



**Stanford**  
**MEDICINE**

**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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### **Personal Data**

Stanford University  
Department of Surgery  
S067D Grant Building  
300 Pasteur Drive  
Stanford, CA 94305  
cpugh@stanford.edu  
(650)-724-3651 (Office)

### **Education**

9/1984-5/1988	University of California, Berkeley B.A. Neurobiology
9/1988-5/1992	Howard University College of Medicine M.D. Medicine
9/1997-5/2001	Stanford University School of Education Ph.D. Education

### **Graduate Medical Education**

7/1992-6/1993	Howard University Hospital	General Surgery Internship
7/1993-6/1997	Howard University Hospital	General Surgery Residency

### **Other**

1999	Surgical Education: Principles and Practice, American College of Surgeons Postgraduate course – October 12, 1999
2006	Early Career Women Faculty Professional Development Seminar – American Association of Medical Colleges – July 8-12, 2006
2007	Workshop on Quasi-Experimentation in Education – Northwestern Institute for Policy Research – July 30 - August 3, 2007
2007	Business for Scientists and Engineers – Northwestern Kellogg School of Management – December 2007 - February 2008
2009	Clinical Fellowship – Acute Care Surgery, University of Michigan Department of Surgery, July 1, 2009 - December 31, 2009
2014	ELAM (Executive Leadership in Academic Medicine) – Drexel University, September 2013 - April 2014



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Thomas Krummel Professor of Surgery

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### **Certification and Licensure**

American Board of Surgery	1999 - Certificate #044296
American Board of Surgery	2007 - Recertification Expired: 07/01/2019
American Board of Surgery	2018 - Recertification Expired: 10/29/2020
American Board of Surgery	2020 - Recertification Expired: 01/20/2023
American Board of Surgery	2022 - Recertification Expires: 01/20/2024
State of California	License #: G83898 Expires: 02/28/2025
State of Illinois	License #: 036110285 Expired: 07/31/2017
Washington, DC	License #: MD21336 Expired: 12/31/2010
State of Michigan	License #: 4301095193 Expired: 01/31/2010
State of Wisconsin	License #: 56978 – 20 Expired: 10/31/2019

### **Present Appointments/Positions**

#### Faculty & Staff Appointments:

05/2021-Present	Thomas Krummel Professor of Surgery Stanford University Department of Surgery
03/01/2018-Present	Professor of Surgery (with Tenure) Stanford University Department of Surgery
03/01/2018-Present	Director, Technology Enabled Clinical Improvement Center Stanford University
12/15/2021-Present	Vice Chair of Innovation Stanford University Department of Surgery



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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Stanford University Committee Service Appointments:

03/01/2018-Present	Department of Surgery Advancement and Promotion Committee, Committee, Stanford Medicine
03/25/2019-Present	Innovation Council Member – Stanford Medicine
01/31/2019-Present	Stanford Cancer Institute (SCI) Member – Stanford Medicine
02/09/2019-Present	Population Sciences Member – Stanford Medicine
01/09/2020-Present	Patient Advocacy Reporting System (PARS) Messenger – Stanford Hospital and Clinics
09/23/2020-Present	Co-Chair for University Provost Faculty IDEAL Cluster Hire Initiative
10/06/2020-Present	Stanford Medicine Commission on Justice and Equity
10/01/2021-09/30/2022	Stanford Leadership Academ

**Past Appointments/Positions**

Faculty & Staff Appointments:

6/2001-8/2003	Research Assistant Professor, Stanford University School of Medicine
8/2003-6/2010	Assistant Professor of Surgery, Northwestern University Feinberg School of Medicine, Department of Surgery
8/2003-6/2010	Assistant Professor of Education, Northwestern University School of Education
7/2010-2/2012	Associate Professor of Surgery, Northwestern University Feinberg School of Medicine, Department of Surgery
7/2010-2/2012	Associate Professor of Education, Northwestern University School of Education



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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3/2012-6/2015	Associate Professor of Surgery (with Tenure), University of Wisconsin School of Medicine and Public Health, Department of Surgery
7/2014-6/2015	Associate Professor of Industrial & Systems Engineering, University of Wisconsin, School of Engineering
7/2015-2/2018	Professor of Surgery (with Tenure), University of Wisconsin, Department of Surgery
7/2015-2/2018	Professor of Industrial & Systems Engineering, University of Wisconsin, School of Engineering
4/2015-2/2018	Susan Behrens, MD Professor of Surgical Education, University of Wisconsin, Department of Surgery

Hospital Appointments:

8/1998-8/2003	Staff Surgeon, Kaiser Permanente Medical Group, Department of Surgery
1/2004-6/2010	Staff Surgeon, Chicago Lakeside VA, Department of Surgery
1/2006-2/2012	Attending Surgeon, Northwestern Memorial Hospital, Department of Surgery

Administrative Appointments:

8/2003-6/2007	Associate Director, Center for Advanced Surgical Education, Northwestern University Feinberg School of Medicine, Department of Surgery
7/2007-3/2012	Director, Center for Advanced Surgical Education, Northwestern University Feinberg School of Medicine, Department of Surgery
3/2012-2/2018	Clinical Director of the UW Health Clinical Simulation Program University of Wisconsin
3/2012-6/2017	Vice-Chair of Education and Patient Safety, University of Wisconsin, Department of Surgery



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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7/2014-6/2017	Director of the UW MOC Portfolio Program
7/2014-2/2018	Director of the UW-ACS Surgical Education Fellowship
7/2017-2/2018	Vice-Chair of Innovation and Entrepreneurship University of Wisconsin, Department of Surgery

Committee Service Appointments:

2003-2012	Resident Evaluation Committee, Department of Surgery, Northwestern
2007-2010	Physician's Health Committee – Northwestern Memorial Hospital
2008-2012	Surgical Residency Advisory Committee, Department of Surgery, Northwestern University
2012-2018	Executive Council – Department of Surgery, University of Wisconsin
2012-2018	Administrative Council – Department of Surgery, University of Wisconsin
2012-2017	Quality Council – Department of Surgery, University of Wisconsin
2012	Research Review Committee – Department of Surgery, University of Wisconsin
2012-2017	Center for Quality and Productivity Improvement Member, School of Engineering, University of Wisconsin
2012-2017	Office of Continuing Professional Development in Medicine and Public Health Strategic Planning Committee – University of Wisconsin School of Medicine and Public Health
2013-2017	MOC Advisory and Liaison Committee – University of Wisconsin School of Medicine and Public Health
2013-2017	Steering Committee for Surgery Summer Research Experience for Medical Students (Doris Duke)
2014-2017	Advisory Committee Member – Surgery Oncology T32 Diversity Oversight Committee
2014	Search and Screen Committee for Vice Chancellor for Research and Graduate Education – University of Wisconsin
2015	Search and Screen Committee for MIS Chief
2015	Health Occupations and Professions Exploration (HOPE) Advisory Board Member
2015-2017	Technology Assessment Committee – University of Wisconsin Hospital and Clinics
2016	Search and Screen Committee for the Senior Associate Dean of the Graduate School – University of Wisconsin



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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2016	Search and Screen Committee for the Associate Dean of Faculty Affairs and Development – University of Wisconsin School of Medicine and Public Health
2016-2017	Discovery to Product (D2P) Review Committee – University of Wisconsin
2016-2018	Surgical Education and Innovation Working Group – Department of Surgery, University of Wisconsin

Military Service:

2002 - 2010	Special Assistant to the Director – Telemedicine and Advanced Technology Research Center – U.S. Army Medical Research & Material Command, Ft. Detrick, MD
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**Professional Society Memberships**

1988-1999	Medical Society of the District of Columbia
1988-1992	Women in Medicine
1998-1992	Student National Medical Association, Chapter Secretary 1989-1990
1994-Present	National Medical Association
1995-Present	American College of Surgeons-Fellow <ul style="list-style-type: none"><li>• Member – Committee on Informatics, 2006-2012</li><li>• Member – Education and Technology Advisory Committee, 2006</li><li>• Member – Surgical Research Committee, 2010-2014</li><li>• Executive Member – Surgical Research Committee, 2014-Present</li><li>• Member – Accredited Education Institutes R &amp; D Committee, 2010-2017</li><li>• Member – Accredited Education Institutes Fellowship Committee, 2011-2017</li><li>• Member – Committee on Surgical Skills for Practicing Surgeons, 2014-Present</li><li>• Member – Committee on Emerging Surgical Technologies and Education, 2022-present</li><li>• Recorder – Accredited Education Institutes Annual Meeting, 2016-Present</li></ul>
1997-1999	San Mateo County Medical Association
1997-1999	California Medical Association
1999-Present	Association of Women Surgeons
1999-Present	LaSalle D. Leffall Surgical Society
1999-Present	Society of Black Academic Surgeons <ul style="list-style-type: none"><li>• Member – Research, Education, Training Committee, 2015-</li></ul>



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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	2019	<ul style="list-style-type: none"><li>• Executive Member – Leadership Institute Committee, 2015-Present</li><li>• Secretary Elect, 2015</li><li>• Secretary, 2016-2019</li><li>• President Elect, 2020</li><li>• President, 2021-2022</li></ul>
2000-Present	Association for Surgical Education	
2001-Present	Claude H. Organ Surgical Society	
2006-2016	Medicine Meets Virtual Reality	<ul style="list-style-type: none"><li>• Organizing Committee, 2007-2016</li></ul>
2006-Present	Association for Academic Surgery	<ul style="list-style-type: none"><li>• Member – Education Committee, 2007</li><li>• Co-Chair – Education Committee, 2008</li><li>• Member – Nominating Committee, 2009</li><li>• 2006 Class Council Representative, 2010-2012</li><li>• AAS Liaison to the AWS, 2012-2014</li></ul>
2006-2016	American Education Research Association	<ul style="list-style-type: none"><li>• Member – Social Justice Action Committee, 2006-2009</li><li>• Editorial Board – American Education Research Journal, 2014-2016</li></ul>
2007-2012	The Institute of Medicine of Chicago	
2007-2012	Chicago Surgical Society	
2007-2018	Central Surgical Association	
2010-Present	Society of University Surgeons	<ul style="list-style-type: none"><li>• Liaison – Council of Faculty and Academic Societies (AAMC), 2013-2016</li><li>• Senior Member – Nominating Committee, 2016</li></ul>
2011-Present	Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)	<ul style="list-style-type: none"><li>• Co-chair – Hernia Task Force, 2011-2017</li><li>• Member – Fundamentals of Laparoscopic Surgery (FLS), 2011-2017</li><li>• Member – Curriculum Task Force, 2016-2017</li><li>• Member – Development Committee, 2016-Present</li><li>• Member – Organization Wide Learning System (OWLS) Tech Workgroup, 2017-2019</li><li>• Member – Executive Board 2018 - Present</li></ul>



## Carla M. Pugh, MD, PhD, FACS

Thomas Krummel Professor of Surgery

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2013-Present	Surgical Biology Club II
2014-Present	American Medical Association
2014-Present	American Surgical Association <ul style="list-style-type: none"><li>• Abstract Reviewer – Program Subcommittee – 2018-Present</li><li>• Advisory Membership Committee – 2019 - Present</li></ul>
2014-Present	American Board of Medical Specialties <ul style="list-style-type: none"><li>• Board of Directors – Research in Education Foundation, 2014-Present</li><li>• Chair Elect – Research in Education Foundation, 2014-2017</li><li>• Chair – Research in Education Foundation, 2017-2019</li></ul>
2014-2016	TEDMED Editorial Advisory Board
2015-Present	Society of Simulation in Healthcare <ul style="list-style-type: none"><li>• Vice Chair – Fellowship Academy, 2015-2017</li></ul>
2016-Present	American Society for Clinical Investigation
2016-Present	Surgical Data Science <ul style="list-style-type: none"><li>• Board Member, 2016-Present</li></ul>
2016-Present	Institute for Surgical Excellence <ul style="list-style-type: none"><li>• Member – Board of Directors, 2016-Present</li></ul>
2016-Present	Layton F. Rikkers Surgical Society
2018-2019	Artificial Intelligence in Healthcare Summit Advisory Board Member
2018-Present	Academy of Master Surgeon Educators Member <ul style="list-style-type: none"><li>• Artificial Intelligence Task Force Member 2019-Present</li></ul>
2018-Present	American Institute for Medical and Biological Engineering
2019-Present	Halsted Society Member
2020-Present	American Board of Surgery <ul style="list-style-type: none"><li>• Council Member, 2020 - Present</li><li>• Assessment Committee Member, 2020 - Present</li><li>• Video Based Assessment Task Force, 2020 - Present</li><li>• General Surgery Board Member, 2020 - Present</li><li>• Quality and Outcomes Task Force, 2020 - Present</li><li>• Candidate Competency Assessment Item-Writer, 2021 – 2022</li><li>• General Surgery Certifying Exam Writer, 2022-present</li><li>• DEI Committee Member - 2022-present</li></ul>
2021-Present	National Academy of Medicine Member <ul style="list-style-type: none"><li>• Health Policy and Health Care Systems Interest Group</li></ul>
2022-2026	Defense Health Board (DHB) Trauma and Injury Subcommittee

### Honors and Awards

#### Student Awards & Distinctions:

1986 Community Involvement Teams in Every Sector, Scholarship Award, Oakland,





**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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**CA**

- 1989 Social Heritage Group, Scholarship Award, Richmond, CA
- 1989 Joseph Collins Scholarship Award, Joseph Collins Foundation, New York, NY
- 1990 Mitchell Surgical Fellowship Award, James F. Mitchell Foundation, Washington, DC
- 1990 Sinkler-Miller Scholarship Award, Oakland California Chapter, National Medical Association
- 1990 Alma Wells – Givens Scholarship Award, Auxiliary to the National Medical Association
- 1991 Pfizer Research Award – Pfizer Medical Student Scholars Program, New York, NY
- 1992 Honorable Mention Outstanding Academic Performance Howard University Hospital Department of Internal Medicine

**Resident Awards & Distinctions:**

- 1993 Highest Score – American Board of Surgery In-Training Examination
- 1996 British Journal of Surgery Merit Award – Howard University Hospital Department of Surgery
- 1996 First Place – Laparoscopic Skills Drill-At Large Competition, American College of Surgeons, San Francisco, CA
- 1996 Patient Care Award – Howard University Hospital
- 1996 Leadership Award for House Staff – Howard University Hospital Medical Staff
- 1996 House Staff President – Howard University Hospital
- 1997 Outstanding Resident Award – Howard University Hospital Medical Association
- 1997 Vivian B. Allen Educational Fellowship – Deans Office, Howard University School of Medicine – Fellowship completed at Stanford University 2001

**Professional Awards & Distinctions:**

**Local Awards:**

- 2007 Public Service Award – Cosmopolitan Chamber of Commerce
- 2007 Inducted into the President's Council – Museum of Science and Industry-Chicago
- 2008 Invited Speaker – Chicago Humanities Festival, November 8, 2008
- 2009 Outstanding Women in Technology Award – Circuit Court of Cook County, Chicago, IL
- 2009 Chosen as a Chicago Visionary – Chicago Public Radio and Chicago Matters
- 2009 Achievement Award – African American Women's Business and Career Group-Chicago
- 2011 Chosen as one of the Top 25 Most Influential African American Physicians in Chicago – Black Health Magazine
- 2012 Invited Speaker – A Day at Northwestern Conference: "Touch, Technology and the Cost of Healthcare" April 14, 2012
- 2012 Invited Speaker – Madison East High School for AVID/TOP Program, May 18, 2012



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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2013 Scholarship Recipient: University of Wisconsin School of Medicine and Public Health Centennial Scholars Program  
2014 Chosen as one of 2014 Women to Watch – Brava Magazine  
2014 Invited Speaker – Madison West High School for AVID/TOP Program, March 17, 2014  
2014 Recipient of the Susan Behrens Surgery Education Professorship  
2015 Selected as a participant in the Discovery to Product (D2P) Igniter Program  
2015 Recipient of the Stanford Graduate School of Education Alumni Excellence Award  
2016 Recipient of the Vilas Faculty Mid-Career Investigator Award  
2019 Invited Speaker – Gunn High School Computer Science Program, Palo Alto, CA, March 5, 2019  
2019 Invited Speaker – Med School 101, Stanford Medicine, March 27, 2019  
2019 Nominated for a 2018-19 MD Program Teaching Award, School of Medicine MD Program, June 12, 2019  
2023 Recipient of the Integrated Strategic Plan Star Award as a member of the Commission on Justice and Equity - Stanford Medicine

National Awards:

2002 Consumers' Research Council of America, America's Top Surgeons  
2004 Consumers' Research Council of America, America's Top Surgeons  
2006 Marquis "Who's Who in America" 2007 Edition  
2006 Featured in an NIH NLM Museum Exhibit – Contemporary African American Surgeons  
2007 Consumers' Research Council of America, America's Top Surgeons  
2007 Marquis "Who's Who in America" 2008 Edition  
2007 Marquis "Who's Who in Science & Engineering" 2008 Edition  
2008 Marquis "Who's Who in America" 2009 Edition  
2008 Invited Member – Covidien Women in Surgery Advisory Board  
2010 Marquis "Who's Who in America" 2011 Edition  
2010 Associate Examiner – Certifying (Oral) Examination of the American Board of Surgery, Chicago, IL, April 19-20-21  
2011 American College of Surgeons, 2012 – Claude Organ, MD, FACS Traveling Fellowship  
2012 Invited Speaker – NIH – NIBIB 10<sup>th</sup> Anniversary: A Decade of Innovation for Health: "Use of Sensors and Simulation Technology to Quantify Clinical Palpation" Rockville, MD, June 21-22, 2012  
2012 Invited Keynote Speaker – 2012 NMA Scientific Assembly Surgical Section Annual Meeting: The 2012 Sinkler Lecture, New Orleans, LA, July 31-August 2, 2012  
2013 Fellow: 2013-2014 Class of the Hedwig van Ameringen Executive Leadership in Academic Medicine (ELAM) Program for Women  
2014 Marquis "Who's Who in America" 2014 Edition  
2014 Invited Speaker – Association for Academic Surgery – TED Talks – Surgical



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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**Innovation**

- 2014 Invited Speaker – The National Academy of Sciences – Distinctive Voices – Sensors, Simulation and Medical Performance: Are we there yet?
- 2014 Named to AcademicKeys Who's Who in Medicine Higher Education (WWMHE)
- 2015 Invited Co-Host of TEDMED 2015
- 2017 Invited Speaker – NIH Director's Wednesday Afternoon Lecture Series (WALS)
- 2017 Savoy Magazine "2017 Top Black Doctor"
- 2017 Marshal for the 2017 American College of Surgeons Convocation of Initiates
- 2018 Inducted into the American Institute for Medical and Biological Engineering, April 2018
- 2018 Inducted into the Alpha Omega Alpha Honor Society – Howard University College of Medicine
- 2019 Invited judge for 2100 Health Odyssey (a scientific fiction short story writing competition), Thomas Jefferson University, May 7, 2019
- 2019 Recipient of the Association of Women Surgeons (AWS) 2019 Olga Jonasson Distinguished Member Award, June 21, 2019
- 2020 Selected for inclusion in the AcademicKeys Who's Who in Medicine Higher Education (WWMHE), March 20, 2020.
- 2020 Named to the "Wall of Honor" for The ASE at 40: Building for the Future campaign - Association of Surgical Education
- 2021 ACS AEI Best in Show Presentation – "Diverse Surgeon Workforce: Quantifying Gender Differences in Technical Approach to Promote Awareness and Facilitate Learning Preferences," March 12, 2021
- 2023 The Rodman E. Sheen and Thomas G. Sheen Award
- 2023 Castle Connolly Exceptional Woman in Medicine 2023
- Castle Connolly Top Black Doctor
- 2023 Castle Connolly Top Doctor
- 2023 Society of University Surgeons (SUS) Trailblazer Award
- 2024 Avant-Garde Health Healthcare Research All-Stars, Top 1%
- 2024 Castle Connolly Top Doctor

**International Awards:**

- 2012 Association for Academic Surgery/Colombian Surgical Association International Visiting Professorship Award
- 2014 Invited Speaker – TEDMED 2014 – "Haptics: The Science of Touch," September 11, 2014
- 2015 Invited Speaker – TEDYouth 2015, November 14, 2015
- 2019 Invited Speaker – Computer Assisted Radiology and Surgery (CARS) 2019 – "Use of Sensor-Based Metrics to Improve Mastery Learning During Simulation," Rennes, France, June 20, 2019

**Keynote Addresses:**

- 2005 Keynote Speaker – 9th Annual Graduate and Professional Student Research



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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- Conference hosted by BGSA (The Black Graduate Student Association) "Many Minds, Many Voices", Northwestern University, Chicago, IL, April 23, 2005
- 2008 Invited Keynote Speaker – Chicago School for Agricultural Sciences Annual Job Fair
- 2010 Invited Keynote Speaker – Association for Surgical Education Annual Meeting
- 2010 Invited Keynote Speaker – Graduation Address, Brenneman Junior High School
- 2010 Invited Keynote Speaker – Science Minors Graduation, Museum of Science & Industry
- 2011 Invited Keynote Speaker – Science Chicago Address, Malcolm X College
- 2011 Invited Keynote Speaker – Science, Inventorship & Entrepreneurship, Olive Harvey College
- 2011 Invited Keynote Speaker – Girls for Science, Museum of Science & Industry
- 2012 Invited Keynote Speaker – Howard University College of Medicine Graduation Ceremony, May 11, 2012
- 2012 Invited Keynote Speaker – Midwest Regional HSPN: "Advancing Healthcare Quality through Formative and Summative Assessment" Madison, WI, July 12, 2012
- 2015 Invited Keynote Speaker – Martin Luther King, Jr. Day Celebration, Medical College of Wisconsin
- 2015 Invited Keynote Speaker – Royal Australasian College of Surgeons
- 2016 Invited Keynote Speaker – Edward Alexander Bouchet Graduate Honor Society Induction Ceremony – University of Wisconsin-Madison, March 16, 2016
- 2016 Invited Keynote Speaker – SIM-one SIM Expo, Toronto, Canada, October 7, 2016
- 2017 Invited Keynote Speaker – Northwestern University Medical Scientists Training Program's Diverse Perspectives of Physician Scientists, Chicago, IL, May 8, 2017
- 2017 Invited Keynote Speaker – Stanford Innovations in Medical Education Conference, Stanford University, May 13, 2017
- 2017 Invited Keynote Speaker – University of Chicago Medical Education Day, University of Chicago, November 16, 2017
- 2018 Invited Keynote Speaker – Howard University 48<sup>th</sup> Annual Drew/Syphax Lecture and Seminar, March 19, 2018
- 2019 Invited Keynote Speaker – Johns Hopkins University School of Medicine Center for Diagnostic Excellence – Diagnostic Excellence Summit, Baltimore, MD, March 7, 2019
- 2019 Invited Keynote Speaker – Digital Surgery Summit, San Francisco, CA, March 21, 2019
- 2019 Invited Keynote Speaker – Alpha Omega Alpha Honor Medical Society at Howard University, Washington DC, May 8, 2019
- 2019 Invited Keynote Speaker – Breast Cancer and African Americans Event, Fremont, CA, May 18, 2019
- 2019 Invited Keynote Speaker – Board of Directors at Physicians Insurance, Coeur d'Alene, ID, August 8, 2019
- 2019 Invited Keynote Speaker - Association of Academic Health Sciences Libraries



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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- (AAHSL) Matheson Lecture, November 7, 2019
- 2019 Invited Keynote Speaker - Diagnostic Error in Medicine 12th International Conference, November 10-13, 2019 Washington, D.C.
- 2019 Invited Keynote Speaker - Healthcare Robotics Engineering Forum, December 10, 2019, Santa Clara CA
- 2020 Invited Keynote Speaker - "A 20/20 Vision of Haptics and Surgery" 2020 Biomedical Engineering Society (BMES) Virtual Meeting, October 15, 2020
- 2020 Invited Keynote Speaker - "Rethinking Measurement Culture in Healthcare: Expanding the Conversation Using Wearable Technology" Northwell Health UME/GME Educational Retreat, Virtual, October 15, 2020
- 2020 Invited Keynote Speaker - "What is Your Haptic Score? That's What Matters in the Operating Room," AAGL Virtual Global Congress on Minimally Invasive Gynecology, Virtual, November 7, 2020
- 2021 Invited Keynote Speaker – "The Government's Role in Supporting Consistent Standards in Surgical Training & Surgical Quality," Surgicon Congress, Virtual, May 5, 2021
- 2021 Invited Keynote Speaker – 4<sup>th</sup> Annual Simulation-Based Quality Improvement and Research Forum, UT Southwestern Simulation Center, Virtual, May 12, 2021

Research Awards & Distinctions:

- 1997 Excellent Poster Presentation – National Medical Association, Third Place Basic Science
- 2002 Excellent Poster Presentation – Biomedical Computation at Stanford, Second Place
- 2002 Excellent Poster Presentation – Medicine Meets Virtual Reality, Second Place
- 2002 Satava Simulation Award – Medicine Meets Virtual Reality Laboratory Group Award
- 2007 Margaret and Muir Frey Memorial Prize – Department of Biomedical Engineering: "The Male Rectal Exam Simulator" First Place, Students: Leslie Gittings, Nurul Hamzah, Sofiah Syed, and Latha Subramaniam
- 2008 Northwestern Medical Student Summer Research Program – Competitive Award
- 2008 Margaret and Muir Frey Memorial Prize – Department of Biomedical Engineering: "The Bleeding Vessel Simulator (BVS)." Students: Josh Abecassis, Nicholas Deep, Suraj Gupta, Neil Tiwari
- 2008 Northwestern Medical Student Thesis Program – Faculty Mentor 2008 Association for Surgical Education – Haemonetics Best Paper Award
- 2009 Margaret and Muir Frey Memorial Prize – Department of Biomedical Engineering: "Female Pelvic Exam Simulator for the Developing World" Students: Tadas Sileika, Rebecca Etrenne, John Leuthner, and Lee Lamers
- 2009 Perfect Score National Institutes of Health R-01
- 2011 Presidential Early Career Award for Scientists and Engineers
- 2012 Perfect Score National Institutes of Health F-32
- 2013 Association of Women Surgeons Starr Poster Contest – Resident Winner, Third Place





**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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- 2016 Inducted into the American Society for Clinical Investigators – April 16, 2016
  - 2017 Layton F. Rikkers, MD, Best Resident Oral Presentation Award – University of Wisconsin Department of Surgery Research Summit, January 18, 2017
  - 2019 Best Plenary Presenter at Surgical Education Week (SEW) 2019 for her presentation: “Use of Error Management Theory to Quantify and Characterize Residents’ Error Recovery Strategies” – April 2019
  - 2021 ACS AEI Best in Show Presentation – “Diverse Surgeon Workforce: Quantifying Gender Differences in Technical Approach to Promote Awareness and Facilitate Learning Preferences,” March 12, 2021

Visiting Professorships (Over 40):

- 2005 Visiting Professorship in Surgery, University of Southern California, April 30, 2005
- 2007 Visiting Professorship in Surgery, Medical College of Georgia, January 29, 2007
- 2007 Visiting Professorship in Surgery, Eastern Virginia Medical School, Sept 14, 2007
- 2008 Visiting Professorship in Surgery, New York Hospital in Queens, March 19, 2008
- 2009 Visiting Professorship in Surgery, Southern Illinois University, March 27, 2009
- 2009 Visiting Professorship in Medical Education, Meharry Medical School, April 9, 2009
- 2009 Kappy Flanders Visiting Professorship in Simulation, McGill University, Sept 16, 2009
- 2011 Visiting Professorship in Surgery, Kansas University Medical Center, October 2011
- 2011 Visiting Professorship in Surgery, University of Illinois, Peoria, December 16, 2011
- 2012 Visiting Professorship in Simulation, Baystate Medical Center, November 15, 2012
- 2014 Visiting Professorship in Surgery, Stanford University, November 11, 2014
- 2015 Visiting Professorship in Engineering, Johns Hopkins University, November 4, 2015
- 2015 Ravitch Visiting Professorship in Surgery, Johns Hopkins University, November 5, 2015
- 2016 Martin Luther King Jr, Visiting Professorship in Surgery, Georgetown University, January 5, 2016
- 2016 Laycock Visiting Professorship in Education, University of Texas Southwestern, January 20, 2016
- 2016 LB Sanders Visiting Professorship in Education and Surgery, Tufts University / Lahey Hospital and Medical Center, May 4, 2016
- 2016 Kim Ephgrave Visiting Professorship, University of Oklahoma, May 13, 2016
- 2016 Visiting Professorship in Surgery, Thomas Jefferson University, May 26, 2016
- 2016 Visiting Professorship in Surgery, University of Virginia, October 26, 2016
- 2016 Visiting Professorship in Surgery, Augusta University, October 31, 2016
- 2016 Ziffren Visiting Professorship in Surgery, University of Iowa, November 11, 2016
- 2016 J. Rawson Collins Visiting Professorship in Surgery, University of Cincinnati, January 11, 2017



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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- 2017 Daniel W. Elliott Visiting Professorship in Surgery, Wright State University, May 3, 2017
- 2017 Claude Organ Lectureship, Medical University of South Carolina, May 16, 2017
- 2017 Visiting Professorship in Surgery, University of California Irvine, October 26, 2017
- 2018 Visiting Professorship in Surgery, Rutgers University, January 19, 2018
- 2018 Visiting Professorship in Surgery, University of Toledo, February 28, 2018
- 2018 Visiting Professor in Surgical Education, Teaching Scholars Program, University of California - San Francisco, April 24, 2018
- 2018 J. Englebert Dunphy Visiting Professor, Resident Research Symposium, University of California - San Francisco, April 25, 2018
- 2018 Visiting Professor in Surgery, University at Buffalo Jacobs School of Medicine and Biomedical Sciences – Buffalo, NY, December 6, 2018
- 2019 Visiting Professor in General Surgery, Wake Forest School of Medicine – Winston-Salem, NC, February 27, 2019
- 2019 Visiting Professor in Surgery, University of Pittsburgh – Pittsburgh, PA, March 13, 2019
- 2019 Visiting Professor in Surgery and Perioperative Care, Dell Medical School at UT Austin Research Symposium – Austin, TX, March 29, 2019
- 2019 Visiting Professor in Surgery, Columbia University Medical Center – New York City, New York, June 13, 2019
- 2019 Krippaehne Visiting Professorship, Oregon Health and Science University – Portland, Oregon, September 30, 2019
- 2019 Visiting Professor in Surgery, Beth-Israel Deaconess Medical Center – Boston, Massachusetts, November 13, 2019
- 2020 Visiting Professor in Surgery, Mayo Clinic - Scottsdale Arizona, January 6, 2020
- 2020 Visiting Professor in Surgery, Dartmouth-Hitchcock Medical Center, October 9, 2020
- 2020 Visiting Professor in Surgery, Cleveland Clinic General Surgery Research Day, October 21, 2020
- 2021 Visiting Professor in Surgery, Southern Illinois University, January 14, 2021
- 2021 Visiting Professor in Surgery, Ohio State University, February 11, 2021
- 2021 Visiting Professor in Surgery, University of Texas Medical Branch, March 3, 2021
- 2021 Visiting Professor in Surgery & Medicine, University of California Los Angeles, March 17, 2021
- 2021 Visiting Professor in Surgery and Simulation, UT Southwestern, May 12, 2021
- 2021 Visiting Professor in Surgery, University of Michigan, June 22, 2021
- 2021 Visiting Professor in Surgery, University of Alabama at Birmingham, July 13, 2021
- 2021 Visiting Professor in Surgery, Texas Tech University, September 24, 2021

Podcasts, Radio, Television and News:

- 2002 News Article, Wired Magazine, March 18, 2002
- 2007 News Article, Reuters, March 19, 2007
- 2007 News Article, Reuters, April 5, 2007



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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- 2007 News Article, Chicago Sun Times, May 1, 2007
  - 2007 News Article, BBC News, July 9, 2007
  - 2007 News Article, The Chronicle of Higher Education, July 27, 2007
  - 2008 News Article, The New York Times, February 12, 2008
  - 2008 Radio Interview, National Public Radio – The Bryant Park Project, February 13, 2008
  - 2008 Featured in a mini-documentary, CPS Right Now! Television Program
  - 2009 Featured in a Channel 7 ABC News Segment, CPS Job Fair Mentor
  - 2009 Featured in a Channel 11 Television Segment on the Chicago Tonight Show
  - 2010 News Article, Chicago Tribune, June 27, 2010
  - 2011 Featured in a Channel 7 ABC News Segment – Black History Month, February 2011
  - 2011 News Article, Associated Press, March 23, 2011
  - 2011 White House Press Release – Presidential Early Career Award, September 26, 2011
  - 2011 News Article, Chicago Tribune, September 29, 2011
  - 2011 News Article, Chicago Defender, September 29, 2011
  - 2013 News Article, Reuters Health, April 29, 2013
  - 2014 Magazine Article, Brava Magazine – 2014 Women to Watch, January 9, 2014
  - 2014 Featured in a Channel 27 News Segment – Robotics at UW Hospital, October 5, 2014
  - 2014 News Article, Wisconsin State Journal, November 16, 2014
  - 2015 Magazine Article, Quarterly Magazine, March 13, 2015
  - 2015 News Article, National Institute of Biomedical Imaging and Bioengineering, April 6, 2015
  - 2015 Featured in a Channel 3 CBS News Segment – Simulator helps UW surgeon improve medical training, patient care, October 26, 2015
  - 2016 Magazine Article, UMOJA Magazine, October 2016
  - 2016 News Article, Madison 365, October 14, 2016
  - 2017 Featured in a Channel 3 CBS News Segment – Research Indicates correct breast examination techniques are widely misunderstood, January 22, 2017
  - 2017 News Article, NIH Record, April 7, 2017
  - 2017 Featured on NIH Women in Biomedical Careers - Women Scientists in Action, June 22, 2017
  - 2018 Featured in a MomsEveryday Segment – New Technology Seeks to Teach Proper Self-Breast Exam Techniques, February 5, 2018
  - 2018 Featured in Stanford Medicine Magazine – Surgeon, educator and inventor builds on collaborations to advance the science of touch, October 10, 2018
  - 2019 Featured for International Day of Women and Girls in Science by the National Institute of Biomedical Imaging and Bioengineering, February 11, 2019
  - 2019 Invited guest on “Listen Up Bay Area with Armand,” July 10, 2019
  - 2019 Featured in a Channel 5 CBS-KPIX News Story – “Surgeons Test New Wearable Tech That Helps Measure Operating Skills,” November 14, 2019
  - 2019 Featured in Stanford Medicine News – “Tracking the movements, minds of surgeons to improve performance,” December 11, 2019





## Carla M. Pugh, MD, PhD, FACS

Thomas Krummel Professor of Surgery

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- 2020 Behind the Knife Podcast – “Systemic Bias and Structural Racism in Surgery and Medicine,” July 27, 2020
  - 2020 PeerSpectrum Podcast – “The Quantified Surgeon. Haptic sensors, wearables, and performance analytics. Stanford Surgeon scientist, Dr. Carla Pugh,” September 22, 2020
  - 2021 STAT News Article – “Video recording is coming to unlock the mysteries of the operating room. Surgeons warn that’s risky.” April 22, 2021
  - 2022 Brava Magazine– “2012-2021 Women to Watch: Where Are They Now.” January 24, 2022
  - 2022 BrainX Community Live! – “Artificial Intelligence and Robotics in Surgery.” February 23, 2022
  - 2022 The Future of Everything with Russ Altman Podcast – “What makes a surgeon great?” April 14, 2022
  - 2023 ACS House of Surgery Podcast – “Wearable Technology and the Quantified Surgeon: The Forefront of Precision Surgery” I.S. Ravdin Lecture at Clinical Congress. February 14, 2023
  - 2023 Global Surgery Spotlight: Dr. Carla Pugh  
<https://surgery.stanford.edu/about/global-surgery/spotlight-pugh.html>

### Select News and Keynote URL’s

Surgeons and Wearable Technology News Stories:

<https://sanfrancisco.cbslocal.com/2019/11/14/surgeons-test-new-wearable-tech-that-helps-measure-operating-skills/>

<https://med.stanford.edu/news/all-news/2019/12/tracking-the-movements--minds-of-surgeons-to-improve-performance.html>

TEDMED Talk – Haptic in Clinical Medicine

<https://www.youtube.com/watch?v=k9D-vxGkHTc>

Haptics and the Clinical Breast Examination

[https://www.youtube.com/watch?v=sue2\\_gSCA8w](https://www.youtube.com/watch?v=sue2_gSCA8w)

### Grant Support

#### Current

Title:	Quantifying the Metrics of Surgical Mastery: An Exploration in Data Science
Sponsor:	NIH 1R01DK123445
Years:	2020-2024
Role:	PI
% Effort:	5%
PI:	Carla Pugh, MD, PhD



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Title: Leveraging Embedded Haptic Sensor Technology for Force Vector Mapping in Orthoses for Adolescent Idiopathic Scoliosis  
Sponsor: Scoliosis Research Society (SRS)  
Years: 2020-2024  
Role: PI  
% Effort: 5%  
PI: Carla Pugh, MD, PhD

Title: ESTEEMED at Stanford  
Sponsor: NIH  
Years: 2023-2027  
Role: Co-PI  
% Effort: 5%  
PI: Jill Helms, MD

***Major Past Awards***

Title: Assuring and Defining Outcomes through Procedural Training (ADOPT)  
Sponsor: Covidien (Industry Contract)  
Years: 2014-2016  
Role: PI  
% Effort: 20%  
PI: Carla Pugh, MD, PhD

Title: Psycho-Motor and Error Enabled Simulations: Modeling Vulnerable Skills in the Pre-Mastery Phase  
Sponsor: U.S. Army Medical Research and Materiel Command- W81XWH 13-1-008  
Years: 2013-2016  
Role: PI  
% Effort: 15%  
PI: Carla Pugh, MD, PhD

Title: Validation of Sensorized Breast Models for High Stakes Testing  
Sponsor: National Institutes of Health R01EB011524  
Years: 2010-2016  
Role: PI  
% Effort: 25%  
PI: Carla Pugh, MD, PhD

Title: The Use of Cognitive Task Analysis to Expose Critical Decision Making in Surgical Procedures  
Sponsor: USAMRMC-W81XWH0710190  
Years: 2007-2009  
Role: PI



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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% Effort: 10%  
PI: Carla Pugh, MD, PhD

***Other Past Awards***

Title: Force-based Robot Learning from Demonstration for Soft Tissue Manipulation  
Sponsor: Stanford Institute for Human-Centered Artificial Intelligence (HAI)  
Years: 2023  
Role: Co-PI  
% Effort: In-Kind  
PI: Allison Okamura, MD

Title: Individualized performance optimization for surgeons: Utilizing biometric analytics to understand the impact of stressors and recovery on surgeon performance and skill acquisition  
Sponsor: Intuitive Foundation  
Years: 2021-2023  
Role: PI  
% Effort: 0%  
PI: Carla Pugh, MD, PhD

Title: Allies in Academic Medicine: Evaluation of an Allyship Training Program to Address Bias and Racism Faced by Physicians  
Sponsor: Stanford Vice Provost and Dean of Research  
Years: 2022-2023  
Role: Co-PI  
% Effort: 0%  
PI: Donna Zulman, MD

Title: Stars of all Colors: Quantifying Variability in Visual-Motor and Cognitive Expertise in Demanding Surgical Tasks  
Sponsor: Wu Tsai Human Performance Alliance  
Years: 2022-2023  
Role: Co-PI  
% Effort: In-Kind  
PI: Allison Okamura, PhD; Mark Cutkosky, PhD; Carla Pugh, MD, PhD

Title: Implementation and Evaluation of Digital Performance Assessments: The Precision Learning Initiative  
Sponsor: American Medical Association - Accelerating Change in Medical Education consortium  
Years: 2019-2022  
Role: Co-Principal Investigator



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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% Effort: 5%  
PI: Carla Pugh, MD, PhD; Lawrence Katznelson, MD; Tait Shanafelt, MD

Title: The Surgical Metrics Project  
Sponsor: American College of Surgeons (National Society Contract)  
Years: 2022-2022  
Role: PI  
% Effort: 5%- In-Kind  
PI: Carla Pugh, MD, PhD

Title: Creating an Ontology for Human Motion and Psychomotor Performance: Surgical Skill as a Use Case  
Sponsor: Stanford University Media-X  
Years: 2019-2020  
Role: PI  
% Effort: 5%- In-Kind  
PI: Carla Pugh, MD, PhD

Title: Motion Analysis for Microvascular Anastomosis  
Sponsor: University of Wisconsin-Madison Dept. of Surgery (Academic Contract)  
Years: 2019-2020  
Role: PI  
% Effort: 5%  
PI: Carla Pugh, MD, PhD

Title: Motion Analysis for Cardiopulmonary Bypass  
Sponsor: University of Wisconsin-Madison Dept. of Surgery (Academic Contract)  
Years: 2018-2020  
Role: PI  
% Effort: 5%  
PI: Carla Pugh, MD, PhD

Title: The Quantified Physician – Metrics of Mastery in Difficult Airway  
Sponsor: 7- Sigma Simulation Systems, Minnesota, MN (Industry Contract)  
Years: 2018-2020  
Role: PI  
% Effort: 5%  
PI: Carla Pugh, MD, PhD

Title: Analysis of Teaching Metrics and Resident Autonomy Through AI Analysis of Laparoscopic Video Capture – The Theator Solution  
Sponsor: Theator Inc.  
Years: 2019



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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Role:	PI
% Effort:	5%
PI:	Carla Pugh, MD, PhD
Title:	Promoting Breast Health Awareness in Underserved Communities: Can Haptic-AI Technology Help?
Sponsor:	Stanford Medicine's Presence – AI in Medicine: Inclusion & Equity
Years:	2019
Role:	PI
% Effort:	5%
PI:	Carla Pugh, MD, PhD
Title:	The Use of Epistemic Network Analysis to Evaluate Non-Technical Skills Performance in Trauma Simulation Education
Sponsor:	National Board of Medical Education – Stemmler Medical Education Research Fund
Years:	2016-2018
Role:	Co-investigator
% Effort:	0%
PI:	Hee Soo Jung, MD
Title:	Patient's Perceptions of the Clinical Breast Examination as a Tool for Patient Education
Sponsor:	National Institutes of Health 3R01EB011524-07S1
Years:	2016-2018
Role:	PI
% Effort:	5%
PI:	Carla Pugh, MD, PhD
Title:	Ponseti Method
Sponsor:	UW-Madison School of Medicine and Public Health
Years:	2016
Role:	Consultant
% Effort:	0%
PI:	Kenneth Noonan
Title:	Surgery Clinical Research Experience for High School Students
Sponsor:	Doris Duke Charitable Foundation
Years:	2012-2020
Role:	PI
% Effort:	5%
PI:	Carla Pugh, MD, PhD (University of Wisconsin PI – until 2018)
Title:	Surgical Oncology Research Training Program
Sponsor:	NIH NCI T32 CA090217-16
Years:	2016-2021



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Role:	Trainer until 2018 at University of Wisconsin
% Effort:	0%
PI:	Caprice Greenberg, MD, MPH
Title:	Integrated Training for Physician Scientists
Sponsor:	NIH T32 GM008692
Years:	2016 - 2021
Role:	Diversity Committee Member until 2018 at University of Wisconsin
% Effort:	0%
PI:	Anna Huttenlocher, MD
Title:	AAS Courses to Increase Women and Minorities in Academic Surgery
Sponsor:	NIH R13GM095236
Years:	2014-2017
Role:	Co-investigator
% Effort:	5%
PI:	Caprice Greenberg, MD, MPH
Title:	Use of Technology for Performance Measurement in Medicine
Sponsor:	University of Wisconsin Discovery to Product Entrepreneurship Program
Years:	2015-2017
Role:	PI/Chief Scientific Officer
% Effort:	0%
PI:	Carla Pugh, MD, PhD
Title:	Tourniquet Master Training
Sponsor:	DOD SBIR Phase II - Award #W81XWH-13-C-0021
Years:	2014-2017
Role:	Co-investigator
% Effort:	5%
PI:	Peter Weyhrauch
Title:	SIMLAB: Using Patient Simulation for Student Exploration of Community Health Issues
Sponsor:	National Institutes of Health 1R25RR026013
Years:	2011-2016
Role:	Consultant
% Effort:	2%
PI:	Mayas and Ward
Title:	The Wisconsin Surgical Coaching Program
Sponsor:	PERC Education and Research Committee
Years:	2012-2015



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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Role:	Co-investigator
% Effort:	5%
PI:	Caprice Greenberg, MD, MPH
Title:	Automated Performance Assessment System
Sponsor:	NIH – NIBIB – F32 - Award # F32 EB017084
Years:	2013-2015
Role:	PI
% Effort:	0% (Mentor/Sponsor)
PI:	Anne-Lise Maag/Carla Pugh, MD, PhD
Title:	Hands-Free Kinetic System for Medical Simulation
Sponsor:	DOD SBIR Phase II - Award #W81XWH-11-C-0050
Years:	2011-2014
Role:	Consultant
% Effort:	5%
PI:	Timothy Judkins
Title:	Tourniquet Master Training
Sponsor:	DOD SBIR Phase I - Award #W81XWH-13-C-0021
Years:	2013-2014
Role:	Co-investigator
% Effort:	5%
PI:	Peter Weyhrauch
Title:	Corridor of Innovation: Simulation for Improved Healthcare Outcomes, Chicago to Peoria, IL
Sponsor:	Peoria, Illinois – Jump Trading Simulation and Education, JTSEC001-2010
Years:	2011-2013
Role:	Co-PI (2011-2012)
% Effort:	7% PI: Vozenilek
Title:	Validity Evidence for a Competency Based Resident OR Instruction and Assessment System
Sponsor:	Augusta Webster Educational Grant – Northwestern University
Years:	2011-2014
Role:	Co-PI (2011-2012)
% Effort:	3% PI: DaRosa
Title:	Use of Decision-Based Surgical Simulators to Assess Intra-Operative Performance: A Focus on Operating Room Efficiency, Patient Safety & Team Communication
Sponsor:	Illinois Excellence in Academic Medicine Grant



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Years:	2010-2012
Role:	PI
% Effort:	10%
PI:	Carla Pugh, MD, PhD
Title:	"HCC-Medium: Mixed Reality Virtual Humans for Training"
Sponsor:	National Science Foundation – Grant #0803652
Years:	2008-2012
Role:	Consultant
% Effort:	5% PI:Lok
Title:	"Transparency in Teleoperation"
Sponsor:	United States – Israel, Bi-national Science Foundation Grant # 2007195
Years:	2008-2012
Role:	Consultant %
Effort:	5%
PI:	Mussa–Ivaldi
Title:	Medical Reserve Trauma Training Program: Achieving Optimal Outcomes & Improving Team Performance
Sponsor:	USAMRMC-W81XWH-05-1-0372
Years:	2007
Role:	Consultant
% Effort:	5% PI: Augustein
Title:	"A simulation-based intervention to improve cancer screening physical examination skills."
Sponsor:	Cancer Institute-Supplement Grant-3U01CA116875-03S1-
Years:	2007-2009
Role:	Co-PI/Mentee
% Effort:	75%
PI:	Charles Bennett
Title:	Evaluating Potential Uses of Simulation Technology in Teaching and Assessing Hands-on Technical Skills: A Focus on Intimate Clinical Examinations
Sponsor:	Augusta Webster Educational Innovation Grants Program
Years:	2005-2007
Role:	PI
% Effort:	5%
Title:	The Shoulder Dystocia Simulator
Sponsor:	Northwestern Memorial Foundation 2005 Research and Education





**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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	Grants Initiative
Years:	2005
Role:	Co-PI
% Effort:	3% PI: Grobman
Title:	The Breast Exam Simulator: Development and Assessment of a Novel Training Tool
Sponsor:	Eleanor Wood-Prince Grants Initiative
Years:	2004
Role:	PI
% Effort:	3%
PI:	Carla Pugh, MD, PhD
Title:	Quantitative Evaluations of Clinical Performance
Sponsor:	Stanford Media X Grant
Years:	2003
Role:	Co-PI
% Effort:	10% PI: Dev
Title:	Biocomputational Methods in Simulation
Sponsor:	National Board of Medical Examiners (NBME) Stemmler Fund
Years:	2002-2004
Role:	Co-PI (2002-2003)
% Effort:	15%
PI:	Carla Pugh, MD, PhD (2003-2004)
Title:	Consultant and Technology Development
Sponsor:	King's College London Technology Fund II
Years:	2002
Role:	Researcher, Consultant
% Effort:	10%
PI:	Marsh
Title:	Prostate Exam Simulator
Sponsor:	Eli Lilly Bio-Technology Initiative at Howard University
Years:	2002
Role:	Consultant
% Effort:	5% PI: Ahagotu
Title:	Advanced E-Team Grant
Sponsor:	National Collegiate Inventors and Innovators Alliance (NCIIA)
Years:	2002
Role:	E-Team Leader



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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% Effort:	10%
PI:	Pugh & Krummel
Title:	Telemedicine and Advanced Medical Technology: Refined Training Tools for Medical Readiness
Sponsor:	STTR – ARMY02-T017 (DAMD17-02-C-0126)
Years:	2002
Role:	Co-PI
% Effort:	10%
PI:	Higgins
Title:	Next Generation Internet Contract “Anatomy and Surgical Simulation”
Sponsor:	National Library of Medicine
Years:	2001-2006
Role:	Researcher
% Effort:	50%
PI:	Dev
Title:	Consultant and Technology Development
Sponsor:	King’s College Teaching Fund London
Years:	2001-2003
Role:	Researcher
% Effort:	10%
PI:	Marsh
Title:	Educational Research Grant
Sponsor:	Linkoping University, Sweden
Years:	2001
Role:	Consultant
% Effort:	10%
PI:	Wijma
Title:	Intelligent Assistant for Web-based Training Vignette Design
Sponsor:	Naval Air Warfare Center SBIR – OSD01-CR14
Years:	2001
Role:	Consultant
% Effort:	5%
PI:	Thompson
Title:	Burroughs-Welcome Research Travel Grant
Sponsor:	King’s College London
Year:	2001
Role:	PI
% Effort:	15%
PI:	Carla Pugh, MD, PhD



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Title:	Spencer Dissertation Grant for Educational Research
Sponsor:	Spencer Foundation
Year:	2000
Role:	PI
% Effort:	15%
PI:	Carla Pugh, MD, PhD
Title:	Utilizing Digital Technology to Foster Community Engagement and Increase Breast Health Awareness Among Diverse Populations
Sponsor:	Spectrum Pilot Grants Program
Years:	2021-2022
Role:	Co-PI
% Effort:	In-Kind
PI:	Alyce Adams, PhD; Carla Pugh, MD, PhD
Title:	The COVID Journey: Exploring healthcare experiences of patients before and during the pandemic
Sponsor:	Stanford University CHEM-H RISE Program and Stanford McCoy Ethics, Technology and Society Program
Years:	2021-2022
Role:	Co-PI
% Effort:	3%
PI:	Malathi Srinivasan, MD; Carla Pugh, MD, PhD
Title:	Enhancing Recovery As Surgeons
Sponsor:	Department of Surgery Seed Grant
Years:	2021-2022
Role:	Co-PI
% Effort:	3%
PI:	Cindy Kin, MD; Carla Pugh, MD, PhD
Title:	The Sensor Enabled Smart Ultrasound
Sponsor:	Flexible Electronics Collaboratory – Beijing Institute of Collaborative Innovation (BICI)
Years:	2020-2022
Role:	PI
% Effort:	5%
PI:	Carla Pugh, MD, PhD
Title:	Tourniquet Master Training
Sponsor:	DOD SBIR Phase IIb – Continuation Award #W81XWH-13-C-0021
Years:	2017-2021
Role:	University Subcontract PI
% Effort:	5%
PI:	Carla Pugh, MD, PhD



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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### **Publications**

#### Peer-reviewed research articles (Over 150):

1. **Pugh CM**, Dennis RH, Massac EA. An Evaluation of The Intra-Operative Anticoagulants Used in Microvascular Free Flap Surgery. *Journal of the National Medical Association*. 88(10): 655-657, 1996.
2. **Pugh CM**, DeWitty RL. Mondor's Disease. *Journal of the National Medical Association*. 88 (6): 359-363, 1996
3. **Pugh CM**, Srivastava SS, Shavelson RJ, et al. The Effect of Simulator Use on Learning and Self-Assessment: The Case of Stanford University's E-Pelvis Simulator. *Studies in Health Technology and Informatics*. 2001;81:396-400. PMID: 11317776
4. **Pugh CM**, Rosen J. Qualitative and Quantitative Analysis of Pressure Sensor Data Acquired by the E-Pelvis Simulator during Simulated Pelvic Examinations. *Studies in Health Technology and Informatics*. 85:376-379, 2002.
5. **Pugh CM**, Srivastava SS, Heinrichs WL. Visual Representations of Physical Abilities: reverse haptics technology. *Studies in Health Technology and Informatics*. 85:380-381, 2002.
6. **Pugh CM**, Youngblood P. Development and Validation of Assessment Measures for a Newly Developed Physical Examination Simulator. *Journal of the American Medical Informatics Association*. Sep-Oct; 9(5):448-60, 2002.
7. **Pugh CM**, Ratiu P. The Surgical Illustrator: a web enabled computer program for documenting clinical and procedural details. *Studies in Health Technology and Informatics*. 98:304-9, 2004.
8. Prystowsky JB, **Pugh CM**, Nagle AP. Appendicitis. *Current Problems in Surgery*. Oct; 42(10):688-742, 2005.
9. Mackel T, Rosen J, **Pugh C**. Data Mining of the E-pelvis Simulator Database
  - A Quest for a Generalized Algorithm for Objectively Assessing Medical Skill.
  - *Studies in Health Technology and Informatics*. 119:355-360, 2006.
10. **Pugh CM**, Salud LH. Fear of Missing a Lesion: Use of Simulated Breast Models to Decrease Student Anxiety When Learning Clinical Breast Examinations. *American Journal of Surgery*. 193 (6):766-70, 2007.
11. Silverstein J, Selkov G, Salud L, **Pugh CM**. Developing Performance Criteria

**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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for the e-Pelvis Simulator Using Visual Analytics *Studies in Health Technology and Informatics*. 125:436-8, 2007

12. Mackel T, Rosen J, **Pugh CM**. Application of Hidden Markov Modeling to Objective Medical Skill Evaluation. *Studies in Health Technology and Informatics*. 125:316-8, 2007.
13. Mackel T, Rosen J, **Pugh CM**. Markov Model Assessment of Subjects' Clinical Skill Using the E-Pelvis Physical Simulator. *IEEE Transactions in Bio-Medical Engineering*. 54(12):2133-41, 2007.
14. **Pugh CM**, DaRosa DA, Glenn D, Bell RH. A Comparison of Faculty and Resident Perception of Resident Learning Needs in the Operating Room. *Journal of Surgical Education*. 64(5):250-55, 2007.
15. Lo DJ, Bilimoria KY, **Pugh CM**. Bowel Complications after Plug and Patch Inguinal Hernia Repair. *Hernia: the journal of hernias and abdominal wall surgery*. 12(4):437-40, 2008.
16. **Pugh CM**, Domont ZB, Salud LH, Blossfield KM. A Simulation Based Assessment of Clinical Breast Examination Techniques: Do patient and clinician factors affect clinician approach? *American Journal of Surgery*. 195(6):874-80, 2008
17. Scott DJ, Cendan JC, **Pugh CM**, Minter RM, Dunnington GL, Kozar RA. The changing face of surgical education: simulation as the new paradigm. *Journal of Surgical Research*. 15; 147(2):189-93, 2008
18. Deladisma A, Gupta M, Kotranza A, Bittner B, Imam T, Swinson D, Gucwa A, Nesbit R, Lok B, **Pugh CM**, Lind DS. "A Pilot Study to Integrate an Immersive Virtual Patient with a Breast Complaint and Breast Exam Simulator into a Surgery Clerkship". *American Journal of Surgery*. 197(1):102-6., Jan 2009
19. Balkissoon R, Blossfield-Iannitelli K, Salud L, Ford D, **Pugh CM**. Lost in Translation: Unfolding Medical Students' Misconceptions of How to Perform the Clinical Digital Rectal Examination. *American Journal of Surgery*. 197(4):525-32, April 2009
20. **Pugh CM**, Watson A, Bell RH, Brasel KJ, Purcell Jackson G, Weber SM, Kao LS. Surgical Education in the Internet Era. *Journal of Surgical Research*. 2009 October; 156(2):177-82
21. Kotranza A, Lok B, Deladisma A., **Pugh CM**, Lind DS. "Mixed Reality Humans: Evaluating Behavior, Usability, and Acceptability." *IEEE Transactions on Visualization and Computer Graphics*. 15(3):369-82, May –

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Jun 2009

22. **Pugh CM**, Aidoo KA. Fear of Causing Harm: Use of Mannequin-Based Simulation to Decrease Student Anxiety Prior to Interacting with Female Teaching Associates. *Teaching and Learning in Medicine*. 2009 Apr-Jun; 21(2):116-20
23. Siwe K, Bertero C, **Pugh CM**, Wijma B. Use of Clinical Simulations for Patient Education: Targeting an untapped audience. *Studies in Health Technology and Informatics*. 142:325-30. May 2009
24. Rooney D, **Pugh CM**, Auyang E, Hungness E, Darosa D. Administrative considerations when implementing the American College of Surgeon's Skills Curriculum. *Surgery*. 147(5): 614-21, May 2010
25. **Pugh CM**, Plachta S, Auyang E, Pryor A, Hungness E. Outcome Measures for Surgical Simulators: Is the focus on technical skills the best approach? *Surgery*. 147(5): 646-54, May 2010
26. **Pugh CM**, DaRosa DA, Bell, Jr. RH. Residents' Self-Reported Learning Needs for Intra-Operative Knowledge: are we missing the bar? *American Journal of Surgery*. 199(4):562-5, April 2010
27. **Pugh CM**, Santacaterina S, DaRosa DA, Clark R. Intra-Operative Decision Making: More than meets the eye. *Journal of Biomedical Informatics*. 2011 Jun; 44(3):486-96
28. **Pugh CM**, DaRosa DA, Santacaterina S, Clark R. Faculty evaluation of simulation-based modules for assessment of intra-operative decision making. *Surgery*. 149(4):534-42. April 2011
29. Scott DJ, **Pugh CM**, Ritter EM, Jacobs LM, Pellegrini CA, Sachdeva AK. New Directions for Simulation-based Education and Training: Breakout Session Reports from the 2010 ACS-Accredited Education Institutes Consortium Meeting. *Surgery*. 149(6):735-44. June 2011
30. Salud LH, **Pugh CM**. Use of sensor technology to explore the science of touch.  
– *Studies in Health Technology and Informatics*. 163:542-8, March 2011
31. Salud LH, Peniche AR, Salud JC, de Hoyos AL, **Pugh CM**. Toward a simulation and assessment method for the practice of camera-guided rigid bronchoscopy. *Studies in Health Technology and Informatics*. 163:535-41, March 2011
32. Salud JC, Blossfield Iannitelli K, Salud LH, **Pugh CM**. Are commercially available simulators durable enough for classroom use? *Studies in Health Technology and*

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*Informatics*. 163:531-4, March 2011

33. Kaye AR, Salud LH, Domont ZB, Blossfield Iannitelli K, **Pugh CM**. Expanding the use of simulators as assessment tools: the new pop quiz. *Studies in Health Technology and Informatics*. 163:271-3, March 2011
34. **Pugh CM**, Bevan MG, Duve R, White HL, Magee JH, Wiehagen GB. A Retrospective Review of TATRC Funding for Medical Modeling and Simulation Technologies. *Simulation in Healthcare*. 2011 Aug;6(4):218-25
35. Huang F, Mussa-Ivaldi F, **Pugh CM**, Patton J. Learning Kinematic Constraints in Laparoscopic Surgery. *IEEE Eng Med Biol Soc*. 2010;2010:2097-102
36. Nisky I, Pressman A, **Pugh CM**, Mussa-Ivaldi FA, Karniel A. Perception and Action in Teleoperated Needle Insertion. *IEEE Transactions on Haptics*. 2011;4(3): 155-166
37. Clark RE, **Pugh CM**, Yates KA, Kenji I, Green DJ, Sullivan ME. The Use of Cognitive Task Analysis To Improve Instructional Descriptions of Procedures. *Journal of Surgical Research*. 2012; 173(1): e37-e42
38. DaRosa DA, **Pugh CM**. Error Training: Missing Link in Surgical Education.  
– *Surgery*. 2012; 151(2): 139-45
39. Kwan C, Salud LH, Ononye C, Zhao S, **Pugh CM**. Moving Past Normal Force: Capturing and Classifying Shear Motion Using 3D Sensors. *Studies in Health Technology and Informatics*. 2012; 173:245-9
40. Nisky I, Huang F, Milstein A, **Pugh CM**, Mussa-Ivaldi FA. Perception of Stiffness in Laparoscopy – the Fulcrum Effect. *Studies in Health Technology and Informatics*. 2012; 173: 313-9
41. Salud JC, Ononye C, Salud LH, **Pugh CM**. Modification of Commercially Available Simulators to Elicit Decision Making Behavior. *Studies in Health Technology and Informatics*. 2012: 173: 418-20
42. Salud JC, Ononye C, Salud LH, **Pugh CM**. Introducing Simulation Technology to New Faculty: Do Not Let Them Play. *Studies in Health Technology and Informatics*. 2012; 173: 421-3
43. Salud LH, Ononye C, Kwan C, Salud JC, **Pugh CM**. Clinical Examination Simulation: Getting to Real. *Studies in Health Technology and Informatics*. 2012; 173: 424-9
44. **Pugh CM**, Blossfield-Iannitelli KM, Rooney DM, Salud LH. Use of Mannequin-



---

Based Simulation to Decrease Student Anxiety Prior to Interacting with the Male Teaching Associates. *Teaching and Learning in Medicine*. 2012; 24: 122-7

45. Andrew B, Plachta S, Salud L, **Pugh CM**. Development and Evaluation of a Decision-Based Simulation to Assess Team Skills. *Surgery*. 2012; 152: 152-7
46. Rooney DM, Hungness ES, DaRosa DA, **Pugh CM**. Can Skills Coaches be Used to Assess Resident Performance in the Skills Laboratory? *Surgery*. 2012 Jun; 151(6):796-802
47. Issa N, Salud L, Kwan C, Woods K, **Pugh CM**. Validity and Reliability of a Sensor-Enabled Intubation Trainer: A Focus on Patient-Centered Data. *J Surg Res*. 2012; 177: 27-32
48. Huang FC, Mussa-Ivaldi FA, **Pugh CM**, Patton JL. Learning Kinematic Constraints in Laparoscopic Surgery. *IEEE Trans Haptics*. 2012 Oct;5(4):356-364
49. Salud LH, Kwan C, **Pugh CM**. Simplifying Touch Data from Tri-Axial Sensors Using a New Data Visualization Tool. *Studies in Health Technology and Informatics*. 2013 Jun; 184:370-6
50. Cohen E, Ononye C, Salud J, Kwan C, Salud L, **Pugh CM**. Use of Simulation to Understand the Effects of Task Complexity and Time Away on Clinical Confidence. *Studies in Health Technology and Informatics*. 2013; 184:92-5
51. **Pugh CM**, Britt LD. A Review of In-Training Assessments used in United States Surgical Residency Programs. *ANZ Journal of Surgery*. 2013 Jun; 83(6):460-5
52. Wohlaer MV, George B, Lawrence PF, **Pugh CM**, Van Eaton EG, DaRosa DA. Review of Influential Articles in Surgical Education: 2002-2012. *Journal of Graduate Medical Education*. 2013 Jun 5(2): 219-226
53. **Pugh CM**, DaRosa DA. Use of Cognitive Task Analysis to Guide the Development of Performance Based Assessments for Intra-Operative Decision Making. *Military Medicine*. 2013 Oct;178(10 Suppl):22-7
54. **Pugh CM**. Application of National Testing Standards to Simulation-Based Assessments of Clinical Palpation Skills. *Military Medicine*. 2013 Oct: 178(10 Suppl):55-63
55. Glarner CE, McDonald RJ, Smith AB, Levenson GE, Peyre S, **Pugh CM**, Greenberg CC, Greenberg JA, Foley EF. Utilizing a novel tool for the comprehensive assessment of resident operative performance. *Journal of Surgical Education*. 2013 Nov/Dec; 70(6)



56. Maag AD, Laufer S, Kwan C, Cohen ER, Lenhart RL, Stork NC, Halanski MA, **Pugh CM**. Sensor-based assessment of cast placement and removal. *Studies in Health, Technology, and Informatics*. 2014; 196:259-61
57. Laufer S, Cohen ER, Maag AD, Kwan C, VanVeen B, **Pugh CM**. Multimodality approach to classifying hand utilization for the clinical breast examination. *Studies in Health, Technology, and Informatics*. 2014; 196:238-44
58. Kwan C, Cohen ER, Salud L, **Pugh CM**. Modification of the pelvic examination simulator for the developing world. *Studies in Health, Technology, and Informatics*.  
– 2014; 196:222-4
59. Kwan C, Salud L, Cohen ER, **Pugh CM**. Validity of a newly developed tri-axial sensor for clinical breast examination skills. *Studies in Health, Technology, and Informatics*. 2014; 196:225-9
60. Kwan C, Cohen ER, **Pugh CM**. Application of a new adaptable thyroid model for ultrasound and hands-on skill assessment. *Studies in Health, Technology, and Informatics*. 2014; 196:230-2
61. Weyhrauch PW, Niehaus J, Metzger M, Laufer S, Kwan C, **Pugh CM**. Tourniquet Master Training for Junctional and Inguinal Hemorrhage Control (TMT). *Studies in Health, Technology, and Informatics*. 2014; 196:457-61
62. **Pugh CM**, Cohen ER, Kwan C, Cannon-Bowers JA. A comparative assessment and gap analysis of commonly used team rating scales. *Journal of Surgical Research*. 2014 Apr 28; 190(2):445-450
63. Glarner CE, Hu Y, Chen C, Radwin RG, Zhao Q, Craven M, Wiegmann D, **Pugh CM**, Crty MJ, Greenberg CC. Quantifying Technical Skills During Open Operations Using Video-Based Motion Analysis. *Surgery*. 2014 Jun 21; 156(3): 729-734
64. Laufer S, **Pugh CM**, Van Veen BD. Characterizing touch using pressure data and auto regressive models. *Engineering in Medicine and Biology Society (EMBC), 2014 36<sup>th</sup> Annual International Conference of the IEEE*. IEEE, 2014; 1839-1842
65. Azari D, **Pugh CM**, Laufer S, Cohen E, Kwan C, Chen CE, Yen TY, Hu YH, Radwin R. Evaluation of hands-on clinical exam performance using marker-less video tracking. *Proceedings of Human Factors and Ergonomics Society Annual Meeting*. 2014 Sep; 58(1) 793-737
66. D'Angelo AD, Cohen ER, Kwan C, Laufer S, Greenberg C, Greenberg J,

**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

---

Wiegmann D, **Pugh CM**. Use of decision-based simulations to assess resident readiness for operative independence. *The American Journal of Surgery*, 2015 Jan; 209(1): 132-139

67. Laufer S, Cohen ER, Kwan C, D'Angelo AL, Yudkowsky R, Boulet JR, McGaghie WC, **Pugh CM**. Sensor technology in assessments of clinical skill. *New England Journal of Medicine*. 2015 Feb 19; 372(8): 784-6
68. D'Angelo AD, Rutherford DN, Ray RD, Laufer S, Kwan C, Cohen ER, Mason A, **Pugh CM**. Idle time: an underdeveloped performance metric for assessing surgical skill. *American Journal of Surgery*. 2015 Apr; 209(4): 645-51
69. Park AE, Zahiri HR, **Pugh CM**, Vassiliou M, Voeller G. Raising the quality of hernia care: is there a need? *Surgical Endoscopy*. 2015 Aug; 29(8): 2061-71
70. Rutherford DN, D'Angelo AD, Law KE, **Pugh CM**. Advanced engineering technology for measuring performance. *Surgical Clinics of North America*. 2015 Aug; 95(4): 813-26
71. Laufer S, Ray RD, D'Angelo AD, Jones GF, **Pugh CM**. Use of simulators to explore specialty recommendation for palpable breast mass. *The American Journal of Surgery*. 2015 Oct; 210(4): 618-23
72. **Pugh CM**, Arafat FO, Kwan C, Cohen ER, Yurashima Y, Vassiliou MC, Fried GM. Development and evaluation of a simulation-based continuing medical education course: beyond lectures and credit-hours. *The American Journal of Surgery*. 2015 Oct; 210(4): 603-609
73. D'Angelo AD, Rutherford DN, Ray RD, Mason A, **Pugh CM**. Operative skill: quantifying surgeon's response to tissue properties. *Journal of Surgical Research*. 2015 Oct; 198(2): 294-8
74. Zahirir HR, Park AE, **Pugh CM**, Vassiliou M, Voeller G. "See one, do one, teach one": inadequacies of current methods to train surgeons in hernia repair. *Surgical Endoscopy*. 2015 Oct; 29(10): 2867-72
75. D'Angelo AD, Ray RD, Jenewein CG, Jones GF, **Pugh CM**. Residents' perception of skill decay during dedicated research time. *Journal of Surgical Research*. 2015 Nov; 199(1): 23-31
76. D'Angelo AD, Law KE, Cohen ER, Greenberg JA, Kwan C, Greenberg C, Wiegmann DA, **Pugh CM**. The use of error analysis to assess resident performance. *Surgery*. 2015 Nov; 158(5): 1408-14
77. Sullivan SA, Anderson BMH, **Pugh CM**. Development of technical skills: Education, simulation, and maintenance of certification. *Journal of Craniofacial*

---

*Surgery*. 2015 Nov; 26(8): 2270-4

78. Kwan C, Laufer S, Contreras MC, Weyhrauch P, Niehaus J, Palmon N, Bauchwitz B, **Pugh CM**. Junctional and Inguinal Hemorrhage Simulation: Tourniquet Master Training. *Studies in Health, Technology, and Informatics*. 2016; 220: 175-8
79. Laufer S, Rasske K, Stopfer L, Kurzynski C, Abbott T, Platner M, Towles J, **Pugh CM**. Fabric force sensors for the clinical breast examination simulator. *Studies in Health, Technology, and Informatics*. 2016; 220: 193-8
80. Laufer S, Amiel I, Nathwani JN, Mashiach R, Margalit RS, Ray RD, Ziv A, **Pugh CM**. A simulator for measuring forces during surgical knots. *Studies in Health, Technology, and Informatics*. 2016; 220: 199-204
81. Laufer S, Kempton SJ, Maciolek K, Terry A, Ray RD, **Pugh CM**, Afifi AM. A multi-layered needle injection simulator. *Studies in Health, Technology, and Informatics*. 2016; 220: 205-8
82. Parthiban C, Ray RD, Rutherford DN, Zinn M, **Pugh CM**. Development and analysis of psychomotor skills metrics for procedural skills decay. *Studies in Health, Technology, and Informatics*. 2016; 220: 285-8
83. D'Angelo AD, Rutherford DN, Ray RD, Laufer S, **Pugh CM**. Working volume: validity evidence for motion-based metric of surgical efficiency. *American Journal of Surgery*. 2016 Feb; 211(2): 445-50
84. Sullivan SA, Bingman E, O'Rourke A, **Pugh CM**. Piloting virtual surgical patient cases with 3rd year medical students during the surgery rotation. *American Journal of Surgery*. 2016 Apr; 211(4): 689-696
85. Azari DP, **Pugh CM**, Laufer S, Kwan C, Chen CH, Yen TY, Hu YH, Radwin RG. Evaluation of simulated clinical breast exam motion patterns using marker-less video tracking. *Human Factors*. 2016 May; 58(3): 427-40
86. Nathwani JN, Law KE, Ray RD, O'Connell-Long BR, Fiers RM, D'Angelo AD, DiMarco SM, **Pugh CM**. Resident performance in complex urinary catheter scenarios. *Journal of Surgical Research*. 2016 Sep; 205(1): 121-6
87. Law KE, Gannon SJ, Jenewein CG, DiMarco SM, Maulson LJ, Laufer S, **Pugh CM**. Exploring hand coordination as a measure of surgical skill. *Journal of Surgical Research*. 2016 Sep; 205(1): 192-7
88. Mohamadipanah H, Parthiban C, Law KE, Nathwani JN, Maulson LJ, DiMarco SM, **Pugh CM**. Hand smoothness in laparoscopic surgery correlates to psychomotor skills in virtual reality. *2016 IEEE 13th International Conference on*

**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

---

*Wearable and Implantable Body Sensor Networks (BSN)*, San Francisco, CA, 2016, pp. 242-246

89. Law KE, Gwillim EC, Ray RD, D'Angelo AD, Cohen ER, Fiers RM, Rutherford DN, **Pugh CM**. Error tolerance: An evaluation of residents' repeated motor coordination errors. *American Journal of Surgery*. 2016 Oct; 212(4): 609-614
90. Mohamadipanah H, Parthiban C, Nathwani JN, Rutherford DN, DiMarco SM, **Pugh CM**. Can a virtual reality assessment of fine motor skill predict successful central line insertion? *American Journal of Surgery*. 2016 Oct; 212(4): 573-578
91. Frasier L., Azari DP, Ma Y, Pavuluri Quamme SR, Radwin RG, **Pugh CM**, Yen TY, Chen CH, Greenberg C. A Marker-less technique for measuring kinematics in the operating room. *Surgery*. 2016 Nov; 160(5): 1400-1413
92. O'Connell-Long BR, Ray RD, Nathwani JN, Fiers RM, **Pugh CM**. Errors in bladder catheterization: Are residents ready for complex scenarios? *Journal of Surgical Research*. 2016 Nov; 206(1): 27-31
93. Law KE, Ray RD, D'Angelo AD, Cohen ER, DiMarco SM, Linsmeier E, Wiegmann DA, **Pugh CM**. Exploring senior residents' intraoperative error management strategies: a potential measure of performance improvement. *Journal of Surgical Education*. 2016 Nov – Dec; 73(6): e64-e70
94. Nathwani JN, Fiers RM, Ray RD, Witt AK, Law KE, DiMarco SM, **Pugh CM**. Relationship between technical errors and decision making skills in the junior resident. *Journal of Surgical Education*. 2016 Nov – Dec; 73(6): e84-e90
95. Gannon SJ, Law KE, Ray RD, DiMarco SM, D'Angelo AD, **Pugh CM**. Do resident's leadership skills relate to ratings of technical skill? *Journal of Surgical Research*. 2016 Dec; 206(2): 466-471
96. Nathwani JN, Law KE, Witt AK, Ray RD, DiMarco SM, **Pugh CM**. A simulation-based, cognitive assessment of resident decision making during complex urinary catheterization scenarios. *American Journal of Surgery*. 2017 Apr; 213(4): 622-626
97. Jones GF, Law KE, Jenewein CG, Ray RD, DiMarco SM, **Pugh CM**. Research residents' perceptions of skill decay: Effects of repeated skills assessments and scenario difficulty. *American Journal of Surgery*. 2017 Apr; 213(4): 631-636
98. Law KE, Ray RD, DiMarco SM, Jenewein CG, D'Angelo AD, Cohen ER, Wiegmann DA, **Pugh CM**. Do errors and critical events relate to hernia repair outcomes? *American Journal of Surgery*. 2017 Apr; 213(4): 652-655
99. Sullivan SA, Ruis A, **Pugh C**. Procedural Simulations and Reflective Practice:

---

Meeting the Need. *Journal of Laparoendoscopic and Advanced Surgical Techniques*. 2017 Apr; 27(5): 455-458

100. Madani A, Gallix B, **Pugh CM**, Azagury D, Bradley P, Fowler D, Hannaford B, Macdonald S, Miyasaka K, Nuño N, Szold A, Verter V, Aggarwal R. Evaluating the role of simulation in healthcare innovation: Recommendations of the Simnovate Medical Technologies Domain Group. *BMJ Simulation & Technology Enhanced Learning*. 2017; 3(Suppl 1): S8-S14
101. Dzau VJ, Asch DA, Hannaford B, Aggarwal R, **Pugh CM**. A Debate on the Cost of Innovation in Healthcare: Is it too costly? *BMJ Simulation & Technology Enhanced Learning*. 2017; 3(Suppl 1): S33-S36
102. Maier-Hein L, Vedula S, Speidel S, Navab N, Kikinis R, Park A, Eisenmann M, Feussner H, Forestier G, Giannarou S, Hashizume M, Katic D, Kenngott H, Kranzfelder M, Malpani A, Marz K, Neumuth T, Padoy N, **Pugh CM**, Schoch N, Stoyanov D, Taylor R, Wagner M, Hager GD, Jannin P. Surgical data science for next-generation interventions. *Nature Biomedical Engineering*. Sep 2017; 1: 691-696
103. Nathwani JN, Wise BJ, Garren ME, Mohamadipanah H, Vanbeek N, DiMarco SM, **Pugh CM**. Residents' surgical performance during the laboratory years: An analysis of rule-based errors. *Journal of Surgical Research*. 2017 Nov; 219: 226-231
104. Walker JL, Nathwani JN, Mohamadipanah H, Laufer S, Jocewicz F, Gwillim E, **Pugh CM**. Residents' response to bleeding during a simulated robotic surgery task. *Journal of Surgical Research*. 2017 Dec; 220: 385-390
105. Laufer S, D'Angelo AD, Kwan C, Ray RD, Yudkowsky R, Boulet JR, McGaghie WC, **Pugh CM**. Rescuing the clinical breast examination: advances in classifying technique and assessing physician competency. *Annals of Surgery*. 2017 Dec; 266(6):1069-1074
106. Greenberg JA, Jolles S, Sullivan SA, Pavuluri Quamme S, Funk LM, Lidor Anne O, Greenberg CC, **Pugh CM**. A structured, extended training program to facilitate adoption of new techniques for practicing surgeons. *Surgical Endoscopy*. 2018 Jan; 32(1):217-224. PMID: 28643054
107. Nathan DP, Hwang C, Kulesa JT, Saluk J, **Pugh CM**, Glucksberg M. Novel low-cost soft-tissue mannequins for medical education. *Global Health Innovation*. 2018 Nov; 1(2).
108. Jung HS, Warner-Hillard C, Thompson R, Haines K, Moungey B, LeGare A, Osman I, **Pugh CM**, Agarwal S, Sullivan S. Why saying what you mean matters: An analysis of trauma team discourse. *American Journal of Surgery*.



---

2018 Feb; 215(2): 250-254. PMID: 29153980

109. D'Angelo AD, D'Angelo J, Rogers D, **Pugh CM**. Faculty perceptions of resident skills decay during dedicated research fellowships. *American Journal of Surgery*. 2018 Feb; 215(2): 336-340. PMID: 29169821
110. Sullivan S, Warner-Hillard C, Eagan B, Thompson RJ, Ruis AR, Haines K, **Pugh CM**, Shaffer DW, Jung HS. Using epistemic network analysis to identify targets for educational interventions in trauma team communication. *Surgery*. 2018 Apr; 163(5): 938-943. PMID: 29395240
111. Mohamadipanah H, Nathwani JN, Peterson K, Forsyth KE, Maulson L, DiMarco SM, **Pugh CM**. Shortcut assessment: Can residents' operative performance be determined in the first five minutes of an operative task? *Surgery*. 2018 Jun; 163(6): 1207-1212. PMID: 29728259
112. Nathwani JN, Garren A, Laufer S, Kwan C, **Pugh CM**. Improving Diagnosis in Healthcare: Local versus national adoption of recommended guidelines for the clinical breast examination. *American Journal of Surgery*. 2018 Jun; 215(6): 995-999. PMID: 29229379
113. Laufer S, **Pugh C**, Van Veen BD. Modeling Touch and Palpation Using Autoregressive Models. *IEEE Transactions in Biomedical Engineering*. 2018 Jul; 65(7):1585-1594. PMID: 28489529
114. Steiman J, Sullivan SA, Scarborough J, Wilke L, **Pugh CM**, Bell RH, Kent KC. Measuring competence in surgical training through assessment of surgical entrustable professional activities. *Journal of Surgical Education*. 2018 Nov; 75(6): 1452-1462. PMID: 30097351
115. Ruis AR, Rosser AA, Quandt-Walle C, Nathwani JN, Shaffer DW, **Pugh CM**. The hands and head of a surgeon: Modeling operative competency with multimodal epistemic network analysis. *American Journal of Surgery*. 2018 Nov; 216(5): 835-840. PMID: 29224911
116. Xu J, Kwan C, Sunkara A, Mohamadipanah H, Tizale M, Bell K, **Pugh CM**. Dynamic Visual Feedback During Junctional Tourniquet Training. *Journal of Surgical Research*. 2019 Jan; 233: 444-452. PMID: 30502284
117. Azari D, Greenberg C, **Pugh C**, Wiegmann D, Radwin R. In Search of Characterizing Surgical Skill. *Journal of Surgical Education*. 2019 Sep - Oct; 76(5):1348-1363. PMID: 30890315
118. Hashimoto DA, Axelsson CG, Jones CB, Phitayakorn R, Petrusa E, McKinley SK, Gee D, **Pugh C**. Surgical procedural map scoring for decision-making in laparoscopic cholecystectomy. *American Journal of Surgery*. 2019

---

Feb; 217(2):356-361. PMID: 30470551

119. Godfrey M, Rosser AA, **Pugh CM**, Sachdeva AK, Sullivan S. What do you want to know? Operative experience predicts the type of questions practicing surgeons ask during a CME laparoscopic hernia repair course. *American Journal of Surgery*. 2019 Feb; 217(2):382-386. PMID: 30527925
120. Bauchwitz BR, Curley T, Kwan C, Niehaus JM, **Pugh CM**, Weyhrauch PW. Modeling Framework Use to Analyze and Describe Junctional Tourniquet Skills. *Military Medicine*. 2019 Mar 1; 184(Suppl 1): 347-360. PMID: 30901425
121. **Pugh CM**. Electronic health records, physician workflows and system change: defining a pathway to better healthcare. *Annals of Translational Medicine*. 2019 Mar; 7 (Suppl 1): 347-360. PMID: 31032307
122. Mohamadipanah H, Perrone K, Peterson K, Garren M, Parthiban C, Sunkara A, Zinn M, **Pugh C**. Can Virtual Reality Be Used to Track Skills Decay During the Research Years? *Journal of Surgical Research*. 2 March 2019. 247: 150-155. PMID: 31776024
123. Azari DP, Frasier L, Pavuluri Quamme SR, Greenberg C, **Pugh CM**, Greenberg J, Radwin RG. Modeling surgical technical skill using expert assessment for automated computer rating. *Annals of Surgery*. 2019 Mar; 269(3):574-581. PMID: 28885509
124. Collins JW, Levy J, Stefanidis D, Gallagher A, Coleman M, Cecil T, Ericsson A, Motttrie A, Wiklund P, Ahmed K, Pratschke J, Casali G, Ghazi A, Gomez M, Hung A, Arnold A, Dunning J, Martino M, Vaz C, Friedman E, Baste JM, Bergamaschi R, Feins R, Earle D, Pusic M, Montgomery O, **Pugh C**, Satava RM. Utilising the Delphi Process to Develop a Proficiency-based Progression Train-the-trainer Course for Robotic Surgery Training. *European Urology*. 2019 May; 75(5): 775-785. PMID: 30665812
125. **Pugh CM**. Advanced Volumetric 3-Dimensional Visualization of Surgical Anatomy-Are We There Yet? *JAMA Surgery*. 2019 Aug 1;154(8):744-745. PMID: 31141145
126. Godfrey M, Rosser AA, **Pugh CM**, Sachdeva AK, Sullivan S. Teaching Practicing Surgeons What Not to Do: An Analysis of Instructional Fluidity During a Simulation-based Continuing Medical Education (CME) Course. *Surgery*. 2019 Jun; 165(6): 1082-1087. PMID: 30876670
127. Mohamadipanah H, Perrone KH, Nathwani J, Parthiban C, Peterson K, Wise B, Garren A, **Pugh C**. Screening surgical residents' laparoscopic skills using virtual reality tasks: Who needs more time in the sim lab? *Surgery*. 2019 Aug; 166(2): 218-222. PMID: 31229312

128. Huang FC, Mohamadipanah H, Mussa-Ivaldi F, **Pugh C**. Combining Metrics from clinical simulators and sensorimotor tasks can reveal the training background of surgeons. *IEEE Trans Biomed Eng*. 2019 Sep; 66(9): 2576-2584. PMID: 30629489
129. Perrone K, Yang S, Wise B, Witt A, Goll C, Dawn S, Eichhorn W, Mohamadipanah H, **Pugh C**. Use of Sensors to Quantify Procedural Idle Time: Validity Evidence for a New Mastery Metric. *Surgery*. 2019 Nov 7. pii: S0039-6060(19)30672-5. PMID: 31708084
130. **Pugh CM**, Law KE, Cohen ER, D'Angelo AD, Greenberg JA, Greenberg CC, Wiegmann DA. Use of error management theory to quantify and characterize residents' error recovery strategies. *American Journal of Surgery*. 2019 Nov 19. pii: S0002-9610(19)30450-7. PMID: 31806167
131. Mohamadipanah H, Perrone K, Peterson K, Garren M, Parthiban C, Sunkara A, Zinn M, **Pugh C**. Can VR Be Used to Track Skills Decay During the Research Years? *Journal of Surgical Research*. 2019 Nov 24. pii: S0022-4804(19)30760-7. PMID: 31776024
132. D'Angelo A, Ruis A, Collier W, Shaffer DW, **Pugh CM**. Evaluating how residents talk and what it means for surgical performance in the simulation lab. *American Journal of Surgery*. 2020 Jul;220(1):37-43. PMID: 32093868
133. Perrone K, Yang S, Wise B, Mohamadipanah H, Witt A, Goll C, **Pugh C**. Translating Motion Tracking Data into Resident Feedback: An Opportunity for Streamlined Video Coaching. *American Journal of Surgery*. 2020 Apr;219(4):552-556 PMID: 32014295
134. Huges, B.D., Butler, P.D., Edwards, M.A., **Pugh, C.M.**, Martin, C. A. The Society of Black Academic Surgeons CV Benchmarking Initiative: Early career trends of academic surgical leaders. *American Journal of Surgery*. 2020 Apr;219(4):546-551. PMID: 32147021
135. Mohamadipanah H., Perrone K., Peterson K., Nathwani, J., Huang, F., Garren, A., Garren M., Witt, A., **Pugh, C**. Sensors and Psychomotor Metrics: A Unique Opportunity to Close the Gap on Surgical Processes and Outcomes. *American College of Surgeons Biomaterials Science and Engineering*. 2020 May 11;6(5):2630-2640. PMID: 33463275
136. Berry, C., Khabele, D., Johnson-Mann, C., Henry-Tillman, R., Joseph, K., Turner, P., **Pugh, C.**, Fayanju, O. M., Backhus, L., Sweeting, R., Newman, E. A., Oseni, T., Hasson, R. M., White, C., Cobb, A., Johnston, F. M., Stallion, A., Karpeh, M., Nwariaku, F., Rodriguez, L. M., Jordan, A. H. A Call to Action: Black/African American Women Surgeon Scientists, Where Are They? *Annals of*



---

*Surgery*. 2020 Jul;272(1):24-29. PMID: 32209893

137. Montgomery BK, Perrone KH, Yang S, Segovia NA, Rinsky L, **Pugh CM**, Frick SL. Does the location of short-arm cast univalve effect pressure of the three-point mould? *Journal of Children's Orthopaedics*. 2020 Jun 1;14(3):236- 240. PMID: 32582392
138. Korndorffer, J., Hawn, M., Spain, D., Knowlton, L., Azagury, D., Nassar, A., Lau, J., Arnow, K. Trickey, A., **Pugh, C.** Situating Artificial Intelligence in Surgery: A Focus on Disease Severity. *Annals of Surgery*. 2020 Sep 1;272(3):523-528. PMID: 33759839
139. Butler PD, **Pugh CM**, Meer E, Lett LA, Tilahun ED, Sanfey HA, Berry C, Stain SC, DeMatteo RP, Vickers SM, Britt LD, Martin CA. Benchmarking Accomplishments of Leaders in American Surgery and Justification for Enhancing Diversity and Inclusion. *Annals of Surgery*. 2020 Dec;272(6):897-903. PMID: 32649466
140. **Pugh CM**, Hashimoto DA, Korndorffer JR Jr. The what? How? And who? Of video based assessment. *American Journal of Surgery*. 2021 Jan;221(1):13- 18. PMID: 32665080
141. Crown A, Berry C, Khabele D, Fayanju OM, Cobb A, Backhus L, Smith RN, Sweeting R, Hasson RM, Johnson-Mann C, Oseni T, Newman EA, Turner P, Karpeh M, **Pugh C**, Jordan AH, Henry-Tillman R, Joseph KA. The Role of Race and Gender in the Career Experiences of Black/African American Academic Surgeons: A Survey of the Society of Black Academic Surgeons and a Call to Action. *Annals of Surgery*. 2021 May 1;273(5):827-831. doi: 10.1097/SLA.0000000000004502. PMID: 32941287.
142. Mohamadipanah H, Wise B, Witt A, Goll C, Yang S, Perumalla C, Huemer K, Kearse L, **Pugh C**. Performance Assessment in Surgery Using Sensor Technology. *Journal of Surgical Oncology*. 2021 July 10. 124: 200- 215. <https://doi.org/10.1002/jso.26519> PMID: 34245582
143. Meireles OR, Rosman G, Altieri MS, Carin L, Hager G, Madani A, Padoy N, **Pugh CM**, Sylla P, Ward TM, Hashimoto DA; SAGES Video Annotation for AI Working Groups. SAGES consensus recommendations on an annotation framework for surgical video. *Surgical Endoscopy*. 2021 Sep;35(9):4918-4929. doi: 10.1007/s00464-021-08578-9. Epub 2021 Jul 6. PMID: 34231065.
144. Hermsen, J., Mohamadipanah, H., Yang, S., Wise, B., **Pugh, C.** Multi- Modal Cardiopulmonary Bypass Skills Assessment within a High-Fidelity Simulation Environment. *The Annals of Thoracic Surgery*. 2021 Aug;112(2):652- 660. PMID: 32971063

**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

- 
145. Meer E, Hughes BD, Martin CA, Rios-Diaz AJ, Patel V, **Pugh CM**, Berry C, Stain SC, Britt LD, Stein SL, Butler PD. Reassessing career pathways of surgical leaders: An examination of surgical leaders' early accomplishments. *American Journal of Surgery*. 2021 Nov;222(5):933-936. doi:10.1016/j.amjsurg.2021.04.012. Epub 2021 Apr 16. PMID: 33894978.
  146. Korndorffer JR Jr, Wren SM, **Pugh CM**, Hawn MT. From Listening to Action: Academic Surgical Departmental Response to Social Injustice Through Curricular Development. *Annals of Surgery*. 2021 Dec 1;274(6):921- 924. doi:10.1097/SLA.0000000000004891. PMID: 33856378.
  147. Mohamadipanah H, Kearse L, Witt A, Wise B, Yang S, Goll C, **Pugh C**. Can Deep Learning Algorithms Help Identify Surgical Workflow and Techniques? *Journal of Surgical Research*. 2021 Dec;268:318-325. doi:10.1016/j.jss.2021.07.003. Epub 2021 Aug 13. PMID: 34399354.
  148. **Pugh CM**. The Experienced Surgeon and New Tricks-It's Time for Full Adoption and Support of Automated Performance Metrics and Databases. *JAMA Surg*. 2021 Dec 1;156(12):1109-1110. doi: 10.1001/jamasurg.2021.4531. PMID: 34524403.
  149. Applewhite MK, Kearse LE, Mohamadipanah H, Witt A, Goll C, Wise B, Korndorffer JR Jr, **Pugh CM**. Developing a longitudinal database of surgical skills performance for practicing surgeons: A formal feasibility and acceptance inquiry. *Am J Surg*. 2022 Jan 1:S0002-9610(21)00783-2. doi: 10.1016/j.amjsurg.2021.12.035. Epub ahead of print. PMID: 34998521.
  150. Maier-Hein L, Eisenmann M, Sarikaya D, März K, Collins T, Malpani A, Fallert J, Feussner H, Giannarou S, Mascagni P, Nakawala H, Park A, **Pugh C**, Stoyanov D, Vedula SS, Cleary K, Fichtinger G, Forestier G, Gibaud B, Grantcharov T, Hashizume M, Heckmann-Nötzl D, Kenngott HG, Kikinis R, Mündermann L, Navab N, Onogur S, Roß T, Sznitman R, Taylor RH, Tizabi MD, Wagner M, Hager GD, Neumuth T, Padoy N, Collins J, Gockel I, Goedeke J, Hashimoto DA, Joyeux L, Lam K, Leff DR, Madani A, Marcus HJ, Meireles O, Seitel A, Teber D, Ückert F, Müller-Stich BP, Jannin P, Speidel S. Surgical data science - from concepts toward clinical translation. *Med Image Anal*. 2022 Feb;76:102306. doi: 10.1016/j.media.2021.102306. Epub 2021 Nov 18. PMID: 34879287.
  151. Goldbraikh A, D'Angelo AL, **Pugh CM**, Laufer S. Video-based fully automatic assessment of open surgery suturing skills. *Int J Comput Assist Radiol Surg*. 2022 Mar;17(3):437-448. doi: 10.1007/s11548-022-02559-6. Epub 2022 Feb 1. PMID: 35103921; PMCID: PMC8805431.
  152. Kearse LE, Goll CK, Jensen RM, Wise BJ, Witt AK, Huemer K, Korndorffer

**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

- 
- JR Jr, **Pugh CM**. Diversity, equity, and inclusion in presidential leadership of academic medical and surgical societies. *Am J Surg*. 2022 Mar 25:S0002-9610(22)00206-9. doi: 10.1016/j.amjsurg.2022.03.028. Epub ahead of print. PMID: 35369971.
153. Hambrecht A, Berry C, DiMaggio C, Chiu W, Inaba K, Frangos S, Krowsoski L, Greene WR, Issa N, **Pugh C**, Bukur M. A disturbing trend: An analysis of the decline in surgical critical care (SCC) fellowship training of Black and Hispanic surgeons. *J Trauma Acute Care Surg*. 2022 Mar 28. doi: 10.1097/TA.0000000000003621. Epub ahead of print. PMID: 35343928.
154. Keshinro A, Butler P, Fayanju O, Khabele D, Newman E, Greene W, Ude Welcome A, Joseph KA, Stallion A, Backhus L, Frangos S, DiMaggio C, Berman R, Hasson R, Rodriguez LM, Stain S, Bukur M, Klein MJ, Henry-Tillman R, Barry L, Oseni T, Martin C, Johnson-Mann C, Smith R, Karpeh M, White C, Turner P, **Pugh C**, Hayes-Jordan A, Berry C. Examination of Intersectionality and the Pipeline for Black Academic Surgeons. *JAMA Surg*. 2022 Apr 1;157(4):327-334. doi: 10.1001/jamasurg.2021.7430. PMID: 35138327; PMCID: PMC8829744.
155. Vedula, S Ghazi, A, Collins J, **Pugh C**, Stefanidis, D, Meireles, O, Hung, A, Schwaartzberg, S, Levy, J, Sachdeva, A, for the Collaborative for Advanced Assessment of Robotic Surgical Skills. Artificial Intelligence Methods and Artificial Intelligence-Enabled Metrics for Surgical Education: A Multidisciplinary Consensus, *Journal of the American College of Surgeons*: 2022 Apr 4. doi: 10.1097/XCS.0000000000000190
156. Goldbraikh A, Volk T, **Pugh CM**, Laufer S. Using open surgery simulation kinematic data for tool and gesture recognition. *Int J Comput Assist Radiol Surg*. 2022 Apr 13. doi: 10.1007/s11548-022-02615-1. Epub ahead of print. PMID: 35419721.
157. Mohamadipannah H, Perumalla C, Yang S, Wise B, Kearse L, Goll C, Witt A, Korndorffer J, **Pugh C**. Artificial Intelligence in Surgery: A Research Team Perspective. *Current Problems in Surgery*. June 2022, 101125. doi: 10.1016/j.cpsurg.2022.101125
158. Basiev K, Goldbraikh A, **Pugh CM**, Laufer S. Open surgery tool classification and hand utilization using a multi-camera system. *Int J Comput Assist Radiol Surg*. 2022 Aug;17(8):1497-1505. doi: 10.1007/s11548-022-02691-3. Epub 2022 Jun 27. PMID: 35759176.
159. Kearse LE, Goll CK, Jensen RM, Wise BJ, Witt AK, Huemer K, Korndorffer JR Jr, **Pugh CM**. Diversity, equity, and inclusion in presidential leadership of academic medical and surgical societies. *American Journal of Surgery*. 2022 Oct;224(4):1028-1031. doi: 10.1016/j.amjsurg.2022.03.028. Epub 2022 Mar 25.

---

PMID: 35369971.

160. Mohamadipanah H, Perumalla C, Kearse L, Yang S, Wise B, Goll C, Witt A, Korndorffer J, **Pugh C**. Do Individual Surgeon Preferences Affect Procedural Outcomes? *Annals of Surgery*. 2022 Oct 1;276(4):701-710. doi: 10.1097/SLA.0000000000005595. Epub 2022 Jul 19. PMID: 35861074
161. Butler PD, Wexner SD, Alimi YR, Dent DL, Fayanju OM, Gantt NL, Johnston FM, **Pugh CM**. Society of Black Academic Surgeons (SBAS) diversity, equity, and inclusion series: Microaggressions - Lessons Learned from Black Academic Surgeons. *American Journal of Surgery*. 2023 Jan;225(1):136-148. doi: 10.1016/j.amjsurg.2022.09.001. Epub 2022 Sep 7. PMID: 36155676; PMCID: PMC9772234.
162. Funk LM, Barr J, Johnston FM, Smith BK, Cooper Z, **Pugh C**, Dimick JB, Clavien PA, Read TE, Wong SL. Annals of Surgery Open Access: Where is the Value, and What does the Future Hold? *Annals of Surgery*. 2023 Feb 1;277(2):e249-e251. doi: 10.1097/SLA.0000000000005723. Epub 2022 Oct 12. PMID: 36218310..
163. Pitre CJ, **Pugh CM**. Reclaiming the Calendar: Time Management for the Clinician Educator. *Journal of Graduate Medical Education*. 2023 Feb;15(1):117-118. doi: 10.4300/JGME-D-22-00939.1. PMID: 36817525; PMCID: PMC9934829.
164. Mohamadipanah H, Kearse L, Wise B, Backhus L, **Pugh C**. Generating Rare Surgical Events Using CycleGAN: Addressing Lack of Data for Artificial Intelligence Event Recognition. *Journal of Surgical Research*. 2023 Mar;283:594-605. doi: 10.1016/j.jss.2022.11.008. Epub 2022 Nov 25. PMID: 36442259.
165. Perumalla C, Kearse L, Peven M, Laufer S, Goll C, Wise B, Yang S, **Pugh C**. AI-Based Video Segmentation: Procedural Steps or Basic Maneuvers? *Journal of Surgical Research*. 2023 Mar;283:500-506. doi: 10.1016/j.jss.2022.10.069. Epub 2022 Nov 24. PMID: 36436286.
166. Pryor AD, Lendvay T, Jones A, Ibáñez B, **Pugh C**. An American Board of Surgery Pilot of Video Assessment of Surgeon Technical Performance in Surgery. *Annals of Surgery*. 2023 Apr 1;277(4):591-595. doi: 10.1097/SLA.0000000000005804. Epub 2023 Jan 16. PMID: 36645875.
167. **Pugh CM**, Kirton OC, Tuttle JEB, Maier RV, Hu YY, Stewart JH 4th, Freischlag JA, Sosa JA, Vickers SM, Hawn MT, Eberlein TJ, Farmer DL, Higgins RS, Pellegrini CA, Roman SA, Crandall ML, De Virgilio CM, Tsung A, Britt LD. Addressing the Surgical Workplace: An Opportunity to Create a Culture of Belonging. *Annals of Surgery*. 2023 Apr 1;277(4):551-556. doi: 10.1097/SLA.0000000000005773. Epub 2022 Dec 28. PMID: 36575980

168. Kearse L, Goll C, Wise B, Yang S, Mohamadipanah H, Witt A, Ratliff P, **Pugh C**. Promoting breast health awareness: Can a sensor-enabled training system for patient education help? *Am J Surg*. 2023 May 3:S0002- 9610(23)00189-7. doi: 10.1016/j.amjsurg.2023.05.003. Online ahead of print. PMID: 37258320
169. Shkolyar E, **Pugh C**, Liao JC. Laying the Groundwork for Optimized Surgical Feedback. *JAMA Netw Open*. 2023 Jun 1;6(6):e2320465. doi: 10.1001/jamanetworkopen.2023.20465. PMID: 37378988.
170. Farmer DL, O'Connell PR, **Pugh CM**, Lang H, Greenberg CC, Borel-Rinkes IH, Mellinger JD, Pinto-Marques H. Surgical Education. *Ann Surg*. 2023 Nov 1;278(5):642-646. doi: 10.1097/SLA.0000000000006078. Epub 2023 Aug 10. PMID: 37796749.
171. **Pugh CM**. The Quantified Surgeon: A Glimpse Into the Future of Surgical Metrics and Outcomes. *Am Surg*. 2023 Sep;89(9):3691-3694. doi: 10.1177/00031348231168315. Epub 2023 Mar 31. PMID: 37002209.
172. **Pugh CM**. Allyship in action: The critical, missing link to crossing the quality chasm in healthcare. *Am J Surg*. 2023 Oct;226(4):404-406. doi: 10.1016/j.amjsurg.2023.06.002. Epub 2023 Jun 7. PMID: 37331909.
173. Eckhoff JA, Rosman G, Altieri MS, Speidel S, Stoyanov D, Anvari M, Meier-Hein L, März K, Jannin P, **Pugh C**, Wagner M, Witkowski E, Shaw P, Madani A, Ban Y, Ward T, Filicori F, Padoy N, Talamini M, Meireles OR. SAGES consensus recommendations on surgical video data use, structure, and exploration (for research in artificial intelligence, clinical quality improvement, and surgical education). *Surg Endosc*. 2023 Nov;37(11):8690-8707. doi: 10.1007/s00464-023-10288-3. Epub 2023 Jul 29. PMID: 37516693; PMCID: PMC10616217.
174. Yule S, Dearani JA, **Pugh C**. Surgical Instant Replay-A National Video-Based Performance Assessment Toolbox. *JAMA Surg*. 2023 Dec 1;158(12):1344-1345. doi: 10.1001/jamasurg.2023.1803. PMID: 37755836.
175. Farmer DL, O'Connell PR, **Pugh CM**, Lang H, Greenberg CC, Borel-Rinkes IH, Mellinger JD, Pinto-Marques H. Surgical Education. *Ann Surg*. 2023 Nov 1;278(5):642-646. doi: 10.1097/SLA.0000000000006078. Epub 2023 Aug 10. PMID: 37796749.
176. Schumacher DJ, Kinnear B, Burk-Rafel J, Santen SA, Bullock JL. The Next Era of Assessment: Can Ensuring High-Quality, Equitable Patient Care Be the Defining Characteristic? *Acad Med*. 2023 Dec 18. doi: 10.1097/ACM.0000000000005603. Epub ahead of print. PMID: 38109659.



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

- 
177. Perrone K, Abdelaal AE, **Pugh C**, Okamura A. Haptics: The Science of Touch as a Foundational Pathway to Precision Education and Assessment. *Acad Med*. 2023 Dec 18. doi: 10.1097/ACM.0000000000005607. Epub ahead of print. PMID: 38109654.
  178. Laufer S, Klatzky RL, **Pugh CM**. Sensor-Based Discovery of Search and Palpation Modes in the Clinical Breast Examination. *Acad Med*. 2024 Jan 9. doi: 10.1097/ACM.0000000000005614. Epub ahead of print. PMID: 38207081.
  179. Desai SV, Burk-Rafel J, Lomis KD, Caverzagie K, Richardson J, O'Brien CL, Andrews J, Heckman K, Henderson D, Prober CG, **Pugh CM**, Stern SD, Triola MM, Santen SA. Precision Education: The Future of Lifelong Learning in Medicine. *Acad Med*. 2024 Jan 29. doi: 10.1097/ACM.0000000000005601. Epub ahead of print. PMID: 38277444.
  180. Schumacher, Daniel J. MD, PhD, MEd; Santen, Sally A. MD, PhD; **Pugh, Carla M. MD, PhD**; Burk-Rafel, Jesse MD, MRes. Foreword: The Next Era of Assessment and Precision Education. *Academic Medicine* 99(4S):p S1-S6, April 2024. | DOI: 10.1097/ACM.0000000000005609
  181. Perumalla C, Goll C, Yang S, Wise B, Kearse L, Bowler A, **Pugh C**. Digitizing Clinical Procedural Skills Using Sensors: New Opportunities for Data Driven Performance Metrics. *The Cutting Edge of Surgical Education (CESE)*. (accepted)

Editorials, Reviews, Chapters, Books, Commentaries:

1. **Pugh CM**. (2001) Evaluating Simulators for Medical Training: The Case of the Pelvic Exam Model. *ProQuest/Bell and Howell Dissertations Publishing*, Ann Arbor, MI
2. **Pugh CM**. (2007) Simulation and High Stakes Testing - *Clinical Simulation: Operations, Engineering, and Management* by Kyle & Murray, Boston, MA Topic 68(1): 655-666.
3. McGaghie W, Wayne D, **Pugh CM**. (2007) Fundamentals of Educational Research Using Medical Simulation- *Clinical Simulation: Operations, Engineering, and Management* by Kyle & Murray, Boston, MA Topic 56(1): 517-526.
4. **Pugh CM**, Halverson AL. (2009) Team Training Simulation: Developing Simulation Based Team Training Scenarios – *ACS/APDS Surgical Skills Curriculum: Guidebook for Faculty*. American College of Surgeons Division of Education, Chicago, IL-Web Publication-<http://elearning.facs.org>
5. **Pugh CM**. Perforated Duodenal Ulcer Repair: Omental Patch. *Northwestern*

6. **Pugh CM.** Small Bowel Resection and Anastomosis (Enterectomy): Open. *Northwestern Handbook of Surgical Procedures, 2<sup>nd</sup> Edition.* © 2010 Landes Bioscience
7. **Pugh CM.** Enterolysis for Small Obstruction: Open. *Northwestern Handbook of Surgical Procedures, 2<sup>nd</sup> Edition.* © 2010 Landes Bioscience
8. **Pugh CM.** Open Feeding Jejunostomy. *Northwestern Handbook of Surgical Procedures, 2<sup>nd</sup> Edition.* © 2010 Landes Bioscience
9. **Pugh CM.** Mechanical Simulators versus Patient Actors: Addressing the Content Validity Question. *Journal of Surgical Research.* 2011 Jun 15; 168(2):177-8. Epub 2010 Jun 4.
10. **Pugh CM.** Low-Cost, Locally Fabricated Simulators: The Wave of the Future. *Journal of Surgical Research.* 2011 Jun 1; 168(1):29-30. Epub 2010 Aug 7.
11. **Pugh CM.** Medical Education Meets Patient Safety. *Journal of Surgical Research.* 2011. 176(2): 400-401.
12. **Pugh CM.** Warm-Ups, Mental Rehearsals and Deliberate Practice: Adopting The Strategies of Elite Professionals. *Journal of Surgical Research.* 2011 Jun 25 176(2): 404-405.
13. **Pugh CM,** Cannon-Bowers J. Higher Order Performance Assessments Using Error Enabled Simulations: A New Approach. *CyberTherapy and Rehabilitation.* 4(4); 22-23. Winter 2011.
14. **Pugh CM.** Time Management. *Success in Academic Surgery-Part 1.* (2012) Eds. Chen, Herbert, Kao, Lillian. Springer.
15. Sippel RS, **Pugh CM.** An Overview of Opportunities in Surgical Education. *Success in Academic Surgery: Developing a Career in Surgical Education.* Eds Sippel, RM and Pugh, CM. Springer. (2013)
16. Swaroop M, **Pugh CM.** Prevention of Postoperative Infection. *ACS Surgery: Principles and Practice.* BC Decker Inc. (2013)
17. Krummel TM, **Pugh CM.** How to Protect your Intellectual Property: Invention Disclosures and Patents. *Success in Academic Surgery: Basic Science.* Springer London, 2014. 195-203.
18. **Pugh CM.** Competency, Mastery and Deliberate Practice: Revisiting the goals of simulation based assessments. *MEdSim Magazine.* Issue 4/2013:



19. **Pugh CM.** Can Engineering Metrics Help Pave the Way for New Learning Opportunities in Medicine? *AM Rounds*. 2014 Sept. 2.  
<http://academicmedicineblog.org/can-engineering-metrics-help-pave-the-way-for-new-learning-opportunities-in-medicine/>
20. **Pugh CM,** Stefanidis D. (2015). Grant Funding. In R. Aggarwal, J. Korndorffer & J. Cannon-Bowers (Eds.), *ACS Principles and Practice for Simulation and Surgical Education Research* (1 ed., Vol. 1, pp. 165-181). Chicago, IL: American College of Surgeons.
21. **Pugh CM.** Presentation Skills. *Navigating Your Surgical Career: The AWS Guide to Success*. MedTronic (2015)
22. **Pugh CM,** Golden RN. Medical Training in the Fitbit, Google Glass and Personal Information Era: Will advanced technologies change the way we learn and practice medicine? *Wisconsin Medical Journal*. 2015 Aug; 114(4): 168-169
23. **Pugh CM.** A Holistic Model of Surgical Expertise and Competency. *Annals of Surgery*. 2017 Feb; 265(2): 268-269
24. Nathwani JN, **Pugh CM.** Time Management. *Success in Academic Surgery-Second Edition*. Eds. Chen, H, and Kao, L. Springer. 2017. 187-199
25. Jung HS, **Pugh CM.** What Does an Academic Career Look Like in Surgical Education? *Success in Academic Surgery: A How To Guide for Medical Students*. Springer. Eds. Englesbe, M, Meyers, MO. 2017. 9-14
26. Forsynth KE, D'Angelo AD, Cohen ER, **Pugh CM.** Improving Clinical Performance by Analyzing Surgical Skills and Operative Errors. *Surgical Patient Care: Improving Safety, Quality and Value*. Springer. Eds. Sanchez, JA, Barach, P, Johnson, JK, Jacobs, JP. 2017. 555-568
27. George EI, Skinner A, **Pugh CM,** Brand TC. Performance Assessment in Robotic and Laparoscopic Surgery. *Surgeons as Educators: A Guide for Academic Development and Teaching Excellence*. Springer. Eds. Kohler, T, Schwartz, B. 2018. 53-91.
28. Seymour N, **Pugh CM.** Skills and Simulation. *Schwartz's Principles of Surgery – Eleventh Edition*. McGraw Hill. Edz. Brunickardi FC, Andersen DK, Billiar TR, Dunn DL, Hunter JG, Matthews J, Pollock RE. 2019. 2163-2186.
29. Lau, JN, Korndorffer, JR, **Pugh, CM.** *Clinical Simulation (Second Edition)*. Chapter 58 - Simulation and High-Stakes Assessment. Edited

30. **Pugh, CM.** Invited Commentary: Quantifying Performance Decline in the Operating Room Using fNIRS. *Annals of Surgery*. 2020. PMID: 32657931
31. Matemavi, P., **Pugh, CM.** Passion and Purpose: Black Female Surgeons. *Chapter Two: General Surgery*. 2020.
32. **Pugh C**, Wolf T, Korndorffer J. Response to Comments on “Situating Artificial Intelligence in Surgery, a Focus on Disease Severity.” *Annals of Surgery*. 2021 Dec 1;274(6):e892-e893. PMID: 33630431
33. **Pugh CM.** The Experienced Surgeon and New Tricks—It’s Time for Full Adoption and Support of Automated Performance Metrics and Databases. *Invited Commentary – JAMA Surg*. 2021 Dec 1;156(12):1109-1110. doi:10.1001/jamasurg.2021.4531. PMID: 34524403
34. **Pugh CM.** Invited Commentary: Dissecting the Mentorship Needs of Women and Ethnic Minorities in Surgery: New Opportunities Revealed (RE: Chen et al 2021-1392). *Journal of the American College of Surgeons*. 2022 Mar 1;234(3):261-262. doi: 10.1097/XCS.000000000000048. PMID: 35213487.
35. Goldbraikh, A., Avisdris, N., **Pugh, C.M.**, Laufer, S. (2023). Bounded Future MS-TCN++ for Surgical Gesture Recognition. In: Karlinsky, L., Michaeli, T., Nishino, K. (eds) *Computer Vision – ECCV 2022 Workshops. ECCV 2022. Lecture Notes in Computer Science*, vol 13803. Springer, Cham. [https://doi.org/10.1007/978-3-031-25066-8\\_22](https://doi.org/10.1007/978-3-031-25066-8_22)

Case reports, technical notes, Letters:

1. **Pugh CM**, Mezghebe HM, Leffall LD. Spontaneous Bowel Perforations in Drug Abusers. *American Journal of Emergency Medicine*. 13(1): 113-115, 1995
2. **Pugh CM**, Heinrichs WL, Srivastava SS, et al. Objective Assessment of Clinical Skills with a Simulator. *Journal of the American Medical Association*. Sep 5; 286(9):1021-3, 2001
3. Huang FC, **Pugh CM**, Patton JL, Mussa-Ivaldi FA. Learning kinematic mappings in laparoscopic surgery. *Conf Proc IEEE Eng Med Biol Soc*. 2010; 1:2097-102
4. Rooney D, **Pugh CM**, Darosa DA. Northwestern Center for Advanced Surgical Education (N-CASE). *Journal of Surgical Education*. 2011 Jan-Feb; 68(1):73-6



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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**Research Presentations (past 5 years only):**

1. Poster: University of Wisconsin Department of Surgery Research Summit. *Assessment of trauma team communication using automated discourse coding and epistemic network analysis.* January 2018
2. Poster: University of Wisconsin Department of Surgery Research Summit. *Immediate visual feedback and its effect on technical skills and confidence during complex tourniquet applications.* January 2018
3. Poster: University of Wisconsin Department of Surgery Research Summit. *Improving diagnosis in healthcare: local versus national adoption of recommended guidelines for the clinical breast examination.* January 2018
4. Poster: University of Wisconsin Department of Surgery Research Summit. *Learning through a laparoscopic trainer: Observations between PGY1-PGY4 OB/GYN Residents.* January 2018
5. Poster: University of Wisconsin Department of Surgery Research Summit. *Pedagogical strategies in simulated CME contexts: How learners' expertise impacts avoidant instructional approaches.* January 2018
6. Poster: University of Wisconsin Department of Surgery Research Summit. *Residents' surgical performance during the laboratory years: An analysis of rule-based errors.* January 2018
7. Poster: University of Wisconsin Department of Surgery Research Summit. *Skills decay: Understanding how time away from surgery affects performance.* January 2018
8. Poster: University of Wisconsin Department of Surgery Research Summit. *What do you know? How surgical experience predicts the types of questions asked in a didactic CME course.* January 2018
9. Poster: Stanford University Holman Resident Research Day at Stanford University. *Can the Ponseti Method be Objectively Quantified Using Force Sensors?* May 2018
10. Poster: Stanford University Holman Resident Research Day. *Objective Assessment of Proficiency in Vaginal Cuff Closure using Sensor Technology.* May 2018
11. Podium: Stanford University Holman Resident Research Day. *Exploring Wearable Fabric Sensors: Documenting Clinical Actions to Afford Patients the*



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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*Highest Level of Care. May 2018*

12. Podium: Academic Surgical Congress Education QuickShot Session 1. *Screening Surgical Residents' Laparoscopic Skills: Who Needs More Time in the Sim Lab?* February 2019
13. Podium: Academic Surgical Congress Education: Simulation Oral Session. *Can VR be used to track skills decay during the research years?* February 2019
14. Podium: Academic Surgical Congress Education QuickShot Session 5. *Beyond Cross-Sectional Assessments: Can Virtual Reality Serve as a Longitudinal Skills Assessment?* February 2019
15. Paper Presentation: American College of Surgeons Surgical Simulation Summit Paper Session II. *Use of Sensors to Quantify Procedural Idle Time: Validity Evidence for a New Mastery Metric.* March 2019
16. Podium: Association for Surgical Education Podium Session 9. *Are experts more cautious? Effect of scenario variation in advanced airway assessment.* April 2019
17. Podium: Annual ACS Surgical Simulation Summit: An International Multi-Professional Meeting. *Diverse Surgeon Workforce: Quantifying Gender Differences in Technical Approach to Promote Awareness and Facilitate Training.* March 2021
18. Poster: American Medical Association Accelerating Change in Medical Education Spring Consortium Meeting. *Exploring Wearable Fabric Sensors: Documenting Clinical Actions to Afford Patients the Highest Level of Care.* April 2021
19. Podium: Annual Academic Surgical Congress Hot Topic Session: Stronger Together: A Conversation with SAAS and SBAS on Diversity in Surgery. *Overcoming Hurdles and the Role of Both Identity-specific and National Societies in Supporting Diverse Surgical Trainees and Faculty.* February 2022.
20. Podium: Annual Academic Surgical Congress Hot Topic Session: Development of DEI Leadership Skills – Allyship, Coaching, Mentorship and Sponsorship. *Best Practices in Sponsorship.* February 2022.
21. Podium: AAMC Group Diversity and Inclusion (GDI) Professional Development Conference. *Justice, equity, Diversity and Inclusion and Artificial Intelligence in Medical Education.* March 2022
22. Podium: American Surgical Association Annual Meeting. *Do Individual Surgeon Preferences Effect Procedural Outcomes?* April 2022.



## **Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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23. Podium: 35<sup>th</sup> Annual Engineering & Urology Meeting at the American Urological Association. *Planning and Skill Modeling*. May 2022
  24. Podium: 32<sup>nd</sup> Annual Society of Black Academic Surgeons Meeting. *Microsurgery in Motion: An Objective Assessment of Microsurgical Skill and Efficiency*. Philadelphia, PA. September 2022

### **Patents**

#### Issued

1. “*Medical Examination Teaching System*” – U.S. Patent Number 6,428,323. 2002.
2. “*Medical Examination Teaching and Measurement System*” – U.S. Patent Number 8,764,450. 2014.
3. “*Clinical Assessment and Training System*” – U.S. Patent Number 9,741,264. 2017.
4. “*Training System for Tourniquet Application*” – U.S. Patent Number 16,447,266. 2019.
5. “*Tracking and Digital Documentation of Haptic Manipulation Data Using Wearable Sensors*” – U.S. Patent Application Number 16/791016. Filed February 14, 2020.

### **Educational Activities & Presentations**

#### Medical Student Courses:

1996-2003	Clinical Instructor “Surgical Anatomy and Technique” Course Emory University-School of Medicine
1997-2003	Teaching Assistant Human Anatomy Course Stanford University School of Medicine
2000-2003	Instructor/Course Coordinator Introduction to Pre-Clinical Medicine Course Stanford University School of Medicine
2003-2012	Instructor/Course Coordinator Physical Exams Skills Unit Northwestern University Feinberg School of Medicine

#### Medical Student Teaching/Mentoring:

2004	<b>Alison Chu</b> – Medical Student, Northwestern – Summer Internship Project: “American Board of Surgery Pilot Breast Surgery Website”
2005	<b>Eniola Obadina</b> – Medical Student, Northwestern – Summer Internship



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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	Project: "Efficacy of Pelvic Exam Simulators for Medical Student Learning"
2006	<b>Zachary Domont</b> – Medical Student, Northwestern – Summer Internship Project: "Use of Simulation to Characterize Breast Exam Techniques"
2007	<b>Rishi Balkissoon</b> – Medical Student, Howard University – Summer Fellow, Project: "Use of Simulation to Characterize Digital Rectal Exam Techniques"
2007	<b>Usha Periyannayagam</b> – Medical Student, Northwestern Project: Clinical Case Study – "Closed Loop Obstruction after an Appendectomy"
2008	<b>Brandon Andrews</b> – Medical Student, Northwestern – Summer Internship, Project: "Data Mining of the Digital Rectal Exam Technique Database"
2009	<b>Chiagonzie Ononye</b> – Medical Student, Northwestern – Summer Internship, Project: "Modification of commercially available simulators to elicit decision making behavior"
2014	<b>Kimberly Maciolek</b> – Medical Student, University of Wisconsin, Madison M1: Shapiro Summer Project Candidate, Project: "Wearable Breast Training and Assessment Model"
2015	<b>Bridget O'Connell-Long</b> – Medical Student, University of Wisconsin, Madison M1: Shapiro Summer Project Candidate, Project: "Unexpected Errors and Decreased Confidence During Bladder Catheterization: Are Residents Ready for Complex Scenarios?"
2015	<b>Colin Millar</b> – Medical Student, University of Wisconsin, Madison M1: Shapiro Summer Project Candidate, Project: "Relationship between Motion-Related Metrics and Quality of Laparoscopic Hernia Repair"
2016	<b>Lakita Maulson</b> – Pre-Medical Student, University of Wisconsin, Diversity Supplement Grant, Project: Patient's Perceptions of the Clinical Breast Examination as a Tool for Patient Education
2016	<b>Jessica Hammes</b> – Medical Student, University of Wisconsin, Madison M1: Shapiro Summer Project Candidate, Project: "An Educational Model for Robotic Pelvic Tumor Excision"





**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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2016	<b>Matthew Kaili</b> – Medical Student, University of Wisconsin, Madison M1: Shapiro Summer Project Candidate, Project: “Development of an Instrumented Clubfoot Model: Educating and Improving the Quality of Correction via the Ponseti Method”
2017	<b>James Xu</b> – Medical Student, University of Wisconsin, Madison M1: Shapiro Summer Project Candidate, Project: “Bleeding and Pulsatile Master Tourniquet Training Model”
2020	<b>Suleman Khan</b> – Medical Student, Stanford University School of Medicine, Dorothy Dee and Marjorie Dee Helene Boring Trust Award Winner 2020, Project: “Vascular1”

Resident Teaching:

2003–2012	Attending Physician & Resident Teaching Clinical Setting Westside VA – Northwestern Residency Program
2003–2012	Examiner, Annual Mock Oral Examinations – Northwestern University, Rush University & University of Illinois at Chicago
2004-2012	Annual Northwestern Surgical Intern Lecture Series – “Drains and Pain Management”
2004-2012	Northwestern Surgery Resident Core Curriculum Lecture – “Diseases of the Small Bowel”
2004	Instructor, Residents as Teacher Course – Northwestern University
2005	Northwestern Surgery Resident Seminar Series – “Identifying Your Learning Style”
2009	Northwestern Surgery Resident Seminar Series – “Team Based Decision Making During Laparoscopic Ventral Hernia Repair”
2010	Northwestern Surgery Resident Core Curriculum Lecture – “Hernia Anatomy, Diagnosis and Complications”
2010	Northwestern Surgery Resident Decision Making Lecture – “Laparoscopic Guided Irrigation and Drainage for Perforated Diverticular Disease.”
2010	Northwestern PGY 1 – Skills Training – Central Line Placement and Urinary Catheterization
2011	Northwestern Surgery Resident Seminar Series – “Team Based



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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	Decision Making During Laparoscopic Ventral Hernia Repair”
2022	Invited Lecture: BIOMEDIN 205: Precision Medicine with Big Data – “The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology,” Stanford, CA, November 30, 2022

Resident Mentoring:

2004	Formal Assigned Mentee – <b>Nik Dallas</b> , Surgical Resident (PGY1 - PGY3)
2008	Summer Research Project – <b>Alicia Growney</b> (PGY5)
2008	Formal Assigned Mentee – <b>Ashley Hardy</b> , Surgical Resident (PGY1 - PGY2)
2008	Research Mentee – <b>Katherine Blossfield</b> (Vanderbilt Surgery Resident; 2008-2010)
2013	Formal Assigned Research Mentee – <b>Anne-Lise D’Angelo</b> (PGY3; 2013-2015), University of Wisconsin - Madison
2014	Research Mentee – <b>Eran Gwillim</b> (Unassigned Surgery Intern; 2014-2015), University of Wisconsin - Madison
2015	Formal Assigned Research Mentee – <b>Jay Nathwani</b> (PGY3; 2015-2017), University of Wisconsin – Madison
2017	American College of Surgeons Education Fellow – <b>Martha Godfrey</b> (PGY 3: 2017-2019, University of Florida, Jacksonville)
2018	Formal Assigned Research Mentee – <b>Kenneth Perrone</b> (PGY2; 2018-2019), Stanford University
2020	Formal Assigned Research Mentee – <b>LaDonna Kearse</b> (PGY2; 2020-2022), Howard University

Master’s & Doctoral Student Teaching/Mentoring:

2001-2003	<b>Kunal S. Girotra</b> – Masters’ Program – Chemical Engineering, Stanford Research Assistant
2004	<b>Paulo Blikstein</b> – Doctoral Program – School of Education, Northwestern Independent Study/Pilot Research
2008	<b>Patrick Gould</b> – Masters’ Program – School of Education,



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Northwestern Independent Study/Pilot Research

2009-2012	<b>Deborah Rooney</b> – Doctoral Program – School of Education, University of Illinois Chicago
2013-2015	<b>Andrew Rutherford</b> – Masters' Program – Kinesiology, University of Wisconsin – Madison
2013-2016	<b>Katherine Law</b> – Doctoral Program – Industrial & Systems Engineering, University of Wisconsin – Madison
2013	<b>David Azari</b> – Masters' Program – Industrial & Systems Engineering, University of Wisconsin - Madison
2013	<b>Jayer Fernandes</b> – Doctoral Program – Electrical and Computer Engineering, University of Wisconsin - Madison
2014-2017	<b>Chembian Parthiban</b> – Doctoral Program – Mechanical Engineering, University of Wisconsin - Madison
2015	<b>Martin Moe III</b> – Masters' Program – Industrial Engineering, University of Wisconsin - Madison – Part-time student Employee
2015-2016	<b>Abby Lian</b> – Masters' Program – Science in Economics, University of Wisconsin - Madison
2015-2016	<b>Crystal Chen</b> – Masters' Program – Biostatistics, University of Wisconsin - Madison
2017	<b>David Azari</b> – Doctoral Program – Industrial & Systems Engineering, University of Wisconsin - Madison
2020-2022	<b>Kayla Huemer</b> – Masters' Program – Bioengineering, Stanford University
<u>Post-Doctoral Mentoring:</u>	
2012-2014	<b>Elaine Cohen</b> – MEd: Education
2013-2017	<b>Shlomi Laufer</b> – PhD: Electrical Engineering & Computer Science
2014	<b>Patrick Barlow</b> – PhD: Educational Psychology & Research
2014-2016	<b>Rebecca Ray</b> – PhD: Psychology and Neuroscience



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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2014-2018	<b>Sarah Sullivan</b> – PhD: Learning Sciences
2015-2017	<b>Andrew Ruis</b> – PhD: History of Science, Medicine, and Technology
2015-2021	<b>Hossein Mohamadipanah</b> – PhD: Computer Vision, Robotics
2016-2020	<b>Adhira Sunkara</b> – PhD: Biomedical Engineering
2021-present	<b>Calvin Perumalla</b> – PhD: Computer Vision, Artificial Intelligence
2022	<b>Zonghe Chua</b> – PhD: Mechanical Engineering
2022	<b>Sam Root</b> – PhD: Chemical Engineering

Faculty Mentoring:

2013 – 2016	<b>Ryan Macke, MD</b> – Assistant Professor: Division of Thoracic Surgery – Department of Surgery, University of Wisconsin - Madison
2013 – 2018	<b>Jacob Greenberg, MD, EdM</b> – Associate Professor (CHS): Division of Minimally Invasive, Foregut and Bariatric Surgery – Department of Surgery, University of Wisconsin - Madison
2014 – 2018	<b>Tony Kille, MD</b> – Associate Professor (CHS): Division of Otolaryngology – Head & Neck Surgery – Department of Surgery, University of Wisconsin - Madison
2014 – 2018	<b>Cara King, DO, MS</b> – Assistant Professor (CHS) – Department of Obstetrics and Gynecology, University of Wisconsin - Madison
2015 – 2018	<b>Ryan Thompson, MD</b> – Assistant Professor (CHS) – Department of Emergency Medicine, University of Wisconsin - Madison
2015 – 2018	<b>Jonathan Kohler, MD</b> – Assistant Professor: Division of Pediatric Surgery – Department of Surgery, University of Wisconsin - Madison
2016 – 2017	<b>Jennifer Steiman, MD</b> – Assistant Professor: Division of Surgical Oncology – Department of Surgery, University of Wisconsin – Madison

Undergraduate Student Teaching/Mentoring:



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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2004	<b>Abby Kaye</b> – Cognitive Science Student, UC Santa Barbara – Summer Intern, Project: "Learning Styles & Learning Preferences"
2005	<b>Jon Salud</b> – Premedical Student, Loyola University – Part-time Student Employee, 2005
2005	<b>Kyle Weber</b> – Mechanical Engineering student, Kettering University – Visiting Internship – "The Mechanical Maternal Pelvis for Shoulder Dystocia"
2005	Biomedical Engineering Students: <b>Mitra Afshari, Asad Basir, Shannon Gunstream, Joe Farnam, and Gnyan Patel</b> , Department of Biomedical Engineering Senior Design Course BME 390: "The Mechanical Fetus for Shoulder Dystocia"
2006	<b>Alec Peniche</b> – Premedical Student, Loyola University – Part-time Student Employee
2006	Biomedical Engineering Students: <b>Leslie Gittings, Nurul Hamzah, Sofiah Syed, and Latha Subramaniam</b> , Department of Biomedical Engineering Senior Design Course BME 390: "The Male Rectal Exam Simulator"
2007	Biomedical Engineering Students: <b>Josh Abecassis, Nicholas Deep, Suraj Gupta, Neil Tiwari</b> , Department of Biomedical Engineering Senior Design Course BME 390: "The Bleeding Vessel Simulator (BVS)"
2007	Biomedical Engineering Students: <b>Sirish Vullaganti, Vicky Huang, Siby Samuel, James Jin</b> , Department of Biomedical Engineering Senior Design Course BME 390: "The Hernia Simulator"
2007	<b>Matt Markese</b> – Premedical Student, Northwestern University – Summer Project: "Factors Associated with Missed Diagnosis in Colon Cancer"
2008	<b>Naomi M. Rapp</b> – Biomedical Engineering Student, George Washington University – Summer Intern, Project: "Material Analysis for Low-Cost Surgical Simulators"
2009	<b>Kyra Woods</b> – Biomedical Engineering Student – Northwestern University – Summer Intern, Project: Validity and reliability of a sensor-enabled intubation trainer: a focus on patient-centered data"
2009	Biomedical Engineering Students: <b>John Leuthner, Rebecca</b>



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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	<b>Etrenne, Tadas Sileika, and Lee Lamers</b> , Department of Biomedical Engineering Senior Design Course BME 390: "Solar Powered Pelvic Examination Simulator for Underserved Nations"
2010	Biomedical Engineering Independent Study: <b>Mohanned El Nator, Austin Walker, Roberts Metzler, and Kellie Kitamura</b> . Department of Biomedical Engineering Senior Design Course BME 390: "Fundal Massage Simulator"
2011	Biomedical Engineering Students: <b>Nate Davidson, Charles Hwang, John Kulesa and Jennifer Saluk</b> . Northwestern University Senior Design Course: Prototyping a Clinical Breast Examination Simulator for Teaching and Learning
2013	<b>Grace Jones</b> – Nutrition Science and Global Health Major/Pre Physician Assistant, University of Wisconsin, Madison – Part-time Student Employee, 2013 – 2015
2013	<b>Zachary Balsiger</b> – Biomedical Engineering, University of Wisconsin, Madison – Part-time student Employee, 2013 - 2015
2014	<b>Aliyya Terry</b> – Biology and Global Health, University of Wisconsin, Madison – Summer Intern, Project: "Wearable Breast Assessment Model"
2014	<b>Matdysen Friedrich</b> – Biomedical Engineering, Arizona State University– Summer Intern
2014	<b>Emily Fox</b> – Psychology, Northwestern University – Summer Intern, Project: "Use of Epistemic Network Analysis to Assess How Surgeons Integrate and Utilize Knowledge During Operative Procedures"
2014	<b>Caitlin Jenewein</b> – Biochemistry, Spanish, University of Wisconsin, Madison – Part-time student Employee, 2014 - 2015
2014	<b>Michael Daniels</b> – Clinical Nutrition, University of Wisconsin, Madison – Part-time student Employee, 2014
2014	<b>Samantha Gannon</b> – Kinesiology, University of Wisconsin, Madison – Part-time student Employee, 2014 - 2016
2014	<b>Brett Wise</b> – Neurobiology, University of Wisconsin – Madison – Part-time student Employee, 2014 - 2016





**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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2014	<b>Anna Witt</b> – Biology and Environmental Studies, University of Wisconsin, Madison – Part-time student Employee, 2014 – 2017
2015	<b>Alexandra Rosser</b> – Neuroscience & Computational Statistics, University of Wisconsin – Madison – Research Associate, 2015-2018
2015	<b>Matthew Knoespel</b> – Biomedical Engineering, University of Wisconsin, Madison – Part-time student Employee, 2015
2015	<b>Veronica Palma</b> – Biomedical Engineering, University of Wisconsin, Madison – Part-time student Employee, 2015
2015	<b>Montserrat Calixto Contreras</b> – Biomedical Engineering, University of Wisconsin, Madison – Part-time student Employee, 2015 - 2016
2015	<b>Derek Pitts</b> – Biomedical Engineering, University of Wisconsin, Madison – Part-time student Employee, 2015
2015	<b>Rebekah Fiers</b> – Neurobiology, University of Wisconsin, Madison – Part-time student Employee, 2015 – 2016
2015	<b>Jordan Gates</b> – Marketing, University of Wisconsin, Madison – Part-time student Employee – 2015 - 2016, Biology 152 Project: “Anatomical accuracy of commercial female urinary catheterization training simulators”, Spring 2016
2015	<b>Elyse Linsmeier</b> – Biology and Global Health, University of Wisconsin, Madison – Part-time student Employee, 2015 - 2016
2015	<b>Aude Lefranc</b> – Biomedical Engineering, University of Wisconsin, Madison – Part-time student Employee, 2015
2015	<b>Danielle Sharon Abramaov</b> – Rehab Psychology, University of Wisconsin, Madison – Part-time student Employee, 2015 - 2016
2015	<b>Nicole Van Beek</b> – Kinesiology, University of Wisconsin, Madison – Part-time student Employee, 2015 - 2017
2015	<b>Su Yang</b> – Electrical Engineering, University of Wisconsin, Madison – Part-time student Employee, 2015 - 2017
2016	<b>Maggie Garren</b> – Molecular Biology and Spanish, University of Wisconsin, Madison – Part-time student Employee, 2016 – 2018



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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2016	<b>Anna Garren</b> – Neurobiology, University of Wisconsin, Madison – Part-time student Employee, 2016 – 2018
2016	<b>Sydney Zaransky</b> – Human Development and Family Studies, University of Wisconsin, Madison – Part-time student Employee, 2016
2016	<b>Phillip Terrien</b> – Biomedical Engineering, University of Wisconsin, Madison – Part-time student Employee, 2016
2016	<b>Trace Jocewicz</b> – Biomedical Engineering, University of Wisconsin, Madison – Part-time student Employee, 2016 - 2017
2016	<b>Katie Peterson</b> – Biomedical Engineering, University of Wisconsin, Madison – Part-time student Employee, 2016 - 2017
2016	<b>Lily Comp</b> – Communication Arts and Environmental Studies, University of Wisconsin, Madison – Part-time student Employee, 2016 – 2017
2016	<b>Jack McGinnity</b> – Biomedical Engineering, University of Wisconsin, Madison – Part-time student Employee, 2016 - 2017
2016	<b>Ryan Sepehr</b> – Biomedical Engineering, University of Wisconsin, Madison – Part-time student Employee, 2016 – 2017
2016	<b>Bryanna Buchman</b> – University of Wisconsin, Madison – Biology 152 Project, Fall 2016
2016	<b>David Yu</b> – Electrical Engineering, University of Wisconsin, Madison – Part-time student Employee, 2016 - 2017
2017	<b>Cassidi Goll</b> – Journalism, University of Wisconsin, Madison – Part-time student Employee, 2017
2017	<b>Pazee (Lisa) Xiong</b> – PEOPLE Program Doris Duke Alumni Student – Summer Scholarship Recipient, Project: “Vaginal Cuff Simulation and Motion Metrics Study
2017	<b>Katrina Bell</b> – PEOPLE Program Doris Duke Alumni Student – Summer Scholarship Recipient, Project: “Penetrating Abdominal Trauma and Bowel Repair Methods”
2018	<b>Myia Mosley</b> – Allied Health, Azusa Pacific University Student – Student Intern, Summer 2018



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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2019 **Brooke Ferber** – Product Design, Stanford University – Part-time student Employee, Summer 2019

High School Student Teaching/Mentoring:

2014 **Champange Goss** – PEOPLE Program Doris Duke Student – Summer Scholarship Recipient, Project: “Wearable Breast Assessment Model”

2015 **Pazee (Lisa) Xiong** – PEOPLE Program Doris Duke Student – Summer Scholarship Recipient, Project: “Resident Readiness: Evaluation of Errors During Bladder Catheterization”

2016 **Jacqueline Zuniga Paiz** – PEOPLE Program Doris Duke Student – Summer Scholarship Recipient, Project: “Model Evaluation: The SEnSE Lab Laparoscopic Pelvic Tumor Extraction Model”

2016 **Aniruddh Srinivasan** – High School Student Volunteer, Fall 2016 – Winter 2017

2017 **Elayne Quintanilla** – High School Student Volunteer, Project: “Thyroid Simulator Enhancement” – Winter 2017

2017 **Le Thuy Trang** – PEOPLE Program Doris Duke Student – Summer Scholarship Recipient, Project: “Penetrating Abdominal Trauma and Bowel Repair Methods”

2019 **Karan Patel** – High School Student Trainee, Summer 2019

2019 **Pranav Pammidimukkala** – High School Student Trainee, Summer 2019

Curriculum Development:

1999 Simulation Based Curriculum – “Clinical Female Pelvic Examination” – Pre-Clinical Medicine Course, 2<sup>nd</sup> yr Medical Students, Stanford University School of Medicine

2004 Simulation Based Curriculum – “Clinical Female Pelvic Examination” – Physical Exams Skills Unit Northwestern University Feinberg School of Medicine, 2<sup>nd</sup> yr Medical Students

2005 Simulation Based Curriculum – “Clinical Female Pelvic Examination” – Physical Exams Skills Unit Northwestern University Feinberg School of Medicine, 1<sup>st</sup> yr Medical Students



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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2006	Simulation Based Curriculum – “Clinical Breast Examination” – Physical Exams Skills Unit Northwestern University Feinberg School of Medicine, 1 <sup>st</sup> yr Medical Students
2006	Simulation Based Curriculum – “Clinical Breast Examination” – Physical Exams Skills Unit Northwestern University Feinberg School of Medicine, 2 <sup>nd</sup> yr Medical Students
2006	Simulation Based Curriculum – “Clinical Male Genitourinary Examination” – Physical Exams Skills Unit Northwestern University Feinberg School of Medicine, 1 <sup>st</sup> yr Medical Students
2006	Simulation Based Curriculum – “Clinical Male Genitourinary Examination” – Physical Exams Skills Unit Northwestern University Feinberg School of Medicine, 2 <sup>nd</sup> yr Medical Students
2006	Simulation Based Curriculum – “Clinical Breast Examination” – Surgical Oncology Classroom Based Assessment, 3 <sup>rd</sup> yr Surgical Clerkship Students, Northwestern
2006	Simulation Based Curriculum – “Clinical Breast and Pelvic Examination” – Classroom Based Assessment and Training, 3 <sup>rd</sup> yr OB/Gyn Clerkship Students, Northwestern
2007	Simulation Based Curriculum – “Annual Endoscopic Therapies for Airway and Esophageal Disorders”, Northwestern Memorial Hospital CME Course
2008	Simulation Based Curriculum – “Management of Shoulder Dystocia”, Northwestern Memorial Hospital Team Training Course
2010	Simulation Based Curriculum – “Clinical Female Pelvic Examination” – Physical Exams Skills Unit Northwestern University Feinberg School of Medicine, 2 <sup>nd</sup> yr Physician’s Assistant Students.
2010	Simulation Based Curriculum – “Clinical Female Pelvic Examination” – Physical Exams Skills Unit Northwestern University Feinberg School of Medicine, 1 <sup>st</sup> yr Physician’s Assistant Students.
2010	Simulation Based Curriculum – “Clinical Breast Examination” – Physical Exams Skills Unit Northwestern University Feinberg School of Medicine, 1 <sup>st</sup> yr Physician’s Assistant Students.
2010	Simulation Based Curriculum – “Clinical Breast Examination” – Physical Exams Skills Unit Northwestern University Feinberg



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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School of Medicine, 2<sup>nd</sup> yr Physician's Assistant Students.

- 2010                      Simulation Based Curriculum – “Clinical Male Genitourinary Examination” – Physical Exams Skills Unit Northwestern University  
Feinberg School of Medicine, 1<sup>st</sup> yr Physician's Assistant Students.
- 2010                      Simulation Based Curriculum – “Clinical Male Genitourinary Examination” – Physical Exams Skills Unit Northwestern University  
Feinberg School of Medicine, 2<sup>nd</sup> yr Physician's Assistant Students.

Continuing Medical Education Course Development

- 2011                      97<sup>th</sup> Annual Clinical Congress  
Co-Chair: Laparoscopic Hernia Hands-On Skills Course  
October 2011
- 2012                      SAGES Education Research 2012 Meeting  
Co-Chair: Lap Ventral Hernia with Endoscopic Components  
Separation  
March 2012
- 2013                      99<sup>th</sup> Annual American College of Surgeons Clinical Congress  
Co-Chair: Laparoscopic Hernia Hands-On Skills Course  
October 2013
- 2015                      101<sup>st</sup> Annual American College of Surgeons Clinical Congress  
Chair: Laparoscopic Hernia Hands-On Skills Course  
October 2015
- 2016                      102<sup>nd</sup> Annual American College of Surgeons Clinical Congress  
Chair: Laparoscopic Hernia Hands-On Skills Course  
October 2016
- 2017                      Society of American Gastrointestinal and Endoscopic Surgeons  
(SAGES) 2017 Surgical Spring Week  
SAGES University Master Series  
Co-Chair: Laparoscopy in Acute Care Surgery  
March 2017
- 2017                      103<sup>rd</sup> Annual American College of Surgeons Clinical Congress  
Chair: Contemporary Strategies for Laparoscopic Inguinal and  
Ventral Hernia Repair Surgical Skills Course October 2017
- 2018                      104<sup>th</sup> Annual American College of Surgeons Clinical Congress  
Chair: Contemporary Strategies for Laparoscopic Inguinal and



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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	Ventral Hernia Repair Surgical Skills Course October 2018
2019	105 <sup>th</sup> Annual American College of Surgeons Clinical Congress  Chair: Contemporary Strategies for Laparoscopic Inguinal and Ventral Hernia Repair Surgical Skills Course October 2019
2020	106 <sup>th</sup> Annual American College of Surgeons Clinical Congress Chair: Contemporary Strategies for Minimally Invasive Hernia Repair October 2020
2021	Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) 2021 Annual Meeting Co-Chair: Video Based Education and Coaching September 2021
2021	107 <sup>th</sup> Annual American College of Surgeons Clinical Congress Chair: Contemporary Strategies for Minimally Invasive Hernia Repair October 2021
2022	Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) 2022 Annual Meeting Co-Chair: Virtual & Augmented Reality March 2022
2022	108 <sup>th</sup> Annual American College of Surgeons Clinical Congress Chair: Contemporary Strategies for Minimally Invasive Hernia Repair October 2022

**Scientific Presentations**

Invited Educator (Local and National):

1999	Presenter: The Pelvic Exam Simulator. Annual Medicine Meets Virtual Reality Conference, Stanford, CA
1999	Presenter: The Pelvic Exam Simulator. DARPA/ISAT Summer Meeting, Woods Hole, MA
2000	Presenter & Panelist: Staying in the Game: Surgery's Role in Pre- Clinical





**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Medicine. American College of Surgeons 82<sup>nd</sup> Clinical Congress, Chicago Illinois

- 2001      Presenter: The Use of Simulators in Medical Education: Collection and Analysis of Performance Data. Stanford Workshop on Surgical Simulation, Stanford, CA
- 2001      Exhibitor & Instructor: Anatomical Trainers – The Pelvic, Breast and Prostate Examination Simulators – CESTE Exhibit American College of Surgeons 83<sup>rd</sup> Clinical Congress, New Orleans, LA
- 2001      Presenter: Mannequin Based Simulation Training and Assessment  
–      “The Virtual Body” – Stanford Continuing Studies Program, Stanford, CA
- 2001      Presenter: The E-Pelvis Simulator: A Teaching and Assessment Tool – Innovations in Medical Education Exhibit - Association of American Medical Colleges Annual Meeting, Washington, DC
- 2001      Presenter & Panelist: Clinical Skills Development with Computer Based Devices – American Association of Gynecologic Laparoscopists – 30<sup>th</sup> Annual Meeting, San Francisco, CA
- 2002      Presenter: Development and Evaluation of Physical Exam Simulators: Objective Assessment Made Possible – Workshop Moderator, Annual Association for Surgical Education Meeting, Baltimore, MD
- 2002      Presenter: The E-Pelvis Simulator as an Assessment Tool – Group on Student Affairs (GSA)/Group on Educational Affairs (GEA) – AAMC Western Regional Meeting, Pacific Grove, CA
- 2002      Presenter & Panelist: The Surgeon and the Biotechnology Revolution - Oral Presentation - American College of Surgeons 84<sup>th</sup> Clinical Congress, San Francisco, CA
- 2002      Presenter & Exhibitor: The Use of Simulators for Clinical Skills Training and Assessment - ACP/ASIM- Annual Scientific Meeting, Monterey, CA
- 2002      Presenter: An Exploration of the Use and Integration of Simulation Technologies in Medical Education GEA/GSA Mini-Workshop Session – 113<sup>th</sup> AAMC Annual Meeting, San Francisco, CA
- 2003      Presenter: Simulators for Training: Assessment, Validation and Acceptance Strategies - The Pelvic Exam and Prostate Exam Simulators - Annual Medicine Meets Virtual Reality Meeting



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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- 2003      Presenter: Data Mining Techniques and the Development of Assessment Variables from Clinical Simulation Data - The Center for Integration of Medicine and Innovative Technology (CIMIT) Forum - Massachusetts General Hospital, Boston, MA
- 2003      Presenter: Data Mining Techniques and the Development of Assessment Variables from Clinical Simulation Data - The Stanford University Simulation in Medical Education (SIME) Series
- 2003      Presenter: Quantitative Evaluations of Clinical Performance - Media X at Stanford University - Annual Program, Stanford, CA
- 2004      Presenter & Panelist: "Adoption of Advanced Technologies in Medical Education, Diagnosis & Care: Economic and Human Realities"; Annual Medicine Meets Virtual Reality Meeting, Newport Beach, CA – January 2004
- 2004      Presenter: Using the Pelvic ExamSIM for Learning & Assessment of the Female Pelvic Exam Annual Human Patient Simulator Network, Tampa, FL – February 2004
- 2004      Panelist: State of the Science: Researcher Panel – Advanced Initiatives in Medical Simulation (AIMS), Center for Telemedicine Law, Washington, D.C. – May 10, 2004
- 2004      Presenter: The Use of Simulators for Training and Assessing Physical Exam Skills – Innovations in Clinical Skills Education: The Chicago Perspective – Clinical Education Center, Northwestern University, Feinberg School of Medicine – Chicago, IL – June 24, 2004
- 2004      Presenter: Surgical Simulation and Education: Adult Learning Reloaded. 18<sup>th</sup> International Congress, Computer Assisted Radiology and Surgery, Chicago, IL, June 2004
- 2004      Presenter: Simulation Technology in Medical Education – Office of Medical Education and Faculty Development, Northwestern University, Feinberg School of Medicine – Chicago, IL -- October 20, 2004
- 2004      Presenter: Medical Skills Proficiency & Advanced Distributed Learning, Advanced Briefing for Industry (ABFI), December 2004 – Washington, DC
- 2005      Panelist: "Academia and Industry: The Future of Medical Simulation" – Annual Medicine Meets Virtual Reality Meeting (MMVR) – January 24-30, 2005



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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| 2005 | Moderator: TATRC's 5 <sup>th</sup> Annual Advanced Medical Technology Review "Enabling Technologies to Make a Difference", Long Beach, CA, January 26, 2005  |
| 2005 | Moderator: "Gaming & Simulation Based Learning: Applications for Medicine," 1 <sup>st</sup> TATRC/SUMMIT Simulation Workshop, Long Beach, CA, January 25, 2005   |
| 2005 | Co-Chair: All day TATRC Symposium on Advanced Distributed Learning – February 14-16, 2005  |
| 2005 | Presenter: HPSN Annual Meeting – Workshop – "Integrating Simulators in the Medical School Curriculum" – February 22-25, 2005   |
| 2005 | Facilitator: HPSN Workshop, "Effective Use of the Pelvic ExamSIM in Your Curriculum, hosted by METI (Medical Education Technologies, Inc.) Tampa, FL, February 22-25, 2005   |
| 2005 | Presenter & Panelist: "Cognitive Development – Curriculum – Web- based" – Annual SAGES Meeting, Ft. Lauderdale, FL, April 15, 2005   |
| 2005 | Presenter: "Simulation and VR Technology: The Future of Surgical Training and Assessment", Northwestern University Department of Surgery Grand Rounds, Chicago, IL, April 26   |
| 2005 | Presenter: Objective Assessment of Physical Examination Skills Using Simulators: Development of a Self-Report Measure of Medical Student Anxiety When Learning to Perform the Female Pelvic Examination. Clinical Skills Research – Chicago Style, Northwestern University Feinberg School of Medicine, Chicago, IL. June 2005 |
| 2005 | Presenter: Teaching and Research Progress with the Pelvic Simulator. Northwestern University Simulation Technology in Medical Education Symposium Robert H. Lurie Research Center Northwestern University, Chicago, IL. October 2005   |
| 2005 | Presenter & Panelist: Changing Paradigms Defining and Redefining Success. Association of Women Surgeons' 2005 Fall Conference Program, San Francisco, CA. October 2005   |
| 2005 | Presenter: The Use of Training Simulators to Enhance Compassionate Patient Care During Sensitive Clinical Examinations: Development and Evaluation of a Breast Exam Simulator. The Woman's Board FY05 Eleanor Wood Prince Grant Recipient Presentations, Northwestern Memorial Hospital, Chicago, IL. November 2005            |



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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| 2005 | Session Organizer: Practical Applications of Simulation in the Medical School. GIR/COD Joint Session, AAMC Annual Meeting, Washington, DC. November 2005   |
| 2006 | Moderator: Important Characteristics of Simulation Training. The Fidelity of Simulation Systems Pros and Cons. TATRC's 6th Annual Advanced Medical Technology Review, Long Beach, CA January 2006              |
| 2006 | Moderator: Potential Uses of Simulation in the World of Training, Assessment and Certification What Does the Future Hold? TATRC's 6th Annual Advanced Medical Technology Review, Long Beach, CA January 2006   |
| 2006 | Presenter: Creating Games & Simulation for Learning. TATRC-West/SUMMIT Workshop, Long Beach, CA January 2006   |
| 2006 | Presenter: New Approaches to Teaching the Breast Examination. Northwestern University Feinberg School of Medicine, Medical Education Research Group Inaugural Meeting, Chicago, IL. January 2006               |
| 2006 | Presenter & Panelist: Enabling Technologies for Simulation: Impact and Influence on Medical Training and Education. Annual Medicine Meets Virtual Reality meeting (MMVR), Long Beach, CA. January 2006         |
| 2006 | Presenter: Simulation Coming of Age: Group Information Resources. Annual Meeting Keys to the Future: Association of American Medical Colleges-Group on Informatics Research, Charlotte, NC. March 2006         |
| 2006 | Presenter: The Use of Simulation for Training, Assessment and Certification: Pearls for Developers and Industry. Minnesota's Medical Device Community Forum: Design of Medical Devices. April 2006             |
| 2006 | Presenter: Simulation & VR Technology: The Future of Training and Assessment in Surgery. AASA-AAOA Educational Conference, Chicago, IL. May 2006   |
| 2006 | Presenter: Assessing and Addressing Medical Student Needs While Learning Intimate Examination: The Use of Simulators in the Male GU Curriculum. 4th Annual Clinical Skills Education and Assessment. June 2006 |
| 2006 | Presenter: Cancer Detection and Prevention: Do Physician Exam Skills Matter Anymore? Robert H. Lurie Medical Research Cancer Center Education Program, Chicago, IL. July 2006                                  |
| 2006 | Presenter & Panelist: Emerging Technologies in Surgical Education:   |



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Surgical Simulation Past, Present & Future. American College of Surgeons Clinical Congress, Chicago, IL. October 2006

- 2006      Presenter & Panelist: Modeling, Simulation and Virtual Reality: What's Proven, What's Not: The Use of Simulators for Performance-Based Assessments. American College of Surgeons Clinical Congress, Chicago, IL October 2006
- 2006      Presenter & Panelist: E-Learning: Practice-Based Learning-It's How We're Going to Keep Up. American College of Surgeons Clinical Congress, Chicago, IL October 2006
- 2006      Moderator: Roadmap for Simulation & Game Based Learning Research: Next Generation Surgery Simulation. Quarterly Summit Gaming Conference, Stanford, CA October 2006
- 2006      Presenter: Patient Simulation as a Medical Education Tool. Northwestern Memorial Hospital Quarterly Medical Staff Meeting. December 2006
- 2007      Presenter: Funding Options in Simulation. International Meeting on Simulation & Healthcare. January 2007
- 2007      Presenter: Simulation for Education & Training. International Meeting on Simulation & Healthcare. January 2007
- 2007      Moderator: Partnering To Enable Technology: From Basic Research to Deployment. Medical Simulation, Annual Medicine Meets Virtual Reality Meeting February 2007
- 2007      Moderator: Surgical Simulation-Technology & Learning. Annual Medicine Meets Virtual Reality Meeting. February 2007
- 2007      Panelist: Designing the Next In Medicine. Annual Medical Meets Virtual Reality Meeting. February 2007
- 2007      Presenter: Effect of Teacher Training on a Simulation Curriculum for Sensitive Examinations. 5th Annual Clinical Skills Education and Assessment Meeting-Chicago Style. July 2007
- 2007      Instructor: Clinical Scenarios in Pelvic, Breast and Prostate Exams. Medical Simulations Course. Department of Medical Education UIC- College of Medicine. July 2007
- 2007      Presenter: Teaching Basic Clinical Skills Using Medical Simulation. Fourth Annual Research and Development Conference. Simulation in Medical



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Education- Northwestern University. October 2007

- 2007      Presenter: Simulation as a Quality Strategy. Medical leadership- Institute of Medicine Meeting. November 2007
- 2008      Moderator: Session on Surgical Simulation – Technology & Learning. 16th Annual Medicine Meets Virtual Reality Surgical Simulation Conference. January 2008
- 2008      Presenter: Use of Cognitive Task Analysis to Define Cognitive Learning Objectives in Surgery. 16th Annual Medicine Meets Virtual Reality Surgical Simulation Conference. January 2008
- 2008      Presenter & Panelist: Design, Development and Evaluation of Cognitive Simulators. 16th Annual Medicine Meets Virtual Reality Surgical Simulation Conference. January 2008
- 2008      Panelist: How can members of SSH better collaborate with Industry to develop systems that meet their needs? 8th Annual Meeting on Simulation in Healthcare. January 2008
- 2008      Panelist: The Changing Face of Surgical Education: Simulation as the new Paradigm. 3<sup>rd</sup> Annual Academic Surgical Congress, February 2008
- 2008      Moderator: Scientific Papers: Education Session. 3<sup>rd</sup> Annual Academic Surgical Congress, February 2008
- 2008      Presenter: Lost in Translation: Exposing Medical Students' Misconceptions About How to Perform Hands-On Clinical Examinations. 6th Annual Northwestern Clinical Skills Education and Assessment. July 17, 2008
- 2008      Presenter: Mesh Options during Laparoscopic Ventral Hernia Repair. SAGES Advanced Laparoscopic Surgery Training Course. September 2008
- 2008      Presenter & Panelist: Measuring Simulation-based Medical Education Outcomes. RIME Symposium. Annual Association of American Medical Colleges Meeting. November 4, 2008
- 2008      Presenter: Work-Life Balance. Association for Academic Surgery - Fundamentals of Surgical Research Course. October 2008
- 2009      Moderator: Session on Surgical Simulation – Technology & Learning. 16th Annual Medicine Meets Virtual Reality Surgical Simulation Conference. January 2009





**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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- 2009 Moderator: Surgical Education in the Internet Era - 4th Annual Academic Surgical Congress, February 2009
- 2009 Presenter: Simulation and Assessment: Surgical Training and Credentialing Reconsidered - Northwestern University Department of Surgery Grand Rounds
- 2009 Moderator, Speaker & Session Organizer: Covidien Women in Surgery Career Development Seminar.
- 2009 Presenter: Simulation Technology @ Northwestern, NUvention Board Meeting
- 2009 Presenter: Making Sense of Haptic Data. Northwestern Conference on Simulation Technology in Health Professions Education
- 2009 Moderator: Managing Information Overload - American College of Surgeon's Clinical Congress General Session, October 2009
- 2009 Paper Discussant: Surgical Education Session - American College of Surgeon's Clinical Congress General Session, October 2009
- 2009 Presenter: Time Management - Weekly Fellows Conference, University of Michigan
- 2010 Moderator: Surgical Education Session - 5th Annual Academic Surgical Congress, February 2010
- 2010 Moderator: Emerging Technology Session - 5th Annual Academic Surgical Congress, February 2010
- 2010 Presenter: Use of Non-Surgeons as Faculty for Simulation-Based Surgical Education - ACS Accredited Education Institutes Consortium Meeting, March 2010
- 2010 Presenter: Surgical Applications of Surgical Activities for Lifelong Learning and Performance Assessment – American Board of Medical Specialties Simulation and MOC Workshop, April 2010
- 2010 Invited Speaker: Haptic Perception and the Cognitive-Motor Continuum: Use of Simulation Technology to Define, Teach and Assess Hands-on Clinical Skills – Northwestern School of Education and Social Policy, May 2010



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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| 2010 | Invited Speaker: Strategies for success in Surgical Education Research - Women in Surgery Career Development Seminar, University of Maryland, May 2010   |
| 2010 | Presenter: Sensors, Students and the Frey Award: The Perfect Bridge to Collaborating with NU Engineers – Northwestern Department of Surgery Faculty Retreat, June 2010                                 |
| 2010 | Presenter: Use of Simulation Technology to Demonstrate the Complexity of Clinical Breast Disease - Women's Health Research Monthly Forum, June 2010  |
| 2010 | Presenter: Patents, Inventions & Disclosures – AAS Fall Course, October 2010   |
| 2011 | Moderator: Education Patient Safety & Simulation – AAS/ACS 6 <sup>th</sup> Annual Academic Surgical Congress. Jan. 31-Feb. 4, 2011   |
| 2011 | Discussant: AAS Plenary Session. AAS/ACS 6th Annual Academic Surgical Congress. Jan. 31-Feb. 4, 2011   |
| 2011 | Presenter: Decision Based Metrics. MMVR18/NextMed – Feb 8-12, 2011   |
| 2011 | Invited Speaker: "The Role of Simulation in the Training of Today's Surgeon" - Lasalle D. Leffall Symposium. March 6, 2011   |
| 2011 | Speaker: AAS Session: How to Design, Analyze and Protect Your Work – AAS. Washington DC, October 2011  |
| 2011 | Invited Speaker: Surgery Grand Rounds - Children's Memorial Hospital, Chicago, IL, September 2011  |
| 2012 | Moderator: Simulation – Design & Development – MMVR19/NextMed. Feb. 7-11, 2012   |
| 2012 | Invited Speaker: The Oncofertility Consortium. "Striving for Excellence as a Surgeon Scientist". Feb. 4, 2012. Northwestern Center for Advanced Surgical Education                                     |
| 2012 | University of Wisconsin CME Course 3 <sup>rd</sup> Annual Topics in General Surgery Simulation Based Medical Education. April 13, 2012   |
| 2012 | UIUC Simulation Conference - Medical Simulation and Training Center of 2025-Challenges and Opportunities for Transformative Outcomes Panel: Perspectives from the Field. Champagne, IL, April 19, 2012 |



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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- 2012      Discussant: 25<sup>th</sup> Annual Resident Research Day - "Comprehensive Assessment of Resident Performance in the Operating Room: A Methodology for Developing an Instrument" May 23, 2012
  
- 2012      Military Health System Research Symposium "Analysis of Important Team Constructs During Decision Based Simulations" Fort Lauderdale, FL, August 13-16, 2012
  
- 2012      Speaker at Grand Rounds with the Department of Surgery at the University of Wisconsin, Madison, WI, September 5, 2012
  
- 2012      Urology Annual Residency Program Evaluation/Retreat Discussion Topic: Faculty Development, Madison, WI, September 19, 2012
  
- 2012      AAS Education Committee - "How to Protect Your Intellectual Property: Invention Disclosures and Patents" Chicago, IL, September 28, 2012
  
- 2012      AAS Annual Meeting - "Building Your Research Team and Establishing Outside Collaborations" Chicago, IL September 29, 2012
  
- 2012      ACS Annual Meeting - Nanotechnology, Nanobots and Surgery - "Biometric Haircell Sensors and Simulation Based Assessments" Chicago, IL, October 1, 2012
  
- 2012      ACS Annual Meeting - Simulation: The Future of Surgical Training and Rehearsal "The Decision-Based Simulators" - Chicago, IL, October 2, 2012
  
- 2012      ACS Annual Meeting - Paper Discussant: "Use of Operative Competency Model with Immediate Feedback to Evaluate Resident Technical Progression" - Chicago, IL, October 3, 2012
  
- 2012      ACS Annual Meeting- Mentoring and Monitoring Your Partners (co moderator) - Chicago, IL, October 3, 2012
  
- 2012      Speaker: University of Wisconsin School of Medicine and Public Health Department of Medicine Grand Rounds. "Simulation-based CME: A Maintenance of Quality Issues."- Madison, WI, December 2013
  
- 2013      Intuitive Surgical. University of Wisconsin Robotics Performance Core Presentation. - Sunnyvale, CA, January 2013
  
- 2013      Speaker: University of Wisconsin School of Medicine and Public Health



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Department of Surgery Research Summit- Madison, WI, January 23, 2013

- 2013 Moderator: IMSH SIG Meeting: "Surgical Simulation on the Cheap: Low Cost May be High-Yield,"- San Francisco, CA, January 28, 2013
- 2013 Speaker: UW Research Symposium: "Use of Haptic Data for Clinical Skills Assessment,"- Madison, WI, January 2013
- 2013 Speaker: AAS-AWS Luncheon. "Achieving Goals through Strategic Partnerships." ASC Annual Meeting - New Orleans, LA, February 4, 2013
- 2013 Speaker: AAS Surgical Investigators Course. "Conveying Significance and Innovation." ASC Annual Meeting- New Orleans, LA, February 2013
- 2013 Speaker: MMVR Annual Meeting: "Engineering the OR of the future"- San Diego, CA, February 4, 2013
- 2013 Speaker: UW Team Seminar – Teaching Team Competencies Using Simulation-Based Training- Madison, WI, February 2013
- 2013 Speaker: University of Wisconsin Departments of Medicine, Psychiatry, and Industrial & Systems Engineering- Class on Women in Leadership- Madison, WI, March 3, 2013
- 2013 Moderator: 6<sup>th</sup> Annual Consortium of ACS- AEI. "Research and Development Committee: Assessing Assessment Technologies."- Chicago, IL, March 15, 2013
- 2013 Speaker: ASE Surgical Education Week Pre-meeting- Directing Surgical Simulation: Getting Started and Maintaining Excellence. "Creating and Evaluating Procedural Assessments,"- Orlando, FL, April 22, 2013
- 2013 Speaker: University of Wisconsin School of Medicine and Public Health General Surgery CME: "Complex Laparoscopic Hernia Repairs,"- Madison, WI, April 27, 2013
- 2013 Speaker: University of Wisconsin School of Medicine and Public Health General Surgery CME: "Use of Simulation in Laparoscopic Training and Assessment,"- Madison, WI, April 27, 2013
- 2013 Speaker: UW BME Symposium: "Use of haptic data for clinical skills assessment," University of Wisconsin School of Engineering - Madison, WI, May 6, 2013
- 2013 Discussant: University of Wisconsin School of Medicine and Public Health-



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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- Resident Research Day: "Teaching Medical Students to Repair Traumatic Wounds: The Results of a Curriculum Change,"- Madison, WI, May 15, 2013
- 2013 Speaker: Graduate Medical Education Resident/Fellows Orientation- "Central Line Insertion Curriculum,"- Madison, WI, June 19, 2013 and June 27, 2013
- 2013 Presenter & Panelist: "The Status of Black Women's Health in Wisconsin." 5th Annual Black Women's Wellness Day- Madison, WI, September 21, 2013
- 2013 Panelist & Presenter: How to Design, Analyze, and Protect your Work Session. "How to Protect your Intellectual Property: Invention Disclosure and Patents." Association for Academic Surgery (AAS) Fall Courses- Washington, D.C., October 4, 2013
- 2013 Panelist & Presenter: Technical Skill and Novel Approaches to Improving Performance. "The Error-enabled, Decision-based Simulators: Exploring New Performance Measures." Surgical Outcomes Club 9<sup>th</sup> Annual Scientific Sessions- Washington, D.C., October 6, 2013
- 2013 Moderator: Surgical Education Paper Session (SP08). ACS Annual Clinical Congress- Washington, D.C., October 8, 2013
- 2013 Panelist: Promoting Black Women's Health and Wellness in Higher Education. University of Wisconsin 2013 Diversity Forum- Madison, WI, October 22, 2013
- 2013 Panelist and Presenter: Planning Your Career: Academics. "Basic Research." University of Wisconsin Women in Surgery Career Symposium- Madison, WI, November 19, 2013
- 2013 Speaker: Attic Angel Association for Continuing Education Programs- Madison, WI, November 25, 2013
- 2013 Presenter: "Can Haptic Data be Used to set Standards for Hands- on Clinical Skills?" Pathology's Seminar Series. University of Wisconsin- Madison Cellular and Molecular Pathology Graduate Program- Madison, WI, December 11, 2013
- 2014 Panelist: Getting Bang for Your Buck: "Aligning Simulation-based Training with Quality Data and Organizational Goals." Surgery SIG Sponsored Events. SSH - International Meeting on Simulation Healthcare (IMSH) - San Francisco, CA, January 27, 2014



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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- 2014      Panelist: "Conveying Significance and Innovation." Essential Elements of a Successful Research Proposal – Outcomes/Health Services Research Session. AAS/SUS Surgical Investigators' Course - San Diego, CA, February 2, 2014
  
- 2014      Presenter: "Innovation in Surgery." AAS Presidential Plenary Session. Academic Surgical Congress Meeting - San Diego, CA, February 5, 2014
  
- 2014      Moderator: "Resident Readiness and Transition to Practice- Are Five Years of Training Still Good Enough?" Association of Women Surgeons Luncheon, Academic Surgical Congress Meeting - San Diego, CA, February 5, 2014
  
- 2014      Panelist: "(Un?) Affordable Care." Morning Plenary Session. Annual Medicine Meets Virtual Reality meeting (MMVR) – Los Angeles, CA, February 20, 2014
  
- 2014      Panelist: "Novel Approaches to the Study of Medical Skill Decay" Independently Organized Session, Annual Medicine Meets Virtual Reality meeting (MMVR) – Los Angeles, CA, February 21, 2014
  
- 2014      Presenter: "Sensors, Simulators and Medical Performance: Are we there yet?" CARE: Cultivating Authenticity, Reflection and Empathy in Medicine Seminar – Madison, WI, March 1, 2014
  
- 2014      Presenter: Health Occupations and Professions Exploration (HOPE) – Madison, WI, March 8, 2014
  
- 2014      Panelist: "Mastery and Deliberate Practice to Medical and Health Sciences Education." Continuum of Health Sciences Education Teaching Enhancement Conference – Madison, WI, March 11, 2014
  
- 2014      Presenter: "How do I Review a Paper?" Career Development Symposium. Annual SAGES Meeting – Salt Lake City, UT, April 2, 2014
  
- 2014      Presenter: "Simulation Research in Surgery." Association for Academic Surgery Meeting – San Francisco, CA, October 24, 2014
  
- 2014      Panelist: "Building a Research Career- This is my Story." Association for Academic Surgery Meeting – San Francisco, CA, October 24, 2014
  
- 2014      Presenter: "Signatures: Drawing Meaning for Technical Skills Performance using Sensors and Motion Tracking Technology." Surgical Biology Club II Meeting – San Francisco, CA, October 26, 2014





**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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- 2014      Panelist: "Use of Simulation in Surgical Residency Training." American College of Surgeons Clinical Congress – San Francisco, CA, October 26, 2014
- 2014      Discussant: "Innovative Clinical Technology." American College of Surgeons Clinical Congress – San Francisco, CA, October 30, 2014
- 2015      Panelist: "Skills of Hands and Mind: Research into Decay, Recovery & Mastery." Society for Simulation in Healthcare (IMSH)  
–      New Orleans, LA, January 12, 2015
- 2015      Speaker: "Conveying Significance and Innovation." Annual Academic Surgical Congress – Las Vegas, NV, February 2, 2015
- 2015      Speaker: "Educating the Surgeon in Practice: Coaching, Collaboratives and Social Media - The American College of Surgeons Perspective." Annual Academic Surgical Congress – Las Vegas, NV, February 5, 2015
- 2015      Co-Chair: "All Things Hernia". Society of American Gastrointestinal and Endoscopic Surgeons – Nashville, TN, April 16, 2015
- 2015      Panelist: "Debate on Hot Topics in Simulation." Association for Surgical Education, Surgical Education Week – Seattle, WA, April 24, 2015
- 2015      Presenter: "Gaining Successful Organizational Leadership Support and Buy-in Within a Portfolio Sponsor Organization." The American Board of Medical Specialties Forum on Organizational Quality Improvement – Chicago, IL, May 14, 2015
- 2015      Presenter: "Palpation: Use of sensors and video classification to characterize exploratory procedures in medicine." IEEE World Haptics Conference – Chicago, IL, June 22, 2015
- 2015      Presenter: "Innovations in Learning Assessment: What is the New Generation Expecting?" American Board of Medical Specialties Annual Conference – Chicago, IL, September 8, 2015
- 2015      Speaker: "Simulation Research in Surgery." Association for Academic Surgery 2015 Fall Courses – 26<sup>th</sup> Annual Fundamentals of Surgical Research Course – Chicago, IL, October 3, 2015
- 2015      Discussant: "Post-Game Analysis: Postoperative Video-Based Coaching for Residents." American College of Surgeons Clinical Congress – Chicago, IL, October 5, 2015



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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| 2015 | Discussant: "Development of a Fresh Cadaver Model for Instruction of Ultrasound-Guided Breast Biopsy during the Surgery Clerkship: Pre- and Post-Test Results among Third Year Medical Students." American College of Surgeons Clinical Congress – Chicago, IL, October 6, 2015 |
| 2015 | Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" Seminar at Johns Hopkins University School of Engineering – Baltimore, MD, November 4, 2015  |
| 2015 | Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" Johns Hopkins University Department of Surgery – Baltimore, MD, November 5, 2015   |
| 2016 | Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" Georgetown University Department of Surgery – Washington, DC, January 5, 2016  |
| 2016 | Presenter: "New Pelvic Training Models for DaVinci Surgery." Intuitive Surgical Education and Training Research Grant Symposium – Sunnyvale, CA, January 7, 2016  |
| 2016 | Panelist: "Special Session: Innovations and Research from United States Department of Defense." International Meeting on Simulation in Healthcare (IMSH) – San Diego, CA, January 18, 2016  |
| 2016 | Presenter: "Playing Nice in the Sandbox: Interprofessional Transitions of Care and Progressive Site Simulation." International Meeting on Simulation in Healthcare (IMSH) – San Diego, CA, January 18, 2016   |
| 2016 | Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" UT Southwestern Medical Center Department of Surgery – Dallas, TX, January 20, 2016  |
| 2016 | Presenter: "Conveying Significance and Innovation." AAS/SUS Surgical Investigators' Course – Jacksonville, FL, February 1, 2016   |
| 2016 | Presenter: "Perishing by Publishing: A Surgeon, an Engineer and an Impact Factor of Zero." 11 <sup>th</sup> Annual Academic Surgical Congress – Jacksonville, FL, February 3, 2016  |
| 2016 | Moderator: "Education: Continuing Medical Education & Simulation- Based Training." 11 <sup>th</sup> Annual Academic Surgical Congress – Jacksonville, FL,   |



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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February 3, 2016

- 2016      Presenter: "What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" University of Wisconsin Department of Neurological Surgery Grand Rounds – Madison, WI, February 24, 2016
  
- 2016      Discussant: "Self/Peer Resident Assessment of the Basics of Open Laparotomy Training (BOLT) on a Simulated Abdominal Model." 9<sup>th</sup> Annual American College of Surgeons Accredited Education Institute (ACS AEI) Consortium Meeting – Chicago, IL, March 7, 2016
  
- 2016      Panelist: "ACS-AEI Best Practices in Curriculum Development: Several Ideas YOU Should STEAL from Your Peers." Annual American College of Surgeons Accredited Education Institute (ACS AEI) Consortium Meeting – Chicago, IL, March 7, 2016
  
- 2016      Panelist: "Higher Fidelity: Better for Learning or a Waste of Money." Annual American College of Surgeons Accredited Education Institute (ACS AEI) Consortium Meeting – Chicago, IL, March 8, 2016
  
- 2016      Presenter: "Developing a Career in Research – Following your Passion." Society of Black Academic Surgeons (SBAS) Leadership and Faculty Development Institute – Columbus, OH, April 28, 2016
  
- 2016      Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" Lahey Hospital and Medical Center's Surgical Division Grand Rounds – Boston, MA, May 4, 2016
  
- 2016      Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" University of Oklahoma Department of Surgery Grand Rounds – Oklahoma City, OK, May 13, 2016
  
- 2016      Presenter: "Novel Approaches to Resident Education and Training." The Association of Academic Surgical Administrators Midyear Retreat – Madison, WI, May 20, 2016
  
- 2016      Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" Thomas Jefferson University Department of Surgery Grand Rounds – Philadelphia, PA, May 26, 2016
  
- 2016      Presenter: "How Can Experienced Clinicians Embrace Simulation?" NIDDK-NIBIB Workshop Simulation Research in Gastrointestinal and Urologic Care: Challenges and Opportunities – Bethesda, MD, June 10, 2016



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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- 2016      Presenter: "Can Simulation Improve the Quality & Uniformity of Expert Performance." NIDDK-NIBIB Workshop Simulation Research in Gastrointestinal and Urologic Care: Challenges and Opportunities – Bethesda, MD, June 10, 2016
- 2016      Presenter: "A Surgeon in an Engineer's Body: The Quest for Performance Measurement." University of Wisconsin Madison School of Medicine and Public Health Mini Med School: Innovations in Medicine – Madison, WI, September 22, 2016
- 2016      Presenter: "Can a virtual reality assessment of fine motor skill predict successful central line insertion?" 34<sup>th</sup> Annual Conference of the Association of Women Surgeons – Washington, DC, October 15, 2016
- 2016      Presenter: "Use of a simulation as a screening tool for surgical skills: Are we there yet?" American College of Surgeons Clinical Congress – Washington, DC, October 20, 2016
- 2016      Presenter: "Sensors, Motion Tracking and Data Science: The breakfast of Champions." Big Ideas for Busy People at the Wisconsin Science Festival – Madison, WI, October 22, 2016
- 2016      Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" University of Virginia Department of Surgery Grand Rounds – Charlottesville, VA, October 26, 2016
- 2016      Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" Augusta University Department of Surgery Grand Rounds – Augusta, GA, October 31, 2016
- 2016      Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" University of Iowa Carver College of Medicine's 2016 Surgery Post Graduate Conference - Ziffren Lecturer – Iowa City, IA, November 11, 2016
- 2017      Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" University of Cincinnati Department of Surgery Grand Rounds – Cincinnati, OH, January 11, 2017
- 2017      Presenter: "Unexpected Events in Robotic Surgery: What can motion tracking tell us?" Intuitive Surgical Education and Training Research Grant Symposium – Sunnyvale, CA, January 26, 2017



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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| 2017      | Presenter: "Progressive Site In-situ and IPE Transitions of Care." International Meeting on Simulation in Healthcare (IMSH) – Orlando, FL, January 30, 2017  |
| 2017      | Presenter: "High Tech – High Touch: How sensors and data science can dramatically change healthcare." Wisconsin Institute of Discovery Spring qBio Seminar Series – Madison, WI, February 1, 2017  |
| 2017      | Presenter: "Use of Sensor Technology to Model Physical Diagnosis Skills." Society to Improve Diagnosis in Medicine's Diagnostic Error in Medicine Journal Club – Webinar, February 27, 2017  |
| 2017      | Presenter: "Sensors, motion tracking, and data science: the quest to train MD's like elite athletes." National Institutes of Health (NIH) Director's Wednesday Afternoon Lecture Series (WALS) – Bethesda, MD, March 8, 2017   |
| 2017      | Discussant: "Interprofessional Simulations to Inform Perioperative Facility Planning and Design." 10 <sup>th</sup> Annual American College of Surgeons Accredited Education Institute (ACS AEI) Surgical Simulation Conference Meeting – Chicago, IL, March 17, 2017 |
| 2017      | Presenter: "Sensors, Motion Tracking and Data Science Metrics: Implications for the Medical Practitioner." Stanford University Department of Surgery Seminar – Stanford, CA, April 13, 2017  |
| 2017      | Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" Wright State University Department of Surgery Grand Rounds – Dayton, OH, May 3, 2017  |
| 2017      | Presenter: "Innovative Pathways for MD PhDs." Northwestern Medical Scientist Training Program's Diverse Perspectives of Physician Scientists Speaker Series – Chicago, IL, May 8, 2017   |
| 2017      | Presenter: "Teaching and Assessing Touch Using Simulation: An Untapped Performance Improvement Opportunity." Stanford Innovations in Medical Education Conference – Stanford, CA, May 13, 2017   |
| 2017<br>– | Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" Medical University of South Carolina Department of Surgery Grand Rounds – Charleston, SC, May 16, 2017  |
| 2017      | Panelist: "Leadership in Medical Education." American Medical Association (AMA) Council on Medical Education Stakeholders' Forum   |



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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– Chicago, IL, June 9, 2017

- 2017      Presenter: “Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?” University of Wisconsin Endocrinology Grand Rounds – Madison, WI, September 14, 2017
- 2017      Presenter: “The Clinical Breast Exam: Can we do better?” Wisconsin Women’s Health Foundation’s 11<sup>th</sup> Annual Dialogue – Madison, WI, October 18, 2017
- 2017      Presenter: “Current Pathways to Promotion.” Association for Academic Surgery (AAS) Fall Courses – La Jolla, CA, October 21, 2017
- 2017      Panelist: “Nuts and Bolts of an Academic Career: Part 1 – How to Advance Your Career to Promotion.” Association for Academic Surgery (AAS) Fall Courses – La Jolla, CA, October 21, 2017
- 2017      Presenter: “Signatures: What Can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?” UC Irvine School of Medicine Department of Surgery Grand Rounds – Orange, CA, October 26, 2017
- 2017      Presenter: “Tacking Unaddressed Barriers Through Communities of Practice.” The Academy of Distinguished Medical Educators 11<sup>th</sup> Annual Medical Education Day – University of Chicago Pritzker School of Medicine – Chicago, IL, November 16, 2017
- 2017      Presenter: “Sensors, Motion Tracking and Data Science: Unfolding the metrics of mystery.” The Academy of Distinguished Medical Educators 11<sup>th</sup> Annual Medical Education Day – University of Chicago Pritzker School of Medicine – Chicago, IL, November 16, 2017
- 2017      Panelist: “D2P 2.0: UW-Madison’s Entrepreneurship Focus.” Wisconsin Alumni Research Foundation’s Entrepreneurs Event – Madison, WI, December 12, 2017
- 2018      Course Co-Chair and Panelist: “Emerging Technology.” 2018 Society for Simulation in Healthcare Forum on Modeling and Simulation – Los Angeles, CA, January 12, 2018
- 2018      Presenter: “Pivoting: An Exciting and Cautionary Tale for Surgeon Scientists.” University of Wisconsin Department of Surgery Research Summit – Madison, WI, January 17, 2018
- 2018      Presenter: “Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?” Rutgers New





**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Jersey Medical School Department of Surgery Grand Rounds, Newark,  
NJ, January 19, 2018

- 2018 Moderator: "Education: Simulation Training QuickShot Session." 13<sup>th</sup> Annual Academic Surgical Congress – Jacksonville, FL, January 31, 2018
- 2018 Presenter: "Hacking Healthcare with Sensors: Unfolding the Metrics of Physician Expertise." Wearable Tech + Digital Health + NeuroTech Silicon Valley – Stanford, CA, February 26, 2018
- 2018 Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" University of Toledo Department of Surgery Grand Rounds – Toledo, OH, February 28, 2018
- 2018 Presenter: "Tech-based Innovation and Entrepreneurship in Academia: An exciting and cautionary tale" University of Wisconsin Department of Biomedical Engineering – Madison, WI March 9, 2018
- 2018 Panelist: "Ask a Surgeon: An Open Q&A Exploring Haptics in Surgery" IEEE Haptics Symposium – San Francisco, CA, March 28, 2018
- 2018 Presenter: "Use of Cognitive Task Analysis as Design Requirements for Educational Tools in Surgery" Stanford University Graduate School of Education – Stanford, CA, May 11, 2018
- 2018 Moderator: "Digital Health and Technology" Big Data in Precision Health Conference – Stanford, CA, May 24, 2018
- 2018 Presenter: "How is AI Turning Wearables into Meaningful Clinical Information?" AI in Healthcare Summit 2018 – San Francisco, CA, June 11, 2018
- 2018 Presenter: "Quantifying Expert Strategies Using Sensors: A Close Look at Clinical Procedural Skills" Stanford-Surgery Policy Improvement Research & Education Center (S-Spire) – Stanford, CA, June 11, 2018
- 2018 Panelist: AI in Medicine: Inclusion and Equity (AiMIE) – Stanford, CA, August 22, 2018
- 2018 Presenter: "What Can Sensors Tell Us About Surgical Skills?" 92<sup>nd</sup> Meeting of the Halsted Society – Stanford, CA, September 6, 2018
- 2018 Presenter: "Use of simulation and sensor technology to quantify procedural skills: Are we there yet?" Endowed Rhoads Symposium, York Hospital –



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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York, PA, September 21, 2018.

- 2018      Presenter: "The role of new technology and data in the objective assessment of performance in GME training and initial and continuing certification" American Board of Medical Specialties Invited Symposium for Advancing the Assessment of Surgical Skills in Initial and Continuing Certification – Las Vegas, NV, September 23, 2018
  
- 2018      Presenter: "Hacking Healthcare with Sensors: Unfolding the Metrics of Physician Expertise" Stanford Medicine Grand Rounds – Stanford, CA, October 10, 2018
  
- 2018      Presenter: "Advocating for Systems Changes to Improve Workflow and Patient Care" American College of Surgeons Clinical Congress  
–          Boston, MA, October 24, 2018
  
- 2018      Presenter: "Digital Surgery" Exponential Medicine – San Diego, CA  
November 4, 2018
  
- 2019      Paper Discussant: "Knot-tying Struggles for Surgical Interns: Bare Hands vs. Gloves vs. Gloves with Butter." American College of Surgeons Surgical Simulation Summit – Chicago, IL, March 16, 2019
  
- 2019      Paper Discussant: "Computer Vision Analysis of Intraoperative Video: Automated Recognition of Operative Steps in Laparoscopic Sleeve Gastrectomy." American Surgical Association Annual Meeting – Dallas, TX, April 11, 2019
  
- 2019      Presenter: "Can Discourse Analysis Predict Surgical Outcomes? Evaluating how we talk in the operating room and what it means." Association for Surgical Education Plenary Session 1– Chicago, IL, April 25, 2019
  
- 2019      Presenter: "Use of Error Management Theory to Quantify and Characterize Residents' Error Recovery Strategies."  
Association for Surgical Education Plenary Session 1– Chicago, IL, April 25, 2019
  
- 2019      Presenter: "The Quantified MD Project: What can physician wearables tell us?" Department of Anesthesiology Grand Rounds Presenter – Stanford, CA, August 19, 2019
  
- 2019      Presenter: "Use of Sensor Technology to Enable Competency Based Advancement for Hands-on Clinical Skills and Procedural Medicine" American Medical Association ChangeMedEd, Chicago, IL, September 20, 2019



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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- 2019      Invited Discussion Chair: "Artificial Intelligence to Advance Surgical Education and Training" American College of Surgeons Master Surgeon Educators Symposium on Emerging Technologies and Artificial Intelligence in Surgical Care and Education, Chicago, IL, October 4, 2019
  
- 2019      Invited Lecturer on Simulation: "Use of Sensors to Quantify Surgical Skill: Simulation 2.0" Philadelphia Academy of Surgery, Philadelphia, PA October 7, 2019
  
- 2020      Presenter: "Use of Advanced Engineering Approaches to Streamline Video-Review" American Board of Surgery Retreat, Scottsdale AZ, January 3, 2020
  
- 2020      Presenter: "Improving Surgeon Performance" Stanford Medicine Board of Fellows, San Francisco, CA, January 16, 2020
  
- 2020      Presenter: "Qualifying Intra-Operative Workflows: Opportunities for Quality & Cost Benefits" Stanford Health Care Board of Directors, Stanford, CA, January 22, 2020
  
- 2020      Presenter: "Measuring Surgeon Performance" Intuitive Surgical Training, Sunnyvale, CA, January 28, 2020
  
- 2020      Presenter: "Doing More with Less: The New Imperative" Vizient Healthcare Executive Forum, Scottsdale, AZ, January 31, 2020
  
- 2020      Presenter: "Health Care Innovation at Stanford Medicine and Beyond" Stanford Medicine Leadership Retreat, Half Moon Bay, CA, February 7, 2020
  
- 2020      Presenter: "The Surgical Metrics Project" Wearable Tech + Digital Health + Neurotech – Silicon Valley, Stanford, CA, February 11, 2020
  
- 2020      Presenter: "Preparing for the Future: New Technologies of Learning and Assessment" American Board of Medical Specialties Board of Directors Retreat, Tucson, AZ, February 25, 2020
  
- 2020      Presenter: "Quantitative Predecessors to Human Actions" Stanford MediaX Retreat, Virtual, July 16, 2020
  
- 2020      Fireside Chat: ACS Quality and Safety Conference, Virtual, August 22, 2020
  
- 2020      Panelist: Association for Academic Surgery Town Hall on Allyship, Virtual, August 26, 2020



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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- 2020      Presenter: "Improving Performance of Medical Trainees with Wearables, Haptics, and Analytics" Stanford eWear Conference, Virtual, September 10, 2020
- 2020      Presenter: "Situating Artificial Intelligence in Surgery: A Focus on Disease Severity" Halsted Annual Meeting, Virtual, September 11, 2020
- 2020      Panelist: "Women in Medicine: Advancing Equity and Creating Change" American Medical Association, Virtual, September 25, 2020
- 2020      Presenter: "Benchmarking Accomplishments of Leaders in American Surgery and Justification for Enhancing Diversity and Inclusion" Association for Women in Surgery Conference, Virtual, October 3, 2020
- 2020      Presenter: "Finding Funding for Education Research" AAS Fundamentals of Surgical Research Course, Virtual, October 10, 2020
- 2020      Panelist: "NIH BMES-NIBIB Funding Panel" 2020 Biomedical Engineering Society (BMES) Virtual Meeting, October 15, 2020
- 2021      Panelist: "The Innovation Council: Breaking Down Barriers to Innovation in the Department of Surgery." Stanford Innovation Grand Rounds, Virtual, January 26, 2021
- 2021      Presenter: "The Life, Times & Epiphanies of a Maker Surgeon" Associated Students of Biomedical Engineering (ASBME) at the University of Southern California Makeathon Lecture, February 17, 2021
- 2021      Invited Speaker: "Honoring Black Scientists and Clinicians" Stanford Medicine Grand Rounds, Virtual, February 17, 2021
- 2021      Presenter: "Quantifying Haptics in Surgery: The New Value Proposition" Café Scientifique – Silicon Valley, Virtual, February 18, 2021
- 2021      Panelist: "Academy Grand Rounds – Diversity, Equity & Inclusion" American College of Surgeons Academy of Master Surgeon Educators Grand Rounds Series, Virtual, February 21, 2021
- 2021      Presenter: "Critical Race Issues in Medical Teams: How to recover brilliantly" Stanford Faculty Fireside Chats: Medical Faculty Excellence in an Era of Social Justice Activism, Virtual, February 22, 2021
- 2021      Panelist: "Successfully Achieving Diversity in Healthcare" Advances in Surgery (AIS) Live Stream, Virtual, March 11, 2021



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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2021	Invited Speaker: "Successfully Achieving Diversity in Healthcare" Advances in Surgery (AIS) Live Stream, Virtual, March 11, 2021
2021	Invited Speaker: "Precision Learning and Data Sharing Through Wearable Technology" Grand Rounds for Stanford Department of Otolaryngology – Head & Neck Surgery, Virtual, March 18, 2021
2021	Presenter: "Race and Medicine – Current Challenges and Solutions" Stanford 25 Bedside Teaching Symposium, Virtual, March 25, 2021
2021	Presenter: "Current Challenges in Surgery for Gallstone Disease: Can AI Be Part of the Solution?" National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) Digestive Interagency Coordinating Committee, Virtual, April 21, 2021
2021	Panelist: "AI for Surgical Education: Friend or Foe?" Association for Surgical Education Annual Meeting, Virtual, April 21, 2021
2021	Panelist: "Future of Health Technology Innovation," Stanford Health++, Virtual, April 30, 2021
2021	Panelist: "Social/Professional Panel: Ensuring Buy-In from Stakeholders," Ethical, Legal and Social Implications of Surgical Recording (ELSI), Virtual, May 14, 2021
2021	Invited Moderator: "The Available Online & In-Store: Health Care's New Setting," Stanford Medicine's Leadership Retreat, Virtual, May 21, 2021
2021	Panelist: "Technology" Stanford Graduate School of Education Transforming Learning Accelerator Spring Summit, Virtual, June 2, 2021
2021	Invited Educator: "Precision Learning and Data Sharing Through Wearable Technology," University of Michigan Zelenock Lecture, Virtual, June 23, 2021
2021	Presenter: "Diversity, Equity and Inclusion in Surgery: How are We Cultivating the Pipeline?" American College of Surgeons Quality and Safety Conference, Virtual, July 12, 2021
2021	Invited Educator: "The Leaky Pipeline: Beyond Bandages," University of Alabama at Birmingham Grand Rounds, Virtual, July 13, 2021
2021	Panelist: "Simulation and the Practicing Physician: It's all about the metrics," Simulation in Surgical Education Panel, National Medical Association Surgical Section Meeting, Virtual, July 18, 2021



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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| 2021 | Panelist: "The Medical Profession Through the Lens of Human Flourishing: Social Justice, Health Equity and Human Flourishing: Are We All Included?" Kern National Network for Caring & Character in Medicine (KNN) Discussion Series, Virtual, August 3, 2021                                     |
| 2021 | Invited Speaker: "Training, Education, and Credentialing," Reimagining Surgery Through AI and Deep Learning – from Video to Big Data Session at the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Annual Meeting, Las Vegas, NV, September 1, 2021                         |
| 2021 | Invited Speaker: "Failing by Design: The Importance of a Failure Mindset in Innovation," Masters Leadership and Development: Failing Forward into Leadership Session at the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Annual Meeting, Las Vegas, NV, September 2, 2021 |
| 2021 | Invited Speaker: "Reimagining Surgical Training," Presidential Plenary: Reimagining the Practice of Surgery at the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Annual Meeting, Las Vegas, NV, September 2, 2021  |
| 2021 | Invited Presenter: "Haptic Technology and the Physical Exam: Rescuing a Lost Art," Alaskan Improving Diagnostic Accuracy in Medicine Conference, Virtual, September 7, 2021   |
| 2021 | Panelist: "Learning from a natural experiment: revisiting the 2020 cohort of early medical school graduates serving during the COVID- 19 pandemic," American Medical Association ChangeMedEd Conference, Virtual, September 30, 2021  |
| 2021 | Panelist: "Surgical Innovation: Taking an Idea All the Way," Involving Your Academic Institutions Session at the American College of Surgeons Clinical Congress, Virtual, October 25, 2021  |
| 2021 | Panelist: "Predecessors to Action in Digital Environments," mediaX: Taxonomies and Ontologies for the Human Experience in Digital Environments, Stanford, CA, November 3, 2021  |
| 2021 | Panelist: "AI & Haptic Technology in Medical Education," Stanford AI + Health Online Conference, Virtual, December 8, 2021  |
| 2022 | Invited Lecturer: "The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology," AR Moossa Lectureship, University of California-San Diego, Virtual, January 5, 2022  |
| 2022 | Invited Speaker: "The Quantified Surgeon: Precision Learning & Data   |





**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Sharing Through Wearable Technology," Temple University Grand Rounds, Virtual, February 2, 2022

- 2022      Invited Speaker: "The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology," Stanford Department of Surgery Grand Rounds, Stanford, CA, February 15, 2022
  
- 2022      Invited Lecturer: "The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology," Carter Chinnis Lectureship at Duke Surgery Grand Rounds, Virtual, March 2, 2022
  
- 2022      Invited Speaker: "Wearable Technology and the Quantified Surgeon: The Forefront of Precision Surgery," Harvard Surgical Research Day, Virtual, March 12, 2022
  
- 2022      Invited Speaker: "How to Become a Successful Researcher Early in Your Career?" Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Annual Meeting, Denver, CO, March 18, 2022
  
- 2022      Invited Speaker: "Use of AR/VR in Surgical Training and Data Visualization," Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Annual Meeting, Denver, CO, March 19, 2022
  
- 2022      Invited Presenter: "The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology," Dr. Alan Turnbull Lecture-Memorial Sloan Kettering Department of Surgery Grand Rounds, Virtual, April 4, 2022
  
- 2022      Invited Presenter: "Precision Learning and Data Sharing Through Wearable Technology," Loyola University Medical Center Department of Surgery Grand Rounds, Chicago, IL, April 6, 2022
  
- 2022      Invited Speaker/Panelist: "Quantifying Surgical Mastery Performance in Surgery Using Wearable Technologies," International Symposium on Medical Robotics Diversity in Surgical Robotics Training, Virtual, April 13, 2022
  
- 2022      Invited Lecturer: "Do surgeons want to be measured? Ethical considerations in performance measurement technologies," Columbia Bioethics Course, Virtual, April 20, 2022
  
- 2022      Invited Lecturer: "The Digital Surgeon: A Glimpse into the Future of Metrics and Outcomes," Harry E. Bacon Lectureship, ASCRS, Tampa, FL, May 2, 2022
  
- 2022      Invited Speaker: "The Learning Journey--Taking stock and hacking your



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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way to success." Washington University Commencement, St. Louis, MO, May 20, 2022

- 2022      Invited Presenter: "The Future of Surgery is Haptic, Digital & Diverse," University of Kentucky Grand Rounds, Virtual, May 31, 2022
- 2022      Invited Speaker: "The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology," Eberbach Visiting Professorship, Medical College of Wisconsin, Milwaukee, WI, June 7, 2022
- 2022      Invited Speaker: "The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology," Morehouse School of Medicine, Virtual, July 13, 2022
- 2022      Invited Speaker: "The Science of Touch: Improving Surgical Precision Through Wearable Technology and Haptic Data" Frontiers in Medicine, Stanford, CA September 29, 2022
- 2022      Invited Lecturer: "The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology," Leonard W. Edwards, MD Lecture, Vanderbilt University, Nashville, TN, October 7, 2022
- 2022      Invited Lecture: "Wearable Technology and the Quantified Surgeon: The Forefront of Precision Surgery," I. S. Ravdin Lecture in the Basic and Surgical Sciences, American College of Surgeons Clinical Congress, San Diego, CA, October 17, 2022
- 2022      Invited Speaker: "The Fundamentals of Allyship: Partnering with your Peers, Colleagues, and Mentors," American College of Surgeons Surgery Resident Program, American College of Surgeons Clinical Congress, San Diego, CA, October 17, 2022
- 2022      Invited Speaker: "New Directions and New Data to Inspire the Next Evolution of AI in Precision Surgery," Stanford HAI Fall Conference, Stanford, CA, November 15, 2022
- 2022      Invited Speaker: "The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology," BIOMEDIN 205: Precision Medicine with Big Data, Stanford, CA, November 30, 2022.
- 2023      Moderator: "Hot Topic Session: 'Stronger Together': A Conversation with SAAS and SBAS on Diversity in Surgery. 18<sup>th</sup> Annual Academic Surgical Congress. Houston, TX, February 7, 2023
- 2023      Podium: Annual Academic Surgical Congress Hot Topic Session: 'Stronger Together': A Conversation with SAAS and SBAS on



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Diversity in Surgery. February 2023

- 2023      Invited Speaker: "The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology," Southeastern Surgical Conference Henry L. Laws II Laws Lecture, Savannah, GA, February 13, 2023
- 2023      Invited Speaker: "The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology," Sheen Award Lecture, March 18, 2023.
- 2023      Invited Speaker: "The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology," One AO and LearnX Meeting, Santa Ana Pueblo, NM, April 30, 2023.
- 2023      Invited Speaker: "The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology," ASE/SIMPL Surgical Education Seminar, Virtual, May 16, 2023
- 2023      Invited Speaker: "The Innovator's Imperative," Jacobson Innovation Award. Chicago, IL, June 9, 2023
- 2023      Invited Speaker: "The Quantified Surgeon: A Glimpse Into the Future of Surgical Metrics and Outcomes," AWS Surgeons' Career and Leadership Professional Education Lecture Series (SCALPELS) 2023 Education Program. Virtual. June 7, 2023
- 2023      Panelist: "Precision Feedback in Medicine and Surgery," AMA Council on Medical Education, Chicago, IL, June 9, 2023
- 2023      Invited Speaker: "The Future of Surgery is Haptic, Digital & Diverse," Johns Hopkins Grand Rounds. September 15, 2023
- 2023      Invited Speaker: "What Do You Do With an Idea?" 25<sup>th</sup> Annual Thomas J. Fogarty MD Lecture, Stanford, CA September 29, 2023
- 2023      Moderator: "ME315--Use of Low-Tech Simulation in Surgical Training," Clinical Congress 2023, Boston, MA, October 25, 2023
- 2023      Speaker: "The Future of Surgery is Haptic, Digital & Diverse." SAAS Annual Meeting - Johns Hopkins Department of Surgery Grand Rounds, September 13, 2023
- 2024      Presenter: "The Quantified Surgeon: A Glimpse into the Future of Surgical Metrics and Outcomes," Calgary Orthopaedic City-Wide Rounds, January



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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19, 2024

Invited Educator (International):

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| 2003 | Presenter: Using the Pelvic Exam Simulator for Research in Student and Patient Education - Linkoping University Hospital – Sweden   |
| 2011 | Speaker: “Building a Career Pathway: opportunities, obstacles and getting past them”. RACS Annual Scientific Congress. May 2011. Adelaide Australia   |
| 2011 | Chair: “History, Balance and the Future”. RACS Annual Scientific Congress. May 2011, Adelaide Australia   |
| 2011 | Speaker: “Trauma Training – Teaching the Teacher”. RACS Annual Scientific Congress. May 2011, Adelaide Australia  |
| 2011 | Co-Chair: “Cutting Edge Tech”. RACS Annual Scientific Congress. May 2011, Adelaide Australia  |
| 2011 | Speaker: “A Career in Surgery: What they don’t tell you”. RACS Annual Scientific Congress. May 2011, Adelaide Australia   |
| 2011 | Speaker: “Surgical Simulation Training for the 21 <sup>st</sup> Century.” RACS Annual Scientific Congress. May 2011, Adelaide Australia   |
| 2012 | Presenter: Columbian Surgical Society - 38 <sup>th</sup> Annual Congress: Advances in Surgery - “Use of Simulation Technology to Assess Errors in Intra-Operative Decision Making” Cali, Columbia, August 22-25, 2012 |
| 2012 | Presenter: Columbian Surgical Society - 38 <sup>th</sup> Annual Congress: Advances in Surgery “Training the Master Surgeon: Does Simulation Technology Have a Role?” Cali, Columbia, August 22- 25, 2012              |
| 2012 | Presenter: Columbian Surgical Society - 38 <sup>th</sup> Annual Congress: Advances in Surgery “Choosing the Right Technology for Your Simulation Training Center” Cali, Columbia, August 22-25, 2012                  |
| 2015 | Presenter: “The Validity and Reliability of Performance Measures, Checklists vs. Computer Generated Metrics.” Medical Simulation Symposium. Christchurch, New Zealand. April 28, 2015                                 |
| 2015 | Presenter: “What is the Difference Between Using Simulation for Teaching vs. Assessment – Manpower Needs, Cost and Learner Motivation” Medical Simulation Symposium. Christchurch, New Zealand. April 28, 2015        |



**Carla M. Pugh, MD, PhD, FACS**  
Thomas Krummel Professor of Surgery

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- 2015      Presenter: "Use of Simulation for Formative or Summative Assessment; Where We Are Against Where We Should Be." Medical Simulation Symposium. Christchurch, New Zealand. April 28, 2015
- 2015      Presenter: "Military Uses of Simulation in Training." Medical Simulation Symposium. Christchurch, New Zealand. April 28, 2015
- 2015      Presenter: "Educational Research." Developing a Career in Academic Surgery Course. Perth, Australia. May 4, 2015
- 2015      Presenter: "Signatures: Drawing Meaning for Clinical Skills Performance Using Sensors and Motion Tracking Technology." RACS Annual Scientific Congress. Perth, Australia. May 5, 2015
- 2015      Presenter: "Role of Simulation: Potential Impact on Training and Assessment." RACS Annual Scientific Congress. Perth, Australia. May 6, 2015
- 2015      Presenter: "Issues in Surgical Training." RACS Annual Scientific Congress. Perth, Australia. May 7, 2015
- 2016      Discussant: "Round Table Discussion: Medical Technologies." Simnovate International Summit – Montreal, Canada, May 5, 2016
- 2016      Panelist: "This House Believes that Innovation in Health Care is too Costly." Simnovate International Summit – Montreal, Canada, May 5, 2016
- 2016      Presenter: "Is Indecisiveness Linked to Hand Movements in Performing Laparoscopic Ventral Hernia Repair?" Surgical Data Science Meeting – Heidelberg, Germany, June 20, 2016
- 2016      Moderator: What are the incentives for the medical profession to support data science?" Surgical Data Science Meeting – Heidelberg, Germany, June 20, 2016
- 2016      Presenter: "Educational Challenges." WHO Global Consultation "Setting Priorities for Global Patient Safety" – Florence, Italy, September 26, 2016
- 2016      Chair: "Global Patient Safety and Quality Initiatives." WHO Global Consultation "Setting Priorities for Global Patient Safety" – Florence, Italy, September 28, 2016
- 2016      Presenter: "Simulation and Performance Improvement: Reality or



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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- Misadventure?" SIM-one SIM Expo – Toronto, Canada, October 7, 2016
- 2017      Presenter: "Educational Challenges and Opportunities for Evaluating Physician Competency." The International Society for Quality in Health Care (ISQua) Education Committee Webinar – Webinar, April 17, 2017
- 2018      Presenter: "Signatures: What can Sensors and Motion Tracking Technology Tell us about Technical Skills Performance?" Medical Council of Canada's Joint meeting of the Research Advisory Committee (RAC) and Research and Development (R&D) Committee – Ottawa, ON via Skype, January 31, 2018
- 2019      Invited Speaker: "Use of Sensor-Based Metrics to Improve Mastery Learning During Simulation," Computer Assisted Radiology and Surgery (CARS) 2019, Rennes, France, June 20, 2019
- 2020      Presenter: "Surgical Metrics Project" Collaborative for Advanced Assessment of Surgical Skills (CAARSS), Virtual, June 5, 2020
- 2020      Presenter: "Surgical Metrics Project" AI and Surgical Metrics Consensus Conference hosted by the Institute for Surgical Excellence (ISE), Virtual, July 10 & 11, 2020
- 2020      Presenter: "The Future of Surgery is Haptic and Digital" SURGICON 2020, Virtual, October 23, 2020
- 2020      Presenter: "Improving Performance of Medical Trainees with Wearables, Haptics & Analytics," The Future of Surgical Training – University College of London, Virtual, October 29, 2020
- 2020      Presenter: "Integration of Performance Coaching in Surgical Culture," AAGL Virtual Global Congress on Minimally Invasive Gynecology, Virtual, November 14, 2020
- 2020      Presenter: "Haptic Considerations in Surgical Navigation: A New Opportunity for Information Sharing," Hamlyn Winter School on Surgical Imaging and Vision, Imperial College London, Virtual, December 1, 2020
- 2021      Invited Keynote Speaker – "The Government's Role in Supporting Consistent Standards in Surgical Training & Surgical Quality," Surgicon Congress, Virtual, May 5, 2021
- 2021      Invited Visiting Professor – "The Quantified Surgeon: Precision Learning & Data Sharing Through Wearable Technology," University of Toronto Robin McLeod Lecture, Virtual, December 3, 2021





**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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| 2023 | Moderator: "SS19: Innovation & New Technology Quickshot Session,"<br>2023 SAGES Annual Meeting, Montreal, Canada, March 30, 2023 |
| 2023 | Invited Speaker: "Simulation," European Surgical Association Jubilee,<br>Bordeaux, France, May 11, 2023                          |

**Service Activities**

**Professional and Scientific Service:**

Intuitive Foundation Global Surgical Training Challenge

Mentor & Judge – August 2020-Present

Wellcome/EPSRC Centre for Interventional and Surgical Sciences (WEISS)

International Advisory Board Member (IAB) – 2019-Present

National Institutes of Health Permanent Study Section Member

Bioengineering, Technology and Surgical Sciences (BTSS) – 2011-2017

Editorial Boards

American Educational Research Journal (Ranking 3/216 in Education Research) – 2014-2016

BMJ Simulation and Technology Enhanced Learning Editorial Board – 2014-2021

IEEE Open Access Journal of Engineering in Medicine and Biology – 2019-Present

Computer Assisted Surgery Journal Editorial Board – 2020-Present

Artificial Intelligence Surgery (AIS) Open Access Editorial Board – 2021-Present

Journal of the American College of Surgeons – 2021-Present

Annals of Surgery – 2021-Present

Invited Reviewer

American Institute of Biological Sciences

American Journal of Surgery

Annals of Surgery

Computers in Biology and Medicine

Journal of the American College of Surgeons

Journal of the American Medical Association (JAMA)

JAMA Surgery

The Journal of Continuing Education in the Health Professions

Journal of Medical Education

Journal of Medical Systems

Journal of Simulation and Healthcare

Journal of Surgical Education

Journal of Surgical Research

MedEd Portal-AAMC

Plastic and Reconstructive Surgery



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Production & Manufacturing Research

Surgery

Surgical Endoscopy

Surgical Innovation

Teaching & Learning in Medicine

Transactions on Haptics

Transactions on Information Technology in BioMedicine

Abstract Reviews

Research in Medical Education – AAMC – 2005

Society for Medical Simulation – 2005

Medicine Meets Virtual Reality – 2005, 2006, 2008, 2012, 2013, 2014, 2015

American College of Surgeons Clinical Congress – 2011, 2013

American Surgical Association – 2018, 2019, 2020, 2021

Fellowship Reviews

American College of Surgeons Accredited Education Institutes Fellowship Accreditation – 2016

NIH Grant Reviews

National Institutes of Health Study Section Reviewer – ZRG1-SBiB-Q50 - 2007

National Institutes of Health Study Section Reviewer – ZRG1 HDM-P (58) – 2009

National Institutes of Health Study Section Reviewer – NIBIB BTSS – 2010, 2015, 2016, 2017

National Institutes of Health – NIDDK Kidney, Urologic and Hematologic Diseases D Sub-Committee Program Reviewer – June 2016

National Institutes of Health Study Section Reviewer – DIRH – October 2016

National Institutes of Health Study Section Reviewer – SAT – September 2017

Other Grant Reviews

Telemedicine & Advanced Technology Research Center – 2002 - 2008

National Board of Medical Examiners Stemmler Fund – 2002, 2005, 2007

UW Institute for Clinical and Translational Research (ICTR) Advancing Health Equity and Diversity (AHEAD) Pilot Awards Program Reviewer – UW Hospital – 2015

Department of Defense – Joint Warfighter Medical Research Program (JWMP) Reviewer – May 2016

University of Missouri Research Board Peer Reviewer – December 2016, May 2017

Society for Surgery of the Alimentary Tract (SSAT) / Society of Black Academic

Surgeons (SBAS) Resident/Fellow Research Award Reviewer – January 2017

Warren and Clara Cole Foundation, University of Illinois – May 2021

Research Portfolio Reviews

2005                      West Coast Medical Skills/Distance Learning Portfolio -Telemedicine & Advanced Technology Research Center Product Line Review,



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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Marina Del Rey, CA

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| 2007 | Medical Modeling and Simulation Portfolio- Telemedicine & Advanced Technology Research Center Product Line Review, San Antonio, TX        |
| 2009 | Medical Modeling and Simulation Portfolio- Telemedicine & Advanced Technology Research Center Product Line Review, Long Beach, California |
| 2012 | Medical Modeling and Simulation Portfolio- Telemedicine & Advanced Technology Research Center Product Line Review, Frederick, MD          |
| 2019 | Wellcome EPSRC Centre for Interventional and Surgical Sciences (WEISS) Program Review, London, UK   |

**Professional Public Service/Philanthropy:**

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|--------------|---|
| 1989         | Howard University Summer Health Careers Program Tutor   |
| 1997         | Stanford University Summer Health Careers Program Mentor  |
| 2006         | Established & Funded the Pugh-Leffall Summer Fellowship Program, Howard University, College of Medicine |
| 2007-present | Chicago High School for the Agricultural Sciences Mentor  |
| 2007         | Northwestern Oncofertility Saturday Academy Mentor, 2007-Present  |
| 2008-present | Museum of Science and Industry – President’s Council  |
| 2009         | Northwestern Memorial Hospital Medical Explorers Mentor   |
| 2012-present | AVID/TOPS Mentor – Boys & Girls Club of Dane County   |
| 2013-present | University of Wisconsin, Madison Surgery Residents for Diversity Mentor                                 |
| 2015         | Harvard College of Future Surgeons (HCFS) Mentor  |
| 2015         | University of Wisconsin, Women in Science and Engineering (WISE) Mentor                                 |
| 2016         | Association for Surgical Education Surgical Education Research Fellowship (SERF) Advisor                |
| 2016         | American College of Surgeons Women in Surgery Mentor  |
| 2017         | African American Women’s Business and Careers (AWBC) Advisor Board Member                               |
| 2020         | Stanford Summer Math & Science Honors (SMASH) Academy Healthcare Panelist                               |
| 2020         | Camera as Witness Panelist for United Nations Association Film Festival                                 |
| 2021         | Shark for Innovative Session at the American College of Surgeons Annual Surgical Simulation Summit      |
| 2021         | Panelist for Stanford URM Mentorship Circle   |
| 2021         | Stanford Gabilan Fellows Mentor   |
| 2021         | Stanford Biodesign Innovation Fellowship Advisor  |



**Carla M. Pugh, MD, PhD, FACS**

Thomas Krummel Professor of Surgery

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2021	COVID Vaccine Education with Black Front-Line Staff at Stanford University IHealth Care
2021	Panelist for Stanford MD Admissions 2021 Second Look Event
2021	Guest Lecturer for "Surgical Technology and Entrepreneurship," a course through the Stanford Precollegiate Studies Program
2021	Stanford Summer Math & Science Honors (SMASH) Academy Healthcare Panelist
2022	Shark for Innovative Session at the American College of Surgeons Annual Surgical Simulation Summit

**Entrepreneurial Activity**

Founded Medical Teaching Systems, Inc – August 27, 2001

Founded 10 Newtons – June 6, 2017