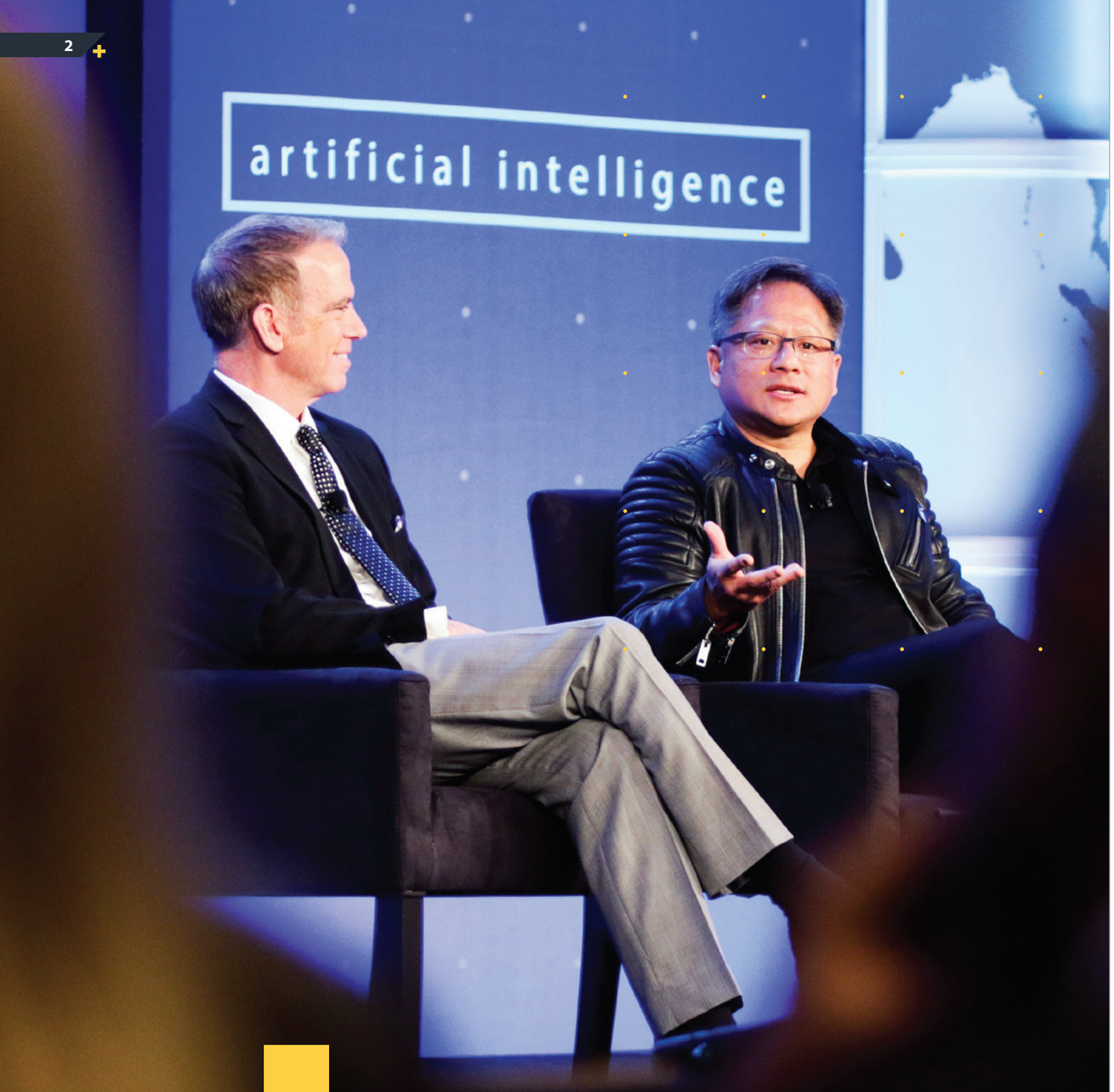
ARTIFICIAL INTELLIGENCE

4/8–10/2019
BOSTON
worldmedicalinnovation.org

where AI meets clinical care

WORLD MEDICAL INNOVATION FORUM



2018 WORLD MEDICAL INNOVATION FORUM

Fireside Chat

Moderator | **Keith Dreyer, DO, PhD**, Chief Data Science Officer, PHS; Vice Chairman, Radiology, MGH; Associate Professor, Radiology, HMS

Jensen Huang, CEO, NVIDIA

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[1] *Big Data and What it Means. U.S. Chamber of Commerce Foundation. See also: https://www.uschamberfoundation.org/bhq/big-data-and-what-it-means*

[2] *The Internet of Things: a movement, not a market; IHS Markit, https://cdn.ihs.com/www/pdf/IoT_ebook.pdf, 2017*

BAYER

dear colleagues.

Thank you for attending this 5th annual World Medical Innovation Forum. We gather to look into the future of medicine and examine how artificial intelligence will affect the delivery of care. More than two dozen sessions will discuss in detail how machine intelligence has begun to shape clinical care, hospital operations, drug discovery, population management and physician empowerment.

The World Medical Innovation Forum was established to reaffirm the importance of collaborative innovation—academia, industry and government working jointly to create new solutions to medicine's great challenges. Our goal is to provide actionable insights that audience members can use to improve care in their field. We are grateful to the more than 150 senior executives, investors, clinicians and investigators who will speak at the Forum including Massachusetts Governor Charlie Baker who will kick off our proceedings.

We welcome attendees and delegations from throughout Boston, across the country and around the globe.

I thank our many sponsors representing some of the most innovative companies in health care and the Steering Committee and Planning Team for their outstanding contributions. I recognize my co-chair Gregg Meyer, MD, Chief Clinical Officer as well as Chris Coburn, Chief Innovation Officer, for their leadership. We hope that many of you will join us next year in May when we reconvene our next World Medical Innovation Forum.

Anne Klibanski, MD
Interim President and CEO,
Chief Academic Officer,
PHS; Laurie Carrol Guthart
Professor of Medicine, HMS;
2019 Forum Co-Chair

welcome.

Thank you for joining us. Over the next three days you will be part of a unique gathering. The structure of the Forum enables in depth conversations among expert panelists and audience members. Our enduring goal is to provide actionable relationships and insights.

AI holds extraordinary promise for all stakeholders in health care. While much remains to be realized, there are clear signs of AI-enabled progress — ranging from back-office tools to new models for routine patient care. These are remarkable, not only for their capacity to improve care but also for how they will shape the next wave of technology.

The Forum is brought to you by Innovation, the global business development arm of Partners HealthCare. Its mission is the commercial application of the breakthroughs and unique capabilities of Partners' 6200 Harvard affiliated faculty and staff—bringing benefits to patients worldwide and generating more than $180 million in revenue to further the Partners' research enterprise.

We express our deep appreciation to the many individuals who made this Forum possible and are particularly grateful to our speakers for sharing their substantial expertise and unique perspectives. Generous support by our leading sponsors – Bayer, Bristol-Myers Squibb, GE Healthcare, Nuance, NVIDIA, Amgen, Biogen, Siemens Healthineers, Wolters Kluwer, Boston Scientific, Canon, Fujifilm, MGH & BWH Center for Clinical Data Science, Mintz Levin, Northern Light Venture Capital, Persistent, Pure Storage, Redhill Capital, Health IT Analytics, and WGBH – contributed to making this a world class event.

Many thanks to the Steering Committee members whose insights and recognition in the field made the Forum possible. The Planning Team's dedicated work over the last 18 months shaped every aspect of our program.

Enjoy the AI Forum!

Christopher Coburn
Chief Innovation Officer, PHS;
President, Partners HealthCare
International

Gregg Meyer, MD
Chief Clinical Officer, PHS;
Professor of Medicine, HMS;
2019 Forum Co-Chair

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information and events

registration

MONDAY, APRIL 8
7:00 am – 5:30 pm

TUESDAY, APRIL 9
7:00 am – 4:30 pm

WEDNESDAY, APRIL 10
7:00 am – 11:00 am

name badges

Name badges will be provided at registration. On-site registration is available on the 4th floor outside the Bayer Ballroom during the hours noted above. Name badges must be worn during all events including meals and receptions. Please return your badge to the registration desk prior to your departure for recycling.

event locations

Registration Desk and Information (Daily)
Bristol-Myers Squibb and Nuance Foyers, 3rd and 4th Floors

Continental Breakfast (Daily)
Bristol-Myers Squibb and Nuance Foyers, 3rd and 4th Floors

MONDAY

First Look Presentations
Bayer Ballroom, 4th Floor

Discovery Café Workshops
3rd and 7th Floors
See pages 41–43 for topics and room locations

Opening Reception
Bristol-Myers Squibb and Nuance Foyers, 3rd and 4th Floors

TUESDAY

Discovery Café Workshops
3rd and 7th Floors
See pages 48–51 for topics and room locations

Attendee Networking Reception
Bristol-Myers Squibb and Nuance Foyers, 3rd and 4th Floors

WEDNESDAY

3rd Annual Innovator's Recognition Dinner
America Ballroom, 4th Floor | 5:30 pm
By Invitation Only

wireless access

Complimentary Internet access is available to all Forum attendees.

To connect to the internet:

- Access your computer's Wireless Network connection
- Connect to: **WMIF19**
- Open your Internet browser
- The login page will ask for password, first and last name, and you will have to accept the Westin's terms and conditions.
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event app

To interact with our moderators, please download our mobile app. Search "WMIF" in the app store. Once downloaded, search for "World Medical Innovation Forum" to add it to your events. If you have questions about the mobile app, please visit the Mobile App Help Desk in the Bristol-Myers Squibb Foyer on the 4th floor.

Mobile App Help Desk
Monday and Tuesday
7:30 am – 4:30 pm

Panel Discussions
To participate in panel discussions and ask questions, go to the individual panel on the agenda.

Speaker Biographies
Speaker bios are available through the mobile app or through the event website:
worldmedicalinnovation.org/speakers

speaker affiliations

PHS	Partners HealthCare System
BH	Brigham and Women's Hospital
MGH	Massachusetts General Hospital
HMS	Harvard Medical School
MEE	Mass. Eye and Ear
MGPO	Massachusetts General Physicians Organization
NWH	Newton-Wellesley Hospital
SRN	Spaulding Rehabilitation Network

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First Look

The Next Wave of AI Breakthroughs in Health Care

Monday, April 8, 2019

8:00am–9:40am | 9:55am–11:35am

BAYER BALLROOM, 4TH FLOOR

Early career Harvard Medical School investigators kick-off the 2019 World Medical Innovation Forum with rapid fire presentations of their high potential new technologies. Rising stars from our Harvard-affiliated hospitals will highlight the potential of their research in artificial intelligence, cognitive computing, machine learning, and big data in 10-minute presentations. This session is designed for investors, entrepreneurs, investigators, donors and others who share a passion for accelerating the application of high impact technologies to the benefit of patients.

Henry Chueh, MD
Director, MGH Lab of Computer Science, MGH; Assistant Professor, Medicine, HMS
Dxplain: Expanding Diagnostic Horizons

Synho Do, MD
Director, Laboratory of Medical Imaging and Computation (LMIC), MGH; Assistant Professor, HMS
Leveraging a Deep-Learning Algorithm for the Detection of Acute Intracranial Hemorrhage

Laura Germine, PhD
Director, Laboratory for Brain and Cognitive Health Technology, McLean; Assistant Professor, Psychiatry, HMS
The Next Generation of Cognitive and Behavioral Assessment

Satrajit Ghosh, PhD
Research Associate, MEE; Principal Research Scientist, MIT; Assistant Professor, Otolaryngology, HMS
Assistive Intelligent Technologies for Brain Health

Xudong Huang, PhD
Co-Director, Neurochemistry Laboratory, MGH; Associate Professor, Psychiatry, HMS
Leveraging Artificial Intelligence for Brain Drug Discovery

Tina Kapur, PhD
Executive Director, Image-Guided Therapy, BH; Assistant Professor, Radiology, HMS
Using AI to Better Visualize Needles in Ultrasound-Guided Liver Biopsies

Bharti Khurana, MD
Director, Emergency Musculoskeletal Radiology, BH; Assistant Professor, HMS
Making the Invisible Visible: Bringing Intimate Partner Violence into Focus

Vesela Kovacheva, MD, PhD
Attending Anesthesiologist, BH; Instructor, Anesthesiology, HMS
Harnessing the Power of Machine Learning to Automate Drug Infusions in the OR and ICU

Constance Lehman, MD, PhD
Chief, Breast Imaging Division, MGH; Professor of Radiology, HMS
AI-Based Care Delivery: A New Paradigm for Curing Cancer

Lisa Nickerson, PhD
Director, Applied Neuroimaging Statistics Lab, McLean; Assistant Professor, HMS
Using Digital Phenotyping and Machine Learning to Forecast, Detect, and Prevent Drug Overdose Deaths

Federico Parisi, PhD
Research Fellow, Wyss Institute for Biologically Inspired Engineering, SRN
Mobile Health Technologies for Monitoring Motor Fluctuations in Patients with Parkinson's Disease

Stuart Pomerantz, MD
Director, Neuro-CT, Neuroradiology, MGH; Instructor, HMS
AI-Powered Diagnostic Reporting for Spinal MRI of Degenerative Disease

Sandro Santagata, MD, PhD
Assistant Professor, Pathology, BH, HMS
Multiplexed Tissue Imaging and Quantitative Pathology for Discovery and Translational Medicine

Joseph Schwab, MD
Chief, Orthopaedic Spine Surgery, MGH; Associate Professor, HMS
Artificial Intelligence for Diagnosis and Management in Spine Surgery

Chris Sidey-Gibbons, PhD
Co-Director, PROVE Center, BH; Member of Faculty, HMS
Three Computational Techniques and One Tool to Bring the Patient Voice into Care

Hiroyuki Yoshida, PhD
Director, 3D Imaging Research, MGH; Associate Professor, Radiology, HMS
AI-Imaging for Patient-Friendly Colon Cancer Screening

Nazlee Zebardast, MD
Instructor, Ophthalmology, MEE, HMS
Deep Learning for Glaucoma Detection

Li Zhou, MD, PhD
Associate Professor/Lead Investigator, BH; Associate Professor, HMS
Machine Learning and NLP to Track Disease Progression and Predict Health Outcomes

NOTE: *Times, speakers, and content are subject to change.*
BH *Brigham and Women's Hospital | **MGH** Massachusetts General Hospital | **MEE** Mass. Eye and Ear | **SRN** Spaulding Rehabilitation Network*
HMS *Harvard Medical School*

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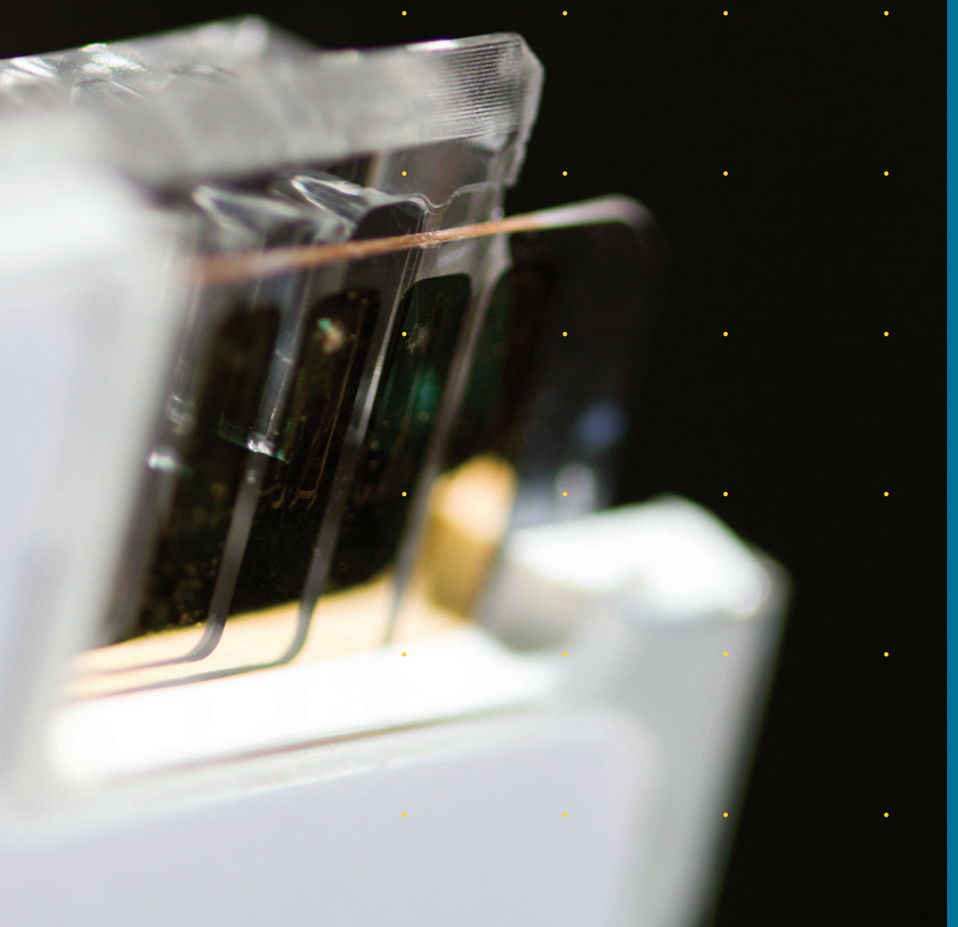

IDG

INNOVATION DISCOVERY GRANTS PROGRAM

Wednesday, April 10, 2019

7:30am–9:30am

BAYER BALLROOM, 4TH FLOOR

Eleven clinical AI teams culled through the Innovation Discovery Grant program present their work illustrating how AI can be used to improve patient health and healthcare delivery. This session is designed for investors, entrepreneurs, investigators, and others who are interested in commercializing AI opportunities that are currently in development with support from the Innovation Office.

Peter Dunn, MD
Vice President, Perioperative Services and Healthcare System Engineering, MGH; Assistant Professor, Anesthesia, HMS
Using Deep Learning to Optimize Hospital Capacity Management

Kevin Elias, MD
Director, Gynecologic Oncology Research Laboratory, BH; Assistant Professor, HMS
Screening for Cancer Using Serum miRNA Neural Networks

Alexandra Golby, MD
Director, Image-Guided Neurosurgery, BH; Professor, Neurosurgery and Radiology, HMS
Using Machine Learning to Optimize Optical Image Guidance for Brain Tumor Surgery

Jayashree Kalpathy-Cramer, PhD
Director, QTIM Lab, MGH; Associate Professor, Radiology, HMS
DeepROP: Point-of-Care System for Diagnosis of Plus Disease in Retinopathy of Prematurity

Jochen Lennerz, MD, PhD
Associate Director, Center for Integrated Diagnostics, MGH; Assistant Professor, HMS
Predicting Unnecessary Surgeries in High-Risk Breast Lesions Predicting Unnecessary Surgeries in High-Risk Breast Lesions

Bruno Madore, PhD
Associate Professor, Radiology, BH, HMS
Sensor Technology for Enhanced Medical Imaging

Jinsong Ouyang, PhD
Physicist, MGH; Associate Professor, HMS
Training a Neural Network to Detect Lesions

David Papke, MD, PhD
Resident, Surgical Pathology, BH; Clinical Fellow, HMS
Augmented Digital Microscopy for Diagnosis of Endometrial Neoplasia

Martin Teicher, MD, PhD
Director, Developmental Biopsychiatry Research Program, McLean; Associate Professor, Psychiatry, HMS
Poly-Exposure Risk Scores for Psychiatric Disorders

Christian Webb, PhD
Director, Treatment and Etiology of Depression, Youth Lab, McLean; Assistant Professor, Psychiatry, HMS
Leveraging Machine Learning to Match Depressed Patients to the Optimal Treatment

Brandon Westover, MD, PhD
Executive Director, Clinical Data Animation Center, MGH; Associate Professor, Neurology, HMS
Deep Learning to Diagnose Epilepsy

NOTE: *Time, speakers, and content are subject to change.*
BH *Brigham and Women's Hospital* | ***MGH*** *Massachusetts General Hospital* | ***HMS*** *Harvard Medical School*

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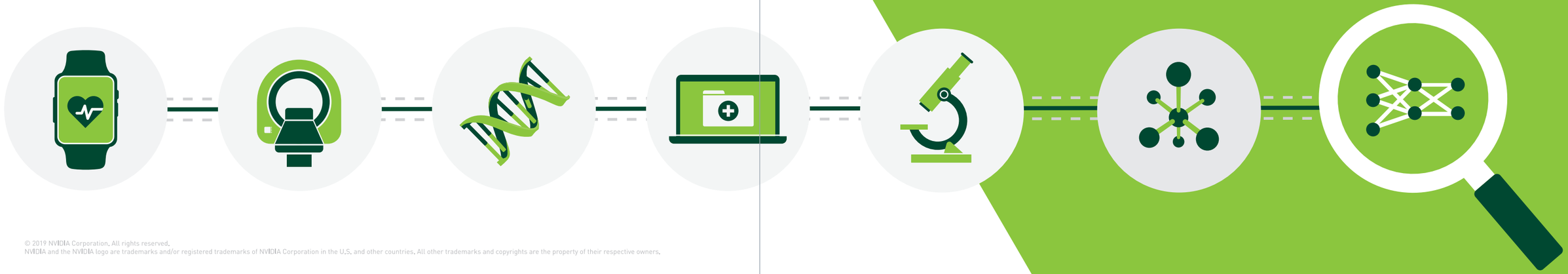

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Vice-Chair of Neurology, Director of Genetics and Aging Research Unit, MGH; Joseph P. and Rose F. Kennedy Professor of Neurology, HMS

Krishna Yeshwant, MD
Partner, GV; Instructor in Medicine, BH

Many thanks to the members of the Steering Committee for their leadership in shaping the Forum agenda, identifying speakers and securing sponsors.

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Leading Edge: Where AI Meets Clinical Care

Anne Klibanski, MD
Interim President and CEO, Chief Academic Officer, PHS; Laurie Carrol Guthart Professor of Medicine, HMS; 2019 Forum Co-Chair

Gregg Meyer, MD
Chief Clinical Officer, PHS; Professor of Medicine, HMS; 2019 Forum Co-Chair

The world of healthcare is abuzz with new capabilities that artificial intelligence (AI) can enable. Yet amidst the talk of algorithms, neural networks, and deep learning, it can be difficult to discern aspiration from reality. A scan of the latest news leaves the impression that AI will fix all of healthcare's ills: reducing physician burden, enhancing the patient experience, and improving how diseases are diagnosed and treated.

And while some dramatic, AI-powered transformations may eventually come to pass, the near-term gains will likely be incremental. However, even these small steps can make patients' lives better. At Partners HealthCare, including Brigham and Women's Hospital (BH) and Massachusetts General Hospital (MGH), there are already some early, groundbreaking applications of AI that hold remarkable promise for improving patient care.

Here and Now: AI-Guided Mammograms

Many women have experienced first-hand the limitations of screening mammography. The images, produced by an X-ray machine to identify early signs of cancer in breast tissue, are currently the best tools available, but not all cancers are seen on mammography. In addition, there are unresolved questions surrounding screening mammograms, leaving women to wonder: What age should I start getting mammograms? When should I stop? How frequently do I need to get them? In short, confusion abounds.

Yet the toll of breast cancer remains devastating: Breast cancer is a leading cause of cancer death in women, both in the U.S. and around the world. This year, over 2 million women worldwide will be diagnosed with, and more than 600,000 women will die from, breast cancer.

"Despite incredibly exciting advances in science, and even in countries with strong resources, countless women continue to die every year from breast cancer," said Constance ("Connie") Lehman, MD, PhD, Chief of the Breast Imaging Division at MGH and Professor of Radiology at Harvard Medical School, who has spent her career grappling with the challenges of early detection, more accurate diagnosis, and better treatment for breast cancer.

"Tragically, it's a fairly young cancer — affecting women typically in their 40's, 50's, and 60's, and the impact on years of life lost and on families is heartbreaking."

Although the guidelines around mammography have shifted in recent years, it is generally recommended that women begin regular mammograms, either annually or biennially, sometime in their 40's.

Like many screening methods, mammography is imperfect. It can miss breast cancer in some women and falsely flag suspicious findings in others, causing anxiety, fear, and unnecessary treatment. "We desperately want more personalized, more precise medicine," said Lehman. "We have more data available on patients than we can currently integrate into improved care. AI can change that."

To improve the power of mammography, Lehman and her team have fully embraced AI. Less than three years ago, they joined forces with MIT professor Regina Barzilay, PhD, an expert on AI and natural language processing, who received her own breast cancer diagnosis in 2014. As she was undergoing treatment, Barzilay was appalled by the lack of data that was applied to guide her own therapy. So, she shifted the focus of her lab to using data-driven approaches, including AI, to improve breast cancer diagnosis and treatment. In October 2017, she was awarded a MacArthur "genius" grant for her work on machine learning.

"There is so much data that we basically leave on the table," said Lehman. "There's data buried in breast images, in pathology slides, in patient records. It's everywhere and now we're figuring out ways to harness it."

Together with Barzilay, Lehman is leading a comprehensive, multi-faceted effort to transform mammography from a one-size-fits-all method to a more precise, highly targeted tool — one that is not only better at detecting tumors but also capable of predicting future breast cancer.

For example, the researchers recently published a report in the journal *Radiology* describing a new automated tool for measuring breast density. Dense breast tissue obscures tumors on mammography and can also independently raise a woman's risk of developing breast cancer. Moreover, radiologists' assessments of breast density are subjective and can vary widely from one reader to another.

"One radiologist could read your mammogram and tell you that you have dense breasts, another could read it and say you don't," said Lehman. "It's ripe for human error because it's a subjective, visual task."

This issue is not simply an academic one. Not only does breast density influence cancer risk, it is also the focus of a nationwide effort to ensure women are informed of their breast density status. As of February 2019, federal law requires mandatory notification for women with dense breast tissue. Those with dense breasts can seek screening with additional imaging methods, including ultrasound and MRI.

To bring much needed clarity to breast density measurements, Lehman, Barzilay, and their colleagues developed an algorithm to automatically assess breast density and trained it using tens of thousands of high-quality digital mammograms from MGH.

While some may consider AI tools as machines, Lehman imagined her team's algorithms as human. "I think of her as this woman whom I'm trying to teach to be the greatest breast imager and breast cancer expert in the world," she said. "So, with breast density, I thought, 'Okay, let me give you this really hard task. Humans are wildly variable on this, so do the best you can, but I'm also going to have my expert radiologists read all the same mammograms that you are reading.'"

And that is precisely what the researchers did. With their new AI tool, they analyzed the mammograms collected from over 10,000 patients in the course of routine breast cancer screening. Notably, the tool's breast density assessments were accepted by the radiologists in 94% of cases.

Based on these results, the researchers believe their system could help standardize and automate breast density measurements. It has been in continuous use at MGH since January 2018 and has processed breast cancer screening mammograms from over 50,000 patients. The algorithm offers up its assessment of breast density, which is then accepted or rejected by the reviewing radiologist.

This AI-based application is just one among many that Lehman, Barzilay, and their colleagues are building. Another effort centers around creating an AI-based predictive tool, which incorporates both clinical and breast imaging data, to give patients their own personalized assessments of breast cancer risk.

Currently, there are multiple methods for assessing a woman's risk of breast cancer, but they are inaccurate and often give wildly divergent answers. Moreover, they have been built using data drawn largely from women who are white and of European descent — neglecting a large swath of the world's population. Notably, the tool Lehman and Barzilay developed can accurately predict breast cancer risk regardless of race.

In addition, the team has developed another deep learning model to actually "read" patients' mammograms and rank them according to the likelihood that cancers lurk within them, all in a rapid, automated fashion. They are now working to integrate the tool — which can examine a mammogram in mere seconds — into routine clinical practice.

The long-term vision of Lehman's program is to build a new paradigm to truly cure breast and other forms of cancer — one that leverages AI to deliver on the promise of personalized medicine across the full continuum of care, from risk assessment, prevention, and early detection to accurate diagnosis and effective treatment.

"AI is where we're going to have a true revolution — we're really going to change the face of breast cancer," she said.

AI Accelerator

These advances in the field of mammography demonstrate the disruptive potential of applying high-performance computing to complex clinical problems. However, scaling this approach across clinical domains and specialties will require the democratization of AI-based tools and technologies to the broader research community. Here in Boston, the MGH and BWH Center for Clinical Data Science (CCDS) is a cross-disciplinary center that develops and deploys infrastructure to support AI-based research and brings together clinicians, researchers, data scientists, software engineers, and product development experts to improve the practice of medicine.

"Connie's work is a prime example of how technology can bring teams together, making it possible to achieve something that cannot be done by physicians or data scientists working on their own," said Keith Dreyer DO, PhD, Chief Data Science Officer at Partners HealthCare.

CCDS boasts a massive supercomputing infrastructure, with vast data storage and graphic processing capabilities that are unparalleled in academic medicine. It also facilitates access to a sprawling database of millions of patient images from the Partners HealthCare system. These resources are essential elements for researchers as they seek to train and validate algorithms using tens or even hundreds of thousands of clinical images.

In addition, through its unique partnerships with key industry players — companies that include General Electric Healthcare, NVIDIA, and Nuance Communications — CCDS has access to both cutting-edge technologies as well as the potential to contribute to products that serve millions of patients outside Partners HealthCare, while also developing capabilities that help accelerate AI-based research efforts.

CCDS includes a team of nearly 30 machine learning scientists, engineers, innovation fellows and product managers, all working together to propel novel AI solutions into the clinic.

"Connie and Regina's tools for mammography are shining examples of the kind of work we can enable here at CCDS — innovative, rigorously validated, and seamlessly integrated into clinical care," said Dreyer.

Filling the AI Pipeline

In addition to building mammography-focused AI tools, research teams across Partners HealthCare are partnering with CCDS and working on a variety of other transformative projects.

Researchers at BH led by Adam Landman, MD are developing machine learning algorithms that can monitor data collected from patients in real-time — measurements like blood pressure, heart rate and other vital signs that are not typically entered into electronic medical records but which may contain subtle signals that can help clinicians predict future adverse outcomes while patients are hospitalized.

McLean scientist Lisa Nickerson, PhD is spearheading a project to help predict, detect, and prevent deaths due to drug overdose. The effort focuses on digital phenotyping — collecting and analyzing the mountains of digital information that flow from smartphones, wearables, and other personal devices. Using machine learning, Nickerson and her colleagues seek to develop a commercial, evidence-based tool that can forecast and detect drug use and overdose.

MGH researcher Jayashree Kalpathy-Cramer, PhD and her colleagues are harnessing AI to develop an automated, point-of-care system that can aid in the diagnosis of retinopathy of prematurity (ROP), a retinal vascular disease that affects a majority of pre-term infants who weigh less than 1250 grams at birth. If left untreated, severe cases of ROP can lead to retinal detachment and blindness.

BH scientist Bruno Madore, PhD, is leading an effort to develop sensors that can be placed on a patient's skin to enhance medical imaging. One of the team's latest endeavors involves an ultrasound-based sensor that patients wear while undergoing an MRI exam. Using AI-based methods, the tiny sensor learns how to create images of the patient's internal organs that look like MRIs but are actually derived from ultrasound — giving doctors more flexibility when it comes to medical imaging without sacrificing image quality. The technology has numerous potential applications, including bringing the power of MRI to the surgical suite.

McLean researcher Christian Webb, PhD, is using machine learning approaches to develop algorithms that are designed to predict which antidepressant medications will work best for patients suffering from depression. While data-driven treatment recommendations are currently used in other medical specialties, the field of psychiatry currently lacks such tools for depression. Webb and his colleagues are mining patients' neural, clinical, behavioral, and demographic profiles to create novel tools that can help clinicians determine which drugs will likely work best for individual patients.

The activities described above are a sample of the AI-focused projects that are now underway at Partners HealthCare. From cardiology to oncology and neuropsychiatric disease to pediatric blindness, research teams across the organization's hospitals and laboratories are working to pioneer innovative AI tools and approaches that can streamline, accelerate, and improve patient care. +

Partners HealthCare

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agenda

NOTE: Times, panel locations, speakers, and content are subject to change.

[monday, april 8th]

All speaker bios are at: **worldmedicalinnovation.org/speakers**

7:00 am | 8:00 am — **Breakfast**
Bristol-Myers Squibb and Nuance Foyers

7:00 am | 5:00 pm — **Registration**
Bristol-Myers Squibb and Nuance Foyers

8:00 am | 9:40 am — **First Look: Round 1**
Bayer Ballroom

Nine rapid fire presentations on the applications of AI in Clinical Care

Moderator
Giles Boland, MD, Chair, Department of Radiology, BH; Philip H. Cook Professor of Radiology, HMS

Moderator
Trung Do, VP, Business Development, Innovation, PHS

9:40 am | 9:55 am — **Morning Break**

9:55 am | 11:35 am — **First Look: Round 2**
Bayer Ballroom

Nine rapid fire presentations on the applications of AI in Clinical Care

11:30 am | 11:45 am — **Break**

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11:45 am | 1:00 pm — **Discovery Café Sessions**
locations vary

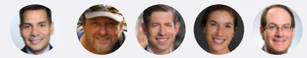
Lunch with Experts: Intensive sessions addressing cutting-edge artificial intelligence topics.

Applying AI to Save Lives During the Opioid Crisis
Essex Center | 3rd Floor

The U.S. is in the throes of a devastating epidemic of opioid addiction and overdose — some 130 people die nationally every day from opioids, says the National Institute on Drug Abuse. With a total economic cost of more than $78 billion a year, AI is being harnassed to develop new tools that can help alleviate this national crisis. This session will discuss AI-based strategies that academic and industry teams are leveraging to help clinical and public health officials better predict, identify, and treat opioid addiction, and also around data privacy concerns.

Moderator
Thomas Sequist, MD, Chief Quality and Safety Officer, PHS

Bob Burgin, CEO, Amplifire Healthcare Alliance
Carm Huntress, CEO, RxRevu Inc
Sarah Wakeman, MD, Medical Director, Substance Use Disorder Initiative, MGH; Assistant Professor, Medicine, HMS
Scott Weiner, MD, Director, Brigham Comprehensive Opioid Response and Education (B-CORE) Program, BH; Assistant Professor, HMS

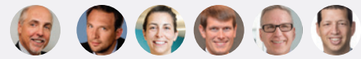


Community Hospitals: Key Component in Healthcare Transformation
Essex North | 3rd Floor

Community hospitals are the largest sources of patient care in the U.S. As such, they represent a frontier in the transformation of health care. How are these organizations using AI and digital technologies to drive transformation? What are the distinctions from academic medical centers? This session will address these and other topics that impact community hospitals.

Moderator
Michael Jaff, DO, President, NWH; Professor of Medicine, HMS

Fabien Beckers, PhD, CEO, Arterys
Joanna Geisinger, CEO, TORq Interface
John Miller, MD, Director, Retinal Imaging, MEE; Assistant Professor, Ophthalmology, HMS
Lee Schwamm, MD, Director, Center for TeleHealth and Exec Vice Chair, Neurology, MGH; Professor, Neurology, HMS
Tal Wenderow, CEO, Beyond Verbal



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Digital Management of Diabetes

Parliament/Adams | 7th Floor

Across the spectrum of patient care, the management of diabetes has been flooded with new technology and treatment options for both type 1 and type 2 diabetes – there is a range of new devices and software, including automatic insulin infusion systems, glucose sensors, AI-based algorithms and decision support tools, with an artificial pancreas on the horizon. This session will focus on these areas and clinical use cases that highlight the value of AI.

Moderator

Deborah Wexler, MD, Clinical Director, Diabetes Center, MGH; Associate Professor, HMS

Marie McDonnell, MD, Section Chief and Director, Diabetes Program, BH; Lecturer, HMS
Michael Meissner, PhD, CTO and VP, MED, Sanofi
Joshua Riff, MD, CEO, Onduo
Marie Schiller, VP, Connected Care and Insulins Product Development and Site Head, Cambridge Innovation Center, Eli Lilly

AI and Its Impact on the Future of Emergency Care

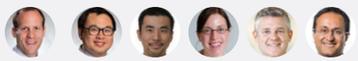
GE Healthcare Ballroom | 3rd Floor

There are over 136 million Emergency Department visits annually in the U.S. providing 24/7 unscheduled treatment for problems from minor illness to life threatening traumatic injuries. Emergency department care teams provide high quality, safe care in an efficient fashion. In this session, we consider the future of AI in emergency care from the initial decision to seek emergency care, to diagnostic process with the ED and final disposition decision. From chat bots for patient triage, telehealth for patient visits to machine learning outcome prediction, we will consider how these novel technologies will impact emergency care delivery.

Moderator

Adam Landman, MD, VP and CIO, BH; Associate Professor of Emergency Medicine, HMS

Peter Chai, MD, Assistant Professor, Emergency Medicine, BH, HMS
Kohei Hasegawa, MD, Attending Physician, Emergency Medicine, MGH; Associate Professor, Emergency Medicine, HMS
Emily Hayden, MD, Attending Physician, Emergency Medicine, MGH; Instructor, Surgery, HMS
Sean Kelly, MD, CMO, Imprivata; Assistant Professor, Emergency Medicine, HMS
Bijoy Sagar, VP, Chief Digital Technology Officer, Stryker



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__HMS__ Harvard Medical School | __MEE__ Mass. Eye and Ear | __MGPO__ Massachusetts General Physicians Organization
__NWH__ Newton-Wellesley Hospital | __SRN__ Spaulding Rehabilitation Network

Mental Health, Smartphone Apps and the Promise of AI

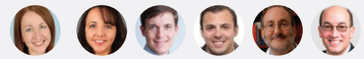
Essex South | 3rd Floor

Patients can face significant barriers when it comes to accessing high quality, evidence-based treatment for mental illness. AI-enabled technologies, including smartphone-based tools, that may help close this treatment gap for patients worldwide. This session will focus on efforts to develop smartphone apps and other tools, including those designed to help predict patients' moods and provide cognitive behavioral therapy.

Moderator

Sabine Wilhelm, PhD, Chief of Psychology; Director, OCD and Related Disorders Program, MGH; Professor, Psychology, HMS

Jennifer Gentile, PsyD, SVP, US Clinical Operations, Ieso Digital Health
Thomas McCoy, MD, Director of Research, Center for Quantitative Health, MGH; Assistant Professor, Psychiatry and Medicine, HMS
Christopher Molaro, CEO, Neuroflow
David Silbersweig, MD, Chairman, Department of Psychiatry, BH; Stanley Cobb Professor of Psychiatry, HMS
Jeremy Sohn, VP, Global Head of Digital Business Development and Licensing, Novartis



From Startup to Impact (Pharma and Diagnostics)

NVIDIA Ballroom | 3rd Floor

Who is really moving the needle in life sciences today? This session will introduce you to five leading start-up companies who will each share their respective impact in the pharmaceutical and diagnostic realms in 10-minute pitches.

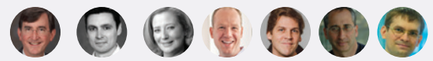
Moderator

James Brink, MD, Radiologist-in-Chief, MGH; Juan M. Taveras Professor of Radiology, HMS

Moderator

James Nicholls, Managing Director, Fitzroy Health

Sarah Beeby, EVP, GM Lifesciences, Clinithink
Charles Cadieu, PhD, CEO, Bay Labs
JB Michel, PhD, SVP Data Science and GM USA, BenevolentAI
Art Papier, MD, CEO, VisualDx
Alex Zhavoronkov, PhD, CEO, Insilico Medicine, Inc



1:00 pm | 1:15 pm — **Break**

1:15 pm | 1:45 pm — **Opening Remarks**
Bayer Ballroom

Anne Klibanski, MD, Interim President and CEO, Chief Academic Officer, PHS; Laurie Carrol Guthart Professor of Medicine, HMS; 2019 Forum Co-Chair
Scott Sperling, Co-President, Thomas H Lee Partners; Chairman of the Board of Directors, PHS
The Honorable Charlie Baker, Governor of the Commonwealth of Massachusetts

1:45 pm | 2:15 pm — **AI Strategy: AI from the Top**
Bayer Ballroom

As the potential of AI comes into clearer view, many academic medical centers are taking notice and crafting institutional strategies for incorporating AI into clinical practice. But where are the most meaningful opportunities? What are the biggest challenges? And, importantly, will patient care be noticeably different — better, more available, and/or less costly?

Moderator
Susan Hockfield, PhD, Board Member, PHS; President Emerita and Professor of Neuroscience, MIT
Keith Dreyer, DO, PhD, Chief Data Science Officer, PHS; Vice Chairman, Radiology, MGH; Associate Professor, Radiology, HMS
Alistair Erskine, MD, Chief Digital Health Officer, PHS
Gregg Meyer, MD, Chief Clinical Officer, PHS; Professor of Medicine, HMS; 2019 Forum Co-Chair

2:15 pm | 3:05 pm — **RWE and Trial Optimization in the AI Era**
Bayer Ballroom

AI is a tool for conducting faster, more efficient clinical trials. Panelists will discuss how AI-enabled methods can further adaptive trial capabilities, trial design and trial management.

Moderator
Thomas Lynch, MD, EVP and CSO, R&D, Bristol-Myers Squibb
Amy Abernethy, MD, PhD, Deputy Commissioner, FDA
Michael Devoy, MD, EVP MA&PV and Bayer CMO, Bayer AG
Josh Mandel, MD, Chief Architect, Microsoft Healthcare
Vicki Seyfert-Margolis, PhD, CEO, My Own Med Inc.
Stephen Wiviott, MD, Executive Director, Clinical Trials Office, PHS; Associate Professor of Medicine, HMS

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3:05 pm | 3:35 pm — **1:1 Fireside Chat: Jensen Huang, CEO, NVIDIA**
Bayer Ballroom

Introduction
Cathy Minehan, Managing Director, Arlington Advisory Partners; Chairman, Board of Trustees, MGH

Moderator
Keith Dreyer, DO, PhD, Chief Data Science Officer, PHS; Vice Chairman, Radiology, MGH; Associate Professor, Radiology, HMS
Jensen Huang, CEO, NVIDIA

3:35 pm | 4:25 pm — **AI Driven Value-Based Care**
Bayer Ballroom

As providers embrace value-based approaches, the demands of clinical data collection, assessment, and information-sharing loom large. In this data-driven environment, clinicians must sift through ever-growing pools of information that can exceed the limits of human capability. An assortment of AI-based solutions is now emerging that may offer some relief. Panelists will discuss how these approaches are helping to support better, more personalized care, and the challenges faced by clinicians and managers for effective adoption.

Moderator
Timothy Ferris, MD, CEO, MGPO; Professor of Medicine, HMS
Nancy Brown, CEO, American Heart Association
Kris Joshi, PhD, EVP, President, Network Solutions, Change Healthcare
Peter Orszag, PhD, Vice Chairman, Investment Banking and Managing Director, Lazard Freres
Simon Stevens, CEO, NHS England

4:25 pm | 5:15 pm — **Cardiovascular Care: Reinvented Through AI**
Bayer Ballroom

Cardiovascular diseases remain the leading cause of death worldwide and a major expense, making this area ripe for AI enabled innovations. Teams are pursuing a range of AI-based tools in cardiovascular medicine: including AI-powered drug discovery and diagnostics to automated cardiac image analyses and AI-guided care delivery pathways. Panelists will discuss where AI is having a sizeable impact. The discussion will also include the perspectives of a patient who benefited from AI-enabled cardiovascular care.

Moderator
Calum MacRae, MD, PhD, Vice Chair for Scientific Innovation, Department of Medicine, BH; Associate Professor of Medicine, HMS
Heather Bell, PhD, SVP, Global Head of Digital and Analytics, Sanofi
Mike Burke, Patient; Independent Recording Engineer, Burke Recording
Sebastian Guth, PhD, President, Bayer Pharma Americas Region, Bayer
Udo Hoffman, MD, Chief Cardiovascular Imaging, MGH; Professor, Radiology, HMS
Rahul Patel, EVP/GM, Healthcare and Life Sciences, Persistent Systems

5:15 pm | 5:45 pm

1:1 Fireside Chat: Seema Verma, Administrator, Centers for Medicare and Medicaid Services

Bayer Ballroom

Moderator

Sree Chaguturu, MD, Chief Population Health Officer, PHS; Assistant Professor, Medicine, HMS

Seema Verma, Administrator, Centers for Medicare and Medicaid Services

5:45 pm | 6:45 pm

Opening Reception

Bristol-Myers Squibb and Nuance Foyers

[tuesday, april 9th]

All speaker bios are at: **worldmedicalinnovation.org/speakers**

7:00 am | 8:00 am

Breakfast

Bristol-Myers Squibb and Nuance Foyers

7:00 am | 5:00 pm

Registration

Bristol-Myers Squibb and Nuance Foyers

7:40 am | 7:50 am

Opening Remarks

Bayer Ballroom

Chris Coburn, Chief Innovation Officer, PHS; President, Partners HealthCare International

7:50 am | 8:40 am

Implementing AI in Cancer Care

Bayer Ballroom

With AI-enabled care strategies and digital technologies, clinicians and patients are embracing new approaches to improve the lives of cancer patients through enhanced diagnosis and treatment. These include AI-guided tools for more precise methods of predicting risk, more effective screening strategies, patient data driven insights and more personalized treatments. Panelists will engage on how these and other innovations are enabling a new era of cancer care.

Moderator

Constance Lehman, MD, PhD, Chief, Breast Imaging Division, MGH; Professor of Radiology, HMS

Dawn Barry, President and Co-Founder, LunaDNA
Regina Barzilay, PhD, Delta Electronics Professor, Electrical Engineering and Computer Science Department, MIT
Gad Getz, PhD, Director, Cancer Genome Analysis, Broad Institute; Professor, Pathology, HMS
Daphne Koller, PhD, CEO, insitro

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NWH Newton-Wellesley Hospital | SRN Spaulding Rehabilitation Network

8:40 am | 9:30 am

Imagining Medicine in the Year 2054

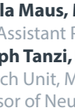
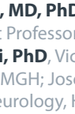
Bayer Ballroom

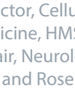
In 1984 Isaac Asimov was asked to predict what life in 2019 would be like. Using the same aperture, we ask what will constitute health care 35 years from now? Current trends suggest there will be significant gains in immunotherapy, gene therapy, and breakthrough treatments for neurologic, cardiovascular and oncologic diseases. Panelists will draw on their visionary perspective and will reflect on what to expect and why.

Moderator

Keith Flaherty, MD, Director, Clinical Research, MGH; Professor of Medicine, HMS

Noubar Afeyan, PhD, CEO, Flagship Pioneering
Calum MacRae, MD, PhD, Vice Chair for Scientific Innovation, Department of Medicine, BH; Associate Professor of Medicine, HMS
Marcela Maus, MD, PhD, Director, Cellular Immunotherapy Program, MGH; Assistant Professor, Medicine, HMS
Rudolph Tanzi, PhD, Vice-Chair, Neurology, Director, Genetics and Aging Research Unit, MGH; Joseph P. and Rose F. Kennedy Professor of Neurology, HMS
Michel Vounatsos, CEO, Biogen



9:30 am | 9:50 am

Morning Break

9:50 am | 10:15 am

1:1 Fireside Chat: Ash Carter, U.S. Secretary of Defense ('15-'17)

Bayer Ballroom

Moderator

Gregg Meyer, MD, Chief Clinical Officer, PHS; Professor of Medicine, HMS; 2019 Forum Co-Chair

Ash Carter, U.S. Secretary of Defense (2015–2017)

10:15 am | 10:40 am

1:1 Fireside Chat: Honorable Alex Azar II, Secretary of Health and Human Services

Bayer Ballroom

Moderator

Gregg Meyer, MD, Chief Clinical Officer, PHS; Professor of Medicine, HMS; 2019 Forum Co-Chair

Honorable Alex Azar II, Secretary of Health and Human Services

WiFi Network: **WMIF19** | Password: **Bayer**

10:40 am | 11:30 am

CEO Roundtable
Bayer Ballroom

Chief executives share perspectives on the impact of AI on their respective companies and industry segments. Panelists will discuss their views of AI, how AI figures into their organizations' current product and investment strategies, and how they are measuring return on existing AI investments. The panel will also address opportunities and challenges surrounding AI, ranging from workforce needs to managing bias in AI development.

Moderator
Anne Klibanski, MD, Interim President and CEO, Chief Academic Officer, PHS; Laurie Carrol Guthart Professor of Medicine, HMS; 2019 Forum Co-Chair

Frans van Houten, CEO, Philips
Joerg Moeller, MD, PhD, EVP, Head, Pharmaceuticals Research and Development, Bayer AG
Bernd Montag, PhD, CEO, Siemens Healthineers
Kieran Murphy, CEO, GE Healthcare

11:30 am | 11:35 am

2019 Innovation Discovery Grant Winners Announcement
Bayer Ballroom

11:35 am | 11:45 am

Break

11:45 am | 1:00 pm

Discovery Café Sessions
locations vary

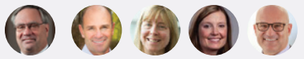
Lunch with Experts: Intensive sessions addressing cutting-edge artificial intelligence topics.

Provider Back Office of the Future
Great Republic | 7th Floor

The application of AI-based technologies to the business side of health care — including functions such as billing, payment, and insurance claims management — could lead to significant improvements in health care operations and efficiency, with billions of dollars in savings each year. Panelists will discuss emerging tools and technologies as well as the opportunities and pitfalls of using AI to innovate and automate back office functions.

Moderator
Peter Markell, EVP, Administration and Finance, CFO and Treasurer, PHS

Kent Ivanoff, CEO, VisitPay
Connie Moser, Chief Operating Officer, Verge Health
Mary Beth Remorenko, VP, Revenue Cycle Operations, PHS
Brian Robertson, CEO, VisiQuate



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__NWH__ Newton-Wellesley Hospital | __SRN__ Spaulding Rehabilitation Network

Chief Digital Strategy Officer Roundtable
Essex South | 3rd Floor

With the advent of AI-enabled technologies, this session brings together leading chief digital health officers. The discussion will address tradeoffs in sequencing technology across academic medical centers; what technologies are being prioritized; and how consumer expectations.

Moderator
Alistair Erskine, MD, Chief Digital Health Officer, PHS

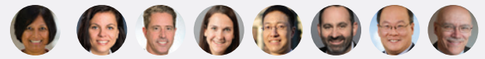
Michael Anderes, Chief Innovation and Digital Health Officer, Froedtert Health; President, Inception Health
Adam Landman, MD, VP and CIO, BH; Associate Professor of Emergency Medicine, HMS
Aimee Quirk, CEO, innovationOchsner
Richard Zane, MD, Chief Innovation Officer, UCHealth; Professor and Chair, Department of Emergency Medicine, University of Colorado School of Medicine

Innovation Fellows: A New Model of Collaboration
Parliament/Adams | 7th Floor

The Innovation Fellows Program provides, experiential career development opportunities for future leaders in health care. It facilitates personnel exchanges between Harvard Medical School staff from Partners' hospitals and participating biopharmaceutical, device, venture capital, digital health, payor and consulting firms. Fellows and Hosts learn from each other as they collaborate on projects ranging from clinical development to digital health and artificial intelligence. Learn how this new model of collaboration can deliver value and lead to broader relationships between industry and academia.

Moderator
Seema Basu, PhD, Market Sector Leader, Innovation, PHS

Nathalie Agar, PhD, Research Scientist, Neurosurgery, BH; Associate Professor, Neurosurgery, Radiology, HMS
Paul Anderson, MD, PhD, Chief Academic Officer, BH; SVP, Research, BH; K. Frank Austen Professor of Medicine, HMS
Laurie Braun, MD, Partners Innovation Fellow, MGH and Boston Pharmaceuticals; Instructor in Pediatrics, HMS
David Chiang, MD, PhD, Research Fellow, BH; Innovation Fellow, Boston Scientific
David Feygin, PhD, Chief Digital Health Officer, Boston Scientific
Peter Ho, MD, PhD, CMO, Boston Pharmaceuticals
Harry Orf, PhD, SVP, Research, MGH; Principal Associate, HMS



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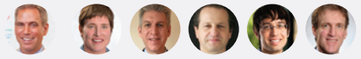
Last Mile: Fully Implementing AI in Healthcare
NVIDIA Ballroom | 3rd Floor

This session will focus on how radiology and pathology specialties are currently applying AI in the clinic. Where will it be built out first? What are the barriers and how will these challenges be overcome?

Moderator
Keith Dreyer, DO, PhD, Chief Data Science Officer, PHS; Vice Chairman, Radiology, MGH; Associate Professor, Radiology, HMS

Katherine Andriole, PhD, Director of Research Strategy and Operations, MGH & BWH CCDS; Associate Professor, Radiology, HMS
Samuel Aronson, Executive Director, IT, Personalized Medicine, PHS
Peter Durlach, SVP, Healthcare Strategy and New Business Development, Nuance
Seth Hain, VP of R&D, Epic
Jonathan Teich, MD, PhD, Chief Medical Information Officer, InterSystems; Emergency Medicine, BH



Reimagining Disease Management
Essex North | 3rd Floor

The management of disease has become vastly more challenging, both for patients and providers. AI-based technologies promise to improve and streamline patient care through a variety of approaches. This session will feature a discussion of these new tools and how they can enhance patient engagement and optimize care management.

Moderator
Sree Chaguturu, MD, Chief Population Health Officer, PHS; Assistant Professor, Medicine, HMS

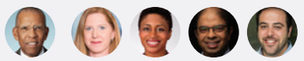
Murray Brozinsky, Chief Strategy Officer, Conversa
Jean Drouin, MD, CEO, Clarify Health Solutions
Julian Harris, MD, President, CareAllies
Erika Pabo, MD, Chief Health Officer, Humana Edge; Associate Faculty, Ariadne Labs; Associate Physician, BH; Instructor, HMS

Standards and Regulation: The Emerging AI Framework
Essex Center | 3rd Floor

As the health care industry faces an explosion of AI-based tools, the FDA's approach to these technologies is evolving. This session will focus on the agency's approach to AI-based products, how to calculate the risk profile of these new technologies, and the challenges of securing adequate data rights.

Moderator
Brent Henry, Member, Mintz Levin

Bethany Hills, Member/ Chair, FDA Practice, Mintz Levin
Michelle McMurry-Heath, MD, PhD, VP, Global Regulatory Affairs and International Clinical Evidence, Johnson & Johnson Medical Devices
Bakul Patel, Associate Director, Digital Health, FDA
Michael Spadafore, Managing Director, Sandbox Industries



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HMS Harvard Medical School | MEE Mass. Eye and Ear | MGPO Massachusetts General Physicians Organization
NWH Newton-Wellesley Hospital | SRN Spaulding Rehabilitation Network

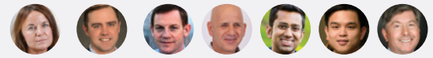
From Startup to Impact (Provider Solutions)
GE Healthcare Ballroom | 3rd Floor

This session will introduce you to five leading start up companies who will each share their respective impact in delivery provider solutions in ten-minute pitches.

Moderator
Meredith Fisher, PhD, Partner, Partners Innovation Fund, PHS

Moderator
James Stanford, Managing Director, Fitzroy Health

William Grambley, COO, AllazoHealth
Gal Salomon, CEO, CLEW
Siddarth Satish, CEO, Gauss Surgical
Pelu Tran, CEO, Ferrum Health
Ed Zecchini, CIO, Remedy Partners



1:00 pm | 1:10 pm — **Break**

1:10 pm | 2:00 pm

China: AI Enabled Healthcare Leadership
Bayer Ballroom

China's health care system faces major access challenges — and its population is aging more rapidly than nearly every other country. To help address these problems, the Chinese health technology sector is strongly embracing AI. What are the most exciting applications? What lessons does China's early forays into AI-enabled patient care hold for other health care systems?

Moderator
Jay Bradner, MD, President, Novartis Institutes for BioMedical Research

Terri Bresenham, Chief Innovation Officer, GE Healthcare
Kuan Chen, CEO, Infervision
Rujing Gong, Chairman and Co-Founder, Yidu Cloud
Nisa Leung, Managing Partner, Qiming Venture Partners
Jian Wu, PhD, CEO, Real Doctor Corporation Limited; Director, Real Doctor AI Research Centre and Professor, Public Health and Computer Science, Zhejiang University
Meng Zhang, Vice President, Tencent Medical

2:00 pm | 2:30 pm

1:1 Fireside Chat: Mark Benjamin, CEO, Nuance
Bayer Ballroom

Moderator
Peter Slavin, MD, President, MGH; Professor, Health Care Policy, HMS

Mark Benjamin, CEO, Nuance Communications

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2:30 pm | 3:00 pm — **Afternoon Break**

3:00 pm | 3:50 pm — **Getting to the AI Investment Decision**

Bayer Ballroom

The billions invested worldwide in AI-based health care technologies underscore the enthusiasm of global investors. But where are the greatest opportunities and what is the timeline to meaningful impact? In this panel, venture, private equity investors, and buy side analysts will discuss investment priorities, timelines, and key areas of interest.

Moderator
Meredith Fisher, PhD, Partner, Partners Innovation Fund, PHS

Roger Kitterman, VP, Venture and Managing Partner, Partners Innovation Fund, PHS
Adam Koppel, MD, PhD, Managing Director, Bain Capital Life Sciences
Amir Nashat, PhD, Managing Partner, Polaris Partners
Mike Nohaile, PhD, SVP, Strategy, Commercialization and Innovation, Amgen
Jim Sinclair, Managing Director, Healthcare Group, Goldman Sachs
Krishna Yeshwant, MD, Partner, GV; Instructor in Medicine, BH

3:50 pm | 4:20 pm — **1:1 Fireside Chat: Robert Bradway, CEO, Amgen**

Bayer Ballroom

Moderator
Jean-François Formela, MD, Partner, Atlas Venture

Robert Bradway, CEO, Amgen

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HMS *Harvard Medical School* | ***MEE*** *Mass. Eye and Ear* | ***MGPO*** *Massachusetts General Physicians Organization*
NWH *Newton-Wellesley Hospital* | ***SRN*** *Spaulding Rehabilitation Network*

4:20 pm | 5:10 pm — **Consumer Healthcare and New Models of Care Delivery**

Bayer Ballroom

AI is powering a revolution in consumer health care, giving patients a deeper role in monitoring their own health and spawning new models of care delivery. Many health care organizations are increasingly focused on creating a digital "front door" for patients - a single gateway to mobile apps and other online services. Panelists will also discuss the role of remote monitoring and virtual care programs as well as the role of AI in care redesign and workflow.

Moderator
Diana Nole, CEO, Wolters Kluwer Health

Cuong Do, President, Global Strategy Group, Samsung; Founder, CareVisor
Patricia Florissi, PhD, VP and Global CTO, Sales, Dell EMC
Vivian Lee, MD, PhD, President, Health Platforms, Verily Life Sciences
Kyu Rhee, MD, VP and Chief Health Officer, IBM Corporation
James Weinstein, DO, SVP, Head of Innovation and Health Equity, Microsoft Healthcare

5:15 pm | 5:25 pm — **Biobank Award Announcement**

Bayer Ballroom

5:30 pm | 6:30 pm — **Attendee Networking Reception**

Bristol-Myers Squibb and Nuance Foyers

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[wednesday, april 10th]

All speaker bios are at: **worldmedicalinnovation.org/speakers**

7:00 am | 8:00 am — **Continental Breakfast**
Bristol-Myers Squibb Foyer

7:00 am | 12:00 pm — **Registration**
Bristol-Myers Squibb Foyer

7:30 am | 9:30 am — **Innovation Discovery Grant Awardee Presentations**
Bayer Ballroom

Eleven clinical teams selected to receive highly competitive Innovation Discovery Grants present their work illustrating how AI can be used to improve patient health and health care delivery. This session is designed for investors, entrepreneurs, investigators, and others who are interested in commercializing AI opportunities that are currently in development with support from the Innovation Office.

Moderator
David Louis, MD, Pathologist-in-Chief, MGH; Benjamin Castleman Professor of Pathology, HMS

Moderator
Clare Tempany, MD, Vice-Chair, Radiology Research, BH; Ferenc Jolesz MD Professor of Radiology, HMS

9:30 am | 10:00 am — **Morning Break**
Bristol-Myers Squibb and Nuance Foyers

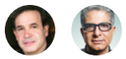
10:00 am | 10:30 am — **1:1 Fireside Chat: Stefan Oelrich, Member of the Board of Management; President, Pharmaceutical, Bayer AG**
Bayer Ballroom

Introduction
John Fish, CEO, Suffolk; Chairman of Board Trustees, BH

Moderator
Betsy Nabel, MD, President, Brigham Health; Professor of Medicine, HMS
Stefan Oelrich, Member of the Board of Management, Bayer AG; President, Pharmaceutical, Bayer AG

10:30 am | 11:00 am — **1:1 Fireside Chat: Deepak Chopra, MD, Founder, The Chopra Foundation**
Bayer Ballroom

Moderator
Rudolph Tanzi, PhD, Vice-Chair, Neurology, Director, Genetics and Aging Research Unit, MGH; Joseph P. and Rose F. Kennedy Professor of Neurology, HMS
Deepak Chopra, MD, Founder, The Chopra Foundation



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__HMS__ Harvard Medical School | __MEE__ Mass. Eye and Ear | __MGPO__ Massachusetts General Physicians Organization
__NWH__ Newton-Wellesley Hospital | __SRN__ Spaulding Rehabilitation Network

11:00 am | 11:50 am — **Using AI to Predict and Monitor Human Performance and Neurological Disease**
Bayer Ballroom

In the quest for effective treatments aimed at devastating neurological diseases like Alzheimer's and ALS, there is a critical need for robust methods to predict and monitor disease progression. AI-based approaches offer promise in this important area. Panelists will discuss efforts to map movement-related disorders and use machine learning to predict the path of disease with imaging and biomarkers.

Moderator
Merit Cudkowicz, MD, Chief of Neurology, Co-Director, Neurological Clinical Research Institute, MGH; Julieanne Dorn Professor of Neurology, HMS
Poppy Crum, PhD, Chief Scientist, Dolby Laboratories
Husseini Manji, MD, Global Therapeutic Head, Neuroscience Janssen Research and Development
Alfred Sandrock, MD, PhD, EVP and CMO, Biogen
Stephen Smith, CEO, Kitman Labs

11:50 am | 12:50 pm — **Disruptive Dozen: 12 Technologies That Will Reinvent AI in the Next 12 Months**
Bayer Ballroom

The Disruptive Dozen identifies and ranks the AI technologies that Partners faculty feel will break through over the next year to significantly improve health care.

Moderator
Jeffrey Golden, MD, Chair, Department of Pathology, BH; Ramzi S. Cotran Professor of Pathology, HMS

Moderator
Erica Shenoy, MD, PhD, Associate Chief, Infection Control Unit, MGH; Assistant Professor, Medicine, HMS

1:00 pm | 1:10 pm — **Closing Remarks and Adjourn**
Bayer Ballroom

2018 WORLD MEDICAL INNOVATION FORUM

Fireside Chat

Moderator | **Betsy Nabel, MD**, President, Brigham Health; Professor of Medicine, HMS

Atul Gawande, MD, Executive Director, Ariadne Labs; Samuel O. Thier, Professor of Surgery, HMS; Surgeon, BH

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Barbara Lubash
Co-Founder and
Managing Director,
Versant Ventures Funds

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CEO, Syndax
Pharmaceuticals

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Managing Partner,
Polaris Partners

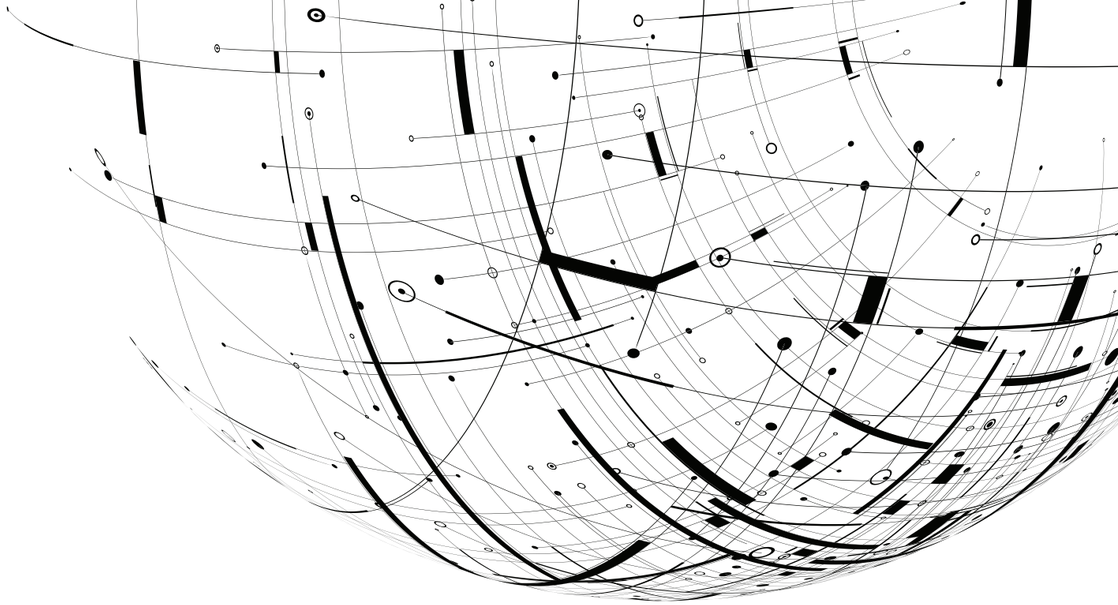
Ben Pless
CEO, Pivotal Design Labs

Paul Ricci
Former Chairman and CEO,
Nuance Communications

Russ Richmond, MD
Founder and CEO, Laudio

Alfred Sandrock, MD, PhD,
EVP and CMO, Biogen

Sue Siegel
Chief Innovation and CEO,
Business Innovations, GE



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K. Frank Austen Professor of Medicine, HMS

Jay Austen, MD
Chief, Division of Plastic and Reconstructive Surgery, MGH; Professor, Surgery, HMS

Sree Chaguturu, MD
Chief Population Health Officer, PHS;
Assistant Professor, Medicine, HMS

Omid Farokhzad, MD
Director, Center for Nanomedicine, BH;
Professor, Anesthesiology, HMS

Maurizio Fava, MD
Director, Division of Clinical Research, MGH;
Associate Dean for Clinical & Translational Research & Professor of Psychiatry, HMS

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Mason Freeman, MD
Director, Translational Research Center, Chief, Lipid Metabolism Unit, MGH; Professor of Medicine, HMS

Ole Isacson, MD, PhD
Founding Director, Neuroregeneration Institute, McLean; Principal Faculty, Harvard Stem Cell Institute; Professor, Neurology, Neuroscience, HMS

Christiana Iyasere, MD
Director, Department of Medicine Innovation Program, MGH; Assistant Professor, Medicine, HMS

Jeff Karp, PhD
Professor, Medicine, BH, HMS; Principal Faculty, Harvard Stem Cell Institute; Affiliate Faculty, Broad Institute and Harvard-MIT Division of Health, Sciences and Technology

Adam Landman, MD
VP and CIO, BH; Associate Professor of Emergency Medicine, HMS

Calum MacRae, MD, PhD
Vice Chair for Scientific Innovation, Department of Medicine, BH; Associate Professor of Medicine, HMS

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Harry Orf, PhD
SVP, Research, MGH; Principal Associate, HMS

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Professor, Surgery, HMS

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REDHILL 丹麓资本 CAPITAL

COMPANY PROFILE

Redhill Capital is a venture capital firm dedicated in healthcare industry. It was co-founded by Cherry Lu and Frank Su in early 2018. The core team have comprehensive experience in both venture capital and healthcare industries with deep resources across Asia and the United States.

Redhill Capital is focused on early stage investment with excellent fund performance. It is committed to grow with great healthcare entrepreneurs as a qualified capital partner. Having built up strong understanding and industry connection with our medical portfolio companies，we grew with them from rookies to industry leaders in the past 20 years. It is our mission to partner with future healthcare leaders in the next 20 years.

Cherry Lu

Funding & Managing Partner

Cherry joined Sequoia Capital China in 2005 and is still a Venture Partner taking care of deals she invested in Sequoia. Before Sequoia, she took various roles in medical devices marketing and hospital projects, accumulated rich industry resources and experience. Cherry has been directly in charge of investments in many early and mid-term stage companies such as Jafron Bio (300529), Snibe Diagnostic (passed review of Issuance Appraisal Committee), ARMO (Nasdaq ARMO), Winner Medical, Shanghai Iray, Shenzhen XtalPi, etc. They are all leading companies in their respective sub-sectors, yielding high return.

Cherry graduated from Huazhong Science & Technology University in 1996 with a bachelor's degree in Clinical Medicine. She received MBA from the Chinese University of Hong Kong in 2004, and EMBA from the Cheung Kong Graduate School of Business in 2017.

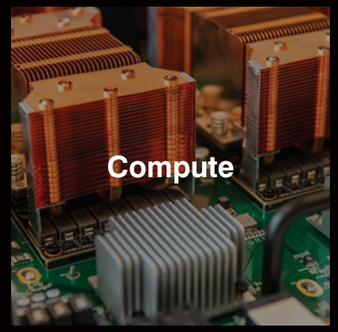
Industry recognition: Forbes 2018 TOP25 female venture capitalist in China. VB100 Best Investor of the year in 2017. FMBA instructor at Cheung Kong Graduate School of Business and mentors of multiple healthcare incubators and start-up camps.

Frank Su

Founding Partner

Before Redhill, Frank acted as managing partner of Shenzhen Share Capital since 2013. His company has invested in more than 50 healthcare companies. He undertook most of the investments as the earliest institutional investor, and many portfolio companies now have become industry leaders, including Beijing Genetron Health, Guangzhou Medprin Regenerative Medical, Hangzhou Regennovo, Beijing Tcrcure, Beijing Houkai, etc.

Before venture capitalist, Frank spent over a decade in the healthcare industry. He worked in many well-known medical companies such as Johnson & Johnson, and served in senior management roles of sales, marketing, and general management. He has deep understanding of the industry both in US and China. Frank also co-founded surgical products company Techlink Medical and grew the company to the sector leader. He is the vice-chairman of the Medical Industry Alliance, mentor and instructor of a number of medical incubators, start-up camps and business schools.



CCDS is transforming healthcare with Artificial Intelligence

MGH & BWH Center for Clinical Data Science (CCDS) is a disruptive innovation group at Partners HealthCare. We are pioneers in changing the landscape of healthcare by developing next-generation informatics and machine learning applications. These tools will enable new ways of accurately diagnosing and treating disease, and save lives.

To pursue our mission, we have partnered up with leading industry players like GE Healthcare, NVIDIA, Nuance and Dasa to accelerate the impact of AI across all domains of healthcare, while closely collaborating with clinicians.

Visit us at our demo booth during World Medical Innovation Forum on the 3rd floor of the Westin Copley Place.

PARTNERS HEALTHCARE

BRIGHAM HEALTH

BWH BRIGHAM AND WOMEN'S HOSPITAL

MGH 1811 MASSACHUSETTS GENERAL HOSPITAL

MGH & BWH CENTER FOR CLINICAL DATA SCIENCE

Visit our website **www.ccds.io**

“Unless we begin to fight diabetes in a serious way, we are going to be destroying the health care system, crashing our economy, and devastating families for decades to come.”

DR. DEAN SCHILLINGER, SAN FRANCISCO GENERAL HOSPITAL

BLOOD SUGAR RISING

A NEW DOCUMENTARY SPECIAL COMING TO PBS IN WINTER 2020

WGBH PBS

A STUDIO SIX PRODUCTION FOR WGBH BOSTON

Innovation Fellows Program

The Innovation Fellows Program provides short-term, experiential career development opportunities for future leaders in health care focused on accelerating collaborative innovation between science and industry. It facilitates personnel exchanges between Harvard Medical School staff from Partners' hospitals and participating biopharmaceutical, device, venture capital, digital health, payor and consulting firms. A successful example of open innovation, Fellows and Hosts learn from each other as they collaborate on projects ranging from clinical development to digital health and artificial intelligence to new care delivery models and industry disruption.

“As a small biotech, we're always looking for ways to network with the scientific and clinical community within Boston and Cambridge. While we have a lot of in-house medical expertise, we'll never be the large hospital teaching facility that is a Mass General or a Brigham and Women's. The Fellows Program is a great way for us to get additional expertise in disease areas or specialties that aren't within our group.”

Peter Ho, MD, PhD, Chief Medical Officer, Boston Pharmaceuticals, Inc.

We welcome interested Fellow candidates and potential host organizations to learn more at: **innovation.partners.org/about/special-programs/innovation-fellows-program**

PARTNERS HEALTHCARE | INNOVATION

planning committee

planning committee

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Chief Innovation Officer, Partners HealthCare
President, Partners HealthCare International

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Director of Research Strategy and Operations, MGH & BWH CCDS; Associate Professor, Radiology, HMS

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Healthcare Leadership Council
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Jamie Belkin
Jerry Mizer
Amy Pappas
Lisa Savin
Rob Weil

Mueller Design
Eric Castle
Greg Mueller
Ashley Volney

A special thanks to Innovation's Planning Committee and Event Team for their unstinting commitment over the last 18 months to create the 2019 World Medical Innovation Forum.

WiFi Network: **WMIF19** | Password: **Bayer**

Join Us in 2020.

AI and the future of medicine

Registration is now open.

Special discounted pricing is available until May 31st.

Register online or at the Forum registration desk to take advantage of this special discount.

May 11–13, 2020

www.worldmedicalinnovation.org

WORLD MEDICAL
INNOVATION
FORUM

3RD ANNUAL

Innovator's Recognition Dinner

KEYNOTE SPEAKER
Alfred Sandrock, MD, PhD
EVP and CMO, Biogen

PARTNERS HEALTHCARE | INNOVATION

Excellence in Innovation

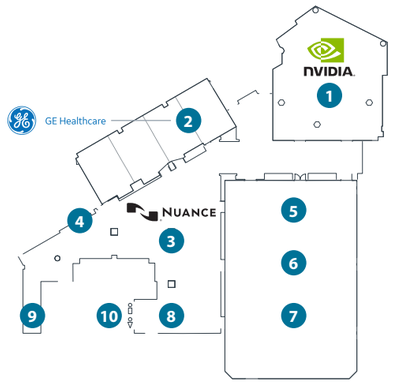
Celebrating the accomplishments of the 788 Partners-wide investigators and their discoveries in 2018.

The 3rd Annual Innovator's Dinner is an invitation-only event on Wednesday, April 10th honoring investigators from the Partners HealthCare community who submitted inventions in calendar year 2018. We commend these inventors for committing to their unique inspirations to better patient care.

maps

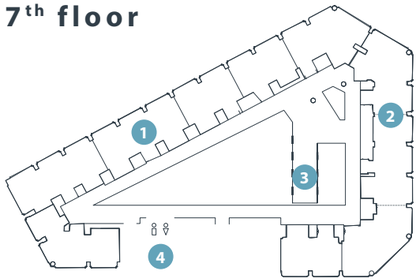
The Westin Copley Place, Boston
10 Huntington Avenue, Boston, MA, 02116

3rd floor



4th floor

7th floor



3rd floor

NVIDIA Ballroom	1
GE Healthcare Ballroom	2
Nuance Foyer	3
Registration M–Z	4
Essex North	5
Essex Center	6
Essex South	7
CCDS Booth	8
Elevators	9
Restrooms	10

4th floor

Bayer Ballroom	1
Bristol-Myers Squibb Foyer	2
Registration A–L	3
Media Room	4
Speaker Ready Room	5
Elevators	6
Restrooms	7

7th floor

Great Republic	1
Parliament/Adams	2
Elevators	3
Restrooms	4

NOTE: *Locations of panels and exhibits are subject to change.*

WiFi Network: **WMIF19** | Password: **Bayer**

PARTNERS HEALTHCARE | INNOVATION

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857-307-2400 | innovation.partners.org

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