

**CURRICULUM VITAE**  
**MICHAEL EMIL MOLLERUS, MD**

**BUSINESS ADDRESS:**

The Duluth Clinic, Ltd.<sup>1</sup>  
400 East Third Street  
Duluth, MN 55805

**PRIMARY PRACTICE SITE:**

St. Mary's Medical Center, dba  
Essentia Health St. Mary's Medical Center<sup>1</sup>  
407 East Third Street  
Duluth, MN 55805

**PRESENT POSITIONS:**

2010- Member, Essentia Medical Group-Duluth<sup>2</sup>  
2001- Director of EP Laboratory, Section of Cardiology, Essentia Health St. Mary's Medical Center, Duluth, MN  
2001- Staff Physician, Section of Cardiology, Essentia Health St. Mary's Medical Center, Duluth, MN

**AFFILIATIONS:**

The Duluth Clinic, Ltd., dba

- Essentia Health Duluth Clinic
- Essentia Health Hibbing Clinic
- Essentia Health Ashland Clinic
- Essentia Health Hayward Clinic
- Essentia Health Ely Clinic
- Essentia Health Spooner Clinic
- Essentia Health Virginia Clinic

Innovis Health, LLC, dba

- Essentia Health 32<sup>nd</sup> Avenue Clinic

Grand Itasca Clinic<sup>3</sup>

**MEDICAL STAFF PRIVILEGES:**

St. Mary's Hospital of Superior, dba

- Essentia Health St. Mary's Hospital-Superior

SMDC Medical Center, dba

- Essentia Health Duluth

Pine Medical Center, dba

- Essentia Health Sandstone

Innovis Health, LLC, dba

- Essentia Health Fargo

<sup>1</sup> This facility is a wholly owned subsidiary of Essentia Health. See attached "Essentia Health Facilities". The Essentia Institute of Rural Health, a wholly owned corporation of Essentia Health, is assigned oversight of research and education for Essentia Health.

<sup>2</sup> The Essentia Medical Group was formed to provide a common practice environment for all physicians and credentialed providers within Essentia Health.

<sup>3</sup> It is noted that this facility is not an Essentia Health facility; therefore, research will not be conducted under the Essentia Health FWA.

**MICHAEL EMIL MOLLERUS, MD**

**PAGE 2:**

**PAST POSITIONS:**

1997-2001      Staff Physician, Section of Cardiology, Naval Medical Center, San Diego, CA  
Pacemaker Clinic Director  
Research Director  
HIV-Cardiology Clinic Staff Physician

**CERTIFICATION:**

1998-2018      American Board of Medical Specialties (ABMS) Internal Medicine, Subspecialty Clinical Cardiac Electrophysiology, Diplomate  
1997-2017      ABMS Internal Medicine, Subspecialty Cardiovascular Disease, Diplomate  
1993-2013      ABMS Internal Medicine, Diplomate

**LICENSURE:**

Minnesota  
Wisconsin  
California  
North Dakota

**EDUCATION:**

1986-1990      University of California-San Francisco, MD, San Francisco, CA  
1976-1980      University of San Francisco, BA *summa cum laude* Philosophy, San Francisco, CA

**POSTGRADUATE EXPERIENCE:**

1996-1997      University of California-San Diego, Electrophysiology (Fellowship), San Diego, CA  
1993-1996      Naval Medical Center, Cardiology (Fellowship), San Diego, CA  
1991-1993      Naval Medical Center, Internal Medicine (Residency), San Diego, CA  
1990-1991      Naval Medical Center, Internal Medicine (Internship), San Diego, CA

**MILITARY SERVICE:**

1990-2001      United States Navy

**HONORS/AWARDS:**

1990      Alpha Omega Alpha, Medical Honor Society  
1980      Alpha Sigma Nu, Jesuit Honor Society

**MICHAEL EMIL MOLLERUS, MD**

**PAGE 3:**

**PROFESSIONAL MEMBERSHIPS AND SOCIETIES:**

1990- Alpha Omega Alpha, Member  
\* American College of Cardiology, Fellow  
\* Heart Rhythm Society, Member

**COMMITTEES / ADMINISTRATIVE RESPONSIBILITIES:**

2010- Chair, Essentia Heart and Vascular Medical Group  
2007-2008 Duluth Clinic Foundation, President  
2006-2010 Research Director, Department of Cardiology, Essentia Health St. Mary's Medical Center  
2006 Moderate Sedation Policy Committee, St. Mary's Medical Center  
2003-2009 Duluth Clinic Foundation, Member  
2003 DoD/VA Guideline Committee on Ischemic Heart Disease, Navy Representative  
2002 Department of Defense/Veteran Affairs (DoD/VA) Guideline Committee on Hyperlipidemia, Navy Representative  
2001- EP Lab Director, Essentia Health St. Mary's Medical Center

**FUNDED RESEARCH/GRANTS RECEIVED**

1. The Painfree SST Clinical Study (Phase II) (Painfree SST), Medtronic, Inc., \$33,000, May 2011 –
2. CRM and Therapeutic Radiation: Evaluation of Boston Scientific's Safety Architecture and Safety Core Technology Following Exposure to Therapeutic Radiotherapy (CARE), Boston Scientific, \$24,096, November 2010 –
3. CRM and Fusion Beats: Effect of Progressive Fusion on Intra-Left Ventricular Mechanical Function (CRM Fusion), Boston Scientific, \$82,750, March 2008 – September 2010.
4. Longitudinal Surveillance Registry of the ACUITY™ Spiral Lead (LSR of ACUITY Spiral), Boston Scientific, \$27,750, June 2009 –
5. Real Time Spectral Analysis of Ventricular Fibrillation Detected in ICDs (REAL TIME), Medtronic, Inc., \$45,643, July 2009 – May 2010.
6. SMDC Pacemaker-MRI Cohort Study (MRI Cohort), Duluth Clinic Foundation, \$150,694, April 2009 – July 2011.
7. Spectral Analysis of Ventricular Fibrillation Detected in ICDs (VF SPECTRAL), SRB Award, July 2007 –
8. Clinical Research Evaluation of the ASSURE™ Device Atrial and Ventricular Tachyarrhythmia Therapies (REASSURE AV Registry), Medtronic, Inc., \$8,000, February 2007 – June 2010.
9. Multicenter Automatic Defibrillator Implantation Trial with Cardiac Resynchronization Therapy (MADIT CRT), University of Rochester, \$146,000, January 2005-January 2011.

**PUBLICATIONS - JOURNAL ARTICLES:**

1. Mollerus M, Renier C, Lipinski M. Spectral methods to distinguish ventricular fibrillation from artefact in implantable cardioverter-defibrillators. *Europace* 2011 Apr 13. [Epub ahead of print].
2. Mollerus M, Albin G, Lipinski M, Lucca J. Magnetic resonance imaging of pacemakers and implantable cardioverter-defibrillators without specific absorption rate restrictions. *Europace*. 2010 July;12(7):947-951.
3. Mollerus M, Albin G, Lipinski M, Lucca J. Ectopy in patients with permanent pacemakers and implantable cardioverter-defibrillators undergoing an MRI scan. *Pacing Clin Electrophysiol*. 2009 Jun;32(6):772-778.
4. Mollerus M, Albin G, Lipinski M, Lucca J. Cardiac biomarkers in patients with permanent pacemakers and implantable cardioverter-defibrillators undergoing an MRI scan. *Pacing Clin Electrophysiol*. 2008 Oct;31(10):1241-1245
5. Mollerus M, Lipinski M, Munger T. A randomized comparison of defibrillation thresholds in the right ventricular outflow tract versus right ventricular apex. *J Interv Card Electrophysiol*. 2008; 22:221-225.
6. Mollerus M, Naslund L. Myocardial stunning following defibrillation threshold testing. *J Interv Card Electrophysiol*. 2007;19(3):213-216.
7. Garg A, Finneran W, Mollerus M, et al. Right atrial compartmentalization using radiofrequency catheter ablation for management of patients with refractory atrial fibrillation. *J Cardiovasc Electrophysiol*. 1999 Jun;10(6):763-71.
8. Feld GK, Mollerus M, et al. Conduction velocity in the tricuspid inferior vena cava isthmus is slower in patients with type I atrial flutter compared to those without a history of atrial flutter. *J Cardiovasc Electrophysiol*. 1997;8:1338-1348.

**ABSTRACTS AND INVITED PRESENTATIONS AT PROFESSIONAL MEETINGS:**

1. "Fractal Properties of Self-Similarity Distinguishes Ventricular Fibrillation from Artifact". Heart Rhythm Society Scientific Sessions, Boston, MA, 2012
2. "Radiation Tolerance of Current ICDs". *Europace* Scientific Sessions, Madrid, Spain, 2011.
3. "What are the EMI Effects of MRI in Patients with Pacemakers and ICDs?", invited lecture. Heart Rhythm Society Scientific Sessions, San Francisco, CA, 2011.
4. "Wavelet Packet Decomposition of Near-Field Signal During Ventricular Fibrillation". Heart Rhythm Society Scientific Sessions, San Francisco, CA, 2011.
5. "Acute Hemodynamic Affects of Progressive Fusion during Right Ventricular Pacing". Heart Rhythm Society Scientific Sessions, San Francisco, CA, 2011.
6. "Spectral Techniques Distinguish Clinical Ventricular Fibrillation from Artifact in Implantable Cardioverter-Defibrillators". American Heart Association Scientific Sessions, Chicago, IL. 2010.
7. "Spectral Techniques Distinguish Atrial Fibrillation from Ventricular Tachycardia in Implantable Cardioverter-Defibrillators". Heart Rhythm Society Scientific Sessions, Denver, CO. 2010.

**MICHAEL EMIL MOLLERUS, MD**

**PAGE 5:**

8. "Magnetic Resonance Imaging of Pacemakers and Implantable Cardioverter-Defibrillators without Specific Absorption Rate Restriction". European Society of Cardiology Scientific Sessions, Barcelona, Spain. 2009.
9. "Wavelet Packet Decomposition of Ventricular Fibrillation in Implantable Cardioverter-Fibrillators". Heart Rhythm Society Scientific Sessions, Boston, MA. 2009.
10. "Acute Threshold Changes in Pacemakers Following an MRI Scan". Heart Rhythm Society Scientific Sessions, Boston, MA. 2009.
11. "Spectral Analysis of Near-Field Electrograms of Ventricular Fibrillation in Implantable Cardioverter-Fibrillators". American Heart Association Scientific Sessions, New Orleans, LA. 2008.
12. "Root Mean Square Properties of Spectral Analysis of Ventricular Fibrillation in ICDs". European Society of Cardiology Scientific Sessions, Munich, Germany. 2008.
13. "Cardiac Markers in Patients with Permanent Pacemakers Undergoing on MRI Scan". Heart Rhythm Society Scientific Sessions, Denver, CO. 2007.

\*Dates not available.