

CURRICULUM VITAE

The University of Arizona Health Sciences

DAVID E. BIFFAR, MS, CHSOS-A, FSSH

DEMOGRAPHIC AND PERSONAL INFORMATION

Current Appointment:

Director, Healthcare Simulation Operations, Arizona Simulation Technology & Education Center (ASTECC), University of Arizona Health Sciences (UAHS), Tucson, AZ

Current Professional Role

Editor-in-Chief, Simulation Technology and Operations Resource Magazine (STORM) and the International Meeting for Simulation in Healthcare (IMSH) Conference Proceedings, Society for Simulation in Healthcare, Minneapolis, MN

Personal Data:

Office Address: University of Arizona Health Sciences
Health Sciences Innovation Building
Arizona Simulation Technology and Education Center (ASTECC)
1670 E. Drachman St.
7th Floor
Tucson, AZ 85721

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E-Mail Contact: dbiffar@surgery.arizona.edu

Website: www.astec.arizona.edu

EDUCATION AND TRAINING

Undergraduate

1999 BS, Human Resources Management, Kings College, Wilkes-Barre, PA
1/98-5/98 Internship, Welfare Rapid Attachment Assistant, Catholic Social Svcs., Wilkes-Barre, PA
9/99-12-99 Internship, Human Resources Assistant, King's College Hospital, London, England

Graduate

2009 MS, Mental Health Counseling, Nova Southeastern University, Fort Lauderdale, FL
1/08-12/08 Practicum, Clinical Intern (450 hrs.), Providence Services Corp., Tucson, AZ

PROFESSIONAL EXPERIENCE

3/00-12/00 Recruitment Admin for the S/C Regional Business Group, Merck & Co., West Point, PA
11/01-10/03 Quality of Care Administrator, Corporate Office, VisionQuest, Ltd., Embreeville, PA
10/03-6/08 Case Manager / Senior Youth Advocate II, VisionQuest, Ltd., Hesperia, CA & Tucson, AZ

7/08-12/09	Instructional Specialist, Coordinator, Arizona Simulation Technology & Education Center (ASTECC), University of Arizona, Department of Surgery, Tucson, AZ
12/09-1/12	Laboratory Manager, Arizona Simulation Technology & Education Center (ASTECC), University of Arizona, College of Medicine, Tucson, AZ
10/10-7/12	Seven Challenges Group Supervision / Facilitator, Aggression Replacement Group Facilitator, Therapist, VisionQuest, Ltd., Tucson, AZ (ad hoc)
01/12-08/21	Assistant Director, Operations, Appointed Professional, Arizona Simulation Technology & Education Center (ASTECC), University of Arizona Health Sciences (UAHS), Tucson, AZ
05/21-	Editor-in-Chief, Simulation Technology and Operations Resource Magazine (STORM) and the International Meeting for Simulation in Healthcare Conference Proceedings (IMSH), Society for Simulation in Healthcare
09/21-	Director, Healthcare Simulation Operations, Arizona Simulation Technology & Education Center (ASTECC), University of Arizona Health Sciences (UAHS), Tucson, AZ

HONORS AND AWARDS

2011	Recipient, National Award for Excellence in Fire Service-Based EMS – Career Category, Presented by the Medic-Alert Foundation and the Congressional Fire Services Institute
2013	Nominee, University of Arizona Award for Excellence
2019	Recipient, Best in Show Award for Augmented Reality-Guided Wound Closure Application, Serious Games and Virtual Environments Showcase, International Meeting for Simulation in Healthcare (IMSH)
2023	Fellow, Class of 2024, Society for Simulation in Healthcare Academy
2024	Presented with Military Challenge Coin for exemplary work in healthcare simulation, Office of the Command Surgeon, Air Forces Southern (12 th AF), Davis-Monthan AFB, AZ

SERVICE AND OUTREACH

5/96-10/04	Volunteer, Executive Committee, Philadelphia Folksong Society / Folk Festival
4/00	Volunteer, Archives, Philadelphia Celtic Festival
9/09-6/14	Staff Pre-med Mentor, Fostering and Achieving Culture Equity and Sensitivity in the Health Professions (F.A.C.E.S.), College of Medicine Office of Outreach and Multicultural Affairs, University of Arizona
6/10-7/12	Mentor, Tucson Urban League, June 2010 – July 2012
8/10-	Staff Mentor, University of Arizona Assurance Program
1/12-	Mentor, Society for Simulation in Healthcare, Intermittent
7/16-9/18	Mentor, The Gathering of Healthcare Simulation Technology Specialists
1/22/24	SimVentors Judge, SimVentors Showcase, International Meeting for Simulation in Healthcare, San Diego, CA, Jan 20 – 24, 2024
11/24-	Mentor, Advancing Simulation Careers and Empowering Next-Generation Development (ASCEND) Program, Society for Simulation in Healthcare (SSH)
11/25-	Mentor, Presentation Mentor for the 2026 International Meeting for Simulation in Healthcare (IMSH), Society for Simulation in Healthcare (SSH)

COMMITTEE SERVICE - INTERNAL

7/08-present	Co-Chair, Simulation Committee, University of Arizona Health Sciences
9/10-5/18	Member, Interprofessional Education and Practice Coordinating Council, Arizona Health Sciences Center
9/12-9/14	Co-Chair, Interprofessional CPR Coordinating Committee for Colleges of Medicine, Nursing and Pharmacy

- 9/15- Member, UAHS Health Sciences Innovation Building, Design Committee, Simulation/Clinical Skills User Group
- 7/16- Member, University of Arizona, College of Medicine, Curriculum Renewal Project, Scholarly Project-Transition to Residency Committee
- 1/17-6/18 Member, University of Arizona, College of Medicine, Learning Modalities Workgroup for Curriculum Reorganization
- 9/18-6/19 Member, University of Arizona Health Sciences Strategic Plan Committee, 5.1: Technology Solutions for Health Initiative team
- 6/18- Member, University of Arizona Health Sciences Interprofessional Education Advisory Committee
- 12/19- Initiative Owner, University of Arizona Strategic Plan, Wildcat Journey: Driving Success for a Rapidly Changing World, Interprofessional Education, UAHS 1.3
- 5/21 – 8/21 Intersession Course Director Search Committee, College of Medicine, University of Arizona Health Sciences
- 6/22- Member, Working Group for International Simulation Programs (WISP), Global Medical Degree Program (GMDP), University of Arizona Health Sciences (UAHS) and the University of Western Australia (UWA)
- 9/25- Member, College of Medicine Technology Integration Committee, Curriculum Renewal Initiative

COMMITTEE SERVICE - EXTERNAL

- 1/11-12/11 Member and Simulation Coordinator, Advisory Board and Content Reviewer, Collaborating Across Borders, 3rd Biennial Interprofessional Educational Conference
- 9/11- Member, Simulation Operations and Technology Section (SOTS), Society for Simulation in Healthcare
- 6/13- Member, Directors Special Interest Group, Society for Simulation in Healthcare
- 1/14-6/14 Content Reviewer, Society for Modeling & Simulation International, Simulation Multiconference, Summer 2014 (SCSC14)
- 9/14- Member, Healthcare Systems Modeling and Simulation Affinity Group, Society for Simulation in Healthcare
- 11/17-2/25 Accreditation Site Reviewer, Society for Simulation in Healthcare (SSH)
- 1/18-9/18 Co-Team Lead for Content Development, Technical Operations Track, Society for Simulation in Healthcare, SimOps 2018
- 7/18- Off-Site Immersive Content Team Lead, International Meeting for Simulation in Healthcare Planning Committee
- 05/21- Editor-in-Chief, Simulation Technology and Operations Resource Magazine (STORM), Society for Simulation in Healthcare
- 9/21- Member, Technology Collaborative Group, Society for Simulation in Healthcare (SSH)
- 01/22- Member, Certification CHSOS-A Subcommittee, Society for Simulation in Healthcare (SSH)
- 04/23- Member, Quality Subcommittee, Society for Simulation in Healthcare (SSH) Accreditation Council
- 01/25- Board Member, Accreditation Council, Society for Simulation in Healthcare (SSH)
- 02/25- Member, Accreditation Marketing Working Group, Society for Simulation in Healthcare (SSH)
- 2/25- Accreditation Site Reviewer – Team Lead, Society for Simulation in Healthcare (SSH)

CERTIFICATIONS AND TRAINING

- 5/02 AMC Outdoor Leadership, Appalachian Mountain Club

10/02	Middle Management, VisionQuest, Ltd.
4/05	Aggression Replacement Training Provider, Education and Treatment Alternatives, Inc.
5/06	Safe Crisis Management Trainer, JKM Training, Inc.
6/06	Rational Living Therapy – Level One Provider, The National Assoc. of Cognitive-Behavioral Therapists
12/06	Multicultural Competency Provider, California Department of Behavioral Health
7/08	Love & Logic Provider, Providence Services Corporation
5/08	Human Patient Simulator Advanced Operator, Medical Education Technologies, Inc. (METI)
3/09	Human Patient Simulator Advanced Operator, Laerdal Medical
9/10	Mold Making and Casting, Smooth-on, Inc.
11/10	Developing a Telemedicine Program, Arizona Telemedicine Program
12/10	BLS for Healthcare Providers, American Heart Association
10/11	Boot Camp Elementary Moulage Technician Course, Military Moulage Combat Injury Simulation
9/12	SimCapture Training Course, B-Line Medical
10/12	SimPad Integration Course, Laerdal Medical
5/14	Certified Group Counselor: The Seven Challenges Comprehensive Substance Abuse Program
3/15	Management in Action Program, University of Arizona
5/16	3D Printing using Cura
1/17	REDCap Basic Training
12/17	Certified Healthcare Simulation Operations Specialist (CHSOS)
03/21	Certified Healthcare Simulation Operations Specialist – Advanced (CHSOS-A, First application cycle)

PROFESSIONAL SOCIETIES

10/08-	Society for Simulation in Healthcare
5/09-	American Psychological Association
1/12-	American Telemedicine Association
9/12-	Human Factors and Ergonomics Society

PATENTS

US Patent No.: US 11,375,985 B2, Systems and Methods for an Ultrasound-Guided Percutaneous Nephrostomy Model, Jul. 5, 2022

US Patent No.: US 11,727,828 B2, Virtual Reality Environment Adapted to Model the Mammalian Airway for Intubation and Airway Management Training, Aug. 15, 2023

RESEARCH ACTIVITIES

Publications:

1. Latifi R, Dehdashti B, **Biffar DE**, Ong E, Jie T, Galvani C, Waer A, Gruessner R. Intensive Laparoscopic Training Course for Surgical Residents: Program Description and Initial Results. Surgical Endoscopy, 25(7), July 2011.
2. Thompson JL, Grisham LM, Scott J, Mogan C, Prescher H, **Biffar DE**, Jarred J, Meyer RJ, Hamilton AJ. Construction of a Reusable High-Fidelity Model to Enhance Extracorporeal Membrane Oxygenation Training Through Simulation. Advances in Neonatal Care, 14(2), pp. 103-109. 2014
3. Prescher H, **Biffar DE**, Galvani CA, Rozenblit JW, Hamilton AJ. Evaluation of a Navigation Grid to Increase the Efficacy of Instrument Movement During Laparoscopic Surgery. Laparoendosc Adv Surg Tech A. 2014 Sep; 24(9):656-9

4. Prescher H, **Biffar DE**, Galvani CA, Rozenblit JW, Hamilton AJ. Surgical Navigation Pointer facilitates Identification of Targets in a Simulated Environment. Proceedings of the Computer Simulation Multiconference, Summer 2014 (SCSC'14), Society for Modeling & Simulation International. 2014 Jul; 35:1-7
5. Prescher H, **Biffar DE**, Rozenblit JW, Hamilton AJ. The comparison of High Definition Versus Stereoscopic Display on Standardized Fundamental Laparoscopic Skill Procedures. Proceedings of the Computer Simulation Multiconference, Summer 2014 (SCSC'14), Society for Modeling & Simulation International. 2014 Jul; 48:1-6
6. Prescher H, **Biffar DE**, Meinke LE, Jarred JE, Brooks AJ, Hamilton AJ. Video-guided Direct laryngoscopy: Consideration for using Simulation to Teach Inexperienced Medical Students. Proceedings of the Computer Simulation Multiconference, Summer 2014 (SCSC'14), Society for Modeling & Simulation International. 2014 Jul; 36:1-6
7. Prescher H, Grover E, Mosier J, Stolz U, **Biffar DE**, Hamilton AJ, Sakles JC. Telepresent Intubation Supervision is as Effective as In-Person Supervision of Procedurally Naive Operators. *Telemed J E Health*, 2015 Mar;21(3):170-5.
8. Hamilton AJ, Prescher H, **Biffar DE**, Poston R. Simulation Trainer for Practicing Emergent Open Thoracotomy Procedures., *J Surg Res*, 2015 Jul;197(1):78-84
9. Amini R, Kartchner JZ, Stolz L, **Biffar DE**, Hamilton AJ, Adhikari S. A novel and inexpensive ballistics gel phantom for ultrasound training., *World J Emerg Med*, 2015;6(3):225-8
10. Grisham LM, Vickers V, **Biffar DE**, Prescher H, Battaglia NJ, Jarred JE, Reid SAH, Hamilton AJ. Feasibility of Air Transport Simulation Training: A Case Series, *Air Medical Journal*, 2016 Sep-Oct;35(5):308-13.
11. Ng V, Plitt J, **Biffar DE**. Development of a Novel Ultrasound Peritonsillar Abscess Model for Simulation Training. *West J Emerg Med*. 2018 19;1:172-6
12. Hughes KE, **Biffar DE**, Ahanonu EO, Cahir, TM, Hamilton AJ, Sakles J. Evaluation of an Innovative Bleeding Cricothyrotomy Model. *Cureus*. 2018 Sep 18;10(9):e3327. Doi: 10.7759/cureus.3327
13. Lovett M, Katz J, Lee S, **Biffar DE**, Hamilton A, Nguyen M, Hua H. Evaluation of Learning Curve and Peripheral Awareness Using a Novel Multiresolution Foveated Laparoscope. Proceedings for SpringSim 2019, The Society for Modeling & Simulation International, IEEE Xplore, ISBN: 978-1-7281-3547-2, Jun. 10, 2019.
14. Collins C, **Biffar DE**, Lovett M, Holder K, Yonsetto P, Holcomb M, Weinstein R, Hamilton A. The Use of Remote and Traditional Facilitation to Evaluate Telesimulation to Support Interprofessional Education and Processing in Healthcare Simulation Training. Proceedings for SpringSim 2019, The Society for Modeling & Simulation International, IEEE Xplore, ISBN: 978-1-7281-3547-2, Jun. 10, 2019.
15. Hamilton AJ, **Biffar DE**, Lovett M, Rozenblit J, Weinstein R, Kanda, J. When Hollywood Inspires Medicine: New Concepts in the Design and Architecture of Medical Simulation Facilities to Support Inter-Professional Healthcare Education and Training. Proceedings for SpringSim 2019, The Society for Modeling & Simulation International, IEEE Xplore, ISBN: 978-1-7281-3547-2, Jun. 10. 2019
16. Srikar A, Situ-LaCasse E, Acuna J, Irving S, Weaver C, Samsel K, **Biffar DE**, Motlagh M, Sakles J. (2020) Integration of Pre-intubation Ultrasound into Airway Management Course: A Novel Training Program. *Indian J Crit Care Med.*, 24(3), 1789-183, March, 2020
17. Lovett M, Phung M, **Biffar DE**, Hamilton A, Lee B, Tzou D. Development of a Low-Cost, High-Fidelity Simulator for Ultrasound-Guided Percutaneous Nephrolithotomy (PCNL). *The Journal of Urology*, 2020. 203_supplement 4_e688.
18. Situ-LaCasse E, Acuña J, Huynh D, Amini R, Irving S, Samsel K, Patanwala AE, **Biffar DE**, Adhikari S. Can ultrasound novices develop image acquisition skills after reviewing online ultrasound modules? *BMC Med Educ*. 2021 Mar 20;21(1):175.

19. Hughes K E, Islam M, Co B, Lopido M, McNinch NL, **Biffar DE**, Subbian V, Son YJ, Mosier JM, (August 20, 2023) Comparison of Force During the Endotracheal Intubation of Commercial Simulation Manikins. *Cureus* 15(8): e43808. doi:10.7759/cureus.43808
20. Lovett M, Ahanonu E, Molzahn A, **Biffar DE**, Hamilton AJ. Optimizing Individual Wound Closure Practice Using Augmented Reality: A Randomized Controlled Study. *Cureus* 2024;16(4): e59296. Published 2024 Apr 29. doi:10.7759/cureus.59296
21. Molzahn AG, Lovett MK, **Biffar D**, de Oliveira Almeida G, Hamilton AJ. The Effect of Time Pressure on Surgical Skill Retention in Novices: A Randomized Controlled Trial. *Surg Innov.* 2024 Oct;31(5):541-549. doi: 10.1177/15533506241273359. Epub 2024 Aug 4. PMID: 39097818.
22. Molzahn A, Burke-Alexander T, **Biffar D**, Hamilton A, Hughes KE. (August 25, 2025) Development of a Cricothyrotomy Virtual Reality Training Module. *Cureus* 17(8): e90955.
23. Samargandy S, Ahmadian D, Zhang J, **Biffar D**, Avery MB, Le C, Chang E. “Incorporating HTA and VR Simulation to Teach Trainees in Endoscopic Endonasal Skull Base Approaches,” *The Laryngoscope* (2025): 1–6. doi.org/10.1002/lary.70188.

Research Abstracts - Poster Presentations:

1. Hamilton AJ, Rozenblit J, Moore E, Feng C, Huang Z, **Biffar DE**. Determining Surgical Hand Dominance. Poster Presented at the Association of Surgeons in Training Surgical Conference, Kingston-upon-Hull, England, March 12-14, 2010
2. **Biffar DE**, Hamilton AJ, Grisham L, Jarred J, Prescher H, Brooks A, Meinke L. For the Inexperienced, Video Laryngoscopy is Superior to Direct Laryngoscopy for Airway Management Training. Poster Presented at the 12th International Meeting on Simulation in Healthcare (IMSH), San Diego, CA, Jan. 27 – Feb. 1, 2012.
3. Grover E, Mendelson J, Valdez S, **Biffar DE**, Hamilton AJ, Grisham L, Jarred J, Prescher H, Theodorou A. IPE PICU Simulation Training Program. Poster Presented at the 12th International Meeting on Simulation in Healthcare (IMSH), San Diego, CA, Jan. 27 – Feb. 1, 2012.
4. **Biffar DE**, Jarred J, Prescher H, Culliney S, Grisham L, Hamilton AJ. Improving Quality of Care by Training First Responders with High-fidelity Medical Simulations. Poster presented at the Annual Arizona Rural Health Conference. Tucson, AZ, Sept. 14, 2012
5. Hamilton AJ, Souza A, **Biffar DE**. Future Trends in Design of Clinical Simulation Facilities – Maximum Utilization Through Minimalist Design. Video abstract presented at the Association of American Medical Colleges (AAMC Annual Meeting, San Francisco, CA, Nov. 2 – 7, 2012
6. Prescher H, **Biffar DE**, Galvani C, Hamilton AJ. The Comparison of High Definition versus Stereoscopic Display on Standardized Fundamental Laparoscopic Skill Procedures. Poster Presented at the International Meeting for Simulation in Healthcare (IMSH), Orlando, FL, Jan. 26 – 30, 2013
7. **Biffar DE**, Poston R, Prescher H, Muzzy A, Hamilton AJ. Developing a Task Trainer to Improve Interprofessional Skills During Robotic Cardiothoracic Surgery. Research Abstract presented at the International Meeting for Simulation in Healthcare, Orlando, FL, Jan. 26 – 30, 2013
8. Prescher H, **Biffar DE**, Tomasa L, Berg M, Grisham L, Hamilton AJ. Breaking Barriers in Health Care Education: The Impact of Interprofessional CPR Training. Poster Presented at the 2013 Association of American Medical Colleges Annual Meeting, Philadelphia, PA, Nov. 1 – Nov. 6, 2013.
9. Grover E, Mosier J, Sakles J, Prescher H, **Biffar DE**, Stolz U. Telepresent intubation instruction is as effective as in-person when instructing naïve intubators. Poster presented at the 14th International Meeting on Simulation in Healthcare (IMSH), Jan. 25 – 29, 2014
10. Prescher H, **Biffar DE**, Tomasa L, Berg M, Grisham L, Mathesen Y, Theodorou A, Hamilton AJ. A seven-year collaboration between 3 colleges to learn interprofessional skills during a CPR team behavior simulation. Poster presented at the 14th International Meeting on Simulation in Healthcare (IMSH), Jan 25 – 29, 2014

11. Dreifuss B, Prescher H, **Biffar DE**, Hamilton, AJ. Developing a novel drain loop abscess model for training intern ED residents. Poster presented at the 14th International Meeting on Simulation in Healthcare (IMSH), Jan. 25 – 29, 2014
12. Frazier A, Prescher H, **Biffar DE**, Hamilton AJ. Using rotational casting techniques to create hollow viscous organs. Poster presented 14th International Meeting on Simulation in Healthcare (IMSH), Jan. 25-29, 2014
13. Ng V, Prescher H, Reid S, **Biffar DE**, Hamilton A. A Comparison of Porcine and Synthetic Models for Lateral Canthotomy and Cantholysis Work in Progress. Poster presented at the 15th Annual International Meeting for Simulation in Healthcare (IMSH), San Diego, Jan 16-20, 2016
14. Lovett MK, Reid S, Prescher H, **Biffar DE**, Fiorello AB, Hamilton AJ. Development and Testing of a Thoracostomy Assessment Tool through Self, Peer, and Expert Evaluation in a Simulation Environment. Poster Presented at the 15th Annual International Meeting for Simulation in Healthcare (IMSH), San Diego, Jan 16-20, 2016
15. Ng V, Prescher H, Barbosa A, **Biffar DE**, Hamilton A. Development of an Ultrasound Pericardiocentesis Model for Simulation Training. Presented at the 15th Annual International Meeting for Simulation in Healthcare (IMSH), Orlando, FL Jan 28-31, 2017
16. Abd El Aziz MA, Cahir TM, **Biffar DE**, Hamilton, AJ, Ghaderi, I. Asynchronous Telementoring in Proficiency-based Training in the Fundamentals of Laparoscopic Surgery (FLS) Skills: Use of Smartphones and Deliberate Practice. iPoster Presentation at the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Annual Meeting, Houston, TX, Mar. 22-25, 2017
17. Situ-LaCasse EH, Samsel K, Weaver C, Motlagh M, **Biffar DE**, Adhikari S. Can Nurse Practitioner Students Learn Point-of-Care Ultrasound Applications after One-Day Training Session? Poster presented at the American Institute of Ultrasound in Medicine, Orlando, FL, April 6 – 10, 2019
18. Molzahn A, Lovett M, **Biffar DE**, de Oliveeira Almedia G, Hamilton A. The Role of Sympathetic Modulation on Long-Term Retention of Information during Clinical Simulation. Poster presented at the International Meeting for Simulation in Healthcare (IMSH), Los Angeles, CA, Jan. 15-19, 2022

Research Abstracts - Podium Presentations

1. Research Presentation, “Developing a Task Trainer to Improve Interprofessional Skills During Robotic Cardiothoracic Surgery” Innovations Abstract selected for oral presentation at the International Meeting for Simulation in Healthcare, Orlando, FL, Jan. 26 – 30, 2013.
2. Research Presentation, “Surgical Navigation Pointer facilitates Identification of Targets in a Simulated Environment” Computer Simulation Multiconference, Summer 2014 (SCSC'14), Monterey, CA, July 6 – 10, 2014
3. Research Presentation, “The comparison of High Definition Versus Stereoscopic Display on Standardized Fundamental Laparoscopic Skill Procedures” Computer Simulation Multiconference, Summer 2014 (SCSC'14), Monterey, CA, July 6 – 10, 2014
4. Research Presentation, “Video-guided Direct laryngoscopy: Consideration for using Simulation to Teach Inexperienced Medical Students” Computer Simulation Multiconference, Summer 2014 (SCSC'14), Monterey, CA, July 6 – 10, 2014
5. Research Presentation, Learning Outcomes of Simulation-Based Education in Preclinical Curriculum: A Pilot Study” Research Abstract Oral Presentations on New Research Findings in Medicine, International Meeting for Simulation in Healthcare, Sand Diego, CA, Jan. 20 – 24, 2024

Extramural Funding

Submitted

PAR-24-247 SurgicalSteps: Virtual Reality Training Platform for Endoscopic Sinus Surgery
National Institute of Health (NIH) STTR / SurgicalSteps, LLC

1.3 Mil
PIs: Chang EH, Hamilton AJ
Role: Project Management / SME Reviewer, 4%

R43/R44 SBIR A Fully Immersive Virtual Reality Platform for Simulating Interpersonal Dynamics in the Pediatric ICU using Conversational Large Language Models
National Institute of Health (NIH)
PIs: Hamilton AJ, Biffar DE (Collaboration with industry)
Submitted Role: Project Management / SME Reviewer, 5%

Current

9/21- High Fidelity Patient Simulator Studies of Carbon Dioxide (CO₂) Accumulation and Physiological Effects of Superhydrophilic Nanoparticle Material (CAMO = Cysteic Acid Mineral Oxide) in CAMO-treated Masks Compared to Untreated and Standard N95 Masks
Arizona Commerce Authority
\$25,000
PI: Sternberg EM
Role: Project Manager (for the simulation phase), 2%

7/22- Development of an extended reality procedural training system for cricothyrotomy, intravenous access, lumbar puncture, and suturing
Industry: 8Chili, Inc.
\$18,200
PI: Hamilton AJ, Hughes, K
Role: Lead project manager, 5%

Previous

7/10-6/12 Laparoscopic Training and Airway Management in Medical Simulation
Educational Grant to Arizona Simulation Technology & Education Center;
Industry: Karl Storz Endoscopy-America
\$34,369
PIs: Hamilton AJ
Role: Co-investigator, 10%

7/11-6/12 Mannequin Development; Cardiothoracic Robotic Simulation Training
Educational Grant to Arizona Simulation Technology & Education Center,
University Medical Center Risk Management Process Improvement
\$13,956
PIs: Poston R, Hamilton AJ
Role: Simulation Technology Engineer and Operator, 10%

7/12-6/14 In Situ Medical Simulation Training for Pediatrics
Practice Plan Risk Management Process Improvement for Patient Safety Fund Program
University of Arizona Medical Center Risk Management Process Improvements for Patient Safety Fund Program \$25,000
PIs: Hamilton AJ, Theodorou A
Role: Research Coordinator, 5%

9/13-8/15	Optical Imaging Falloposcope for Minimally Invasive Ovarian Cancer Detection Department of Defense \$432,414 PIs: Barton, J Role: Simulation Technology Engineer, 5%
7/13-6/14	Best Practices in Central Line Insertion by Resident Physicians: A Simulation Lab Educational Program University of Arizona Medical Center Risk Management Process Improvements for Patient Safety Fund Program \$15,000 PIs: Fiorello A Role: Simulation Technician, 10%
8/15-7/16	Rural Simulation Training for the Arizona Area Health Education Centers (AHEC) Program Technology-Enhanced Rural Interprofessional Primary Care FNP Education, Department of Health and Human Services \$21,788 PIs: Reel S Role: Senior Research Coordinator, 10%
1/16-9/17	Leadership Education Advanced During Simulation (LEADS) Agency for Healthcare Research and Quality (R18) Department of Health and Human Services Control Site PI: Ng V Role: Senior Research Coordinator
7/18-6/19	Usability Study on the impact of a navigation grid on focusing instruments during FLS surgery tasks Karl Storz Endoscopy-America \$16,500 and \$30,000 fellowship PIs: Ghaderi I, Hamilton AJ Role: Senior Research Coordinator, 3%
7/15-6/20	Multi-Resolution Foveated Laparoscope for Safer Surgery National Institute of Health (RO1) \$1,779,165 PIs: Hua H, Hamilton, AJ Role: Senior Research Coordinator, 5%
7/16-6/20	Collaborative Research: Computer Guided Laparoscopy Training National Science Foundation Proposal No. 1622589 Div. of Information and Intelligent Systems \$1,118,923 PIs: Rozenblit J, Hamilton AJ Role: Senior Research Coordinator, 3%

Intramural Funding

Current

- 04/24- Virtual Reality and Computer Assisted Simulation of Tactile Feedback and Force Guidance in Functional Endoscopic Sinus Surgery Training
18th Mile Technology and Research Initiative Fund (TRIF)
\$200,000
PIs: Chang EH
Submitted Role: Lead Simulation Operations Specialist, 5%
- 01/25- Advancing Methadone Prescribing (AMP)
Vitalyst Health Foundation Spark Grant
\$46,000
PI's: Meyerson B, **Biffar DE**
- Previous*
- 7/12-6/13 Using artificial tissue to design high-fidelity teaching modalities – preparing medical students for clinical training
Vernon & Virginia Furrow Award, Academy of Medical Education Scholars (AMES) Grant for Medical Education Research,
University of Arizona, College of Medicine
\$5,000
PIs: Hamilton, AJ
Role: Co-investigator, 5%
- 7/15-6/16 Designing a Simulation-based Education Assessment Tool (SEAT) for Skill-based Simulation Assessment
Vernon & Virginia Furrow Award, Academy of Medical Education Scholars (AMES) Grant for Medical Education Research
University of Arizona, College of Medicine
\$5,000
PIs: Hamilton, AJ
Role: Co-investigator, 5%
- 7/15-6/16 3D Printing for Medical Applications
University of Arizona, IT Student Advisory Board,
\$26,012
PIs: **Biffar DE**
Role: PI, 10%
- 7/16-6/17 Ultrasound Imaging Simulation Training
University of Arizona, IT Student Advisory Board
\$24,500
PIs: **Biffar DE**
Role: PI, 10%
- 7/18-6/19 Optimizing Individual Suturing Practice using Augmented Reality
Vernon & Virginia Furrow Award, Academy of Medical Education Scholars (AMES) Grant for Medical Education Research
University of Arizona, College of Medicine
\$5,000

PIs: Hamilton AJ, **Biffar DE**

Role: PI, 10%

- 7/18-6/19 Can ultrasound naïve first-year medical students develop hands-on skills in image acquisition after reviewing online ultrasound modules?
Vernon & Virginia Furrow Award, Academy of Medical Education Scholars (AMES) Grant for Medical Education Research,
University of Arizona, College of Medicine
\$5,000
PIs: Adhikari S, Situ-LaCasse EH
Role: Senior Research Coordinator, 3%
- 7/19-6/22 What Differentiates Expert from Novice Surgeons? A study of eye movements and verbal reports during a critical event in laparoscopic cholecystectomy
Vernon & Virginia Furrow Award, Academy of Medical Education Scholars (AMES) Grant for Medical Education Research
University of Arizona, College of Medicine
\$5,000
PI: Ghaderi, I
Role: Senior Research Coordinator, 3%
- 2/22-6/23 IMMERSION: IMmersive MixEd-Reality SimulatION for Difficult Airway Management.
Sensor Lab Seed Grant
University of Arizona Health Sciences
\$50,000
PI: Hughes, K
Role: Senior Research Coordinator, 1%
- 12/21-6/23 When Conflict Arises in the OR: Teaching Anesthesiology Residents Conflict Management Strategy with Multidisciplinary Involvement
Academy of Medical Education Scholars (AMES) Grant for Medical Education Research
University of Arizona, College of Medicine
\$5,000
PI's: Thoeny A, Garcia G
Role: Simulation Operations Specialist, 1%
- 5/24-12/24 Transfer efficiencies of Escherichia coli from fingertip to the eyes, nose, and mouth using simulated human face.
University of Arizona Graduate & Professional Student Council Grant
\$2,220
PI: Elizondo-Craig G
Role: Modeling of synthetic materials, 1%

SUPERVISED RESEARCH ACTIVITIES (MENTOR-MENTEE)

- 01/09-5/09 Resident Research Rotation: Artificial Tissue Development of an Ultrasound Needle Guided Insertion Trainer; Department of Emergency Medicine, University of Arizona
- 9/09-12/09 International Medical Student Research Rotation, Pilot Study Determining Surgical Hand Dominance, Computerized Assisted Surgical Training, University of Aberdeen, Scotland

09/09-12/09	Resident Research Rotation: Artificial Tissue Development of an Adult Chest Tube Placement Model for use with Patient Simulators; Department of Emergency Medicine, University of Arizona
6/10-12/10	Graduate Research Rotation, Artificial Tissue Development for Medical Simulation Training, College of Engineering, Department of Biomedical Engineering, University of Arizona
09/10-12/10	Resident Simulation Elective: Simulated Tissue Design of a Pediatric Trachea Trainer, Department of Pediatrics, University of Arizona
09/10-4/12	Pre-med Research Rotation, Development of Medical Simulation Environments and Curriculum, University of California, Berkley
1/11-5/11	Resident Simulation Elective: Simulated Tissue Design of a Capillary Refill Trainer; Department of Pediatrics, University of Arizona
01/11-5/11	Resident Simulation Elective: Simulated Tissue Design of a Pediatric Femoral Line Trainer; Department of Pediatrics, University of Arizona
01/11-5/11	Undergraduate Independent Study, Development of Surgical Simulation Environments, Department of Physiology, University of Arizona
9/11-12/11	Undergraduate Independent Study, Department of Surgery, Development of a Laparoscopic Boot Camp for Year I Residents, Department of Physiology, University of Arizona
9/11-12/11	Undergraduate Medical Simulation Internship, Fostering and Achieving Culture Equity and Sensitivity in Health Professions (F.A.C.E.S.), Office Outreach & Multicultural Affairs, University of Arizona
5/12-9/12	Biomedical Engineering Clinical Immersion Internship, Development of a Rotational Casting Device for Creating Hollow Viscus Organs, Department of Biomedical Engineering, University of Arizona
9/13-5/14	Honors Thesis, 3D Modeling of a Mitral Valve for Simulation Training, Department of Physiology, University of Arizona
5/14-9/14	Visiting Scholar, Movement Analysis in Laparoscopic Surgery Training, Department of Electrical and Computer Engineering, College of Engineering, University of Arizona
9/14-12/14	Public Health Internship, Game-based Simulation of a Virtual Pandemic, College of Public Health, University of Arizona
9/14-12/14	Undergraduate Independent Study, Developing a Tablet Application for Scoring Performance During Simulation Training, Department of Computer Science, University of Arizona
09/14-5/15	Physiology Honors Thesis, Standardizing Assessment Protocols for Emergency Medicine Simulation Curriculum, Department of Physiology, University of Arizona
09/15-5/16	Undergraduate Independent Study, Aiding in the design, production and research of electronically receptive simulation tissues, Department of Surgery, University of Arizona
09/15-5/16	Senior Design Project, 3D printing of soft tissues, College of Engineering, University of Arizona
05/16-09/16	Biomedical Engineering Clinical Immersion Internship, , Development of an Ultrasoundable Pericardiocentesis Task Trainer, Department of Biomedical Engineering, University of Arizona
05/16-09/16	Visiting Scholar, Curriculum Development for Neonatal Procedural Training, Department of Pediatrics, University of Colorado
07/16-present	Emergency Medicine Fellowship, Department of Emergency Medicine, Banner Health
05/17-9/17	Biomedical Engineering Clinical Immersion Internship, Development and Validation of the Advanced Laparoscopic Program Skills, Department of Biomedical Engineering, University of Arizona
01/18-present	International collaboration, Pilot study validating an advanced laparoscopic skills curriculum, Department of Surgery, University of Arizona

- 09/18-12/18 Medical Student Research Rotation, Pilot study on using simulation technology (telesimulation) for distance learning and telemedicine, College of Medicine, University of Arizona
- 09/18-5/19 Emergency Medicine Simulation Elective, Development and evaluation of a 3D printed bleeding cricothyrotomy model, Department of Emergency Medicine, University of Arizona
- 01/19-12/19 Psychology Honors Thesis, Gender and Conversational Interruptions in Clinical Scenario-Based Simulation Training, Department of Psychology, University of Arizona
- 01/19-12/19 Medical Student Research Rotation, Development and evaluation of a kidney biopsy ultrasound task trainer, Department of Urology, University of Arizona
- 09/20-05/21 Undergraduate Honors Thesis, Implicit Gender Biases Affecting Individual Limit Recognition in Cardiopulmonary Resuscitation Simulations, Department of Neuroscience, University of Arizona
- 09/20-05/21 Undergraduate Honors Thesis, The Role of Sympathetic Modulation on Long-Term Consolidation of Information during Clinical Simulation, Department of Neuroscience, University of Arizona

PRESENTATIONS AND WORKSHOPS

1. Invited Speaker, "Simulation-Based Training in Healthcare", Fostering and Achieving Culture, Equity and Sensitivity in Health Professions (F.A.C.E.S.), Office of Multicultural Affairs, University of Arizona, Tucson, September 29, 2009
2. Simulation Technician and Co-Instructor, Peripheral Intravenous Skills Medical Simulation Workshop. Siemens Innovations 2010 for Imaging, Orlando, FL, July 29, 2010.
3. Simulation Technician and Co-Instructor, "Patient Management of Pneumothorax after Image-Guided Lung Biopsy." Hands-on medical simulation breakout sessions, Siemens Innovations 2010 for Imaging; Orlando, FL, July 30 – 31, 2010.
4. Simulation Technician and Co-Instructor, "Responding to Stent Placement Errors during Catheterization Procedures." Hands-on medical simulation breakout sessions, Siemens Innovations 2010 for Imaging; Orlando, FL, July 30 – 31, 2010.
5. Simulation Technician and Co-Instructor, "Treating Unplanned Reactions to Cardiac Medications during Stress Tests." Hands-on medical simulation breakout sessions, Siemens Innovations 2010 for Imaging; Orlando, FL, July 30 – 31, 2010.
6. Simulation Technician and Co-Instructor, "Post-Biopsy Fluid Management." Hands-on medical simulation breakout sessions, Siemens Innovations 2010 for Imaging; Orlando, FL, July 30 – 31, 2010.
7. Simulation Technician and Co-Instructor, "Seizing the Moment: A Step-by-Step Approach to Epilepsy." Hands-on medical simulation breakout sessions, Siemens Innovations 2010 for Imaging; Orlando, FL, July 30 – 31, 2010.
8. Simulation Technician and Co-Instructor, "Responding to Contrast Reactions: Everyday Occurrences and Unforgettable Complications." Hands-on medical simulation breakout sessions, Siemens Innovations 2010 for Imaging; Orlando, FL, July 30 – 31, 2010.
9. Simulation Technician and Co-Instructor, "Telemedicine Simulation Workshop: Emergency Wilderness Case of a Gila Monster Bite with a Telemedicine Assisted Intubation Procedure."
10. Simulation Technician, Bridging the Gap: Border Health Binational Medical Conference: Tucson, Arizona, October 22, 2011
11. Event Director and Co-Instructor, "Interprofessional Simulation Workshop" Concurrent Sessions (7), Collaborating Across Borders III, Tucson, Arizona, November 19 – 21, 2011.
12. Simulation Technician, "Pediatric Emergency Medicine Scenarios." Emergency Pediatric Interdisciplinary Care Conference (EPICC) of Southern Arizona, Tucson, Arizona, February 19, 2012

13. Podium Presentation, “Bringing Simulation to the Customer, That’s How We Roll.” Podium Presentation at the CAE Healthcare Western Regional Human Patient Simulator Network (HPSN) Conference, Phoenix, AZ, Nov. 8 – 9, 2012.
14. Podium Presentation, “Playing Frankenstein: Make artificial tissue come to life!” Podium Presentation at the International Meeting for Simulation in Healthcare (IMSH), Orlando, FL, Jan. 26 – 30, 2013.
15. Invited Speaker, “3D Modeling and Virtual Reality in Medicine.” Virtual Reality Education Pathfinders Program, Gridley Middle School, Tucson, AZ, March 21, 2013.
16. Invited Session Facilitator, Simulation Center Coordinators and Technicians Special Interest Group, Human Patient Simulator Network (HPSN) World, San Francisco, CA, June 30 – July 2, 2013.
17. Podium Presentation, “How Mobile Can You Go? Making the most of your patient simulator outside of the training facility.” Human Patient Simulator Network World, San Francisco, CA, June 30 – July 2, 2013.
18. Simulation Technician, Pediatric Simulation Pre-Conference Workshop, National Association of EMS Physicians Annual Meeting, Tucson, Arizona, January 14 – 18, 2014
19. Podium Presentation and Remote Demonstration, “Real-Time Virtual Interprofessional Simulation: Linking the Simulation Theater to Smart Devices. Live Virtual Interprofessional Training Session.” All Together Better Health (ATBH) VIII Conference. Oxford, UK: Oxford University, Sept. 7, 2016.
20. Presentation and Live Demonstration, Ultrasound Peritonsillar Abscess Model. Presented at the Spectrum of Ideas Showcase for the 16th Annual International Meeting for Simulation in Healthcare (IMSH), Los Angeles, CA, Jan 13-17, 2018
21. Presentation and Live Demonstration, Bleeding Cricothyrotomy and Ultrasound Intravenous Access Model Making, Presented at the SimOps 2018 SimVentors Showcase, Portland, OR, July 26-29, 2018
22. Invited Speaker, “Play Frankenstein: Making the most of your simulation makerspace” Podium Presentation at SimOps 2018, Portland, OR, July 26-29, 2018.
23. Presentation and Live Demonstration, AR-Guided Wound Closure Application” presented at the 2019 International Meeting on Simulation in Healthcare (IMSH) SimVentors Showcase, San Antonio, TX, Jan. 26-30, 2019
24. Podium Presentation and Remote Demonstration, Telesimulation: The Journey and Facilitation, International Meeting for Simulation in Healthcare (IMSH), San Antonio, TX, Jan. 26-30, 2019
25. Invited Speaker, “Play Frankenstein: Make the most of your simulation makerspace”, Webinar for the Society for Simulation in Healthcare Simulation Operations and Technology Section, December 9, 2019.
26. Presentation and Live Demonstration, Mixed-Reality Endoscopic Sinus Surgery Simulator, International Meeting for Simulation in Healthcare (IMSH), SimVentors Showcase, San Diego, CA January 19-22, 2020
27. Live Virtual Presentation, Leveraging Digital Platforms to Deliver Large-Scale Interprofessional Education, International Meeting for Simulation in Healthcare (IMSH), Virtual Conference, March 9, 2021.
28. Pre-recorded Virtual Presentation, Strengthen your Modelmaking Skills with a Step-by-Step Demonstration, International Meeting for Simulation in Healthcare (IMSH), Virtual Conference, Jan. 19 – Mar. 31, 2021
29. Invited Speaker, 3D Printing, is it worth it? Costs and considerations. Presented at SimOps 2021, July 14-16, 2021
30. Invited Speaker, Taking Matters in to Your Own Hands: Onboarding and maintaining your own in-house makerspace, Webinar presentation for Healthy Simulation, November 16, 2021

31. Invited Speaker, Wearing Multiple Hats: How We Juggle the Five Key Roles in Simulation, Live stream and in-person expert panel, International Meeting for Simulation in Healthcare (IMSH), Los Angeles, CA, Jan. 15 – 20, 2022.
32. Invited Speaker, Are You Ready to Publish? The Simulation Technology and Operations Resource Magazine (STORM) May be the Right Place for You. Podium presentation at SimOps 2022, July 20-22, 2022.
33. Closing Keynote Speaker, The Right Technology for the Job. Expert panel presentation at SimOps 2022, July 20-22, 2022.
34. Invited Speaker, ROI in 3-D Printing: Do the Benefits Justify the Costs? Podium presentation at SimOps 2022, July 20-22, 2022.
35. Invited Speaker, SOS Role in the Innovation Process. Expert panel presentation at SimOps 2022, July 20-22, 2022.
36. Invited Speaker, Are Your Ready to Publish: Simulation Technology and Operations Resource Magazine (STORM) may be the right place for you! SSH SimSeries Webinar, The Society for Simulation in Healthcare. December 5, 2022
37. Podium Presentation, Learner Contact Log, Lifeblood of the Lab, International Meeting for Simulation in Healthcare (IMSH), Orlando, FL, January 22-25, 2023
38. Presentation and Live Demonstration, Development of a Discectomy Procedural Task Trainer, SimVentors Showcase, International Meeting for Simulation in Healthcare (IMSH), Orlando, FL, January 22-25, 2023
39. Invited Speaker, The State of Simulation Technologies for Healthcare, Tristate Healthcare Simulation Consortium, Quarterly Meeting via Zoom, Cincinnati, OH, February 7, 2023
40. Invited Speaker, Taking Matters in to Your Own Hands: Managing a Modelmaking Operation for New Collaborations, Simulation Brown Bag Series, Webinar presented for the Carolinas Simulation Center and Atrium Health, May 19, 2023
41. Hands-on Workshop, CHSOS-A Application Overview and Strategies for Success, International Meeting for Simulation in Healthcare, San Diego, CA, Jan 20 – 24, 2024
42. Hands-on Workshop, Simplify your Strategies: Lessons Learned from an Innovative 2-Year IPE Pilot Program, International Meeting for Simulation in Healthcare, San Diego, CA, Jan 20 – 24, 2024
43. Hands-on Workshop, Getting Published in STORM: Academic Writing and the Peer Review Process for STORM, International Meeting for Simulation in Healthcare, San Diego, CA, Jan 20 – 24, 2024
44. Hands-on Workshop, CHSOS-A Application Overview and Strategies for Success, Society for Simulation in Healthcare, SimOps, Denver, CO, Jul 17 – 19, 2024
45. Hands-on Workshop, Getting Published in STORM: Academic Writing and the Peer Review Process for STORM, Society for Simulation in Healthcare, Denver, CO, Jul 17 – 19, 2024
46. Invited Speaker, What's your real worth? Determining costs and identifying funding sources for a healthcare simulation operation, Webinar presented for the Directors of Simulation Centers Section, Society for Simulation in Healthcare (SSH), September 18, 2024
47. Panel Presentation, Getting Published in STORM: Academic Writing and the Peer Review Process for STORM, International Meeting for Simulation in Healthcare, Orlando, FL, January 10-14, 2025
48. Invited Speaker, Debate: Will AI Replace the Simulationist? Panel presentation at the International Meeting for Simulation in Healthcare (IMSH), Orlando, FL, January 10-14, 2025
49. Hands-on Workshop, CHSOS-A Application Overview and Strategies for Success, International Meeting for Simulation in Healthcare, San Diego, CA, Jan 10-14, 2025
50. Invited Speaker, From Closet to Cutting-Edge: Arizona Simulation Technology and Education Center's Journey to a Tech-Driven Sim Powerhouse, The Real Sim Center Webinar Series, Elevate Healthcare, April 24, 2025

51. Invited Speaker, Are We Asking the Right Questions? A Scoping Review of Evaluation Tools for Simulation Technologies, SimSeries Webinar sponsored by the Simulation Operations and Technology Section (SOTS), Society for Simulation in Healthcare (SSH), June 16, 2025
52. Invited Speaker, CHSOS-A Application Overview and Strategies for Success, SimSeries Webinar sponsored by the Simulation Operations and Technology Section (SOTS), Society for Simulation in Healthcare (SSH), July 28, 2025
53. Podium Presentation, Getting published in STORM: Turning your big ideas into best practice for healthcare simulation operations. The Gathering of Healthcare Simulation Technology Specialists (SimGHOSTS), Nashville, TN, July 29-Aug. 4, 2025
54. Invited Panelist, Simulation Facility Design Panel. Webinar sponsored by the Program Leadership Section, Society for Simulation in Healthcare (SSH), Sept. 8, 2025
55. Virtual Presentation, Fostering Publishable Research in Simulation Centers, Advancing Simulation Careers and Empowering Next-Generation Development (ASCEND) Program Monthly Webinar Series, Society for Simulation in Healthcare (SSH), Nov. 10, 2025

MEDIA & LAY PUBLICATIONS

1. Podcast Invited Speaker, “SSIH Sim Ops Pause & Discuss.” Simulcast. May 28, 2018
2. Evolving Health Care Landscape Spurs New Training Approaches, Heath Sciences Connect, The University of Arizona Health Sciences (UAHS), August, 5, 2021
3. Great Work Must be Recognized, Editorial for the Simulation Technology and Operations Resource Magazine (STORM), IMSH Daily Newsletter, International Meeting for Simulation in Healthcare (IMSH), January, 24 2023
4. Podcast Invited Speaker, Fostering Excellence in Patient Care Through Simulation Technology, The Sim Café, S03, E73, April 5, 2024

DEVELOPMENT OF NOVEL TECHNOLOGIES

Below is a list of novel technologies I have developed, evaluated, and incorporated in to either a specific research project and/or as part of regular training activities in ASTEC. Additionally, to demonstrate the breadth of my impact in developing simulation technologies, the following is an overview of my scholarly activities (grants, publications, patents, abstracts, and presentations) that have advanced the field of healthcare simulation: <https://prezi.com/view/oUZ9QqesewyroQDqR54Y/>

- 2008 Ballistic gelatin IV model for adult human patient simulator
- 2008 Early prototype: Bronchoscopy training system
- 2009 Early prototype: Ultrasound needle guided ballistic gelatin phantom
- 2009 Pulsatile arterial bleeding tibia compound fracture model
- 2009 Laparoscopic motion tracking using a computer assisted surgical training system
- 2010 Pediatric chest tube task trainer
- 2010 Arterial line placement model for adult manikin and as a task trainer
- 2010 Adult chest tube model for adult manikin and as a task trainer
- 2010 Fluid-based anastomosis and bifurcation task trainer
- 2011 Fluid-based umbilical venous catheter task trainer
- 2011 Laparoscopic bowel anastomosis task trainer
- 2011 Ectopic pregnancy task trainer
- 2011 External Carotid-Internal Carotid Bypass task trainer
- 2011 Adult and pediatric Pericardiocentesis task trainer
- 2012 Intraosseous access task trainer
- 2012 Pediatric Trachea model for pediatric manikin
- 2012 Extracorporeal membrane Oxygenation (ECMO) system for pediatric manikin
- 2012 Cardiothoracic robotic surgery task training system

2012 Mobile workstation, A/V, and LMS cart for both training center and in situ activities
 2013 Adult bleeding cricothyrotomy task trainer
 2013 C-section task trainer
 2013 Bleeding Wound and suturing task trainers
 2013 Medication administration “Five-rights” serious game for NICU nursing staff
 2013 Abscess task trainer
 2013 Escharotomy model for use with manikin and as a task trainer
 2013 Rotational casting device for creating hollow viscus organs
 2014 Jugular vein distention model for adult manikin
 2014 Rotational casting device for creating bowel and vessel models
 2015 Wearable sensor-based bleeding chest tube task trainer
 2015 Ultrasound adult pericardiocentesis task trainer
 2015 Mobile high-fidelity patient simulator and A/V system for in situ air transport simulation
 2016 Prototype of silicone 3D printer
 2016 Re-design of advanced laparoscopic task models
 2016 Motion and sensor-based laparoscopic box training system for movement and collision analysis
 2016 Standardized molding jigs for mass producing bleeding suture and cricothyrotomy pads
 2017 Ultrasound peritonsillar abscess task trainer
 2017 Prototype of a clinical in-patient non-ambulatory smart exercise device
 2017 VR-based orientation for surgery clerkship students
 2018 Ultrasound IV task trainer using synthetic ballistic gelatin
 2018 Augmented reality suturing guidance system
 2019 Mixed reality ENT simulator using VR and patient specific 3D printed models
 2019 Ultrasound kidney biopsy task trainer
 2020 Mixed reality airway management decision making training system for pulmonary fellows
 2020 Prototype airway management “halo” to prevent aerosol virus transmission
 2021 Facial suture task trainer
 2021 Pediatric cricothyrotomy task trainer
 2022 Vaginal laceration trainer
 2022 Discectomy procedural task trainer
 2023 Nerve block training system
 2023 Pediatric ultrasound nerve block task trainer
 2024 Advanced ultrasound IV task trainer
 2024 Orthopedic trainer box system for various minimally invasive procedures
 2025 Adult ultrasound extracorporeal membrane oxygenation (ECMO) trainer
 2025 Advanced front of neck access (FONA) trainer