



Sanjiv Narayan

Professor of Medicine (Cardiovascular Medicine) at the Stanford University Medical Center

Medicine - Cardiovascular Medicine

 NIH Biosketch available Online

CLINICAL OFFICES

- **Cardiovascular Medicine**

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ACADEMIC CONTACT INFORMATION

- **Alternate Contact**

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Bio

BIO

Dr. Narayan is Professor of Medicine, Cardiologist and Bioengineer at Stanford University whose vision is to advance patient outcomes through the computational and engineering sciences. Dr. Narayan is Co-Founder and Co-Director of the Stanford Arrhythmia Center, whose mission is to develop world-leading therapy based on patient centered research for heart rhythm disorders. As Director of the Computational Arrhythmia Research Laboratory, Dr. Narayan has built an extramurally funded “bedside-to-bench-to-bedside” program focused on atrial and ventricular fibrillation, applying analytic methods, modeling and machine learning to define mechanisms and novel therapy. This work led to the discovery of rotational (rotors) and focal drivers for human cardiac fibrillation, confirmed by optical mapping in human atria and numerous independent clinical studies. Ablation of fibrillatory drivers (e.g. Focal Impulse and Rotor Modulation, FIRM) improves patient outcomes in reports from multiple centers, and understanding drivers of AF and VF is a major clinical and research area.

Dr. Narayan is a passionate mentor, and has trained numerous graduate students in bioengineering, residents/fellows in training and medical students. A large number of these trainees have received extramural funding, have won research and clinical prizes and over 80% remain in academic medicine. Dr. Narayan has won teaching prizes for his clinical mentorship as well as research prizes and his mentorship program has been supported by the National Institutes of Health (K24 HL103800, 2010 to present).

Dr. Narayan was born in Aylesbury, Buckinghamshire, England, then his family moved to Birmingham where he trained in medicine (MB, ChB) then software engineering (MSc) with a concentration on neural networks. He gained membership (MRCP) then fellowship (FRCP) of the Royal College of Physicians of London. He moved to the renowned neuroimaging/computational laboratory of Arthur Toga, PhD at UCLA where his research in optical mapping/neuroscience led to his research doctorate (MD). He completed U.S. clinical training in Internal medicine at Harvard/Mount Auburn Hospital under Dr. Charles Hatem, and Cardiology/EP at Washington University in St. Louis under Drs Michael Cain and Bruce Lindsay. Dr. Narayan is board-certified in Cardiology and Clinical Cardiac Electrophysiology, and has been voted as a “Top Doctor”. He is a devoted family man, and he and his wife have three children. Together, they enjoy swimming, biking, skiing, music and travel.

FINANCIAL DISCLOSURES: The Narayan laboratory is extremely grateful to its funding agencies. Fellows in Dr. Narayan's Laboratory have been funded by the Fulbright Foundation, American College of Cardiology, American Heart Association, Heart Rhythm Society and British Heart Foundation. Dr. Narayan's work has been supported by continuous grants over 2001-2020 from the NIH (HL70529, HL83359, HL103800, HL122384 and SBIR grants), the Doris Duke Charitable Foundation and American Heart Association. To further develop technology resulting from this research for wider clinical use, Dr. Narayan co-invented intellectual property from this research owned by the University of California Regents. This IP was licensed to a start-up Dr. Narayan co-founded (Topera), in which he held equity and which was acquired in 2014 by Abbott Laboratories. Dr. Narayan has received consulting income from Abbott Electrophysiology, Medtronic, St. Jude Medical, Uptodate and the American College of Cardiology

CLINICAL FOCUS

- Clinical Cardiac Electrophysiology

ACADEMIC APPOINTMENTS

- Professor - Med Center Line, Medicine - Cardiovascular Medicine
- Member, Bio-X
- Member, Cardiovascular Institute

ADMINISTRATIVE APPOINTMENTS

- Co-Director, Stanford Arrhythmia Center, (2016- present)
- Director, Atrial Fibrillation Program, Stanford Medicine, (2014- present)
- Director, Electrophysiology Research, Stanford Medicine, (2014- present)
- Co-Director, Electrophysiology Program, University of California, San Diego, (2008-2014)
- Director, Clinical Cardiac Electrophysiology Fellowship Training Program, University of California, San Diego, (2008-2012)
- Director, Electrophysiology Program, Veterans Affairs San Diego Healthcare System, (2001-2014)

HONORS AND AWARDS

- Mentor to AJ Rogers, MD MBA, Recipient F32 Award, National Institutes of Health (2018-2021)
- Mentor to AJ Rogers, MD MBA, Recipient, Josephson and Wellens Fellowship (Declined in Favor of NIH), Heart Rhythm Society (2018-2019)
- Charter Member, ESTA Study Section, National Institutes of Health (2017 - present)
- Mentor to Junaid Zaman, MD, Best Poster Award, European Society of Cardiology Meeting, Barcelona (2017)
- Mentor to Rachita Navara, MD; 1st Prize 2017 Stanford General Internal Medicine Symposium, Stanford University (2017)
- Mentor to Mallika Tomboli, BS (MD class of 2019); Stanford MedScholars Program, Stanford University (2016 - 2017)
- Mentor to Rachita Navara, MD; 2016-7 Stanford Society of Physician Scholars research grant, Stanford University (2016 - 2017)
- Mentor to Christopher Kowalewski; Clinical Prize 2016 Stanford-Karolinska Institute Symposium, Stanford University (2016)
- Mentor to Tina Baykaner, MD, Recipient, Josephson and Wellens Fellowship, Heart Rhythm Society (2015-2016)
- Mentor to Junaid Zaman, MD, Fulbright Scholar, Fulbright Foundation (2015 - 2016)
- Mentor to Junaid Zaman, MD, Finalist Young Investigator Awards Competition, American Heart Association (2015)
- Mentor to Tina Baykaner, MD, Awardee Postdoctoral Fellowship (declined for HRS fellowship), American Heart Association (2015)
- Mentor to Junaid Zaman, MD, Recipient British Heart Foundation Grant 2014, British Heart Foundation (2014 - 2015)
- Mentor to Amir Schricker, MD, Recipient 1st Prize HRS 2013 Young Investigator Awards, Heart Rhythm Society (2013)
- Mentor to Amir Schricker, MD, Recipient, ACC-Merck Fellowship, American College of Cardiology Foundation (2012 - 2013)
- Mentor to Amir Schricker, MD, HRS Max Schaldach Fellow (declined in favor of ACC-Merck), Heart Rhythm Society (2012)
- Mentor to David Krummen, MD, Finalist, Samuel Levine Young Investigator Awards Competition, American Heart Association (2011)

- Mentor to David E. Krummen, MD. AHA Beginning-Grant-In-Aid, American Heart Association (2010 - 2012)
- Mentor to Antonio Moyeda, RCVT, 1st Prize, Allied Professionals, Heart Rhythm Society (2010)
- Ad Hoc Member, ESTA, CCIS, Other Study Section, National Institutes of Health (2008 - 2017)
- Mentor to David Krummen, MD, Finalist Young Investigator Awards Competition, American College of Cardiology Foundation (2008)
- Mentor to Han Bui, MD, Recipient of ACC-Merck Fellowship, American College of Cardiology Foundation (2005 - 2006)
- Mentor to David Krummen, MD, Recipient, ACC-Merck Fellowship, American College of Cardiology Foundation (2003 - 2004)
- Finalist, Astra-Zeneca Cardiovascular Young Investigator Awards Competition, Astra-Zeneca-Competition (2001)
- Finalist, Samuel Levine Young Investigator Awards Competition, American Heart Association (1998)
- Finalist, Young Investigator Awards Competition, North American Society for Pacing and Electrophysiology (NASPE/HRS) (1998)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Associate Editor, Journal of the American College of Cardiology (2006 - 2017)
- Section Editor, Journal of the American College of Cardiology (2017 - present)
- Chair, Research Fellowship Committee, Heart Rhythm Society (2016 - present)
- Associate Editor, Journal of the American College Of Cardiology: Clinical Electrophysiology (2014 - present)
- Section Editor, Heart Rhythm Journal (2014 - 2014)
- Member, Editorial Board, Journal of Interventional Cardiac Electrophysiology (2013 - present)
- Coordinator and Co-Coordinator, Electrophysiology Program, American College of Cardiology Scientific Sessions (2013 - 2015)
- Member, Editorial Board, Journal of Cardiovascular Electrophysiology (2012 - present)
- Vice-Chair, Research Fellowship Committee, Heart Rhythm Society (2012 - 2016)
- Scientific Program Committee, Member, American Heart Association Scientific Sessions (2010 - 2012)
- Member, Editorial Board, Heart Rhythm Journal (2007 - present)

PROFESSIONAL EDUCATION

- Fellowship: UCLA David Geffen School Of Medicine Registrar (1994) CA
- Board Certification: Clinical Cardiac Electrophysiology, American Board of Internal Medicine (2001)
- Fellowship: Washington University School of Medicine/Barnes Jewish Consortium (2001) MO
- Board Certification: Cardiovascular Disease, American Board of Internal Medicine (2000)
- Residency: Barnes and Allied Hospitals/Washington University School of Med (2000) MO
- Internship: Mount Auburn / Harvard Medical School (1996) MA
- MD (Neuroscience Doctorate), University of Birmingham , UK (1994)
- Internship: University of Birmingham (1991) UK
- MSc (Computer Science), University of Birmingham , UK (1990)
- Medical Education: University of Birmingham (1987) United Kingdom

PATENTS

- Carey R. Briggs, Sanjiv M. Narayan. "United States Patent 9,392,948 B2 System and Method for Identifying Sources for Biological Rhythms", University of California, Regents., Jul 19, 2016
- Sanjiv Narayan, Ruchir Sehra. "United States Patent 8,868,169 B2 Method and System for Detection of Biological Rhythm Disorders", Regents of the University of California; Topera Inc; US Government represented by Dept of Veterans Affairs, Oct 21, 2014
- Sanjiv M. Narayan, Wouter-Jan Rappel. "United States Patent 8,838,222 B2 Method for Treating Complex Rhythm Disorders", University of California Regents, Sep 16, 2014

- Sanjiv M. Narayan, Wouter-Jan Rappel. "United States Patent 8,838,223 B2 Method for Analyzing Complex Rhythm Disorders.", University of California Regents, Sep 16, 2014
- Sanjiv M. Narayan, Ruchir Sehra. "United States Patent 8,700,140 Methods, system and apparatus for the detection, diagnosis and treatment of biological rhythm disorders", Regents of the University of California; Topera Inc., US Department of Veterans Affairs, Apr 15, 2014
- Sanjiv Narayan. "United States Patent 8,676,303 Machine and Process for Treating Heart Instability", University of California Regents, Mar 18, 2014
- Carey R. Briggs, Sanjiv M. Narayan. "United States Patent 8,594,777 System And Method For Reconstructing Cardiac Activation Information", University of California Regents, Nov 26, 2013
- Sanjiv M. Narayan, Wouter-Jan Rappel. "United States Patent 8,521,266 Methods for the Detection And/Or Diagnosis Of Biological Rhythm Disorders", University of California Regents, Aug 27, 2013
- Carey R. Briggs, Sanjiv M. Narayan. "United States Patent 8,165,666 System And Method For Reconstructing Cardiac Activation Information", University of California Regents, Apr 24, 2012
- Sanjiv Narayan, Valmik Bhargava. "United States Patent 7,123,954 Method and Apparatus for Classifying and Localizing Heart Arrhythmias", University of California Regents, Oct 17, 2006

LINKS

- My Lab Site: <http://web.stanford.edu/group/narayanlab/cgi-bin/wordpress/contact/>
- Why I Went Into Medicine: <https://www.youtube.com/watch?v=42Um2o2oSJI&feature=youtu.be>
- Video Story: <https://stanfordhealthcare.org/stanford-health-now/why-i-got-into-medicine/why-medicine-sanjiv-narayan-md.html>
- FIRM Physician Centered Video: <https://youtu.be/OBozymcv4hI>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Dr. Narayan directs the Computational Arrhythmia Research Laboratory, whose goal is to define the mechanisms underlying complex human heart rhythm disorders, to develop bioengineering-focused solutions to improve therapy that will be tested in clinical trials. The laboratory has been funded continuously since 2001 by the National Institutes of Health, AHA and ACC, and interlinks a disease-focused group of clinicians, computational physicists, bioengineers and trialists.

CLINICAL TRIALS

- Ablation of Sources for Rapid Heart Rhythms, Recruiting
- The Maintenance of Human Atrial Fibrillation, Recruiting
- Substrate Versus Trigger Ablation for Paroxysmal Atrial Fibrillation, Not Recruiting
- The Dynamics of Human Atrial Fibrillation, Not Recruiting

Teaching

COURSES

2017-18

- Introduction to Bioengineering Research: BIOE 390, MED 289 (Aut)

2016-17

- Introduction to Bioengineering Research: BIOE 390, MED 289 (Aut)

2015-16

- Introduction to Bioengineering Research: BIOE 390, MED 289 (Aut)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Albert Rogers

Postdoctoral Research Mentor

Albert Rogers

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Cardiac Electrophysiology (Fellowship Program)
- Cardiovascular Medicine (Fellowship Program)

Publications

PUBLICATIONS

- **Multicentre safety of adding Focal Impulse and Rotor Modulation (FIRM) to conventional ablation for atrial fibrillation.** *Europace*
Krummen, D. E., Baykaner, T., Schricker, A. A., Kowalewski, C. A., Swarup, V., Miller, J. M., Tomassoni, G. F., Park, S., Viswanathan, M. N., Wang, P. J., Narayan, S. M.
2017; 19 (5): 769-774
- **Spatial relationship of organized rotational and focal sources in human atrial fibrillation to autonomic ganglionated plexi.** *International journal of cardiology*
Baykaner, T., Zografos, T. A., Zaman, J. A., Pantos, I., Alhousseini, M., Navara, R., Krummen, D. E., Narayan, S. M., Katritsis, D. G.
2017
- **Determining conduction patterns on a sparse electrode grid: Implications for the analysis of clinical arrhythmias** *PHYSICAL REVIEW E*
Vidmar, D., Narayan, S. M., Krummen, D. E., Rappel, W.
2016; 94 (5)
- **Challenging the complementarity of different metrics of left atrial function: insight from a cardiomyopathy-based study.** *European heart journal cardiovascular Imaging*
Kobayashi, Y., Moneghetti, K. J., Boralkar, K., Amsallem, M., Tuzovic, M., Liang, D., Yang, P. C., Narayan, S., Kuznetsova, T., Wu, J. C., Schnittger, I., Haddad, F.
2016
- **Mechanisms linking electrical alternans and clinical ventricular arrhythmia in human heart failure.** *Heart rhythm*
Bayer, J. D., Lalani, G. G., Vigmond, E. J., Narayan, S. M., Trayanova, N. A.
2016; 13 (9): 1922-1931
- **Comparison of Detailed and Simplified Models of Human Atrial Myocytes to Recapitulate Patient Specific Properties.** *PLoS computational biology*
Lombardo, D. M., Fenton, F. H., Narayan, S. M., Rappel, W.
2016; 12 (8)
- **Can Cardiac Conduction System Disease Be Prevented?** *JAMA internal medicine*
Narayan, S. M., Baykaner, T., Maron, D. J.
2016; 176 (8): 1093-1094
- **Organized Sources Are Spatially Conserved in Recurrent Compared to Pre-Ablation Atrial Fibrillation: Further Evidence for Non-Random Electrical Substrates** *JOURNAL OF CARDIOVASCULAR ELECTROPHYSIOLOGY*
Lalani, G. G., Coysh, T., Baykaner, T., Zaman, J., Hopper, K., Schricker, A. A., Trikha, R., Clopton, P., Krummen, D. E., Narayan, S. M.
2016; 27 (6): 661-669
- **Mechanistically based mapping of human cardiac fibrillation** *JOURNAL OF PHYSIOLOGY-LONDON*
Narayan, S. M., Zaman, J. A.
2016; 594 (9): 2399-2415
- **Intracoronary Gene Transfer of Adenylyl Cyclase 6 in Patients With Heart Failure: A Randomized Clinical Trial.** *JAMA cardiology*
Hammond, H. K., Penny, W. F., Traverse, J. H., Henry, T. D., Watkins, M. W., Yancy, C. W., Sweis, R. N., Adler, E. D., Patel, A. N., Murray, D. R., Ross, R. S., Bhargava, V., Maisel, et al
2016; 1 (2): 163-171
- **The precise timing of tachycardia entrainment is determined by the postpacing interval, the tachycardia cycle length, and the pacing rate: Theoretical insights and practical applications** *HEART RHYTHM*

- Kaiser, D. W., Hsia, H. H., Dubin, A. M., Liem, L. B., Viswanathan, M. N., Zei, P. C., Wang, P. J., Narayan, S. M., Turakhia, M. P.
2016; 13 (3): 695-703
- **The precise timing of tachycardia entrainment is determined by the postpacing interval, the tachycardia cycle length, and the pacing rate: Theoretical insights and practical applications.** *Heart rhythm*
Kaiser, D. W., Hsia, H. H., Dubin, A. M., Liem, L. B., Viswanathan, M. N., Zei, P. C., Wang, P. J., Narayan, S. M., Turakhia, M. P.
2016; 13 (3): 695-703
 - **New Mechanism-based Approaches to Ablating Persistent AF: Will Drug Therapy Soon Be Obsolete?** *JOURNAL OF CARDIOVASCULAR PHARMACOLOGY*
Zaman, J. A., Baykaner, T., Narayan, S. M.
2016; 67 (1): 1-8
 - **New Mechanism-based Approaches to Ablating Persistent AF: Will Drug Therapy Soon Be Obsolete?** *Journal of cardiovascular pharmacology*
Zaman, J. A., Baykaner, T., Narayan, S. M.
2016; 67 (1): 1-8
 - **Phase synchrony reveals organization in human atrial fibrillation** *AMERICAN JOURNAL OF PHYSIOLOGY-HEART AND CIRCULATORY PHYSIOLOGY*
Vidmar, D., Narayan, S. M., Rappel, W.
2015; 309 (12): H2118-H2126
 - **Mechanisms for the Termination of Atrial Fibrillation by Localized Ablation Computational and Clinical Studies** *CIRCULATION-ARRHYTHMIA AND ELECTROPHYSIOLOGY*
Rappel, W., Zaman, J. A., Narayan, S. M.
2015; 8 (6): 1325-1333
 - **Mechanisms for the Termination of Atrial Fibrillation by Localized Ablation: Computational and Clinical Studies.** *Circulation. Arrhythmia and electrophysiology*
Rappel, W., Zaman, J. A., Narayan, S. M.
2015; 8 (6): 1325-1333
 - **Modifying Ventricular Fibrillation by Targeted Rotor Substrate Ablation: Proof-of-Concept from Experimental Studies to Clinical VF** *JOURNAL OF CARDIOVASCULAR ELECTROPHYSIOLOGY*
Krummen, D. E., Hayase, J., Vampola, S. P., Ho, G., Schricker, A. A., Lalani, G. G., Baykaner, T., Coe, T. M., Clopton, P., Rappel, W., Omens, J. H., Narayan, S. M.
2015; 26 (10): 1117-1126
 - **Ablation of atrial fibrillation** *TRENDS IN CARDIOVASCULAR MEDICINE*
Wright, M., Narayan, S. M.
2015; 25 (5): 409-419
 - **Ablating Atrial Fibrillation: Customizing Lesion Sets Guided by Rotor Mapping.** *Methodist DeBakey cardiovascular journal*
Zaman, J. A., Narayan, S. M.
2015; 11 (2): 76-81
 - **The role of rotors in atrial fibrillation.** *Journal of thoracic disease*
Krummen, D. E., Swarup, V., Narayan, S. M.
2015; 7 (2): 142-151
 - **Rotor mapping and ablation to treat atrial fibrillation** *CURRENT OPINION IN CARDIOLOGY*
Zaman, J. A., Peters, N. S., Narayan, S. M.
2015; 30 (1): 24-32
 - **Progress toward the prevention and treatment of atrial fibrillation: A summary of the Heart Rhythm Society Research Forum on the Treatment and Prevention of Atrial Fibrillation, Washington, DC, December 9-10, 2013.** *Heart rhythm*
Van Wagoner, D. R., Piccini, J. P., Albert, C. M., Anderson, M. E., Benjamin, E. J., Brundel, B., Califf, R. M., Calkins, H., Chen, P., Chiamvimonvat, N., Darbar, D., Eckhardt, L. L., Ellinor, et al
2015; 12 (1): e5-e29
 - **Stability of Rotors and Focal Sources for Human Atrial Fibrillation: Focal Impulse and Rotor Mapping (FIRM) of AF Sources and Fibrillatory Conduction** *JOURNAL OF CARDIOVASCULAR ELECTROPHYSIOLOGY*

- Swarup, V., Baykaner, T., Rostamian, A., Daubert, J. P., Hummel, J., Krummen, D. E., Trikha, R., Miller, J. M., Tomassoni, G. F., Narayan, S. M.
2014; 25 (12): 1284-1292
- **Rotors and Focal Sources for Human Atrial Fibrillation - Mechanistic Paradigm With Direct Clinical Relevance** *CIRCULATION JOURNAL*
Lalani, G. G., Trikha, R., Krummen, D. E., Narayan, S. M.
2014; 78 (10): 2357-2366
 - **Human Atrial Fibrillation Initiates via Organized Rather Than Disorganized Mechanisms** *CIRCULATION-ARRHYTHMIA AND ELECTROPHYSIOLOGY*
Schricker, A. A., Lalani, G. G., Krummen, D. E., Rappel, W., Narayan, S. M.
2014; 7 (5): 816-U94
 - **Mapping and ablating stable sources for atrial fibrillation: summary of the literature on Focal Impulse and Rotor Modulation (FIRM)** *JOURNAL OF INTERVENTIONAL CARDIAC ELECTROPHYSIOLOGY*
Baykaner, T., Lalani, G. G., Schricker, A., Krummen, D. E., Narayan, S. M.
2014; 40 (3): 237-244
 - **Initial Independent Outcomes from Focal Impulse and Rotor Modulation Ablation for Atrial Fibrillation: Multicenter FIRM Registry** *JOURNAL OF CARDIOVASCULAR ELECTROPHYSIOLOGY*
Miller, J. M., Kowal, R. C., Swarup, V., Daubert, J. P., Daoud, E. G., Day, J. D., Ellenbogen, K. A., Hummel, J. D., Baykaner, T., Krummen, D. E., Narayan, S. M., Reddy, V. Y., Shivkumar, et al
2014; 25 (9): 921-929
 - **CrossTalk proposal: Rotors have been demonstrated to drive human atrial fibrillation** *JOURNAL OF PHYSIOLOGY-LONDON*
Narayan, S. M., Jalife, J.
2014; 592 (15): 3163-3166
 - **Defining Arrhythmic Risk and Defibrillator Therapy in ARVC Shocking Rhythm?** *JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY*
McGarry, T. J., Narayan, S. M.
2014; 64 (2): 126-128
 - **Rotor Stability Separates Sustained Ventricular Fibrillation From Self-Terminating Episodes in Humans** *JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY*
Krummen, D. E., Hayase, J., Morris, D. J., Ho, J., Smetak, M. R., Clopton, P., Rappel, W., Narayan, S. M.
2014; 63 (24): 2712-2721
 - **Ablation of Rotor and Focal Sources Reduces Late Recurrence of Atrial Fibrillation Compared With Trigger Ablation Alone Extended Follow-Up of the CONFIRM Trial (Conventional Ablation for Atrial Fibrillation With or Without Focal Impulse and Rotor Modulation)** *JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY*
Narayan, S. M., Baykaner, T., Clopton, P., Schricker, A., Lalani, G. G., Krummen, D. E., Shivkumar, K., Miller, J. M.
2014; 63 (17): 1761-1768
 - **Lone Atrial Fibrillation Does it Exist?** *JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY*
Wyse, D. G., van Gelder, I. C., Ellinor, P. T., Go, A. S., Kalman, J. M., Narayan, S. M., Nattel, S., Schotten, U., Rienstra, M.
2014; 63 (17): 1715-1723
 - **Intermittent Atrial Tachycardia Promotes Repolarization Alternans and Conduction Slowing During Rapid Rates, and Increases Susceptibility to Atrial Fibrillation in a Free-Behaving Sheep Model** *JOURNAL OF CARDIOVASCULAR ELECTROPHYSIOLOGY*
Monigatti-Tenkorang, J., Jousset, F., Pascale, P., Vesin, J., Ruchat, P., Fromer, M., Narayan, S. M., Pruvot, E.
2014; 25 (4): 418-427
 - **Highlights of the Year in JACC 2013** *JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY*
DeMaria, A. N., Adler, E. D., Bax, J. J., Ben-Yehuda, O., Feld, G. K., Greenberg, B. H., Hall, J. L., Hlatky, M. A., Lew, W. Y., Lima, J. A., Mahmud, E., Maisel, A. S., Narayan, et al
2014; 63 (6): 570-602
 - **Structural contributions to fibrillatory rotors in a patient-derived computational model of the atria.** *Europace : European pacing, arrhythmias, and cardiac electrophysiology : journal of the working groups on cardiac pacing, arrhythmias, and cardiac cellular electrophysiology of the European Society of Cardiology*
Gonzales, M. J., Vincent, K. P., Rappel, W. J., Narayan, S. M., McCulloch, A. D.
2014; 16 Suppl 4: iv3-iv10
 - **Human Atrial Fibrillation Initiates via Organized Rather Than Disorganized Mechanisms.** *Circulation. Arrhythmia and electrophysiology*

- Schricker, A. A., Lalani, G. G., Krummen, D. E., Rappel, W. J., Narayan, S. M.
2014; 7 (5): 816–24
- **Rotors and focal sources for human atrial fibrillation: mechanistic paradigm with direct clinical relevance.** *Circulation journal : official journal of the Japanese Circulation Society*
Lalani, G. G., Trikha, R., Krummen, D. E., Narayan, S. M.
2014; 78 (10): 2357–66
 - **Rhythm control in heart failure patients with atrial fibrillation: contemporary challenges including the role of ablation.** *Journal of the American College of Cardiology*
Trulock, K. M., Narayan, S. M., Piccini, J. P.
2014; 64 (7): 710–21
 - **A case of a human ventricular fibrillation rotor localized to ablation sites for scar-mediated monomorphic ventricular tachycardia** *HEART RHYTHM*
Hayase, J., Tung, R., Narayan, S. M., Krummen, D. E.
2013; 10 (12): 1913-1916
 - **Frequency Analysis of Atrial Action Potential Alternans A Sensitive Clinical Index of Individual Propensity to Atrial Fibrillation** *CIRCULATION-ARRHYTHMIA AND ELECTROPHYSIOLOGY*
Lalani, G. G., Schricker, A. A., Clopton, P., Krummen, D. E., Narayan, S. M.
2013; 6 (5): 859-867
 - **Targeted Ablation at Stable Atrial Fibrillation Sources Improves Success Over Conventional Ablation in High-Risk Patients: A Substudy of the CONFIRM Trial** *CANADIAN JOURNAL OF CARDIOLOGY*
Baykaner, T., Clopton, P., Lalani, G. G., Schricker, A. A., Krummen, D. E., Narayan, S. M.
2013; 29 (10): 1218-1226
 - **Direct or Coincidental Elimination of Stable Rotors or Focal Sources May Explain Successful Atrial Fibrillation Ablation On-Treatment Analysis of the CONFIRM Trial (Conventional Ablation for AF With or Without Focal Impulse and Rotor Modulation)** *JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY*
Narayan, S. M., Krummen, D. E., Clopton, P., Shivkumar, K., Miller, J. M.
2013; 62 (2): 138-147
 - **Panoramic Electrophysiological Mapping but not Electrogram Morphology Identifies Stable Sources for Human Atrial Fibrillation Stable Atrial Fibrillation Rotors and Focal Sources Relate Poorly to Fractionated Electrograms** *CIRCULATION-ARRHYTHMIA AND ELECTROPHYSIOLOGY*
Narayan, S. M., Shivkumar, K., Krummen, D. E., Miller, J. M., Rappel, W.
2013; 6 (1): 58-67
 - **What Tissue Does Circumferential PV Isolation Actually Modulate?** *Journal of cardiovascular electrophysiology*
McGarry, T. J., Narayan, S. M.
2013
 - **HRS Policy Statement: Clinical Cardiac Electrophysiology Fellowship Curriculum: Update 2011** *HEART RHYTHM*
Link, M. S., Exner, D. V., Anderson, M., Ackerman, M., Al-Ahmad, A., Knight, B. P., Markowitz, S. M., Kaufman, E. S., Haines, D., Asirvatham, S. J., Callans, D. J., Mounsey, J. P., Bogun, et al
2011; 8 (8): 1340-1356
 - **Highlights of the Year in JACC 2010** *JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY*
DeMaria, A. N., Bax, J. J., Ben-Yehuda, O., Feld, G. K., Greenberg, B. H., Hall, J., Hlatky, M., Lew, W. Y., Lima, J. A., Maisel, A. S., Narayan, S. M., Nissen, S., Sahn, et al
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 - **Highlights of the Year in JACC 2009** *JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY*
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