future, he may harbor the potential to actually achieve his goal. As for his immediate future, Lee is eager to use all he learned as a Global Fellow to shape Korea's patient safety culture. "Korea recently passed its own Patient Safety Act, which will go into effect in eighteen months," he explains. "I want to estab-

(Continued on page 8)

Selected Publications by members of the Center

[Harmonizing and extending standards from a domain-specific and bottom-up approach: an example from development through use in clinical applications.](#) Harris MR, Langford LH, Miller H, Hook M, Dykes PC, Matney SA. J Am Med Inform Assoc. 2015 Feb 10. pii: ocu020. doi: 10.1093/jamia/ocu020. [Epub ahead of print] PMID: 25670750 [PubMed - as supplied by publisher].

[Evaluating ambulatory practice safety: the PROMISES project administrators and practice staff surveys.](#) Singer SJ, Reyes Nieva H, Brede N, Ling J, Leydon N, Weissman JS, Goldmann D, Griswold P, Yoon C, Orav EJ, Bates DW, Biondolillo M, Schiff GD. Med Care. 2015 Feb; 53(2):141-52. doi: 10.1097/MLR.0000000000000269.

[Task analysis of IT-mediated medication management in outpatient care.](#) van Stiphout F, Zwart-van Rijkom JE, Maggio LA, Aarts JE, Bates DW, van Gelder T, Jansen PA, Schraagen JM, Egberts AC, Ter Braak EW. Br J Clin Pharmacol. 2015 Mar 9. doi: 10.1111/bcp.12625. [Epub ahead of print] PMID: 25753467 [PubMed - as supplied by publisher].

[Related citations](#)

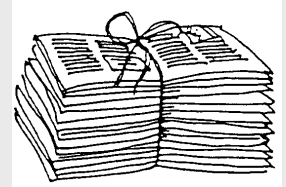
[Graphical Display of Diagnostic Test Results in Electronic Health Records: A Comparison of 8 Systems.](#) Stigtig DF, Murphy DR, Smith MW, Russo E, Wright A, Singh H. J Am Med Inform Assoc. 2015 Mar 18. pii: ocv013. doi: 10.1093/jamia/ocv013. [Epub ahead of print]. PMID: 25792704 [PubMed - as supplied by publisher] Free Article.

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[Design of a cluster-randomized trial of electronic health record-based tools to address overweight and obesity in primary care.](#) Baer HJ, Wee CC, DeVito K, Orav EJ, Frolkis JP, Williams DH, Wright A, Bates DW. Clin Trials. 2015 Mar 25. pii: 1740774515578132. [Epub ahead of print]. PMID: 25810449 [PubMed - as supplied by publisher].

[Post-Discharge Adverse Events Among Urban and Rural Patients of an Urban Community Hospital: A Prospective Cohort Study.](#) Tsilimingras D, Schnipper J, Duke A, Agens J, Quintero S, Bellamy G, Janisse J, Helmkamp L, Bates DW. J Gen Intern Med. 2015 Mar 31. [Epub ahead of print]. PMID: 25822112 [PubMed - as supplied by publisher].

Impact of incorporating pharmacy claims data into electronic medication reconciliation. Phansalkar S, Her QL, Tucker AD, et al. Am J Health Syst Pharm. 2015; 72:212-217. <http://psnet.ahrq.gov/resource.aspx?resourceID=28706&sourceID=2&emailID=1983>



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some recent
publications by
members of the
Center!*



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PRACTICE



TRANSFORMING
PATIENT CARE



RESEARCH AND
INNOVATION TO
IMPROVE QUALITY

Patient Safety Learning Lab

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ments. These requirements will determine the steps in provider workflow and patient engagement that can be leveraged to input data into the PSLL tools. The work of Phase One will aid in discovery of new perspectives from the accounts of participants' experiences, enabling the PSLL to develop detailed requirements and prototypes for the PSLL toolkits (Fall Prevention, Safety Checklists, and MySafeCare). The remaining four phases will involve designing, developing, implementing, and evaluating these tools.

The BWH PSLL will establish a vibrant learning ecosystem of health services, informatics, and systems engineering researchers; collaborating with patients and family to evolve and apply these approaches to adverse event prevention in hospitalized patients. Within the PSLL, the HSyE program will contribute its many developed engineering methods and tools, including statistical methods for "bundling" checklist compliance, rare and risk-adjusted adverse events, and statistical control charts based on interrupted time series concepts. Through increased implementation and use of HIT and patient/family engagement in their plan of care, this PSLL, its cores, and its projects will provide information, strategies, and tools for utilizing HIT to facilitate patient activation in eliminating harm in hospital settings.

Global Fellows Corner

(Continued from page 6)

lish the patient safety infrastructure in Korea and make patient safety solutions. My hospital is preparing to develop next-generation EMRs this year. Using the knowledge I gained at BWH, I want to help make these systems safe, user-friendly, and patient-centered. Above all, I want to help establish and manage a center in Korea similar to BWH's Center for Patient Safety Research and Practice. Such a coalition would be great for generating a strong patient safety culture and foundation for research. I hope to collaborate with BWH's Center in the planning and developmental stages, and dream to one day see the two entities work together to lead globalized patient safety reform."

BWH and the Center praise Dr. Lee for his brilliance and drive, and are grateful for all he has contributed to their healthcare safety and quality improvement efforts. Likewise, Lee considers himself fortunate to have been granted the opportunity to participate in the Global Fellows Program. "I could not forget my invaluable stay at BWH," Lee recounts. "I appreciate Dr. Bates and other colleagues with a happy heart. I attended Partners clinical informatics seminars, monthly quality rounds, and others; and learned so much about the culture of BWH and Boston Strong."

"What I'm most impressed with," Lee continues, "is the collaborative and positive culture at BWH. Dr. Bates and other colleagues I was introduced to were of great help to me. I worked with so many intelligent and talented people I never would have had the chance to meet if not for this program. Even though they were very busy, researchers and clinical and IT experts made themselves available to me, because they were genuinely interested in my work and wanted to help me solve problems. I think that there is no limit to the innovation that can be accomplished through such a dynamic."

Post-fellowship, Dr. Lee intends to continue to his work on the PROSPECT discharge checklist. He will consult Dr. Bates about CDSS solutions and use of Big Data to improve patient safety, and plans to collaborate with the Center on possible future projects.



Brigham and Women's Hospital
Center for Patient Safety Research and Practice
Division of General Internal Medicine and Primary Care
1620 Tremont Street
Boston, MA 02120-1613

Online at <http://patientsafetyresearch.org/>