

Michael Robert Marohn, D.O.

**The Johns Hopkins University School
of Medicine**



Curriculum Vitae

DEMOGRAPHIC AND PERSONAL INFORMATION

Current Appointments

University

Associate Professor of Surgery
Department of Surgery
The Johns Hopkins University School of Medicine
Baltimore, Maryland

Associate Professor of Engineering
The Johns Hopkins University Whiting School of Engineering
Baltimore, Maryland

Hospital

Attending Surgeon
The Johns Hopkins Hospital
Baltimore, Maryland

Program Director, Minimally Invasive Surgery (MIS) Fellowship
The Johns Hopkins Hospital

Faculty, Endocrine Surgery Fellowship
The Johns Hopkins Hospital

Director, Minimally Invasive Surgery Training Center (MISTC)
The Johns Hopkins Hospital

Other

Associate Professor of Surgery
Department of Surgery
Uniformed Services University (USU) School of Medicine
Bethesda, Maryland

International Expert Faculty
IRCAD
University Louis Pasteur
Strasbourg, France

Personal Data

Business address, phone, fax, e-mail

Department of Surgery
The Johns Hopkins University School of Medicine
600 N. Wolfe Street
MISTC/ Blalock 1222
Baltimore, MD 21287

410-502-0723 (office)
410-502-0726 (fax)
mmarohn1@jhmi.edu

EDUCATION AND TRAINING

Year	Degree/Certificate	Institution	Discipline
• Undergraduate			
1969-1973	A.B.	Dartmouth College	Psychology
7-12/1974	Non-degree	Dartmouth College	Pre-Medical
1-8/1975	Non-degree	Indiana University	Pre-Medical
• Doctoral/graduate			
1975-1979	D.O.	Midwestern University/ Chicago College of Osteopathic Medicine (CCOM)	Medicine
• Post Doctoral			
1979-1980	Internship	Wilford Hall United States Air Force Medical Center (WHMC) Lackland AFB, Texas	Medicine
1980-1985	Residency	Wilford Hall United States Air Force Medical Center (WHMC) Lackland AFB, Texas	General Surgery

1981-1982	Fellowship	Combined program: First USAF Critical Care Fellow	Surgical Critical Care
		Wilford Hall United States Air Force Medical Center (WHMC) Lackland AFB, Texas	
		Massachusetts General Hospital (MGH) Boston, Massachusetts	
1987	Military	School of Aerospace Medicine Brooks Air Force Base, Texas	Aerospace Medicine Primary United States Air Force Flight Surgeon training

PROFESSIONAL EXPERIENCE

Dates	Positions	Institutions
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Academic Appointments

1987-1989	Instructor Department of Surgery	Uniformed Services University School of Medicine Bethesda, Maryland
1989-1996	Assistant Professor Department of Surgery	Uniformed Services University School of Medicine Bethesda, Maryland
1996-2004	Associate Professor Department of Surgery	Uniformed Services University School of Medicine Bethesda, Maryland
1997-2004	Vice-Chair Department of Surgery For United States Air Force	Uniformed Services University School of Medicine Bethesda, Maryland
12/03-6/2006	Visiting Associate Professor Department of Surgery	Johns Hopkins University School of Medicine Baltimore, Maryland
7/05-6/2006	Visiting Associate Professor Engineering Research Center	Johns Hopkins University Whiting School of Engineering Baltimore, Maryland
7/06-present	Associate Professor Department of Surgery	Johns Hopkins University School of Medicine Baltimore, Maryland
7/06-present	Associate Professor Engineering Research Center	Johns Hopkins University Whiting School of Engineering Baltimore, Maryland

Military Assignments

1975-1979	Health Professions Scholarship Program (HPSP) 2Lt, USAF, MC MC	Midwestern University/ Chicago College of Osteopathic Medicine (CCOM) Chicago, Illinois
1979-2004	Active Duty US Military	United States Air Force Medical Corps (USAF MC)

General Surgery, Surgical Critical Care, Flight Surgery (FS)

Military rank

1975 2nd Lieutenant, MSC

1979 Captain, USAF, MC

1984 Major, USAF, MC

1990 Lieutenant Colonel, USAF, MC, FS

1996 Colonel, USAF, MC, FS

Flight surgeon hours in aircraft: F-16, C-5, C-9, C-21, C-22, C32, C-130, VC-25, KC-135, RC-135, T-37, T-38, H-58, H-60, H-64

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|--------------|---|---|
| 1979-1985 | Graduate Medical Education
Captain, USAF, MC then
Major, USAF, MC in 1984 | Wilford Hall USAF Medical Center (WHMC)
Lackland Air Force Base, Texas |
| 1985-1987 | Chief, General Surgery
Flight Surgeon
Deputy Chief, Hospital Services
Major, USAF, MC, FS | Incirlik Air Base, USAF Europe/ NATO
Adana, Turkey |
| 1987-2004 | Dual Assignment:
Academic Surgeon
Assigned to: Office of the
USAF Surgeon General | Uniformed Services University (USU) School of Medicine
Department of Surgery
Bethesda, Maryland |
| | Vice-Chair, USU Department of Surgery for the Air Force, 1997-2004 | |
| | Clinical Surgeon
Chief, General Surgery
1994-2004 | Malcolm Grow USAF Medical Center (MGMC)
Andrews Air Force Base, Maryland |
| 1989 | Operation Desert Storm
Director, Burn Unit Staging
Facility, Major, USAF, MC, FS | Bicester 317 th Contingency Hospital, United Kingdom
USAF Europe/ NATO Desert Storm Coalition |
| 1996 | Operation Southern Watch
Chief of Surgery and Chief,
Hospital Services

Deputy Commander
Colonel, USAF, MC, FS | Prince Sultan Air Base, 4404 th Hospital, Saudi Arabia
Joint Services Southwest Asia |
| 2001-2002 | Project Athena Surgeon
Colonel, USAF, MC, FS | Spangdahlem Air Base B 52 Medical Group
Bitburg, Germany |
| 2002 | Critical Care Air Transport
Team (CCATT)
Team Chief,
Colonel, USAF, MC, FS | Al Jaber Air Base, Kuwait
Operation Enduring Freedom |
| 1 April 2004 | Retired
Colonel, United States Air Force
Medical Corps (MC)
Flight Surgeon (FS) | United States Air Force (Retired) |

Professional Positions

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|-----------|---|---|
| 1985-1987 | Co-founder and Team Leader, One of the first four Forward Surgical Ambulance Trauma Teams (FAST) in the USAF | Incirlik Air Base, Turkey
USAF Europe/ NATO |
| 1985-1987 | Founder, Incirlik-Adana Medical Cooperation Group with Dr. Ozhan Surer | Incirlik Air Base, Turkey
USAF Europe/ NATO |
| | <p>Performed surgery at five civilian Adana hospitals side-by-side with Turkish surgeons</p> <p>Introduced several innovations to Adana medical community, including arthroscopy</p> <p>Secured vendor funding and installation of 1st CT scanner in southwest Turkey, in a collaborative effort with the US Military and Siemens Corporation</p> | |
| 1987-2004 | Director, Surgical Intensive Care Unit (SICU) for 7 years, then Senior Advisor to SICU for 7 years | Malcolm Grow USAF Medical Center (MGMC)
Andrews Air Force Base, Maryland |
| 1987-2004 | Consultant to USAF Surgeon General for Quality Assurance | Office of the USAF Surgeon General
Bolling Air Force Base, DC |
| 1988-2004 | Faculty, General Surgery | Walter Reed Army Medical Center (WRAMC)
Washington, DC |
| 1988-2004 | Director, Endocrine Surgery | Malcolm Grow USAF Medical Center (MGMC)
Andrews Air Force Base, Maryland |
| | <p>Established 2nd highest volume endocrine surgery center in US Military</p> | |
| 1989-2004 | Founder and Director, Minimally Invasive Surgery (MIS) Program | Malcolm Grow USAF Medical Center (MGMC)
Andrews Air Force Base, Maryland |
| 1989-2004 | Pioneer for US Military in Minimally Invasive Surgery | Uniformed Services University School of Medicine
Bethesda, Maryland |
| | <p>Co-Founder & Co-Director with Dr. David Wherry, Department of Defense (DOD) Tri-Service Emerging Surgery Technologies Program</p> <p>Developed and conducted >250 courses worldwide for >2500 DOD surgeons in topics from basic laparoscopic to advanced laparoscopy, surgical ultrasound, radio imaged guided surgery (RIGS), cryosurgery, laser surgery, and surgical robotics, 1989-2004</p> <p>Established on-going minimally invasive and emerging surgical technology training programs worldwide for DOD surgeons, conducting annual educational programs in France and Germany for European stationed DOD and host nation surgeons, and in South Korea for Pacific Rim stationed DOD and host nation surgeons, 1991-2004</p> <p>Performed numerous 'laparoscopic surgery 'firsts' in US Military</p> | |

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| 1992-2004 | Chair, Cancer Program,
American College of Surgeons
of Surgeons Commission on
Cancer Liaison Physician | Malcolm Grow USAF Medical Center (MGMC)
Andrews Air Force Base, Maryland |
| | Achieved American College of Surgeons Commission on Cancer Program Accreditation in 1994, 1997, 2000, 2004 | |
| 1994-2004 | Associate Program Director,
General Surgery Residency
Program | Walter Reed Army Medical Center (WRAMC)
Washington, DC |
| | Integrated program with Walter Reed Army Medical Center and Malcolm Grow USAF Medical Center | |
| | Achieved ACGME Residency Review Committee (RRC) five-year citation-free approval of General Surgery Residency in 1994, re-approved without citations for five-years in 1999; Working with Program Directors Drs. David Jacques & Craig Shriver | |
| 1994-2004 | Chief, General Surgery | Malcolm Grow USAF Medical Center (MGMC)
Andrews Air Force Base, Maryland |
| 1994-2004 | Vice-Chair, USAF Committee
on Trauma | American College of Surgeons (ACS)
Committee on Trauma (COT) |
| | Advanced Trauma Life Support (ATLS) State Faculty | |
| | Conducted over 60 ATLS courses worldwide for DOD providers 1987-2004 | |
| 1997-2004 | Attending Surgeon
Minimally Invasive Surgery
(MIS) Consultant | Walter Reed Army Medical Center (WRAMC)
Washington, DC |
| 1997-2004 | Vice-Chair for USAF
Department of Surgery | Uniformed Services University School of Medicine
Bethesda, Maryland |
| | Expanded Tri-Service surgical collaboration in the Department of Defense (DOD) National Capitol Area (NCA) between USU and the three US Military medical centers: Bethesda NNMC, MGMC, and WRAMC; working with Dr. Norman Rich, Chair, USU Department of Surgery | |
| 1998 | Associate Examiner | American Board of Surgery (ABS)
Philadelphia, Pennsylvania |
| 1998-2004 | Tri-Service Standardization
Consultant for Surgery | National Capitol Area (NCA) Tri-Service US Military
Consortium |
| 2000-2004 | Affiliate Faculty
General Surgery | Bethesda National Naval Medical Center (NNMC)
Bethesda, Maryland |
| 2000-2004 | Minimally Invasive Surgery
(MIS) Consultant | National Institutes of Health (NIH) (NIDDK)
Bethesda, Maryland |
| | Co-founder of joint Walter Reed Army Medical Center and NIH Laparoscopic Donor Nephrectomy program with Drs. Alan Kirk, Doug Hale, Noah Schenkman | |

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| 2000-present | Consultant
Working with Dr. Rick Satava | Defense Advanced Projects Research Projects Agency (DARPA), Arlington, Virginia |
| 2000-present | Consultant
Working with Dr. Gerry Moses | Telemedicine and Advanced Technology Research Center (TATRC), Fort Detrick, Maryland |
| 2001-2004 | Project Athena Program
Founder & Project Officer- | Spangdahlem Air BaseB 52 Medical Group
Bitburg, Germany |
| | | Exchange program for surgeons for surgeons at Bitburg Air Base and Malcolm Grow USAF Medical Center (MGMC) |
| 2001-present | International Expert Faculty
Collaboration with Professor
Jacques Marescaux | IRCAD
University Louis Pasteur
Strasbourg, France |
| | | Invited US Expert at press conference for Professor Marescaux' 1 st in the world Telerobotic Transatlantic Laparoscopic Cholecystectomy performed between New York City, New York and Strasbourg, France, 7 September 2001
Frequent invited expert at IRCAD/ EITS training center with Professor Marescaux |
| 2001-2004 | Co-Founder, Surgical
Robotics Program with Drs.
Noah Schenkman, David
McLeod, & William DeVries | Walter Reed Army Medical Center (WRAMC)
Washington, DC |
| | | Performed first robotic laparoscopic surgery In US Military |
| 2004-present | Consultant,
Telemedicine and Advanced
Minimally Invasive Surgery
(TAMIS) Center, with Noah
Schenkman, David McLeod, &
William DeVries | Walter Reed Army Medical Center (WRAMC)
Washington, DC |
| | | Secured \$4.1 Million Congressional funding for TAMIS Center at Walter Reed to establish a telesurgery and surgical robotics research lab at the Walter Reed Army Institute of Research (WRAIR), to collaborate with extramural partners (including Johns Hopkins) |
| 2005-present | Program Director,
Minimally Invasive Surgery
Fellowship | Johns Hopkins University School of Medicine
Baltimore, Maryland |
| | | Fellowship funded by extra-mural educational grants |
| | | Achieved MIS Fellowship Council Accreditation 2006 |
| 2005-present | Director, Minimally Invasive
Surgery (MIS) Interdisciplinary
Technology Research Group | Johns Hopkins University School of Medicine
and Whiting School of Engineering
Baltimore, Maryland |
| | | Research focus: MIS technology, 'smart' instruments, robotics, telesurgery, simulation, NOTES; Group grew out of Dr. Mark Talamini's MIS research group |

Group performed first telerobotic surgery in USA at the American Telemedicine Association meeting, 4/2005

MIS Technology Research Fellows productivity for 2005-2006:

	<u>2005</u>	<u>2006</u>
Publications	10	14
Published abstracts	11	8
Presentations	7	19
Peer reviewed posters	8	8

2005-11/2006 Co-Director, Johns Hopkins University School of Medicine
Minimally Invasive Surgery Baltimore, Maryland
Training Center (MISTC)

12/06-present Director, Johns Hopkins University School of Medicine
Minimally Invasive Surgery Baltimore, Maryland
Training Center (MISTC)

Introduced SAGES Fundamentals of Laparoscopic Surgery (FLS) program, 2005

Secured vendor support for \$1.5 Million over five-years for education and research, plus Support to renovate MISTC auditorium and lab space, 2006

Established surgical simulator laboratory, 2006

2005-present Endolumenal Surgery Task ASGE – SAGES (American Society of Gastrointestinal
Force, including 8 ASGE Endoscopy and Society of American Gastrointestinal
And 6 SAGES members. Endoscopic Surgeons)

Mission to prospectively develop guidelines for Natural Orifice Surgery Consortium for Assessment and Research (NOSCAR)

Members: ASGE: Drs. Anthony Kalloo, William Brugge, Christopher Gostout, Robert Hawes, Sergey Kantsevov, Jay Pasricha, Richard Rothstein, and Christopher Thompson; SAGES: Drs. David Rattner, Michael Marohn, Jeffery Ponsky, Nathaniel Soper, William Richards, and Lee Swanstrom

Organizing Committee for 1st International Conference on Natural Orifice Trans-luminal Endoscopic Surgery (NOTES), Scottsdale AZ, 3/9-10/2006

Secured \$10K from TATRC to support NOTES 2006 meeting

ASGE – SAGES (American Society of Gastrointestinal Endoscopy and Society of American Gastrointestinal Endoscopic Surgeons) Joint Committee on Natural Orifice Trans-luminal Endoscopic Surgery (NOTES), established by both ASGE and SAGES Boards, Co-chaired by Drs. David Rattner and Robert Hawes

Organizing Committee for 2nd International Conference on Natural Orifice Trans-luminal Endoscopic Surgery (NOTES), Boston MA, 7/2007

2005-present Member Johns Hopkins University School of Medicine
Government Affairs Committee Baltimore, Maryland
Perioperative Beta-Block Committee
Simulation Committee
Surgery Education Committee

- Surgical POE Committee
- 2005-present Founding Member Johns Hopkins University School of Medicine
I4M Committee- Integrating Baltimore, Maryland
Imaging, Intervention, and
Informatics in Medicine
Medicine
- Mission to encourage Johns Hopkins University enterprise-wide trans-disciplinary collaborative research initiatives
- Executive Committee member, Co-chaired by Drs. Chi Dang & Marc Donohue
- Chair of organizing committee for I4M Symposium: "Advancing Technology for Patient Care and Safety", Baltimore MD, 2/27/2006
- Secured \$15K from TATRC to support 2006 I4M Symposium
- Designated lead for ongoing I4M initiatives, including Fraunhofer Institute collaborative
- 2005-present Co-Chair, with Dr. Dan Herron, MIRA – SAGES (Minimally Invasive Robotic Association
Surgical Robotics Joint Task and Society of American Gastrointestinal Endoscopic
Force Surgeons)
- Mission: Develop consensus statements regarding surgical robotics
- Co-chair, 1st MIRA-SAGES Surgical Robotics Consensus Conference, New York City, 6/9-10/2006
- Secured \$25K from DARPA to support 2006 MIRA-SAGES Surgical Robotics Consensus Conference
- Co-chair, Consensus Conference on Surgical Robotics, 2007
- 2006-present Surgical Endoscopy Education Johns Hopkins University School of Medicine
Working Group Baltimore, Maryland
- 2006-present Steering Committee Society of Medical Innovation & Technology (SMIT)

RESEARCH ACTIVITIES

Publications

Peer-reviewed scientific articles

1. Dlabal P, Jordan R, Dorfman S, **Marohn MR**: "Medullary sponge kidney and renal leak hypercalciuria: A link to the development of parathyroid adenoma?" *JAMA*, 241(14):1490-1, 6 Apr 1979.
2. Smith L, Wherry D, **Marohn MR**: "Intra-operative use of ultrasound to identify the ureter in the porcine model." *Surgical Endoscopy*, 7(5):467, 1993.

3. Wherry D, Rob C, **Marohn MR**, Rich N: "An external audit of laparoscopic cholecystectomy performed in medical treatment facilities of the Department of Defense." *Annals of Surgery*, 220(5):626-635, 1994.
4. **Marohn MR** & LaCivita KA: "Evaluation of total/ near total thyroidectomy in a short-stay hospitalization: safe and cost-effective." *Surgery*, 118(6):943-8, Dec 1995.
5. Wherry D, **Marohn MR**, Malanoski M, Hetz S, Rich N: "An external audit of laparoscopic cholecystectomy in the steady state performed in medical treatment facilities of the Department of Defense." *Annals of Surgery*, 224(2):145-54, Aug 1996.
6. Hanly EJ, **Marohn MR**, Bachman SL, Talamini MA, Schenkman NS. Multiservice laparoscopic surgical training using the daVinci surgical system. *The American Journal of Surgery* 2004;187(2):309-315.
7. Kennedy JS, Hanly EJ, **Marohn MR**, Arceiro C, Mittendorf EA. Management of giant gastric ulcers: case report and review of the literature. *Current Surgery* 2004;61(2):220-223.
8. **Marohn MR**, Hanly EJ. Twenty-first century surgery using twenty-first century technology: surgical robotics. *Current Surgery* 2004;61(5):466-73.
9. Bachman SL, Hanly EJ, Nwankwo JI, Lamb J, Herring AE, **Marohn MR**, De Maio A, Talamini MA. The effect of timing of pneumoperitoneum on the inflammatory response. *Surgical Endoscopy* 2004;18(11):1640-1644.
10. Fuentes JM, Hanly EJ, Bachman SL, Aurora AR, **Marohn MR**, Talamini MA. Videoendoscopic endotracheal intubation in the rat: a comprehensive rodent model of laparoscopic surgery. *Journal of Surgical Research* 2004;122(2):240-248.
11. Kennedy JS, Hanly EJ, **Marohn MR**, Mittendorf EA. Management of asymptomatic appendicolithiasis. *Current Surgery* 2005;62(1):87-90.
12. Hanly EJ, Strobel LM, **Marohn MR**, Rasmussen T, Mittendorf EA. Complications of low-molecular-weight heparin in surgical patients with impaired renal function. *Current Surgery* 2005;62(3):358-61.
13. Hanly EJ, Zand J, Bachman SL, **Marohn MR**, Talamini MA. Value of the SAGES learning center in introducing new technology. *Surgical Endoscopy* 2005;19(4):477-83.
14. Bachman SL, Hanly EJ, Saad D, Edwards T, Herring A, Lamb J, Nwankwo I, **Marohn MR**, De Maio A, Talamini MA. Role of the spleen in laparoscopy-associated inflammatory response. *Surgical Endoscopy* 2005;19(8):1035-44.
15. **Marohn MR**, Hanly EJ, McKenna KJ, Varin CR. Laparoscopic total abdominal colectomy in the acute setting. *J Gastrointest Surg*. 2005;9(7):881-6; discussion 887.
16. Hanly EJ, Bachman SL, **Marohn MR**, Boden JH, Herring AE, De Maio A, Talamini MA. CO₂-pneumoperitoneum-mediated attenuation of the inflammatory response is independent of systemic acidosis. *Surgery* 2005;137(5):559-66.
17. Hanly EJ, **Marohn MR**, Schenkman NS, Miller BE, Moses GR, Marchessault R, Broderick TJ. Dynamics and organization of telesurgery. *European Surgery*. 2005;37(5):274-278.
18. Hanly EJ, Aurora AR, Fuentes JM, Shih SP, **Marohn MR**, DeMaio A, Talamini MA. Abdominal insufflation with CO₂ causes peritoneal acidosis independent of pH. *J Gastrointest Surg*. 2005;9(9):1245-51; discussion 1251-2.

19. Leven J, Burschka D, Kumar R, Zhang G, Blumenkranz S, Dai XD, Awad M, Hager GD, **Marohn MR**, Choti M, Hasser C, Taylor RH. DaVinci canvas: a telerobotic surgical system with integrated, robot-assisted, laparoscopic ultrasound capability. *Med Image Comput Comput Assist Interv Int Conf.* 2005;8(Pt 1):811-8.
20. Fuentes JM, Hanly EJ, Aurora AR, De Maio A, Shih SP, **Marohn MR**, Talamini MA. CO2 abdominal insufflation pretreatment increases survival after a lipopolysaccharide-contaminated laparotomy. *J Gastrointest Surg.* 2006;10(1):32-8.
21. Mithani SK, **Marohn MR**, Freischlag JA, Dackiw AP, Zeiger MA. Laparoscopic resection of paraganglioma of the organ of Zuckerkandl in a patient with a carotid body tumor. *Am Surg.* 2006;72(1):55-9.
22. Fuentes JM, Hanly EJ, Aurora AR, De Maio A, Shih SP, **Marohn MR**, Talamini MA. Laparoscopic surgery and the parasympathetic nervous system. *Surg Endosc.* 2006;20(8):1225-32.
23. Hanly EJ, Fuentes JM, Aurora AR, Bachman SL, De Maio A, **Marohn MR**, Talamini MA. Carbon dioxide pneumoperitoneum prevents mortality from sepsis. *Surg Endosc.* 2006 Jul 24 (Epub ahead of print).
24. Sterbis JR, Hanly EJ, Herman BC, **Marohn MR**, Broderick TJ, Shih SP, Harnett BS, Doarn C, Schenkman NS. *Urol.* 2006 (in press).
25. Hanly EJ, Aurora AR, Shih SP, Fuentes JM, **Marohn MR**, Talamini MA. Peritoneal acidosis mediates immunoprotection in laparoscopic surgery. *Surgery* 2006 (in press).
26. Hanly EJ, Miller BE, Kumar R, Hasser CJ, Coste-Maniere E, Talamini MA, Aurora AR, Schenkman NS, **Marohn MR**. Mentoring console improves collaboration and teaching in surgical robotics. *J Laparoendosc Adv Surg Tech.* 2006 (in press).
27. Meireles O, Shih SP, Kantsevov SV, Kalloo AN, Jagannath SB, Giday SA, Magno P, Hanly EJ, Ko CW, Beitler DM, **Marohn MR**. Comparison of intraabdominal pressures using the gastroscope and laparoscope for transgastric surgery. *Surg Endosc.* 2006 (in press).

Book chapters, monographs

1. **Marohn MR** & Marohn ML: "Hypothermia in the intensive care unit." In Muldoon S & Marohn ML (ed.), Problems in Anesthesia, Lippincott, Philadelphia, 8(1):23-43, 1994.
2. LaPorta AJ & **Marohn MR**: "Laparoscopic Surgery." In McNally P (ed.), Gastroenterology Secrets, Mosby, Philadelphia, 639-649, 1996.
3. **Marohn MR**, Steward CM: "Esophagus." In Makary MA (ed.), General Surgery Review, Ladner-Drysdale, Washington, 45-52, 2004.
4. **Marohn MR**: "How to get started, credentialing." In Machi J & Staren ED (ed.), Ultrasound for Surgeons, Lippincott, Philadelphia, 489-498, 2005.
5. Sonnenday C, **Marohn MR**, Yeo CJ: "Cystic neoplasms of the pancreas." In Yeo CJ (ed.), Shackelford's Surgery of the Alimentary Tract, 6th Edition, Elsevier, Philadelphia, 2005.

6. **Marohn MR**, Steele K, Lawler L: "Minimally invasive surgical and imaged guided interventional approaches to the spleen." In Yeo CJ (ed.), Shackelford's Surgery of the Alimentary Tract, 6th Edition, Saunders, Philadelphia, 1780-1797, 2007.
7. Sebastian M and **Marohn MR**. Cameron JL (ed), Current Surgical Therapy, 8th Edition, Mosby, St. Louis, 2007 (in press).

Other media

1. Hanly EJ, **Marohn MR**, Yeo CJ, Lillemoe KD, McGrail LH. Neoplasms of the endocrine pancreas. *eMedicine* 2002;3(9).
2. Hanly EJ, Cooperman MT, **Marohn MR**, Kundrotas LW, House MG, Yeo CJ. Somatostatinomas. *eMedicine* 2003;4(1).
3. **Marohn MR**: "Getting started: challenges and strategies." In Smith R (ed.), Basic Ultrasound, CD-ROM format, American College of Surgeons, Chicago, 2004.
4. Schwaitzberg S, Scott, D, **Marohn MR**: "2007 Poster Session Proceedings." *Society of American Gastrointestinal Endoscopic Surgeons (SAGES) Annual Meeting*, Las Vegas, NV, 17-22 April 2007. DVD-ROM format, SAGES, Las Vegas, 2007.

Peer-reviewed posters

1. Herman BC, Hanly EJ, Schenkman NS, Taylor RH, Talamini MA, **Marohn MR**. "An augmented reality system to evaluate the effects of monocular visual feedback delay on telesurgical task performance." 13th Annual *Medicine Meets Virtual Reality (MMVR) Conference*, Long Beach, CA, 26-29 January 2005.
2. Fuentes JM, Hanly EJ, Aurora AR, De Maio A, **Marohn MR**, Talamini MA. "Carbon dioxide pneumoperitoneum posttreatment attenuates IL-6 production." *Society of American Gastrointestinal Endoscopic Surgeons (SAGES) Annual Meeting*, Ft. Lauderdale, FL, 13-16 April 2005.
3. Zand JM, Fischer GS, Hanly EJ, Shih SP, **Marohn MR**, Taylor RH, Talamini MA. "Ischemia sensing surgical instruments." *Society of American Gastrointestinal Endoscopic Surgeons (SAGES) Annual Meeting*, Ft. Lauderdale, FL, 13-16 April 2005.
4. Hanly EJ, Miller BE, Herman BC, **Marohn MR**, Broderick TJ, Shih SP, Sterbis JR, Doarn CR, Harnett B, Hasser CJ, Talamini MA, Schenkman NS. "Stereoscopic robotic surgical telementoring: feasibility and future applications." 10th Annual *American Telemedicine Association (ATA) Meeting*, Denver, CO, 17-20 April 2005.
5. Fuentes JM, Hanly EJ, Aurora AR, Shih S, De Maio A, **Marohn MR**, Talamini MA. "CO₂ abdominal insufflation pretreatment increases survival following a contaminated laparotomy." 46th Annual *Society for Surgery of the Alimentary Tract (SSAT) Meeting*, Digestive Disease Week (DDW), Chicago, IL, 14-19 May 2005.
6. Hanly EJ, Miller BE, Herman BC, **Marohn MR**, Broderick TJ, Shih SP, Sterbis JR, Doarn CR, Harnett B, Hasser CJ, Talamini MA, Meireles O, Moses GR, Marchessault R, Schenkman NS. "Remote stereoscopic robotic telesurgery using the public internet." *Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Annual Meeting*, Dallas, TX, 26-29 April 2006.

7. Schenkman NS, Sterbis J, **Marohn MR**, Hanly E, Herman B, Shih S, Broderick T, Hartnett B, Doarn C. "Remote robotic nephrectomy using the public internet: inexpensive telesurgery." *American Urological Association (AUA) Annual Meeting*, Atlanta, GA, 20-25 May 2006.

Abstracts

1. Bachman SL, Hanly EJ, De Maio A, **Marohn MR**, Talamini MA. Decreased TNF response to pneumoperitoneum: the role of metabolic versus mechanical effects in a rodent model of endotoxemia. *Surgical Endoscopy* 2003;17:S230.
2. Hanly EJ, Bachman SL, **Marohn MR**, Herring AE, De Maio A, Talamini MA. Acidosis is not responsible for laparoscopy-associated inflammatory response reduction. *Surgical Endoscopy* 2003;17:S230.
3. Bachman SL, Hanly EJ, Nwankwo JI, Lamb J, Herring AE, **Marohn MR**, De Maio A, Talamini MA. The effect of timing of pneumoperitoneum on the inflammatory response. *Surgical Endoscopy* 2003;17:S189.
4. Hanly EJ, **Marohn MR**, Schenkman NS, Talamini MA. Multiservice laparoscopic surgical training using the daVinci surgical system: Characterization of the learning curve associated with new use of a surgical robotic device. *Current Surgery* 2003;60(2):186.
5. Hanly EJ, Bachman SL, **Marohn MR**, Herring AE, De Maio A, Talamini MA. Acidosis is not responsible for laparoscopy-associated inflammatory response reduction. *Current Surgery* 2004;61(2):185-186.
6. Bachman SL, Saad D, Hanly EJ, Edwards T, Herring A, Lamb J, Nwankwo I, **Marohn MR**, De Maio A, Talamini MA. Role of the spleen in laparoscopy-associated inflammatory response. *Surgical Endoscopy* 2004;18:S161.
7. Hanly EJ, Zand J, Bachman SL, **Marohn MR**, Talamini MA. Value of the SAGES learning center in introducing new technology. *Surgical Endoscopy* 2004;18:S167.
8. Hanly EJ, Bachman SL, Fuentes JM, **Marohn MR**, Talamini MA. Videoendoscopic endotracheal intubation in the rat. *Surgical Endoscopy* 2004;18:S210.
9. **Marohn MR**, Hanly EJ, McKenna KJ, Varin CR. Laparoscopic total abdominal colectomy in the acute setting. *Surgical Endoscopy* 2004;18:S217.
10. Aurora AR, Hanly EJ, Lidor AO, Talamini MA, Gearhart SD, **Marohn MR**. Appropriate management of lipomatous colonic polyps. *Surgical Endoscopy* 2004;18:S251.
11. Hanly EJ, Bachman SL, Zand J, **Marohn MR**, Talamini MA. Robotic task metrics: a diverse assessment. *Surgical Endoscopy* 2004;18:S279.
12. Hanly EJ, **Marohn MR**, Schenkman NS. Use of telemedicine to enhance medical student surgery education. *Telemedicine Journal and e-Health* 2004;10:S55.
13. Hanly EJ, Bachman SL, Zand J, **Marohn MR**, Talamini MA. Cost-adjusted surgical robotic performance: the plea for a cheaper robot. *Journal of Surgical Research* 2004;121:293.

14. Aurora AR, Hanly EJ, Fuentes JM, **Marohn MR**, De Maio A, Talamini MA. Isoflurane pretreatment increases survival in a rat model of sepsis. *Journal of Surgical Research* 2004;121:315.
15. Fuentes JM, Hanly EJ, Aurora AR, De Maio A, **Marohn MR**, Talamini MA. Carbon dioxide pneumoperitoneum attenuates the inflammatory response following laparotomy. *Journal of Surgical Research* 2004;121:316.
16. Aurora AR, Hanly EJ, Fuentes JM, **Marohn MR**, Talamini MA. Helium pneumoperitoneum specifically alters liver function tests. *Journal of Surgical Research* 2004;121:332.
17. Hanly EJ, Langley R, Bernet V, Uribe P, **Marohn MR**, Melder P. Safety profile of ultrasound-guided radio-frequency ablation in the thyroid gland. *Journal of Surgical Research* 2004;121:340.
18. Hanly EJ, Fuentes JM, Aurora AR, Bachman SL, **Marohn MR**, De Maio A, Talamini MA. CO₂ pneumoperitoneum prevents mortality from sepsis. *Surgical Endoscopy* 2005;19:S176.
19. Fuentes JM, Hanly EJ, Aurora AR, De Maio A, **Marohn MR**, Talamini MA. Carbon dioxide pneumoperitoneum post-treatment attenuates IL-6 production. *Surgical Endoscopy* 2005;19:S226.
20. Herman BC, Hanly EJ, Schenkman NS, Taylor RH, Talamini MA, **Marohn MR**. Telerobotic surgery creates opportunity for augmented reality. *Telemedicine Journal and e-Health* 2005;11:203.
21. Hanly EJ, Miller BE, **Marohn MR**, Talamini MA, Broderick TJ, Doarn CR, Harnett B, Hasser CJ, Schenkman NS. Stereoscopic robotic surgical telementoring: feasibility and future applications. *Telemedicine Journal and e-Health* 2005;11:247.
22. Hanly EJ, Aurora AR, Fuentes JM, Shih S, **Marohn MR**, De Maio A, Talamini MA. Abdominal insufflation with CO₂ causes peritoneal acidosis independent of systemic pH. *Gastroenterology* 2005;128:A783.
23. Hanly EJ, Aurora A, Shih S, Fuentes J, **Marohn MR**, De Maio A, Talamini MA. Peritoneal acidosis mediates CO₂-laparoscopy immunoprotection. *Journal of Surgical Research* 2006;130(2):224.
24. Shih SP, Meireles O, Kantsevov SV, Hanly EJ, Kalloo AN, Jagannath SB, Beitler DM, **Marohn MR**. Hybrid minimally invasive surgery – a bridge between laparoscopic and transluminal surgery. *Surgical Endoscopy* 2006;20:S270.
25. Meireles O, Shih SP, Kantsevov SV, Kalloo AN, Jagannath SB, Hanly EJ, DM Beitler, **Marohn MR**. Comparison of intra-abdominal pressures using the gastroscope and laparoscope for transgastric surgery. *Surgical Endoscopy* 2006;20:S275.
26. Hanly EJ, Miller BE, Herman BC, **Marohn MR**, Broderick TJ, Shih SP, Sterbis JR, Doarn CR, Harnett B, Hasser CJ, Talamini MA, Meireles O, Moses GR, Marchessault R, Schenkman NS. Remote stereoscopic robotic telesurgery using the public internet. *Surgical Endoscopy* 2006;20:S279,S398.
27. Hanly EJ, Miller BE, Herman BC, **Marohn MR**, Broderick TJ, Shih SP, Sterbis JR, Doarn CR, Harnett B, Hasser CJ, Talamini MA, Moses GR, Marchessault R, Schenkman NS. Remote robotic surgery using the public internet: cheap transcontinental telesurgery. *Telemedicine Journal and e-Health* 2006;12:223.

Oral presentations

1. Dlabal P, Jordan R, Dorfman S, **Marohn MR**. Medullary sponge kidney and renal leak hypercalciuria: A link to the development of parathyroid adenoma? Annual *Society of Air Force Physicians* (SAFP) Symposium, St. Louis, MO, April 1979.
2. **Marohn MR**. Early experience establishing laparoscopic surgery training in the Department of Defense. ISS/SIE meeting, Stockholm, Sweden, August 1991.
3. Wherry D, Rob C, **Marohn MR**, Rich N. An external audit of laparoscopic cholecystectomy performed in medical treatment facilities of the Department of Defense. Annual *Society of Air Force Clinical Surgeons* (SAFCS) Symposium, San Antonio, TX, April 1993.
4. **Marohn MR**, LaCivita KA. Evaluation of total/ near total thyroidectomy in a short-stay hospitalization: safe and cost-effective. Annual *Society of Air Force Physicians* (SAFP) Symposium, Sacramento, CA, April 1994.
5. **Marohn MR**, LaCivita KA. Evaluation of total/ near total thyroidectomy in a short-stay hospitalization: safe and cost-effective. 15th Annual *Association of American Endocrine Surgeons* (AAES) meeting. St. Louis MO, April 1994.
6. Wherry D, **Marohn MR**, Malanoski M, Hetz S, Rich N. An external audit of laparoscopic cholecystectomy in the steady state performed in medical treatment facilities of the Department of Defense. Annual *Society of Air Force Clinical Surgeons* (SAFCS) Symposium, San Antonio, TX, April 1996.
7. **Marohn MR**. Laparoscopic colon cancer surgery: should we do this? *Society of American Gastrointestinal Endoscopic Surgeons* (SAGES) symposium, San Diego, CA 1997.
8. **Marohn MR**. Endorectal ultrasound: emerging gold standard? *Society of American Gastrointestinal Endoscopic Surgeons* (SAGES) symposium, San Diego, CA. 1997.
9. **Marohn MR**. Computers in Medicine. *American College of Surgeons (ACS) Metropolitan Washington Chapter* "All Surgeons Day", Washington, DC, March 1998.
10. **Marohn MR**. Laparoscopic Colon Surgery: Pitfalls and Tips. Surgery Grand Rounds, Fairfax Hospital, Fairfax, VA, October 1999.
11. **Marohn MR**. Radio-Image Guided Surgery. Featured speaker at *American College of Surgeons Metropolitan Washington Chapter* "All Surgeons Day", Washington, DC. March 2000.
12. **Marohn MR**. Computer Assisted Surgery- Current Technology and Limitations. Featured speaker at *International Laparoscopic Surgery Symposium*, IRCAD, University Louis Pasteur, Strasbourg France, 10-11 September 2001.
13. **Marohn MR**. Operating Room of the Future. *Telemedicine and Advanced Technology Research Center* (TATRC) symposium, Baltimore, MD, 8-9 November 2001
14. **Marohn MR**. Laparoscopic adrenalectomy: lessons learned in 10 years. Featured speaker at Annual Meeting of the *Philippine College of Surgeons* (PCS), Manila, Philippines, 3-5 December 2001.
15. **Marohn MR**. Surgical Education: Principles and Practice. Invited outside speaker to Georgetown University Surgery Grand Rounds. Washington, DC. April 2002.

16. Perdue P, Shriver C, DeNobile J,, **Marohn M**, et al. Use of Simulation Center for Surgery Mock Oral Examinations in a Multi-Institution Setting. *Association of Program Directors in Surgery* (APDS) annual meeting, April 2002.
17. Hanly EJ, **Marohn MR**, Schenkman NS, Talamini MA. Multiservice laparoscopic surgical training using the daVinci surgical system: Characterization of the learning curve associated with new use of a surgical robotic device. 49th Annual *Society of Air Force Clinical Surgeons* (SAFCS) Symposium, Las Vegas, NV, 15-19 April 2002.
18. **Marohn MR**. Ultrasound and the Surgeon. Invited outside speaker to Ohio State University Surgery Grand Rounds. Columbus, OH. June 2002.
19. **Marohn MR**. Lapaorscopic colon surgery: challenges and pitfalls. Featured speaker at Annual Meeting of the *Philippine College of Surgeons* (PCS), Manila, Philippines, 2-4 December 2002.
20. **Marohn MR**. Twenty-first century surgery using twenty-first century techology: they way ahead. Featured speaker at Emerging Surgical Techology meeting, Seoul National University School of Medicine, Seoul, Korea, 6 December 2002.
21. Psolka M, Hanly EJ, **Marohn MR**, Schenkman NS. Initial experience with the daVinci system in urologic surgery. 50th Annual *James C. Kimbrough Urological Seminar*, Washington, DC, 10 December 2002.
22. Hanly EJ, **Marohn MR**, Bachman SL, Talamini MA, Schenkman NS. Multiservice laparoscopic surgical training using the daVinci surgical system: Lessons learned. 50th Annual *James C. Kimbrough Urological Seminar*, Washington, DC, 10 December 2002.
23. Bachman SL, Hanly EJ, De Maio A, **Marohn MR**, Talamini MA. Decreased TNF response to pneumoperitoneum: the role of metabolic versus mechanical effects in a rodent model of endotoxemia. Region III *American College of Surgeons* (ACS) Trauma Resident Paper Competition, Norfolk, VA, January 2003.
24. **Marohn MR**, Moses G, Gallagher A, et al. *MMVR: Medicine Meets Virtual Reality*, Panel chair on simulators in surgical education, Marina del Rey, CA, 13-15 January 2003.
25. **Marohn MR**. Laparoscopic Colon Surgery: Experience with Total Abdominal Colectomy. Featured speaker at *International Laparoscopic Colorectal Surgery Symposium*, IRCAD, University Louis Pasteur, Strasbourg France, February 2003.
26. Bachman SL, Hanly EJ, Nwankwo JI, Lamb J, Herring AE, **Marohn MR**, De Maio A, Talamini MA. The effect of timing of pneumoperitoneum on the inflammatory response. *Society of American Gastrointestinal Endoscopic Surgeons* (SAGES) Annual Meeting, Los Angeles, CA, 12-15 March 2003.
27. **Marohn MR**. The role of simulators in surgical education. Annual *Society of American Gastrointestinal Endoscopic Surgeons* (SAGES) meeting, Los Angeles, CA, 14 March 2003.
28. Hanly EJ, Bachman SL, **Marohn MR**, Herring AE, De Maio A, Talamini MA. Acidosis is not responsible for laparoscopy-associated inflammatory response reduction. 50th Annual *Society of Air Force Clinical Surgeons* (SAFCS) Symposium, San Antonio, TX, 30 March - 3 April 2003.
29. Kennedy JS, Arceiro C, Hanly EJ, **Marohn MR**, Mittendorf EA. Management of giant gastric ulcers. 50th Annual *Society of Air Force Clinical Surgeons* (SAFCS) Symposium, San Antonio, TX, 30 March - 3 April 2003.

30. **Marohn MR**, Hanly, EJ. 21st Century Surgery Using 21st Century Technology: Surgical Robotics. Featured speaker at 50th Annual *Society of Air Force Clinical Surgeons (SAFCS)* Symposium, San Antonio, TX, 30 March - 3 April 2003.
31. **Marohn MR**. Surgical robotics / computer assisted surgery: What's next? Invited outside speaker to Johns Hopkins Monthly Surgery Research Conference, 14 April 2003.
32. **Marohn MR**. Ultrasound applications in surgery. Ohio State University surgery meeting. Columbus, OH, 21 April 2003.
33. **Marohn MR**. Ultrasound for surgeons. Georgetown University surgery grand rounds. Washington, DC, 10 June 2003.
34. **Marohn MR**, Satava RS. 21st century surgery: Two faces of the coin: High technology and high cost. Annual *Society of Italian Endoscopic Surgeons (SICE)* meeting, Sorrento, IT, 21 September 2003.
35. **Marohn MR**, Satava RS. Imaging and intervention- from crisis management to risk management. 10th annual DICOM meeting, Baltimore, MD, 23 September 2003.
36. **Marohn MR**. Emerging surgical technologies: Computer assisted surgery. IRCAD/EITS *International Advanced Laparoscopic Surgery* meeting, Strasbourg, France, 22 November 2003.
37. Hanly EJ, Bachman SL, **Marohn MR**, Boden JH, Herring AE, De Maio A, Talamini MA. Acidosis is not responsible for laparoscopy-associated inflammatory response reduction. 65th Annual *Society of University Surgeons (SUS)* Residents' Conference, St. Louis, MO, 11-14 February 2004.
38. Bachman SL, Saad D, Hanly EJ, Edwards T, Herring A, Lamb J, Nwankwo I, **Marohn MR**, De Maio A, Talamini MA. Role of the spleen in laparoscopy-associated inflammatory response. *Society of American Gastrointestinal Endoscopic Surgeons (SAGES)* Annual Meeting, Denver, CO, 31 March - 3 April 2004.
39. Hanly EJ, Zand J, Bachman SL, **Marohn MR**, Talamini MA. Value of the SAGES learning center in introducing new technology. *Society of American Gastrointestinal Endoscopic Surgeons (SAGES)* Annual Meeting, Denver, CO, 31 March - 3 April 2004.
40. Hanly EJ, Strobel LM, **Marohn MR**, Rasmussen T, Mittendorf EA. Complications of low-molecular-weight heparin in surgical patients with impaired renal function. 51st Annual *Society of Air Force Clinical Surgeons (SAFCS)* Symposium, San Francisco, CA, 4-8 April 2004.
41. Hanly EJ, Kennedy JS, **Marohn MR**, Mittendorf EA. Management of asymptomatic appendicolithiasis. 51st Annual *Society of Air Force Clinical Surgeons (SAFCS)* Symposium, San Francisco, CA, 4-8 April 2004.
42. Hanly EJ, **Marohn MR**, Biggot T, Schenkman NS. Use of telemedicine to enhance medical student surgery education. 9th Annual *American Telemedicine Association (ATA)* Meeting, Tampa, FL, 2-5 May 2004.
43. **Marohn MR**, Hanly EJ, McKenna KJ, Varin CR. Laparoscopic total abdominal colectomy in the acute setting. 45th Annual *Society for Surgery of the Alimentary Tract (SSAT)* Meeting, Digestive Disease Week (DDW), New Orleans, LA, 15-19 May 2004.
44. **Marohn MR**. Surgical robotics: role in simulation and training: we can do better. TATRC IRT, Marina del Rey, CA, 9 September 2004.

45. **Marohn MR.** Surgical simulators in surgical education: limitations and potential. Johns Hopkins Surgery Research Conference, 30 September 2004.
46. **Marohn MR,** Talamini MA. Robotics in General Surgery: 21st Century Surgery using 21st Century Technology. Annual *American College of Surgeons (ACS)* meeting, New Orleans, LA, 11 October 2004.
47. **Marohn MR,** Talamini MA. Challenges in the Assessment and Implementation of Surgical Technology. Annual *American College of Surgeons (ACS)* meeting, New Orleans, LA, 12 October 2004.
48. **Marohn MR,** Satava RS. Future of Robotics in Surgery: The future is not what it used to be. International Robotics meeting, Amsterdam, NL, 2-3 November 2004.
49. Hanly EJ, Bachman SL, Zand J, **Marohn MR,** Talamini MA. Cost-adjusted surgical robotic performance: the plea for a cheaper robot. 38th Annual *Association for Academic Surgery (AAS)* Meeting, Houston, TX, 11-13 November 2004.
50. **Marohn MR.** Laparoscopic surgery applications in oncology. Johns Hopkins Oncology Grand Rounds, 19 November 2004.
51. Fuentes JM, De Maio A, Hanly EJ, Aurora AR, **Marohn MR,** Talamini MA. Anesthesia-specific protection from endotoxic shock is not mediated through the vagus nerve. 66th Annual *Society of University Surgeons (SUS)* Residents' Conference, Nashville, TN, 9-12 February 2005.
52. Minken S, Peoples G, **Marohn MR.** War Surgery 2005: New challenges and technologies. Johns Hopkins Surgery Grand Rounds, 10 February 2005.
53. **Marohn MR.** Laparoscopic colon surgery for cancer. *Colorectal Surgery Symposium*, Johns Hopkins, Baltimore, MD, 31 March-1 April 2005.
54. Hanly EJ, Fuentes JM, Aurora AR, Bachman SL, Edwards T, **Marohn MR,** De Maio A, Talamini MA. CO₂ pneumoperitoneum prevents mortality from sepsis. *Society of American Gastrointestinal Endoscopic Surgeons (SAGES)* Annual Meeting, Ft. Lauderdale, FL, 13-16 April 2005.
55. Fuentes JM, Hanly EJ, Aurora AR, Shih SP, **Marohn MR,** De Maio A, Talamini MA. Chemical vagotomy blocks the protective effect of CO₂ pneumoperitoneum in sepsis. *Society of American Gastrointestinal Endoscopic Surgeons (SAGES)* Annual Meeting, Ft. Lauderdale, FL, 13-16 April 2005.
56. Herman BC, Hanly EJ, Schenkman NS, Taylor RH, Talamini MA, **Marohn MR.** Telerobotic surgery creates opportunity for augmented reality surgery. 10th Annual *American Telemedicine Association (ATA)* Meeting, Denver, CO, 17-20 April 2005.
57. Hanly EJ, Fuentes JM, Aurora AR, Shih S, **Marohn MR,** De Maio A, Talamini MA. Abdominal insufflation with CO₂ causes peritoneal acidosis independent of systemic pH. 46th Annual *Society for Surgery of the Alimentary Tract (SSAT)* Meeting, Digestive Disease Week (DDW), Chicago, IL, 14-19 May 2005.
58. **Marohn MR.** Patient Safety in the Perioperative Environment. *TATRC* Integrated Research Team meeting, Frederick, MD, 20-22 June 2005.
59. **Marohn MR.** Laparoscopic anti-reflux surgery: Lessons learned. 32nd Annual *Topics in Gastroenterology and Liver Disease*, Johns Hopkins, Baltimore, MD, 29-29 September 2005.

60. **Marohn MR.** Advanced surgical technologies. TATRC Product Line Review. Frederick, MD, 4 October 2005.
61. **Marohn MR.** Robotics and its role in globalization of health care. Invited keynote speaker at *Scientific, Ethical and Technological Pillars Of Actual Medicine*, Panama City, Panama, 19-22 Oct 2005.
62. **Marohn MR.** Operating Room/ Interventional Suite of the Future. Invited keynote speaker at *Scientific, Ethical and Technological Pillars Of Actual Medicine*, Panama City, Panama, 19-22 Oct 2005.
63. Hanly EJ, Miller BE, Kumar R, Hasser C, Coste-Maniere E, Talamini MA, Aurora AR, Schenkman NS, **Marohn MR.** Collaboration and resident education in surgical robotics: the 'driver's ed' console. *Pacific Rim Robotics Symposium*, University of California, Irvine, School of Medicine, Anaheim, CA, 6-7 January 2006.
64. Meireles OR, Herman BC, Hanly EJ, Schenkman NS, Taylor RH, Talamini MA, Shih SP, **Marohn MR.** Implementation of augmented reality in robotic telesurgery. *Pacific Rim Robotics Symposium*, University of California, Irvine, School of Medicine, Anaheim, CA, 6-7 January 2006.
65. Hanly EJ, Miller BE, Herman BC, **Marohn MR**, Broderick TJ, Shih SP, Sterbis JR, Doarn CR, Harnett BR, Hasser CJ, Talamini MA, Moses GR, Marchessault R, Schenkman NS. daVinci telesurgery using the public internet. *Pacific Rim Robotics Symposium*, University of California, Irvine, School of Medicine, Anaheim, CA, 6-7 January 2006.
66. Shih SP, Hanly EJ, Schenkman MS, Miller BE, Herman BC, Broderick TJ, Sterbis JR, Doarn CR, Harnett BR, Hasser CJ, Talamini MA, Meireles OR, **Marohn MR.** Telesurgical repair of a vena cava injury in California: 'Denver, we have a problem.' *Pacific Rim Robotics Symposium*, University of California, Irvine, School of Medicine, Anaheim, CA, 6-7 January 2006.
67. Hanly EJ, Bachman SL, Zand J, **Marohn MR**, Talamini MA. Cost-adjusted surgical robotic performance: the plea for a cheaper robot. *Pacific Rim Robotics Symposium*, University of California, Irvine, School of Medicine, Anaheim, CA, 6-7 January 2006.
68. Meireles OR, Hanly EJ, Herman BC, Schenkman NS, Shih SP, Fuentes JM, Aurora AR, Taylor RH, Talamini MA, **Marohn MR.** Effects of visual feedback delay on surgical task performance during telerobotic surgery. *Pacific Rim Robotics Symposium*, University of California, Irvine, School of Medicine, Anaheim, CA, 6-7 January 2006.
69. Hanly EJ, Herman BC, Schenkman NS, Taylor RH, Talamini MA, **Marohn MR.** 3-D-picture-in-3-D-picture: a novel multi-application surgical technology. *Pacific Rim Robotics Symposium*, University of California, Irvine, School of Medicine, Anaheim, CA, 6-7 January 2006.
70. **Marohn MR.** No Instrument Left Behind: Partnership Initiative to Harness Technology to Improve Surgery. CISST/ ERC Industrial Affiliates Meeting, Baltimore MD, 12 January 2006.
71. **Marohn MR.** I4M Vision: Integrating Imaging, Intervention, and Informatics. Framing address for I4M Symposium: "Advancing Technology for Patient Care and Safety", Baltimore MD, 27 February 2006.
72. **Marohn MR.** Current Surgical Treatment of Achalasia. *23rd Annual Medical and Surgical Gastroenterology symposium*, Snowmass, CO, 29 January-02 February 2006.

73. **Marohn MR.** Procedure Room/ Operating Room of the Future. *23rd Annual Medical and Surgical Gastroenterology symposium*, Snowmass, CO, 29 January-02 February 2006.
74. Hanly EJ, Fuentes JM, Aurora AR, Bachman SL, Marohn MR, De Maio A, Talamini MA. CO₂ pneumoperitoneum increases survival from sepsis. *Baltimore Academy of Surgery Meeting*, Baltimore, MD, 1 February 2006.
75. Hanly EJ, Miller BE, Kumar R, Hasser CJ, Coste-Maniere E, Talamini MA, Aurora AR, Schenkman NS, Marohn MR. Mentoring console improves collaboration and teaching in surgical robotics. *67th Annual Society of University Surgeons (SUS) Meeting, 1st Annual Academic Surgical Congress*, San Diego, CA, 8-11 February 2006.
76. Hanly EJ, Aurora AR, Shih S, Fuentes JM, Marohn MR, De Maio A, Talamini MA. Peritoneal acidosis mediates CO₂-laparoscopy immunoprotection. *67th Annual Society of University Surgeons (SUS) Meeting, 1st Annual Academic Surgical Congress*, San Diego, CA, 8-11 February 2006.
77. **Marohn MR.** Applications of Next Generation Data Management in Healthcare. Keynote speaker for 'M' Language Symposium, launching new Data Center at the Massachusetts Institute of Technology (MIT), Boston MA, 7 March 2006.
78. **Marohn MR** and Thompson C. Challenges to Solve with Gastric Closure for NOTES Surgery. Seminal presentation at 1st International conference on NOTES, Scottsdale AZ, 9-10 March 2006.
79. **Marohn MR.** 'Smart' Surgical Technology: What's Next? Johns Hopkins Surgery Grand Rounds, Baltimore MD, 16 March 2006.
79. Hanly EJ, Miller BE, Herman BC, Marohn MR, Broderick TJ, Shih SP, Sterbis JR, Doarn CR, Harnett B, Hasser CJ, Talamini MA, Meireles O, Moses GR, Marchessault R, Schenkman NS. Remote stereoscopic robotic telesurgery using the public internet. *Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Residents Session*, Dallas, TX, 26-29 April 2006.
80. Shih SP, Meireles O, Kantsevov SV, Hanly EJ, Kalloo AN, Jagannath SB, Beitler DM, Marohn MR. Hybrid minimally invasive surgery – a bridge between laparoscopic and transluminal surgery. *Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Annual Meeting*, Dallas, TX, 26-29 April 2006.
81. Meireles O, Shih SP, Kantsevov SV, Kalloo AN, Jagannath SB, Hanly EJ, DM Beitler, Marohn MR. Comparison of intra-abdominal pressures using the gastroscope and laparoscope for transgastric surgery. *Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Annual Meeting*, Dallas, TX, 26-29 April 2006.
82. **Marohn MR.** Laparoscopic anti-reflux surgery: Lessons learned after 14 years. Keynote speaker for annual Meeting of the *Virginia Society of Surgery*, Williamsburg VA, 28-29 April 2006.
83. **Marohn MR.** Interventional Suites of the Future. Invited keynote address for annual meeting of the *Virginia Society of Surgery*, Williamsburg VA, 28-29 April 2006.
84. Hanly EJ, Miller BE, Herman BC, Marohn MR, Broderick TJ, Shih SP, Sterbis JR, Doarn CR, Harnett B, Hasser CJ, Talamini MA, Moses GR, Marchessault R, Schenkman NS. Remote robotic surgery using the public internet: cheap transcontinental telesurgery. *11th Annual American Telemedicine Association (ATA) Meeting*, San Diego, CA, 7-10 May 2006.

85. **Marohn MR.** Future directions for robotics research. Invited presentation to the 1st International Consensus Conference on Surgical Robotics, convened by a joint *Minimally Invasive Robotics Association (MIRA)* – *Society of American Gastrointestinal Endoscopic Surgeons (SAGES)* taskforce, New York City, 9-10 June 2006.
86. **Marohn MR.** Robots, Robotic Surgery, and Future Applications. Featured presentation at the 61st Annual Meeting of the *American Society for Surgery of the Hand (ASSH)*, Washington DC, 7-9 September 2006.
87. Hanly EJ, Miller BE, Kumar R, Hasser CJ, Coste-Maniere E, Talamini MA, Aurora AR, Schenkman NS, **Marohn MR.** Mentoring console improves collaboration and teaching in surgical robotics. 10th World Congress of Endoscopic Surgery, *European Association of Endoscopic Surgeons (EAES)*, Berlin, GE, 13-16 September 2006.
88. Meireles O, Shih SP, Kantsevov SV, Kalloo AN, Jagannath SB, Hanly EJ, DM Beitler, Marohn MR. Comparison of intra-abdominal pressures using the gastroscope and laparoscope in transgastric surgery. 10th World Congress of Endoscopic Surgery, *European Association of Endoscopic Surgeons (EAES)*, Berlin, GE, 13-16 September 2006.
89. Hanly EJ, Aurora AR, Shih S, Fuentes JM, Marohn MR, De Maio A, Talamini MA. Peritoneal acidosis mediates CO₂-laparoscopy immunoprotection. 10th World Congress of Endoscopic Surgery, *European Association of Endoscopic Surgeons (EAES)*, Berlin, GE, 13-16 September 2006.
90. Hanly EJ, Miller BE, Herman BC, Marohn MR, Broderick TJ, Shih SP, Sterbis JR, Doarn CR, Harnett B, Hasser CJ, Talamini MA, Meireles O, Moses GR, Marchessault R, Schenkman NS. Remote stereoscopic robotic telesurgery using the public internet. 10th World Congress of Endoscopic Surgery, *European Association of Endoscopic Surgeons (EAES)*, Berlin, GE, 13-16 September 2006.
91. Hanly EJ, Miller BE, Herman BC, Marohn MR, Broderick TJ, Shih SP, Sterbis JR, Doarn CR, Harnett B, Hasser CJ, Talamini MA, Meireles O, Moses GR, Marchessault R, Schenkman NS. Remote stereoscopic robotic telesurgery using the public internet. 10th World Congress of Endoscopic Surgery, *European Association of Endoscopic Surgeons (EAES)*, Berlin, GE, 13-16 September 2006.
92. Hanly EJ, Herman BC, Schenkman NS, Taylor RH, Talamini MA, Marohn MR. 3-D-picture-in-3-D-picture: a novel multi-application surgical technology. 10th World Congress of Endoscopic Surgery, *European Association of Endoscopic Surgeons (EAES)*, Berlin, GE, 13-16 September 2006.
93. Hanly EJ, Herman BC, Schenkman NS, Taylor RH, Talamini MA, Meireles OR, Shih SP, Marohn MR. Novel stereoscopic information overlay enhances robotic endourology. Surgical Forum, *American College of Surgeons 92nd Annual Clinical Congress*, Chicago, IL, 8-12 October 2006..
94. **Marohn MR.** 21st Century Medicine: Integrating Imaging, Intervention, and Informatics. Keynote speaker for graduation at the American University of the Caribbean School of Medicine, Saint Maarten in the Netherlands Antilles, 28 October 2006.

Invited Reviews, Editorials

1. OR2020 Workshop Proceedings. Edited by Cleary K & **Marohn MR.** *Journal of Laparoendoscopic & Advanced Surgical Techniques*, accepted for publication in October 2005.

Inventions, Patents, Copyrights

- 1990 Designed laparoscopic surgical dissecting instrument, eventually commercialized by Karl Storz Endoskopie (KSEA)
- 1993 First in USA to deploy first laparoscopic ultrasound probe commercialized by Bruel & Kaer (B&K)
- 1992-present Frequent consultant role regarding video-endo-surgical and surgical robotic device development to Karl Storz Endoskopie, Ethicon EndoSurgical, Fuji, Power Medical, USGI, US Surgical, Intuitive Surgical, among other minimally invasive surgical Vendors
- 2004-present MIS Technology Research Group at Johns Hopkins has applied for several patents related to 'smart instruments', lesser sac fiberoptic peritoneoscopy, 3D ultrasound imaging, among others

Extramural Funding

Research Grants

Previous research grants

- Department of Defense (DOD) Quality Assurance Grant 1990-1994
 - *Amount: Research conducted through the DOD External Peer Review Program funded at \$6,000,000 by a contract between DOD and the Forensic Medical Advisory Service (FMAS). FMAS had access to all medical records at all DOD healthcare facilities worldwide, enabling a landmark methodology whereby we achieved >99% record completion rate of ~15,000 medical records*
 - Wherry DC, Rob C, Rich N, **Marohn MR.**
 - "External audit of the laparoscopic cholecystectomy performed worldwide in the Department of Defense healthcare system during the introduction (1990-1992) and steady state (1992-1994) to assess safety."
 - Note: This study was the first system-wide study of the introduction of a new surgical technique/ technology, enabling study of key safety parameters, including rate of bile duct injury, with remarkable >99% medical record availability.

Results helped establish benchmark of 0.5% as rate of bile duct injury during laparoscopic cholecystectomy, and exposed increased risks related to the learning curve of a new technology/ technique (27/29 bile duct injuries occurred on or before the first 10 procedures of a surgeon's experience).

Studies were published in the *Annals of Surgery* (listed in publications).

- United States Army Telemedicine and Advanced Technology Research Center (TATRC) 2003
 - *Amount: \$250,000 funded*
 - Schenkman NS, Hanly EJ, **Marohn MR**, Talamini MA, Marescaux J, Rosa D, Strobridge R, Melder P, DeVries W, Jarrett T.
 - "Telesurgery using the internet and a minimally invasive surgical robotics system."
 - Note: Resulted in identifications of limitations and minimal requirements for surgically acceptable telesurgery telecommunications.

- United States Army Telemedicine and Advanced Technology Research Center (TATRC) 2003
 - Amount: \$12,000 funded
 - **Marohn MR**, Hanly EJ, Marescaux J.
 - “Three dimensional image-guided robotic surgery.”
 - Note: Collaborative work strengthened on-going efforts with IRCAD in integrating imaging and robotic surgical platforms.
- Walter Reed Army Medical Center Department of Clinical Investigations 2003
 - Amount: \$8,501 funded
 - Melder P, Hanly EJ, Langley R, **Marohn MR**, Bernet V, Uribe P.
 - “Physiology and safety profile of radio-frequency ablation of thyroid tissue in pigs.”
 - Note: Limited pilot found limited no evident injury to the pig recurrent laryngeal nerve using RFA for a simulated thyroid nodule, but more work needed.
- United States Army Telemedicine and Advanced Technology Research Center (TATRC) 2004
 - Amount: \$152,172 funded
 - Miller BE, Schenkman NS, Hanly EJ, Hasser CJ, **Marohn MR**
 - “Telesurgery using a minimally invasive surgical robotics system.”
 - Note: Resulted in development of ‘driver’s education’ DaVinci console, with series of experiments culminating in the 1st robotic telesurgery in the USA at the American Telesurgery Association (ATA) meeting in Denver, CO, April 2005.
- United States Army Telemedicine and Advanced Technology Research Center (TATRC) 2005
 - Amount: \$150,000 funded
 - Miller BE, Schenkman NS, Hanly EJ, **Marohn MR**
 - “Context Aware Surgical Assistance for Virtual Mentoring”
 - Note: Project with vendor (Intuitive Surgical) to test surgical mentoring using the prototype daVinci ‘driver’s education’ console. Resulted in publication about mentoring using the DaVinci robot (see publications)

Current research grants

- Intuitive Surgical Research Grant 2005
 - Amount: \$10,000 funded
 - **Marohn MR**
 - “Surgical Robotics research projects with the daVinci surgical robot.”
 - Note: Grant supports our MIS non-clinical research fellow activities working with our WSE engineers on projects related to the daVinci surgical robot. The group has been very productive, with 24 publications, 19 abstracts, 16 peer reviewed posters, and 26 presentations in 2005-2006
- National Institutes of Health (NIH) Small Business Technology Transfer (STTR) Grant, Phase II proposal 2006-2008
 - Amount: \$1,500,000, including 750,000 funded by STTR & \$750,000 from National Science Foundation (NSF) support for ERC (Engineering Research Center)
 - Taylor RH, Hasser C, Hager G, Awad M, **Marohn MR**, Choti MA.
 - “Laparoscopic surgical robot assisted ultrasound”
 - Note: Based upon earlier preliminary work, this project enables further development of the previously demonstrated ability to import 3D ultrasound imaging into the daVinci surgical robot immersive 3D environment.
- Johns Hopkins University Partnership Grant 2006

- Transdisciplinary planning grant
 - *Amount: \$120,000 funded*
 - **Marohn MR**, Taylor RH,
 - “Nothing left behind...(NLB)”
 - Note: This project falls under the I4M umbrella, and is a demonstration project of collaborative research efforts among the SOM, WSE, and APL. The project focuses on safety, specifically, on seeking a technology solution to the 1/1500 incidence of a foreign body left within a patient in surgery, seeking a 0% tolerance solution. Sponges account for 1/3 of errant foreign bodies. We are working with a vendor partner testing an ‘NLB’ solution.

- Karl Storz Endoscopy Education and Research Grant 2006-2010
 - *Amount: \$300,000 to be funded annually for five years*
 - **Marohn MR**, Freischlag JA, Brown PR, Lipsett P
 - Minimally Invasive Surgery Training Center (MISTC) surgical education, research, and simulation grant
 - Note: This grant supports MISTC through educational efforts, MIS research, and establishment of a simulation laboratory within MISTC.

- Ethicon Endosurgery and Inscope Investigator-initiated Research Grant 2006
 - *Amount: \$92,000 funded*
 - Kallou A, Kantsevoy S, **Marohn MR**, Meireles O, Shih
 - “Per-oral Transgastric Surgery with long-term survival in the Porcine Model: target procedure: cholecystectomy, goals: feasibility assessment and identification of needed technologies”
 - Note: Once funds are received, this grant enables testing of technology solutions to NOTES challenges, including gastric closure.

- United States Army Telemedicine and Advanced Technology Research Center (TATRC) 2006
 - BAA05-1 Conference grant
 - *Amount: \$15,000 funded*
 - **Marohn MR**, Donohue MD, Lewin J, Taylor RH, Yuh D
 - I4M Symposium: “Advancing Technology for Patient Care and Safety”, Baltimore MD 2/27/2006
 - Note: Funds supported this launch of the I4M initiative at Johns Hopkins, with over 120 attendees and subsequent trans-disciplinary efforts, including proposals for Quantum, U54, among others.

- United States Army Telemedicine and Advanced Technology Research Center (TATRC) 2006
 - BAA05-1 Conference grant
 - *Amount: \$10,000 funded*
 - **Marohn MR**, Hawes RH, Ratter DW
 - SAGES/ASGE Joint Symposium: “1st International Conference on Natural Orifice Transluminal Endoscopic Surgery (NOTES)”, Scottsdale AZ, 3/9-11/2006
 - Note: Funds supported this seminal conference attended by 120 surgeons and 60 vendors, hoping to guide the evolution of NOTES, resulting in publication of a NOTES White Paper, and recommendations, subsequently approved by both ASGE and SAGES to establish a joint NOSCAR committee.

- United States Army Telemedicine and Advanced Technology Research Center (TATRC) 2006
 - *Amount: \$4,100,000 funded*
 - Schenkman NS, Lockrow E, Corcoran P, DeVries W, McLeod DG, Hanly EJ, **Marohn MR**, Winkley J.
 - “Walter Reed Center for Telerobotic and Advanced Minimally Invasive Surgery (TAMIS).”

- Note: Johns Hopkins remains in a consultant role as WRAMC establishes a telesurgery and surgical robotics research lab at the Walter Reed Army Institute of Research (WRAIR), with embedded plans to collaborate with extramural partners (including Johns Hopkins)
- Johns Hopkins University Partnership Grant 2007
 - Transdisciplinary grant renewal
 - *Amount: \$120,000 funded year two*
 - **Marohn MR**, Miragliotta J, Taylor RH, et al
 - "Nothing left behind...(NLB) II"
 - Note: This project falls under the I4M umbrella, and is a demonstration project of collaborative research efforts among the SOM, WSE, and APL. The project focuses on safety, specifically, on seeking a technology solution to the 1/1500 incidence of a foreign body left within a patient in surgery, seeking a 0% tolerance solution. Sponges account for 1/3 of errant foreign bodies. We are continuing work with vendors, expanding our own technology solution, and looking at technologies to move beyond sponges to instruments
- NOTES/ NOSCAR Grant 2007-2008
 - o *Amount: \$80,000 awarded*
 - o Kantsevov S, Kalloo A, **Marohn MR**
 - o "Randomized controlled study comparing safety of different techniques of transgastric and transcolonic access to the peritoneal cavity."

Pending research grants

- United States Army Telemedicine and Advanced Technology Research Center (TATRC) 2005
 - *Amount: \$300,000/ requested, proposal approval pending*
 - Hasser C, **Marohn MR**, Holmes E, Schenkman NS
 - "daVinci Surgical Network pilot project"
 - Note: Still in review.
- National Institutes of Health (NIH) Roadmap U54 Center Grant 2006
 - *Amount: \$3-5 Million/year for five years, renewable*
 - Sachs M, Lewin J, Taylor R, **Marohn MR**, McNutt T, Fichtinger G, Naiman D, Choti M, Goldberg, H, Kazanzides P, Fayad L, Hager L.
 - "U54 Center Grant for Integrating Imaging, Information, and Intervention."
 - Note: Still in review
- Defense Agency Advanced Research Program (DARPA) 2006-2008
 - o *Amount: \$1,600,000 under review*
 - o Taylor RH, Hager G, Kazanzides P, **Marohn MR**
 - o "Virtual autopsy image integration with a robotic platform for automated tissue acquisition."
 - o Note: This program is part of DARPA and TATRC's shared Virtual Soldier program. Grant application is still in review.

Research Program Building/ Leadership

MIS Technology Research Group Overview

While the 'Nintendo' revolution has affected every surgical discipline, minimally invasive surgery (MIS) technology is hardly high tech. We use rigid, awkward 'chop stick' instruments and work in a two-dimensional representation of a three-dimensional space. As a pioneer in minimally invasive surgery, I have spent the past fifteen years pressing for better technology. Our transdisciplinary MIS Technology Research Group views computer assisted intervention as the next true revolution in healthcare. In a digital bio-information age, a CT scanner is a computer with eyes, a robot is a computer with arms, and our interventional suites should be 'smart' suites.

Our MIS Technology Research Group has portfolios of research projects to push emerging surgical technologies:

- Minimally Invasive Surgery (MIS)
- Emerging Surgical Technologies
- Surgical Robotics
- Telesurgery
- 'Smart' Instruments
- Natural orifice transluminal endoscopic surgery (NOTES)

The **I4M** initiative is an extension of our vision to harness the power of Johns Hopkins entities to foster transdisciplinary breakthroughs.

Minimally invasive surgery (MIS)

1989-2004 Pioneer for US Military in Uniformed Services University School of Medicine
 Minimally Invasive Surgery Bethesda, Maryland
 (MIS)- Co-Founder &
 Co-Director with Dr. David Wherry,
 Department of Defense (DOD)
 Tri-Service Emerging Surgery Technologies Program

Developed and conducted >250 courses worldwide for >2500 DOD surgeons in topics from basic laparoscopic to advanced laparoscopy, surgical ultrasound, radio imaged guided surgery (RIGS), cryosurgery, laser surgery, and surgical robotics, 1989-2004

Established on-going minimally invasive and emerging surgical technology training programs worldwide for DOD surgeons, conducting annual educational programs in France and Germany for European stationed DOD and host nation surgeons, and in South Korea for Pacific Rim stationed DOD and host nation surgeons, 1991-2004

Performed numerous 'laparoscopic surgery 'firsts' in US Military

Taking advantage of the unique opportunity for access to >99% of medical records worldwide in DOD, we detailed the introduction of laparoscopic cholecystectomy and defined steady state outcomes.

Surgical robotics and telesurgery

2000-present Consultant Defense Advanced Projects Research Projects Agency
 Working with Dr. Rick Satava (DARPA), Arlington, Virginia

2000-present Consultant Telemedicine and Advanced Technology Research
Working with Dr. Gerry Moses Center (TATRC), Fort Detrick, Maryland

2001-present International Expert Faculty IRCAD
Collaboration with Professor University Louis Pasteur
Jacques Marescaux Strasbourg, France

Invited US Expert at press conference for Professor Marescaux' 1st in the world
Telerobotic Transatlantic Laparoscopic Cholecystectomy performed between New York
City, New York and Strasbourg, France, 7 September 2001
Frequent invited expert at IRCAD/ EITS training center with Professor Marescaux

2001-2004 Co-Founder, Surgical Robotics Program with Drs. Walter Reed Army Medical Center (WRAMC)
Noah Schenkman, David Washington, DC
McLeod, & William DeVries

Performed first robotic laparoscopic surgery In US Military

2004-present Consultant, Telemedicine and Advanced Walter Reed Army Medical Center (WRAMC)
Minimally Invasive Surgery Washington, DC
(TAMIS) Center, with Noah
Schenkman, David McLeod, &
William DeVries

Secured \$4.1 Million Congressional funding for TAMIS Center at Walter Reed to
establish a telesurgery and surgical robotics research lab at the Walter Reed Army
Institute of Research (WRAIR), to collaborate with extramural partners (including
Johns Hopkins). Our input was instrument in securing this funding.

2005-present Director, Minimally Invasive Surgery (MIS) Interdisciplinary Johns Hopkins University School of Medicine
Technology Research Group and Whiting School of Engineering
Baltimore, Maryland

Research focus: MIS technology, 'smart' instruments, robotics, telesurgery, simulation,
NOTES; Group grew out of Dr. Mark Talamini's MIS research group

Group performed first telerobotic surgery in USA at the American Telemedicine
Association meeting, 4/2005

MIS Technology Research Fellows productivity for 2005-2006:

	<u>2005</u>	<u>2006</u>
Publications	10	14
Published abstracts	11	8
Presentations	7	19
Peer reviewed posters	8	8

2005-present Co-Director, Minimally Invasive Surgery Johns Hopkins University School of Medicine
Training Center (MISTC) Baltimore, Maryland

Introduced SAGES Fundamentals of Laparoscopic Surgery (FLS) program, 2005

Secured vendor support for \$1.5 Million over five-years for education and research, plus

Support to renovate MISTC auditorium and lab space, 2006

Established surgical simulator laboratory, 2006

2006-present Steering Committee Society of Medical Innovation & Technology (SMIT)

Natural orifice transluminal endoscopic surgery (NOTES)

2005-present Endolumenal Surgery Task ASGE – SAGES (American Society of Gastrointestinal
Force, including 8 ASGE Endoscopy and Society of American Gastrointestinal
And 6 SAGES members. Endoscopic Surgeons)

Mission to prospectively develop guidelines for Natural Orifice Surgery Consortium for Assessment and Research (NOSCAR)

Members: ASGE: Drs. Anthony Kalloo, William Brugge, Christopher Gostout, Robert Hawes, Sergey Kantsevov, Jay Pasricha, Richard Rothstein, and Christopher Thompson; SAGES: Drs. David Rattner, Michael Marohn, Jeffery Ponsky, Nathaniel Soper, William Richards, and Lee Swanstrom

Organizing Committee for 1st International Conference on Natural Orifice Trans-luminal Endoscopic Surgery (NOTES), Scottsdale AZ, 3/9-10/2006

Secured \$10K from TATRC to support NOTES 2006 meeting

ASGE – SAGES (American Society of Gastrointestinal Endoscopy and Society of American Gastrointestinal Endoscopic Surgeons) Joint Committee on Natural Orifice Trans-luminal Endoscopic Surgery (NOTES), established by both ASGE and SAGES Boards, Co-chaired by Drs. David Rattner and Robert Hawes

Organizing Committee for 2nd International Conference on Natural Orifice Trans-luminal Endoscopic Surgery (NOTES), Boston MA, 7/2007

2006-present Surgical Endoscopy Education Johns Hopkins University School of Medicine
Working Group Baltimore, Maryland

I4M: Integrating Imaging, Informatics, and Intervention for Medicine

2005-present Founding Member Johns Hopkins University School of Medicine
I4M Committee- Integrating Baltimore, Maryland
Imaging, Informatics, and
Intervention in Medicine

Mission to encourage Johns Hopkins University enterprise-wide trans-disciplinary collaborative research initiatives

Executive Committee member, Co-chaired by Drs. Chi Dang & Marc Donohue

Chair of organizing committee for I4M Symposium: "Advancing Technology for Patient Care and Safety", Baltimore MD, 2/27/2006

Secured \$15K from TATRC to support 2006 I4M Symposium

Designated lead for ongoing I4M initiatives, including Fraunhofer Institute collaborative and liaison with TATRC, DARPA, and WRAMC

EDUCATIONAL ACTIVITIES

Teaching

Classroom instruction

- Extensive experience as a surgical educator
- Current regular lecturer for surgical medical students
- Current regular lecturer for surgical intern lecture series
- Current regular lecturer for surgical resident lecture series

Clinical instruction

- Regular participant in weekly teaching conferences: M&M, GI Gold, Colorectal Tumor Board, Surgical Grand Rounds, Surgery Onc-Endo Case Conference, periodically presenting at each
- Regular participant in monthly Minimally Invasive Surgery Multi-Site video-teleconference
- Routine daily teaching as part of clinic, ward rounds, and operative teaching
- Regular teaching in MISTC hands-on surgical skills laboratories for surgical residents

CME instruction

- Refer to extensive CME education programs in minimally invasive surgery, emerging Surgical technologies, surgical ultrasound, and surgical education detailed below under Program Building
- Frequent invited expert at national CME meetings, detailed in invited lecture section

Workshops/ seminars

- Refer to Education Program Building detailing extensive experience developing curriculum and conducting didactic and hands-on workshops/ seminars worldwide. I have only summarized the high volume workshop/ seminars I have conducted:

- >250 Minimally Invasive Surgery/ Emerging Surgical Technologies courses for over 2500 surgeons worldwide
- >20 Surgical ultrasound courses for over 500 surgeons worldwide
- >14 Surgical education: Principles and Practice (SEPAP) courses for over 500 surgeons
- >60 Advanced Trauma Life Support courses for over 2000 providers worldwide
- >30 ACLS courses for over 600 providers worldwide

On-going participation in intra-mural CME activities as a surgical expert at Johns Hopkins

Frequently invited expert to national and international forums, including the annual Clinical Congress of the American College of Surgeons, the annual meetings of the Society of American Gastrointestinal Endoscopic Surgeons (SAGES), among others, and dedicated SAGES resident courses in advanced MIS topics.

Mentoring (pre- and post-doctoral)

Advisees

- 1987-2004 US Military surgeon mentor: Particularly during 17 years in the National Capitol Area (NCA), dedicated lifelong mentor for many young military surgeons from medical school through residency to the attending surgeon level to civilian practice
- 1994-2004 Associate director, General Surgery Residency, Walter Reed Army Medical Center, ACGME RRC approved for full 5-year periods at two RRC reviews, 1994 and 1999. Mentored over 50 finishing chief residents
- 2004-present Medical Student mentoring program
- 2005-present Program director, Minimally Invasive Surgery Fellowship, Johns Hopkins University School of Medicine. MIS Fellowship approved, 2006. 100% of our graduated MIS fellows have academic positions.
- 2005-present Director, Minimally Invasive Surgery (MIS) Non-Clinical Research Fellowship program, Johns Hopkins University School of Medicine. Currently two MIS non-clinical fellows. Productive program with 24 publications, 19 abstracts, 16 peer reviewed posters, and 26 presentations in 2005-2006 (detailed in MIS section).

Educational Program Building/ Leadership

1985-1987 *Critical care/ Readiness skills*

Established USAF Europe-wide training program to enhance critical care and readiness skills for US Military providers. Program based in Incirlik Air Base, Turkey, but supported by USAFE HQ, American Heart Association (AHA), and American College of Surgeons (ACS).

Advanced Trauma Life Support (ATLS)
Advanced Cardiac Life Support (ACLS)

Conducted extensive series of both ATLS and ACLS courses to assure readiness and deployability of USAFE providers: >10 courses for over 100 providers

Developed, founded, trained, and exercised one of USAF's first Forward Ambulance Surgical Trauma (FAST) teams at Incirlik Air Base, Turkey; coordinated with Dr. P.K. Carlton

1987-1994 *Surgical residency program development*

Established surgery resident affiliation between Walter Reed and Malcolm Grow in 1988,

1994-2004 *Surgical residency program development*

Working with Dr. David Jacques, WRAMC General Surgery Residency Program Director, achieved ACGME Residency Review Committee (RRC) approved integrated Walter Reed & Malcolm Grow General Surgery Residency in 1994 with full 5-year accreditation, renewed in 1999.

Impact: The Walter Reed Surgery Residency Program is the premier surgical training program in the Department of Defense. Dedicated to developing not only excellent young surgeons for the US Military, it is also dedicated to developing excellent young academic surgeons. It is DOD's only six-year program, requiring all residents to complete one year of surgical research.

1989-2004 *Minimally Invasive Surgery and Emerging Surgical Technologies*

Extensive experience in establishing surgical education programs to promulgate emerging surgical technologies worldwide in the US Military

Co-founded and Co-Directed, along with Professor David C. Wherry, Department of Defense Tri-Service Video-endoscopic Surgery and Emerging Surgical Technologies Program, developing and conducting over 250 courses worldwide for >2,500 United States Military Surgeons in emerging surgical technology topics:

- Laparoscopic Cholecystectomy and Basic Laparoscopic Surgery
- Advanced Laparoscopic Surgery, including Foregut, Solid Organ, Hernia, and Colorectal Surgery
- Laparoscopy for Urology
- Laparoscopy for Pediatric Surgery
- Thoracoscopy
- Surgeon Performed Ultrasound
- Radio-Image Guided Surgery (RIGS), including Sentinel Node Mapping
- Cryosurgery
- Robotic Surgery

Impact: Program recognized by the Department of Defense for the impact at assuring quality during the introduction of emerging technologies, and for the innovative features of the program:

- Enlisting volunteer internationally known expert faculty
- Saving DOD \$3 Million in direct costs (conducting the courses totally with vendor support)
- Saving DOD an additional \$6 Million in cost avoidance (conducting courses at no tuition fee)

1993-present *Surgeon performed ultrasound*

After completing intensive ultrasound training at Bowman Gray Medical School with Dr. Fred Kremkau in 1992 , then engaging in surgical ultrasound in clinical practice, developed curriculum and began conducting surgeon performed ultrasound courses at the Uniformed Services University to US military surgeons in 1993. Courses included basic ultrasound, ultrasound in the acute setting, ultrasound intervention, including ultrasound guided cryotherapy and radiofrequency ablation (RFA).

Evaluated first flexible laparoscopic ultrasound probe (B&K) in USA in 1993.

Member of American College of Surgeons National Ultrasound Faculty, Executive Committee, 1999-2005.

Co-chair or instructor for >20 ACS surgical ultrasound post-graduate courses (basic, instructor, breast, transabdominal and laparoscopic), training >500 surgeons.

ACS Ultrasound Instructor Module Director 2002-2005.

Member of team that created CD-based ACS Basic Ultrasound Module completed in 2003

Impact: Early pioneer in surgical ultrasound and member of national surgical ultrasound leadership promulgating surgeon performed ultrasound into expanded clinical practice. Exposure to surgical ultrasound is now required by the ACGME RRC, and surgical ultrasound questions developed by the ACS National Ultrasound Faculty appear on the American Board of Surgery examinations.

1995-2006 *Surgical education*

Completed American College of Surgeons 'Surgeons as Educators' course, then invited to join the faculty for 'Surgical Education: Principles and Practice (SEPAP)' in 1997

Impact: SEPAP co-chair since 2001 with Dr. Mary Maniscalco-Theberge: conducted >14 SEPAP graduate medical education (GME) courses for over 500 surgeon educators, with a curriculum which remains focused on the principles of adult education, including needs assessment, questioning skills, performance evaluation, feedback, but which now includes the 6 ACGME core competences, teaching technical skills, and simulation.

1996-1998 *Surgical basic science education*

Co-developer and Director Basic Surgical Science Review Course	Metropolitan Washington Chapter of the American College of Surgeons (ACS) Washington, DC
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Developed course for all six surgical residency programs in the Washington Metropolitan area, sponsored by the Metropolitan Washington Chapter of the American College of Surgeons (ACS).

Impact: Program attracted >100 residents annually, all of whom became Candidate Group members of ACS (cost of admission), and resulted in improved ABSITE Scores. After directing the program three years, it became self-perpetuating and continues now.

2003-present *Surgical simulation*

Member, Committee for Validation and Metrics for Surgical Simulators established at TATRC Medicine Meets Virtual Reality (MMVR) Conference, 2003.

Impact: Drafted guidelines for use of simulators in surgical education. Continued work toward improved surgical simulators and standards adoption for validation and research.

2005-present *MIS training and surgical simulation*

Co-Director, Johns Hopkins University School of Medicine
Minimally Invasive Surgery Baltimore, Maryland
Training Center (MISTC)

Established Johns Hopkins participation in monthly multi-site MIS VTC program, 2004

Introduced SAGES Fundamentals of Laparoscopic Surgery (FLS) program, 2006

Secured vendor support for \$1.5 Million over five-years for education and research, plus Support to renovate MISTC auditorium and lab space, 2006

Established surgical simulator laboratory, 2006

Impact: Increased laparoscopic skills among surgical residents. Goal to have finishing residents FLS certified. As of 2006, all finishing chief residents met or exceed new RRC requirements for advanced laparoscopic surgery cases, a first in our residency program.

Educational Extramural Funding

Educational Grants

Previous educational grants

- Ethicon Endo-Surgery (EESUS) MIS Educational Grant Series 1989-2004
 - Amount: >\$1 Million in series of annual educational grants
 - Wherry DC, **Marohn MR**
 - "Minimally Invasive Surgery (MIS) and Emerging Surgical Technologies support"
 - Note: Series of annual grants supported 50% (see USSC MIS Educational Grant Series) of development and conduct of >250 DOD Tri-Service Emerging Surgical Technologies courses for >2500 DOD surgeons and support staff, initially focused on basic laparoscopy, but evolved to include advanced laparoscopy (foregut, colorectal, pediatric, urology, gynecology, thoracoscopy), surgical ultrasound, radio-image guided surgery (RIGS), cryotherapy, and surgical robotics.

- United States Surgical Corporation (USSC) Educational Grant Series 1989-2004
 - Amount: >\$1 Million in series of annual educational grants
 - Wherry DC, **Marohn MR**
 - "Minimally Invasive Surgery (MIS) and Emerging Surgical Technologies support"
 - Note: Series of annual grants supported 50% (see Ethicon MIS Educational Grant Series) of development and conduct of >250 DOD Tri-Service Emerging Surgical Technologies courses for >2500 DOD surgeons and support staff, initially focused on basic laparoscopy, but evolved to include advanced laparoscopy (foregut, colorectal, pediatric, urology,

gynecology, thoracoscopy), surgical ultrasound, radio-image guided surgery (RIGS), cryotherapy, and surgical robotics.

- Karl Storz Endoskopie (KSEA) Equipment Educational Grant Series 1989-2004
 - Amount: \$500,000 in series of annual educational grants
 - Wherry DC, **Marohn MR**
 - “Minimally Invasive Surgery (M(S) Equipment Educational Grant Series
 - Note: Series of annual MIS equipment grants supported 50% (see Olympus MIS Equipment Educational Grant Series) of development and conduct of >250 DOD Tri-Service Emerging Surgical Technologies courses for >2500 DOD surgeons and support staff, initially focused on basic laparoscopy, but evolved to include advanced laparoscopy (foregut, colorectal, pediatric, urology, gynecology, thoracoscopy), surgical ultrasound, radio-image guided surgery (RIGS), cryotherapy, and surgical robotics.

- Olympus Equipment Educational Grant Series 1989-2004
 - Amount: \$500,000 in series of annual educational grants
 - Wherry DC, **Marohn MR**
 - “Minimally Invasive Surgery (M(S) Equipment Educational Grant Series
 - Note: Series of annual MIS equipment grants supported 50% (see Karl Storz MIS Equipment Educational Grant Series) of development and conduct of >250 DOD Tri-Service Emerging Surgical Technologies courses for >2500 DOD surgeons and support staff, initially focused on basic laparoscopy, but evolved to include advanced laparoscopy (foregut, colorectal, pediatric, urology, gynecology, thoracoscopy), surgical ultrasound, radio-image guided surgery (RIGS), cryotherapy, and surgical robotics.

- United States Army Telemedicine and Advanced Technology Research Center (TATRC) 2004
 - Amount: \$145,000 funded
 - Schenkman NS, Hanly EJ, **Marohn MR**, Bowyer M, Lenhart M, Bigott T, Lockrow E, DeVries W
 - “Introduction of Telemedicine into Surgical Education.”
 - Note: Grant enabled introduction of a curriculum reaching all MSIII Uniformed Services University (USU) students rotating on surgery, insuring exposure to telemedicine, telesurgery, and surgical robotics, achieving minimal working knowledge of how to employ telesurgery capability at remote sites. Long term, this is a high impact program because USU graduates constitute 20% of US Military Active Duty physicians.

- Ethicon Endo-Surgery Minimally Invasive Surgery Fellowship Training Grant 2005-2006
 - Amount: \$50,000 funded
 - **Marohn MR**, Minimally Invasive Surgery (MIS) Fellowship Program Director
 - Minimally Invasive Surgery Clinical Fellow funding 2005-2006
 - Note: Educational grant for our 2005-2006 MIS Clinical Fellow, Dr. Kimberley Steele

- Current educational grants

- United States Surgical / Tyco Minimal Invasive Surgery Fellowship Training Grant 2006-2007
 - Amount: \$70,000 funded
 - **Marohn MR**, Minimally Invasive Surgery (MIS) Fellowship Program Director
 - Minimally Invasive Surgery Clinical Fellow funding 2006-2007
 - Note: Educational grant for our 2006-2007 MIS Clinical Fellow, Dr. Mary ‘Molly’ Sebastian

- Karl Storz Endoscopy Education and Research Grant (note, grant referenced in research section) 2006-2010

- *Amount: \$300,000 to be funded annually for five years; 2006 funded*
- **Marohn MR**, Freischlag JA, Brown PR, Lipsett P
- Minimally Invasive Surgery Training Center (MISTC) surgical education, research, and simulation grant
- Note: This grant supports MISTC through educational efforts, MIS research, and establishment of a simulation laboratory within MISTC.

Pending educational grants

- Ethicon Endo-Surgery Minimally Invasive Surgery Educational Grant 2006
 - *Amount: \$10,000 in review*
 - **Marohn MR**
 - Minimally Invasive Surgery educational grant
 - Note: Education grant to support surgery resident FLS and MISTC simulation training

CLINICAL ACTIVITIES

Certification

Medical licensure

12/1979	Federal Licensure Examination (FLEX)	Diplomate
04/1980	National Board of Osteopathic Medical Examiners	Diplomate
1980	Texas Medical License	F5638
1988	Maryland Medical License	H36179
1988	Virginia Medical License	1010242180

Boards

11/7/1989	American Board of Surgery: General Surgery	Certificate 34653
1998	American Board of Surgery: General Surgery recertification	
10/26/1990	American Board of Surgery: Surgical Critical Care	Certificate 589
1998	American Board of Surgery: Surgical Critical Care recertification	
3/20/2000	Society Apothecaries of London: Medical Care of Catastrophes	Diplomate/ DMCC

Clinical Service Responsibilities

1975-2004 US Military Service – refer to Military assignments and Professional positions sections

2004-present Attending Surgeon at Johns Hopkins
 Specialty: General Surgery
 Focus areas: Minimally invasive surgery (MIS), robotics, foregut, colorectal, endocrine, solid organ, reoperative surgery
 Role: Assigned to GI Blue Surgery Service, now the Ravitch Surgery Service
 On Call responsibilities:
 Monthly Hopkins Access (HAL) line general surgery call (1 week/month)
 Monthly Halsted Surgery call (1 day/month)
 Weekly clinic
 Operative experience: 200 cases per year
 Operative case mix

Laparoscopic v. 'open':	70% / 30%
Colorectal	30%
Foregut	20%
Hepatobiliary/pancreatic	15%
Endocrine	10%
Hernia	10%
Solid organ	10%
Other	5%

Clinical Program Building/ Leadership

Minimally invasive surgery (MIS) and emerging surgical technologies

1989-2004 Pioneer for US Military in Minimally Invasive Surgery (MIS)- Co-Founder & Co-Director with Dr. David Wherry, Department of Defense (DOD) Tri-Service Emerging Surgery Technologies Program
 Uniformed Services University School of Medicine
 Bethesda, Maryland

Co-founded and co-directed, along with Professor David C. Wherry, Department of Defense Tri-Service Video-endoscopic Surgery and Emerging Surgical Technologies Program, conducting over 250 courses for >2,500 United States Military surgeons in topics evolving from basic laparoscopic surgery, advanced laparoscopic surgery, surgeon performed ultrasound, radio-image guided surgery, cryosurgery, to robotic surgery

Performed numerous 'firsts' in video-endoscopic surgery in the US Military

Developed one of busiest, broadest spectrum, minimally invasive surgery (MIS) clinical practices in the Department of Defense (DOD), resulting in being billeted stably in the Washington, DC National Capitol Area (NCA) for 18 years, and performing advanced laparoscopic surgeries routinely at all three NCA DOD medical centers (MGMC, NNMC, and WRAMC, training attending surgeons and residents, and pushing emerging advanced MIS applications and technologies

2000-2004 Affiliate Faculty General Surgery
 Bethesda National Naval Medical Center (NNMC)
 Bethesda, Maryland

2000-2004 Minimally Invasive Surgery (MIS) Consultant
 National Institutes of Health (NIH) (NIDDK)
 Bethesda, Maryland

- Co-founder of joint Walter Reed Army Medical Center and NIH Laparoscopic Donor Nephrectomy program with Drs. Alan Kirk, Doug Hale, Noah Schenkman
- 2001-2004 Co-Founder, Surgical Robotics Program with Drs. Noah Schenkman, David McLeod, & William DeVries
Walter Reed Army Medical Center (WRAMC) Washington, DC
- Performed first robotic laparoscopic surgery In US Military
- 2005-present Program Director, Minimally Invasive Surgery Fellowship
Johns Hopkins University School of Medicine Baltimore, Maryland
- Fellowship funded by extra-mural educational grants
- Achieved MIS Fellowship Council Accreditation 2006
- One in four national MIS Fellowship Council Match applicants applies to the Johns Hopkins program, making our program one of the leading MIS fellowships
- As of 2006, all finishing chief residents met or exceeded new RRC requirements for advanced laparoscopic surgery cases, a first in our residency program
- Our MIS program continues to grow, with busy components at both JHH and JHBMC

Surgeon performed ultrasound

- 1993-2004 Began teaching surgeon performed ultrasound courses at USU to US military surgeons in 1993. Courses have included basic ultrasound, ultrasound in the acute setting, ultrasound intervention, including ultrasound guided cryotherapy and radiofrequency ablation (RFA)
Evaluated first flexible laparoscopic ultrasound probe (B&K) in USA in 1993; have routinely performed intraoperative ultrasound since 1993
Member of American College of Surgeons National Ultrasound Faculty since 1999. Co-chair or instructor for >20 ACS surgical ultrasound post-graduate courses (basic, instructor, breast, transabdominal and laparoscopic). Now ACS Ultrasound Instructor Module Director and member of CD-based ACS Basic Ultrasound Module project completed in 2003
- 2004-present Perform surgical ultrasound routinely. Working with Dr. Michael Choti and research research initiatives related to ultrasound imaging. We have upgraded our operative ultrasound equipment. Plans to expand surgeon performed ultrasound education

Emerging surgical technologies and techniques

- 1998-present Sentinel lymph node (SLN) mapping and radio-image guided surgery (RIGS):
Began conducting radio-image guided surgery courses at USU for US military in 1998. Performs endocrine RIGS since 1995. On-going minimally invasive radioimage guided parathyroidectomy (MIRP) study. Performed first SLN for breast CA at MGMC
- 2000-present Co-founded joint National Institutes of Health and Walter Reed Army Medical Center laparoscopic donor nephrectomy program with Alan Kirk, Doug Hale, John Swanson, and Noah Schenkman, successfully performing over 50 laparoscopic donor nephrectomies for renal transplant patients

Surgical robotics and telemedicine

- 2001-present Surgical robotics/ computer assisted minimally invasive surgery (CAMIS):
Co-founded Walter Reed robotic assisted laparoscopic surgery program with Noah Schenkman, Dave McLeod, William DeVries, and Eric Hanly in 2001, including multi-disciplinary surgical robotic training lab at Walter Reed Army Institute of Research (WRAIR). Performed first robotic assisted laparoscopic surgery in Department of Defense at Walter Reed Army Medical Center in 2002. Member of Walter Reed Army Medical Center Innovative Surgery Committee. Collaborates with Professor Jacques Marescaux of IRCAD, Strasbourg, France, on telesurgery and computer imaging. Invited US expert at press conference announcing milestone first transatlantic telerobotic laparoscopic cholecystectomy, 7 Sep 01
- 2004-present Co-leader with Mark Talamini of Johns Hopkins Minimally Invasive Surgery (MIS) biology and technology research working groups, including clinical surgeons, non-clinical research fellows, engineers, engineering research fellows- meeting regularly to coordinate research into the biology of MIS and to push MIS innovative technology

Cancer care

- 1992-2005 Chair, Cancer Program, Malcolm Grow USAF Medical Center (MGMC)
American College of Surgeons Andrews Air Force Base, Maryland
of Surgeons Commission on
Cancer Liaison Physician
- Achieved American College of Surgeons Commission on Cancer Program Accreditation in 1994, 1997, 2000, 2004. At time of accreditation, the MGMC Cancer program was only the 12th cancer program in Maryland to be accredited

Endocrine surgery

- 1988-present Recognized expert in thyroid, parathyroid, and adrenal surgery
Established at MGMC 2nd busiest endocrine surgery service in Department of Defense performing 65+ endocrine surgeries annually since 1989
Developed evidence-based protocol for safe post-op management of total thyroidectomy patients- recognized as best clinical practice and received USAF Scientific Award
Established 10-year database on role of nuclear medicine imaging in parathyroid surgery
Established Tri-service National Capital Area (NCA) collaborative laparoscopic adrenalectomy program with urology and general surgery at WRAMC, NNMC, and MGMC working cooperatively to optimize patient outcomes and pool expertise since 1997, performing over 100 laparoscopic adrenalectomies
- 2003-present Co-leader with Martha Zeiger at Johns Hopkins investigating minimally invasive surgical applications in head and neck endocrine surgery, having performed over thirty minimal access video-assisted thyroid and parathyroid surgeries
- We continue to expand the MIS solid organ endocrine program (adrenal and endocrine pancreas)
- 2006-present Faculty, newly established Johns Hopkins Endocrine Surgery Fellowship, directed by Dr. Martha Zeiger

ORGANIZATIONAL ACTIVITIES

Institutional administrative appointments

- 1988-1991 US Congressional Delegation (CODEL) physician for Ways & Means Committee missions to Pacific Rim, Middle East, Europe
- 1989, 1993, 1997 US Presidential Inauguration physician support, Washington, DC
- 2000-2003 Uniformed Services University (USU) Faculty Senate
- 2001-present Walter Reed Army Medical Center (WRAMC) Innovative Surgery Committee
- 2002 US Congressional Delegation (CODEL) physician for Resource Committee mission to Australia, New Zealand, Guam, and American Samoa
- 2004-present Johns Hopkins Surgery Education Committee
- 2004-present Johns Hopkins Government Affairs Committee
- 2004-present Johns Hopkins Hospital Minimally Invasive Surgery Training Center (MISTC) Steering Committee
- 2005-present Johns Hopkins University I4M Committee
- 2006-present Johns Hopkins School of Medicine Simulation Center Liaison for Surgery

Editorial Activities

Editorial Board appointments

- 2005-present Editorial Board, Journal of Laparoendoscopic & Advanced Surgical Techniques

Journal peer review activities

- 1999-present Reviewer, Surgical Endoscopy
- 2000-present Reviewer, Journal of Laparoscopy, Endoscopy and Percutaneous Surgical Techniques
- 2004-present Reviewer, Urology
- 2004-present Reviewer, Journal of Laparoendoscopic & Advanced Surgical Techniques
- 2004-present Reviewer, Archives of Surgery

Advisory Committees, Review Groups

- 1990-2004 Co-Founder and Co-Director of Uniformed Services University/ Department of Defense Emerging Surgical Technologies Program
Developed and conducted >250 courses for nearly 2,500 US Military surgeon students world-wide

- 1994-2004 Department of Defense National Capital Area (NCA) General Surgery Committee, (Chair 1994-1995)
- 1999-2004 Department of Defense National Capital Area (NCA) Videoendoscopic Surgeon Product Line Standardization Consultant
- 1999-present American College of Surgeons National Ultrasound Faculty
- 2002-2004 Department of Department Joint Programmatic Review Panel for \$100M funded grant proposals
- 2005-present Joint SAGES & ASGE NOTES/ National Translumenal Surgery Task Force
- 2005-present Joint MIRA/SAGES Surgical Robotics Task Force

Professional Societies

American Association of Endocrine Surgeons (AAES), since 1998

American College of Surgeons (ACS), Fellow #3010072 (FACS), since 1991

Board of Governors, USAF representative, 2002-2005

Financial Affairs Committee, 2004-2005

National Ultrasound Faculty since 1999, faculty or chair of several ACS post-graduate courses (Basic, Breast, Abdominal, Instructor), Instructor Module Director, 2002-2004

Advanced Trauma Life Support (ATLS): USAF Committee on Trauma Vice-Chair since 1994, ATLS State Faculty since 1990 and ATLS Instructor since 1988

Fellows Leadership Society- since 1996

Surgical Education: Principles & Practice (SEPAP) post-graduate program faculty since 1997, co-chair 2001-present

Metropolitan Washington Chapter- Founded All-City Basic Science Course for all six National Capitol area General Surgery Residencies- 1996; Young Surgeons Committee, 1993-1997; Webmaster & Membership chairs- since 1999; Council member- 2002-2007

American Heart Association Advanced Cardiac Life Support (ACLS) Instructor since 1985

American Institute of Ultrasound Medicine (AIUM), since 1997

American Medical Association (AMA), since 1982

Representative to Section on Medical Schools for USAF Surgeon General & USU (Dean's section), 1998-2004

Association of Military Surgeons of the United States (AMSUS), life member since 1992

Association of Program Directors in Surgery (APDS), since 1998 to 2004

Association of Surgical Educators (ASE), since 1998

Chesapeake Colorectal Society (CCS), since 1996

Minimally Invasive Robot Association (MIRA), since 2004

Society of Air Force Clinical Surgeons (SAFCS), since 1981
Board of Governors 1994-1997 & 2002-2005
James W. Humphries Fund Liaison, 1994-2004
General Surgery Program Chair for annual symposium, 1990
Frequent annual SAFCS symposium faculty, including directing ACS ultrasound courses for SAFCS; helped secure Sonosite educational grant for DoD surgeon ultrasound training, 2003-2004

Society of American Gastrointestinal Endoscopic Surgeons (SAGES), since 1990
Resident Education Committee, 1992-present
Co-chair 1993-1994
Frequent Resident Workshop Faculty, 1995-present
Program Committee, 1999-present
Technology Committee, 2001-present
Co-chair 2005-2006
US Congressional Testimony on Video Endoscopic Surgery, 8/1995
Annual Symposium Faculty 1997, 2000, & 2003
Surgical Endoscopy & Ultrasound Journal reviewer, 2000-ongoing
Endoluminal Surgery Joint SAGES/ ASGE Task Force, 2005-ongoing
Surgical Robotics Joint MIRA/SAGES Task Force, 2006-ongoing
Fundamentals of Endoscopic Surgery (FES) Committee, 2006-ongoing

Society of Critical Care Medicine (SCCM), since 1981

Society of Laparoendoscopic Surgeons (SLS), since 1993

Society of Medical Innovation and Technology (SMIT), since 2006

Society of Surgeons of the Alimentary Tract (SSAT), since 1996

Washington Computer Assisted Surgery Society (WasCAS), since 2003

Conference Organizer, Session Chair

- 1989-2004 Co-founded and co-directed, along with Professor David C. Wherry, *Department of Defense Tri-Service Video-endoscopic Surgery and Emerging Surgical Technologies Program*, conducting over 250 courses for >2,500 United States Military surgeons in topics evolving from basic laparoscopic surgery, advanced laparoscopic surgery, surgeon performed ultrasound, radio-image guided surgery, cryosurgery, to robotic surgery. Performed numerous 'firsts' in video-endoscopic surgery in the US Military
- 1987 *Society of Air Force Clinical Surgeons* annual symposium, Washington, DC- program co-chair
Chair, General Surgery section
- 1997 American College of Surgeons *Surgical Education: Principles & Practice (SEPAP)* post-graduate program faculty since 1997, co-chair 2001-present
- 1996 American College of Surgeons *National Ultrasound Faculty* since 1999, faculty or chair of several ACS post-graduate courses (Basic, Breast, Abdominal, Instructor), Instructor Module
Director, 2002-2004, member of Executive Committee, 2000-present

- 2004 Organizing Committee, *OR2020 Workshop*, 18-20 March 2004, Ellicott City, MD, funded by U.S. Army Medical Research and Materiel Command, National Science Foundation, National Institutes of Health (NIBIB)
- 2005 Established *Fundamentals of Laparoscopic Surgery (FLS)* SAGES sponsored program for Johns Hopkins surgery senior residents, MIS fellows, and MIS faculty. Goal to FLS certify all MIS faculty, finishing MIS fellows, and finishing general surgery residents
- 2006 Chair, Organizing Committee, I4M symposium: *Advancing Technology for Improved Patient Care and Safety at Johns Hopkins*, 27 February 2006, Baltimore MD
- 2006 Organizing Committee for 1st International Conference on Natural Orifice Trans-luminal Endoscopic Surgery (NOTES), Scottsdale AZ, 9-10 March 2006
- 2006 Co-Chair Organizing Committee for 1st International Consensus Conference on Surgical Robotics, New York City, NY, 9-10 June 2006
- 2006 Steering Committee, Society for Medical Innovation and Technology (SMIT)
- 2007 Organizing Committee for 2nd International Conference on Natural Orifice Trans-luminal Endoscopic Surgery (NOTES), Boston MA, 7/2007
- 2007 Co-Chair Organizing Committee for 2nd International Consensus Conference for Surgical Robotics, 2008

Consultantships

- 1988-2004 United States Air Force Surgeon General Medical Legal Consultant
- 1990-2004 Department of Defense Tri-Service Video-Endoscopic Surgery Consultant
- 2001-present Department of Defense Telemedicine & Advanced Technology Research Center (TATRC) Consultant
- 2003-present Defense Advanced Research Projects Agency (DARPA) Consultant

RECOGNITION**Awards, honors:**

- 1995 United States Air Force (USAF) Innovative Scientific Contribution Award
- 1998 Dominique Larrey Award for Contributions to Military Surgery, Bethesda, MD
- 2001 David C. Wherry Emerging Surgical Technologies Award, Uniformed Services University, Bethesda, MD
- 2003 Ex Calibur Society of Air Force Clinical Surgeons (SAFCS) Lifetime Military Contribution Award
- 2004 Senior Surgery Professor Award, Uniformed Services University, Bethesda, MD

2004 Meritorious Service Award, Uniformed Services University, Bethesda, MD

Invited Talks, Panels

1. **Marohn MR.** Laparoscopic colon cancer surgery: should we do this? Featured speaker at *Society of American Gastrointestinal Endoscopic Surgeons (SAGES)* annual symposium, San Diego, CA 1997.
2. **Marohn MR.** Endorectal ultrasound: emerging gold standard? Featured speaker at *Society of American Gastrointestinal Endoscopic Surgeons (SAGES)* annual symposium, San Diego, CA. 1997.
3. **Marohn MR.** Computers in Medicine. Featured speaker at *American College of Surgeons Metropolitan Washington Chapter "All Surgeons Day"*, Washington, DC. March 1998.
4. **Marohn MR.** Laparoscopic Colon Surgery: Pitfalls and Tips. Invited outside speaker to Fairfax Hospital Surgery Grand Rounds, Fairfax, VA. October 1999.
5. **Marohn MR.** Radio-Image Guided Surgery. Featured speaker at *American College of Surgeons Metropolitan Washington Chapter "All Surgeons Day"*, Washington, DC. March 2000.
6. **Marohn MR.** Computer Assisted Surgery- Current Technology and Limitations. Featured speaker at *International Laparoscopic Surgery Symposium*, IRCAD, University Louis Pasteur, Strasbourg France, 10-11 September 2001.
7. **Marohn MR.** Operating Room of the Future. *Telemedicine and Advanced Technology Research Center (TATRC)* symposium, Baltimore, MD, 8-9 November 2001
8. **Marohn MR.** Laparoscopic adrenalectomy: lessons learned in 10 years. Featured speaker at Annual Meeting of the *Philippine College of Surgeons (PCS)*, Manila, Philippines, 3-5 December 2001.
9. **Marohn MR.** Surgical Education: Principles and Practice. Invited outside speaker to Georgetown University Surgery Grand Rounds. Washington, DC. April 2002.
10. **Marohn MR.** Ultrasound and the Surgeon. Invited outside speaker to Ohio State University Surgery Grand Rounds. Columbus, OH. June 2002.
11. **Marohn MR.** Lapaorscopic colon surgery: challenges and pitfalls. Featured speaker at Annual Meeting of the *Philippine College of Surgeons (PCS)*, Manila, Philippines, 2-4 December 2002.
12. **Marohn MR.** Twenty-first century surgery using twenty-first century technology: they way ahead. Featured speaker at Emerging Surgical Technology meeting, Seoul National University School of Medicine, Seoul, Korea, 6 December 2002.
13. **Marohn MR,** Moses G, Gallagher A, *et al.* MMVR: Medicine Meets Virtual Reality, Panel chair on simulators in surgical education, Marina del Rey, CA, 13-15 January 2003.
14. **Marohn MR.** Laparoscopic Colon Surgery: Experience with Total Abdominal Colectomy. Featured speaker at *International Laparoscopic Colorectal Surgery Symposium*, IRCAD, University Louis Pasteur, Strasbourg France, February 2003.
15. **Marohn MR.** 21st Century Surgery Using 21st Century Technology: Surgical Robotics. Featured speaker at 50th Annual *Society of Air Force Clinical Surgeons (SAFCS)* Symposium, San Antonio, TX, 30 March - 3 April 2003.

16. **Marohn MR.** Surgical robotics / computer assisted surgery: What's next? _Invited outside speaker to Johns Hopkins Monthly Surgery Research Conference, 14 April 2003.
17. **Marohn MR.** Ultrasound applications in surgery. Ohio State University surgery meeting. Columbus, OH, 21 April 2003.
18. **Marohn MR.** Ultrasound for surgeons. Georgetown University surgery grand rounds. Washington, DC, 10 June 2003.
19. **Marohn MR.** 21st Century surgery: Two Faces of the Coin: High Technology and High cost. Keynote speaker at Annual *Society of Italian Endoscopic Surgeons (SICE)* meeting, Sorrento, IT, 21 September 2003.
20. **Marohn MR.** Imaging and Intervention: From Crisis Management to Risk Management. Keynote speaker at 10th Annual *D/COM* meeting, Baltimore, MD, 23 September 2003.
21. **Marohn MR.** Emerging surgical technologies: Computer assisted surgery. IRCAD/EITS *International Advanced Laparoscopic Surgery* meeting, Strasbourg, France, 22 November 2003.
22. **Marohn MR.** Surgical Robotics: Role in Simulation and Training. Featured speaker at *TATRC Integrated Research Team (IRT)* meeting, Marina del Rey, CA, 9 September 2004.
23. **Marohn MR.** Laparoscopic Surgery for Colon Cancer: Is it a good idea? *31st Annual Topics in Gastroenterology and Liver Disease*, Johns Hopkins, Baltimore, MD, 28-30 September 2004.
24. **Marohn MR.** Surgical Simulators: Current Status in Surgical Education. Invited outside speaker for Johns Hopkins Surgery Research Conference, 30 September 2004.
25. **Marohn MR.** Robotics in General Surgery: 21st Century Surgery using 21st Century Technology. Featured speaker at Annual *American College of Surgeons (ACS)* Clinical Congress, New Orleans, LA, 11 October 2004.
26. **Marohn MR.** Challenges in the Assessment and Implementation of Surgical Technology. Featured speaker at Annual *American College of Surgeons (ACS)* meeting, New Orleans, LA, 12 October 2004.
27. **Marohn MR.** Future of Robotics in Surgery. Keynote speaker at *International Robotics meeting*, Amsterdam, NL, 2-3 November 2004.
28. **Marohn MR.** Laparoscopic surgery applications in oncology. Johns Hopkins Oncology Grand Rounds, Baltimore, MD, 19 November 2004.
29. Minken S, Peoples G, **Marohn MR.** War Surgery 2005: New Challenges and Technologies. Johns Hopkins Surgery Grand Rounds, 10 February 2005.
30. **Marohn MR.** Laparoscopic colon surgery for cancer. *Colorectal Surgery Symposium*, Johns Hopkins, Baltimore, MD, 31 March-1 April 2005.
31. **Marohn MR.** Patient Safety in the Perioperative Environment. *TATRC Integrated Research Team* meeting, Frederick, MD, 20-22 June 2005.
32. **Marohn MR.** Laparoscopic anti-reflux surgery: Lessons learned. *32nd Annual Topics in Gastroenterology and Liver Disease*, Johns Hopkins, Baltimore, MD, 29-29 September 2005.
33. **Marohn MR.** Advanced surgical technologies. *TATRC Product Line Review*. Frederick, MD, 4

October 2005.

34. **Marohn MR.** Robotics and its role in globalization of health care. Invited keynote speaker at *Scientific, Ethical and Technological Pillars Of Actual Medicine*, Panama City, Panama, 19-22 Oct 2005.
35. **Marohn MR.** Operating Room/ Interventional Suite of the Future. Invited keynote speaker at *Scientific, Ethical and Technological Pillars Of Actual Medicine*, Panama City, Panama, 19-22 Oct 2005.
36. **Marohn MR.** No Instrument Left Behind: Partnership Initiative to Harness Technology to Improve Surgery. CISST/ ERC Industrial Affiliates Meeting, Baltimore MD, 12 January 2006.
37. **Marohn MR.** I4M Vision: Integrating Imaging, Intervention, and Informatics. Framing address for I4M Symposium: "Advancing Technology for Patient Care and Safety", Baltimore MD, 27 February 2006.
38. **Marohn MR.** Current Surgical Treatment of Achalasia. *23rd Annual Medical and Surgical Gastroenterology symposium*, Snowmass, CO, 29 January-02 February 2006.
39. **Marohn MR.** Procedure Room/ Operating Room of the Future. *23rd Annual Medical and Surgical Gastroenterology symposium*, Snowmass, CO, 29 January-02 February 2006.
40. **Marohn MR.** Applications of Next Generation Data Management in Healthcare. Keynote speaker for 'M' Language Symposium, launching new Data Center at the Massachusetts Institute of Technology (MIT), Boston MA, 7 March 2006.
41. **Marohn MR** and Thompson C. Challenges to Solve with Gastric Closure for NOTES Surgery. Seminal presentation at 1st International conference on NOTES, Scottsdale AZ, 9-10 March 2006.
42. **Marohn MR.** 'Smart' Surgical Technology: What's Next? Johns Hopkins Surgery Grand Rounds, Baltimore MD, 16 March 2006.
43. **Marohn MR.** Laparoscopic anti-reflux surgery: Lessons learned after 14 years. Keynote speaker for annual Meeting of the *Virginia Society of Surgery*, Williamsburg VA, 28-29 April 2006.
44. **Marohn MR.** Interventional Suites of the Future. Invited keynote address for annual meeting of the *Virginia Society of Surgery*, Williamsburg VA, 28-29 April 2006.
45. **Marohn MR.** Future directions for robotics research. Invited presentation to the 1st International Consensus Conference on Surgical Robotics, convened by a joint *Minimally Invasive Robotics Association (MIRA)* – *Society of American Gastrointestinal Endoscopic Surgeons (SAGES)* taskforce, New York City, 9-10 June 2006.
46. **Marohn MR.** Robots, Robotic Surgery, and Future Applications. Featured presentation at the 61st Annual Meeting of the *American Society for Surgery of the Hand (ASSH)*, Washington DC, 7-9 September 2006.
47. **Marohn MR.** What technologies do we need for 21st century medical interventions? Keynote commencement speaker, American University of the Caribbean School of Medicine, St. Maartin (Netherlands), 28 October 2006.

OTHER PROFESSIONAL ACCOMPLISHMENTS

Humanitarian / international health activities

- 1977-1979 Chief Extern, Municipal Communicable Disease Hospital (MCDH), lived on site, taking call once weekly evaluating referral infectious disease patients, Chicago, IL
- 1/1978 Medical Mission to Haiti, providing medical evaluation for indigent, Port-au-Prince, Haiti
- 7/1978 Kalaupapa Leper Colony, volunteer extern caring for Hansen's disease patients, Molokai, Hawaii
- 1/1979 Medical Mission to Haiti, providing medical evaluation for indigent, Port-au-Prince, Haiti
- 1985-1987 Volunteer surgery in Turkish hospitals, performing surgery with local surgeon, Dr. Ozhan Surer, once weekly, Adana, Turkey
- 1992-2003 Annual surgical education mission to South Korea, bringing updates on emerging techniques and technologies to US military surgeons and Korean nationals, Seoul, Korea
- 2001 Philippine General Hospital, part of volunteer visiting US academic surgeons, with Drs. Herand Abcarian and David C. Wherry, Manila, Philippines