Breakthrough Opportunities in Technologies for Patient Engagement: Event Discussion Brief
By the GHD Team

At a House committee hearing on health in 2004, Dr. Charles Safran, President of the American Medical Informatics Association, testified, “In our country, patients are the most underutilized resource, and they have the most at stake. They want to be involved, and they can be involved. Their participation will lead to better medical outcomes at lower cost with dramatically higher patient and customer satisfaction. We should remember that the real goal of improved health information systems is not better hospitals or better physician practices but better quality of care and healthier citizens.”

In the decade since his remarks, public policies and organizational strategies have shifted favorably for patient-centered care. Technologies to support patient engagement continue to be designed, tested, and implemented. Selecting the most promising, value-generating technologies, however, has vexed the health care community. This is due, in part, to the complex systemic and human factors that patient engagement technologies must consider, as well as the sheer volume of technologies available or under review. More work is needed to understand which specific technologies or technological attributes will lead to gains in patient engagement and improved health outcomes.

In response, the Global Health Delivery Project at Harvard University has partnered with the Commonwealth Fund Breakthrough Health Care Opportunities Program to develop a series of online events to crowd-source, assess, and examine breakthrough ideas with our professional virtual community of over 14,000 health care implementers from 184 countries. Through robust ideation and discussion with the geographically and professionally diverse community on GHDonline.org, we hope to identify unique opportunities to dramatically improve the health of populations (See Exhibits 1 and 2 for a map of participants and full event statistics).

The online event—spanning three weeks in December 2014—welcomed submissions of technology innovations for patient engagement at any stage of development. A selection of 50 submissions were reviewed, curated and discussed by experts in health technologies. Leading thinkers in health care innovation and consumer engagement recorded keynote presentations describing how patient engagement can generate value for patients and populations. These experts described why we must press on innovators and developers...
to build technologies that create bridges across patients, providers and payers. In review of the keynotes and corresponding discussions, we found four common attributes critical for success—“sticky,” “delightful,” “mobile,” and “social.” After 20 days of continuous discussion, insights emerged about the state of patient engagement technology today and where the field is headed (See Exhibit 3 for the list of all advisors and keynote speakers).

The event’s submissions and keynote presentations demonstrated principles of value-based health care delivery in action. In his book, Redefining Healthcare Delivery, Harvard Business School Professor Michael Porter asserts that information is fundamental to delivering value in health care delivery. He writes, “The patient must be the fundamental unit around which information is collected and stored, not physicians, functions, departments, or cost categories. Patient value is the ultimate goal of health care delivery. All information must be able to be tied to each individual patient longitudinally.” Patient value is created when supporting activities across a care cycle serve to “inform and engage,” “measure,” and improve “access.” Accordingly, data from the GHDonline event showed that technologies for patient engagement that serve these three purposes well can and do create value for patients and populations (See Figure 1 for examples of submissions that inform, measure, or improve access).

Furthermore, technologies that possess certain attributes are likely to perform well in regard to informing, measuring, and accessing. These attributes—sticky, delightful, mobile, and social—were drawn from the prepared remarks of leading experts in the field.

David Bates, Senior Vice President and Chief Clinical Innovation Officer at Brigham and Women’s Hospital in Boston, says patients could use sticky technology to manage their condition over time. He said, “Sticky means how long somebody spends on a site or how often they go back to it. Once we start to build personal health records that have a lot of information about your condition, how you can manage it better, how you are not doing so well, and how you can do things differently, that will really be a game changer.”
Nina Kjellson, Managing Partner at InterWest whose portfolio spans biopharmaceuticals and health informatics, presented how technology must be designed to delight the user to ensure longitudinal patient engagement. She remarked, “Technology needs to provide a great consumer experience: an easy, terrific engagement with an app or program. If new developed tools don't hold up to standards such as Travelocity or Amazon, they will be dead on arrival.”

John Halamka, Chief Information Officer at the Beth Israel Deaconess Medical Center, described the benefits of social technology: “Wouldn’t it be better if the patients, families, the medical care team (nurses, physicians, social workers, pharmacists) all came together and created a social network-driven comprehensive note that described the care plan? So everyone actually understood, read each other’s work and you ended up with a Wikipedia—a centralized article the group authored that described the wisdom of a crowd.”

Ashish Jha, Director of the Harvard Global Health Institute and Professor of International Health & Health Policy at Harvard School of Public Health, emphasized that technology should be mobile. It needs to meet

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<th>Figure 1: Examples of patient engagement technologies that “inform,” “measure,” or improve “access”</th>
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<tr>
<td><strong>Inform</strong></td>
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<tr>
<td>E-learning technologies for patient education and monitoring</td>
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<td>• Cloud-based health &quot;kiosks&quot; to interact with healthcare providers, and access information</td>
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<td>Utilizing and improving current mHealth technologies to diagnose illnesses</td>
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<td>• Using mobile technology to survey and diagnose illnesses in rural communities</td>
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<td>Technology to improve patient compliance monitoring and counseling</td>
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<td>• Treatment compliance software that tracks the intake of every dose of medication by every patient</td>
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<td>Other pre-intervention patient education and counseling technologies</td>
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<td>• Patient profiles and Primary Care Provider (PCP) matching system</td>
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<td><strong>Measure</strong></td>
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<td>Improving and managing EHR and patient portals</td>
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<td>• Centralized access portal for health records</td>
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<td>Advancing testing and research</td>
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<td>• Quantify patients’ value for treatments and treatment outcomes using stated-preference research</td>
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<td><strong>Access</strong></td>
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<td>Remote consultation and communication</td>
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<td>• Connecting data from different sectors for public information (i.e. civil registration offices) to medical records</td>
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<td>Utilizing and improving current m-health technology to improve access of medical records</td>
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<td>• A mobile app that allows patients and healthcare providers to access all medical history</td>
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<td>Improving member feedback system</td>
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<td>• Web and mobile tools for gathering patient-reported outcome data</td>
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patients and providers where they are. He said, “Another important phenomenon that I see is the use of mobile technology that is really pretty global now. Obviously you’ve all heard the statistics: more people have mobile phones than they do landlines in lots of places. What that does is it changes how people access information, it changes how they interact with providers, and I think as countries like India and China think about improving the healthcare delivery system, they’re going to think about how to harness and rely on that technology to engage patients very differently.”

For example, an idea submitted by Dr. Abhijit Bhograj, an endocrinology resident working in Bangalore, India, would enable patients to share their medical history with a provider before a clinical visit. Based on the patient's primary concern, the application may ask specific questions or suggest testing needed prior to the visit. The provider would then use this information to plan for the visit and prepare to discuss treatment options or next steps with the patient. This application is a prime example of technology supporting “access” in Porter’s care delivery value chain, as it improves a patient's ability to communicate with their providers and could save costs and time to diagnoses. It is "mobile," both as a literal mobile application, and also as a technology that meets both patients and providers where they currently are. It is "social," fostering a collaborative network that includes both the medical team (nurses, physicians, social workers, pharmacists) and patients. It would likely be a "sticky" and “delightful” because it has the potential to dramatically improve the patient's experience as a consumer, and maximizes the limited time they have with their health care providers.

Another idea, submitted by Norman Sondheimer of the University of Massachusetts at Amherst, proposed the development of collaborative editing tools for existing patient portals and electronic health records. With simplified online forms, patients would be able to review and update out-of-date or inaccurate information regarding their medical histories, medications, allergies, test results and more. These tools, potentially building on the work of Open Notes, would facilitate information exchange with patients, keeping them informed across the care delivery value chain. Such technology would be quite “sticky,” as it provides patients with real-time feedback, and builds trust between patients and providers, ensuring that both parties are working from the same information when discussing treatment options, care plans, prevention measures and more. These collaborative tools also allow for a more social experience, as patients and health care providers work together to ensure the accuracy of this important information.

Patient portal technology was widely viewed as an area with significant potential for improvement. An idea submitted by Elizabeth Berka recommended the development of incentive programs to encourage sustained
engagement with patient portal tools. A point-redemption system could be used to encourage patients to view their medical records or leave comments after receiving care. Points could be redeemed for health and wellness-related rewards, such as gym memberships, or gift cards to a grocery or health foods store. Dialogue around existing technology in this space raised important questions about why patients don’t consistently enroll in or use portals. Questions were also raised about how incentives could be structured to encourage appropriate usage of this technology, and the changes that could be made by payers and providers to increase ownership of these tools and improve their usability. If these questions are addressed, patient portals could become a prime example of accessing and informing technologies that are “mobile,” “social,” “sticky,” and “delightful.”

Another idea that generated rich, global discussion proposed the use of drones for Directly Observed Treatment, Short-course (DOTS) therapy for tuberculosis. This idea, submitted by Dr. Rostislav Mitrofanov, of the Novosibirsk TB Research Institute in Russia, quickly garnered interest from colleagues around the world and the discussion expanded to consider opportunities for the use of drones in emergency medicine, as well as treatment delivery and specimen collection from remote regions, or from highly contagious patient populations. Drones are inherently “mobile” technologies that can meet patients where they are, quite literally. This technology would also be “social,” allowing for dialogue between patients, providers, emergency responders, and other stakeholders within health care systems who may not traditionally interact. While this technology remains in the nascent stages, the concept generated significant appeal amongst GHDonline members based on the potential for drones to expand access and improve a range of challenging health care delivery processes in the US and around the world.

With the dramatic increase in public and private financing for health technologies,¹ the health care community has an unprecedented opportunity and responsibility to study, test, develop, and improve technologies that will best serve patients in their homes, schools, and communities. The data set from the Breakthrough Opportunities event on GHDonline reflects a promising outlook and potential attributes for technology in patient engagement. The consensus is that engaged patients better generate value for themselves and their communities. Sticky, delightful, mobile, and social technologies that support patients in this endeavor—by informing, measuring, and improving access—have the greatest potential to fulfill what Dr. Safran calls the “real goal” of health information systems: high quality care and healthier populations.

¹Venture capital funding of health technologies topped 4 four billion in 2014—a 125% increase since 2013.²
Exhibit 1: Map of who read, posted, and submitted ideas
Exhibit 2: GHDonline and Commonwealth Fund Breakthrough Opportunities Event Statistics

Over the course of event, we received 62 ideas submissions, selecting 47 for discussion amongst the full GHDonline community of 13,737 members (since the event, our membership has surpassed 14,000). The 15 ideas not selected for discussion fell into three categories: they were not related to the topic, they contained a challenge but no suggested solution, or were strictly self-promotional.

Members also shared a total of 11 challenges they face in engaging patients through technology. Across the event, a total of 378 posts were made by 76 members from 29 countries, representing expertise from 85 organizations. Members read 46,655 email notifications during this time, and traffic to the Breakthrough Opportunities event pages totaled over 12,600 visits.

While social sharing data can be more difficult to collect, references to the event reached over 140,000 people on Twitter, 2,382 on Facebook and 1,743 on LinkedIn.
Exhibit 3: Advisors & Speakers
Our team of expert advisors reviews ideas, shares feedback, and offers insight from their work in technology and patient engagement.

Aaron Beals
Aaron is the Director of Product Development for the Global Health Delivery Project at Harvard University. For the last five years at GHD, he has been working to integrate information access theory with online communities of practice. As part of his role, he leads the team behind GHDonline.org in helping health delivery professionals share and access the knowledge they need to deliver better care. Aaron graduated from the Massachusetts Institute of Technology with a degree in computer science and electrical engineering.

Joaquin Blaya
Joaquin, PhD, is currently CEO at eHS (www.ehs.cl) and a Research Fellow at the Brigham & Women’s Hospital. His work focuses on the use of IT in improving health care in resource poor settings and in promoting the use of open source software and open standards to improve local capacity building and interoperability between information systems.

Terry Hannan
Terry is a consultant physician, health informatician, and a clinical associate professor at the School of Human Health Sciences and Menzies Institute, University of Tasmania, Launceston Campus. He is the co-founder of the Mosoriot Medical Record System, an Electronic Medical Record (EMR) project in Kenya that preceded the AMPATH and OpenMRS e-record systems. This is currently the largest open-source web based EMR for developing nations. Terry’s main focuses have been on end-user acceptability of eHealth technologies. He was the former author of the InformaticsInsider, which provided a regular opinion column on current health informatics and eHealth issues affecting Australia. He has many peer-reviewed publications on Health Informatics.

Jordan Harmon
Jordan is the Director of Advocacy Initiatives for Costs of Care, an independent nonprofit that uses advocacy, education, and technology to help caregivers deflate medical bills. He is also the Associate Director for Operational Excellence at Hospital for Special Surgery (HHS) in New York City. Jordan focuses on both financial and operation improvements throughout the hospital, working closely with the senior leadership team. Jordan believes that Costs of Care represents a valuable step towards raising awareness on value-driven healthcare decisions. He obtained a Master of Health Administration from the Ohio State University and a Bachelor of Arts in Business at the University of Mount Union.

Andrea Ippolito
Andrea is a PhD student in the Engineering Systems Division at MIT, Innovation Specialist at the Brigham & Women’s Hospital Innovation Hub, and co-leader of MIT’s Hacking Medicine. Recently, she served as a Product Innovation Manager at athenahealth and completed her M.S. in Engineering & Management at MIT. Prior to MIT, Andrea worked as a Research Scientist within the Corporate Technology Development group at Boston Scientific. She obtained both her B.S. in Biological Engineering in 2006 and Masters of Engineering in Biomedical Engineering in 2007 from Cornell University.
**Chris Moses**

Chris Moses is the co-founder and CEO of Smart Scheduling, a company that creates software that helps health professionals schedule minimize scheduling mistakes and schedule appointments more effectively. He is also the co-founder of the Science and Technology Leadership Association (STeLA) and Sana Mobile. Chris received his SB in Brain and Cognitive Sciences from Massachusetts Institute of Technology.

**Tara Narula**

Dr. Narula is a board certified cardiologist and is an Assistant Professor of Cardiovascular Medicine for Hofstra University NSLIJ School of Medicine and Associate Director of the Cardiac Care Unit at Lenox Hill Hospital/NSLIJ in Manhattan. She is a medical contributor for CBS News and her opinions are frequently cited in the press. She joined Lenox Hill Heart & Vascular Institute in 2010 and provides outpatient consultative care as well as inpatient cardiac critical care. She is additionally board certified in Nuclear Cardiology, Echocardiography and Internal Medicine. After graduating from Stanford University with degrees in Economics and Biology, she was founder and CEO of her own small business, Sun Juice Inc. Subsequently she obtained her medical degree at USC Keck School of Medicine where she graduated with Alpha Omega Alpha Society Honors. Dr. Narula completed her residency in internal medicine at Harvard University/Brigham and Women’s Hospital and her fellowship training in cardiology at New York Presbyterian-Weill Cornell Medical Center. Dr. Narula is currently a fellow of the American College of Cardiology (FACC). She serves as a member for both the NYC Go Red for Women Committee and the NYC Advocacy Committee of the American Heart Association and is a national spokesperson for the AHA. She is also a member of the Women’s Health Program and the Critical Care Committee of Lenox Hill Hospital/NSLIJ. Her interests include preventive cardiology, women’s health, and the management of coronary artery and valvular disease.

**Andrey Ostrovsky**

Andrey is a practicing physician and social entrepreneur who leads Care at Hand’s executive management and strategic vision. He has led teams at the World Health Organization, United States Senate, and San Francisco Health Department toward health system strengthening through technology. Andrey has contributed to legislation at the city and national level to advance care delivery for vulnerable populations. He is a published researcher in public health informatics, rapid cycle improvement, healthcare innovation, and care coordination.

Andrey holds a Medical Doctorate and undergraduate degrees in Chemistry and Psychology with Magna cum Laude honors and is a member of Phi Beta Kappa. Andrey is completing his pediatrics residency training in the Boston Combined Residency Program at Boston Medical Center and Boston Children’s Hospital and is a clinical instructor at Harvard Medical School.

**Lisa Shufro**

Lisa is a curator and content design expert who specializes in convening influencers across communities and disciplines. She currently serves as the Chief Content Officer for Life is Beautiful, and is the former Managing Editor of TEDMED.

Prior to joining Life is Beautiful, Lisa led learning initiatives for the Downtown Project, a large-scale city revitalization effort led by Zappos CEO Tony Hsieh. Her work included programming for Inspire Theater, as well as the test implementation of a new management practice called Holacracy.

Lisa also has over ten years of experience as a business executive marketer, inventor for Synapse Group, a subsidiary of Time Warner, and Walker Digital, a business invention firm. She held a faculty position at the
Feldenkrais Institute of New York, and is an advisory board member for the Young Professional’s Chronic Disease Network. In 2014, Disruptive Women in Health Care named Lisa one of its inaugural class of “Women to Watch.”

**Nancy Street**

Nancy is a pediatric nurse practitioner, with over twenty years of experience in adolescent health, working in urban health care centers. She is currently an Associate Professor at Regis College, where she teaches both nursing and public health and directs the international Nurse Faculty Partnership Initiative.

Nancy received a Bachelor of Science in Nursing from Boston College and Master of Science from the University of Pennsylvania. Nancy earned both a Master of Science and Doctorate of Science at the Harvard School of Public Health. She has two professional passions, one being adolescent health and well-being and the other nursing education.

Dr. Street’s global work involves the development and implementation of a nurse faculty education program in Haiti, where current faculty from public nursing schools all across Haiti study towards a Master of Science in nursing degree. Collaborating with Partners in Health, the Ministry of Health, and the State University of Haiti, this project is building upon current infrastructure in Haiti, creating a sustainable model for advancing nursing education and health care. This innovative model for nursing faculty development is setting the stage for outreach to nurses across the globe.

Nancy is a life-long resident of the Boston area, where she lives with her husband. She has two grown children, a son and daughter who both work in Boston. She is active in local and state politics and volunteers in her community on a regular basis.

**Maxim Topaz**

Maxim is a PhD prepared Nurse Informatician with expertise in Clinical Decision Support, Standardized Health Terminologies, and Data and Text Mining. His passion lies in applying new technologies to improve patients’ health. In the past, Maxim was involved with health policy (National and International levels), leadership (eg. Chair of the students Working Group with International Medical Informatics Association) and health entrepreneurship. Maxim also has clinical experience in Internal and Urgent Medicine.

**Thomas Tsai**

Thomas, MD, MPH, is a surgeon and health policy researcher committed to improving health care by understanding the role of policy in shaping the cost and quality of health care delivery.

Thomas’ research focuses on the use of quality metrics, such as readmissions in public reporting and pay for performance socioeconomic disparities and innovative delivery models. He worked on the implementation of the Affordable Care Act as a senior adviser to the Assistant Secretary Planning and Evaluation in the US Department of Health and Human Services from 2014-15. He is currently completing his general surgery residency at Brigham and Women’s Hospital and is a research associate in the Department of Health Policy and Management at Harvard School of Public Health.

Dr. Tsai is a graduate from Harvard College, Stanford University School of Medicine, and Harvard School of Public Health.
**Hisham Yousif**

Hisham is a Global Health Delivery Fellow of the Harvard Global Health Delivery Project who works on entrepreneurial projects related to health delivery and case study development. He is currently a fourth year student in the MD program at Harvard Medical School with a specific interest in health systems delivery on a global level. Hisham has previously worked at the United Nations under the direction of Dr. Paul Farmer, looking at how to make aid delivery more efficient and sustainable. He has also worked in Sudan with the International Federation of the Red Cross and Red Crescent working on food security and disaster management issues for refugees displaced by civil conflict in the region. Throughout his undergraduate and graduate years, he has spent significant time engaging with refugee and immigrant communities with the United States through various mentoring, educational and health initiatives.

**Keynote Speakers**

**Julia Adler-Milstein**

Julia is an Assistant Professor at the University of Michigan School of Information with a joint appointment in the School of Public Health (Health Management and Policy). Her research focuses on policy and management issues related to the use of IT in healthcare delivery. Her expertise is in health information exchange and she has conducted four national surveys of health information organizations. She also studies the productivity and efficiency of electronic health records. Julia graduated with a PhD in Health Policy from Harvard University. Prior to graduate school, she worked at the Center for IT Leadership at Partners Healthcare in Boston and in the Health and Life Sciences Division of Accenture.

**David W. Bates**

David is an internationally renowned expert in patient safety, using information technology to improve care, quality-of-care, cost-effectiveness, and outcomes assessment in medical practice. He is a Professor of Medicine at Harvard Medical School, and a Professor of Health Policy and Management at the Harvard School of Public Health, where he co-directs the Program in Clinical Effectiveness. He directs the Center for Patient Safety Research and Practice at Brigham and Women’s Hospital, and serves as external program lead for research in the World Health Organization’s Global Alliance for Patient Safety. He is the president of the International Society for Quality in Healthcare (ISQua) and the editor of the Journal of Patient Safety. He serves as the principle investigator of the Health Information Technology CERT. He has been elected to the Institute of Medicine, the American Society for Clinical Investigation, the Association of American Physicians and the American College of Medical Informatics, and was chairman of the Board of the American Medical Informatics Association. He has over 600 peer-reviewed publications, and an H-index of over 80.

**Naomi Fried**

Naomi, Ph.D. is Boston Children’s Hospital’s (BCH) first Chief Innovation Officer. She leads the Innovation Acceleration Program, focused on enhancing the innovation culture by supporting strategic innovation initiatives, resourcing grass roots innovation, and identifying unmet innovation opportunities. Naomi oversees the Innovestment Seed Grant program and FastTrack Innovation in Technology Program. She also leads the development of BCH’s telehealth strategy.

Previously, she was the Vice President of Innovation and Advanced Technology at Kaiser Permanente (KP) where she led an effort to identify and assess new and emerging health care technology and was involved in the start-up and governance of KP’s Innovation laboratory, the Sidney R. Garfield Center for Health Care Innovation. Prior to this position, she was Managing Director of KP’s Archimedes Project.
Before KP, Naomi advised two venture capital firms on life science and health care information technology investments; served as the General Manager and Vice President for Business Development of 1747, Inc., which conducts online clinical trials for new drugs; and was instrumental in the formation of the medical informatics internet start-up company (e-SKOLAR, formerly SHINE) spun out of Stanford School of Medicine, serving as interim President for its first year.

Naomi received her Ph.D. in Materials Science from MIT and her B.S. in Chemistry from the University of California, Berkeley. Naomi is on the Advisory Board for HealthCare Business Women's Association, Digital Collaboration Solutions, the Journal of Clinical Innovation and Technology and is on the board of Directors for the American Telemedicine Association. She is a member of the Governor of Massachusetts’ Innovation Council. Her awards include being named one of WEST’s “Notable Women Entrepreneurs in Science & Technology” in 2013 and one of Healthcare IT News’ “2013 Health Information Technology (HIT) Men and Women of the Year Award, Innovators.” Naomi was named “The Emerging Executive of the Year” in 2014 by the Massachusetts Technology Leadership Council.

**Felix Greaves**
Felix is an honorary senior clinical lecturer in the Department of Primary Care and Public Health at Imperial College London and a public health doctor.
Felix's research interests are in measuring quality and safety in healthcare systems. He is currently evaluating 'Tripadvisor' models of online feedback in healthcare in the UK, and whether patients' descriptions of their care online can be used to measure health system performance.

He was previously clinical adviser to the Chief Medical Officer at the Department of Health, where he worked on developing national quality and safety policy. He also worked for the World Health Organization’s Patient Safety Programme, where he managed their project on improving patient safety education in medical schools and technology for patient safety.
Felix trained at Oxford University (BA, BM BCh), Harvard University (MPH) and Imperial College (MBA, PhD). He was awarded a Knox Fellowship by Harvard University, an Academic Clinical Fellowship by the National Institute for Health Research, and a Harkness Fellowship in Health Care Policy and Practice by the Commonwealth Fund.

**John D. Halamka**
John is a Professor of Medicine at Harvard Medical School, Chief Information Officer of Beth Israel Deaconess Medical Center, Chairman of the New England Healthcare Exchange Network (NEHEN), co-Chair of the national HIT Standards Committee, a member of the Massachusetts State HIT Council, and a practicing Emergency Physician.

**Ashish Jha**
Ashish, M.D., M.P.H. is the K. T. Li. Professor of Health Policy at the Harvard School of Public Health, the Director of the Harvard Global Health Institute and a practicing Internal Medicine physician at the VA Boston Healthcare System. Over the past five years, he has also served as Special Advisor for Quality and Safety to the Department of Veterans Affairs. Dr. Jha received his M.D. from Harvard Medical School and trained in Internal Medicine at the University of California, San Francisco where he also served as Chief Medical Resident. He completed his General Medicine fellowship from Brigham and Women’s Hospital and Harvard Medical School and received his M.P.H. from Harvard School of Public Health. His major research interests lie in improving the quality and costs of healthcare with a specific focus on the impact of state and federal policy efforts. His work has focused on four primary areas: public reporting, pay-for-performance,
health information technology, and leadership, and the roles they play in effecting the delivery of high quality care in the U.S. healthcare system and globally.

**Nina Kjellson**

Nina has been investing in health care at InterWest since 2002 and has been a Managing Director at the firm since 2008. Current investments include Alvine Pharmaceuticals, Alt12, Cebix, Cidara, Eiger Biopharmaceuticals, Lycera, Ocera (OCRX), and WellTok. Nina also co-sponsored InterWest's investment in TESARO (TSRO). Previous investments include Labrys Biologics (acquired by Teva), Trius Therapeutics (TSRX; acquired by Cubist), CNS Therapeutics (acquired by Coviden), NovaCardia (acquired by Merck), and Aspreva (ASPV; acquired by Galenica). Nina leads InterWest's cross-sector initiative in health care IT and is co-chair of the Consumer Medicine Summit, a forum for entrepreneurs at the intersection of health care and consumer innovation. She serves as a mentor to Nike+ and Blueprint Health accelerators. Prior to joining InterWest, Nina was at Bay City Capital, Oracle Partners and the Kaiser Family Foundation. She is a graduate of Stanford University with a degree in Human Biology.

**Kedar Mate**

Kedar Mate, MD is an Internal Medicine physician and an Assistant Professor of Medicine at Weill Cornell Medical College and a Research Fellow at Harvard Medical School’s Division of Global Health Equity. In addition, he serves as the Senior Vice President for Innovation at the Institute for Healthcare Improvement and the Regional Senior Vice-President for the Middle-East and Asia-Pacific. Previously he worked with Partners in Health, served as a special assistant to the Director of the HIV/AIDS Department at the World Health Organization, and led the IHI’s national program in South Africa. In addition to his clinical expertise in hospital-based medicine, Dr. Mate has developed broad expertise in health systems improvement, innovation and implementation science. He advises initiatives in multiple countries on developing and applying novel strategies to strengthen health systems to improve delivery of critical health services. In his leadership role at IHI, Dr. Mate has overseen the developments of innovative new systems designs to implement high quality, low cost health care both in the United States and in international settings. Dr. Mate has published numerous peer-reviewed articles, book chapters and white papers, and delivered keynote speeches in forums all over the world. He teaches undergraduate and graduate-level courses in New York, Haiti, Tanzania, and South Africa. He graduated from Brown University with a degree in American History and from Harvard Medical School with his medical degree. He trained in internal medicine at the Brigham and Women’s Hospital in Boston and currently resides in Virginia.

**Lygeia Ricciardi**

Lygeia is an expert in consumer engagement and digital health. Through her consulting practice, Clear Voice Consulting, she supports diverse stakeholders including consumer technology companies, startups, and members of the traditional health system in successfully engaging consumers via digital technology.

Prior to consulting, Lygeia established and directed the Office of Consumer eHealth at ONC (the Office of the National Coordinator for Health IT) within the US Department of Health and Human Services. Her office was responsible for leading the Blue Button Initiative, which helps consumers access their health data online, and integrating the consumer perspective into Meaningful Use requirements and other federal policies and programs. Previously she has worked at startups, Harvard Business School, the Markle Foundation, and the Federal Communications Commission.

Lygeia has been voted among the “Top 10 Most Influential Women in Health IT,” and nominated repeatedly to lists of the most influential individuals in the health IT and related social media communities. She has been
featured by C-SPAN, the Wall Street Journal, NPR, and Health Affairs, and speaks frequently at conferences ranging from HIMSS to the Consumer Electronics Show.

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