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Oakland University William Beaumont School of Medicine
Associate Professor Emeritus of
Diagnostic Radiology and Molecular Imaging
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EDUCATION AND TRAINING

7/1977 – 6/1981	Massachusetts Institute of Technology B.S. Mechanical Engineering Pi Tau Sigma, Mechanical Engineering Honor Society	Cambridge, MA
7/1981 – 6/1985	University of Michigan Medical School Doctorate of Medicine	Ann Arbor, MI
7/1985 – 6/1986	University of Wisconsin Hospitals Transitional Internship	Madison, WI
7/1986 – 6/1987	New England Deaconess Hospital Radiology Residency	Boston, MA
7/1991 – 6/1995	University of Washington Hospitals and Clinics Radiology Residency	Seattle, WA
7/1995 – 6/1996	Hospital of the University of Pennsylvania Fellow, Interventional Radiology	Philadelphia, PA

LICENSURES AND CERTIFICATION

Certification

06/1995	Diplomate of the American Board of Radiology
11/1997	Certificate of Added Qualification in Vascular and Interventional Radiology
10/2017	Interventional Radiology/Diagnostic Radiology
1999 – 2004	Legs for Life - Coordinating Physician, Michigan
2002	Registered Vascular Technologist

License:

06/1996–6/5/2027 Michigan Medical License: 4301068439, exp. 6/5/2027
 06/1996 – 6/5/2027 Michigan Controlled Substance License: 4301068439, exp. 6/5/2027
 12/12/25-5/31/2028 Virginia Medical License: 0101288112
 3/2020-1/31/2024 Missouri Medical License: 2020010316
 3/2020-1/31/2024 Missouri Controlled Substance License: 2500059843
 8/2019–10/31/2023 Indiana Medical License: 01082721A, exp. 10/31/2023
 08/2019 – 10/2023 Indiana Controlled Substance License: 01082721B, exp. 10/31/2023
 10/2019–1/31/2022 Florida Medical License: ME 142820, exp. 1/31/2022
 7/20/2020-9/23/2021 Arizona Medical License: 60466, exp. 9/23/2021
 10/11/24-6/30/25 West Virginia Medical License 34432, exp 6/30/25
 Remote Previous Pennsylvania Medical Physician and Surgeon MD-056571-L
 Washington Physician and Surgeon MD00031385
 Massachusetts Physician Registration No. 58231, exp. 5/23/91

2/28/2028 Expires DEA MI BS4539740
 2/29/2028 Expires DEA VA FS1928677
 National Provider Identifier: 1821059049

PROFESSIONAL, ACADEMIC, ADMINISTRATIVE, CLINICAL POSITIONS

PROFESSIONAL POSITIONS

1979 – 1981 Harvard Medical School Boston, MA
 Biomedical Engineer MIT Thesis: Design, Construction and Testing of a Device for Building Lipid Bio-membranes

1982 Sarns, Inc., Ann Arbor, MI
 Design Engineer. Studied sternum opening and closure techniques during cardiac surgery. Designed a device for closing the sternum

1984 University of Michigan Medical School. Ann Arbor, MI
 Medical Research Designed and built device to manipulate cadaver knees to evaluate meniscus injury mechanisms

1987 – 1991 Boston Scientific Corporation Natick, MA
 Research Manager. Directed design, development, and animal and clinical studies of two percutaneously introduced implants – over-the-wire Greenfield filter and an expandable stent
 Senior Regulatory Affairs Specialist. Management and strategy for obtaining FDA approval of catheter related devices

1991 – 1993 Boston Scientific Corporation Consultant Clinical research, patents.

7/1996 – 12/1999 Associated Radiologists of Oakland County, P.C., Pontiac, MI
 Michael A. Savin, M.D.

Partner, Director, Interventional Radiology, St. Joseph Mercy - Oakland

1/2000-7/2023	Beaumont Health, Interventional Radiologist	Royal Oak, MI
1/2000-7/2023	Beaumont Hospital, Royal Oak	
1/2000-7/2023	Beaumont Hospital, Troy	
4/2013-7/2023	Beaumont Hospital, Grosse Pointe	
5/2009-7/2023	Associate Professor of Radiology Oakland University William Beaumont School of Medicine	Royal Oak, MI
4/2020-4/2022	All Star Health Care Solutions	
4/2020-6/2021	Cape Radiology, Interventional Radiologist	Cape Girardeau, MO
	Southeast Health	Cape Girardeau, MO
	Saint Francis Medical Center	Cape Girardeau, MO
	Poplar Bluff Regional Medical Center	Poplar Bluff, MO
3/2020-Current	Cross Country/MINT Locums	Grand Blanc, MI
3/2021-11/2023	Spartan Radiology - AHSA, Interventional Radiologist	Bay City, MI
4/2021-4/2024	McLaren Bay Region	Bay City, MI
10/2022-4/2023	Elkhart General Hospital	Elkhart, IN
2/2023-Current	Ascension Genesys Hospital/Henry Ford Health	Grand Blanc, MI
5/2023	McLaren Northern Michigan	Petoskey, MI
7/2023-Current	Precision IR, Interventional Radiologist	Farmington Hills, MI

COMMITTEES

Procedure Review Committee, St. Joseph Mercy – Oakland
Beaumont Cancer Committee
Beaumont Community Clinical Oncology Program Steering Committee
Beaumont Peripheral Vascular Intervention QA Committee
Beaumont Health Heart & Vascular Value Analysis Team (2015-2020)
Beaumont Trauma QI / Task Force (2015-2019)

PROFESSIONAL MEMBERSHIPS

American Roentgen Ray Society
Radiologic Society of North America
American College of Radiology
Society of Interventional Radiology
American Medical Association
American College of Surgeons Oncology Group
Michigan State Medical Society
Oakland County Medical Society
American College of Surgeons Oncology Group – Enrolling Physician
Community Clinical Oncology Program Member, Southwest Oncology Group

AWARDS AND HONORS

Michael A. Savin, M.D.

Pi Tau Sigma, M.I.T. Mechanical Engineering Honor Society

Boston Scientific 2000 John Abele Award for Science and Technology.
SOX™ System Technology

Sirtex Center of Excellence Designation

Certificate of Merit award for educational exhibit 97th Scientific Assembly and
Annual Meeting, Radiologic Society of North America, Chicago, IL Nov-Dec 2011

Top Doctor. U.S. News and World Report 2012-13

Top Doctor Award. Castle Connolly 2013-2026

Fellow, Society of Interventional Radiology January 5, 2015.

PUBLICATIONS

Matsumoto AH, Teitelbaum GP, Barth KH, Carvlin MJ, **Savin MA**, Strecker EP Tantalum vascular stents: In vivo evaluation with MR imaging Radiology 1989; 170:753-755

Greenfield LJ, **Savin MA** Comparison of titanium and stainless steel Greenfield vena caval filters Surgery 1989; 106:820-828.

Barth KH, Virmani R, Strecker EP, **Savin MA**, Lindisch D, Matsumoto AH, Teitelbaum GP Flexible tantalum stents implanted in aortas and iliac arteries: Effects in normal canines. Radiology 1990; 175:91-96

Matsumoto AH, Teitelbaum GP, Carvlin MJ, Barth KH, **Savin MA**, Strecker EP Gadolinium enhanced MR imaging of vascular stents. J Comput Assist Tomogr 1990; 14(3):357-361.

Strecker EP, Schneider B, **Savin MA**, Matsumoto AH Intravascular prosthesis: flexible tantalum stent (Strecker). Technical considerations In: Maynar-Moliner M, Castaneda-Zuniga WR, Joffre F, Zollikofer CL (eds). Percutaneous Revascularization Techniques. New York: Thieme Medical Publishers, 1993.

Savin MA, Bush WH, Starr F, Schmiedl UP, Nelson JA Blood back flow into angiographic catheters JVIR 1995; 6:807-812

Savin MA, Shlansky-Goldberg RD. Greenfield filter fixation in large venae cavae. JVIR 1998; 9:75-80

Savin MA, Panicker HK, Sadiq S, Albeer YA, Olson RE Placement of vena cava filters: factors affecting technical success and immediate complications. AJR 2002; 179:597-602.

Savin MA, Kirsch MJ, Romano WJ, Wang SK, Arpasi PJ, Mazon CD. Peritoneal ports for treatment of intractable ascites. JVIR 2005; 16:363-368.

Wong CO, Qing F, **Savin MA**, Campbell J, Gates VL, Sherpa KM, Lewandowski RJ, Nagle C, Salem R. Reduction of metastatic load to liver after intra-arterial hepatic ⁹⁰Y-radioembolization as evaluated by F-18 FDG PET imaging. JVIR 2005; 16:1101-1106.

Wong CO, **Savin MA**, Sherpa KM, Qing F, Campbell J, Gates VL, Lewandowski RJ, Thie J, Cheng V, Fink-Bennett D, Nagle C, Salem R. Regional yttrium-90 microsphere treatment of surgically unresectable and chemotherapy refractory metastatic liver carcinoma. Cancer Biotherapy and Radiopharmaceuticals 2006; 21(4):305-13.

Kennedy AS, McNeillie P, Dezarn WA, Nutting C, Sangro B, Wertman D, Garafalo M, Liu D, Coldwell D, **Savin MA**, Jakobs T, Rose S, Warner R, Carter D, Sapareto S, Nag S, Gulec S, Calkins A, Gates V, Salem R. Treatment parameters and outcome in 680 treatments of internal radiation with resin ⁹⁰Y-microspheres for unresectable hepatic tumors. Int J Radiation Oncology Biol. Phys 2009; 74(5):1494-1500.

Schultz C, Campbell, J, Bakalyar D, Beauvais M, Feng W, **Savin MA**, Y-90 Microsphere therapy – Prevention of adverse events Cancer Biotherapy & Radiopharmaceuticals 2009; 24(4):427-433.

Konda A, **Savin MA**, Cappell MS, Duffy MC. Radiation microsphere-induced GI ulcers after selective internal radiation therapy for hepatic tumors: an under recognized clinical entity. Gastrointestinal Endoscopy 2009; 70(3):561-567.

Morden, P, Sokhandon F, Miller L, **Savin MA**, Kirsch M, Farah M, Silbergleit R. The role of saline flush injection rate in displacement of CT-injectable peripherally inserted central catheter tip during power injection of contrast material AJR 2014; 202:W13-W18.

Sag AA, **Savin MA**, Lal N, Mehta R. Yttrium-90 radioembolization for liver malignancies: Gallbladder effects. AJR 2014; 202:1130-1135.

Kennedy AS, David Ball D, Cohen SJ, Cohn M, Coldwell D, Drooz A, Ehrenwald E, Kanan S, Rose SC, Nutting CW, Moeslein FM, **Savin MA**, Schirm S, Putnam SG, Navesh K, Sharma NK, Wang EA. Multicenter evaluation of the safety and efficacy of radioembolization in patients with unresectable colorectal liver metastases selected as candidates for ⁹⁰Y resin microspheres. J Gastrointestinal Onc April 2015; 6(2):134-142.

Kennedy AS, Ball D, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Nutting CW, Moeslein FM, Putnam SG, Rose SC, **Savin MA**, Schirm S, Sharma NK. Hepatic imaging response to radioembolization with yttrium-90-labeled resin microspheres for tumor progression during systemic chemotherapy in patients with colorectal liver metastases J Gastrointestinal Onc December 2015; 6(6):594-604. PMID: 26697190

Savin MA, Chehab M, Campbell J, Savin JH, Cash C, Wong CO, Schultz CC. Yttrium-90 infusion: Incidence and outcome of delivery system occlusions during 885 deliveries. JVIR December 2015; 26:1769-1776. PMID: 26481823

Kennedy AS, Ball DS, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Rose SC, Nutting CW, Moeslein FM, **Savin MA**, Schirm S, Putnam SG, Sharma NK, Wang E,. Safety and efficacy of radioembolization in elderly (≥70 years) and younger patients with unresectable liver-

dominant colorectal cancer Clinical Colorectal Cancer (in press) Clin Colorectal Cancer 2015 Nov 2 pii: S1533-0028(15)00111-5. doi: 10.1016/j.clcc.2015.09.001. [Epub ahead of print] PMID: 26541321

Kennedy AS, Ball DS, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Nutting CW, Moeslein FM, Putnam SG 3rd, Rose SC, **Savin MA**, Schirm S, Sharma NK, Wang EA. Hepatic imaging response to radioembolization with yttrium-90-labeled resin microspheres for tumor progression during systemic chemotherapy in patients with colorectal liver metastases Journal of gastrointestinal oncology 12/2015; 6(6): 594-604. 26697190

Wong CO, **Savin MA**, Sherpa KM, Qing F, Campbell J, Gates VL, Lewandowski RJ, Nagle C, Salem R. Regional yttrium-90 microsphere treatment of surgically unresectable and chemotherapy refractory metastatic liver carcinoma Cancer and Radiopharmaceuticals 06/2016 16999596

Kennedy AS, Ball DS, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Rose SC, Nutting CW, Moeslein FM, **Savin MA**, Schirm S, Putnam SG, Sharma NK, Wang E., Safety and efficacy of radioembolization in elderly (≥ 70 yrs) and younger patients with unresectable liver-dominant colorectal cancer. Clinical Colorectal Cancer 2016; 15:141-151. PMID# 26541321 doi: 10.1016/j.clcc.2015.09.001

Narsinh KH, Van Buskirk M, Kennedy AS, Suhail M, Aisaikhan N, Hoh CK, Thurston K, Minocha J, Ball DS, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Nutting CW, Moeslein FM, **Savin MA**, Schirm S, Putnam SG, Sharma NK, Wang EA, Rose SC. Hepatopulmonary shunting: A prognostic indicator of survival in patients with metastatic colorectal adenocarcinoma treated with 90Y radioembolization. Radiology 2017; 282:281-288. PMID# 27440733 doi: 10.1148/radiol.2016152100

Narsinh KH, Van Buskirk M, **Savin MA**, Kennedy AS, Rose SC Lung shunting: An indicator of survival, but not necessarily a tool for selecting patients for radioembolization. Letter to the editor response Radiology 2017; 282:612-613 PMID# 28099100

Kennedy AS, Ball D, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Moeslein FM, Nutting CW, Putnam SC, Rose SC, **Savin M**, Schirm S, Sharma NK, Wang E. Baseline hemoglobin and liver function predict tolerability and overall survival of patients receiving radioembolization for chemotherapy-refractory metastatic colorectal cancer. J Gastrointest Oncol 2017; 8:70-80 01/2017 PMID# 28280611 doi: 10.21037/jgo.2017.01.03

Kennedy A, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kaiser A, Nutting CW, Rose SC, Wang EA, **Savin MA**. Updated survival outcomes and analysis of long-term survivors from the MORE study on safety and efficacy of radioembolization in patients with unresectable colorectal cancer liver metastases. J Gastrointest Oncol 2017; 8(4):614-624. PMID# 28890810 doi: 10.21037/jgo.2017.03.10

Savin JH, Kesselman A, Kiefer RM, Niekamp AS, **Savin MA**. Inferior Vena Cava Filter. In: Shafa J, Kee ST (eds). Learning Interventional Radiology. Philadelphia: Elsevier, Inc, 2019.

Balanescu DV, Kado HS, Mertens A, Chand R, **Savin M**, McNally V, Bowers TR. Mechanical thrombectomy in pulmonary embolism associated with COVID-19: A “clotography” gallery. Vascular

and Endovascular Surgery 2021; 55(8): 903-906. DOI: 10.1177/15385744211037600. PMID: 34355600.

Toma C, Bunte MC, Cho KH, Jaber W, Chambers J, Stegman B, Gondi S, Leung DA, **Savin M**, Khandhar S, Kado HS, Koenig G, Weinberg M, Beasley RE, Roberts J, Angel W, Sarosi MG, Qaqi O, Veerina K, Brown MA, Pollak JS. Percutaneous mechanical thrombectomy in a real-world pulmonary embolism population: Interim results of the FLASH registry. Catheter Cardiovasc Interv. 2022;99:1345-1355; DOI: 10.1002/ccd.30091

Toma C, Jaber WA, Weinberg MD, Bunte MC, Khandhar S, Stegman B, Gondi S, Chambers J, Amin R, Leung DA, Kado H, Brown MA, Sarosi MG, Bhat AP, Castle J, **Savin M**, Siskin G, Rosenberg M, Fanola C, Horowitz JM, Pollak JS. Acute outcomes for the full US cohort of the FLASH mechanical thrombectomy registry in pulmonary embolism. EuroIntervention 2022; 17:1-1 published online. DOI: 10.4244/EIJ-D-22-00732

Horowitz J, Jaber W, Stegman B, Rosenberg M, Fanolae C, Bhat A, Gondi S, Castle J, Ahmed M, Brown M, Amin R, Bisharat M, Butros P, DuCoffe A, **Savin M**, Pollak J, Weinberg M, Brancheau D, Tomar C, for the FLASH Investigators. Mechanical Thrombectomy for High-risk Pulmonary Embolism: Insights from the US 2 3 Cohort of the FLASH Registry. JSCAI (in press)

JOURNAL REVIEWER

BioMed Central Cancer 2021-present
Journal of Vascular and Interventional Radiology 2008-present
Cardio-Vascular & Interventional Radiology 2005-present

ABSTRACT REVIEWER

2015-2022 SIR Annual Scientific Meeting

COURSE DIRECTOR/FACULTY

Course director, Microwave Ablation Workshop Covidien Headquarters, Boulder, CO. October 21-22, 2010

Faculty, Interventional Management of Diseased Soft Tissue (Tumors) using Microwave Ablation, Tampa, FL. July 13, 2013

PRESENTATIONS

Althaus SJ, **Savin MA**, Coldwell DM, Glickerman DJ, Harley JD. Transjugular intrahepatic portacaval shunts necessitating variceal embolization. Radiology(S) 1992: 185; 103-4

Savin MA, Althaus SJ, Coldwell DM, Harley JD, Glickerman DJ Transjugular intrahepatic portosystemic shunts: Technical success and complication rate in 42 consecutive patients. Radiology(S) 1992; 185:104.

Savin MA, Transjugular intrahepatic portosystemic shunts: Technical success and complication rate in 64 consecutive patients. Pacific Northwest Radiological Society, Vancouver, B.C., May 1, 1993.

Savin MA, Blood back flow into angiographic catheters. Washington-Oregon Radiology Residents' Research Symposium, Tacoma, Washington, April 16, 1994.

Savin MA, Blood back flow into angiographic catheters. Pacific Northwest Radiological Society, Portland, Oregon, May 7, 1994.

Savin MA, Shlansky RD. Greenfield filter fixation in large venae cavae. JVIR(S) 1996; 7:289-90.

Albeer Y, **Savin MA**, Morar K, Olson RE. Vena cava filter fixation in large venae cavae. JVIR(S) 1999; 10:241-242.

Panicker HK, **Savin MA**, Sadiq S, Albeer YA, Olson RE Vena caval filter placement: Technical success and immediate complications: Variations between interventional radiologist and vascular surgeon operators. JVIR(S) 2000; 11:301

Panicker HK, **Savin MA**, Sadiq S, Albeer YA, Olson RE Vena caval filter placement: Technical success and immediate complications: Variations between interventional radiologist and vascular surgeon operators. AJR(S) 2000;174:51.

Romano WJ, Weintraub JL, Eshshaki CM, Kirsch MJ, **Savin MA**. An overview of techniques that may be used for successful IVC filter deployment Canadian Assoc of Radiol, 63rd Annual scientific meeting June 10-14, 2000

Martin D, Salem R, Kirsch MJ, Romano WJ, **Savin MA** Feasibility of the saphenous vein as last resort access site for peripherally inserted central catheter JVIR(S) 2001; 12:16

Massin C, Kirsch MJ, Salem R, Romano WJ, **Savin MA**, Long G, Bove P. Clinical outcomes following hypogastric artery coil embolization prior to stent-graft treatment of abdominal aortic aneurysms. JVIR(S) 2001; 12:56

Romano WJ, Salem R, Kirsch MJ, **Savin MA** Bilateral uterine artery embolization using a 4-french catheter via a single femoral artery. Radiology(S) 2001; 221:266

Romano WJ, Salem R, Kirsch MJ, **Savin MA** Alteplase in catheter directed thrombolysis of symptomatic upper extremity DVT JVIR(S) 2002; 13:107

Madrazo BL, **Savin MA**, Mastromatteo J, Bove P, Long G, Huckabone C, Brown OW. Incidental pathology diagnosed during CT-aortography (CT-AO). AJR(S) 2002; 178:87

Parino SS, Madrazo BL, Mastromatteo JF, **Savin MA**, Mesenteric Doppler: Correlative studies with MRA and Angiography AJR(S) 2002; 178:19

Savin MA, Thanawalla FA, Kirsch MJ, Romano WJ, Salem R, Wang SK Implantable peritoneal access system for palliative treatment of refractory ascites Poster presentation JVIR(S) 2003; 14:S97

Kirsch MJ, Salari M, Romano WJ, Salem R, Wang SK, **Savin MA** Splenic embolization: Review of indications and techniques. Poster presentation JVIR(S) 2003; 14:S130

Wang SK, **Savin MA**, Salem R, Kirsch MJ, Romano WJ Management of recurrent ascites by the interventional radiologist. Poster presentation JVIR(S) 2003; 14:S134.

Savin MA, Kirsch MJ, Romano WJ, Wang SK, Arpasi PJ. Peritoneal ports for treatment of intractable ascites. JVIR(S) 2004; 15:S155.

Iliescu BM, Kirsch MJ, Romano WJ, **Savin MA**, Wang SK, Arpasi PJ. The emerging role of endovascular interventional techniques in the treatment of acute mesenteric ischemia Poster presentation JVIR(S) 2004; 15:S243.

Lewandowski R, Basmaji C, Jafri S, Tucker R, **Savin MA**, Bis K, Imaging algorithm for the evaluation of patients with suspected renovascular stenosis Poster Presentation 30th Scientific Assembly of the Society of Uroradiology. San Antonio February 27-March 4, 2005.

Wong CO, Salem R, Qing F, **Savin MA**, Campbell J, Sherpa KM, Lewandowski R, Nagle C. Metabolic response of hepatic metastasis treated by Y-90 radioembolisation Poster Presentation Society of Nuclear Medicine, Toronto June 21, 2005.

Campbell JM, Wong CO, **Savin MA**, Nagle C. Spect liver perfusion imaging assists in treatment planning of Y-90 radioembolization. Society of Nuclear Medicine, Toronto June 22, 2005.

Fleser PS, **Savin MA**, Howells GA, Bair HA, Bendick PJ, Bhardway V, et al. Vena cava filter placement in pediatric patient: Long-term safety and efficacy Scientific Poster Presentation Radiologic Society of North America, Chicago Nov 27-Dec 2, 2005.

Qadri NO, **Savin MA**, Arpasi P, Picotte J, Haidary A, Hong S et al. Factors effecting inferior vena cava filter occlusion rate in 622 consecutive patients. 32nd Annual Scientific Meeting, Society of Interventional Radiology, Seattle March 2, 2007.

Ebersole JD, Kirsch MJ, Noujaim DL, Srinivasa RN, Romano WJ, **Savin MA**, et al. Conversion of non-tunneled to tunneled hemodialysis catheters: Retrospective comparison to de novo placement. 32nd Annual Scientific Meeting, Society of Interventional Radiology, Seattle March 3, 2007.

Picotte JP, Romano WJ, Kirsch MJ, **Savin MA**, Wang SK, Arpasi PJ, Holcomb J. GDA occlusion with the Amplatzer vascular occlusion plug: A feasibility study. Scientific Poster Presentation 33rd Annual Scientific Meeting, Society of Interventional Radiology, Washington D.C., Mar 15-20, 2008.

Savin MA, Konda A, Campbell JM, Wong CO, Picotte JP, Dobzyniak CJ, Hong SC. Gastrointestinal ulcerations in 100 consecutive patients treated with Y90 microspheres: Rate and associations. 33rd Annual Scientific Meeting, Society of Interventional Radiology, Washington D.C. March 16, 2008.

Balon HR, Tang B, Campbell J, Lang O, **Savin MA** Hepatic arterial perfusion with Tc-99m AA and SPECT-CT in planning internal radiation therapy of unresectable liver tumors with ⁹⁰Y-microspheres. 10/12/2008, Munich Germany

Campbell J, Mahajan P, **Savin MA**, Wong CO. Benefits of SPECT and SPECT-CT liver perfusion imaging in treatment planning for Y-90 radioembolization. Scientific Poster Presentation Radiomicrosphere Therapy 4th Annual Symposium, Chicago May 2-3, 2008. J Int Onc 2009; 2:94.

Schultz CC, Campbell J, Bakalyar D, Feng W, **Savin MA**, Y-90 Microsphere therapy – Prevention of adverse events Scientific Poster Presentation Society of Nuclear Medicine. Radiomicrosphere Therapy 4th Annual Symposium, Chicago May 2-3, 2008. J Int Onc 2009; 2:94.

Campbell J, Mahajan P, **Savin MA**, Wong CO. Benefits of SPECT and SPECT-CT liver perfusion imaging in treatment planning for Y-90 radioembolization Scientific Poster Presentation Society of Nuclear Medicine. New Orleans June 17, 2008.

Schultz CC, Campbell J, Bakalyar D, Feng W, **Savin MA**, Y-90 Microsphere therapy – Prevention of adverse events Scientific Poster Presentation Society of Nuclear Medicine. New Orleans June 17, 2008.

Balon HR, Tang B, Campbell J, Lang O, **Savin MA** Hepatic arterial perfusion with Tc-99m MAA and SPECT-CT in planning internal radiation therapy of unresectable liver tumors with ⁹⁰Y-microspheres Poster Presentation Annual Congress of the European Association of Nuclear Medicine Munich, Germany Oct 12-15, 2008.

Hong SC, **Savin MA**, Desai T, Kumar U, Wong C. Low liver toxicity after radioembolization of hepatocellular carcinoma. 35th Annual Scientific Meeting, Society of Interventional Radiology, Tampa, FL March 14, 2010.

Dobzyniak C, **Savin MA**, Cystic artery coil embolization prior to Y-90 radioembolization of liver malignancies Poster Presentation Global Embolization Symposium and Technologies, San Francisco May 6-9, 2010.

Waters JR, Nandalur KR, **Savin MA**, Bollampally SR. A primer of therapeutic options for Stage 1 Non-small cell lung cancer: Surgery versus extracranial stereotactic radiation versus image-guided ablation. Educational Exhibit 96th Scientific Assembly and Annual Meeting, Radiologic Society of North America, Chicago, IL Nov-Dec 2010.

Vartanian SA, Kirsch MJ, Cash C, **Savin M**, Wang S, Handel J, Dixit P The ABCs of GDA Embolization. Educational Exhibit at the 96th Scientific Assembly and Annual Meeting of the RSNA, Chicago, Illinois (IL)

Cash C, Vartanian SA, Kirsch M, **Savin MA**, Wang S, Handel J, Dixit P. The ABC's of GDA embolization. Michigan Radiological Society Resident Research Forum, Novi, MI, January 28, 2011.

Sag AA, **Savin MA**, Lal NR, Mehta, RR. The post-yttrium-90 microsphere gallbladder: imaging findings and incidence of cholecystitis. 36th Annual Scientific Meeting, Society of Interventional Radiology, Chicago, IL March 30, 2011.

Nguyen A, Goldin D, Kirsch M, Vartanian SA, **Savin MA**, Handel J, Dixit P. When to call interventional radiology? Traumatic and non-traumatic emergency interventional radiology American Society of Emergency Radiology (ASER), Key Biscayne, FL, Sept 14-17, 2011

Trpkovski M, Eckstein L, Vartanian SA, **Savin MA**, Kirsch M. Traumatic and vascular emergencies detected at diagnostic imaging: Indications for intervention. American Society of Emergency Radiology (ASER), Key Biscayne, FL, Sept 14-17, 2011.

Nguyen AH, Shirkhoda A, **Savin MA** Spectrum of imaging features of malignant hepatic tumors following radioembolization with Yttrium 90. Exhibit 97th Scientific Assembly and Annual Meeting, Radiologic Society of North America, Chicago, IL Nov-Dec 2011.
Certificate of Merit award for educational exhibit

Nguyen AH, Kirsch MJ, Handel JD, **Savin MA**, Dixit PK, Vartanian SA A primer of embolotherapy: Agents, clinical applications, and techniques. Exhibit 97th Scientific Assembly and Annual Meeting, Radiologic Society of North America, Chicago, IL Nov-Dec 2011.

Sag AA, Trpkovski MP, Metz T, Dixit P, Kirsch M, **Savin MA**, Handel J. Developing a new interventional radiology resident clinic: A catalyst for radiology education via ACGME core competencies, research, academic practice growth, and the changing face of radiology. Exhibit 97th Scientific Assembly and Annual Meeting, Radiologic Society of North America, Chicago, IL Nov-Dec 2011.

Shah SM, Dixit PK, Eckstein LH, Kirsch MJ, **Savin MA**, Handel JD, Vartanian SA, Ciacci J, Wang SK. Aiming for the perfect puncture: Image-guided renal collecting system access for percutaneous nephrolithotomy. Exhibit 97th Scientific Assembly and Annual Meeting, Radiologic Society of North America, Chicago, IL Nov-Dec 2011.

Nguyen AH, **Savin MA**, Percutaneous thermal ablation for salvage treatment of recurrent non-small cell lung cancer following previous external beam radiation therapy Poster presentation 4th Annual Symposium on Clinical Interventional Oncology, Miami Beach, FL Jan 14-15, 2012.

Savin MA, Vartanian SA, Metz T, Nguyen AH, Campbell J, Early imaging accuracy post Y90 radioembolization for liver metastases from colorectal cancer 37th Annual Scientific Meeting, Society of Interventional Radiology, San Francisco, CA March 27, 2012.

Bhutani C, Dixit P, Kirsch MJ, Ciacci J, **Savin M**, Handel J, Vartanian SA Percutaneous Management of Dysfunctional Endoscopically Placed Metallic Biliary Endoprosthesis. Oral Presentation at the 37th Annual Scientific Meeting of the Society of Interventional Radiology, San Francisco, California (CA)

Bhutani C, Kirsch MJ, Ciacci J, **Savin M**, Dixit P, Handel J, Vartanian SA What's in Your Toolbox? A Review of Endovascular Techniques to Treat DVT Oral Presentation at the 37th Annual Scientific Meeting of the Society of Interventional Radiology, San Francisco, California (CA)

Greene RB, Kirsch M, Mansour B, **Savin MA**, Handel J, Dixit P, Ciacci J, Vartanian SA. Complications of percutaneous radiological gastrostomy tube insertion – “Let our past complications guide your future success”. Poster presentation 37th Annual Scientific Meeting, Society of Interventional Radiology, San Francisco, CA March 24-29, 2012.

Kennedy AS, Ball D, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Rose SC, Nutting CW, Moeslein FM, **Savin MA**, Schirm S, Sharma NK, Wang E. USA patients receiving resin 90y microspheres for unresectable colorectal liver metastases: A multicenter study of 506 patients. Poster presentation ASCO Annual Meeting, June 1-5, 2012

Goldin D, Mansoor B, Berry SK, Emerson S, Campbell J, **Savin MA** Effects of bevacizumab on yttrium-90 microsphere administration, tumor-to-normal liver vascularity ratio and survival in metastatic colorectal cancer patients Oral and Poster presentations 5th Annual Symposium on Clinical Interventional Oncology, Miami Beach, FL Jan 18-19, 2013.

Vadlamudi, V, **Savin MA**. Utilization of adjunctive techniques for percutaneous ablation of hepatic tumors Poster presentation 5th Annual Symposium on Clinical Interventional Oncology, Miami Beach, FL Jan 18-19, 2013.

Kennedy AS, Ball D, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Nutting CW, Moeslein FM, Putnam SG, Rose SC, **Savin MA**, Schirm S, Sharma NK, Wang E. Hepatic imaging response to 90Y-microsphere therapy administered for tumor progression during systemic chemotherapy in patients with colorectal liver metastases. Poster presentation 2013 ASCO Gastrointestinal Cancers Symposium San Francisco, CA Jan 24-26, 2013

Kennedy AS, Ball D, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Rose SC, Nutting CW, Moeslein FM, **Savin MA**, Schirm S, Putnam SG, Sharma NK, Wang E. Safety and efficacy of resin 90Y-microspheres in 548 patients with colorectal liver metastases progressing on systemic chemotherapy Poster presentation 2013 ASCO Gastrointestinal Cancers Symposium San Francisco, CA Jan 24-26, 2013.

Cash C, **Savin MA**, Campbell JM, Schultz C, Zaki M, Ciacci J, Handel J, Vartanian SA. Yttrium-90 infusion: Incidence and outcomes of delivery catheter occlusion. Oral presentation 38th Annual Scientific Meeting, Society of Interventional Radiology, New Orleans, LA April 15, 2013.

Golden D, Berry SK, Mansoor BM, Emerson S, Campbell J, **Savin MA**, Survival after radioembolization for metastatic colorectal cancer: Search for prognostic factors. Oral presentation 28th Annual Scientific Meeting, Society of Interventional Radiology, New Orleans, LA April 15, 2013.

Goldin D, Emerson S, Goike J, Weiner A, Schultz C, Vartanian SA, **Savin MA**, Kirsch M. Indirect predictors of peak skin dose during high risk interventional procedures: A data driven approach to find a better method than total fluoroscopy time. Oral presentation 38th Annual Scientific Meeting, Society of Interventional Radiology, New Orleans, LA April 16, 2013.

Kennedy AS, Ball D, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Moeslein FM, Nutting CW, Putnam SG, Rose SC, **Savin MA**, Schirm S, Sharma NK, Wang E. Safety and efficacy of ⁹⁰y resin microspheres in elderly (≥ 70 years) compared to younger patients with colorectal liver metastases (mCRC). 2013 ASCO Annual Meeting, May 31 – June 4, 2013.

Thottakara P, Zaki M, Dixit PK, Kirsch MJ, **Savin MA**, Handel J, Ciacci J, Vartanian SA. Diagnosis and endovascular therapy of pelvic congestion syndrome Poster presentation Association of University Radiologists 61st Annual Meeting April 9-12, 2013, Washington DC

Thottakara P, Zaki M, Dixit PK, Kirsch MJ, **Savin MA**, Handel J, Ciacci J, Vartanian SA. Pelvic congestion syndrome: The radiologist's role from diagnosis to treatment. Electronic poster ARRS 113th annual meeting, April 14-19, 2013, Washington DC

Kennedy AS, Ball D, Cohen S, Cohn M, Coldwell D, Drooz A, Ehrenwald E, Kanani S, Moeslein FM, Nutting CW, Putnam SG, Rose SC, **Savin MA**, Schirm S, Sharma NK, Wang E. Multicenter comparison of safety and efficacy of yttrium-90 resin microspheres in elderly (≥ 70 years) and younger patients with unresectable liver-dominant metastatic colorectal cancer Oral presentation CIRSE, Sept 17, 2013, Barcelona, Spain

Kennedy AS, Ball D, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Moeslein FM, Nutting CW, Putnam SG, Rose SC, **Savin MA**, Schirm S, Sharma NK, Wang E. Pre-^{90Y} hepatic radiotherapy hemoglobin and liver functions to predict overall survival in unresectable, chemotherapy-refractory metastatic colorectal cancer Poster presentation. ASCO Gastrointestinal Cancers Symposium January 16-18, 2014, San Francisco

Kennedy AS, Ball D, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Moeslein FM, Nutting CW, Putnam SG, Rose SC, **Savin MA**, Schirm S, Sharma NK, Wang E. Central review of radiologic response following radioembolization with yttrium-90-labeled resin microspheres in unresectable liver-dominant metastases from colorectal cancer. Poster presentation ACRO Annual meeting Feb 27-Mar 1, 2014, Orlando

Kennedy AS, Ball D, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Moeslein FM, Nutting CW, Putnam SG, Rose SC, **Savin MA**, Schirm S, Sharma NK, Wang E. Safety and efficacy of radioembolization in elderly (≥ 70 years) and very elderly (≥ 75 years) patients compared with younger patients with unresectable liver-dominant colorectal cancer. Poster presentation ACRO Annual meeting Feb 27-Mar 1, 2014, Orlando

Kennedy AS, Ball D, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Moeslein FM, Nutting CW, Putnam SG, Rose SC, **Savin MA**, Schirm S, Sharma NK, Wang E. Impact of baseline laboratory values on survival following radioembolization in patients with unresectable, liver-dominant colorectal metastases. Poster presentation ACRO Annual meeting Feb 27-Mar 1, 2014, Orlando

Kennedy AS, Ball D, Cohen SJ, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kanani S, Moeslein FM, Nutting CW, Putnam SG, Rose SC, **Savin MA**, Schirm S, Sharma NK, Wang E. Multicenter evaluation of the safety and efficacy of radioembolization with ^{90Y} resin microspheres in 606 patients with unresectable colorectal liver metastases Poster presentation ACRO Annual meeting. Feb 27-Mar 1, 2014, Orlando

Goldin D, Campbell J, Emerson S, Bahoura L, George D, Reich S, **Savin MA** Tumor-to-normal particle deposition ratio in primary versus secondary liver malignancies: impact on tumor dose and radioembolization treatment planning. Oral presentation 39th Annual Scientific Meeting, Society of Interventional Radiology San Diego, March 25, 2014

Goldin D, Jack D, Walsh E, Handel J, **Savin MA**. Bevacizumab-associated angiographic findings and complications during radioembolization planning and treatment in metastatic colorectal patients Poster presentation WCIO 2014 May 11-14, 2014, NY, NY

Goldin D, Reich S, George D, Bahoura L, Emerson S, Campbell J, **Savin MA**. Carcinoembryonic antigen response after initial single- or multi-session radioembolization for colorectal cancer: analysis of cumulative delivered radioactivity and dose. Oral presentation CIRSE 2014 Sept 16, 2014, Glasgow, Scotland

Chehab M, **Savin MA**, Campbell J, Cash C, Savin JH, Wong C, Schultz C. Yttrium-90 infusion: Incidence and outcomes of delivery system occlusions Oral presentation 40th Annual Scientific Meeting, Society of Interventional Radiology. Atlanta, March 3, 2015.

Goldin D, George D, Chen C, Guimaraes M, Campbell J, **Savin MA**. Incomplete yttrium-90 infusion and high residual radioactivity during radioembolization Oral presentation Society of Interventional Radiology (SIR) Annual Scientific Meeting, Atlanta, GA; February 28 – March 5, 2015.
HIC: 2012-171

Olsen J, **Savin MA**, Campbell JC, Savin JH, Wong C. 885 Yttrium-90 Radioembolization deliveries: Incidence and role of multiple deliveries during single procedures. Poster presentation. WCIO 2016 Boston, June 9-12, 2016

Kennedy AS, Cohn M, Coldwell DM, Drooz A, Ehrenwald E, Kaiser A, Nutting CW, Rose SC, Wang E, **Savin M** Unresectable colorectal cancer liver metastases treated with radioembolization: Updated survival analysis of the MORE study. Poster presentation ASCO 2017 Gastrointestinal Cancers Symposium San Francisco, CA January 19-21, 2017

Chehab M, Ciacci J, Handel J, Vartanian S, Kirsch M, Purushottam D, **Savin M**. Moxifloxacin Prophylaxis for Patients Undergoing Radioembolization with a History of Biliary Colonization. Poster presentation. 9th Annual Symposium on Clinical Interventional Oncology, Hollywood, FL. February 4-5, 2017

Savin JH, **Savin MA** Acute thrombosis in large venous spaces: Mechanical thrombectomy with a 15mm rotational thrombectomy device. Original Educational ePoster. Society of Interventional Radiology Annual Scientific Meeting Washington DC March 4-9, 2017

Fergus J, Chehab M, Ciacci J, Handel J, Vartanian S, Campbell J, **Savin M**. Etiology of Hepatocellular Carcinoma and Overall Survival of Patients Treated with Yttrium-90 Microspheres. 42nd Annual Society of Interventional Radiology, Washington, DC, March 4-9, 2017

Savin J, Green A, Rassmussen C, **Savin M**. Impact of healthcare disparities on patients undergoing transarterial radioembolization. Poster presentation. 10th Annual Symposium on Clinical Interventional Oncology, Hollywood, FL. February 3-4, 2018

Singh KT, **Savin M**, Savin JH, Wong C. Radioembolization for Metastatic Colon Cancer: Survival Differences Between Right and Left Sided Primary Sites. ePoster 1497. 43rd Annual Society of Interventional Radiology, Los Angeles, March 17-22, 2018

Savin J, Kakish D, **Savin M**, Colvin R, Al-Katib S, Roberson J. Pressure differences between right and left pulmonary arteries during catheter-directed treatment for pulmonary embolism. Poster presentation. 31th Annual Symposium on Endovascular Therapy (ISET), Hollywood, FL. January 27-30, 2019

Loudon NE, Savin JH, Vartanian SA, Asare B, **Savin MA**. Embolization of Iliac Artery to Rectum Fistula and Occlusive Nephroureteral Stent Diversion of Ureterorectal Fistula. Poster Presentation. 11th Annual Symposium on Clinical Interventional Oncology. Miami Beach, FL. October 11-13, 2019.

Asare B, Savin JH, Cheti D, Loudon NE, **Savin MA**. Tumor Lysis Syndrome After Embolization of Renal Cell Carcinoma: Case Report and Literature Review. Poster Presentation. 11th Annual Symposium on Clinical Interventional Oncology. Miami Beach, FL. October 11-13, 2019.

Friedman BJ, Savin JH, **Savin MA**. Irreversible Electroporation of an Internal Iliac Lymph Node Metastasis. Poster Presentation. 11th Annual Symposium on Clinical Interventional Oncology. Miami Beach, FL. October 11-13, 2019.

Savin JH, Handel JD, Loudon NE, Campbell JM, **Savin MA**. Hot vessel sign: technetium-99m macroaggregated albumin at the catheter tip location during radioembolization planning. Poster Presentation. Society of Interventional Oncology Annual Scientific Meeting. New Orleans, January 31-February 3, 2020.

Savin JH, Sharma J, Piziali DJ, Robbins JM, Ghaith G, **Savin MA**. An unusual cause of upper gastrointestinal bleeding: Jejunal diverticula, Case report and literature review. E-poster Presentation. 33rd Annual International Symposium on Endovascular Therapy (ISET). Miami Beach, May 9-11, 2021.

Stevens DA, Savin JH, Friedman BJ, **Savin MA**. Irreversible Electroporation for recurrent pelvic metastases: Case series and literature review. Poster Presentation. 14th Annual Symposium on Clinical Interventional Oncology. Miami Beach, FL. September 23-25, 2022.

VISITING PROFESSORSHIPS/LECTURESHIPS

INVITED LECTURES

Uterine Fibroid Embolization Michigan Radiological Society – Resident Physician Section March 3, 2000.

Pulmonary Embolism: Diagnosis and Treatment William Beaumont Hospital Innovative Therapies in the Management and Diagnosis of DVT and Pulmonary Embolism. April 7, 2001.

Interventional Radiology Michigan State Medical Society – 136th Annual Scientific Meeting November 1, 2001

Implantable peritoneal access for treatment of refractory ascites Michigan Chapter – Society of Interventional Radiology January 14, 2003

Ports for Treatment of Ascites the Third Annual Interventional Radiology Swing Conference Ypsilanti, MI August 23, 2003

Arteriovenous Dialysis Access Maintenance Michigan Chapter of American Nephrology Nursing Association Annual Spring Conference. Ann Arbor, MI. May 3, 2004.

Selective internal radiation therapy for liver metastases from colon cancer William Beaumont Hospital Colon Tumor Board Royal Oak, MI August 9, 2004

Selective internal radiation therapy for liver metastases from colon cancer William Beaumont Hospital Tumor Board Troy, MI. September 23, 2004

Selective internal radiation with intraarterial Yttrium-90 microspheres Chaim Sheba Medical Center Tel-Hashomer, Israel December 29, 2005

Minimally invasive treatments for liver metastases (and primary liver cancers) William Beaumont Hospital Medical Services – Troy Update meeting May 23, 2006.

Radioembolization for treatment of unresectable liver metastases from colorectal cancer William Beaumont Hospital Colon Tumor Board Royal Oak, MI October 9, 2006

Chemoembolization and Radioembolization William Beaumont Hospital Hepatic Tumor Conference Royal Oak, MI. November 15, 2006

Chemoembolization and radioembolization of hepatic malignancies The 6th Annual Great Lakes Interventional Conference Ypsilanti, MI. April 28, 2007

Interventional Oncology of Hepatic Malignancies William Beaumont Hospital – Troy Medical symposium Crystal Mountain, MI June 23, 2007

Chemoembolization and radioembolization of hepatic malignancies Wright State Department of Surgery Annual Post Graduate Symposium Dayton, OH September 14, 2007

Percutaneous radiofrequency ablation of hepatic malignancies Wright State Department of Surgery Annual Post Graduate Symposium Dayton, OH September 14, 2007

Radioembolization of hepatic malignancies William Beaumont Hospital Department of Nuclear Medicine Continuing Education Royal Oak, MI. April 2, 2009

Interventional Oncology: Liver Malignancies William Beaumont Hospital Division of Hematology-Oncology Meeting Royal Oak, MI. April 7, 2009

Liver Malignancies – Minimally Invasive Local and Regional Management Michigan State Hematology Oncology Annual Meeting Glen Arbor, MI. September 26, 2009.

Ablations and embolizations: Liver metastases from colorectal cancer. Colorectal cancer symposium: Curing advanced disease. William Beaumont Hospital Beaumont Cancer Institute. Birmingham, MI. June 25, 2010.

Anticipating and reducing complications in microwave ablation. Microwave Ablation Workshop. Covidien Headquarters, Boulder, CO. October 22, 2010.

Combination of selective internal radiation and chemotherapy for unresectable liver metastases from colon cancer Beaumont Foundation Board of Directors Meeting Beaumont Hospital, Royal Oak, MI December 7, 2010

IVC Filters 9th Annual Vascular Innovations Conference Beaumont Health System, Pontiac, MI. February 3, 2012.

TIPS 10th Annual Vascular Innovations Conference Beaumont Health System, Pontiac, MI February 1, 2013

Pre and post imaging assessment of ablated lesions BSD Medical Microwave Ablation Workshop, Tampa, FL July 13, 2013

Radioembolization of liver malignancies Interdisciplinary Oncology Symposium Beaumont Health, Southfield, MI March 4, 2016

Radioembolization of Liver Malignancies Interventional Radiology Symposium for Medical Students Beaumont Health, Royal Oak, MI March 2017

Image Guided Tumor Ablation and Radioembolization. Medical Hematology Oncology Grand Rounds, Royal Oak, MI February 2, 2024

INVITED MODERATOR

Moderator: Scientific Session: IO: Radioembolization II. March 7, 2017. Society of Interventional Radiology Annual Scientific Meeting Washington D.C., March 4-9, 2017

RESEARCH/GRANTS/PATENTS

PRINCIPAL INVESTIGATOR - MULTICENTER RESEARCH STUDIES

EPOCH. A Phase III Clinical Trial **E**valuating TheraSphere® in **P**atients with Metastatic Colorectal Carcinoma **o**f the Liver who have Failed First Line **C**hemotherapy. Sponsor: BTG International Inc.

Randomized Comparative Study of FOLFOX6m plus SIR-Spheres Microspheres versus FOLFOX6m Alone as First Line Treatment in Patients with Nonresectable Liver Metastases from Primary Colorectal Carcinoma. Sponsor: Sirtex Medical.

Pilot study of Folfox 6 plus SIR-Spheres Microspheres (Chemo-radiotherapy) in combination with Bevacizumab (Avastin) as first line treatment in patients with non-resectable liver metastases from primary colorectal carcinoma Sponsor: Sirtex Medical.

A pilot study of radiofrequency ablation in high-risk cancer patients with stage 1a non-small cell lung cancer Sponsor: American College of Surgeons Oncology Group (ACOSOG).

Multicenter feasibility study of percutaneous radiofrequency ablation of hepatocellular carcinoma in cirrhotic patients Sponsor: American college of radiology imaging network (ACRIN).

FLASH. **F**lowTrierer **A**ll-Comer Registry for Patient **S**afety and **H**emodynamics. PE patients including massive and submassive (intermediate-risk). Multicenter study. PI Beaumont Royal Oak. Sponsor: Inari Medical, Inc.

GRANTS

Boston Scientific Corp., August 1995, Greenfield filter fixation in large venae cavae.

Boston Scientific Corp., March 1998, Vena cava filter fixation in large venae cavae.

Gandhi Foundation., October 1, 2009, Research in Interventional Oncology.

PATENTS

Savin MA, Windheuser J, Noddin R, Stent Delivery System U.S. Patent #4,950,227; August 21, 1990

Savin MA, Windheuser J, Noddin R. Stent Delivery system European Patent #90901127.2; December 13, 1990.