S&E 26

SURGEONS AND ENGINEERS

A Dialogue on Surgical Simulation

March 10–11 | Chicago, IL

PROGRAM

ACS AMERICAN COLLEGE OF SURGEONS

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This program also may be viewed online at *facs.org/surg-eng*.

WELCOME

On behalf of the American College of Surgeons (ACS), I would like to welcome you to the 2026 Surgeons and Engineers: A Dialogue on Surgical Simulation meeting. Given the success of this unique event over the past 7 years, we are pleased to offer this 1.5-day in-person event with optional workshops. This will permit us to more fully explore synergies among surgeons, engineers, scientists, healthcare professionals, and educators to advance simulation-based surgical education and use of state-of-the-art simulations and simulators.

The Keynote Address, "25 Years of Simulations and Surgical Learners: An Educator's Odyssey," will be delivered by Neal E. Seymour, MD, FACS, vice chair for clinical and educational affairs in the Department of Surgery at Baystate Health and professor at the University of Massachusetts Chan Medical School-Baystate in Massachusetts.

The meeting will feature two panel sessions, "Optimizing Surgical Performance Through Mental Skills" and "Virtual Reality in Medical Education and Training: From Classroom to Clinic," as well a debate discussing whether sustainability is an option in surgical education.

Building on the success of the Do-It-Yourself (DIY) Simulator/Model Competition over the past 2 years, 20 entrants will demonstrate their DIY simulators/models in a competition designed to highlight the surgical simulation community's collaborative and innovative spirit. Additionally, from the high-quality abstracts received, the ACS Surgeons and Engineers Committee selected 15 abstracts for podium presentations and 39 abstracts for poster presentations.

Thank you for attending. We look forward to continuing the productive dialogue we have initiated between surgeons and engineers to foster meaningful collaboration.

Kyla P. Terhune, MD, MBA, FACS

Senior Vice President, Education
American College of Surgeons

WELCOME FROM PROGRAM CHAIR

On behalf of the Surgeons and Engineers Committee, welcome to this year's meeting at ACS Headquarters.

The agenda is specifically designed to convey the exciting ideas and cutting-edge innovations of a unique collaborative community of surgeons, academic and industry engineers, scientists, and surgical education leaders. It is our hope that by attending this meeting, you will gain a better understanding of the multifaceted needs, challenges, and potential benefits that arise from this multidisciplinary collaboration and enthusiastically contribute to promoting the highest quality of surgical care through advanced knowledge and innovative education.

The Surgeons and Engineers Meeting has three essential goals: to bridge surgical and engineering communities, advance and support expertise and excellence in surgery, and enrich surgical simulation-based training with the most current dialogue on state-of-the-art technological and engineering advancements.

With these goals in mind, the Program Committee planned a premier program to foster dialogue, enhance knowledge, build relationships, and spark ingenuity:

- **Keynote Address**—*25 Years of Simulations and Surgical Learnings: An Educator's Odyssey,* Neal Seymour, MD, FACS, Baystate Health, Springfield, Massachusetts

- **Workshops** (designed to promote interaction and collaboration)
  - — *Transforming Surgical Performance and Education Using Mixed-Reality Technology: How to Get Started in Cross-Disciplinary Teams*
  - — *SSERE-AI: Experiential Learning Tutorial on AI for Surgical Simulation and Education Research*

- **Panel Sessions**
  - — *Optimizing Surgical Performance Through Mental Skills*
  - — *Virtual Reality in Medical Education and Training: From Classroom to Clinic*

- **Debate Session**—*Is Sustainability an Option in Surgical Simulation?*

- **Oral and Poster Presentations**—Highlights of the multifaceted collaborations between surgeons and engineers working together in research and technology development

- **Do-It-Yourself (DIY) Simulator/Model Competition**—Promotes the development of DIY simulators and models and encourages the use of such simulators and models to improve simulation-based surgical education and training

Thank you for attending. We are confident that you will find this meeting to be thought-provoking and rewarding. Please provide us with your feedback to help us ensure future meetings.

Gyusung Lee, PhD

Program Chair, Surgeons and Engineers
Assistant Director, Simulation-Based Surgical and Education Training, Division of Education
American College of Surgeons

AGENDA

March 10, 8:30 am–March 11, 5:00 pm

ACS Headquarters, Chicago, IL | Board of Regents Room (28th Floor)

All times listed are Central Time. Agenda and speakers are subject to change. The views expressed by individual speakers are their own and do not necessarily reflect those of the American College of Surgeons.

Tuesday, March 10		
7:30–8:30 am	**Workshop Registration**	*Foyer*
8:30–11:30 am	**Optional Workshops:** **Transforming Surgical Performance and Education Using Mixed-Reality Technology: How to Get Started in Cross-Disciplinary Teams** Inki Kim, PhD, *University of Illinois Urbana-Champaign* Avinash Gupta, PhD, *University of Illinois Urbana-Champaign* Duo Wang, PhD, *University of Illinois Urbana-Champaign* **SSERE-AI: Experiential Learning Tutorial on AI for Surgical Simulation and Education Research** S. Swaroop Vedula, MBBS, MPH, PhD, *Johns Hopkins University* Emily Guan, MSE, *Johns Hopkins University*	*BOR & BOG Room*
12:00–1:00 pm	**Registration**	*Foyer*
1:00–1:15 pm	**Welcoming Remarks** Kyla P. Terhune, MD, MBS, FACS, *American College of Surgeons* Gyusung Lee, PhD, *American College of Surgeons*	*BOR Room*
1:15–2:15 pm	**Keynote Address:** **25 Years of Simulations and Surgical Learners: An Educator's Odyssey** Neal Seymour, MD, FACS, *Baystate Health*	*BOR Room*
2:15–3:15 pm	**DIY Simulator/Model Presentation 1**	*Foyer*
3:15–3:30 pm	**Afternoon Break and Exhibitors Visit**	*Foyer*
3:30–4:30 pm	**Panel Session: Optimizing Surgical Performance Through Mental Skills** Jin Yang, PhD, *University of Buffalo* Dimitrios Stefanidis, MD, PhD, FACS, FASMBS, FSSH, *Indiana University School of Medicine* Nicholas Anton, MS, *Indiana University School of Medicine* Carter Lebares, MD, FACS, *University of California San Francisco*	*BOR Room*
4:30–4:45 pm	**First-Day Wrap-Up**	*BOR Room*
4:45–5:45 pm	**Welcome Reception**	*Foyer*

Wednesday, March 11		
7:00–8:00 am	**Registration**	*Foyer*
8:00–8:15 am	**Day 2 Opening Remarks** Gyusung Lee, PhD, *American College of Surgeons*	*BOR Room*
8:15–9:45 am	**Abstract Presentation I**	*BOR Room*
9:45–10:45 am	**DIY Simulator/Model Presentation 2**	*Foyer*
10:45–11:00 am	**Morning Break and Exhibitor Visit**	*Foyer*
11:00 am–12:00 pm	**Debate: Is Sustainability an Option in Surgical Simulation?** Leonie Heskin, MB BCh BAO, BArch, MArch, MSc(Bioeng), FRCSI, PhD, *University College Cork* Deborah Rooney, PhD, *University of Michigan* S. Swaroop Vedula, MBBS, MPH, PhD, *Johns Hopkins University*	*BOR Room*
12:00–1:00 pm	**Lunch and Exhibitors Visit**	*Foyer & BOR Room*
1:00–2:00 pm	**Abstract Presentation II**	*BOR Room*
2:00–3:00 pm	**Panel Session: Virtual Reality in Medical Education and Training: From Classroom to Clinic** Rand Kittani, BS, *Carle Illinois College of Medicine* Claudius Conrad, MD, PhD, *Carle Illinois College of Medicine* Blair Rowitz, MD, FACS, *Carle Illinois College of Medicine* Joe Bradley, BSE, MS, MBA, PhD, *Carle Illinois College of Medicin*	*BOR Room*
3:00–3:15 pm	**Afternoon Break and Exhibitors Visit**	*Foyer*
3:15–4:30 pm	**Poster Presentations**	*Various Designated Areas*
4:30–4:45 pm	**DIY Competition and Abstract Award Announcement**	*BOR Room*
4:45–5:00 pm	**Closing** Kyla P. Terhune, MD, MBA, FACS, *American College of Surgeons* Gyusung Lee, PhD, *American College of Surgeons*	*BOR Room*

KEYNOTE SPEAKER

Neal E. Seymour, MD, FACS

Neal E. Seymour, MD, FACS, is the surgery residency program director for the University of Massachusetts (UMass) Chan Medical School–Baystate and vice chair for education in the Department of Surgery for Baystate Health.

He received his undergraduate and medical education at Columbia University and surgical training at SUNY Downstate in Brooklyn, New York. He served as a faculty member at The University of Texas Southwestern Medical School in Dallas and Yale University School of Medicine in New Haven, Connecticut, before becoming a professor of surgery at the UMass Chan Medical School–Baystate.

In addition to clinical surgery, his current efforts are devoted to the training needs of new surgeons. His academic work has focused on the use of various simulation methods in surgical training, as well as the measurement of surgical skills for the purposes of professional development and high-stakes testing.

He has authored numerous scientific papers and other works on these subjects. He also serves as director of the Baystate Simulation Center–Goldberg Surgical Skills Lab and is a member of the ACS Academy of Master Surgeon Educators. His other education roles include chair of the Fundamentals of Laparoscopic Surgery Committee for the Society of American Gastrointestinal and Endoscopic Surgeons and chair of the Graduate Medical Education Committee at his home institution.

PODIUM PRESENTATION ABSTRACTS

The presenting author is underlined.

O-01 Research Abstracts

Immersive Simulation of Congenital Heart Disease: Patient-Specific Augmented Reality Model Development for Apple Vision Pro

Christopher Ibarra, MD; Alex D. Contreras, MD; Rebecca Barnes, MBS; Tommaso Cambiaghi, MD; Austin Ryan Shelton, MBE; Alan B. Lusmden, MD, ChB, FACS; and Andrea G. Quarti, MD, PhD

Houston Methodist Hospital, Houston, TX; The Bookout Center, Houston, TX

O-02 Research Abstracts

Can AI Provide Reliable Feedback for Surgical Skills? A Rubric-Based Comparison with Faculty for Suturing Assessment

Nicholas Roth, MD; Kendall Gross, MD; Traves Crabtree, MD; Pinckney Benedict; Nicole Sommer, MD, FACS; Janet Ketchum; Harrison Barr; Jessica Cantrall; and Sowmy Thuppal, PhD

Southern Illinois University School of Medicine, Springfield, IL

O-03 Research in Progress

Leveraging Scrum Framework for Innovative Simulation-Based Surgical Education: A Retrospective Methods Study

Dheeraj Baji, MD; Kristoffel Dumon, MD FACS; Caoimhe Duffy, MD, MSc; Joshua H. Atkins; Juan Perez MD; Sebastian Leon; Daniel Weber; Noel Williams; and Joy L. Collins, MD, FACS

Hospital of the University of Pennsylvania, Philadelphia, PA; Children's Hospital of Philadelphia, PA

O-04 Research in Progress

AI-Driven Dual-Layer Surgical Navigation to Prevent Ureteric Injury: Development and Preclinical Validation of DragonFlyX

Shwaib Hussam Eldin, MD, MAS; Srivatsan Manikandan, BSCS(C); Jenya Pandu, BSCS(C); Kristen Donohue, MD, FACS; Brendan F. Scully, MD; Theodore E. Eisenstat, MD, FACS; Daniel Lawrence Feingold, MD, FACS; and Nell Maloney Patel, MD, FACS, FASCRS

Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ

O-05 Challenges in Surgical Education

Mi SafeSAM: Early Evaluation and Durability Test of a Novel Infant Spinal Anesthesia Task Trainer

Benjamin Travis Gerber; Raj Patel; Deborah M. Rooney, PhD; and Ashlee Holman

University of Michigan, Ann Arbor, MI

O-06 Research in Progress

Patient-Specific 3D Modeling and Printing of Valvular and Thoracic Aortic Pathologies: A Feasibility Study

Carlos J. Perez, MD; Samuel D. Martinez; Nataly Gisseth Montañez; Maria Camila De Vivero; Juan Felipe Victoria; and Daniela Rojas

Universidad el Bosque, Bogotá, Colombia

O-07 Promoting Technology and Collaboration

Iterate and Innovate Through the Knowledge Donor Program Platform for Engineer-Surgeon Medical Device Development

Hahn Soe-Lin, MD, FACS; Kayla Gray; Mark Anthony Orlando; Nicholas Steele; Han Grezenko; James A. Mankin, MD; Vincent Pizziconi; and James Bogert, MD, FACS

CommonSpirit, Phoenix, AZ; Arizona State University, Phoenix, AZ; Arizona State University, Tempe, AZ

O-08 Research Abstracts

Evaluation of Objective Performance Indicators to Measure Skill and Drive Personalized Recommendations in the Early Robotic Surgery Learning Curve

Jeffrey Voien; Andrew Yee, PhD; and Gretchen Purcell Jackson, MD, PhD, FACS

Intuitive Surgical, Sunnyvale, CA; Intuitive Surgical, Atlanta, GA; Intuitive Surgical/Vanderbilt University Medical Center, Nashville, TN

O-09 Research Abstracts

Evaluating Surgical Reasoning in Multiagent Artificial Intelligence Systems Using the ENTRUST Learning and Assessment Platform

Benjamin Liu; Kiran Nijjer; Raghav Thallapragada; Derek Jiu; Adnan Ahmed; Jason Tsai; Jeffrey K. Jopling, MD; Edward Franklin Melcer; Dana Tsing-Yip Lin, MD, FACS; and Cara A. Liebert, MD, FACS

Stanford University School of Medicine, Palo Alto, CA; The Johns Hopkins University School of Medicine, Baltimore, MD; University of California, Santa Cruz, CA

O-10 Research Abstracts

Multimodal Graph Convolutional Networks for Action Recognition in the Operating Room

Benjamin Liu; Ryan Bui; Kiran Nijjer; Lauren Pak; Derek Jiu; Pranav Siddineni; Nicholas Rennie; Jeffrey K. Jopling, MD; Isabele Van Herzeele; and Serena Yeung-Levy

Stanford University, Palo Alto, CA; University of California, Irvine, Winnetka, CA, University of Southern California, Los Angeles, CA; United World College of South East Asia (Dover), Singapore, Singapore; Stanford University, Stanford, CA; University of California, Irvine, Irvine, CA; Ghent University Hospital, Ghent, Belgium; The Johns Hopkins University School of Medicine, Baltimore, MD

O-11 Research in Progress

Low-Cost, Patient-Derived, and Insufflatable Modular Abdominal Simulation Environment (MASE) for Surgical Testing

Kent K. Yamamoto, BS; Olufemi Oladokun, MD; Danyi Chen, BS; Layla Triplett, Med; Kerry Gao, BS; Katharine Jackson, MD, MBBS; and Sabino Zani, MD, FACS

Duke University, Durham, NC; Duke University School of Medicine, Durham, NC

O-12 Promoting Technology and Collaboration

3D Printed Bowel Anastomosis Models for Surgical Training: Bridging Technology and Collaboration

Warda Siddiqi; Joanna Kovilpillai; and Homero Rivas, MD, FACS

Mohammad Bin Rashid University of Health Sciences, Dubai, United Arab Emirates

O-13 Research Abstracts

Scalpel and Code: An AI-Driven Framework for Automated Surgical Skill Assessment Using Real-World Robotic Data

Han Grezenko; Josh Zhe; Kayla Gray; Mikaela G. Mahrer; Angela Mankin; Rylee McGuire, D O; James A. Mankin, MD; and Hahn Soe-Lin, MD, FACS

CommonSpirit, Phoenix, AZ, University of Arizona, Phoenix, AZ; CommonSpirit, Scottsdale, AZ; Creighton University, Phoenix, AZ

O-14 Promoting Technology and Collaboration

Low-Cost Pressurized Porcine Heart Model with Physiologic Coronary Flow for Cardiopulmonary Bypass and Off-Pump Skills Training

Celestino Castanon, MD; Katherine Foley, MD; Mohamad A. Allam, MD, FACS; and Vern Antoine Keller, MD, FACS, FACC

Louisiana State University Health, New Orleans, LA

O-15 Research Abstracts

Seeing the Unseen: AR Visualization Powered by State Estimation for Breast Conserving Surgery

Jacqueline Tsai, MD, FACS; Yuxuan Wu; and Bruce Daniel, MD

Stanford University, Redwood City, CA; Stanford University, Stanford, CA

VIEW FULL ABSTRACTS

POSTER PRESENTATION ABSTRACTS

The presenting author is underlined.

Group A

P-A-01 Promoting Technology and Collaboration

Exploring Interaction Paradigms in VR Surgical Training: Hands Alone or Hand-Held Devices?

Dheeraj Baji, MD; Caoimhe Duffy, MD, MSc; Joshua H. Atkins; Sebastian Leon; Kristoffel Dumon, MD, FACS; Noel Williams; Juan Perez, MD; Joy L. Collins, MD, FACS; and Daniel Weber

Hospital of the University of Pennsylvania, Philadelphia, PA; Children's Hospital of Philadelphia, Children's Hospital of Philadelphia, Philadelphia, PA

P-A-02 Research in Progress

A Mixed Reality and 3D Printing-Based Simulation System to Enhance Planning and Education in Hepatectomies

James Tan; Max Choe; James B. Piper, MD; Larry Walker; and Jihui Li, PhD

Appleby College, Oakville, ON, Canada; James Madison High School, Vienna, VA; Inova Fairfax Medical Campus, Falls Church, VA

P-A-03 Research Abstracts

Training Surgeons Like Athletes: Surgical Video Coaching in OB-GYN

Julia Rose Alvey, BS; Lyons R. Genevieve, MSPH; and Laura N. Homewood, MD

University of Virginia School of Medicine, Falls Church, VA; University of Virginia School of Medicine, Charlottesville, VA; University of Virginia Department of Obstetrics and Gynecology, Charlottesville, VA

P-A-04 Research in Progress

Bowel Perfusion Monitoring with FUJIFILM ELUXEO® VISION Imaging System in Colorectal Surgery

Anthony Lim, MD; Alexis Peters, MD; Jordan Martucci, MD; Aubrey Swinford, MD; Abhinav Gupta, MD; Brian Williams, MD; Sacha Broccard, MD; Kyle G. Cologne, MD; Joongho Shin, MD; and Sang W. Lee, MD

Keck Medicine of University of Southern California, Los Angeles, CA

P-A-05 Research in Progress

Evaluating the Validity of a Virtual Reality Simulation for Emergency Front of Neck Access Training

Dheeraj Baji, MD; Caoimhe Duffy, MD, MSc; Joshua H. Atkins; Sebastian Leon; Kristoffel Dumon, MD, FACS; Juan Perez, MD; Joy L. Collins, MD, FACS; Noel Williams; and Daniel Weber

Hospital of the University of Pennsylvania, Philadelphia, PA; Children's Hospital of Philadelphia, Philadelphia, PA

P-A-06 Challenges in Surgical Education

Challenges in Motion Capture Technology to Assess Surgeon Technical Skills

Gary Sutkin, MD, FACS; Alleana Corpin, BA; Carsen Steele, BS; and Gregory W. King, PhD

University of Missouri Kansas City School of Medicine, Kansas City, MO; University of Missouri Kansas City School of Computing and Engineering, Kansas City, MO

P-A-07 Promoting Technology and Collaboration

Novel Retrieval-Augmented Generation (RAG) Models for Hand Surgery Education in Plastic and Orthopaedic Surgery

Iulianna Taritsa, MD; Berk Baris Ozmen, MD; Nishant Singh, MSc; Kavach Shah, MSc; Ibrahim Berber, MSc; Eugene Pinsky, PhD; Antonio Rampazzo, MD, FACS; and Graham S. Schwarz, MD, FACS

Cleveland Clinic, Cleveland, OH; Boston University, Boston, MA; Case Western Reserve University, Cleveland, OH; Cleveland Clinic, Pepper Pike, OH

P-A-08 Challenges in Surgical Education

Artificial Intelligence for Automated Surgical Phase Recognition: Addressing Challenges in Microsurgical Education

Berk B. Ozmen, MD; Iulianna Taritsa, MD; Nathan J. Honn, BS; and Graham S. Schwarz, MD, MSE, FACS

Cleveland Clinic, Cleveland, OH; University of Cincinnati, Cincinnati, OH

Group B

P-B-01 Research in Progress

Developing Soft Impact Exercise Foot Stepper Prototype to Reduce Frailty Preoperatively of Patients Undergoing Major Abdominal Surgery

Grace Ma, MSc, MD, FACS; Mike Commito; Patrick Galipaeu-Belair; Tabitha C. Rono; Bradely Deroches; and Harris Polehoykie

Health Sciences North, Sudbury, ON, Canada; Cambrian College of Applied Arts and Technology, Sudbury, ON, Canada; Health Sciences North Research Institute, Sudbury, ON, Canada

P-B-02 Research in Progress

Reconceiving the Current Standard of Surgical Simulation Training in the UK: A Multistage Initiative to Prepare Early Stage Doctors for Careers in Surgery

Sai Kotecha; Patrick Garfjeld; Jeffrey Gilmour; Luke Solomons; and Mohamed Shams

Oxford University Hospitals NHS Foundation Trust, United Kingdom

P-B-03 Promoting Technology and Collaboration

3D Printing High-Resolution Models in Silicone Rubber

Kevin Dai
Mimetic, Pittsburgh, PA

P-B-04 Research Abstracts

A Novel IMU-Based System for Tracking Surgical Device Orientations During Simulated Bicortical Screw Fixation: Foundation for More Effective Training of Foundational Orthopaedic Surgical Skills

Seung-Ho Bae, BS; Louis Grodman, MD, Meng; Colin Brady, MEng; Daniel S. Yang, MD; Mark Hake, MD; and Adam Abraham, PhD
University of Michigan Medical School, Ann Arbor, MI; University of California, San Diego Jacobs School of Engineers, La Jolla, CA; University of Michigan, Ann Arbor, MI; Trinity Health IHA Medical Group, Ann Arbor Campus, Ypsilanti, MI

P-B-05 Research Abstracts

Enhancing Medical Student Skill Acquisition in Trocar Placement Through Physical Simulation

Kyleigh Kriener, BSE, MSc; Mason Williams, BSc; Kate Sinclair, MSc, MD; Hayley Finley, MD; William Richardson, MD; and Mark John Midwinter, BMedSci(Hons), MBBS MD(Res), FRCS
The University of Queensland, Ochsner Clinical School, New Orleans, LA; The University of Queensland, Ochsner Clinical School, Jefferson, LA; The University of Queensland, Brisbane, Australia

P-B-06 Research in Progress

Determining Skill from Behaviors Analyzed in Videos of Knee Arthroscopy

Abigail Edwards; Geb Thomas; Evan Williams; Steven Long; Richard J. VanTienderen, CPT, USA, MC; and Donald D. Anderson
University of Iowa, Iowa City, IA

P-B-07 Research Abstracts

Evaluating CPR Breast Attachment Impact on EMT Training: A Randomized Controlled Trial

Deeya Sharma; Naeha Geogy; and Victoria A. Roach, PhD
University of Washington School of Medicine, Seattle, WA; University of Washington, Seattle, WA

Group C

P-C-01 Research in Progress

Social Network-Based Surgery Scheduling for Optimized Patient Experience and Quality of Care

Alejandro Diaz Barreiro Aldana; Abdullah Alsaheal; Nurcin Celik; Mehmet Akcin; M. Carolina Jimenez; Onur C. Kutlu, MD; and Jose M. Martinez
University of Miami, Miami, FL; University of Miami, Coral Gables, FL

P-C-02 Challenges in Surgical Education

Beyond One-Size-Fits-All Tailoring Simulation Models to Surgical Learning Objectives

Kayla Gray; Mikaela G. Mahrer; Angela Mankin; Han Grezenko; Rylee McGuire, DO; James A. Mankin, MD; and Hahn Soe-Lin, MD, FACS
CommonSpirit, Phoenix, AZ; CommonSpirit, Scottsdale, AZ; Creighton University, Phoenix, AZ

P-C-03 Research Abstracts

The Value of Self-Assessment in Robotic Surgical System Training

Stella Zaharoff; Jeff Spalazzi, PhD; Robin Xu; Sara Lazzaretti, PhD; and Ed Chekan, MD, FACS
Asensus Surgical, Durham, NC

P-C-04 Research in Progress

Expert-Novice Behavioral Differences in a Pediatric Supracondylar Distal Humerus Fracture Reduction and Fixation Simulation

Molly Bimm; Marcus Tatum, MS; Steven Long, PhD; Donald D. Anderson; and Geb Thomas
University of Iowa, Bettendorf, IA; University of Iowa, Iowa City, IA

P-C-05 Research in Progress

AI-Powered Markerless 3D Motion Analysis for Objective Assessment of Suturing Proficiency

Jafar Arash Mehr; Eric S. Hungness, MD, FACS; and Jeffrey H. Barsuk, MD
Northwestern Simulation, Northwestern University, Chicago, IL; Northwestern Medicine, Northwestern University, Chicago, IL

P-C-06 Research in Progress

Robotic Surgery Simulation for Warm Up, Skill Maintenance, and Skill Enhancement in Practicing Surgeons

Andrew Yee, PhD; Niranjan Sathivel, MD; Nuvi Njinimbam; Jeffrey Voien; Karlis Draulis; and Gretchen Purcell Jackson, MD, PhD, FACS
Intuitive Surgical, Atlanta, GA; Intuitive Surgical, Sunnyvale, CA; Intuitive Surgical/Vanderbilt University Medical Center, Nashville, TN

P-C-07 Research in Progress

Evaluation of 3D Printing Capabilities of Polymeric Gyroid Bone Scaffolds

Georgia Wimmer, BS, and Alina Kirillova, BS, MS, PhD

University of Nebraska Medical Center, Omaha, NE; Iowa State University, Ames, IA

P-C-08 Research Abstracts

Peer Review of Consent Process in a District General Hospital in North Wales: A Quality Improvement Project

Joyanti Ghosh, MBBS; Mostafa Abdelkarim, MRCS; Elizabeth Dean, MRCS; Richard Morgan, MB BS, FRCS; Antonio Alves Dos Santos, FRCS; and Mahir Al-Rawi, MB ChB, FRCS

Glan Clwyd Hospital, Slough, United Kingdom; Glan Clwyd Hospital, Rhyl, United Kingdom

Group D

P-D-01 Research Abstracts

Networks Analysis of Clinical Outcomes for Multidisciplinary Care in Burn ICU Teams

Jericho Hallare, MD; Ashley Peters, MD; John C. Kubasiak, MD, FACS; and Nicholas D. Soulakis, PhD

Loyola University Medical Center, Maywood, IL; Loyola University, Chicago, IL

P-D-02 Research Abstracts

Designing Natural Language, Reinforcement Learning Agents for Surgical Decision-Making Using a Virtual Patient Simulation Platform

Benjamin Liu; Niyel Hassan; Raghav Thallapragada; Derek Jiu; Adnan Ahmed; Jason Tsai; Jeffrey K. Jopling, MD; Dana Tsing-Yip Lin, MD, FACS; Edward Franklin Melcer; and Cara A. Liebert, MD, FACS

Stanford University, Stanford, CA; The Johns Hopkins University School of Medicine, Baltimore, MD; Stanford University School of Medicine, Stanford, CA; University of California, Santa Cruz, CA; Stanford University School of Medicine, Palo Alto, CA

P-D-03 Research in Progress

System and Method for Continuous Critical Tissue Tracking in Surgical Procedures

Mikhail Chowdhury

McGill University, Montreal, QC, Canada

P-D-04 Challenges in Surgical Education

Enhancing Fundamentals of Laparoscopic Surgery Training with Vision and Infrared Camera-Based 3D Tracking

Niya Simone Johnson, BS; Shawn Moore, EdD; and Zhen Zhu, PhD

East Carolina University, Brody School of Medicine, Greenville, NC

P-D-05 Research Abstracts

CROWNS: A Platform to Train and Assess Wire Navigation Skills in Orthopaedics

Steven Long, PhD; Geb Thomas, PhD; Donald D. Anderson, PhD; Heather Kowalski, MD; and Matthew Karam, MD

University of Iowa, Iowa City, IA

P-D-06 Research in Progress

Device and Method to Facilitate a Guidewire to Cross the Aortic Valve in Difficult Situations

Danielle Niemann, DO, and Rabin Gerrah, MD

Good Samaritan Regional Medical Center, Corvallis, OR; Stanford University, Corvallis, OR

P-D-07 Research Abstracts

Impact of Sinus Surgery on Nitric Oxide Concentration in the Maxillary Sinus

Jessica Chan; Giancarlo B. Cherobin, MD, PhD; and Guilherme J. M. Garcia, PhD

Medical College of Wisconsin, Wauwatosa, WI; Universidade Federal de Minas Gerais, Minas Gerais, Brazil

P-D-08 Promoting Technology and Collaboration

Developing a 3D Printed Laparoscopic Fundoplication Model for Surgical Training

Warda Siddiqi; Joanna Kovilpillai; and Homero Rivas, MD, FACS

Mohammad Bin Rashid University of Health Sciences, Dubai, United Arab Emirates

Group E

P-E-01 Research in Progress

Haptic Models Protocol with AI: Transforming Learning and Surgery

Andres Felipe Vargas Cuadros; Jonathan Camargo Leyva; Luis Felipe Cabrera Vargas, MD, FACS; Emmanuel Forero; Luisa Fernanda Leal Puig; Maria Diaz Sanchez; and Melissa Hernandez Hoyos

Universidad de los Andes, Bogotá DC, Colombia; Pontificia Universidad Javeriana, Bogotá DC, Colombia

P-E-02 Promoting Technology and Collaboration

Engineers in the Operating Room Collaborative Innovation in Surgical Technology Through Engineering-Driven Clinical Exposure

Mark Anthony Orlando; Nicholas Steele; Kayla Gray; Han Grezenko; James Bogert, MD, FACS; Hahn Soe-Lin, MD, FACS; Vincent Pizziconi; and James A. Mankin, MD

Arizona State University, Phoenix, AZ; CommonSpirit, Phoenix, AZ; Arizona State University, Tempe, AZ

P-E-03 Research Abstracts

Concise and Effective Simulation-Based Tracheostomy Education for Preclinical Medical Students

Tony D. Satroplus, MD; Katie Geelan-Hansen, MD; Christopher Bingcang, MD, FACS; Tony Richa; Chelsea Hamill, MD; and Jayme Rose Dowdall, MD
University of Nebraska Medical Center, Omaha, NE

P-E-04 Promoting Technology and Collaboration

A Space Habitat Surgical Bay—A Collaborative & Interdisciplinary Model for Space Surgery Research, Simulation, Training & Education

Bindhu Oommen, MD, MPH, FACS; Michael Hodapp, DDS; Thomas S. Hoffman; Connor J. MacRobbie; Madelyn MacRobbie; Mira Milas, MD; Eric H. Petersen, MD; Kai Staats, MSc; Kaleigh A. Stabenau; and David Wexler, MD, PhD
Space Analog for the Moon and Mars at University of Arizona, Plano, TX; University of Waterloo, Waterloo, ON, Canada; Health Sciences and Technology, Massachusetts Institute of Technology and Harvard Medical School, Cambridge, MA; Banner University Medical Center, Tucson, AZ; Space Analog for the Moon and Mars at University of Arizona, Oracle, AZ; University of California Irvine School of Medicine; University of Massachusetts Lowell, MA

P-E-05 Research in Progress

Microsimulation Improves Stop the Bleed Training Among First-Year Medical Students

Robert Salkin, BSA; Claudia Ranniger, MD, PhD, FACEP; and Megan Theresa Quintana, MD, FACS
The George Washington University School of Medicine and Health Sciences, Washington, DC

P-E-06 Research in Progress

Automated Surgical Knot-Tying Skill Assessment Tool using Computer Vision

Cameron Martine Reid; Sarah Glomski; Zachary T. Moore; Shannon Barter, MD; Joanna D. Bertram, PhD; Kent K. Yamamoto; Siobhan Oca, PhD; Sabino Zani, MD, FACS; and Katharine Louise Jackson, MD, FACS
Duke University, Carrollton, GA; Duke University, Durham, NC; Duke University School of Medicine, Durham, NC

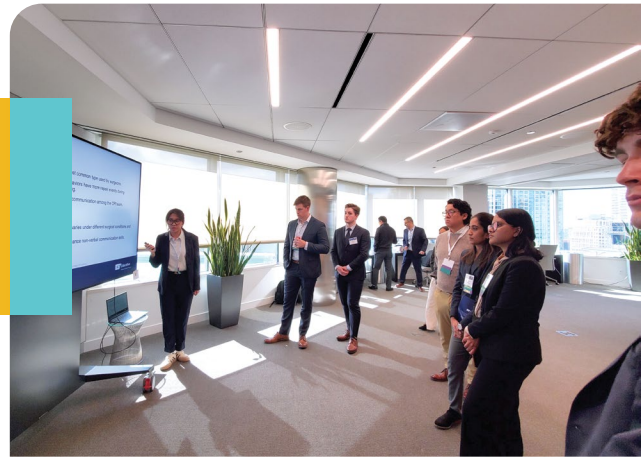
P-E-07

Promoting Technology and Collaboration

Augmented Reality Glasses for Real-Time Bedside Guidance in General Surgery Resident Education: A Feasibility Study

Jeffrey Baum, MD; Tomer Lagziel, MD; Colin Rousset, MD; Priscilla Tran, MD; Jennifer Cheung, MD; Neema Patel, MD; Paige Varney, MD; Joseph Caliendo, BS; Shariyour Andaz, MD; and Joshua Melamed, MD
Icahn School of Medicine at Mount Sinai, Mount Sinai South Nassau, Valley Stream, NY; Icahn School of Medicine at Mount Sinai, Mount Sinai South Nassau, Rockville Centre, NY; Icahn School of Medicine at Mount Sinai, Mount Sinai South Nassau, Oceanside, NY

VIEW FULL ABSTRACTS



DO-IT-YOURSELF (DIY) COMPETITION ENTRIES

The aim of the Do-It-Yourself (DIY) Simulator/Model Competition is to promote the development of DIY simulators and models to improve simulation-based surgical education and training. The DIY theme reflects the strong spirit of innovation and drive for improving educational outcomes championed by the surgical simulation-based education community. The competition received great interest and will feature 20 DIY entrants demonstrating innovative and cost-effective surgical simulation solutions they have developed. Dedicated time for the DIY Competition in the Surgeons and Engineers Meeting program will ensure that all attendees are able to explore the creative and impactful innovations from the community. A panel of expert judges will evaluate the entries, and the top three entries will be recognized. Additionally, we encourage all attendees to vote for their top DIY simulator/model for the notable Popular Vote Award.

DIY-A-01
Rotator Cuff Repair Simulator
Aaron Damon
Mayo Clinic, Rochester, MN

DIY-A-02
Thyroid Biopsy Ultrasound Training Model
Ibrahim Gomaa, MD
Mayo Clinic, Rochester, MN

DIY-A-03
A Low-Cost 3D Printing DIY Simulation Model for OB-GYN Procedures
Cameron Harris, MD
Cleveland Clinic, Cleveland, OH

DIY-A-04
Appy-Ready
Saad Mahmood
Johns Hopkins School of Medicine, Columbia, MD

DIY-A-05
3D Printed Laparoscopic Trainer
Olivia Heinecke
University of South Dakota, Sanford School of Medicine, Vermillion, SD

DIY-A-06
Pediatric Laparoscopic Inguinal Hernia Repair Trainer
Jeremiah Egolf, BSBME
Boston Children's Hospital, Boston, MA

DIY-A-07
Hernia 3D Training Model
Paulo Barros, MD
Hospital Israelita Albert Einstein, São Paulo, Brazil

DIY-A-08
Low-Cost DIY Pediatric Laparoscopic Trainer
Sarah Chen, MB BCh BAO (Hons)
Nationwide Children's Hospital, Columbus, OH

DIY-A-09
Suprapubic Tube Simulator
Mika Lindsley, MD, MPH
Lahey Hospital & Medical Center, Burlington, MA

DIY-A-10
Pediatric Neck ECMO Simulator
Francesco Bertelli, MD
The Hospital for Sick Children, Toronto, Canada

DIY-B-01
Low-Cost, DIY, Internal Bleeding Simulator for Trauma Surgical Simulation
Bao-Ling Adam, PhD
Medical College of Georgia, Augusta University, Augusta, GA

DIY-B-02
3D Printed Hemodialysis Simulator
Keenan Gibson, DO
University of California, Davis, Sacramento, CA

DIY-B-03
VCOM Virginia Laparoscopic Box Trainer
Rozlan Basha, BS
Edward Via College of Osteopathic Medicine Virginia Campus, Blacksburg, VA

DIY-B-04
Low-Cost Modular Abdominal/Appendectomy Surgery Simulator
Edvin Pepeljak
University of Limerick, Ireland

DIY-B-05
UA Canthotomy Trainer
James Lindgren, MD
University of Arizona College of Medicine, Phoenix, AR

DIY-B-06
Low-Cost, 3D Endovascular Navigation Training Platform with Reconfigurable Vascular Branch Points
Lais Haddad
Texas A&M School of Engineering Medicine, Houston, TX

DIY-B-07
Anatomically-Accurate, Low-Cost Educational Model for Endovascular Procedures Utilizing Ultrasound-Guided Common Femoral Artery Access
Veronica Stuckey, BS
Texas A&M School of Engineering Medicine, Houston, TX

DIY-B-08
Sebaceous Cyst Excision
Oviya Giri, MBBS
Mayo Clinic, Rochester, MN

DIY-B-09
MiSafeSpinalSam
Raj Patel, MEng
Michigan Medicine, Redford, MI

SURGEONS AND ENGINEERS COMMITTEE

Chair

Gyusung I. Lee, PhD
Assistant Director, Simulation-Based Surgical Education and Training, *American College of Surgeons, Chicago, IL*

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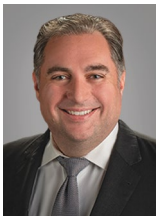

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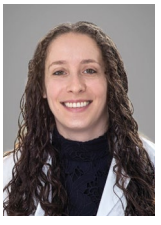

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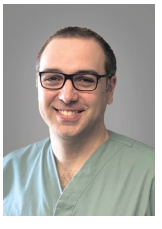
Doran S. Mix, MD, FSVS, RPVI
Associate Professor of Surgery, Division of Vascular Surgery, *University of Rochester Medical Center, NY*



Giuseppe Retrosi, MD, MEd, FACS
Assistant Professor; Pediatric General Surgeon; Health Sciences Center, *University of Manitoba, Winnipeg, Canada*

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Assistant Research Professor, Malone Center for Engineering in Healthcare, Whiting School of Engineering, *The Johns Hopkins University, Baltimore, MD*

Areti Tillou, MD, FACS, MSEd
Professor; Vice-Chair for Education; Assistant Designated Institutional Official; Director, UCLA-CASIT Accredited Education Institute, *UCLA School of Medicine, Department of General Surgery, Los Angeles, CA*

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SPONSORSHIP AND EXHIBIT OPPORTUNITIES

The annual ACS Surgeons and Engineers: A Dialogue on Surgical Simulation meeting is growing. Sponsorship and exhibit opportunities are available on a first-come, first-served basis.

Sponsorship
Various levels of sponsorship opportunities are available.

Exhibitors
Meeting participants have asked for exhibitor involvement. Exhibitors are invited to participate in this meeting.

Please visit *facs.org/surg-eng* for more information about 2026 meeting opportunities.

JOIN THE COMMUNITY

Interested in being part of the ACS Surgeons and Engineers Community? Connect with nearly 200 members in our growing LinkedIn group!

ACS SURGEONS & ENGINEERS *Community*

SAVE THE DATE

S&E 27 | SURGEONS AND ENGINEERS

A Dialogue on Surgical Simulation

March 9–10 | Chicago, IL

Call for Abstracts and Content in May 2026
Registration will open late fall.

ACS AMERICAN COLLEGE OF SURGEONS

2026 MEETING SURVEY

Thank you for attending *the 2026 ACS Surgeons and Engineers: A Dialogue on Surgical Simulation meeting.*

In order to better serve the surgical and engineering communities, we ask that you complete a brief survey. Please share what you found valuable about the meeting's content and changes or additions that would be impactful in the future.

NAVIGATE TO
https://redcap.link/2026SurgEngFeedback

OR SCAN THE QR CODE
with your smartphone camera to access the survey

We offer you our sincere thanks for attending this meeting, and we hope you have gained beneficial insights and inspiration from this dialogue and activity.

We welcome your input. Please contact Gyusung Lee, PhD, at glee@facs.org or 312-202-5782 with any questions, comments, and suggestions to benefit the planning of future meetings.

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