



## **Robert Wallace Williams Biederman, MD, FACC, FAHA, FSGC**

Medical Advisor

### **Career Summary**



In addition to his role as Medical Advisor at Corazon, Dr. Robert W. Biederman is the Medical Director of the Cardiovascular MRI Center at Allegheny General Hospital in Pittsburgh, Pennsylvania. In his career, Dr. Biederman has authored hundreds of publications, given numerous presentations to national and international audiences, mentored more than fifty doctors, and launched an innovative clinical protocol with his team to allow patients with pacemakers and ICDs to undergo MRI studies.

### **Clinical Consulting**

**Corazon, Inc.**

**2016 - Present**

**Medical Advisor, Cardiovascular MRI**

Provides consultation to hospitals and health systems across the country for the implementation or development of stand-alone or hospital-based cardiovascular programs. Interacts with physicians at client sites on a peer-to-peer basis. Participates in site visits to present to Boards, hospital leadership, and/or internal and external stakeholders on the clinical, operational, and financial aspects of best practice cardiovascular services. Provides expertise and opinions on procedures and commentary about current industry trends, medical advances, and new technology in his area of specialty.

## Education and Training

<b>Medical University of Southern Carolina, Charleston, SC</b> Doctor of Medicine	<b>1989 - 1993</b>
<b>Charleston Southern University, Charleston, SC</b> Bachelor of Science, Biology Major, Chemistry and English Minors	<b>1983 - 1985</b>
<b>The Citadel, Charleston, SC</b> Biology Major	<b>1980 - 1982</b>
<b>Carson Long Military Institute, New Bloomfield, PA</b> Academic Diploma	<b>1974 - 1980</b>

## Licensure

<b>Pennsylvania</b> MD-056988-L	<b>1993 - Present</b>
<b>Alabama</b> AL-19862	<b>1996 - 1998</b>

## Board Certification

<b>Internal Medicine</b> Certificate #173609	<b>1997</b>
<b>Cardiovascular Disease</b> Certificate #173609	<b>2000, 2011</b>
<b>Cardiovascular MRI</b> Certificate: NIH/UA	<b>2000 (Permanent)</b>

## Academic Awards and Honors

• Best Doctors in America	2015
• Who's Who in Science and Engineering	2013
• Pulse of Pittsburgh's 'Best Cardiologist' Award: Judge	2011 - 2013
• America's Top Physicians	2008 - 2009
• Distinguished Service Award: In the Field of Cardiology in the World	2008
• Who's Who in America	2008
• Best Doctors	2005 - 2007
• Marquis-Who's Who in America	2000 - 2005

## Memberships and Offices in Professional Services

- Society of Cardiovascular Magnetic Resonance      Founding Member
- Heart Valve Society of America      Founding Member
- American College of Cardiology      Fellow
- American College of Cardiology      First Alabama Affiliate Council Member
- American Society of Angiology      Fellow
- Society of Geriatric Cardiology      Fellow
- American Society of Chest Physicians      Affiliate member
- American Heart Association      Council member in Cardiovascular Radiology
- American Heart Association      Council member in Arter Thro & Vasc Biology
- American Heart Association      Fellow
- American Medical Association      Member

## Published Full-Length Peer Reviewed Papers\*

- Farber NJ, Reddy ST, Doyle M, Rayarao G, Thompson DV, Olson P, Glass J, Williams RB, Yamrozik JA, Murali S, Biederman R. *Ex vivo* cardiovascular magnetic resonance measurements of right and left ventricular mass compared with direct mass measurement in excised hearts after transplantation: a first in human SSFP comparison. *J Cardiovasc Magn Reson*. 2014;16(1):74.
- Omslaer BT, Biederman RW. Gargantuan Left Atrium: A Sequela of Mitral Regurgitation and Mitral Stenosis. *Echocardiography*. 2015 Jun;32(6):1033-5.
- Samar HY, Doyle M, Williams RB, Yamrozik JA, Bunker M, Biederman RW, Shah MB. Novel Use of Cardiac Magnetic Resonance Imaging for the Diagnosis of Cobalt Cardiomyopathy. *JACC Cardiovasc Imaging*. 2015
- Simprini LA, Afroz A, Cooper MA, Klem I, Jensen C, Kim RJ, Srichai MB, Heitner JF, Sood M, Chandy E, Shah DJ, Lopez-Mattei J, Biederman RW, Grizzard JD, Fuisz A, Ghafourian K, Farzaneh-Far A, Weinsaft J. Routine cine-CMR for prosthesis-associated mitral regurgitation: a multicenter comparison to echocardiography. *J Heart Valve Dis*. 2015; 23(5):575-82.
- Pfeiffer MP, Biederman RW. Cardiac MRI: A General Overview with Emphasis on Current Use and Indications. *Med Clin North Am*. 2015;99(4):849-61.

\*Additional available upon request

## Books

- **Cardiovascular Magnetic Resonance Imaging Tutorial: Lectures and Learning.** Foreword by **Valentin Fuster, MD, PhD.** Biederman RWW, Yamrozik, J and Doyle M. Publication date November 2007, Lippincott, Williams and Wilkins. 460pp, 37 chapters > 1000 images. Compendium of Cardiovascular imaging for the Physician, Technologist and Physicist.
- **Cardiovascular MRI Tutorial: Lectures and Learning Accompanying DVD.** Biederman RWW, Yamrozik, J and Doyle M. Publication date September 2007, Lippincott, Williams and Wilkins. > 500 images, 1000 movies and 40 lectures. DVD Compendium of Cardiovascular imaging for the Physician, Technologist and Physicist.

## Abstracts\*

- Biederman, Robert, June Yamrozik, Ronald Williams, Geetha Rayarao, Diane Thompson, Huma Samar, Moneal Shah, Mark Doyle. Considerations on Imaging the PM/AICD Patient; Are We Entering a New Era? An Evolutionary Report of our first 100 Patients. *Journal of Cardiovascular Magnetic Resonance 2015, 17(Supple 1):P240 (3 February 2015).*
- Kassis, Hayah, Brandon Mikolich, Robert Biederman, Ronald Mikolich. Is There a Potential Role for CMR in Deciding Appropriateness for AICD Placement? *Journal of Cardiovascular Magnetic Resonance 2015, 17(Supple 1):P229 (3 February 2015).*
- Biederman, Robert, Nessim Amin, Sirikarn Napan, Diane Thompson, Moneal Shah, Mark Doyle. Does RV Fibrosis Have an Effect on Mortality in Patients Hypertrophic Cardiomyopathy? An LV vs. RV National Death Index (NDI) Study. *Journal of Cardiovascular Magnetic Resonance 2015, 17(Supple 1):P179 (3 February 2015).*
- Ivanov, Alexander, James Yossef, Ambreen Mohamed, Joshua Socolow, Iossif Gulkarov, Berhane Worku, Pairoj Chattranukulchai, Anthony Tortolani, Terrence Sacchi, Mohamad Ghosn, Dipan Shah, John Grizzard, Robert Biederman, Igor Klem, John Heitner. Evaluating Change of Function after Revascularization in Patients with Multi Vessel Coronary Artery Disease, Severely Reduced Left Ventricular Systolic Function and No Scar on CMR Imaging. *Journal of Cardiovascular Magnetic Resonance 2015, 17(Supple 1):P169 (3 February 2015).*
- Biederman, Robert, June Yamrozik, Ronald Williams, Geetha Rayarao, Diane Thompson, Huma Samar, Moneal Shah, Mark Doyle. Is there Value Beyond Safety in CMR Imaging of PM/AICD Patients? *Journal of Cardiovascular Magnetic Resonance 2015, 17(Supple 1):P168 (3 February 2015).*

\*Additional available upon request

## National Presentations and Invited Lectures

- Presentation: Serendipity in Cardiovascular Medicine; Does chance truly favor the prepared mind? Boston, MA. World Congress of Cardiology July 2014
- Debate: Cardiovascular MRI vs SPECT vs CT as complementary or antagonistic regarding Echocardiography (Anthony DeMaria, Harold Betcher and RWWB). Echocardiography use of Contrast Ultrasound Meeting. Coral Gables, Fl. February 2014
- Advanced Cardiovascular MRI; Can it be safe and effective in Pacemakers and AICD's? Vancouver. World College of Cardiology, Sept 2013.
- Moderator: 30<sup>th</sup> International Conference on Recent Advances in Echocardiography; American College of Cardiology 2013.
- Moderator: 29<sup>th</sup> International Conference on Recent Advances in Echocardiography; American College of Cardiology 2012.
- Moderator: 25<sup>th</sup> International Conference on Recent Advances in Echocardiography; American Heart Association 2010.
- Co-Chair for AHA Nov 2011: Plenary Session: Advanced Interrogation of Hypertrophic Cardiomyopathy with Christopher Semsarium, MD.
- Moderator: 28<sup>th</sup> International Conference on Recent Advances in Echocardiography; American College of Cardiology 2011.
- Late gadolinium enhancement: is it the same for the right ventricle as it is for the left ventricle? A Cardiac MRI study of hypertrophic cardiomyopathy. World College of Cardiology, Vancouver Sept 2011.
- Moderator: Abstract Session; Myocardial Disease and Advanced Interrogation. World Congress of Cardiology. Vancouver, September 2011.

- Moderator: Abstract Session; Biomarkers in Cardiovascular Disease. World Congress of Cardiology. Vancouver, September 2011.
- Grand Rounds: Mayo Clinic. Cardiac Magnetic Resonance; not your Granddaddy's MRI. September 29, 2010.
- Meet the Expert Evaluation of cardiac function by Cardiac Imaging with William Zoghbi. American College of Cardiology March, 2010.
- Poster Discussant: Imaging Applications in Electrophysiology American College of Cardiology March, 2010
- Co-Chair with Theodore P. Abraham. Case Studies: Disease-Based Heart Failure/Myocardial Disease. American College of Cardiology March, 2010.
- Co-Chair. Imaging: What is the Ideal Imaging Modality? American College of Cardiology March, 2010
- Moderator: 27<sup>th</sup> International Conference on Recent Advances in Echocardiography; American College of Cardiology 2010.
- Presenter: TEE vs. MRI. 27<sup>th</sup> International Conference on Recent Advances in Echocardiography; American College of Cardiology 2010.
- Moderator: 26<sup>th</sup> International Conference on Recent Advances in Echocardiography; American College of Cardiology 2010
- Presenter: TEE vs. MRI. 26<sup>th</sup> International Conference on Recent Advances in Echocardiography; American College of Cardiology 2009.
- Cardiovascular Magnetic Resonance in the Evaluation of Pulmonary Hypertension. Orlando, FL Nov 17, 2009.
- Moderator. 18<sup>th</sup> Annual International Conference on Echocardiography and Allied Techniques (MRI, CT scan, Nuclear: Case Studies and Recent Advances. (3D TEE, Cardiac Rysynchronization therapy, MRI, Congenital Heart Disease, Anticoagulation, Aortic Disorders, Viability, Masses, Misc. AHA November 2009.
- Basic-Cardiovascular Magnetic Resonance Imaging. New Cardiovascular Horizons Meeting at the 10<sup>th</sup> Anniversary. Roosevelt-Waldorf Astoria Hotel, New Orleans, Louisiana July 10-11, 2009.
- Advanced - Cardiovascular Magnetic Resonance Imaging. New Cardiovascular Horizon Meeting at the 10<sup>th</sup> Anniversary Roosevelt-Waldorf Astoria Hotel. New Orleans, LA July 10-11, 2009.
- Moderator. 18<sup>th</sup> Annual International Conference on Echocardiography and Allied Techniques (MRI, CT scan, Nuclear: Case Studies and Recent Advances. (3D TEE, Cardiac Rysynchronization therapy, MRI, Congenital Heart Disease, Anticoagulation, Aortic Disorders, Viability, Masses and Misc. AHA November 2009.
- 3D Volumetric Carotid Plaque Imaging by Cardiovascular MRI Solves the Mystery of the 'Percent Stenosis Paradox'. New Orleans, Louisiana, American Heart Association, November 9, 2008.
- Moderator: Twenty-first Annual 2D Conventional and Color Doppler Echocardiography Conference . Moderator with Navin Nanda, MD; Special Symposium on "Imaging in the Elderly". Calloway Gardens, Pine Mountain, Georgia Sept 11-14, 2008.
- Cardiovascular Magnetic Resonance for the Echocardiographer. Twenty-first Annual 2D Conventional and Color Doppler Echocardiography Conference ; Special Symposium on "Imaging in the Elderly". Calloway Gardens, Pine Mountain, Georgia Sept 11-14, 2008.
- Cardiovascular Magnetic Resonance in the Elderly; Usefulness and Pitfalls. Twenty-first Annual 2D Conventional and Color Doppler Echocardiography Conference . Moderator with Navin Nanda, MD; Special Symposium on "Imaging in the Elderly". Calloway Gardens, Pine Mountain, Georgia Sept 11-14, 2008.
- Update on Computed Tomographic Evaluation of Coronary artery stenosis with Special Reference to the Elderly Patient. Twenty-first Annual 2D Conventional and Color Doppler Echocardiography

Conference. Moderator; Special Symposium on "Imaging in the Elderly". Calloway Gardens, Pine Mountain, Georgia Sept 11-14, 2008.

- Using Novel Approaches to Imaging with Cardiovascular Magnetic Resonance; Focus on Contrast Enhancement for Myocardial Viability. Grand Rounds. Strong Memorial Hospital, Rochester NY June 20, 2008.
- Cardiovascular Imaging of Atherosclerotic Plaque via CV MRI. Auburn Hospital, Auburn NY.
- Using Novel Approaches to Imaging with Cardiovascular Magnetic Resonance; Focus on Contrast Enhancement with Increased Relaxivity. University of Rochester, NY, June 2008.
- LVH Regression following Aortic Valve Replacement by CMR, is it Durable? Heart Valve Society of America. Bellagio, Las Vegas May 2008.
- The Role of the RAAS in CV Disease. Moderator. Vascular Biology Working Group with Arshed Quyyumi, MD, Emory University. Pittsburgh, PA May 2008.
- Moderator. 18<sup>th</sup> Annual International Conference on Echocardiography and Allied Techniques (MRI, CT scan, Nuclear: Case Studies and Recent Advances. (3D TEE, Cardiac Resynchronization therapy, MRI, Congenital Heart Disease, Anticoagulation, Aortic Disorders, Viability, Masses, Misc. ACC March 2008.
- Does a 3D Evaluation of Dyssynchrony Offer an Advantage Over a 2D Approach? A Cardiovascular MRI Method for Myocardial Dyssynchrony Quantification. ISHLT: Boston 2008
- Medical Therapy or Cardiac Resynchronization Therapy for Congestive Heart Failure? American College of Cardiology 57<sup>th</sup> Scientific Sessions, Integrated Imaging Session, 2008.
- Meet the Experts Session, Cardiac Magnetic Resonance, American College of Cardiology 57<sup>th</sup> Scientific Sessions, 2008.
- Does TEE help us or hurt us here; a CMR/TEE evaluation. Echocardiography Session. Echocardiography and Allied Health Specialties. Invited lecturer. Satellite Session of ACC March 2008.
- Defining Myocardial Viability, Mass and Function in 2008; Important Case-Based Questions and Answers, Clinical Focus Session, American College of Cardiology 57<sup>th</sup> Scientific Sessions, 2008.
- Evaluation of Woman's Health Issues. CMR and the evaluation of carotid and coronary plaque 13<sup>th</sup> Annual CV Retreat. Joint Session with Valentine Fuster and I. Topeka, Kansas March 2008.
- Grand Rounds: Ischemia and Angina: CMR. Deaconess Hospital. March 2008.
- Moderator: Abstract Session; Clinical Science. Society of Cardiovascular MRI. Los Angeles March 2008
- Read with the Experts. Society of Cardiovascular MRI Los Angeles. March 2008
- CMR, Current Indications. Key Note Address. West Virginia ACC. Charleston, West Virginia. Nov 17, 2007.
- Narrow QRS, Dyssynchrony for all? American Heart Association Satellite presentation. Orlando, Florida, November, 2007.
- IMAX 2007, Echocardiography: American Heart Association, CMR case presentations, Orlando, FL, November 2006.
- Cardiac MRI and Computed Tomography. 12<sup>th</sup> Annual Joint Meeting sponsored by Ft. Myers and Massachusetts General Hospital. Fort Myers, Florida. June 2007.
- Can Cardiac MRI Assist in Echocardiography? Three Rivers Echocardiography Society. Lakeside, West Virginia. June 2007
- Clinical Advantages of Higher Relaxivity Agents in Cardiac MRI: MultiHance Expert Meeting. Las Vegas, Nevada. June 2006
- New Therapeutic Options of the Treatment of Chronic Angina: Contemporary Management of Myocardial Ischemia- Vascular Biology Working Group, Philadelphia, Pennsylvania. May 2006
- Myocardial Ischemia: View from the Vessel Wall. Contemporary Management of Myocardial Ischemia- Vascular Biology Working Group. St Louis, Missouri. May, 2006.

- Renin-Angiotensin System; use of Cardiovascular Magnetic Resonance Imaging to Define Application and Benefit in Patients with Coronary Artery Disease. Medical College of Augusta. December 2005. Grand Rounds.
- The Renin-Angiotensin System as Applied to Patients with Coronary Artery Disease. Hershey Medical Center. November 2005. Grand Rounds.
- The Renin-Angiotensin-Aldosterone System: Linking New Directions and Data for Patients with CAD. Vascular Biology Working Group, Speaker and Moderator, Chicago, IL October 22, 2005.
- "How To" Lecture: Left/ Right Ventricular Function Assessment by CMR. Society of Cardiovascular Magnetic Resonance, San Francisco, CA, Society of Cardiovascular Magnetic Resonance. February, 2005
- Assessment of Cardiomyopathies (Moderator). SCMR, San Francisco, CA, Society of Cardiovascular Magnetic Resonance. February, 2005.
- The Use of Cardiovascular MRI for Perfusion/Viability; a Change in the Guard, General Electric (with Mark Doyle, PhD), Milwaukee, WI, September 2004.
- Reshaping the Heart to Improve Function. (Invited Dinner Symposium). International Society of Heart and Lung Transplantation April 2004, San Francisco, California
- Grand Rounds/Review- Cardiovascular MRI: Is it helpful when Echocardiography is not? Northeastern Ohio University. May 2003.
- Will an Epicardial Restraining Mesh (Nitinol) Thwart the Post-infarct LV Remodeling Process? ISMRM-Honolulu, Hawaii. May 2002.
- Evaluation of Pericardial Heart Disease. Society of Cardiovascular Magnetic Resonance. January 2001.
- Does LV Volume Reduction Surgery Also Correct Regional Geometry- **Semifinalist** - Clinical Science Competition at the 15th Annual Research Competition University of Alabama at Birmingham. March, 2000.
- Grand Rounds-University of Alabama at Birmingham-Cardiology. February 2000.
- Heart House Lecturer- Cardiovascular MRI Imaging-Read with the Experts, Bethesda, MD. September, 1999.
- MRI Analysis of the Dor procedure in End-Stage Cardiomyopathy Suggests that LV Remodeling Continues to Occur After Surgical LV reconstruction. Alabama American College of Cardiology.
- (ACC) Young Investigators Research Competition, Destin, Alabama. **First** Place, May 1999.
- MRI analysis of the Dor LV Surgical Reconstruction for Non-ischemic Dilated Cardiomyopathy.
- **Second** Place Clinical Science Competition at the 15th Annual Research Competition University of Alabama at Birmingham, March, 1998.
- Distinctive Deviation from Strain Patterns in Left Ventricular Hypertrophy: Observations of the LIFE Study, American College of Cardiology (ACC), Young Investigators Research Competition, Destin, Alabama. **First** Place, May 1998.
- Inter-observer Reproducibility of MRI Tagged Data in Patients with Hypertensive Left Ventricular Hypertrophy. First Annual Meeting of the Society for Cardiovascular Magnetic Resonance in Collaboration with the American Heart Association (AHA) Conference on the Application of Magnetic Resonance to the Cardiovascular System (SCMR), February, 1998.
- Disproportionate Myocardial Dysfunction In The Septum In Hypertensive Left Ventricular Hypertrophy. **Second** Place Clinical Science Competition at the 14th Annual Research Competition University of Alabama at Birmingham, March, 1998.
- The Septal Paradox: Myocardial Wall Strain Reveals Insights into Disease Processes and Pathophysiological Mechanisms. Annual Cardiology Research Retreat, Birmingham, Alabama, October, 1998.

- Evidence For Disproportionate Myocardial Dysfunction In The Septum In Hypertensive Left Ventricular Hypertrophy, Poster-American College of Cardiology 47th Annual Meeting, Atlanta Georgia, April, 1998.
- Evidence For Disproportionate Myocardial Dysfunction In The Septum In Hypertensive Left Ventricular Hypertrophy. Annual Cardiology Research Retreat, Lake Guntersville, AL, November, 1997.
- Reflex Syncope Complicating Permanent Pacing for Heart Block, American College of Physicians' Annual Meeting, Miami, Florida, 1994.
- Pancreatic Islet Cell Transplantation.
- Medical University of South Carolina, Surgical Presentation, 1992.

## International Presentations and Invited Lectures

- Use of Cardiac MRI for the Evaluation of Viability in Advanced CAD. 17<sup>th</sup> Annual Interventional Cardiology Conference. Tremblant, Mont Tremblant, Montreal, Canada February 2014.
- Closing Session Address: Society of Cardiovascular MRI. Debate (Con: T2 imaging is not ready for clinical use) against Daniel Kim, PhD, New York University. Nice, France February 2011.
- Can the midwall stripe be the crystal ball in prediction for outcomes in non-ischemic cardiomyopathy? Society of Cardiovascular MRI, Nice, France. February 2011.
- Cardiovascular MRI in Valvular Heart disease; a comparison with Echocardiography. World Congress of Cardiology. Vancouver, Canada. July 2010
- Discussant: International Panel. Healthy Heart and Lifestyle Optimization. World Congress on Clinical, Preventive and Geriatric Cardiology (WCCPGC), (Swaminarayan Akshardham), New Delhi, India. October 4, 2009.
- Moderator: Percutaneous aortic valve replacement: Status Report. World Congress on Clinical, Preventive and Geriatric Cardiology (WCCPGC), (Swaminarayan Akshardham), New Delhi, India. October 4, 2009.
- Moderator: Newer Horizons in Transcatheter Valvular Therapy. World Congress on Clinical, Preventive and Geriatric Cardiology (WCCPGC), (Swaminarayan Akshardham), New Delhi, India. October 3, 2009.
- Moderator: Advances in Interventional Cardiology, The William Ganz WCCPGC 2009 Oration. World Congress on Clinical, Preventive and Geriatric Cardiology (WCCPGC), (Swaminarayan Akshardham), New Delhi, India. October 4, 2009.
- Moderator: EECF in Heart Failure. World Congress on Clinical, Preventive and Geriatric Cardiology (WCCPGC), (Swaminarayan Akshardham), New Delhi, India. October 3, 2009.
- Moderator: How has Echocardiography changed Pediatric Cardiology. World Congress on Clinical, Preventive and Geriatric Cardiology (WCCPGC), (Swaminarayan Akshardham), New Delhi, India. October 2, 2009.
- Lecture: Evaluation of Aortic Stenosis: By Echocardiography and Cardiovascular MRI. World Congress on Clinical, Preventive and Geriatric Cardiology (WCCPGC), (Swaminarayan Akshardham), New Delhi, India. October 2-4, 2009.
- Faculty Member: World Congress on Clinical, Preventive and Geriatric Cardiology (WCCPGC), (Swaminarayan Akshardham), New Delhi, India. October 2-4, 2009.
- Moderator. World Congress on Clinical, Preventive & Geriatric Cardiology (WCCPGC).
- *CAD:Prevention to Intervention and Intervention to Prevention: Consensus- 2008.*
- New Delhi, India. September 19th 2008.
- *The Use of MRI for Cardiovascular applications.* World Congress on Clinical, Preventive Geriatric Cardiology (WCCPGC). New Delhi, India. September 19, 2008.



- Moderator. World Congress on Clinical, Preventive & Geriatric Cardiology (WCCPGC). *Diagnostic Approach to a Cyanotic Heart Disease* New Delhi, India. September 20, 2008.
- Discussant: Session to reduce Cardiovascular Morbidity and Mortality in the Indian Population. Lead discussant: H.K. Copra, MD. World Congress on Clinical, Preventive & Geriatric Cardiology (WCCPGC). New Delhi, India. September 21, 2008.
- Young Investigator Award Presentations: Moderator. Society of Cardiovascular MRI. Rome 2007.
- LV/RV Function by CMR. Society of Cardiovascular MRI. Rome 2007.
- CVMRI; with an Emphasis on Carotid Plaque and Coronary Imaging. 10/04 Bermuda.
- Physiologic Compensation is Supranormal in Advanced Aortic Stenosis; Does it Return to Normal after Aortic Valve Replacement? An MRI LV Torsion Study Using 3D-HARP. Presented at SCMR. 2/2004, Barcelona, Spain.
- Recent Advances and Future Promise for Cardiovascular MRI. VII Annual World Congress of Echocardiology and Vascular Ultrasound. October, 2003. Buenos Aires, Argentina.
- Insights into Cardiovascular MRI, VII Annual World Congress of Echocardiology and Vascular Ultrasound. October, 2003. Buenos Aires, Argentina.
- Graduation Address: Cattolica University, Roma, Italy- September 2002.
- Global and Regional Mechanics Together with Reverse Remodeling after LV Reconstruction Surgery: A One year 3D MRI Analysis. World Congress of Cardiology. Sydney, Australia. May, 2002.
- CVMRI: Imaging the Effects of Surgery. International Congress of CV MRI, Rome, Italy. April 2002.
- Grand Rounds-Cattolica Universita' Radiologica, Rome, Italy. September 2000.
- ESMRMB Poster- Does the 1D End-Diastolic Dimension Misguide the Estimation of 3D End-Diastolic Volume in Patients with Ischemic Cardiomyopathy? Paris, France. September 2000.

## Patents

Patent #	Patent Title and Description	Date
20090174404	<p><a href="#">Split-echo with fractional temporal-interpolation</a> - An MRI to form an image of a patient includes at least one emitting coil which produces RF pulses and gradients. The MRI includes a controller in communication with the emitting coil for obtaining a steady-state image of the patient, where gradient areas balance to zero for each time repetition (TR) interval, and for causing the emitting coil to produce the RF pulses without interruption during the time repetition interval. The MRI includes at least one receiving coil in communication with the controller which receives the RF pulses and provides the RF pulses to the controller for the controller to obtain the image. A method to form an image of a patient with an MRI. A computer program embodied on a computer readable medium to form an image of a patient with an MRI.</p>	07-09-2009
20090326367	<p><a href="#">Magnetic resonance imager, method and program which continuously applies steady-state free precession to k-space</a> - A magnetic resonance imager for forming images of a moving portion of a patient includes imaging coils. The imager includes a computer that causes the imaging coils to apply continuously steady-state free precession to k-space of a magnetic resonance image series of the patient and acquire the image series, and generates images from the image</p>	12-31-2009

	<p>series. A method for forming images of a moving portion of a patient includes the steps of applying continuously steady-state free precession to k-space of a magnetic resonance image series of a patient. There is the step of acquiring the image series. There is the step of generating images from the image series. A method for forming images of a patient includes the steps of triggering a steady-state free precision imaging sequence to an ECG r wave of cardiac cycles of the patient. There is the step of performing the steady-state free precision imaging sequence with imaging coils of a magnetic resonance imaging scanner such that data for a series of k-space data sets associated with the imaging sequence are acquired in a manner that is time resolved through the cardiac cycle, with data acquired over a number of consecutive cardiac cycles. A computer program embodied on a computer readable medium to form an image of a patient with an MRI.</p>	
20110054302	<p><a href="#">Method and apparatus for detecting, Characterizing, and sampling tissue via a lumen</a> - An apparatus for diagnosing a patient includes a catheter having a tip. The apparatus includes a bioptome disposed in proximity to the tip to obtain a tissue sample of the patient. The apparatus includes a radiodetector disposed in proximity to the tip to detect radiation in the patient. A method for diagnosing a patient includes the steps of moving a tip of a catheter to a desired location in a blood vessel of the patient determined by radiation detected by a radiodetector disposed in proximity to the tip. There is the step of obtaining a tissue sample of the patient with a bioptome disposed in proximity to the tip.</p>	03-03-2011

- Patent applied for: Advanced imaging using MRI images; method and program of application of steady-state free precession to k-space (SKIPI).
- Patent applied for: Advanced imaging using respiratory application  
*Five others applied for (patent pending).*