

**Rodrigo F. Alban, MD**, is an Assistant Professor in the Department of Surgery at Cedars-Sinai Medical Center. After graduation from the Central University School of Medicine in Quito, Ecuador, he completed General Surgery residency at Cedars Sinai, and Surgical Critical Care fellowship at Brigham and Women's Hospital in Boston. He obtained a research post-doctoral fellowship in Immunology at Harbor-UCLA Medical Center and is a yellow belt in Lean and Six Sigma. His academic interests include health services research involving efficiency models, healthcare economics, patient safety, and quality improvement in all aspects of surgery.

**Emily C. Anania, MS**, received her BS degree in Psychology from the University of Delaware and an MS degree in Human Factors from Embry-Riddle Aeronautical University, where she is currently pursuing her PhD. Her research focuses on human-automation teaming, teamwork training, and simulation

**Tara N. Cohen, PhD**, is a Human Factors research scientist and Assistant Professor of Surgery at Cedars-Sinai Medical Center in Los Angeles. She received her doctorate from Embry-Riddle Aeronautical University and has supported research and performance improvement initiatives at multiple medical institutions including Mayo Clinic, Florida Hospital, Medical University of South Carolina, and Halifax Health. Her current work involves proactive approaches to patient safety through potential threat identification, including flow disruption.

**Peter J. Fabri, MD, PhD**, is Emeritus Professor of Surgery and Industrial Engineering at the University of South Florida. After a career as an academic surgeon, he earned a PhD in industrial engineering for the specific purpose of "fixing healthcare." He developed graduate level courses in patient safety, analytics, process optimization, and quality management Lean-Six Sigma. His expertise is in data analytics, systems engineering, and predictive modeling.

**Bruce L. Gewertz, MD**, is Professor and Surgeon-in-Chief, Chair of the Department of Surgery, Vice-Dean for Academic Affairs, and Vice-President for Interventional Services at Cedars-Sinai Health System in Los Angeles. Previously, he was on the faculty at the University of Chicago for 25 years, serving as the Dallas B. Phemister Professor and Chair of the Department of Surgery from 1992 until 2006. He graduated from Jefferson Medical College and trained in general and Vascular Surgery at the University of Michigan. His principal clinical and research interests include leadership development, mesenteric ischemia, and cerebrovascular disease. He coordinates a \$4 million multi-institutional research project integrating human performance and technology, funded by the Department of Defense.

**Monica Jain, MD**, is a Fellow in Endocrine Surgery and a Clinical Instructor in General Surgery at the University of California San Francisco. She obtained her MD degree from Boston University and completed her General Surgery residency at Cedars-Sinai Medical Center. Dr. Jain's professional interests include medical innovation, entrepreneurship, leadership, Human Factors, and imaging in Endocrine Surgery. She is passionate about bridging the gap between bioengineering and medicine and has consulted for and mentored numerous startup companies.

**Jeffrey K. Jopling, MD**, is currently a Resident in General Surgery-4 at Stanford University. He completed a 3-year fellowship at the Stanford Clinical Excellence Research Center (CERC), studying healthcare system design and implementation. He

holds an M.D. degree from Emory University and a master's degree in systems engineering from the Georgia Institute of Technology. Previously he worked at Intermountain Healthcare in its Institute for Healthcare Delivery Research. It is there that he first developed his passions for surgery and systems design and completed an advanced training program in clinical quality improvement.

**Paul M. Maggio, MD, MBA**, is Associate Professor of Surgery and Vice Chair for Clinical Affairs at Stanford University Medical Center. He graduated from SUNY Buffalo School of Medicine and trained in General Surgery at Brown University and Rhode Island Hospital. Following his fellowship in Burns, Trauma and Critical Care at the University of Michigan he completed an MBA at the Ross School of Business. Dr. Maggio is a national examiner for the Baldrige Foundation with strong interest in performance improvement techniques, including Lean, Six Sigma, and systems engineering.

**Juan A. Sanchez, MD**, is Chair and Vice President of Surgical Services at St Agnes Hospital in Baltimore, where he also serves as Associate Professor of Surgery at Johns Hopkins. His training includes an MD degree from the University of Florida, General Surgery residency at Georgetown University, Cardiothoracic Surgery at Yale University and a post-doctoral fellowship in Transplantation at Columbia University. Dr. Sanchez studies the intersection of leadership and organizational dynamics in improving safety, quality, and value. He has been successful in applying Lean/Six Sigma techniques to the improvement of patient flow in the operating room. He was a Kennedy Scholar at Harvard University, where he completed a Master of Public Administration degree.

**Harry C. Sax, MD**, is Professor and Executive Vice Chair of Surgery at Cedars-Sinai Medical Center, where he facilitates quality, safety, and clinical transformation initiatives for the institution. He received his MD from Johns Hopkins and completed a General Surgery residency and Nutrition fellowship at the University of Cincinnati. During subsequent tenure at the University of Rochester, he became interested in patient safety and the lessons that could be learned from high reliability organizations. Drawing on his experiences as a general aviation pilot, he created some of the early checklists used in the operating room. He then earned a Master in Health Care Management from the Harvard School of Public Health. Dr. Sax has chaired the post graduate course, "Measure Twice, Cut Once," at the annual Clinical Congress of the American College of Surgeons with many of the coauthors of this manuscript.