

try. make. solve.

MAKING HEALTH

*An Interactive Celebration of How Tinkering, Technology
and Design Tools are Transforming Health Care*

THURSDAY, JUNE 23, 2016

2 to 7 p.m., with reception at 5:30 p.m.

Maker.MedStarHealth.org



MedStar Health



National Institutes of Health
Turning Discovery Into Health



HHS IDEA LAB

with support from

1776

WHERE REVOLUTIONS BEGIN



Speaking Schedule

2 p.m.

Doors open

- 2:20 p.m. - Table 22: Arthur Daemmrch, director, **Lemelson Center for the Study of Invention and Innovation**, Smithsonian National Museum of American History
- 2:40 p.m. - Table 13: Peter Liacouras, PhD, director of services, 3D Medical Applications Center, **Walter Reed National Military Medical Center**
- 3:10 p.m. - Table 3: John Rockwood, president, **MedStar National Rehabilitation Network**, senior vice president, MedStar Health
- 3:30 p.m. - Table 24: James Coburn, LT USPHS, senior research engineer, **U.S. Food and Drug Administration (FDA)**
- 3:50 p.m. - Table 25: Meghan Coakley McCarthy, PhD, project lead, NIH 3D Print Exchange, **National Institutes of Health**
- 4:10 p.m. - Table 4: Bill Sheahan, MPA, corporate vice president, MedStar Health, and director, **MedStar Simulation Training and Education Lab (SiTEL)**; and John Yosaitis, MD, medical director, SiTEL
- 4:30 p.m. - Table 23: Terry Fairbanks, MD, MS, FACEP, director, **MedStar National Center for Human Factors in Healthcare**, and associate director, MedStar Institute for Innovation
- 4:50 p.m. - Table 18: Jen Lee Reeves, founder, and Jordan Reeves, innovator, **Born Just Right**
- 5:10 p.m. - Table 29: Anna Young, co-founder, **MakerHealth**

5:30 p.m.

Reception

- Mark Smith, MD, chief innovation officer, MedStar Health, and director, **MedStar Institute for Innovation** (MI2)
- Susannah Fox, chief technology officer, **U.S. Department of Health and Human Services**
- Mark L. Rohrbaugh, PhD, JD, special advisor for technology transfer, **National Institutes of Health** (NIH)
- Steve R.T. Evans, MD, executive vice president, medical affairs, and chief medical officer, **MedStar Health**

Table 1: Inventing at MedStar Health

MedStar Inventor Services

MedStar Inventor Services works hand-in-hand with MedStar Health associates to transform their innovative ideas and discoveries into commercial products and services that advance health and improve the patient and family experience. Examples: the Thyroidectomy Surgical Trainer (Erin Felger, MD); High Frequency Nasal Cannula for neonates (Moraji Peesay, MD)
MI2.MedStarHealth.org/Invent or email **invent@medstar.net**

Table 2: Inventing Rehabilitation

MedStar National Rehabilitation Network and MedStar Inventor Services

Featuring Brain FORCE mTBI Screener (Alexander Dromerick, MD); Face-to-Face Rehabilitation App (Jodi Barth, PT)
MI2.MedStarHealth.org/Invent or email **invent@medstar.net**

Table 3: Adding Life to Years

MedStar National Rehabilitation Network (MNRN)

MedStar National Rehabilitation Network offers inpatient, outpatient and day rehabilitation treatment services in Maryland and the Washington, D.C. region. Research projects with the Catholic University of America include BiomHED exoskeleton device (Sang Wook Lee, PhD); HandSOME, spring-powered hand exoskeleton (Peter Lum, PhD); and BrainFORCE. Within Rehabilitation Engineering, Richard Keller and Jonathan Moncton are helping patients with disabilities live more productive lives by providing new or adapted pieces of “technology” to facilitate accessibility and function.

MedStarNRH.org
@MedStarNRH

Table 4: When the Patient Comes First, We Don't Try First on Patients™

MedStar Simulation Training and Education Lab (SiTEL)

MedStar SiTEL provides a blended model of interactive online and face-to-face training, 3-D virtual simulation and hands-on, high-fidelity simulations, as well as performance support tools, to support world-class performance by MedStar Health associates. Exhibit: trainer for epidural placement (John Yosaitis, MD, medical director); femoral sheath removal simulator (Jessica Preston, simulation specialist, and Patricia Filomena, senior clinical educator).

SiTEL.org
@MedStarSiTEL

**Table 5: Catalyzing Innovation That Advances Health
MedStar Institute for Innovation (MI2)**

Thoracic surgeons, orthopedic surgeons and interventional cardiologists are gaining insights into the anatomy of their patients through 3D models generated from CT and MRI scans.

MI2.MedStarHealth.org

@MI2Innovation

Table 6: Innovating with Novel Electrical Devices

MedStar Institute for Innovation (MI2)

Explore building new electrical devices, wearable health sensors and patient recovery tools that facilitate our understanding of health and how to advance health care. Example: Kit Check helps hospitals automate manual medication practices using RFID and cloud technology.

MI2.MedStarHealth.org

@MI2Innovation

Table 7: Design Thinking for Health

Health for America (HFA)

Embedded at MI2, the Health for America fellowship at MedStar Health inspires the best and brightest young professionals to tackle the nation's most pressing health challenges. The fellowship annually brings together an interdisciplinary team that applies innovation, human-centered design and lean startup principles to deliver a novel solution that improves health outcomes.

HealthforAmerica.org

@Health4America

**Table 8: Supporting Innovation in Health Care and Beyond
Halcyon Incubator**

The Halcyon Incubator is an immersive 18-month fellowship program that supports early stage social entrepreneurs with free housing, workspace, a stipend, coaching, and access to thought leaders and potential investors. One fellow's project, Sen Sound, uses human-centered sound design to help humanize the patient experience—making hospitals sound nicer.

HalcyonHouse.org and **Sensound.space**

@SandRFoundation

Table 9: Printing a Patient's Brain**The Innovation Hub at Sibley Memorial Hospital**

The Hub @ Sibley is experimenting with helping doctors explain complicated surgeries to their patients. One idea is to use precise 3D-printed models of the patient's own body parts, based on CT scans and other imaging, as hands-on tools for those conversations.

SibleyHub.com

@SibleyHub

Table 10: The Innovation School**NuVu Studio**

NuVu was founded in 2010 in Cambridge, Massachusetts, by PhDs and graduates of the Massachusetts Institute of Technology (MIT). NuVu has provided an innovation-focused experience for over 3,000 students, ages 11 to 18, worldwide and created and energized a generation of entrepreneurs, designers, makers, and inventors. Health prototypes include the Emotion Owl for autistic children, Comfortable Cane, wheelchair pump extension, Warm IV, Emotion Mask, Tremor Monitor, and Sleeping Pillow.

NuVuStudio.com

@NuVuStudio

Table 11: Startups Make and Deliver Solutions**1776**

MedStar Health is one of only four founding partners in the global start-up incubator and seed fund 1776. This strategic partnership is part of MedStar's quest to find new, better and faster responses to the challenges facing America's healthcare system. 1776 helps identify the most promising startups in health care and related fields and helps engineer their success. This tour of health startups making and delivering unique solutions features Babyscripts™ Remote monitor, for pregnant women's weight gain and blood pressure; and CyberTimez for arms, ears and eyes

1776.vc

@1176

Table 12: The Super Path to Super Duper Better: An Innovative Incentive Program for Hospitalized Children Hope for Henry Foundation

Hope for Henry is a pioneer in incentivizing young patients to comply with uncomfortable or painful medical interventions that are critical to recovery. The foundation has developed an innovative game-based program using Hope for Henry Bucks to pay young patients to overcome challenges like chemotherapy, radiation and needle sticks, for which they are rewarded with gifts off their personal wish lists.

HopeforHenry.org
@HopeforHenry

Table 13: Solving Military Problems in 3D Walter Reed National Military Medical Center

The mission of the 3D Medical Applications center is to provide computer aided design (CAD) and computer aided manufacturing (CAM) for fabrication of medical models and custom implants; and provide technical support for virtual treatment planning and image capture in support of patient treatment, and graduate medical and dental education and research.

WRNMMC.CapMed.mil/ResearchEducation/3DMAC
@WRBethesda

Table 14: Reconnecting Veterans to the World through Custom Assistive Technology

Hunter Holmes McGuire VA Medical Center

The Hunter Holmes McGuire VA Medical Center exhibit provides an opportunity to explore different custom solutions for veterans where commercial products were not available (i.e. Touchscreen access for individuals with SCI, Button Pusher for hospital bed access).

Richmond.VA.gov
@DeptVetAffairs

Table 15: Internet of Things for Health

Link Labs

Link Labs wireless system for real-time location and asset tracking for health systems, built with Link Labs for a fraction of the cost of traditional RTLS systems.

Link-Labs.com
@LinkLabsInc

Table 16: 3D Cardiac Printing**Children's National Health System**

Congenital heart disease is a three-dimensional structural problem; however, current imaging methods are only able to display images of heart defects in two dimensions. The health system's lab is dedicated to advancing both imaging technology and segmentation methods to create 3D replicas of congenital heart disease to improve the care of patients.

ChildrensNational.org

@ChildrensHealth

Table 17: Healthier Patients, One Maker at a Time**Maker Therapy**

Gokul Krishnan's (MD) goal is to engage and empower children in hospitals across the country through the use of Maker Therapy, developed by ongoing research, training and key collaborations with medical institutions. The exhibit showcases the creativity and innovativeness of chronically ill patients.

MakerTherapy.com

@MakerTherapy

Table 18: Project Unicorn**Born Just Right**

Give a 10 year old a chance to use her physical differences as an advantage, and you'll see her create a glitter cannon inspired by unicorns. Learn how a collaboration between a kid, a designer, a prosthetist, and a couple of supportive organizations made magic happen. Together with her mother, Jordan Reeves has also created Born Just Right, an online support network for families and a resource for designs that make a difference in people's lives.

BornJustRight.com

@BornJustRight

Table 19: e-Nabling the Future**e-NABLE**

e-NABLE is an international network of volunteers (teachers, students, engineers, scientists, medical professionals, tinkerers, designers, parents, children, scout troops, artists, philanthropists, dreamers, coders, makers, and everyday people) delivering open-source 3D-printed upper-limb prosthetics to all who can use them. Exhibit includes assembling devices on site.

eNABLECommunityFoundation.org

eNABLINGTheFuture.org

@e-NABLETheFuture

Table 20: Making for Access at DC Public Library**The FabLab@DCPL**

The FabLab@DCPL—a free resource in the D.C. Public Library—helps patrons pursue Do It Yourself solutions for everyday problems. Exhibit showcases examples of solutions made by homeless, disabled and elderly people.

DCLibrary.org/LabsAtDCPL
@DCPL

Table 21: TOM: DC Makeathon for Assistive Technology**Nova Labs**

TOM:DC is a 72-hour makeathon event that combines the spirit of making and the needs of those with disabilities. On July 22, makers will build assistive technology solutions that meet specific needs for individuals with challenges that are often overlooked by the market and government programs.

DC.TomGlobal.org
@NovaLabRobotics

Table 22: Health Inventions**The Smithsonian's Lemelson Center for the Study of Invention and Innovation**

Attendees are invited to explore historic medical objects from the National Museum of American History's teaching collection, and to invent their own device to hear a heartbeat.

Invention.SI.edu
@LemelsonFdn

Table 23: Work as Performed, Not Work as Imagined**MedStar Health National Center for Human Factors in Healthcare and MedStar Usability Services**

The National Center for Human Factors in Healthcare at MI2 applies the scientific rigor of human factors engineering to create a safer, more efficient healthcare environment. Human factors engineering—born from the aviation and defense industries—optimizes systems, processes and devices to be consonant with how humans think, work and interact. MedStar Usability Services provide customized usability consultations and testing throughout the product development process.

MedicalHumanFactors.net
@MedicalHFE

Table 24: Innovating with the FDA**U.S. Food and Drug Administration (FDA)**

An interactive description and demonstration of the valuable resources that the FDA can provide to clinician investigators, entrepreneurs and small businesses. The exhibit will include handouts with links to help people start their interactions with the FDA.

FDA.gov

@US_FDA

@FDAcdrhIndustry

@FDADeviceInfo

Table 25: Automated Cell Counting for Malaria Screening**National Library of Medicine (NLM), National Institute of Allergy and Infectious Diseases (NIAID)**

A smartphone application counts red blood cells automatically under the microscope for malaria diagnosis. The software uses image analysis and machine learning to discriminate between uninfected and parasite-infected red blood cells.

Archive.NLM.NIH.Gov

@nlm_news

**Table 26: Turning Health Into Discovery Through Making
National Institutes of Health (NIH)**

NIH researchers are using Maker technologies to create innovative new tools that facilitate and advance scientific and health research: 3D-printed labware and molecules, custom apps and medical devices. Inventions are shared through open source resources and maximize the impact of advanced, patented developments through the process of testing, regulatory approval, manufacturing, and distribution. The exhibit includes projects from the Centers for Disease Control and Prevention (CDC) and U.S. Food and Drug Administration (FDA).

3DPrint.NIH.gov

OTT.NIH.Gov

@NIH

Table 27: Build Your Dreams Here

TechShop DC-Arlington

TechShop DC-Arlington is a community-based workshop and prototyping studio on a mission to democratize access to the tools of innovation. Filled with cutting-edge tools, equipment and computers loaded with design software featuring the Autodesk Design Suite, they offer the space to make, and the support and camaraderie of a community of makers. The exhibit includes a series of demonstrations that illustrate how the Maker Movement is impacting the health community through medical-focused innovation in high technology.

TechShop.com

@TechShopDC

Table 28: Build Your Ideas!

TechGarden

TechGarden empowers kids, teens and adults to embrace technology and acquire technical problem-solving skills. Drawing on military backgrounds and time spent prototyping technologies during dangerous conditions in Iraq and Afghanistan, founders Brad Halsey and Dr. Albert Vega provide training through hands-on, challenge-focused and objective-driven multidisciplinary projects that result in functioning prototypes.

TechGarden.org

@TechGardening

Table 29: Clinical Prototyping for Making Health in Hospitals, Homes, and Medical and Nursing Schools

MakerHealth

MakerHealth is bringing the tools of the maker movement to the point of care through a network of clinical makerspaces—creating health making facilities for physicians, nurses, caregivers, and patients. MakerNurse, powered by MakerHealth, has launched mobile makerspaces in several hospitals and nursing schools across the country, including Bon Secours St. Mary's Hospital; Mayo Clinic; and University of Texas Medical Branch at Galveston Library.

MakerHealth.com

@MakerHealthco

Table 30: Future Makers

Future Makers are designers, technologists, artists, and educators who make makers. At this table you will invent a machine that incorporates craft materials, LED lights and a motor to create a spinning light machine that hypnotizes.

KidsMakeThingsBetter.com

@FutureMakerKids

Please don't forget to share your wisdom at the U.S. Department of Health & Human Services IDEA Lab board!

Resources for Making

Local Places to Make

FabLabDC.org

BaltimoreNode.org

TechShop.com

DigitalHarbor.org

TechGarden.org

OpenWorksBmore.com

DCLibrary.org/LabsAtDCPL

Some Tools for Making

- 3D printer (\$400 to \$4,000)
- 3D mechanical modeling software (\$1,000 to \$6,000)
- Laser engraving cutting machine (\$1,000 to \$3,000)
- Arduino (\$30 to \$100)
- Raspberry Pi (\$30 to \$150)
- LittleBits "LEGO of electronics" (\$100)
- MaKey MaKey (\$50)
- Wearable technology (bit.ly/1TDyGBA)
- Actuators and controllers (see "Robots" on next page)
- For a great list of tools, go to HSTMakerLab.org/Tools-and-Materials.

Places to Get and Learn About Makers Tools

- NIH 3D print exchange: 3DPrint.NIH.gov
- Info on tools and tutorials: Goo.gl/rCxW1q
- The DIY World of Maker Tools and Their Uses: Goo.gl/hr7wbe
- Maker Tools Buying Guide: ToolGuyD.com/Maker-Tools
- Shop affordable maker tools: ADAFruit.com
- Crowdsourced solutions: NotImpossible.com
- RobotShop.com or CommunityofRobots.com
- DIY Tools and Maker Kits: Goo.gl/yZzHwh

Books on Making

- *The Maker Movement Manifesto* by Mark Hatch
- *Makers: The New Industrial Revolution* by Chris Anderson
- *Not Impossible: The Art and Joy of Doing What Couldn't Be Done* by Mick Ebeling

Websites, Videos and Articles on Making

- Make Magazine and Zero to Maker: MakeZine.com/tag/ZerotoMaker
- How the Maker Movement is Innovating Health Care: Goo.gl/TJQmCK
- 3D design community: Thingiverse.com
- TEDMED - How Can the Maker Movement Drive Medical Innovation: Goo.gl/tai4tP
- What Has the Maker Movement Got to Do with Public Health?: Goo.gl/ti9n51
- Design Thinking in Healthcare: MI2.MedstarHealth.org/Design
- Why the Maker Movement Matters: theatln.tc/1PdueHI
- Maker Movement: MakerMedia.com
- MakerLab - Construction Sets for Health: HSTMakerLab.org

MedStar Inventor Services

If you are a MedStar Health associate, MedStar Inventor Services will work hand-in-hand with you to transform your innovative ideas and discoveries into commercial products and services that advance health and improve the patient and family experience. MI2.MedStarHealth.org/Invent or email invent@medstar.net

Making Health Hosted By

U.S. Department of Health and Human Service IDEA Lab

The U.S. Department of Health & Human Services (HHS) IDEA Lab advances the department's mission to enhance and protect the health and well-being of all Americans by empowering ideas and collaboration that will lead to impactful solutions. This effort is centered around three core beliefs:

- Every individual has the ability to improve the health and well-being of Americans.
- People are more powerful when working together.
- There is a solution to every problem.

[HHS.gov/IdeaLab](https://www.hhs.gov/IdeaLab)

@HHSIdeaLab

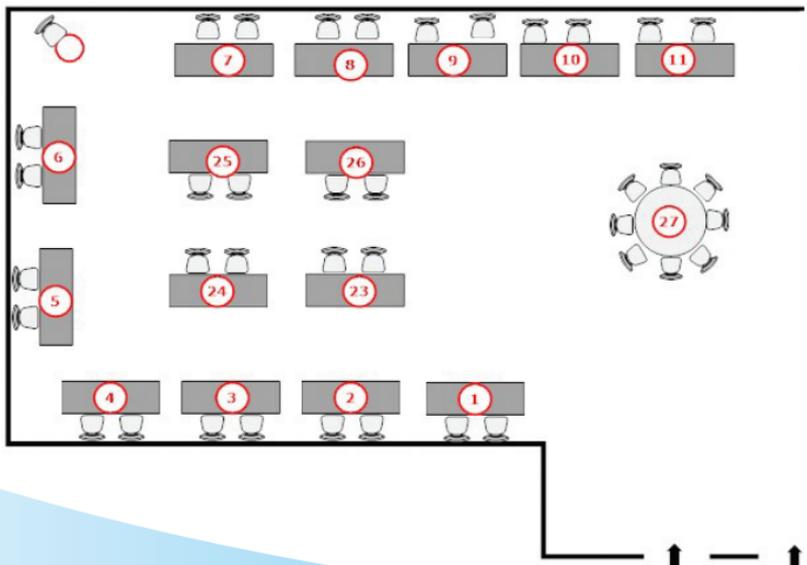
National Institutes of Health

The mission of the National Institutes of Health is to seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life and reduce illness and disability.

[NIH.gov](https://www.nih.gov)

@NIH

Room Layout



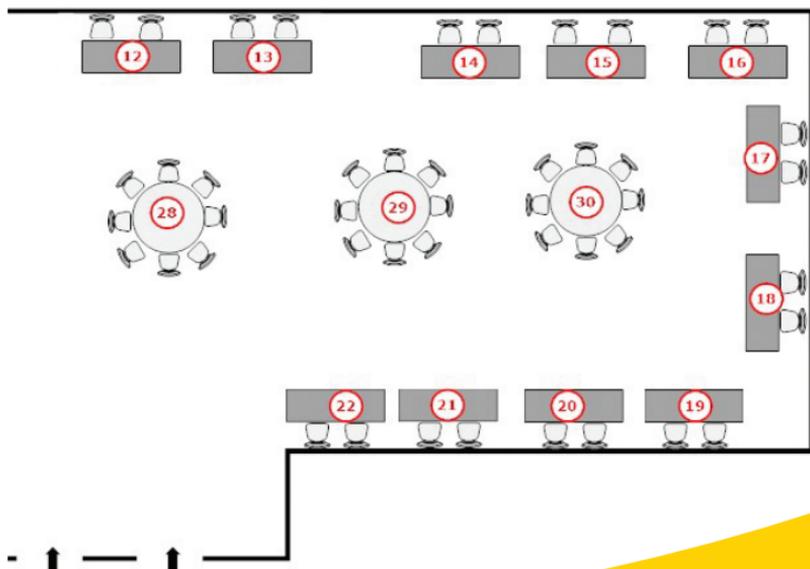
MedStar Health and the MedStar Institute for Innovation

MedStar Health is a not-for-profit health system dedicated to caring for people in Maryland and the Washington, D.C., region, while advancing the practice of medicine through education, innovation and research.

The MedStar Institute for Innovation (MI2) is unique among innovation centers that are embedded in health systems. MI2's approach is to create an innovation ecosystem across MedStar that fosters the vast creative talent and energy of its 31,000 associates and 6,000 physicians. Includes: MedStar Simulation Training and Education Lab (SiTEL); National Center for Human Factors in Healthcare; MedStar Inventor Services; Center for Digital Health & Data Science; Center for Health Influence & Engagement; Founding Partner 1776; Health for America; and MedStar Innovation Hub.

MI2.MedStarHealth.org

@MI2Innovation



try. make. solve.



MedStar Health

#inventhealth