## Our Laboratory

### MedStar Health
- $5.1$ billion not-for-profit health system
- $31,000$ Associates
- $4,700$ Affiliated physicians

<table>
<thead>
<tr>
<th>Total number of inpatient admissions and observation stays</th>
<th>204,528</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inpatient admissions</td>
<td>143,664</td>
</tr>
<tr>
<td>Number of observation stays</td>
<td>60,864</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Total number of outpatient visits</th>
<th>4,332,707</th>
</tr>
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<tbody>
<tr>
<td>Number of home health visits</td>
<td>266,778</td>
</tr>
<tr>
<td>Number of emergency department visits</td>
<td>547,472</td>
</tr>
<tr>
<td>Number of physician office visits</td>
<td>1,696,460</td>
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<tr>
<td>Number of ambulatory visits and surgeries</td>
<td>1,821,997</td>
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<table>
<thead>
<tr>
<th>Net operating revenue</th>
<th>$5.03$ billion</th>
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<tbody>
<tr>
<td>Money spent caring for patients</td>
<td>$4.87$ billion</td>
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<tr>
<td>Earnings from operations that were reinvested</td>
<td>$160.8$ million</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Investments in information technology</th>
<th>$60$ million</th>
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<tbody>
<tr>
<td>Philanthropy</td>
<td>$31.9$ million</td>
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<table>
<thead>
<tr>
<th>Number of associates, residents and fellows</th>
<th>31,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses</td>
<td>8,700</td>
</tr>
<tr>
<td>Residents and fellows</td>
<td>1,100</td>
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<table>
<thead>
<tr>
<th>Number of affiliated physicians</th>
<th>4,700</th>
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<tbody>
<tr>
<td>Employed physicians</td>
<td>1,800</td>
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*Data from fiscal year 2015*
The National Center for Human Factors in Healthcare

The National Center for Human Factors in Healthcare is a large U.S. human factors program embedded within a healthcare system. We are housed within MedStar Institute for Innovation (MI2) in collaboration with MedStar Health Research Institute. The center brings together human factors scientists, system safety engineers, health services researchers, and clinicians to conduct basic safety science and applied research and consultation in medicine to improve safety, quality, efficiency, and reliability.

Our mission is to improve patient safety, identify and test better ways to protect patients, and create ultra-safe healthcare environments at MedStar Health and beyond.

**Human Factors Engineering Areas of Expertise**
- System safety engineering
- Usability evaluation
- Cognitive performance
- Team performance in dynamic situations
- Proactive risk assessment
- Design of healthcare work processes
- Evaluation and design of medical devices and health information technology
- Education in human factors and system safety

**How Does Human Factors Apply to Health Care?**
- Improving patient safety by understanding human capabilities and limitations
- Creating more efficient processes in medical care
- Enhancing communication between healthcare providers
- Implementing effective and sustainable solutions for event reviews
- Reducing the risk of medical device use error
- Creating intuitive devices and systems that reduce the need for training
- Designing easier-to-use health IT solutions to support the work of care providers
- Identifying drug hazards
Our Mission at the National Center for Human Factors in Healthcare

Improve healthcare quality, efficiency, reliability, and safety by applying human factors principles.
## Summary of Accomplishments

**July 2015 to June 2016**

<table>
<thead>
<tr>
<th>33</th>
<th>Grants and contracts awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2 R01 Awards</td>
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<tr>
<td>23</td>
<td>Publications</td>
</tr>
<tr>
<td>64</td>
<td>National presentations</td>
</tr>
<tr>
<td>21</td>
<td>National committees</td>
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<td>21</td>
<td>National committees</td>
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<td>National committees</td>
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<td>21</td>
<td>National committees</td>
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| 21 | National committees |
| 17 | Fellows and students mentored and instructed |
| 1 | Patent |

Photo credit: Washington Business Journal
### Grants and Contracts

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Source</th>
<th>Principal Investigator(s)</th>
<th>Term</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Development of a Novel Tool for Interruption Management</strong>&lt;br&gt;<strong>SOURCE:</strong> MedStar Health Research Institute’s New Investigator - Associate Giving Grant Fund&lt;br&gt;<strong>PRINCIPAL INVESTIGATOR:</strong> Kathryn Kellogg&lt;br&gt;<strong>TERM:</strong> June 2016 to June 2017&lt;br&gt;<strong>PURPOSE:</strong> Create and pilot assessment of a task management tool intended to support the cognitive work of emergency physicians.</td>
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<tr>
<td><strong>Health Information Technology Usability and Safety Gap Analysis</strong>&lt;br&gt;<strong>SOURCE:</strong> Office of the National Coordinator for Health Information Technology&lt;br&gt;<strong>PRINCIPAL INVESTIGATOR:</strong> Raj Ratwani&lt;br&gt;<strong>TERM:</strong> Feb. 2016 to June 2016&lt;br&gt;<strong>PURPOSE:</strong> Identify critical HIT usability and safety gaps by conducting a formal literature review and stakeholder discussions. Develop near term and long-term solutions to the usability and safety gaps.</td>
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<tr>
<td><strong>Developing Evidence-based User-Centered Design and Implementation Guideline to Improve Health Information Technology Usability</strong>&lt;br&gt;<strong>SOURCE:</strong> Agency for Healthcare Research and Quality&lt;br&gt;<strong>PRINCIPAL INVESTIGATOR:</strong> Raj Ratwani&lt;br&gt;<strong>TERM:</strong> Sept. 2015 to Sept. 2020&lt;br&gt;<strong>PURPOSE:</strong> Develop natural language processing algorithms to identify HIT related patient safety events from large database and use these events to support improved user-centered design and implementation guidelines for vendors and providers.</td>
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<tr>
<td><strong>Connecting the Dots: Advanced Visualization Tools for Patient Safety Report Analysis</strong>&lt;br&gt;<strong>SOURCE:</strong> Agency for Healthcare Research and Quality&lt;br&gt;<strong>PRINCIPAL INVESTIGATOR:</strong> Raj Ratwani&lt;br&gt;<strong>TERM:</strong> April 2015 to March 2016&lt;br&gt;<strong>PURPOSE:</strong> Study the cognitive processing and information needs of patient safety leaders, and leverage this knowledge to develop and prototype innovative visual analytic tools, which will allow new and otherwise unapparent insights to be drawn from the data.</td>
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<tr>
<td><strong>Advanced Data Analytics for Patient Safety</strong>&lt;br&gt;<strong>SOURCE:</strong> MedStar Risk (Greenspring Financial Insurance Limited)&lt;br&gt;<strong>PRINCIPAL INVESTIGATOR:</strong> Raj Ratwani&lt;br&gt;<strong>TERM:</strong> Jan. 2015 to Jan. 2016&lt;br&gt;<strong>PURPOSE:</strong> Develop visual analytic tools to support the analysis of patient safety event data and legal claims data.</td>
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</tr>
<tr>
<td>Project Title</td>
<td>Source</td>
<td>Principal Investigator(S)</td>
<td>Term</td>
<td>Purpose</td>
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<td>------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Cognitive Engineering for Complex Decision Making and Problem Solving in Acute Care</td>
<td>Agency for Healthcare Research and Quality</td>
<td>Rollin (Terry) Fairbanks and A. Zach Hettinger</td>
<td>Sept. 2014 to June 2019</td>
<td>Apply cognitive engineering methods to understand and support complex cognition and work activities within the acute care environment, using emergency medicine as the research setting.</td>
</tr>
<tr>
<td>Developing Eye-Movement Based Cognitive Process Models of Anesthesiologist to Enhance Understanding and Training Around Non-Routine Events</td>
<td>Mary and Charles Latham Foundation</td>
<td>Allan Fong</td>
<td>Dec. 2013 to Dec. 2015</td>
<td>Use eye movements to develop perceptual and cognitive models of how anesthesiologists scan for and integrate information during the induction phase.</td>
</tr>
<tr>
<td>Validation of an Affordable and Accessible Alternative Simulation Technology</td>
<td>Agency for Healthcare Research and Quality</td>
<td>Rollin (Terry) Fairbanks</td>
<td>July 2012 to July 2014</td>
<td>Test and validate a serious game simulation platform against traditional simulation as an educational tool to be used in the obstetrical environment.</td>
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**COLLABORATIVE GRANTS AND CONTRACTS**

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Source</th>
<th>Principal Investigator(S)</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characters Allowing Rehearsal and Assessment of Communication in Team Emergency Response (CHARACTER)</td>
<td>Charles River Analytics Inc. BAA</td>
<td>Raj Ratwani</td>
<td>2016 to 2018</td>
</tr>
<tr>
<td>Reworking Visualizations and Analytics for Medical Information Prioritization (REVAMP) Phase II</td>
<td>Office of Naval Research</td>
<td>James Niehaus, Charles River Analytics</td>
<td>2016 to 2017</td>
</tr>
<tr>
<td>Project Description</td>
<td>Source</td>
<td>Principal Investigator</td>
<td>Subcontract Principal Investigator</td>
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<tr>
<td>----------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Medical Decision Aids - Predictive Markers (SimMarkers)</td>
<td>Defense Health Agency, Department of Defense</td>
<td>Jeff Beaubien, Aptima</td>
<td>Raj Ratwani</td>
</tr>
<tr>
<td>Data Collection on Resources Used in Furnishing Global Services</td>
<td>Centers for Medicare &amp; Medicaid Services</td>
<td>Andrew Mulcahy, RAND</td>
<td>Raj Ratwani</td>
</tr>
<tr>
<td>Molecular and Clinical Extraction: A Natural Language Processing Tool for Personalized Medicine</td>
<td>National Institutes of Health</td>
<td>Subha Madhavan, Georgetown University</td>
<td>Raj Ratwani</td>
</tr>
<tr>
<td>Evaluation of Secure Sign-on Technologies</td>
<td>Intel</td>
<td>Raj Ratwani</td>
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</tbody>
</table>
Publications


Conference Proceedings


National Center for Human Factors in Health Care researchers are indicated in bold.
Presentations
(16 of 64 presentations selected)


Service to MedStar Health through Human Factors Safety Integration

The National Center for Human Factors in Healthcare supports MedStar hospital leaders and frontline workers across the hospital system through human factors consults that include data gathering, analysis, and reporting, to influence and implement innovative change.

The Human Factors Center applies the scientific rigor of human factors engineering, a discipline that optimizes systems, processes and devices to be consonant with how humans think, work and interact. Each year, our human factors experts conduct safety hazard analyses and engage in different clinical domains to identify human factors and safety issues that affect the quality and safety of clinical care and staff performance. By asking questions, learning and analyzing the underlying conditions that facilitated the error or failed to protect caregivers from the error, the human factors team develops recommendations and solutions to design a safer and more efficient healthcare environment.

The Human Factors Center collaborates closely with MedStar Health Institute for Quality and Safety to change the way we look at human error: human error is normal, anticipatable and repeatable, even among the excellent selection of individuals, competence and skill level. Rather than misdirecting resources and placing blame on individuals with the "name, shame, blame, and train" mentality, the Human Factors Center promotes a “systems approach” to error by identifying systemic vulnerabilities and create work environments that is least likely to cause or facilitate error.

Top 12 Focal Areas for Human Factors Consults

- Medication Safety
- Clinical Decision Support
- Discharge Instructions
- Look-alike Sound-alike Errors
- Wrong-sided Surgery
- Medication Allergy Errors
- Sepsis
- EHR and Health IT
- Medical Devices and Equipment
- Imaging and Radiology
- Fatigue
- Patient Falls
- Alarm

Within a five-year span, the number of human factors consults have increased by 20-fold.

The National Center for Human Factors in Healthcare engaged in 56 consults during fiscal year 2016.
Usability Services

Usability testing ensures that the intended users of a system can carry out tasks safely, efficiently and effectively, and with an optimized user experience.

The National Center for Human Factors in Healthcare provides customized usability assessments at all stages of the development process. We focus on evaluating medical device and health IT products, both for MedStar Health and for clients from the healthcare industry.

Our team can help at any stage of the product development life cycle. This includes exploratory efforts in the concept stage and designing and executing studies during the formative and summative stages. We also draft the necessary documentation for use in regulatory submissions.

Usability Expertise

Our team has broad experience in the healthcare, adaptive technology and defense industries, with expertise in:

- Medical devices and products
- Medical device accessories
- Websites, mobile applications and health IT
- Documentation and training
- Anthropometrics and accessibility
- Signage and labeling

Usability Capabilities

Our usability team has expertise in the following capabilities:

- Interviews and focus groups
- Heuristic evaluation
- Risk analysis
- Labeling comprehension
- Formative evaluations
- Validation studies
- FDA-compliant reporting

Unique Access

Our usability experts have direct access to healthcare domain specialists, end users and healthcare environments, including:

- In-house usability lab
- Large-scale simulation centers
- In-hospital simulation labs
- Hospitals
- Long-term care facilities
- Ground and air EMS
- Outpatient clinics
- Retail pharmacies
- Surgery centers
- Home health agencies
Education and Training National Service
National and International Committee Service

2. National Advisory Group on Health Information Technology in England (Fairbanks)
3. Clinical Excellence Commission, New South Wales Department of Health, Sydney, Australia, Visiting Professor (Fairbanks)
4. National Patient Safety Foundation, Board of Advisors (Fairbanks)
5. Health Information Exchange Policy Board Member, District of Columbia (Hettinger)
6. RTI/ONC Health IT Safety Collaborative: Usability and Medication Management Work Group Committee Member (Ratwani)
7. Food and Drug Administration, General Hospital and Personal Use Devices Panel of the FDA Medical Devices Advisory Committee (Fairbanks)
8. Health IT Standards Committee, Association for Advancement of Medical Instrumentation (Hettinger)
9. Association for the Advancement of Medical Instrumentation, Research Review Committee (Fairbanks)
11. Veterans Affairs Center for Medical Product End-User Testing, Advisory Board (Fairbanks)
12. Health Research and Educational Trust, Senior Fellow (Fairbanks)
13. ACEP/ABEM Patient Safety, LLSA CME Task Force (Fairbanks)
14. Agency for Healthcare Research and Quality, Healthcare Safety and Quality Improvement Study Section (Fairbanks)
15. Emergency Medicine Patient Safety Foundation, Board of Directors (Fairbanks)
16. Society for Academic Emergency Medicine, Research Committee Member (Hettinger)
17. Health Information Technology Evaluation Collaborative, Steering Committee (Fairbanks)
18. Healthcare Information and Management Systems Society, EHR Usability Task Force (Fairbanks)
19. Healthcare Facilities Guidelines Review Committee, of the Facilities Guideline Institute (Franklin)
20. National Patient Safety Foundation, Certification Board for Professionals in Patient Safety (Fairbanks)
21. American College of Medical Quality (ACMQ) Conference Planning Committee (Ratwani)
Service to Georgetown University Medical Center

System Safety Engineering in Healthcare Course
The National Center for Human Factors in Healthcare teaches System Safety Engineering in Healthcare, a fourth-year elective offered to Georgetown University School of Medicine students. The elective helps students understand the central concepts of human factors and system safety engineering in healthcare, and how to apply those concepts to their everyday practice of medicine and in their future leadership roles.

Fellows and Student Researchers

Satyan Chari
Metro North Chairman’s Scholarship Fellow
Metro North Hospital and Health Service, Australia
Mentor: Rollin J (Terry) Fairbanks, MD MS

Tianyi Cheng, MS
Research Intern
Communication Culture Technology,
Georgetown University
Mentor: Sarah Parker, PhD

Arman Cohan
Summer Research Intern
Computer Science, Georgetown University
Mentor: Allan Fong, MS

Michael Melesse
Summer Research Intern
Princeton University
Mentor: Allan Fong, MS

Lindsey Moskowitz
Research Intern
Industrial Design, Syracuse University
Mentor: Grace Tran, MS

Charlie O’Mara
Summer Research Intern
Harvard University
Mentor: Akhila Iyer, MS

Marlie Philiossaint
Summer Medical Student
Georgetown University School of Medicine
Mentor: Zach Hettinger, MD, and Raj Ratwani, PhD
Leadership Team

Rollin (Terry) Fairbanks, MD, MS
Director

Rollin J. (Terry) Fairbanks, MD, MS, FACEP is the associate director of the MedStar Institute for Innovation (MI2), where he is responsible for innovation in safety and innovation in learning, with oversight of National Center for Human Factors in Healthcare and MedStar SiTEL, MedStar Health’s learning technology infrastructure. Dr. Fairbanks is associate professor of emergency medicine at Georgetown University and adjunct associate professor of industrial systems engineering at the University at Buffalo. He practices emergency medicine at MedStar Washington Hospital Center. Dr. Fairbanks serves on the National Patient Safety Foundation Board of Advisors, Emergency Medicine Patient Safety Foundation Board of Directors, POLITICO Health IT Advisory Forum and is a Health Research and Educational Trust (HRET) senior fellow. Dr. Fairbanks is a 2008 graduate of the HRET/NPSF Patient Safety Leadership Fellowship and is known for inspiring people to think differently about patient safety. Dr. Fairbanks’ work has been published in more than 100 journal articles, book chapters and proceedings papers in human factors engineering and medical literature. Dr. Fairbanks flew as a private pilot for 10 years and often relates his experience in aviation safety to his work in healthcare safety.

Raj Ratwani, PhD
Scientific Director and Senior Research Scientist

As Scientific Director, Raj Ratwani, PhD, applies human factors and cognitive science theories to challenging healthcare problems to develop innovative solutions. Dr. Ratwani is an assistant professor of emergency medicine at Georgetown University in addition to his role with the National Center for Human Factors in Healthcare. He holds a master’s and PhD in psychology, with a focus on human factors, from George Mason University. He was a National Research Council postdoctoral fellow at the Naval Research Laboratory, where he received the Alan Berman publication award. Dr. Ratwani has extensive experience planning, managing and executing large-scale research programs. In addition, he has made major contributions to healthcare policy, with a focus on health information technology usability and safety. His research areas of interest include patient safety, report analysis and visualization, health information technology usability, and clinician cognitive performance (e.g., perception of diagnostic images, interruptions etc.). His work has been sponsored by the Agency for Healthcare Research and Quality (AHRQ), National Institutes of Health (NIH), the Office of the National Coordinator (ONC), as well as several foundations and associations. He has published numerous high impact journal articles, testified in front of the U.S. Senate and has given several widely attended speeches and presentations.
A. Zach Hettinger, MD, MS
Medical Director and Clinical Lead, Human Factors Safety Integration

A. Zach Hettinger, MD, MS, serves as the medical director for the National Center for Human Factors in Healthcare, providing medical expertise and direction on projects, grants, contracts, and adverse event reviews. He has significant experience in funded research applying human factors methods to adverse event analysis and health IT usability and safety. He has received funding from AHRQ, NIH, ONC, and several foundations. Dr. Hettinger completed a research fellowship at the University of Rochester and holds a master’s degree in clinical investigation. Prior to his medical training, Dr. Hettinger had experience as a web programmer, database manager and network administrator. He has expertise in health IT and has focused his IT research in data visualization, human-computer interaction and health IT safety. Dr. Hettinger is dual board-certified in emergency medicine and clinical informatics. In addition, he is an assistant professor of emergency medicine at Georgetown University and a practicing emergency physician at MedStar Union Memorial Hospital.

Grace Tran, MS
Director, Human Factors Safety Integration

Grace Tran, MS, brings significant experience in applying human factors and usability methods to design innovative system safety solutions. She serves as the central connection point between the National Center for Human Factors in Healthcare and MedStar Health Institute for Quality and Safety, ensuring collaborative efforts and sharing information and expertise as a senior member of both teams and with joint accountability to leadership. Grace leads the program development and performance improvement of the MedStar Safety Program through the integration of human factors engineering and safety science to guide the team in their work to implement innovative and effective culture change. She also leads human factors event reviews and hazard analyses, which includes data gathering, analysis, reporting, and development of effective and sustainable solutions. Grace holds a bachelor’s degree in materials science and engineering and a master’s degree in industrial and systems engineering/human factors engineering and ergonomics, both from Virginia Tech.

(continued on next page)
Leadership Team continued

Lawrence Wolpert, PhD  
Director, Usability Services

Lawrence Wolpert, PhD, serves as the director of the National Center for Human Factors in Healthcare’s Usability Services, providing usability evaluations of medical devices, health IT, and healthcare processes for both MedStar Health entities and commercial clients. With an extensive background in human factors engineering and human-systems integration, he has spent most of his career managing and conducting large-scale research and development efforts within the U.S. Department of Defense. Dr. Wolpert obtained his PhD from The Ohio State University in experimental psychology. Prior to that he served as a combat medic in the Israeli Defense Forces, and as an officer for human factors in the Israeli Ministry of Defense, R&D branch.

Core Team

Natalie Abts, MS, Program Manager, Usability Services

Natalie Abts, MS, oversees the technical and quality aspects of all projects conducted by the Usability Services team for both the medical device industry and within MedStar Health. In addition to managing the planning and execution of usability evaluations, she also leads an initiative to incorporate usability testing into the medical device procurement process within the MedStar Health system. She has a special interest in ensuring that safe and effective products are brought to market through successful FDA submission. Natalie holds a master’s degree in industrial engineering with a focus on human factors and ergonomics from the University of Wisconsin, where she was mentored by Dr. Ben-Tzion Karsh. Some of her previous work involved research on primary care redesign for the aging population and implementation of process improvement efforts in the ambulatory care setting.

Katie Adams, Research Assistant

Katie Adams provides research support on all aspects of the research lifecycle, including study coordination, data analysis, and manuscript creation. She previously worked as the research assistant for the Simulation Training & Education Lab (MedStar SiTEL). Katie holds a Bachelor of Arts in neuroscience from Dartmouth College. Through her coursework and previous work conducting observations and qualitative research with a pediatric neurologist at Dartmouth-Hitchcock Medical Center, she has developed a strong interest in improving healthcare and system-provider interactions.

Natalie (Nat) Benda, MS, Senior Research Fellow

Natalie (Nat) Benda, MS, focused her work on improving the design of health IT as well as researching new, innovative ways to use information technology to reduce health disparities. Nat has expertise in cognitive systems engineering as well as extensive experience improving the safety and usability of health information technology design. She received a bachelor’s degree in industrial engineering from Purdue University and a master’s in industrial engineering from the University at Buffalo. She is currently pursuing her PhD in human factors engineering.
under adviser Dr. Ann Bisantz at the University at Buffalo (UB). She has received the National Science Foundation’s Graduate Research Fellowship program award as well as UB’s School of Engineering and Applied Sciences Dean’s Fellowship to support her graduate work. Nat has several publications in high impact journals including Annals of Emergency Medicine and the Journal of the American Medical Association.

Rebecca Butler, Research Assistant, Usability Services

Rebecca Butler serves as a research assistant for the Usability Services Team. She provides support on all aspects of usability testing from the initial test preparation to the final report submissions. She holds a bachelor’s degree in industrial and systems engineering from Virginia Tech. Before joining the National Center for Human Factors in Healthcare, Rebecca worked with assistive technology, both at Virginia Tech and in the Washington, D.C., area.

AnnKatherine Chernenkoff, Administrative Coordinator

AnnKatherine Chernenkoff assists in the organizational and logistical infrastructure of the National Center for Human Factors in Healthcare as an administrative coordinator and as the assistant to Dr. Terry Fairbanks and Dr. Raj Ratwani. She has a bachelor’s degree in sociology and a certificate in global health and disability from Queen’s University in Canada.

Ross Filice, MD, Clinical Informatics Scientist

Ross Filice, MD, is a board certified radiologist with fellowship training in imaging informatics. He currently serves as assistant professor and chief of imaging informatics in the Department of Radiology at MedStar Georgetown University Hospital as well as chief of imaging informatics for MedStar Medical Group Radiology. Prior to this, Dr. Filice worked with the FDA. He works on enterprise and operational informatics challenges including the ongoing deployment of an enterprise-wide radiology system as well as collaborative informatics, quality and safety research. He has published a number of articles in the field of imaging informatics. Dr. Filice holds bachelor’s degrees in computer science and molecular biology from the University of Wisconsin - Madison, obtained his medical degree from the University of Minnesota - Twin Cities and trained at the Johns Hopkins Hospital for residency and the University of Maryland Medical Center for fellowship.

Allan Fong, MS, Research Specialist

Allan Fong focuses on developing, integrating and applying advanced technologies and techniques to study and improve healthcare systems. He has a background in engineering, computer science and human factors, and is particularly interested in natural language processing, predictive analytics, information visualization, and sensor integration to understand clinical workflow and promote patient safety and health literacy. Allan received a master’s degree in aeronautical and astronautical engineering from Massachusetts Institute of Technology, a master’s degree in computer science from University of Maryland College Park and a bachelor’s degree in mechanical engineering from Columbia University.

(continued on next page)
**Core Team continued**

**Ella Franklin, RN, BSN, Nursing Research Program Director**

Ella Franklin, RN, BSN, provides nursing domain expertise to the National Center for Human Factors in Healthcare's research and consulting projects while expanding our nursing research portfolio. Her research expertise is in the application of design and technology solutions to enhance patient and staff safety, reduce healthcare-associated infections and improve health system efficiency. She has extensive nursing experience in diverse settings, holds a clinical research certificate from the National Institute of Nursing Research and is completing her Master of Science in nursing in healthcare quality and safety at The George Washington University.

**Daniel Hoffman, Research Assistant**

Daniel Hoffman has significant experience in data collection, quantitative and qualitative data analysis and dissemination. He also has experience in facilitating usability studies on medical devices. He is interested in motivation, communication and team-work, utilizing novel technology such as eye-tracking, natural language processing and visualization. Daniel received his bachelor's degree in industrial and systems engineering from The Ohio State University.

**Jessica Howe, MA, Research Specialist**

Jessica Howe performs quantitative and qualitative research using focus groups, surveys, eye tracking, and more traditional behavioral measures. Her research interests include: attention, decision making and human-computer interaction. Previously, Jessica worked as a research psychologist at the U.S. Army Natick Soldier Research, Development, and Engineering Center (NSRDEC) in Natick, Massachusetts. She is a member of the Human Factors and Ergonomics Society (HFES), Association for Computing Machinery (ACM), User Experience Professionals Association (UXPA), Association for Psychological Science (APS), and Cognitive Science Society (CSS). Jessica received her master's in psychology/human factors and applied cognition from George Mason University and her bachelor's in psychology from Saint Anselm College.

**Akhila Iyer, MS, Research Coordinator**

Akhila Iyer is a research coordinator at the National Center for Human Factors in Healthcare. She provides grant support and project management for various human factors-related projects. Her primary research interests include the built environment, communication and organizational culture in health care. She has extensive experience conducting quantitative and qualitative research in both lab and field settings. Prior to her work at Mi2, Akhila worked as the project research coordinator in movement disorders at the Mount Sinai - Beth Israel Phillips Ambulatory Care Center. There, she collaborated with movement disorder specialists and senior research psychologists to understand external and genetic factors at play in the progression of Parkinson's Disease. She holds a bachelor's in neuroscience and behavior from Barnard College of Columbia University and earned a master's in medical science at Boston University School of Medicine.
Kathryn (Kate) Kellogg, MD, MPH, Clinical Safety Scientist

Kathryn (Kate) Kellogg, MD, MPH, is a clinician and academician with expertise in healthcare safety and adverse event analysis. She studied medicine at the University of Rochester and received a master’s in public health from The Dartmouth Institute, with a focus on developing a systems approach to healthcare improvement. During a year-out medical school research fellowship, Dr. Kellogg conducted a study using both qualitative and quantitative methods to initiate development of a tool for adverse event analysis, which was subsequently used at MedStar Health. In addition to event review, Dr. Kellogg has interests in workplace stress and interruption management. Dr. Kellogg is a board-certified emergency medicine physician who practices at MedStar Washington Hospital Center and is an assistant professor of emergency medicine at Georgetown University.

Nicoleta Parau, Administrative Coordinator

Nicoleta Parau supports all administrative activities of the National Center for Human Factors in Healthcare, including human resources, finance and clerical responsibilities. She has been a champion in implementing various environmentally-friendly practices in line with our innovative company culture. She has a bachelor’s degree in health systems management from the University of Baltimore.

Sarah H. Parker, PhD, Adjunct Human Factors Scientist

Dr. Parker’s research focuses on understanding team performance in high-risk healthcare settings. Dr. Parker completed her PhD in industrial and organizational psychology from the University of Aberdeen, Scotland. She earned a master’s degree in human factors and applied cognition from George Mason University, followed by two years working as a human factors expert and researcher at Mayo Clinic. Dr. Parker’s work has been published in 50 journal articles, book chapters and proceedings papers, which have appeared in human factors and medical literature. She has given numerous national and international presentations on human factors in healthcare and patient safety.

Josh Puthumana, Research Assistant

Josh Puthumana holds a Bachelor of Arts in psychology, with a minor in biology, from Georgetown University. Through coursework and previous experiences in research, healthcare innovation and clinical exposure, he has developed a passion for exploring novel methods to improve patient outcomes.

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Core Team continued

Erica Savage, Project Manager
Erica Savage is a project manager focusing primarily on human factors and safety consultations and is the project manager on several MedStar Health committees that focus on optimizing processes and culture to improve safety and outcomes. She also works on the center’s health IT and usability policy research. Erica is getting her master’s in healthcare administration from the University of North Carolina at Chapel Hill.

Josh Singer, MS, Research Assistant, Usability Services
Josh Singer, MS, holds a bachelor’s degree in industrial and operations engineering from the University of Michigan and a master’s degree in bioengineering from the University of Pittsburgh. His previous work has involved the development of medical products from designing novel technologies to performing analyses (including market, intellectual property, regulatory, reimbursement, human factors, and systems engineering) for start-up companies and research groups developing medical products. His work focuses on all aspects of usability research and evaluation, both internal to MedStar Health and for external and commercial projects.

Lucy Stein, MS OTR/L, CAPS, Human Factors Safety Integration
Lucy Stein is an occupational therapist at the MedStar National Rehabilitation Hospital, working mainly on the stroke and orthopedic services. Her primary interest is the impact of design on health care, and she serves on several committees supporting the implementation of good design to increase safety and accessibility throughout the hospital. She is also a certified aging in place specialist. She has developed and delivered educational material to both staff and patients to inform them of how to modify the home environment to maximize safety and independence beyond the hospital. She holds a bachelor’s in human factors and ergonomics from Cornell University, and received her master’s in occupational therapy from Columbia University.

Amy Will, Usability Coordinator
Amy Will serves as the coordinator for Usability Services, providing usability evaluations of medical devices for MedStar entities and commercial companies. Her work focuses on conducting usability evaluations of medical devices, health IT and healthcare processes to ensure safe and effective care delivery. She consults on all usability aspects of the product design from the initial prototype through to FDA submission. Amy holds a Bachelor of Arts in psychology and Hispanic studies from East Carolina University.
Advisory Board

Mark Smith, MD
Chief Innovation Officer, MedStar Health
Director, MedStar Institute for Innovation
Professor of Emergency Medicine, Georgetown University

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Bogle Professor Fellow, Industrial and Systems Engineering, Virginia Tech
Director, Myers Lawson School of Construction, Virginia Tech

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Robert Wears, MD, MS, PhD
Professor of Emergency Medicine, University of Florida
Visiting Professor, Clinical Safety Research Unit, Imperial College London

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Professor, Department of Integrated Systems Engineering, The Ohio State University

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Managing Partner, The Wreathwood Group

Deborah Boehm-Davis, PhD
Professor and Dean, College of Humanities and Social Sciences, George Mason University

Stan Caplan, MS, CHFP
President and Principal, Usability Associates LLC
Back (left to right): Raj Razwani, Terry Fairbanks, Satyan Chari, Katie Adams, Jeff Collins, Allan Fong, Lawrence Wolpert, Ross Filice, Rebecca Butler, Angela Thomas, Nicoleta Parsu, Dan Hoffman, Zach Hettinger
Front (left to right): Kate Kellogg, Erica Savage, Ann Katherine Chernenkoff, Natalie Abis, Amy Will, Alex Walker, Jessica Howe, Akhila Iyer, Grace Iran, Josh Singer, Cathryna Nieves