

Virtual Workshop

Technology to Improve Maternal Health

January 18, 2022



National Institute of Biomedical Imaging and Bioengineering
Engineering the Future of Health

IMPROVE

Implementing a Maternal
health and PRenancy
Outcomes Vision for Everyone



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Technology to Improve Maternal Health

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This workshop seeks to further advance interdisciplinary collaborations in maternal health technology by bringing together researchers, small businesses, technology developers, and community partners to identify technology gaps and consider how new technologies can be used to improve maternal health and ultimately treat and/or prevent Maternal Morbidity and Mortality (MMM). To reduce MMM among high-risk populations, we must consider Social Determinants of Health (SDoH) to understand the needs of the communities serving birthing people and develop low-cost, accessible, technology-based strategies addressing these needs using Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) mechanisms.

KEY OBJECTIVES

- (1) Describe societal implications and determinants of maternal health.
- (2) Review the state of technology in maternal health and identify gaps and translational challenges.
- (3) Identify maternal health, clinical, and community care innovations or areas ready for translation.
- (4) Understand community needs that can be addressed by development, commercialization, and sustainable implementation of technologies. Develop strategies to connect small businesses and collaborate with the community.

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Virtual Workshop Agenda Technology to Improve Maternal Health

Tuesday, January 18, 2022 • 12:00 p.m. – 6:30 p.m. EST

12:00 P.M.

WELCOME

Bruce J. Tromberg, Ph.D., Director, National Institute of Biomedical Imaging and Bioengineering (NIBIB)
Janine Austin Clayton, M.D., Director, National Institutes of Health Office of Research on Women’s Health (ORWH)
Diana W. Bianchi, M.D., Director, Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)

12:10 P.M.

PLENARY SESSION: THE MATERNAL HEALTH CRISIS: HOW DID WE GET HERE AND HOW CAN TECHNOLOGY HELP US

Plenary Speaker: Elizabeth Howell, M.D., M.P.P., University of Pennsylvania

12:40 P.M.

PANEL: TECHNOLOGY

Moderator: Alberto Gandini, Ph.D., M.B.A., Accel Diagnostics

Presenters:

Alberto Gandini, Ph.D., M.B.A., Accel Diagnostics
Steve Xu, M.D., M.Sc., Northwestern University
Alicia Chong Rodriguez, M.A., Bloomer Tech
Kate Ryder, M.Sc., Maven Clinic
Tony Ma, M.S., Benten Technologies
Elizabeth Bailey, M.A., Rhia Ventures

2:10 P.M.

BREAK

2:20 P.M.

PANEL: CLINICAL OUTCOMES

Moderator: Patricia Cavazos-Rehg, Ph.D., Washington University in St. Louis

Presenters:

Carol Levy, M.D., CDCES, Icahn School of Medicine at Mount Sinai
S. Ananth Karumanchi, M.D., Cedars-Sinai Medical Center
Dennis McNamara, M.D., M.S., University of Pittsburgh
Melissa Bauer, D.O., Duke University
Nancy Byatt, D.O., M.S., M.B.A., FACLP, University of Massachusetts Medical School
Patricia Cavazos-Rehg, Ph.D., Washington University in St. Louis

4:00 P.M.

BREAK

4:10 P.M.

FACILITATED DISCUSSION: COMMUNITY

Moderator: Joia Crear-Perry, M.D., FACOG, National Birth Equity Collaborative

Presenters:

Tonya L. Corbin, M.D., M.S., M.B.A., Organon
Gerald Harmon, M.D., American Medical Association
Natalie Hernandez, Ph.D., M.P.H., Morehouse School of Medicine
Nathaniel DeNicola, M.D., M.S.H.P., FACOG, Johns Hopkins Medicine, American College of Obstetricians and Gynecologists
Monica McLemore, Ph.D., M.P.H., R.N., University of California, San Francisco
Steve Porter, M.D., M.B.A., riskLD, University Hospital Ventures

5:20 P.M.

BREAK

5:30 P.M.

MODERATED NETWORKING SESSIONS

6:30 P.M.

ADJOURN



Speaker Information



Elizabeth Bailey, M.A.

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Elizabeth Bailey serves as Managing Director of Rhia Ventures' RH Capital, an impact venture fund investing in transformative innovation for women's health. She has over 20 years of experience in venture capital and supporting early-stage healthcare companies. As a Partner at Commons Capital, one of the first impact investment funds, Elizabeth managed the healthcare and education portfolios, which included Claros Diagnostics (acquired by OPKO), CodeRyte (acquired by 3M), HistoRx (acquired by Genoptix), Medical Metrx Solutions (acquired by AIG), TelaDoc (IPO: TDOC) and Apex Learning (acquired by Education Growth Partners). Elizabeth also served as the Founding Director for the Consortium for Affordable Medical Technologies (CAMTech) at Mass

General Hospital, where she built a global program to accelerate medtech innovation and catalyze investment in new health startups. She earned a Master's in Public Policy from Harvard's Kennedy School of Government and a BA from Brown University. Throughout her career, Elizabeth has been an advocate of the power of business to drive social change.



Melissa E. Bauer, D.O.

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Melissa Bauer, D.O. is an Associate Professor of Anesthesiology at Duke University. She completed residency in Anesthesiology at the University of Michigan. She subsequently completed a fellowship in Critical Care at New York Presbyterian Hospital at Columbia followed by a fellowship in Obstetric Anesthesiology at the University of Michigan. She provides anesthesia for high-risk obstetric patients and focuses her research on maternal sepsis.

She is funded by the National Institutes of Health (National Institute of Child Health and Development) to work to reduce maternal mortality and morbidity from maternal sepsis. Her research is centered on the early identification and treatment of maternal sepsis. She has published multiple studies identifying the differences and difficulties of diagnosis of sepsis in pregnant women and highlighted opportunities for improvement in maternal sepsis care. She served as an editor for the California Maternal Quality Care Collaborative Maternal Sepsis toolkit, which provides step-by-step instructions for hospitals on how to implement screening and treatment for maternal sepsis. She serves on the Advisory Board for the Sepsis Alliance, a non-profit organization dedicated to educating patients and providers about sepsis to improve outcomes. She currently serves as Chair for the national Alliance for Innovation on Maternal Health Sepsis in Obstetrical Care Patient Safety Bundle Workgroup with the American College of Obstetricians and Gynecologists.



Diana W. Bianchi, M.D.

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Diana W. Bianchi is the Director of the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD). Dr. Bianchi oversees an annual budget of approximately \$1.5 billion in support of NICHD's mission to lead research and training to understand human development, improve reproductive health, enhance the lives of children and adolescents, and optimize abilities for all.

Dr. Bianchi received her M.D. from Stanford University School of Medicine and her postgraduate training in Pediatrics, Medical Genetics and Neonatal-Perinatal Medicine at



Boston Children's Hospital and Harvard Medical School. Dr. Bianchi's research focuses on prenatal genomics with the goal of advancing noninvasive prenatal DNA screening and diagnosis to develop new therapies for genetic disorders that can be administered prenatally.

She is a member of the National Academy of Medicine and a past president of the Perinatal Research Society and the International Society for Prenatal Diagnosis. She has served on the Board of Directors of the American Society of Human Genetics and on the Councils of the American Pediatric Society and Society for Pediatric Research. Dr. Bianchi has received multiple awards, including the 2015 Neonatal Landmark Award from the American Academy of Pediatrics, the 2016 Maureen Andrew Award for Mentorship from the Society for Pediatric Research, and the 2017 Colonel Harland Sanders Award for lifetime achievement in Medical Genetics from the March of Dimes. In 2020, she received an honorary doctorate from the University of Amsterdam and received the Health Public Service Visionary Award from the Society for Women's Health Research.



Nancy Byatt, D.O., M.S., M.B.A., FACLP

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Dr. Byatt is a perinatal psychiatrist and physician-scientist focused on improving health care systems to promote perinatal mental health. She is a Professor of Psychiatry, Ob/Gyn, and Population and Quantitative Health Sciences at UMass Chan Medical School. She developed the Massachusetts Child Psychiatry Access Program (MCPAP) for Moms (www.mcpapformoms.org). MCPAP for Moms is a statewide program that has 1) increased access to mental health care for millions of perinatal individuals 2) become a national model for perinatal mental health care, and 3) impacted state and national policies and funding. She is the Founding Executive Director of the Lifeline for Families Center and Lifeline for Moms Program (www.lifeline4moms) at UMass Chan Medical

School. The Center's activities include capacity building, consultation, and research. Dr. Byatt's research program focuses on designing, implementing, and evaluating scalable interventions that aim to improve parental and child mental health services and outcomes. With over ten years of continuous federal funding for her research, Dr. Byatt's achievements have led to over 80 peer-reviewed publications and book chapters, over 250 presentations and numerous national awards.



Patricia A. Cavazos-Rehg, Ph.D.

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Dr. Patricia Cavazos is a Professor and Vice Chair for Diversity, Equity and Inclusion in the Department of Psychiatry at Washington University School of Medicine. She is also a licensed clinical psychologist. Her clinical research focuses on health disparities and the use of technology to improve substance use assessment and treatment. She has been funded by the National Institutes of Health (NIH) for over 15 years and she authored more than 100 peer-reviewed papers focused on understanding, preventing, and evaluating treatments for mental illness and substance use disorders. She is currently funded by NIH and the Substance Abuse and Mental Health Services Administration to tailor and implement a digital intervention for individuals recovering from opioid and stimulant use disorders, including pregnant and postpartum individuals.

**Janine Austin Clayton, M.D.**janine.clayton@nih.gov

Janine Austin Clayton, M.D., Associate Director for Research on Women's Health and Director of the Office of Research on Women's Health (ORWH) at the National Institutes of Health (NIH), is the architect of the NIH policy requiring scientists to consider sex as a biological variable across the research spectrum. This policy is part of NIH's initiative to enhance reproducibility through rigor and transparency. As co-chair of the NIH Working Group on Women in Biomedical Careers with NIH Director Dr. Francis Collins, Dr. Clayton also leads NIH's efforts to advance women in science careers. In 2021, Dr. Clayton was elected to the Board of Directors of the American Association for the Advancement of Science (AAAS).

Prior to joining the ORWH, Dr. Clayton was the Deputy Clinical Director of the National Eye Institute (NEI) for seven years. A board-certified ophthalmologist, Dr. Clayton's research interests include autoimmune ocular diseases and the role of sex and gender in health and disease. She is the author of more than 120 scientific publications, journal articles, and book chapters.

Dr. Clayton, a native Washingtonian, received her undergraduate degree with honors from Johns Hopkins University and her medical degree from Howard University College of Medicine. She completed a residency in ophthalmology at the Medical College of Virginia. Dr. Clayton completed fellowship training in cornea and external disease at the Wilmer Eye Institute at Johns Hopkins Hospital and in uveitis and ocular immunology at NEI.

Dr. Clayton has received numerous awards, including the Senior Achievement Award from the Board of Trustees of the American Academy of Ophthalmology in 2008 and the European Uveitis Patient Interest Association Clinical Uveitis Research Award in 2010. She was selected as a 2010 Silver Fellow by the Association for Research in Vision and Ophthalmology. In 2015, she was awarded the American Medical Women's Association Lila A. Wallis Women's Health Award and the Wenger Award for Excellence in Public Service. Dr. Clayton was granted the Bernadine Healy Award for Visionary Leadership in Women's Health in 2016. She was also selected as an honoree for the *Woman's Day* Red Dress Awards and the American Medical Association's Dr. Nathan Davis Awards for Outstanding Government Service in 2017.

**Tonya L. Corbin, M.D., M.S., M.B.A.**tonya.corbin@organon.com

Dr. Tonya Corbin joined Organon Women's Health Team as a Medical Scientific Liaison, Medical Affairs. In this role she will provide Scientific Leaders (SLs) balanced, factual scientific information about non-product areas of interest to the company. Tonya will also provide research support to our Investigator-Sponsored and Company-Sponsored Trials to enhance the understanding of the scientific foundation and goals of the study, support patient enrollment and retention or address Investigator questions.

Dr. Corbin received her Medical Degree, from Wayne State School of Medicine, and completed an Internal Medicine Residency Program at the Detroit Medical Center (DMC) and Allergy/Clinical Immunology at the Henry Ford Health System. Dr. Corbin received an academic scholarship for her Master's in Clinical Research Design and Statistical Analysis from the University of Michigan and her Master's in Business Administration-concentration in Health Care at Oakland University School of Business.

Dr. Corbin worked on faculty at the University of Michigan where she collaborated with Cardiology (Hypertension) and Renal Team to support Cardiovascular and Renal Trials in partnership with industry and National Institute of Health (NIH).



Dr. Corbin brings greater than 13 years of experience, recognition and expertise in the Medical Science Liaison, medical Affairs organization with Lilly Pharmaceutical, AstraZeneca and Merck Pharmaceutical in various therapeutic areas. Dr. Corbin's diversity of background and expertise in the Pharmaceutical Industry continues to be a demonstrated value to medical affairs.

Having a love for travel and the four seasons in Michigan in Dr. Corbin's spare time, she and her family are avid golfers, skiers out west and island scuba divers. During Tonya's down time, she enjoys art galleries, reading books and great cup of coffee.

Joia A. Crear-Perry, M.D., FACOG

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Joia A. Crear-Perry, MD, FACOG is a physician, policy expert, thought leader and advocate for transformational justice. As the founder and president of the National Birth Equity Collaborative (NBECC), she identifies and challenges racism as a root cause of health inequities.

She is a highly sought-after birth equity and racial health disparities expert and speaker who has both been featured in numerous publications including NPR, Forbes, Washington Post, Glamour, Essence, Ms. Magazine, Bloomberg, etc. to name just a few.

Dr. Crear-Perry has received numerous awards for her work as a health advocate exploring racial disparities in the industry including from the National Organization of Women (NOW), USA Today's Women of the Century, USA Families, Balm in Gilead, etc.

Dr. Crear-Perry has addressed the United Nations Office of the High Commissioner for Human Rights multiple times to elevate the cause of gender diversity and urge a human rights framework toward addressing maternal mortality. A proud recipient of both the Congressional Black Caucus Healthcare Heroes award and the Maternal Health Task Force at Harvard University Global Visionary Award for Commitment to Advancing Women's Health, Dr. Crear-Perry's most notable efforts include the removal of race as a risk factor for illnesses including premature birth.

Previously, she served as the Executive Director of the Birthing Project, Director of Women's and Children's Services at Jefferson Community Healthcare Center and as the Director of Clinical Services for the City of New Orleans Health Department. In that role, she was responsible for four facilities that provided health care for the homeless, pediatric, WIC, and gynecologic services within the New Orleans clinical service area.

Dr. Crear-Perry has been celebrated for her work improving the availability and utilization of affordable health care for New Orleans citizens post the Hurricane Katrina disaster of 2005.

Dr. Crear-Perry testified before the House Energy and Commerce Committee as the Democratic witness in support of the only Maternal Health Bill signed into law under the Trump administration. She has received funding from the Robert Wood Johnson Foundation (RWJF) to work with the American College of Obstetrics and Gynecology (ACOG) and develop a Standard for Respectful Maternity Care. She also serves on the National Quality Forum Maternal Mortality and Morbidity Committee and the Joint Commission Perinatal Safety Project Technical Advisory Panel.

Dr. Crear-Perry currently serves as a Principal at Health Equity Cypher and on the Board of Trustees for Black Mamas Matter Alliance, Community Catalyst, National Clinical Training Center for Family Planning and the UCSF PTBi. She is an Adjunct Professor at Tulane School of Public Health.



After completing undergraduate studies at Princeton University and Xavier University, Dr. Crear-Perry received her M.D. from Louisiana State University and completed her residency in Obstetrics and Gynecology at Tulane University’s School of Medicine. She was also recognized as a Fellow of the American College of Obstetrics and Gynecology.

She is married to Dr. Andre Perry and has three children: Jade, Carlos, and Robeson.

Her love is her family; health equity is her passion; maternal and child health are her callings.



Nathaniel DeNicola, M.D., M.S.H.P., FACOG
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Nathaniel DeNicola, M.D., M.S.H.P., FACOG is a board-certified Ob/Gyn practicing in Washington, DC with Johns Hopkins Health System, and is Chair of Telehealth for the American College of Obstetricians and Gynecologists (ACOG). In this role he serves as the ACOG Mobile and Telehealth expert and leads their current work on innovation -- which includes publication of the ACOG Committee Opinion on Telehealth and Telehealth Systematic review in February 2020 *Obstetrics & Gynecology*.

He has also served as an expert consultant for national and international medical organizations including the American Academy of Pediatrics (AAP) and the International Federation of Gynecology and Obstetrics (FIGO) on adopting mobile and social media, producing educational material, and implementing best practices in telehealth. He is a published international speaker on the integration of telehealth, mobile and social media into medical practice.

Prior to these current roles he completed the Robert Wood Johnson Clinical Scholars Program (VA) at the University of Pennsylvania, where he also served as Faculty on the Social Media and Health Innovation Lab, and as Senior Fellow at the Leonard Davis Institute on Health Economics. He is a former Merkin Scholar at the Brookings Institution Engelberg Center on Health Care Reform.

Nathaniel completed residency in Obstetrics & Gynecology at Tulane University, earned his medical degree at the University of California, Irvine School of Medicine, and received a Bachelor of Science (Biology) and the University of Notre Dame.



Alberto Gandini, Ph.D., M.B.A.
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Dr. Alberto Gandini is a physicist turned biomedical engineer turned entrepreneur. Following an unconventional professional trajectory, from working on high temperature superconductivity and particle radiation to developing medical devices, Dr. Gandini founded Accel Diagnostics with the goal of improving quality of life through medical innovation. Dr. Gandini has led Accel Diagnostics through the development and commercialization of the company’s patent protected microfluid-based blood testing technology - the first disposable, credit card side quantitative immunoassay. Among the products are a quantitative COVID-19 anti-spike antibody test, a cardiac POC test for early detection of heart disease, and PreeMo™ a mobile-enabled finger-prick blood test to

monitor the early onset of preeclampsia.

At Accel Diagnostics, Dr. Gandini secured over \$3M in early-stage funding from angel investors and through NIH SBIRs. Accel Diagnostic also operates a successful CLIA high complexity laboratory focusing on COVID-19 testing.



Dr. Gandini has authored peer-reviewed publications and holds multiple U.S. and EU patents. He completed his undergraduate studies at the University of Milan, completed his Ph.D. in Physics from the University of Houston, and holds an MBA in Entrepreneurship and Finance from the Tepper School of Business at Carnegie Mellon University. He and his wife have three active young children and a rescue dog named Sniffer.

Gerald E. Harmon, M.D.

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Gerald E. Harmon, MD, a family medicine specialist having practiced for more than 30 years in coastal South Carolina, became 176th president of the American Medical Association in June 2021. He was first elected to the AMA Board of Trustees in June 2013 and elected board chair in 2018. In addition, Dr. Harmon also served as the secretary of the AMA in 2016.

In South Carolina Dr. Harmon has held several leadership positions in the South Carolina Medical Association, including chairman of the board and president. Dr. Harmon serves as a clinical professor at two of South Carolina's medical schools and is a member of the clinical faculty for the Tidelands Health Family Medicine residency program while regularly precepting physicians in training.

In his hometown, Dr. Harmon is an adviser to the board of trustees for his community health system and is vice president in a multispecialty physician practice. He is a medical director for several organizations and volunteers as medical supervisor for his local school district's 23 schools. He has also been recognized with the Lifetime Achievement Award from his county's Chamber of Commerce. At the state level he has served as secretary for the State Aeronautics Commission.

Before his retirement from the military as a major general, Dr. Harmon served the nation in the Air Force Reserve, on Active Duty, and in the Air National Guard holding responsibilities as chief physician for the National Guard Bureau and assistant surgeon general for the U.S. Air Force. His military decorations include the Distinguished Service Medal, the Legion of Merit, the Meritorious Service Medal, the Air Force Commendation Medal, and the Humanitarian Service Medal.

Dr. Harmon received his undergraduate degree in physics and mathematics from the University of South Carolina and, more recently, an honorary Doctor of Public Service. He received his medical degree from the Medical University of South Carolina and completed his residency training program in family medicine with the U.S. Air Force at Eglin Air Force Base and is recognized as a fellow of the American Academy of Family Physicians.

During the rare times when not actively practicing medicine, Dr. Harmon and his wife, Linda, enjoy spending time outdoors in their coastal hometown of Georgetown with their three married children and eight grandchildren.



Natalie D. Hernandez, Ph.D., M.P.H.

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Dr. Hernandez is an Assistant Professor in the Department of Community Health and Preventive Medicine and the Executive Director of the Center for Maternal Health Equity at Morehouse School of Medicine. Dr. Hernandez received her Master of Public Health from Emory University's Rollins School of Public Health and a Bachelor of Arts in anthropology from Stony Brook University in New York. She earned her PhD in public health as well as a graduate certificate in interdisciplinary women's health from the University of South Florida. Dr. Hernandez was a Health Resources and Services Administration (HRSA) maternal and child health leadership trainee and epidemiology trainee.



Dr. Hernandez's previous research experiences and contributions to science have been dedicated to rigorous methodology using community engagement approaches to advance health equity through research and practice. Dr. Hernandez has a broad background in community-based participatory research (CBPR), women's health inequities, health policy, and social determinants of health. She has more than 16 years of experience in developing community partnerships and implementing CBPR that engages diverse stakeholder groups including health care providers, patient populations, organizational leaders, and policymakers. She also has expertise in conducting robust qualitative research using a broad array of research methods.

To advance science toward the elimination of women's health inequities, Dr. Hernandez has obtained extramural funding to develop multiple lines of research in the context of maternal and women's health, specifically with Black and Latina populations. The research approach in these local and nationally funded initiatives encompassed utilization of CBPR approaches, and takes a multi-sectoral and multi-level translational, health disparities research approach to understanding the myriad causes of women's health inequities. Additionally, her research explores the integration of technology to advance women's health and provides easy access to maternal and women's through patient navigation, mobile health interventions, telehealth approaches, and remote monitoring. Dr. Hernandez has laid the groundwork for research in maternal health by establishing partnerships with local and national organizations dedicated to maternal morbidity and mortality disparities, evaluating maternal health interventions and programs, and validating effective measures of maternal mental health, medical mistrust, as well as psychosocial factors.

Prior to her doctoral studies, Dr. Hernandez worked as a Program Manager for UnidosUS (formerly National Council of La Raza) leading all their national maternal health projects. With these projects she has established strong ties with diverse stakeholders and as a result of her work, she has received a number of awards including the MundoHispanico Latinas Poderosas (Powerful Latinas in Atlanta) Award, American Association for Cancer Research-Minorities in Cancer Research (MICR) Council, Minority & Minority Serving Institution Faculty Scholar in Cancer Research Award, Rising Scholar in the field of sexuality by The Society for the Scientific Study of Sexuality, Rolling Out Sista with Superpowers, Health Disparities Scholar of the NIH National Institutes on Minority Health and Health Disparities Loan Repayment Program and the Georgia Clinical & Translational Science Alliance Team Science Award of Distinction for Early Stage Research Teams, and the Healthy Mothers, Healthy Babies Coalition of Georgia 2021 Carolyn Wetzel Continuum Award.

Dr. Hernandez currently sits on Georgia's Maternal Mortality Review Committee, Georgia PRAMS Steering Committee, Georgia Improving Postpartum Care Affinity Group, and on various maternal and child health organizations including Postpartum Support International-Georgia Chapter Advocacy Group and Georgia Maternal Health Stakeholder Group. She also sits on national organizations including the American Public Health Association Committee on Health Equity, Health Disparities Taskforce of the National Preeclampsia Foundation, and many others. Dr. Hernandez has presented her work at various international, national, state, and local conferences.



Elizabeth A. Howell, M.D., M.P.P.

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Elizabeth Howell, MD, MPP, is the Harrison McCrea Dickson President's Distinguished Professor and Chair of the Department of Obstetrics & Gynecology, Perelman School of Medicine at the University of Pennsylvania. Prior to coming to the University of Pennsylvania, Dr. Howell was the Founding Director of the Blavatnik Family Women's Health Research Institute, Vice Chair of Research for the Department of Obstetrics, Gynecology, and Reproductive Science, and Associate Dean for Faculty Development at the Icahn School of Medicine at Mount Sinai. Dr. Howell is a NIH-funded ob/gyn health services researcher and her major research interests lie at the intersection between quality of care and disparities in maternal and infant mortality and morbidity. She has served on several expert committees including for the Institute of Medicine, NIH, the Joint Commission, ACOG, and



international external scientific advisory boards. She co-chaired the Alliance for Innovation on Maternal Health Working Group on Reduction of Peripartum Racial Disparities, served on the Governor's Taskforce on Maternal Mortality and Disparate Racial Outcomes for New York State and the New York City Maternal Mortality and Morbidity Steering Committee for the New York City Department of Health, and testified in Congress for maternal healthcare legislation. She has provided testimony to the U.S Commission on Civil Rights on racial disparities in maternal health and co-chaired the National Quality Forum Committee on Maternal Morbidity and Mortality. Dr. Howell was recently invited to the White House by Vice President Harris to participate in a roundtable on Black Maternal Health. Many media outlets have featured Dr. Howell, including NPR, ProPublica, the *NBC Nightly News*, *The Today Show*, *The New York Times*, and *Essence Magazine*. She recently shared her research on quality of care, maternal mortality and morbidity, and racial and ethnic disparities in a TEDMED talk that has garnered nearly two million views.

Dr. Howell received her undergraduate degree from Stanford University and received her medical and public policy degrees at Harvard Medical School and the Harvard Kennedy School of Government. She received her residency training at Cornell /New York Hospital and her post-doctoral training in clinical epidemiology as a Robert Wood Johnson Clinical Scholar at Yale Medical School.



Ananth Karumanchi, M.D.

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Dr. Ananth Karumanchi, Medallion Chair in Vascular Biology, is Director of Renovascular Research and Professor in the Department of Medicine at Cedars-Sinai Medical Center, Los Angeles. Dr. Karumanchi also has a second appointment as a Visiting Staff Scientist at the Beth Israel Deaconess Medical Center (BIDMC) and Harvard Medical School, Boston. He completed his medical degree from Kilpauk Medical College, University of Madras, India (1992). He then completed his residency in Internal Medicine at the Henry Ford Hospital, Detroit (1996) and fellowship in Nephrology at BIDMC, Boston (1999). His laboratory is focused on characterizing pathogenic pathways and bringing therapies to patients in the areas of hypertensive disorders of pregnancy and chronic renal disease. Dr. Karumanchi's research activities are vertically integrated, ranging from molecular and cell biological studies to animal models to first-in-class human clinical trials. Dr. Karumanchi has published >300 papers (with several publications in *NEJM*, *Circulation*, *Nature*, *Nature Medicine*, and *JCI* with *H index* = 108). He has received prestigious awards such as the American Heart Association (AHA) - *Established Investigator Award* (2008), the International Society for the Study of Hypertension in Pregnancy - *Chesley Award* (2010), *Outstanding Investigator Award* from the American Federation for Medical Research (2010), and the *Gregory Pincus Memorial Medal* from Worcester Foundation for Biomedical Research (2021). Dr. Karumanchi was elected as a member of the American Society for Clinical Investigation (ASCI) in 2007 and Association of American Physicians (AAP) in 2015. Dr. Karumanchi's research has been funded by the NIH, AHA, Howard Hughes Medical Institute and the Gates Foundation.



Carol J. Levy, M.D., CDCES

Carol J. Levy, MD, CDCES is a Professor in the Department of Medicine, Division of Endocrinology, Diabetes and Bone Disease and Obstetrics and Gynecology at the Icahn School of Medicine at Mount Sinai.

As the Director of the [Mount Sinai Diabetes Center](#) she is known as a clinical expert in type 1 diabetes and diabetes in pregnancy. Her clinical and research interests include technology use for diabetes management and diabetes during pregnancy. She leads a research team evaluating artificial pancreas systems and glucose sensors including a project evaluating a customized closed loop system specifically designed for pregnancy.

**Tony Ma, M.S.**tonyma@bententech.com

Tony Ma is a social entrepreneur, recovering management consultant, and researcher with over 20 years of experience in mobile and telecommunication. As a veteran of the first dot com era, he has held management positions at high profile companies. His prior success and accomplishments include helping create, scale, and grow products and organizations through various stages of growth from early idea, startup, and scaling with growth and maturity. His engineering experience includes 12 years in the healthcare industry.

As President of Benten Technologies, Tony has successfully raised over \$15M in non-dilutive funding to build a pipeline of digital health and digital therapeutics products focusing on maternal-child health. The focus on maternal child health stems from his mother and his journey in rural Vietnam, where his mother almost died giving birth to him. His company is working on a comprehensive maternal health platform funded by over \$3M in funding to improve the prenatal and postpartum journey for all mothers, especially for the underserved populations.

He is a former member of Entrepreneur's Organization and an active member of the Founder's Network, an invite-only peer-to-peer network of successful entrepreneurs, many with multiple exits. His company's mission is to create digital health solutions to democratize healthcare and impact a billion people. Tony received his Bachelor of Science in Systems Engineering at the University of Virginia and his Master of Science in Telecommunications and Computer Networks at George Washington University. In his free time, he enjoys reading books, playing with his three children, and the occasional game of chess and golf.

**Monica R. McLemore, Ph.D., M.P.H., RN**Monica.McLemore@ucsf.edu

At the University of California, San Francisco, Monica McLemore is a tenured associate professor in the Family Health Care Nursing Department, an affiliated scientist with Advancing New Standards in Reproductive Health, and a member of the Bixby Center for Global Reproductive Health. She retired from clinical practice as a public health and staff nurse after a 28-year clinical nursing career in 2019, however, continues to provide flu and COVID-19 vaccines. Her program of research is focused on understanding reproductive health and justice. To date, she has 85 peer reviewed articles, OpEds and commentaries and her research has been cited in the Huffington Post, Lavender Health, five amicus briefs to the Supreme Court of the United States, and three National

Academies of Science, Engineering, and Medicine reports, and a data visualization project entitled *How To Fix Maternal Mortality: The first step is to stop blaming women* that was published in the 2019 Future of Medicine edition of Scientific American. Her work has appeared in publications such as Dame Magazine, Politico, ProPublica/NPR and she made a voice appearance in Terrance Nance's HBO series Random Acts of Flyness. She is the recipient of numerous awards and currently serves as chair for Sexual and Reproductive Health section of the American Public Health Association. She was inducted as a fellow of the American Academy of Nursing in 2019 and was named the Thelma Shobe Endowed Chair in 2021.

**Dennis McNamara, M.D., M.S.**mcnamaradm@upmc.edu

Dr. Dennis McNamara is a Professor of Medicine and the Director of the Center for Heart Failure Research at the University of Pittsburgh Medical Center (UPMC). Dr. McNamara, a graduate of Yale University and Harvard Medical School, completed his research and clinical training at Massachusetts General Hospital in Boston before joining the University of Pittsburgh faculty in 1994. A cardiologist specializing in advanced heart failure, he directed the Heart Failure/Transplantation program at UPMC for a decade prior to being named the Director of the Center for Heart Failure Research in 2014.

His research has focused on understanding myocardial recovery in non-ischemic dilated cardiomyopathy and the impact of genetic heterogeneity on clinical outcomes. More recently his work has centered on understanding the pathogenesis and therapy of peripartum cardiomyopathy. He directed the IPAC study (Investigation of Pregnancy Associated Cardiomyopathy), a thirty center NIH funded investigation of myocardial recovery for women with peripartum cardiomyopathy. He will be the principal investigator for the REBIRTH trial, a 50-center investigation funded by the NHLBI of the use of bromocriptine therapy to improve outcomes in PPCM.

**Steve Porter, M.D., M.B.A.**sporter@riskld.net

Dr. Steve Porter is a physician entrepreneur who is passionate about applying social and technological innovations to improve the health and wellbeing of women around the world.

Dr. Porter is a Board-certified OB/GYN and Clinical Instructor in the Department of Obstetrics and Gynecology at University Hospitals MacDonal Women's Hospital in Cleveland, Ohio. He also serves as the CEO of riskLD Inc., a digital health platform providing an early alerting and clinical decision support solution for use on Labor & Delivery.

Dr. Porter completed his residency training in Obstetrics and Gynecology at University Hospitals Cleveland Medical Center.

Prior to residency, Dr. Porter was part of the inaugural group of fellows in the Blavatnik Fellowship in Life Science Entrepreneurship at Harvard Business School. As a Fellow, he partnered with a team to license a groundbreaking anti-infective platform and establish Macrolide Pharmaceuticals, a venture-backed company that is leading the development of new antibiotics to treat multi drug-resistant bacteria.

After graduating from medical and business school in 2011, Dr. Porter worked as a Consultant in the Johannesburg, South Africa, office of Bain & Company, a multinational management consulting firm.

Dr. Porter has a long-term affiliation with the South Africa-based non-profit organization mothers2mothers (m2m), a program providing peer-based psychosocial support services to pregnant women and new mothers living with HIV/AIDS. m2m now operates in 8 countries in sub-Saharan Africa, employing 3,000 HIV+ women and reaching 2 million new clients annually.

Dr. Porter holds a BA *summa cum laude* from Princeton University (2004), where he was the recipient of the Moses Taylor Pyne Honor Prize, the highest general distinction conferred on an undergraduate. He also holds an MD with Honors from Harvard Medical School (2011) and an MBA from Harvard Business School (2011).

**Alicia Chong Rodriguez, M.A.**alicia@bloomertech.com

Alicia Chong Rodriguez is the CEO at Bloomer Tech. She graduated from the MIT Electrical Engineering & Computer Science program and MIT IDM, where her research focused on sex-specific, computationally-generated, cardiac biomarkers at the MIT Computational Cardiovascular Research Group. She received the MIT Legatum Fellowship and the MIT Graduate Women of Excellence Award. She has also been recognized as a 2021 TED Fellow, 2018 Medtech Boston 40 under 40 Healthcare Innovator, and in the top 100 Female Founders across the U.S. by Inc Magazine. Prior to MIT she worked in the semiconductor industry at companies such as HP and Teradyne and co-founded MenTe en Acción (Mujeres en Tecnología) where she currently serves on

the board as a technical advisor.

**Kate Ryder, M.Sc.**katherine@mavenclinic.com

Kate Ryder is the founder and CEO of Maven, the largest virtual clinic for women's and family health. Maven's mission is to change the health of the world — one woman, one family at a time. Maven offers virtual care and services across fertility, maternity, and pediatrics, and operates the largest women's and family health telehealth network globally. With Maven, employers and health plans can see improved maternal outcomes, lower costs, and attract and retain more parents in the workforce. Named #1 Most Innovative Healthcare Company by Fast Company in 2020, Maven has raised more than \$200 million in capital from top investors, including Sequoia Capital, Oak HC/FT, Dragoneer Investment Group, and Lux Capital.

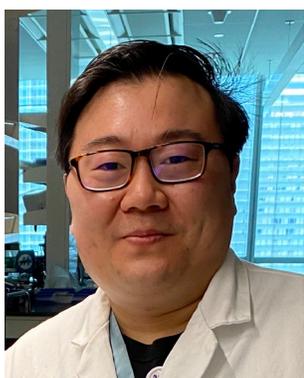
Kate founded Maven in 2014, reimagining healthcare for women and families from the ground up after seeing first hand how the lack of access to care impacted those starting a family and returning to work as new parents. Prior to founding Maven, Kate worked in venture capital and as a journalist, writing for The Economist from Southeast Asia, New York and London and for The New Yorker. In 2009, she worked with former U.S. Treasury Secretary Hank Paulson, helping him write his memoirs about the financial crisis.

Kate has been named to Fortune's 40 Under 40 and to Fast Company's "Most Creative People." She has spoken on stage at industry events including the Forbes Healthcare Summit, Fortune Brainstorm Health, the Oliver Wyman Health Innovation Summit and HLTH. Kate received her B.A. from the University of Michigan and her MSc from the London School of Economics. She lives in Brooklyn, New York with her husband and three children.

**Bruce J. Tromberg, Ph.D.**Bruce.tromberg@nih.gov

Dr. Tromberg is the Director of the National Institute of Biomedical Imaging and Bioengineering (NIBIB) at the National Institutes of Health (NIH) where he oversees a portfolio of research programs focused on developing, translating, and commercializing engineering, physical science, and computational technologies in Biology and Medicine. In addition, he leads NIBIB's Rapid Acceleration of Diagnostics (RADx Tech) innovation initiative to increase SARS-COV-2 testing capacity and performance. Prior to joining NIH in January 2019, he was a professor of Biomedical Engineering and Surgery at the University of California, Irvine (UCI). During this time he served as director of the Beckman Laser Institute and Medical Clinic (BLIMC) (2003-2018) and the Laser

Microbeam and Medical Program (LAMMP), an NIH National Biomedical Technology Center at the BLIMC (1997-2018). Dr. Tromberg specializes in the development of optics and photonics technologies for biomedical imaging and therapy. He has co-authored more than 450 publications and holds 23 patents in new technology development as well as bench-to-bedside clinical translation, validation and commercialization of devices.

**Steve Xu, M.D., M.Sc.**stevexu@northwestern.edu

Steve Xu MD, MSc is currently the Medical Director of the Querrey Simpson Institute for Bioelectronics at Northwestern University. He is also an Assistant Professor in the Department of Biomedical Engineering at Northwestern University McCormick School of Engineering, and the Department of Dermatology and Pediatrics at Northwestern's Feinberg School of Medicine. He received his undergraduate degree in bioengineering from Rice University *summa cum laude*. He completed his medical training at Harvard Medical School with special honors as a Soros Fellow, and a Masters in Health Policy and Finance with Merit from The London School of Economics as a Marshall Scholar. Finally, he completed an NIH-funded T32 post-doctoral fellowship in Northwestern's Department of Materials Science and Engineering under John Rogers PhD. Dr. Xu has authored more than 120 peer-reviewed publications and listed as an inventor on 11 pending and granted patents. He has developed several wearable technologies with a focus on maternal, fetal, and neonatal health. His publications have appeared in The New England Journal of Medicine, Science, PNAS, and Nature garnering press attention from sources such as The New York Times, CNN, The Washington Post, and The Los Angeles Times. As part of his collaborative research efforts, several of his joint inventions have been licensed to early stage companies commercialization, and cleared by the FDA.



Virtual Workshop

Technology to Improve Maternal Health

Notice of Special Interest (NOSI): Small Business Initiatives for Innovative Diagnostic Technology for Improving Outcomes for Maternal Health

Purpose

The purpose of this trans-NIH Notice of Special Interest (NOSI) is to inform potential applicants that the National Institute of Biomedical Imaging and Bioengineering and participating Institutes and Centers (ICs) invite SBIR/STTR applications to develop technologies or tools to quantitatively predict or indicate an increased risk for maternal morbidity and mortality (MMM). This NOSI is part of the Implementing a Maternal health and PRegnancy Outcomes Vision for Everyone (IMPROVE) initiative, which supports research to reduce preventable causes of maternal deaths and improve health for women before, during, and after delivery.

Key Dates

Next application due date: April 5, 2022

Expiration Date: April 6, 2023

<https://grants.nih.gov/grants/guide/notice-files/NOT-EB-21-001.html>



Virtual Workshop

Technology to Improve
Maternal Health

NIBIB launches the NIH Technology Accelerator Challenge (NTAC) series of prize competitions to stimulate the design of new maternal health diagnostic technologies



The National Institutes of Health is offering up to \$1 million in cash prizes for innovative diagnostic technologies to help improve maternal health around the world. The NTAC for Maternal Health will seek to spur and reward the development of prototypes for low-cost, point-of-care molecular, cellular, and/or metabolic sensing and diagnostic technologies. The prize competition is managed by the National Institute of Biomedical Imaging and Bioengineering (NIBIB), in partnership with the Bill & Melinda Gates Foundation and with support from the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development and the NIH Office of Research on Women's Health.

For more information: NIBIB NTAC Webpage:

<https://www.nibib.nih.gov/research-program/NIH-Technology-Accelerator-Challenge>



Virtual Workshop

Technology to Improve Maternal Health

Funding opportunities for small businesses

The NIH Small Business Innovation Research (SBIR) and the Small Business Technology Transfer (STTR) programs award federal research grants and contracts to small businesses conducting biomedical research. These programs invest over \$1 billion into health and life science companies that are creating innovative technologies that align with NIH's mission to improve health and save lives.



NIH SBIR/STTR website: <https://seed.nih.gov/>

Program Manager list: [HHS Small Business Program Managers | Seed \(nih.gov\)](#)



Virtual Workshop

Technology to Improve
Maternal Health

IMPROVE

Implementing a Maternal health and
PRenancy Outcomes Vision for Everyone

Learn more about the **Implementing a Maternal health and PRenancy Outcomes Vision for Everyone (IMPROVE)** initiative to improve maternal health outcomes before, during, and after delivery

For more information visit:

<https://www.nih.gov/research-training/medical-research-initiatives/improve-initiative>



National Institutes of Health
Office of Research on Women's Health



Eunice Kennedy Shriver National Institute
of Child Health and Human Development



Virtual Workshop

Technology to Improve
Maternal Health

Visit the NIH Maternal Morbidity and Mortality (MMM) Web Portal to learn about how the NIH is addressing MMM, including information on ongoing studies; funding opportunities; maternal health research efforts across NIH Institutes, Centers, and Offices; events; and more.



NIH Maternal Morbidity & Mortality Web Portal

Presented by the Office of Research on Women's Health
www.nih.gov/women/maternalhealth

For More Information Visit:
<https://orwh.od.nih.gov/mmm-portal>