

Jonathan A. Schoen, M.D. FACS

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Jonathan.Schoen@ucdenver.edu

Education

Colgate University

B.A. Biology; 1993

Touro College School of Health Sciences

M.A. Biomedical Sciences; 1994

Technion Israel Institute of Technology

B. Rappaport Faculty of Medicine

M.D.; 1998

Post-Doctoral Training

Internship

General Surgery - University of Colorado Health Sciences Center

July 1998 – June 1999

Residency

General Surgery - University of Colorado Health Sciences Center

July 1999 – June 2003

Fellowship

Minimally Invasive Bariatric Surgery - University of Colorado Hospital

July 2003 – June 2004

Awards and Honors

Ben Eiseman, MD Faculty Teaching Excellence Award

UCHSC School of Medicine, 2011

Golden Apple Outstanding Instructor Award

USHSC School of Medicine, 2001

Presidents Award - University of Colorado Hospital, 2012

Barry Z. Levine Most Outstanding Student Award

Touro, 1994

Honors in Medicine, Pediatrics, OB/GYN, Psychiatry

Technion Israel Institute of Technology

Licensure

State of Colorado, Physician License #41803

Original Issue 2003

DEA License, BS8424335

Issued 4/13/09

ECFMG; #0-547-165-1 - Issued 6/1998

ATLS; 3/2003, 8/2013

PALS; 6/2002

Certification

American Board of Surgery; #049244 – Issued: May 3, 2004
-Recert: Dec 9, 2013

Academic Appointments

Associate Professor of Surgery
Director, Surgical Weight Loss Center
Director, Minimally Invasive Bariatric Surgery Fellowship
Division of GI, Tumor and Endocrine Surgery
University of Colorado Hospital
July 2011 – Present

Associate Professor of Surgery
Division of General Surgery
Veterans Affairs Medical Center
July 2011 – Present

Assistant Professor of Surgery
Director, Surgical Weight Loss Center
Director Minimally Invasive Bariatric Surgery Fellowship
Division of GI, Tumor and Endocrine Surgery
University of Colorado Hospital
June 2004 – July 2011

Assistant Professor of Surgery
Division of General Surgery
Veterans Affairs Medical Center
July 2004 – July 2011

Clinical Instructor in Surgery
University of Colorado Hospital
July 2003 – June 2004

Clinical Instructor in Surgery
Veterans Affairs Medical Center
July 2003 – June 2004

Special Faculty Appointment
University of Colorado at Boulder Graduate School
Department of Mechanical Engineering
MS and PhD Committees
June 2010 – Present

Medical Organizations

Founding President and CEO The Colorado Chapter of the American Society of Metabolic and Bariatric Surgeons; 9/2014

American College of Surgery; Fellow, 2007

American Society for Metabolic and Bariatric Surgeons; 2003 – Present

Colorado Chapter, American College of Surgery; 2003 – Present

Colorado Representative – CAS Council of Representatives, 2003

Society American Gastrointestinal Endoscopic Surgeons; 2003 – Present

Denver Academy of Surgery; 2008 – Present

Southwestern Surgical Congress; 2008 – Present

Paid Position

Center for Personalized Education for Physicians (CPEP)
Interviewer and chart review
2009 – Present

Committee Appointments

Hepatocellular Cancer Center, VA Medical Center
Surgical Representative
2003 – Present

Antimicrobial Subcommittee, University of Colorado Hospital
Surgical Representative
2005 – Present

Patient and Family Centered Care, University of Colorado Hospital
2005 – Present

Trauma Committee, University of Colorado Hospital; 2005 – Present

Surgical Preceptor – UCHSC Family Medicine Residency 2006-2009

UCHSC Office of Diversity – Underprivileged Physician Mentorship Program: 2005 - Present

University of Colorado School of Medicine Admissions Committee
2009 – Present

Safe Patient Handling Committee 2010-Present

Surgical Volunteer

International Surgical Missions – Philippines 1/2008

International Surgical Missions – Philippines 1/2009

International Surgical Missions – Ecuador 6/2010

International Surgical Missions – Guatemala 10/2012

Research

1. **Schoen JA** – P.I. Mechanisms of Improvement of Type 2 Diabetes Mellitus Following Bariatric Surgery. COMIRB and CTSC approval Pending. Funding: Dept of Surgery AEF \$40,000 seed grant.
2. **Schoen JA** – P.I. In Vivo Robotic Capsule Endoscopy for Small Bowel and Colonoscopy. Funding: Dept of Surgery AEF \$30,000 seed grant.
3. **Schoen JA** – P.I. Sleeve Gastrectomy as a Primary Weight Loss Procedure. COMIRB # 06-0371 (study in progress).
4. **Schoen JA** – P.I., Bustamante A, Dinarello, C. The Effects of Obesity and Bariatric Surgery – Mediated Weight Loss on Expressible and Inducible Cytokine Production Including the Use of Proteomics. COMIRB #06-1138 (study on hold).
5. **Schoen JA** – Consultant, Cornier M – P.I. Neuronal Responses to Effective Weight Loss Maintenance Strategies. NIH R01: #R01DK089095, \$521,372 (study in progress).
6. Rentschler ME – P.I., **Schoen JA** – Collaborator, Qi H. New Dynamic Tissue Modeling for Mobile *In vivo* Surgical Robots. Duration: 7/1/2009-6/30/2010. Funding: AEF Innovative Seed Grant \$41,250.
7. Bambha K – P.I., **Schoen JA** – Co-investigator. Nonalcoholic Fatty Liver Among Obese Patients Undergoing Bariatric Surgery: The Effect of Weight Loss on Clinical, Biochemical and Liver Histopathologic Features and Examination of Potential Biochemical and Genetic Factors in Disease Pathogenesis and Progression/Regression. COMIRB #10-0585 (study in progress).
8. **Schoen JA**, Chae FH. The Use of Peri-strips for Staple-Line Reinforcement During Laparoscopic Gastric Bypass May Reduce Perioperative Complications (study completed).
9. The RESTORE Trial: A Multicenter, Prospective, Randomized, Controlled Trial Comparing EndoCinch for Narrowing an Enlarged Gastrojejunostomy After Gastric Bypass Failure Versus Sham Procedure (study ended early).
10. A Phase 3b, Multicenter, Double-Blind, Placebo Controlled, Parallel Study of Alvimopan for the Management of Postoperative Ileus (study completed).
11. A Multicenter, Double-Blind, Randomized, Phase 3 Study to Compare the Safety and Efficacy of Intravenous Doripenem With That of Meropenem in Complicated Intra-abdominal Infections (study completed).
12. A Multicenter, Randomized, Double-Blind, Placebo-Controlled Study to Evaluate the Efficacy and Safety of Intravenous (IV) Ulimorelin Administered Post-Operatively to Accelerate Recovery of Gastrointestinal (GI) Motility in Subjects Who Have Undergone Partial Bowel Resection (TZP-101-CL-P007) COMIRB 11-0880 (study complete)

13. A Multicenter, Randomized, Double-Blind, Placebo-Controlled Study to Evaluate the Efficacy and Safety of Intravenous (IV) Ulimorelin Administered Post-Operatively to Accelerate Recovery of Gastrointestinal (GI) Motility in Subjects Who Have Undergone Partial Bowel Resection (TZP-101-CL-P008) (study complete)

14. A Phase II, Double-Blind, Placebo-Controlled, Multiple-Dose Study to Evaluate the Safety and Efficacy of Ipamorelin Compared to Placebo for the Management of Post-Operative Ileus in Patients who have Undergone Partial Bowel resection Surgery” COMIRB 08-0749 (study complete)

Presentations Scientific

1. Clarke J, Robinson T, **Schoen JA**, Walsh W. Major Mesh-Related Complications Following Hernia Repair; Events Reported to the Food and Drug Administration. Presented during the scientific sessions, SAGES, April 2005.
2. Escobar G, **Schoen JA**. Laparoscopic Repair of Median Arcuate Syndrome. Presented at the Southwestern Surgical Congress, April 2008.
3. Lee J, **Schoen JA**. Selective Renal Artery Embolization After Stab Wound to Solitary Kidney. Presented at the Southwestern Surgical Congress, March 2009.
4. Yogel R, **Schoen JA**. Occult GI Bleed Diagnosed and Treated by Laparoscopy – Proposal for a New Diagnostic Algorithm. Presented at the Southwestern Surgical Congress, March 2010.
5. **Schoen JA**, Terry B, Rentschler M. Single Incision Laparoscopic Surgery with a Novel Port Camera System. Poster presentation – SAGES Annual National Conference, April 2010.
6. Powell R, **Schoen JA**. Outcomes of Medicaid Patients Following Laparoscopic Gastric Bypass. Poster presentation – ASBMS Annual National Conference, June 2010.
7. Sliker LJ, **Schoen JA**, Rentschler ME. Preliminary *In vivo* Capsule Crawler Mobility. ASME International Design Engineering and Technical Conference-1-Mechanisms and Robotics Conference. Montreal, Quebec, Canada, August 2010.
8. Terry BS, **Schoen JA**, Rentschler ME. Preliminary Mechanical Characterization of the Small Bowel for *In vivo* Mobility. ASME International Mechanical Engineering Congress and Exposition. Vancouver, British Columbia, Canada, November 2010.
9. **Schoen JA**, Mills ZC, Terry BS, Rentschler ME. A SILS-specific Camera System. Poster presentation - SAGES Annual National Conference, April 2011.

10. **Schoen JA**, Sliker LJ, Rentschler ME. A Locomotion System for Capsule Mobility. Poster presentation - SAGES Annual National Conference, April 2011.
11. Terry, B.S., Francisco, M., **Schoen, J.A.**, Rentschler, M.E. "Sensor for Measuring the Contact Force from Human Myenteric Contractions for In vivo Robotic Capsule Endoscope Mobility," ASME Design of Medical Devices Conference, Minneapolis, MN, April, 2013
12. Terry, B.S., Lyle, A., **Schoen, J.A.**, Rentschler, M.E., "Preliminary Mechanical Characterization of the Small Bowel for In vivo Mobility," ASME International Mechanical Engineering Congress and Exposition, Vancouver, British Columbia, Canada, November, 2010 (IMECE2010-37010)
13. Mills, Z., Terry, B., **Schoen, J.A.**, Rentschler, M.E., "Single Port Access Surgery with a Novel Magnet Camera System," ASME International Mechanical Engineering Congress and Exposition, Denver, CO, November, 2011
14. Lyle, A., Terry, B., **Schoen, J.A.**, Rentschler, M.E., "An Experimental Evaluation of Small Bowel Friction Forces when Eliminating Edge Effects," ASME International Mechanical Engineering Congress and Exposition, Denver, CO, November, 2011 (IMECE2011-63943)
15. Kern, M., Sliker, L.J., **Schoen, J.A.**, Rentschler, M.E., "Preliminary In vivo Capsule Endoscopic Mobility Using Micro-Patterned Treads," ASME International Mechanical Engineering Congress and Exposition, Denver, CO, November, 2011 (IMECE2011-63723)
16. Sliker, L.J., **Schoen, J.A.**, Rentschler, M.E., "The Design and Experimental Evaluation of Micro-Patterned Treads for In vivo Robotic Mobility," ASME International Mechanical Engineering Congress and Exposition, Denver, CO, November, 2011
17. Terry, B.S., **Schoen, J.A.**, Rentschler, M.E., "Development and Characterization of a Novel Sensor for Measuring the Radial Force from Myenteric Contractions," ASME International Mechanical Engineering Congress and Exposition, Denver, CO, November, 2011
18. Zimkowski, M.M., Lanning, C., Rech, B., Glang, R., Mandava, N., Mandava, N., **Schoen, J.**, Rentschler, M., Shandas, R., "Mechanical Evaluation of Surgical Meshes Integrated with New Shape-Memory Polymer for Abdominal Wall Defect Repair," Poster Presentation - American Hernia Society, March, 2012.
19. Sliker, L., Kern, M.D., **Schoen, J.A.**, Rentschler, M.E., "Biologically Inspired Micro-Patterned Treads for Robotic Capsule Endoscope Mobility," Covidien R&D Summit, Westminster, CO, October, 2011
20. Terry, B.S., **Schoen, J.A.**, Rentschler, M.E., "Experimental Measurements of the Radial Force from Myenteric Contractions on a Solid Bolus," Covidien R&D Summit, Westminster, CO, October, 2011.

21. **Schoen, J.A.**, Leopold, D., James, J., Jones, E., Mitchell, B., Hirth, D. "Improvement In High Sensitivity C-Reactive Protein Following Bariatric Surgery and Correlation to HgbA1c," Poster Presentation – ASMBS Obesity Week, Atlanta, GA 11/2013
22. **Schoen, J.A.**, Leopold, D., James, J., Jones, T., Mitchell, B., Hirth, D., Kweku. "Sleeve Gastrectomy: 7 Year Weight Loss Outcomes" Poster Presentation – ASMBS Obesity Week, Atlanta, GA 11/2013.
23. Schoen, J.A., Kramer, E.A., Rentschler, M.E., "Tissue Storage *Ex Vivo* Significantly Increases Vascular Fusion Bursting Pressure" Podium presentation – SAGES 2014

Invited Lectures

1. Montrose Fall Clinics. *Surgical Treatment of Morbid Obesity. Debate: Medicine vs. Surgery for the Treatment of Obesity.* Montrose Hospital, Montrose, CO. Sept 2013
2. High Country chapter of the American Nephrology Nurses Association. Keynote Speaker. *Bariatric Surgery and the Renal Patient.* Wynkoop, Denver, CO March 2013
3. Colorado Society for Parenteral and Enteral Nutrition. Doubletree Hotel, Denver, CO. *Morbid Obesity: The Surgical Approach.* Keynote Speaker, September 2011.
4. Rocky Mountain Metabolic Syndrome Symposium, Renaissance Hotel, Denver, CO. *Surgery for Diabetes*, April 2009.
5. Rocky Mountain Council on Renal Nutrition. National Kidney Foundation. Rocky Mountain Lions Eye Institute. University of Colorado *Bariatric Surgery and the Renal Patient*, August 2009.
6. Department of Veterans Affairs Employee Education System and VA National Center for Health Promotion and Disease Prevention (NCP). Renaissance Hotel, Denver, CO. *Move! Forward Together for VISNs 11-23. Bariatric Surgery*, July 2009.
7. Horizons in Surgery. University of Colorado Health Sciences Center, Division of General Surgery. Beaver Run Resort, Breckenridge, CO. *Approach to the Gastric Bypass Patient with Acute Abdominal Pain*, March 2006.
Minimally Invasive Bariatric Surgery, March 2004 & March 2005
Neoadjuvant Therapy for Esophageal Cancer, March 2003
Carotid Endarterectomy for Asymptomatic Stenosis, March 2002
8. University of Colorado Health Sciences Center, Dept of Medicine, Division of Gastroenterology Grand Rounds. *Minimally Invasive Bariatric Surgery*, January 2006.

9. University of Colorado Health Sciences Center, Dept of Medicine, Division of Endocrinology Grand Rounds: *Minimally Invasive Bariatric Surgery*, October 2005.
Morbid Obesity and Metabolic Syndrome, The Surgical Approach, October 2011
10. Family Practice Review – 50th and 51st Annual. University of Colorado Health Sciences, Dept of Family Medicine. YMCA of the Rockies, Estes Park, CO. *Minimally Invasive Bariatric Surgery*, June 2005 and November 2005.
11. Internal Medicine Program – 42nd Annual. University of Colorado Health Sciences, Dept of Medicine. YMCA of the Rockies, Estes Park, CO. *Minimally Invasive Bariatric Surgery*, July 2006.
12. University of Colorado Health Sciences Center, Dept of Surgery Grand Rounds.
Minimally Invasive Bariatric Surgery, December 2004 & 2005
Bariatric Surgery Update, January 2008, December 2009, 2010, 2011, 2013, 2014
13. University of Colorado Hospital, Dept of Staff Grand Rounds
Surgical Volunteerism – Philippines 2008, March 2008
Surgical Volunteerism – Philippines and Ecuador 2009, September 2009
14. University of Colorado Health Sciences Center, Multidisciplinary Staff Grand Rounds, *Minimally Invasive Bariatric Surgery*, January 2005, March 2011.
15. St. Mary's Hospital Grand Rounds. *Surgical Treatment of Morbid Obesity*. July 2014
Grand Junction, CO
16. Multidisciplinary Staff Grand Rounds, Salem Hospital. Salem, OR. *Minimally Invasive Bariatric Surgery*, February 2005
17. Northern Plains Vascular Surgery Society. Denver, CO. *Carotid Endarterectomy for Asymptomatic Stenosis*, January 2001.

News/Media

1. Rocky Mountain News. Article by Rachel Branch on Bariatric Surgery. December 2004.
2. Channel 9 News. Interview with Dr. Steph Clements. Bariatric Surgery. April 2006.
3. Channel 5 Fox 31 News. Televised interview – Sleeve Gastrectomy, May 2007.
4. Channel 4 News. Televised interview - Medical Tourism. May 2008.
5. Channel 7 News. "It's Your Business" segment. Joana Canals. July 2010.

Publications

1. Robinson T, Clark J, **Schoen JA**, Walsh M. Major Mesh-related Complications Following Hernia Repair: Events Reported to the Food and Drug Administration. *Surg Endoscopy* 19(12): 1556-60, December 2005.
2. Campsen J, Zimmerman M, **Schoen JA**, Wachs M, Bak T, Mandell MS, Kam I. Adjustable Gastric Band Placement at Time of Liver Transplant. *Obesity Surgery* 19 (12): 1625-7, December 2008.
3. Flaig TW, Kim FJ, La Rosa FG, Breaker K, **Schoen JA**, Russ P. Colonic Pneumatosis and Intestinal Perforations with Sunitinib Treatment for Renal Cell Carcinoma. *Invest New Drugs* 27 (1):83-7, February 2009.
4. Terry BS, Ruppert AD, Steinhaus Kr, **Schoen JA**, Rentschler ME. An Integrated Port Camera and Display System for Laparoscopy. *IEEE Transactions on Biomedical Engineering* 57(5):1191-1197, 2010.
5. Sliker, L.J., Wang, X., **Schoen, J.A.**, Rentschler, M.E. Micropatterned Treads for In vivo Robotic Mobility. *ASME Journal of Medical Devices*. 4(4): 041006-1-041006-8, 2010
6. Terry BS, **Schoen JA**, Rentschler ME. Experimental Measurements of the Radial Force from Myenteric Contractions on a Solid Bolus. *Surgical Endoscopy*. Manuscript SEND-11-1327, Sept 2011.
7. Terry BS, Lyle AB, **Schoen JA**, Rentschler ME. Preliminary Mechanical Characterization of the Small Bowel for *In vivo* Robotic Mobility. *ASME J of Biomech*, Sept 2011.
8. Zimkowski, M.M., Rentschler, M.E., **Schoen, J.A.**, Rech, B.A., Mandava, N., Shandas, R. Integrating a novel shape memory polymer into surgical meshes decreases placement time in laparoscopic surgery: an in vitro and acute in vivo study. *J Biomed Mater Res A*. 2013 Sep;101(9):2613-20. PMID: 23412974
9. Wang, X., **Schoen, J.A.**, Rentschler, M.E. A Quantitative Comparison of Soft Tissue Compressive Viscoelastic Model Accuracy. *Journal of Mechanical Behavior of Biomedical Materials*. 2013, Apr;20:126-36. PMID: 23455169
10. Terry, B.S., **Schoen, J.A.**, Rentschler, M.E. Measurements of the Contact Force from Myenteric Contractions on a Solid Bolus. *Journal of Robotic Surgery*. 7(1): 53-57, 2013
11. Terry, B.S., Passernig, A.C., Hill, M., **Schoen, J.A.**, Rentschler, M.E. Small Intestine Mucosal Adhesivity to In vivo Capsule Robot Materials. *Journal of Mechanical Behavior of Biomedical Materials*. 2012 Nov;15:24-32. PMID: 23026729
12. Sliker, L., Kern, M., **Schoen, J.A.**, Rentschler, M.E. Surgical Evaluation of a Novel Tethered Robotic Capsule Endoscope using Micro-Patterned Treads. *Surgical Endoscopy*. 2012 Oct;26(10):2862-9. PMID: 22538681
13. Terry, B.S., **Schoen, J.A.**, Rentschler, M.E. Characterization and Experimental Results of a Novel Sensor for Measuring the Contact Force from

Myenteric Contractions. IEEE Transactions on Biomedical Engineering. 2012 Jul;59(7):1971-7. PMID: 22531741

14. Terry, B.S., **Schoen, J.A.**, Mills, Z., Rentschler, M.E. Single Port Access Surgery with a Novel Port Camera System. Surgical Innovation. 2012 Jun;19(2):123-9. PMID: 21914703

15. Terry, B.S., Mills, Z., **Schoen, J.A.**, Rentschler, M.E. Single-Port-Access Surgery with a Novel Magnet Camera System. IEEE Transactions on Biomedical Engineering. 59(4): 1187-1193, 2012

16. Cezo, J.D., Kramer, E.A., **Schoen, J.A.**, Ferguson, V.L., Taylor, K.D., Rentschler, M.E. Tissue Storage *Ex Vivo* Significantly Increases Vascular Fusion Bursting Pressure. Surgical Endoscopy. 2014 Oct 16. PMID: 25318365

17. Jensen-Otsu, E., Ward, E.K., Mitchell, B., **Schoen, J.A.**, Rothchild, K., Mitchell, N.S., Austin, G.L. The Effect of Medicaid Status on Weight Loss, Hospital Length of Stay, and 30-day Readmission After Laparoscopic Roux-en-Y Gastric Bypass Surgery. Obes Surg. 2015 Feb;25(2):295-301. PMID: 25022673

18. Tsai AG, Hosokawa P, **Schoen J.A.**, Prochazka AV. Laboratory testing following gastric bypass surgery. Surg Obes Relat Dis. 2014 Mar-Apr;10(2):340-5. PMID: 24355327

19. Beccani M, Di Natali C, Sliker LJ, **Schoen J.A.**, Rentschler ME, Valdastrì P. Wireless tissue palpation for intraoperative detection of lumps in soft tissue. IEEE Trans Biomed Eng. 2014 Feb;61(2):353-61. PMID: 23974523

20. Zimkowski, M.M., Rentschler, M.E., **Schoen, J.A.**, Rech, B.A., Mandava, N., Shandas, R. Biocompatibility and tissue integration of a novel shape memory surgical mesh for ventral hernia: In vivo animal studies. J Biomed Mater Res B Appl Biomater. 2014 Jul;102(5):1093-100. PMID: 24327401

21. Ward EK, Jensen-Otsu E, **Schoen JA**, Rothchild K, Mitchell B, Austin GL. Acid suppression medications are associated with suboptimal weight loss after laparoscopic Roux-en-Y gastric bypass in patients older than 40 years. Surg Obes Relat Dis. 2014 Oct 7. PMID: 25553887

22. Hirth DA, Jones EL, Rothchild K, Mitchell B, **Schoen JA**. Laparoscopic Sleeve Gastrectomy: Long-term weight loss outcomes. Surg Obes Relat Dis. 2015 14-415R3 (manuscript accepted for publication)

Publications

Non-Peer Reviewed

1. Rhonda Schafer-McLean, MD PhD, Lisa Kassel, RD, **Jonathan Schoen, MD**, and Jill Davies, MD. Pregnancy After Bariatric Surgery. Postgraduate Obstetrics and Gynecology 27(3):1-8, February 2007.

Book Chapters

1. **Schoen JA**, Chae FH. Diseases of the Appendix. Chapter 50 in McNally PR; ed. GI/Liver Secrets, Third Edition. Elsevier/Mosby, 2006: 431-434.

2. **Schoen JA**, Chae FH. Surgical Approach to the Acute Abdomen. Chapter 77 in McNally PR; ed. GI/Liver Secrets, Third Edition. Elsevier/Mosby, 2006:700-705.
3. **Schoen JA**, Chae FH. Obesity and Surgical Weight Loss. Chapter 79 In McNally PR; ed. GI/Liver Secrets, Third Edition. Elsevier/Mosby, 2006:718-722.
4. **Schoen JA**, Raeburn C, McIntyre R. Bariatric Surgery. Endocrine Surgery Chapter in McDermott M; ed. Endocrine Secrets. Third Edition. 2008.
5. Rothchild K, **Schoen JA**. Diseases of the Appendix. Chapter 49 in McNally PR; ed. GI/Liver Secrets, Fourth Edition. 2010.
6. Rothchild K, **Schoen JA**. Surgical Approach to the Acute Abdomen. Chapter 77 in McNally Pr; ed. GI/Liver Secrets Plus, Fourth Edition. Elsevier/Mosby, 2010.
7. **Schoen JA**. Obesity and Surgical Weight Loss. Chapter 79 in McNally PR; ed. GI/Liver Secrets Plus, Fourth Edition. Elsevier/Mosby, 2010.

Patents

1. Rentschler ME, **Schoen JA**. Laparoscopic Surgical Port Camera. S/N 61/356,414. Filing Date June 2010.
2. Rentschler ME, **Schoen JA**. Robotic Capsule Endoscope for Minimally Invasive Surgical Procedures, Micro-Patterned Treads for Friction Enhancement of a Robotic Capsule Endoscope in a Biological Environment, and Process for Fabrication of Micro-Treads. S/N 61/566,611
Filing Date: 3 Dec 2011.