

# CURRICULUM VITAE

**Peter Zwerner, M.D., F.A.C.C.**

Cardiology/Medicine  
Medical University of South Carolina  
25 Courtenay Drive  
Charleston, South Carolina 29464  
[zwernerp@musc.edu](mailto:zwernerp@musc.edu)  
843-876-4776

## EXPERIENCE

- January 2005- Assistant Professor of Medicine and Radiology  
Division of Cardiology  
Medical University of South Carolina
- Vice Chair of Clinical Affairs  
Department of Medicine  
Medical University of South Carolina
- Co- Director Chest Pain Center  
Medical University of South Carolina
- Medical Director  
Cardiology Out Reach Clinic  
West Ashley
- 2002-2004 Director of Clinical Cardiology  
Director of Cardiac Catheterization Laboratory  
Berkshire Medical Center, Berkshire Faculty Services  
Department of Cardiology  
Pittsfield, MA
- 2000-2001 President, Berkshire Heart Associates, PC  
Pittsfield, MA
- 1992-2000 President, Berkshire Physicians and Surgeons, PC  
Pittsfield, MA  
100 Provider MultiSpecialty Group Practice.

1988-1992      Cardiologist-Berkshire Physicians and Surgeons  
                         Director of Cardiac Catheterization Laboratory  
                         Berkshire Medical Center  
                         Pittsfield, MA

## **FELLOWSHIP**

1987-1988      Chief Fellow, Cardiology  
                         Instructor in Medicine  
                         University of Massachusetts Medical Center

1985-1987      Fellow, Cardiology  
                         University of Massachusetts Medical Center

## **RESIDENCY**

1983-1985      Resident in Medicine  
                         University of Massachusetts Medical Center  
                         Worcester, MA

1982-1983      Intern, Internal Medicine  
                         University of Massachusetts Medical Center  
                         Worcester, MA

## **EDUCATION**

1978-1982      Doctor of Medicine  
                         George Washington University School of Medicine  
                         Washington, D.C.

1975-1977      Bachelor of Science  
                         University of New Hampshire  
                         Durham, NH

1968-1972      Bachelor of Arts  
                         University of New Hampshire  
                         Durham, NH

## **CERTIFICATION/LICENSURE**

1989              American Board of Internal Medicine  
                         Cardiovascular Disease

1985              American Board of Internal Medicine

1982                      Massachusetts Board of Registration # 51791  
2005                      South Carolina Board of Medicine Registration # 27529

### **ACADEMIC APPOINTMENTS**

1987-1988                Instructor in Medicine  
University of Massachusetts Medical School  
1988-2004                Assistant Professor of Medicine  
University of Massachusetts Medical School  
2005-                      Assistant Professor of Medicine  
Medical University of South Carolina  
2006-                      Assistant Professor of Radiology  
Medical University of South Carolina

### **PROFESSIONAL AFFILIATIONS**

Fellow of the American College of Cardiology  
Member, South Carolina Medical Society  
Member of the American Society of Echocardiography  
Member of the American Heart Association  
Founding Member Society of Cardiovascular Computed  
Tomography

### **COMMITTEES**

2005- Present

Acute Coronary Syndrome Center Steering Committee  
Acute Coronary Center Research Committee  
Heart and Vascular Quality Steering Committee  
Joint Cardiology Radiology Advanced Imaging Research  
Committee  
Executive Compliance Committee

## PUBLICATIONS

**Zwerner, P.L.**, Gore, J.M.: The Use of Heparin Coated Pulmonary Artery Catheters in the Assessment of Critically Ill Patients, *Journal of Respiratory Diseases*, 6:11, 1985.

**Zwerner, P.L.**, Gore, J.M.: Differentiating Peri-Infarction Pericarditis from Recurrent Ischemia in Acute Myocardial Infarction. *Practical Cardiology* 11:94-111, 1985.

**Zwerner PL** and Gore JM: Thrombolytic Therapy in Acute Myocardial Infarction. *Journal of Intensive Care Medicine* 1:302-318, 1986.

The Global Use of Strategies to Open Occluded Coronary Arteries (GUSTO)  
GUSTO: An International Randomized Trial Comparing Four Thrombolytic Strategies for Acute Myocardial Infarction. *The New England Journal of Medicine*, 329:673-682, 1993

A Comparison of Recombinant Hirudin with Heparin for the Treatment of Acute Coronary Syndromes the Global Use of Strategies to Open Occluded Coronary Arteries (GUSTO) IIb Investigators. September 12, 1996 Vol 335:775-782

Herzog C, **Zwerner P**, Doll J, Nielson C, Nguyen A, Savino G, Vogl T, Costello P, Schoepf J. Significant Coronary Artery Stenosis: Comparison on a per-patient and a per-vessel or per-segment basis at 64-slice CT angiography " *Radiology*: Vol 244:No1 July 2007

Herzog C, Nguyen S, Savino G, **Zwerner P**, Doll J, Nielson C, Flohr T, Vogle T, Costello P, Schoepf J. Does Two-Segment Image Reconstruction at 64-Section CT Coronary Angiography Improve Image Quality and Diagnostic Accuracy. *Radiology*. Vol 244 No 1 July 2007

Schoepf J, **Zwerner P**, Savino G, Herzog J, Kerl M, Costello P, MD. Coronary CT Angiography. *Radiology*: Volume 244: No 1 July 2007

Schoepf J, **Zwerner P**, Costello P. Clinical Experience in Computed Tomography Imaging: Update on Cardiac CT. *Cath Lab Digest*. April 2006. supplement, pg12-26

Schoepf J, **Zwerner P**, Costello P. Clinical Experience. *Cath Lab Digest*. April, 2006.

Herzog C, Zangos S, **Zwerner P**, Costello P, Vogl T, Schoepf J. CT of Coronary Artery Disease. *J Thorac Imaging*. Volume 22, number 1, February 2007.

Thilo C, Auler M, **Zwerner P**, Costello P, Schoepf J. Coronary CTA Indications, patient Selection, and Clinical Implications. J Thorac Imaging Volume 22, number 1, February 2007.

Savino G, **Zwerner P**, Herzo C, Politt M, Bonomo L, Costello, P. Schoepf, J. CT of Cardiac Function. J Thorac Imaging Volume 22, number 1, pg86-100. February 2007.

Schoepf J, Suranyi P, Thilo C, Costello P, **Zwerner P**. Replacing diagnostic catheterization with coronary CT angiography: the final frontier. Eur Heart J Sept 3, 2007

Ezekowitz M D et al Dabigatran with or without concomitant aspirin compared with Warfarin alone in Patients with Nonvalvular Atrial Fibrillation (PETRO Study) Am J Cardiol 2007;100:1419-1426

Ruzsics B, Heon L, **Zwerner P**, Gebregziabher M, Costello P, Schoepf UJ: Dual-Energy CT of the Heart for Diagnosing Coronary Artery Stenosis and Myocardial Ischemia-Initial Experience. European journal of Radiology. 2009 in press

Aho M, Gebregzoabher m, Schoepf J, Suaranyi P, Lee H, Gregg D, Costello P, **Zwerner P**. Impact of Right Ventricular Contrast Attenuation on the accuracy of Right Ventricular Function Analysis at Cardiac Multi-Detector-Row CT. European Journal of Radiology. Jan 21 2009

Barriers to Copidogrel Adherence Following Placement of Drug-Eluting Stents. Pallares MJ. Powers E, **Zwerner P**, Fowler A, Reeves R, Nappi J. Annals of Pharmacology. Feb 2009 Vol. 43 259

Comparison of Dual-Energy Computed Tomography of the Heart to Single Photon Emission Computed Tomography for Assessment of Coronary Artery Stenosis and of Myocardial Blood Supply. Ruzsics B, Schwarz F, Schoepf J, Yeong Shyan L, Bastarrika G, Chiaramida S, Costello P, **Zwerner P**. American Journal of Cardiology. Aug , 2009 in Press

Bastarrika G, Thilo C, Headden G, **Zwerner P**, Costello P, Schoepf J. The use of Cardiac CT to Assess Acute Chest Pain in the Emergency Department. American Journal of Roentgenology. August, 2009 In press

## Book Chapters

**Zwerner, P.L.**, Gore, J.M (1991): Hemodynamic Monitoring of Acute Myocardial Infarction, Chapter 8. Coronary Care, Edition 1, Francis, Gary S., ed., Lippincott-Ravin.

**Zwerner, P.L.**, Gore, J.M. (1995): Hemodynamic Monitoring of Acute Myocardial Infarction, Chapter 8. Coronary Care, Edition 2, Francis, Gary S., ed., Lippincott-Ravin, 1995.

**Zwerner, P.L.**, Thilo, C (2007): CT Coronary Angiography: Indications and Patient Selection. CT of The Heart; Principles and Applications. Second edition Edited by U. Joseph Schoepf, MD. Humana Press 2007. In Press

## Abstracts

**Peter Zwerner**, Christopher Herzog, Josh Doll, Christopher Nielsen, U. Joseph Schoepf, .Accuracy of 64-Slice CT for Evaluation of Coronary Artery suitability for Coronary Bypass Surgery. North American Society for Cardiac Imaging Annual Meeting & Scientific Sessions, Amelia Island, Fl, Oct 2005

Giancarlo Savino, Josh Doll, Shaun A. Nguyen, Christopher Herzog, **Peter L. Zwerner**, Philip Costello, U. Joseph Schoepf, Rapid Assessment of Cardiac Function at 64-Slice CT: Optimized Parameters and Clinical Validity. North American Society for Cardiac Imaging Annual Meeting & Scientific Sessions, Amelia Island, Fl, Oct 2005

J Doll, C Herzog, **P Zwerner**, C Nielson, P Costello, U Schoepf. 64-Slice CT Angiography Compared to Invasive Angiography for Detection and Exclusion of Significant Coronary Artery Stenosis. Moderated poster session the American Heart Association Scientific Sessions. Dallas, Texas, (November 13-16, 2005.)

**Zwerner P**, Doll J, Herzog C, ,Nielsen C, Costello P, Schoepf U  
64-slice CT-Coronary Angiography Reliably Detects and Excludes Significant Coronary Artery Stenosis on a per-Patient but Not on a per-Segment Basis  
North American Society for Cardiovascular Imaging, Annual Meeting. Amelia Island, Florida . (Oct 8-11 2005)

Gantt III, P **Zwerner** P Burch, S Goodroe, R Nguyen, S Schiaramida, S Savino, G Schoepf J. (Oct 8-11 2005) Global and Regional Left Ventricular Function: Assessment by 64- Slice CT Coronary Angiography :Abstract: The North American Society of Cardiovascular Imaging .Annual Meeting. Amelia Island, Florida. Oct. 2005

Savino, G Nguyen, S **Zwerner**, P. Goodroe, R  
Gantt III, P Schoepf J: (November 2005) Global and Regional Left Ventricular Cardiac Function of 64-Slice MDCT: Comparison with Gated SPECT, Ventriculography and Echocardiography Annual Meeting of the Radiological Society of North America. Chicago, Ill. Nov, 2005

C Herzog, J Doll, **P Zwerner**, C Nielson, P Costello, U Schoepf.  
64-slice CT-Coronary Angiography Reliably Detects and Excludes Significant Coronary Artery Stenosis on a per-Patient but Not on a per-Segment Basis Annual Meeting of the Radiological Society of North America (RSNA). Chicago, Ill Nov. 2005

C Thilo, F Myers, **P Zwerner**, P Costello, U Schoepf. Can Non-calcified Plaque be Detected by non-contrast Calcium Scoring Studies? Annual Meeting of the Radiological Society for North America (RSNA). November, 2006. Chicago, Ill.

F Mayer, C Thilo, S Nguyen, **P Zwerner**, P Costello, U Schoepf; Coronary Artery Calcium: Correlation of Calcification Patterns with Non-Calcified Plaque And Stenosis. Annual Meeting of the north American Society for Cardiac Imaging Oct6-10, 2006 Las Vegas, NV.

C Herzog, **P Zwerner**; G Savino, P Costello; T J Vogl; U Schoepf, Usefulness of Clinical Data in the Interpretation of Coronary Artery Disease in Coronary Angiography and 4- slice CT . 2006 Annual Meeting of the Radiological Society of North America (RSNA). November, 2006. Chicago, Ill.

C Herzog, **P Zwerner** ; G Savino, P Costello, T J Vogl, U Schoepf,. Use of Advanced Visualization Tools in 64-slice CT Coronary Angiography and Impact on Diagnostic Accuracy: A Comparison to Quantitative Coronary Angiography . Annual Meeting of the Radiological Society of North America (RSNA). November, 2006. Chicago, Ill.

Streck J, Nguyen S, Ravenel J, Savino G, **Zwerner P**, Schoepf J. CT Coronary Angiography: 64 –Slice versus 16-Slice Multi Detector Row CT. Annual Meeting of The Radiological Society of North America (RSNA). November, 2006. Chicago, Ill.

C Thilo, F Mayer, **P Zwerner**, P Costello, U Schoepf. "Ca Non- Calcified Coronary Plaques be Detected on Non-Contrast Calcium Scoring Studies?" RSNA 92<sup>nd</sup> Scientific Assembly & Annual Meeting, Chicago,IL Nov 26- Dec 1,2006

C Herzog' UJ Schoepf, G Savino, **P Zwerner**, J Doll, TJ Vogl Johann Wolfgang Göthe Universität, Institut für Diagnostische und Interventionelle Radiologie, Frankfurt Charleston In-vitro Evaluation koronararterieller Stents mittels 64-Zeilen Mehrschicht CT Fortschr Röntgenstr 2006; 178 DOI: 10.1055/s-2006-940848

Jose, M Powers, E **Zwerner**, P Nappi, J Barriers to Adherence with Clopidogrel following Placement of Drug Eluting Stents. Spring Practice Research Forum of the American of Clinical Pharmacy. April 23<sup>rd</sup> 2007

C Thilo, S Chiamida, **P Zwerner**, S A Nguyen; P Costello,U Schoepf. Comparison of 64-slice CT Coronary Angiography with CT Cardiac Function Analysis to Quantitative Catheter Angiography for Predicting Functionally Relevant Coronary Artery Stenosis. E- poster session. The American College of Cardiology 56th Annual Scientific Sessions. March 24-27<sup>th</sup> 2007. New Orleans, Louisiana

C. Thilo, **P. Zwerner**, E.R. Powers, S.A. Nguyen, P. Costello, U.J. Schoepf CT for acute chest pain: Is it time- and cost-effective? E- poster The American College of Cardiology 56th Annual Scientific Session. March 24th-27th . New Orleans, Louisiana

Ruzsics, B **Zwerner P**, Schoepf, J Coronary CTA and Myocardial Blood Pool Analysis using Cardiac Dual-energy CT-Initial Experience. E-poster The American College of Cardiology 57th Annual Scientific Session. March 29<sup>th</sup> -April 1st, 2008. Chicago, Ill

C. Thilo , F. Myer , **P. Zwerner**, P. Costello, UJ Schoepf. "Can Non- Calcified Coronary Plaques be Detected on Non-Contrast Calcium Scoring Studies?" RSNA 92<sup>nd</sup> Scientific Assembly & Annual Meeting, Chicago, IL, November 26 2008

C. Thilo , F. Myer , **P. Zwerner**, P. Costello, UJ Schoepf. Understanding The Heart: Methods for Display and analysis of Cardiac Multidetector CT." RSNA 92<sup>nd</sup> Scientific Assembly & Annual Meeting, Chicago, IL, November 26 2008

Balazs Ruzsics , Michael Rosenblum , **Peter Zwerner** , Salvatore Chiaramida, Joseph Abro , Sebastian Vogt , U. Joseph Schoepf .Adenosine Stress Dual-Energy CT of the Heart for Diagnosing Myocardial Ischemia and Viability Compared with Cardiac MRI and SPECT: Initial Experience. The American College of Cardiology 58th Annual Scientific Session. March 29<sup>th</sup> -31<sup>st</sup> 2009. Orlando, Fl

## **RESEARCH**

### **Principal Investigator:**

PETRO, Prevention of Embolic and Thrombotic Events in Patients with Persistent Atrial Fibrillation. A phase two trial investigating a new anti- thrombotic agent in atrial fibrillation. 10/2003

Crusade MUSC : National Quality Improvement Initiative for Patients with Non-ST – segment-Elevation Myocardial Infarction

Randomized Evaluation of Long Term Anticoagulant Therapy Comparing the Efficacy and Safety of Two Blinded Doses of Dabigatran Etexilate with Open Label Warfarin for the Prevention of Stroke and Systemic Embolism in Patients with Non-valvular Atrial Fibrillation: Prospective, Multi-centre, Parallel-group, Non-Inferiority trial (RE-LY STUDY)

Apixaban Versus Acetylsalicylic Acid (ASA) to prevent Stroke in Atrial Fibrillation Patients Who Have Failed or are Unsuitable for Vitamin K Antagonist Treatment (AVERROES) an international, multi-centre, phase III, randomized, double-blind, double-dummy, parallel-arm Multicenter study to determine if apixaban is superior to aspirin for prevention of stroke or systemic embolism in patients with atrial fibrillation.

Aristotle Study: A Phase 3 Active Controlled , Randomized Double-Blind Parallel Arm study to Evaluate Efficacy and Safety of Apixaban in Preventing Stroke and Systemic Embolism in Subjects with Nonvalvular Atrial Fibrillation.

**Co Investigator:**

A Phase II Multicenter Randomized Double-Blind Dose-Finding Study of Iopamidol Injection 370 in Multidetector Computed Tomographic Angiography (MDCT) in Patients with Suspected Coronary Artery Stenosis – Bracco Sponser

Cost-Effectiveness and Cost-Benefit of Multi-Slice Coronary CT Angiography versus Cardiac Catheterization in Patients with Abnormal Myocardial Perfusion Studies – GE Sponser

Dual-Source CT with Dual-Energy for the Assessment of Myocardial Perfusion Compared with SPECT – Bracco Sponser

Evaluation of Patients with Confirmed Myocardial Infarction Using Novel Cardiac Magnetic Resonance Imaging Approaches – Siemens Sponser

Prospectively ECG-Triggered Coronary CT Angiography – Siemens Sponser

Adenosine-Stress Cardiac Dual-Source CT for the Assessment of Myocardial Perfusion and Viability Compared with MRI – Bayer Sponser

Coronary Computed Tomography for Systematic Triage of Acute Chest Pain Patients to Treatment (CT-STAT) – Bayer Sponser

Multi-detector-Row CT imaging of the Coronary Arteries – Bracco

Contrast Enhanced Multidetector-Row Computed Tomography of The Heart for Differentiating Cardiac and Non-Cardiac Sources of Acute Chest Pain in the Emergency Department. Ongoing trial medical University of South Carolina

Study of Myocardial Perfusion and Coronary Anatomy Imaging Roles in CAD (SPARC) Co- Investigator: Study of myocardial perfusion and Coronary Anatomy Imaging Roles in CAD (SPARK) multicenter observational Registry to define the Clinical value of stress perfusion (stress SPECT, stress PET), noninvasive Angiograph (CTA) and combined perfusion-anatomy (PET/CT) studies in Patients with known or suspected CAD with respect to post-test resource Utilization and prediction of cardiac death and non-fatal myocardial infarction

TRILOGY ACS Study: A Comparison of Prasugrel and Clopidogrel in Acute Coronary Syndrome (ACS) Subjects with Unstable Angina/Non-ST-Elevation Myocardial infarction (UA/NSTEMI) Who are Medically Managed.

EVEREST 2 : Real world Expanded Multicenter Study of the MitraClip system  
( REALISM)

**Editorial Reviewer:**

American Journal of Medical Sciences. Official Journal of the Southern Society  
for Clinical Investigation

The American Journal of Medicine

**Invited Lectures**

Guidelines for Secondary Prevention  
Cardiology Grand Rounds  
Medical University of South Carolina  
Charleston, SC 12/04

CTA in Clinical Practice  
Cardiology Grand Rounds  
Medical University of South Carolina  
Charleston, SC  
1/6/06

Cardiac CT: Clinical Applications  
Medical Grand Rounds  
Medical University of South Carolina  
Charleston, SC  
7/11/06

Cardiovascular CT Update  
American College of Cardiology North and South Carolina Chapters Annual Meeting.  
Kiawah, SC  
10/9/06

CT Angiography in Clinical Practice  
Genesys Regional Medical Center  
Grand Blanc, Michigan  
2/11/06

The Science Behind Get With The Guidelines  
America Heart Association SC Chapter  
GWTG workshop  
Columbia, SC  
10/11/06

Cardiovascular CT Angiography Update  
New Horizons Special Evening Session HMP Communications  
New Orleans, Louisiana  
11/1/06

CT for Evaluation of Cardiac Patients  
Cardiology for the Primary Care Physician at Spoleto  
Charleston, SC  
6/06/06

New Techniques for the Evaluation of Chest Pain  
Cardiology for the Primary care Physician at Spoleto  
Charleston, SC  
5/30/07

A Clinical Case for Support: A foundation in Best Evidence.  
American Heart Association CEO Leadership Event  
Capital City Club  
Columbia, SC 2/7/07

Update of CT Angiography  
Combined NC/SC Chapter American College of Cardiology Annual Meeting  
Asheville, NC 9/26/07

Cardiac CT in Clinical Practice  
Cardiology Grand rounds  
Mission Hospital  
Asheville, NC 4/24/07

CTA indications and Patient Selection  
Medical Grand rounds  
Medical University of South Carolina  
Charleston, South Carolina 11/06/07

Evaluating Left Ventricular Function  
Cardiovascular Imaging in Costa Rica  
January 8-12,2008

Cardiac Ct Indications and Patient Management  
Cardiovascular Imaging in Costa Rica  
January 8-12,2008

Cardiovascular Imaging 2008  
The Charleston Course at the Sanctuary  
Cardiac CT Indications, patient selection and management  
Fe 25<sup>th</sup> 2008

Cardiac CT: Clinical Applications Medical Grand Rounds  
Medical University of South Carolina  
Charleston, SC 7/11/06

Cardiovascular CT Update  
American College of Cardiology North and South Carolina Chapters Annual Meeting.  
Kiawah, SC 10/9/06

The Science Behind Get With The Guidelines  
America Heart Association SC Chapter  
GWTG workshop  
Columbia, SC 10/11/06

Cardiovascular CT Angiography Update  
New Horizons Special Evening Session HMP Communications  
New Orleans, Louisiana  
11/1/06

A Clinical Case for Support: A foundation in Best Evidence.  
American Heart Association CEO Leadership Event  
Capital City Club  
Columbia, SC  
2/7/07

Cardiac CT in Clinical Practice  
Cardiology Grand rounds  
Mission Hospital  
Ashville, NC  
4/24/07

New Techniques for the Evaluation of Chest Pain  
Cardiology for the Primary care Physician at Spoleto  
Charleston, SC  
5/30/07

Update of CT Angiography  
Combined NC/SC Chapter American College of Cardiology Annual Meeting  
Ashville, NC  
9/26/07

Medical Grand Rounds  
MUSC Department of Medicine  
CTA Indications and Patient Selection  
Nov 8<sup>th</sup> , 2007

Evaluation of Left Ventricular Function  
Cardiovascular Imaging in Costa Rica  
Medical University of South Carolina  
January 10-15, 2008

Cardiac CT: Indications, Patient Selection and Management  
The Charleston Course at the Sanctuary Kiawah, SC  
Medical University of South Carolina  
Department of Radiology  
Feb 27<sup>th</sup> , 2008

CTA Indications and patient selection  
Cardiovascular imaging in Costa Rica  
MUSC  
Department of Radiology  
Costa Rica  
1/8-12/2008

Physician Assistance MUSC School of Allied Health Student Lecture  
Ischemic Heart Disease  
March 26<sup>th</sup> 2008

Cardiac CT: Clinical Needs.  
Society for Cardiac and Body Tomography and Magnetic Resonance (SCBT MR) 31<sup>st</sup>  
Annual Course  
Charleston, SC  
April 2<sup>nd</sup> ,2008

Testing for Cardiac Ischemia  
Cardiology for the Primary care Physician  
Medical University of South Carolina  
Charleston, SC  
6/1/08

Cardiac CT Imaging  
Combined NC/SC Chapter American College of Cardiology Annual Meeting  
Wild Dunes, SC  
9/28/ 2008

Cardiology /Radiology Collaboration: Can it be done?  
North American Society of Cardiac Imaging  
Annual Meeting  
Oct 11-14, 2008 Scottsdale, AR

Evaluation of Chest Pain in the Emergency setting  
MUSC Emergency Division Grand Rounds  
February 10<sup>th</sup> 2009

Cardiac CT  
The Annual Sanctuary of Endovascular Therapy Conference  
Kiawah 2009 Feb 21<sup>st</sup>

Clinical Questions in Cardiac imaging:  
CT Case Presentations:  
CT Clinical Vignettes:  
The Charleston Course at the Sanctuary: Cardiac Imaging 2009  
Feb 22-25

Ischemic Heart Disease  
Lecture to first year Physician Assistant Students, MUSC School of Allied Health  
March 16, 2009

New Techniques for the Evaluation of Ischemia  
33<sup>rd</sup> Cardiology for the Primary care Physician at Spoleto Conference  
Charleston, SC 5/30/09