



**Penn Medicine**  
Continuing Medical and  
Interprofessional Education

**IN-PERSON AND VIRTUAL**

# **The Mark E. Josephson Thirty-First Annual State-of-the-Art Arrhythmia Symposium**

**Arrhythmia Diagnosis & Treatment Standards 2024  
and Leonard N. Horowitz, MD Memorial Lecture**

**A CME/CNE-ACCREDITED SYMPOSIUM**

**Saturday, September 7, 2024**

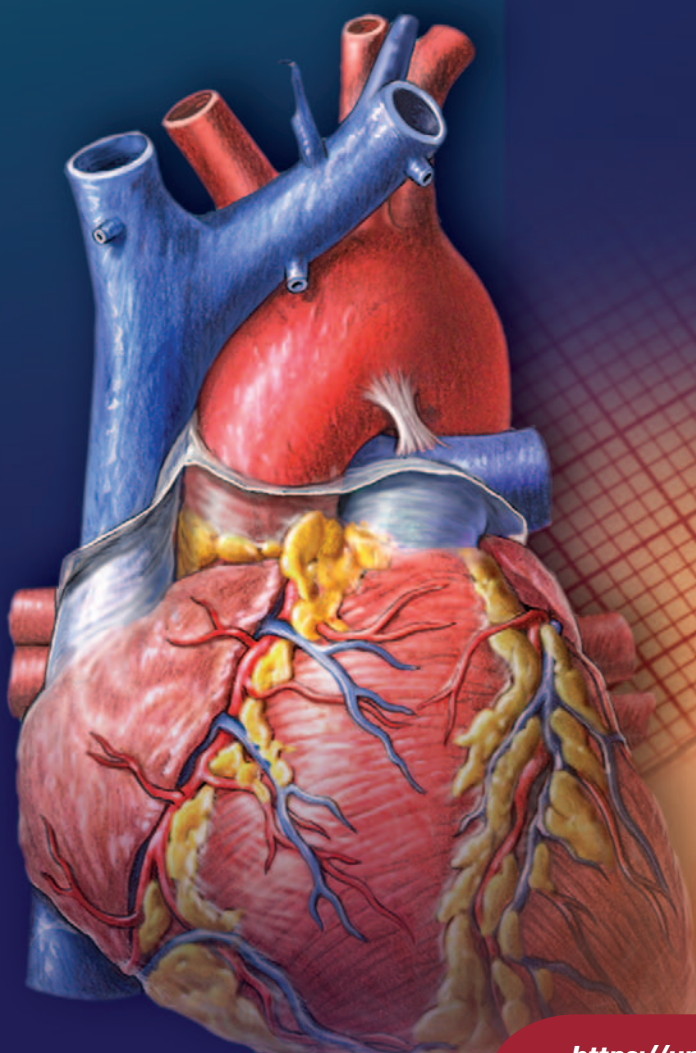
**7:30 AM – 5:00 PM EST**

**In-Person Meeting Location**

**Marriott Old City**

**One Dock Street**

**Philadelphia, PA 19106**



Recognized by



<https://upenn.cloud-cme.com/arrhythmia2024>

## PROGRAM OVERVIEW & TARGET AUDIENCE

This is the 31st year for the *State-of-the-Art Arrhythmia Symposium*. Using a combination of case presentations with audience participation, didactic presentations, and question and answer sessions, our goal is to educate the participants in state-of-the-art information on invasive and non-invasive electrophysiologic and electrocardiographic tools used in the current diagnosis, evaluation and treatment of cardiac rhythm disorders. The program is taught by members of the faculty and staff from the University of Pennsylvania Health System, Department of Electrophysiology, in addition to invited speakers from other institutions. The course is structured to meet the educational needs of electrophysiologists, cardiologists, internists, advanced practice providers, nurses, and associated professionals with an interest in the care of patients with cardiac rhythm disorders. In addition to the morning session with lectures aimed at the entire audience, there are three breakout sessions in the afternoon. These are geared towards: associated professionals; general cardiologists; as well as advanced electrophysiologists aimed at EP fellows, electrophysiologists, and EP lab staff. The *State-of-the-Art Symposium* is coupled each year with the Leonard N. Horowitz Memorial Lecture which is given by a leader in cardiology.

### Learning Objectives

Upon completion of this activity, participants should be better able to:

- Describe the appropriate evaluation of patients with frequent PVCs and NSVT as well as indications for treatment including ablation and antiarrhythmic medications.
- Identify ECG clues to detect patients at risk for sudden death.
- Describe evaluation and new treatment for patients presenting with POTS, inappropriate sinus tachycardia and neurocardiogenic syncope.
- Apply in practice the newest information regarding evaluation and treatment of atrial arrhythmias including screening for episodes and ablation indications, techniques, and endpoints.
- Discuss the indications for “leadless” pacing and defibrillating devices.
- Discuss the indications, contraindications, and complications associated with left atrial (LA) appendage occlusion and closure.
- Review the methods, techniques, associated tools, and equipment including emerging technologies to perform catheter ablation of atrial fibrillation and flutter.
- Explain the use and value of new techniques and technologies employed for complex EP device and ablation cases.
- Describe the importance of risk modification in the treatment of atrial fibrillation.
- Apply into practice the ECG patterns/clinical characteristics, evaluation, and treatment of patients with genetically linked arrhythmia syndromes.
- Describe common cardiac rhythm device implantation complications and malfunction.

**IN-PERSON AND VIRTUAL**

## **The Mark E. Josephson Thirty-First Annual State-of-the-Art Arrhythmia Symposium**

**Arrhythmia Diagnosis & Treatment Standards 2024  
and Leonard N. Horowitz, MD Memorial Lecture**

**A CME/CNE-ACCREDITED SYMPOSIUM**

**Saturday, September 7, 2024**

**7:30 AM – 5:00 PM EST**

### **Hosting Department**

*The Mark E. Josephson Thirty-First Annual State-of-the-Art Arrhythmia Symposium* is hosted by the Department of Medicine, Division of Cardiology, Electrophysiology Section, University of Pennsylvania Health System.

### **Accreditation**



In support of improving patient care, Penn Medicine is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

### **Designation of Credit**

**Physicians:** Penn Medicine designates this live activity for a maximum of 7.75 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

**Nurses:** This program provides 7.75 NCPD hours.

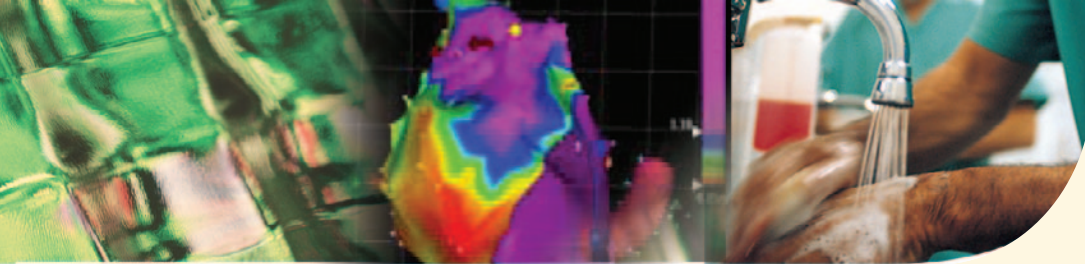
**Physician Assistants:** Penn Medicine has been authorized by the American Academy of PAs (AAPA) to award AAPA Category 1 CME credit for activities planned in accordance with AAPA CME Criteria. This activity is designated for 7.75 AAPA Category 1 CME credits. PAs should only claim credit commensurate with the extent of their participation.

**Certificates and Transcripts:** After the conference has concluded, all participants will receive a followup email with a link and instructions on how to complete the post-test and evaluation as well as claim their credit. Once participants submit the request for credit, the earned credits will be available for viewing on your transcript or available for printing at <https://upenn.cloud-cme.com>. Please note that the individual certificate will not be mailed.

---

**Services for the Disabled** If special arrangements are required for an individual with a disability to participate in this meeting, please contact the Office of Continuing Medical and Interprofessional Education no later than August 23, 2024, at 215-898-6400.

**Nondiscrimination Statement** The University of Pennsylvania values diversity and seeks talented students, faculty, and staff from diverse backgrounds. The University of Pennsylvania does not discriminate on the basis of race, sex, sexual orientation, gender identity, religion, color, national or ethnic origin, age, disability, or status as a Vietnam Era Veteran or disabled veteran in the administration of educational policies, programs or activities; admissions policies; scholarship and loan awards; athletic, or other University administered programs or employment. Questions or complaints regarding this policy should be directed to Executive Director, Office of Affirmative Action and Equal Opportunity Programs, 3600 Chestnut Street, Sansom Place East Suite 228, Philadelphia PA 19104-6106 or 215-898-6993 (Voice) or 215-898-7803 (TDD). [www.upenn.edu/affirm-action](http://www.upenn.edu/affirm-action).



## LIVE AND VIRTUAL PRESENTATIONS

The Mark E. Josephson Thirty-First Annual State-of-the-Art Arrhythmia Symposium will be held Saturday, September 7, 2024 by in-person or live-stream (virtual) attendance. The live and virtual presentations will follow the scheduled agenda in real time (EDT).

### TO ATTEND IN-PERSON:

#### Meeting Location

Marriott Old City

One Dock Street, Philadelphia, PA 19106

## REGISTRATION INFORMATION

Please register online at <https://upenn.cloud-cme.com/arrhythmia2024>.

Verified attendance includes access to view the presentations online for one year. Pre-registration is required to attend. Walk-ins are discouraged. Please be sure to register in advance.

### LIVE-STREAM (VIRTUAL) REGISTRATION:

Attendees who are registered to attend virtually will receive an email including the link to join the symposium 48 hours in advance. All virtual attendees will be required to sign into the meeting using your first name, last name and email address in order to be marked as attended, receive credit and view the recordings.

### IN-PERSON REGISTRATION:

The fees to attend in-person are as follows: \$90 for physicians and industry attendees, \$75 for nurse practitioners, physician assistants and other healthcare professionals. There is no fee for residents, fellows, students and Penn Medicine employees, faculty and staff to attend.

All pre-registered, in-person attendees will receive access to the conference, program handout, continental breakfast, lunch, breaks and the reception.

#### Need to Register by Mail?

*Please note:* mailed registrations may take 5 business days before they are received. We encourage all attendees to register online. See the registration form for mailing instructions. All registrations will be confirmed by email as long as your registration is received before September 5, 2024.

Please save our Penn Medicine email ([penncme@upenn.cloud-cme.com](mailto:penncme@upenn.cloud-cme.com)) to alleviate our emails from going to spam.

## Cancellation Policy

In order to process refunds for course withdrawals, cancellations must be received in writing by August 23, 2024 (subject to a service charge equivalent to 10% of the registration fee, but no less than \$25.00). No refunds will be issued thereafter.

The University reserves the right to cancel or postpone any course due to unforeseen circumstances. In the event of cancellation or postponement, the University will refund registration fees but is not responsible for related costs or expenses to participants, including cancellation fees assessed by hotels, airlines, and travel agencies.



Course Director

Francis Marchlinski, MD

Richard T. and Angela Clark President's Distinguished Professor  
Director, Cardiac Electrophysiology  
University of Pennsylvania Health System  
Philadelphia, PA

Guest Faculty

Haris Haqqani, MBBS, PhD

Associate Professor of Medicine  
University of Queensland School of Medicine  
Senior Electrophysiologist, The Prince Charles Hospital  
Brisbane, Australia

Edward Gerstenfeld, MD

Professor of Medicine  
Chief, Cardiac Electrophysiology and Arrhythmia Service  
University of California San Francisco Medical Center  
San Francisco, CA

Maully Shah, MBBS

Director, Cardiac Electrophysiology  
The Children's Hospital of Philadelphia  
Philadelphia, PA

Faculty

All faculty listed below are affiliated with the Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA

Trevor Bonney, PA-C

Physician Assistant  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

Monique Brooks, CRNP

Nurse Practitioner  
Cardiac Electrophysiology  
Pennsylvania Hospital/UPHS

John Bullinga, MD

Associate Professor of Clinical Medicine  
Penn Presbyterian Medical Center/UPHS

David Callans, MD

Professor of Medicine  
Co-Director Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

Kirstan Clay-Weinfeld, CRNP

Nurse Practitioner  
Cardiac Electrophysiology  
Pennsylvania Hospital/UPHS

Kristine Conn, MSN, RN

Associate Clinical Director Interventional Cardiology  
Electrophysiology Laboratory/HUP Pavilion

Rajat Deo, MD

Associate Professor of Medicine  
Director, EP Genetics  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

Benjamin D'Souza, MD

Associate Professor of Medicine  
Director, Cardiac Electrophysiology Laboratory  
Cardiac Electrophysiology  
Penn Presbyterian Medical Center/UPHS

Sanjay Dixit, MD

Professor of Medicine  
Director, Electrophysiology Laboratory  
Philadelphia VA Medical Center

Andres Enriquez, MD

Assistant Professor of Medicine  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

Andrew Epstein, MD

Professor of Medicine  
Chief, Cardiology Section  
Philadelphia VA Medical Center

David Frankel, MD

Director, Cardiac Electrophysiology Laboratory  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

Fermin Garcia, MD

Associate Professor of Medicine  
Director of VT Ablation Center  
Director of International EP Program  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

Gustavo Guandalini, MD

Assistant Professor of Medicine  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

Balaram Krishna Hanumanthu, MD

Assistant Professor of Clinical Medicine  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

Robert Hipp, PA-C, MS, MBA

Physician Assistant  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

Matthew Hyman, MD, PhD

Assistant Professor of Medicine  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

Ramanan Kumareswaran, MD

Assistant Professor of Clinical Medicine  
Director of ECG Lab/Heart Station  
Co-Director, Cardiac Electrophysiology Fellowship Program  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

David Lin, MD

Associate Professor of Medicine  
Directory of Remote and Ambulatory Monitoring  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

**Jeffrey Luebbert, MD**

Assistant Professor of Clinical Medicine  
Director of Cardiac Electrophysiology Laboratory  
Pennsylvania Hospital/UPHS

**Timothy Markman, MD**

Assistant Professor of Medicine  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

**Alanna Miller, DNP, CRNP**

Nurse Practitioner  
Cardiac Electrophysiology  
Penn Presbyterian Medical Center/UPHS

**Tracey Munson, CRNP**

Nurse Practitioner  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

**Saman Nazarian, MD, PhD**

Professor of Medicine  
Director of Arrhythmia Imaging Laboratory  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

**Monica Pammer-Austin, PA-C**

Physician Assistant  
Cardiac Electrophysiology  
Chester County Hospital/UPHS

**Tara Parham Graham, DNP, CRNP**

Nurse Practitioner  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

**Ashley Penza, CRNP**

Nurse Practitioner  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

**Emily Perovich, PA-C**

Physician Assistant  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

**Michael Riley, MD, PhD**

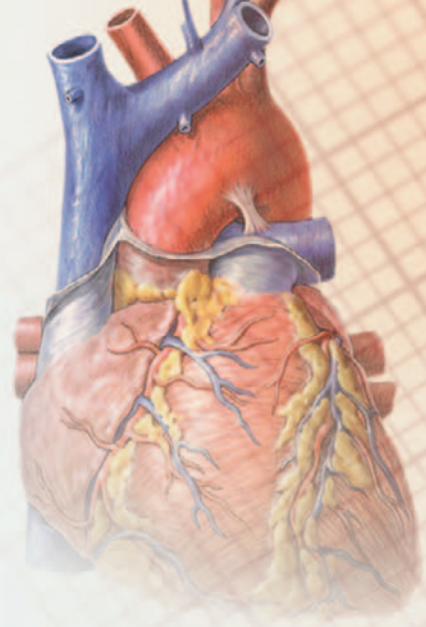
Associate Professor of Clinical Medicine  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

**Robert Schaller, DO**

Associate Professor of Clinical Medicine  
Director of EP Device and Extraction Programs  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

**Caroline Scherer, PA-C**

Physician Assistant  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS



**Vincent See, MD**

Associate Professor of Clinical Medicine  
Director, Complex Ablation  
Cardiac Electrophysiology  
Pennsylvania Hospital/UPHS

**Poojita Shivamurthy, MD**

Assistant Professor of Clinical Medicine  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

**Justin Sowers, PA-C**

Physician Assistant  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

**Gregory Supple, MD**

Associate Professor of Clinical Medicine  
Director, Cardiac Electrophysiology  
Fellowship Program  
Hospital of the University of Pennsylvania/UPHS

**Cory Tschabrunn, PhD**

Director, Translational Electrophysiology Program  
Cardiac Electrophysiology  
University of Pennsylvania Health System

**Christian Yacono, PA-C**

Physician Assistant  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

**Erica Zado, PA-C**

Physician Assistant  
Cardiac Electrophysiology  
Hospital of the University of Pennsylvania/UPHS

---

**Disclosures**

Penn Medicine, Office of Continuing Medical and Interprofessional Education, adheres to the *ACCME Standards for Integrity and Independence in Accredited Continuing Education*. Faculty and planners' disclosure information will be made available in the conference materials and syllabus. Faculty members are also expected to disclose to participants any discussions of off-label and/or investigational uses of pharmaceutical products or devices within their presentations.

# AGENDA

Saturday, September 7, 2024

7:00 – 7:30 AM  
Coffee and Light Breakfast

7:30 AM– 12:00 PM  
Morning Combined Group Session

---

Moderator: Francis Marchlinski, MD

7:30 – 7:35 AM  
Welcome and Introduction  
Francis Marchlinski, MD

7:35 – 8:05 AM  
Mark E. Josephson Keynote ECG Lecture

---

The ElectroPHYSIOLOGY of Pacing:  
When the 12-lead ECG Defines Procedural Success

- Issues with conventional RV and BiV pacing
- ECG and mechanical dyssynchrony
- Anatomic subtleties of the conduction system
- Optimal pacing site to capture the conduction system?
- Defining conduction system capture with the ECG

Haris Haqqani, MBBS, PhD

8:05 – 8:30 AM  
Nonsustained Ventricular Tachycardia: What We Know and Don't Know

- Appropriate testing
- ECG markers of risk
- Imaging markers of risk
- When to consider programmed stimulation in EP lab?
- How to best monitor
- Who gets an ICD?

Gregory Supple, MD

8:30 – 9:40 AM  
Focused Updates on the Management of AFib

(12 minute presentations + 3 minute Q&A)

Moderator: Francis Marchlinski, MD

- Role of Catheter Ablation in HFpEF and Advanced HF  
Matthew Hyman, MD, PhD
- Medications Versus Catheter Ablation as Initial Afib Therapy – Changing the Order of Things?  
Francis Marchlinski, MD
- Epicardial Ablation and Ligament of Marshall Alcohol Ablation to Overcome the Challenges  
Associated with Advanced Atrial Disease  
Fermin Garcia, MD
- State-of-the-Art Lecture (20 minute presentation + 5 min Q and A): New Considerations Regarding Anticoagulation  
David Callans, MD

9:40 – 10:10 AM Break and Visit Exhibits

10:10 – 10:40 AM  
Panel Discussion: Atrial Fibrillation Management (Case-based presentation/audience response)

- Why the excitement regarding pulsed field ablation?
- How to select the best drug therapy?
- Can we stop anticoagulation after catheter ablation in moderate risk patients?

Moderator: Francis Marchlinski, MD

Panelists: Haris Haqqani, MBBS, PhD, Matthew Hyman, MD, PhD, Fermin Garcia, MD,  
David Callans, MD, Andrew Epstein, MD

10:40– 11:15 AM  
Debate: Patients With Frequent PVCs Should Undergo PVC Ablation Even in the Absence  
of Symptoms or LV Dysfunction

Pro: David Frankel, MD (15 minutes)

Con: Robert Schaller, DO (15 minutes)

Q&A: 5 minutes

11:15 AM – 12:00 PM  
Leonard N. Horowitz MD Memorial Lecture – Keynote

---

Can We Treat Atrial Fibrillation Early Before Remodeling Occurs?

- New information about ectopy-induced atrial remodeling
- Can we prevent progressive atrial fibrosis?
- Why recent clinical trials have put AFFIRM to rest

Edward Gerstenfeld, MD

**12:00 – 1:00 PM    Lunch and Visit Exhibits**

**Afternoon Breakout Sessions**

---

**1:00 – 3:10 PM**

**General Cardiology Afternoon Session – PART I**

*Moderator: Michael Riley, MD, PhD*

**1:00 – 1:25 PM**

**Vasovagal Syncope and POTS**

- High-risk conditions
- Medical treatment recommendations
- Role of pacing therapy
- Role of neuromodulation

*Timothy Markman, MD*

**1:25 – 1:50 PM**

**Device Diagnostic Information for Optimizing Evaluation and Treatment of VPDs and Sustained Ventricular Arrhythmias**

- Clues to establish VT diagnosis
- Identification of “clinical” VT/PVC
- Identifying PVC burden before and after therapy
- Clues for identifying septal or free wall origin

*Poojita Shivamurthy, MD*

**1:50 – 2:15 PM**

**Syncope 3.0**

- Clues to distinguish benign from malignant syncope
- Who should undergo EP evaluation?
- Threshold for implantable monitor implantation
- Common bradycardia syndromes
- Unusual arrhythmic causes for syncope

*Ramanan Kumareswaran, MD*

**2:15 – 3:10 PM**

**Focused Overview and Case Presentations/Panel Discussion – Avoiding Intravascular Leads When Pacing and Defibrillating**

- Focused Overview on Leadless Devices (15 minutes with 5 minute Q&A)

*Robert Schaller, DO*

(Case Discussions/Audience Participation 35 minutes)

- Patient selection for leadless pacing
- Patient selection for nonvascular defibrillator
- Technical implant and removal considerations
- Efforts to maintain AV synchrony
- Outcome comparison with devices that have intravascular leads

*Moderator: Gregory Supple, MD*

*Panelists: Haris Haqqani, MBBS, PhD, Jeffrey Luebbert, MD, John Bullinga, MD, Robert Schaller, DO, Balaram K. Hanumanthu, MD*

**3:10 – 3:30 PM    Break and Visit Exhibits**

**3:30 – 5:00 PM**

**General Cardiology Afternoon Session - PART II**

---

*Moderator: David Lin, MD*

**3:30 – 3:55 PM**

**Additional Afib Treatment Pearls-Considerations**

- Role of diet and GLP inhibitors in controlling Afib
- AF ablation therapy in asymptomatic patients
- Cognitive decline in Afib – How strong is the evidence?

*Saman Nazarian, MD, PhD*

**3:55 – 5:00 PM**

**Case Presentations/Audience Response – Genetically Linked Syndromes**

- Long QT identified in the elderly – when to worry?
- Brugada syndrome with recurrent VF on quinidine
- What to do with variants of unknown significance on genetic testing?
- Should all patients with NICM undergo genetic testing?

*Moderator and Case Presentation: Rajat Deo, MD*

*Panelists: David Lin, MD, Vincent See, MD, Benjamin D’Souza, MD, Gustavo Guandalini, MD, Andrew Epstein, MD*



**1:00 – 3:10 PM**  
**Advanced EP Afternoon Session – PART I**

---

Moderator: *Saman Nazarian, MD, PhD*

**1:00 – 1:30 PM**  
**Fluoro-less Mapping and Ablation – Pearls and Challenges**

- What are the goals?
- How to be safe and achieve successful procedural outcomes
- New study results

*Andres Enriquez, MD*

**1:30 – 2:00 PM**  
**Challenges With PFA and How to Avoid or Minimize**

- Coronary spasm
- Hemolysis and renal dysfunction
- Phrenic nerve injury

*Edward Gerstenfeld, MD*

**2:00 – 2:30 PM**  
**Pulsed Field Ablation in the Ventricle**

- Review of current technologies under development
- Safety and efficacy data from pre-clinical studies
- Next steps for clinical translation and evaluation

*Cory Tschabrunn, PhD*

**2:30 – 3:10 PM**  
**Challenging WPW Cases**

- Multiple bypass tracts
- Diverticuli
- Ebstein’s Anomaly
- Mastering mid septal pathways

*Maully Shah, MBBS*

**3:10 – 3:30 PM Break and Visit Exhibits**

**3:30 – 5:00 PM**  
**Advanced EP Afternoon Session – PART II**

---

Moderator: *Francis Marchlinski, MD*

**3:30 – 4:30 PM**  
**Rapid Fire Technology/Technique/and EP Science Updates** (12 minute presentations, 3 minute Q&A)

- What have we learned about non PV Afib triggers? – *Francis Marchlinski MD*
- Role of CO2 insufflation for pericardial adhesion identification – *Matthew Hyman, MD, PhD*
- Vertebral vein stimulation – Lessons learned – *Timothy Markman, MD*
- High output pacing to identify VT circuits – *Sanjay Dixit, MD*

**4:30 – 5:00 PM**  
**New Directions in Mapping and Imaging to Improve Ablation Outcomes**

- High-density mapping catheters
- High-density signal analysis techniques
- Imaging non-viable myocardium: fibrosis versus fat, and why it matters

*Saman Nazarian, MD, PhD*

**1:00 – 3:10 PM**  
**Associated Professionals Afternoon Breakout Session – PART I**

---

Moderator: *Kristine Conn, MSN, RN*

**1:00 – 1:30 PM**  
**Update on the ACC/AHA Atrial Fibrillation Guidelines – What’s New?**

- Importance of early rhythm control
- Updated indications for catheter ablation and LAAO
- Thinking beyond CHA2DS2-VASc score for stroke prediction/prevention
- Treatment of AF associated with non-cardiac illness and surgery

*Robert Hipp, PA-C, MS*

**1:30 – 2:10 PM**  
**New Ablation and Device Technologies – 2024 Update**

- Pulsed field ablation for AF
- Extravascular ICD
- Dual chamber leadless pacemaker
- Radiation therapy for VT

*Christian Yacono, PA-C*

**2:10 – 3:10 PM**

**Panel Discussion/Audience Response: Case Presentations Highlighting the Management of Complications Observed After Device Implantation**

- Wound hematoma
- Infection
- Tamponade
- Pneumothorax

*Moderator: Caroline Scherer, PA-C*

*Panelists: Alanna Miller, CRNP, Justin Sowers, PA-C, Kirstan Clay-Weinfeld, CRNP, Monique Brooks, CRNP, Tracey Munson, CRNP*

**3:10 – 3:30 PM Break and Visit Exhibits**

**3:00 – 5:00 PM**

**Associated Professionals Afternoon Breakout Session – PART II**

---

*Moderator: Trevor Bonney, PA-C*

**3:30 – 4:00 PM**

**Demystifying Localization of Arrhythmias on ECG and in the EP Lab**

- Basics of entrainment and pacemapping
- ECG clues to PVC/VT localization prior to ablation
- SVT discrimination on the ECG and in the EP lab

*Andres Enriquez, MD*

**4:00 –5:00 PM**

**ECG and Device Jeopardy**

- Device malfunction and diagnostics
- Bradycardia and conduction disturbance
- Tachycardia
- “Can’t miss” ECGs and device electrograms

*Moderator: Erica Zado, PA-C*

*Panelists: Tara Parham Graham, DNP, CRNP, Monica Austin, PA-C, Ashley Penza, CRNP, Emily Perovich, PA-C*

**5:00 PM**

**Thank you and Farewell**

*Francis Marchlinski, MD*

IN-PERSON AND VIRTUAL

The Mark E. Josephson Thirty-First Annual  
State-of-the-Art Arrhythmia Symposium

Arrhythmia Diagnosis & Treatment Standards 2024  
and Leonard N. Horowitz, MD Memorial Lecture

Saturday, September 7, 2024  
7:30 AM – 5:00 PM EST

A CME/CNE-ACCREDITED SYMPOSIUM

We strongly encourage you to register for this conference online by check or credit card at  
<https://upenn.cloud-cme.com/arrhythmia2024>

Questions? Contact us at:  
[penncme@pennmedicine.upenn.edu](mailto:penncme@pennmedicine.upenn.edu) • Phone: 215-898-6400 or 215-898-8005  
Please note we are unable to accept faxed registration forms.

PLEASE PRINT OR TYPE

Name (First)			(Last)		
Academic Degree					
Medical Specialty					
Affiliation (Hospital, Office, or Company)					
Address ( <input type="checkbox"/> affiliation <input type="checkbox"/> home)					
City		State		Zip	
Phone		Fax			
E-mail					

REGISTRATION FEES

Registration is required to attend

IN-PERSON ATTENDANCE:

- ☐ Physicians and industry employees – \$90
- ☐ Nurse practitioners, nurses, pharmacists, physician assistants, researchers and other healthcare professionals – \$75
- ☐ There is no fee for residents, fellows, students and Penn Medicine employees, faculty and staff to attend.

LIVE-STREAM (VIRTUAL) ATTENDANCE:

- ☐ \$75 for all virtual attendees

PAYMENT METHOD

- If you are paying by check or credit card, please register online at  
<https://upenn.cloud-cme.com/arrhythmia2024>
- If you are paying by check, you may mail your completed registration form and check made payable to The Trustees of the University of Pennsylvania/CME to:  
Conference Manager  
Office of Continuing Medical & Interprofessional Education  
3400 Civic Center Blvd, Bldg 421, 6th Floor, JMEC/CME  
Philadelphia, PA 19104-5162
- Do not include any credit card information on the registration form or share via email.