

Learning Health Systems

Fall 2022 Symposium

EVENT PROGRAM

Columbia University's Learning Health System Initiative will optimize our health system's performance by enhancing the patient experience, improving quality and outcomes of care, addressing population health, increasing value, and improving the work life of health care providers in alignment with the Quintuple Aim. It aims to achieve these goals by leveraging Columbia University and NewYork-Presbyterian (NYP) resources and interdisciplinary partnerships to create sustainable processes, resources and training on rapid, rigorous design, evaluation and implementation of systems interventions particularly using real-time informatics data and digital health tools.

This ideation symposium aims to establish opportunities for cross-disciplinary engagement by surfacing ideas for what is not only currently achievable but also the adjacent possible and beyond. The symposium will feature clinicians and researchers leveraging learning health system concepts across Columbia, NYP and Weill Cornell Medicine to advance knowledge to practice. The session will also include spark talks from Columbia faculty, including two recent Learning Health System pilot project awardees, and will be moderated by faculty leads who will introduce the challenge and opportunities, sparking ideas from participating attendees and leading to collaborative research efforts. Ideas discussed that apply a learning health systems approach that integrates informatics, research, and clinical practice programs to solve real-world problems will be eligible for the Learning Health Systems pilot award available this Winter.

HOSTED BY



IRVING INSTITUTE FOR CLINICAL
AND TRANSLATIONAL RESEARCH



COLUMBIA | ENGINEERING
The Fu Foundation School of Engineering and Applied Science

IN PARTNERSHIP WITH



Office of
Mental Health



COLUMBIA UNIVERSITY
IRVING MEDICAL CENTER

NewYork-Presbyterian
Columbia University Irving Medical Center



FACULTY FACILITATORS

Muredach Reilly, MBBCh, MSCE | Eric Vieira, PhD | Chunhua Weng, PhD

AGENDA

10:00 a.m.

SESSION 1: Movement Towards LHS

Introduction: *Muredach Reilly, MBCh, MSCE, Chunhua Weng, PhD*

- 1A: Transforming Care Delivery: Application of a Learning Health System Model
Namita Azad, MPH
- 1B: Learning Health System Approach to Preventing Catheter Associated Urinary Tract Infections (CAUTIs): A Randomized Quality Improvement Project
Jason Adelman, MD, MS
- 1C: Creating a Learning Public Mental Health System in New York State
Thomas E. Smith, MD

11:10 a.m.

Session 1 Q&A

11:30 a.m.

Break

11:40 a.m.

SESSION 2 - LHS Pilot Programs at Columbia

Introduction: *Muredach Reilly, MBCh, MSCE*

- SPARK TALK #1: Innovation at the Point of Care: Optimized Appointment Scheduling
Corinne DePue, MPH + Carolyn Armstrong
- SPARK TALK #2: Causal Fairness in Intensive Care Medicine
Drago Plecko, PhD
- PILOT WINNER: Piloting a Pediatric Health Equity and Quality Dashboard and Implementation Roadmap
Sandhya Brachio, MD, MSCH
- PILOT WINNER: A Machine Learning Approach for Early Detection of Sepsis
Carri Chan, PhD + Benjamin Ranard, MD, MSHP

12:22 p.m.

Session 2 Q&A

12:50 p.m.

Lunch

1:50 p.m.

SESSION 3 - Community Innovations in LHS

Introduction: *Eric Vieira, PhD*

- HER in the EHR: Developing and Implementing a Postpartum Depression Risk Prediction Model
Yiye Zhang, PhD, MS
- Using Speech and Language to Identify Patients at Risk for Emergency Department Visit and Hospitalization in Home Healthcare
Maryam Zolnoori, PhD

2:40 p.m.

Session 3 Q&A

2:55 p.m.

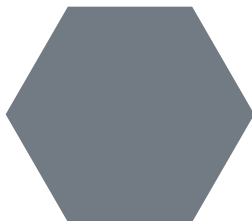
Closing Remarks: *Eric Vieira, PhD*

SPEAKERS & FACILITATORS



Jason Adelman, MD, MS
Chief Patient Safety Officer & Associate Chief Quality Officer; Executive Director, Center for Patient Safety Research; Director, Patient Safety Research Fellowship; Vice Chair for Quality & Patient Safety, Department of Medicine

Jason Adelman, MD, MS is the Chief Patient Safety Officer, Executive Director of the Center for Patient Safety Research, Director of the T32 Patient Safety Research Fellowship, and Vice Chair for Quality & Patient Safety for the Department of Medicine at Columbia University Irving Medical Center/NewYork-Presbyterian. In his operations role, Dr. Adelman leads the quality and patient safety initiatives for Columbia University Irving Medical Center. As a patient safety researcher, he is principal investigator of several studies funded by AHRQ and NIH. Dr. Adelman's research has been published in multiple high-impact journals including JAMA, JAMA Internal Medicine, and JAMA Pediatrics, and has led to national patient safety recommendations and regulations from the Office of the National Coordinator for Health Information Technology (ONC) and The Joint Commission. As the Director of the AHRQ-funded T32 Patient Safety Research Fellowship, he mentors fellows in projects addressing many of the challenges facing hospitalized patients today, including sepsis, hospital-acquired infections (CAUTIs, CLABSIs), and medication errors. Dr. Adelman is faculty at the Institute for Healthcare Improvement (IHI) and in 2017, 2018, and 2020, Dr. Adelman was named one of the 50 leading National Patient Safety Experts by Becker's Hospital Review.



Carolyn Armstrong
Health Informatics Data Analyst, People & Organization Development – Transformation
ColumbiaDoctors, Columbia University Irving Medical Center

Carolyn Armstrong is a Health Informatics Data Analyst on the Transformation team within People and Organizations Development at ColumbiaDoctors. She supports the team's mission to catalyze and facilitate innovation at point of care through her technical expertise, contributing to data-driven solutions to improve patient, staff, and provider experience. Carolyn has a background in data architecture and analysis, including utilization of cloud computing and machine learning for optimization and prediction problems in public health.



Namita Azad, MPH
Director, People & Organization Development - Transformation, ColumbiaDoctors, Columbia University Irving Medical Center

Namita Azad is the Director of Transformation at ColumbiaDoctors, Columbia University Irving Medical Center. She has earned her BS and MS in Global Health from the University of Wisconsin, Madison and her MPH from Benedictine University. In her career spanning over ten years, she's worked in strategic design and deployment of programs focused on improving quality and safety metrics, optimizing clinical and operational workflows, integrating social determinants of health in primary care settings and designing community-based interventions. She specializes in change management and performance improvement tools and techniques and has delivered numerous trainings and education sessions in this space. In her current role at ColumbiaDoctors, she oversees the strategy for innovation and transformation for point of care delivery within the ambulatory space.



Sandhya Brachio, MD, MSCH
Assistant Professor of Pediatrics in the Division of Neonatology, Columbia University Irving Medical Center

Dr. Sandhya Brachio is an Assistant Professor of Pediatrics in the Division of Neonatology at Columbia University Irving Medical Center, and she is also the Director for NICU Quality Improvement. She received her medical degree from the University of California, San Diego School of Medicine. She completed her internship and residency in Pediatrics, as well as her fellowship in Neonatal-Perinatal Medicine, at Columbia University. She has received further training in QI methodology by completing the Intermediate Improvement Science Series course offered by the James M. Anderson Center for Health Systems Excellence affiliated with Cincinnati Children's Hospital. She was also selected to participate in the 2020-2021 Columbia Women's and Children's Health Faculty Leadership Academy to further develop leadership and mentorship skills and to gain an enhanced understanding of operational and financial structures. Her research is focused on Quality Improvement and how we integrate multidisciplinary teams to successfully bring evidence-based medicine to the bedside.

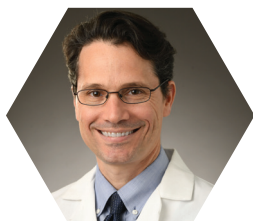
SPEAKERS & FACILITATORS



Carri Chan, PhD

John A Howard Professor of Business in the Division of Decision, Risk, and Operations, Columbia Business School

Carri W. Chan is the John A Howard Professor of Business in the Division of Decision, Risk, and Operations Columbia Business School. Her research is in the area of healthcare operations management. Her primary focus is on data-driven modeling of healthcare systems. Her research combines empirical and mathematical modeling to develop evidence-based approaches to improve patient flow. She has worked with clinicians and administrators in numerous hospital systems including Northern California Kaiser Permanente, New York Presbyterian, and Montefiore Medical Center. She is the recipient of a 2014 National Science Foundation (NSF) Faculty Early Career Development Program (CAREER) award, the 2016 Production and Operations Management Society (POMS) Wickham Skinner Early Career Award, and the 2019 MSOM Young Scholar Prize. She received her BS in Electrical Engineering from MIT and MS and PhD in Electrical Engineering from Stanford University.



Timothy Crimmins, MD, RPVI

CMIO, Columbia University Irving Medical Center
Director, Vascular Laboratory
Division of Cardiology

Timothy J. Crimmins received his BS and MD from The George Washington University. He completed residency in internal medicine at The University of Washington in Seattle and board certification in internal medicine in 2001. He completed training in Vascular Medicine at Columbia University through the informal pathway and completed board certification in Vascular Medicine in 2008. Dr. Crimmins serves as Medical Director of the Non-Invasive Vascular Medicine Lab where ultrasound is used for the diagnosis of vascular disorders. Clinical interests include vascular medicine, non-invasive vascular diagnosis, general internal medicine and medical education. He has a master's certificate in Leadership Development having completed the Master Teacher in Medical Education Program at The George Washington University. His clinical goals of care include patient education, patient-centered care and use of systems to enable high-quality patient care. His education goals include enabling independent thinking and the use of metacognition to foster an understanding of the underlying thought processes involved in medical decision-making.



Corinne DePue, MPH

Director, People & Organization Development - Transformation, ColumbiaDoctors, Columbia University Irving Medical Center

Corinne DePue is a Director of Transformation on the People and Organizations Development team at ColumbiaDoctors. A key focus in her current role is serving as a lead for Columbia's Clinical Innovation Lab, with a mission to catalyze transformation efforts at the point of health care delivery. Corinne also has experience in supporting large scale technology implementations such as Epic, Nuance Dragon and M*Modal Fluency Direct.



Laureen L. Hill, MD, MBA
Group Senior Vice President & Chief Operating Officer, NYP/ Columbia Division
NewYork-Presbyterian/ Columbia University Irving Medical Center

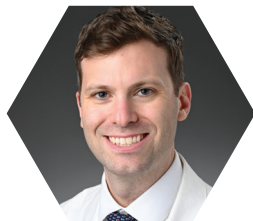
Laureen Hill, MD, MBA, is Group Senior Vice President & Chief Operating Officer for NewYork-Presbyterian/Columbia University Irving Medical Center. In this role, she manages and directs daily operations, including the cost, quality, and delivery of services for NYP/Columbia, and is also accountable for NYP Allen. Dr. Hill joined NewYork-Presbyterian in 2017, and previously held several key leadership roles at Emory University School of Medicine/Emory Healthcare, including Chair of the Department of Anesthesiology and Chief of Anesthesia Services, as well as Chair of Emory's IT Governance Committee and Co-Chair of its Perioperative Governance Committee. Prior to joining Emory, she was Vice Chair of the Department of Anesthesiology at Washington University School of Medicine and a Professor of Anesthesiology and Cardiothoracic Surgery. A board certified anesthesiologist, she received her medical degree from the University of California, Davis, and holds an M.B.A. from Washington University. She completed her residency in anesthesia at Stanford University, as well as fellowships in critical care medicine and adult and pediatric cardiovascular anesthesia. Dr. Hill is a member of numerous national and international committees, including the Society of Critical Care Anesthesiologists, the Society of Critical Care Medicine and the Society of Academic Anesthesiology Association.

SPEAKERS & FACILITATORS



Drago Plecko, PhD
Postdoctoral Scholar,
Department of Computer
Science, Fu Foundation School
of Engineering and Applied
Sciences, Columbia University

Drago is a Postdoctoral Scholar at Columbia Computer Science, working with Professor Elias Bareinboim. His research interest lie at the intersection of statistics, causal inference and applied sciences. In particular, he is interested in methods that can be used for applied problems in social sciences and health sciences, as well as writing open-source software that can support such applications. His main research topics are fair machine learning and explainability, and also epidemiological questions of causation in intensive care unit (ICU) research, including applications of AI tools in the ICU.



Benjamin Ranard, MD, MSHP
Patient Safety Research and
Postdoctoral Fellow, Columbia
University; Pulmonary and critical
care medicine physician, NewYork-
Presbyterian / Columbia University
Irving Medical Center

Benjamin Ranard, MD, MSHP is a Patient Safety Research and Postdoctoral Fellow at Columbia University. He is a pulmonary and critical care medicine physician and works clinically as a medical intensivist at NewYork-Presbyterian / Columbia University Irving Medical Center. His research focuses on using clinical decision support systems, the electronic health record, and informatics to measure and improve outcomes for patients. His work focuses on sepsis, the leading cause of death of hospitalized patients, and he is studying clinical decision support and predictive modeling for patients with sepsis.

SPEAKERS & FACILITATORS



Muredach P. Reilly, MBBCh, MSCE
Herbert and Florence Irving
Professor of Medicine; Director,
Irving Institute for Clinical
and Translational Research;
Associate Dean for Clinical and
Translational Research Columbia
University College of Physicians
and Surgeons

Dr. Muredach Reilly is Director and PI of the Irving Institute for Clinical and Translational Research (Irving Institute), home to Columbia University’s NIH-NCATS funded Clinical and Translational Science Award (CTSA) Program hub. Since 2017, Dr. Reilly has worked to accelerate the Irving Institute and Columbia’s transition into a new era of genomics and precision medicine in biomedical research and personalized healthcare. A cardiologist by training, Dr. Reilly’s research program is dedicated to translational precision medicine studies of human atherosclerosis and heart disease as well as inflammatory mechanisms in cardio-metabolic disease, emphasizing humans as the most ideal “model” to understand mechanisms of and therapeutic opportunities for human disease and prevention. Clinically, Dr. Reilly is an expert in preventive cardiology, and he provides expert care for patients with lipid disorders and premature atherosclerosis.



Thomas E. Smith, MD
Special Lecturer, Columbia
University Department of
Psychiatry; Medical Director,
Division of Managed Care and
Chief Medical Officer, NYS Office
of Mental Health

Dr. Smith is Chief Medical Officer, New York State Office of Mental Health (NYS OMH) and Special Lecturer in the Department of Psychiatry at Columbia University. He oversees clinical and quality aspects of the New York State public mental health system with a focus on improving access to prevention, recovery, and rehabilitation services for persons with serious mental illness (SMI). He is the recipient of numerous NIMH and foundation grants for studies of engagement strategies for persons with SMI, services for persons with first episode psychosis, and care management approaches for high-need persons with SMI.

SPEAKERS & FACILITATORS



Eric Vieira, PhD

Director of Strategic Collaborations and Administrative Lead of Columbia COVID Tech Innovation Group, Columbia University School of Engineering and Applied Science

Eric is currently the Director of Strategic Collaborations for the Columbia University School of Engineering and Applied Science. He is primarily responsible for developing and stewarding strategic research collaborations with industry, foundations, government, and other external partners. In that capacity, Eric supports the school's Leadership Team, Board of Visitors, faculty, and staff by directing all partnership activities for the school and providing advice to the University on strategic internal and external collaborations. He has over 20 years of experience in research administration and technology & business development working in various professional environments, from small tech startups to large university systems. Before joining Columbia, Eric served as the Director of Special Research Programs in the Office of the Vice Chancellor for Research at the City University of New York (CUNY). Eric represented CUNY as the liaison on city and state economic development projects between the NYC Economic Development Corporation and NYS Empire State Development Corporation, respectively. Eric also served for four years in the Office of Technology and Business Development at Mount Sinai School of Medicine after a few years as a sell-side analyst in the financial industry covering the biopharma industry.



Chunhua Weng, PhD

Professor of Biomedical Informatics, Columbia University; Co-Director, Biomedical Informatics Resource, The Irving Institute for Clinical and Translational Science

Dr. Chunhua Weng is a Professor of Biomedical Informatics at Columbia University and an elected fellow of American College of Medical Informatics (ACMI) and International Academy of Health Sciences Informatics (IAHSI). She has been co-leading the Biomedical Informatics Resource for the Columbia CTSA (The Irving Institute for Clinical and Translational Science) since 2011. She is also an Associate Editor for Journal of Biomedical Informatics. Dr. Weng holds a Ph.D. in Biomedical and Health Informatics from University of Washington at Seattle. Dr. Weng's long-term goal is to improve the rigor, efficiency, patient centeredness, and generalizability of clinical research by developing novel informatics and data science methods to address stakeholder needs throughout the life cycle of clinical evidence, from evidence generation to evidence retrieval, appraisal, synthesis and dissemination. As an active researcher in the field of Clinical Research Informatics since 2000, Dr. Weng has published extensively on data-driven optimization of clinical trial eligibility criteria, deep phenotyping for genetic disorders, EHR data quality assessment and data analytics, and text knowledge engineering using a variety of text (e.g., EHR narratives, PubMed abstracts and clinical trial summaries).

SPEAKERS & FACILITATORS



Yiye Zhang, PhD, MS

Assistant Professor in Population Health Sciences and Emergency Medicine, Weill Cornell Medicine

Yiye Zhang, PhD MS is Assistant Professor in Population Health Sciences and Emergency Medicine at Weill Cornell Medicine and Graduate Faculty Member in Cornell Systems Engineering. Her research studies data-driven decision support for health and healthcare delivery for outcome prediction, process optimization, and health communication.



Maryam Zolnoori, PhD

Research Scientist, Columbia University Irving Medical Center

Maryam Zolnoori, PhD, is a research scientist at Columbia University Irving Medical Center. She received her PhD in Biomedical Informatics. Her research has focused on utilizing cutting-edge technologies and routinely generated data in clinical settings to build decision-support tools to improve the quality of healthcare services. She is the recipient of several research awards from the National Library of Medicine, the National Institute on Aging, the Food and Drug Administration, and the Mayo Clinic in recognition of her work.



Health Care
Doctor
Hospital
Pharmacist
Nurse
Dentist
First Aid
Surgeon
Emergency

MEDICAL