



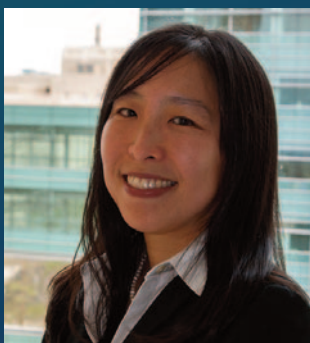
Penn Medicine
Continuing Medical and
Interprofessional Education

IN-PERSON AND VIRTUAL

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

Arrhythmia Diagnosis & Treatment Standards 2025

Mark E. Josephson, MD Lecture

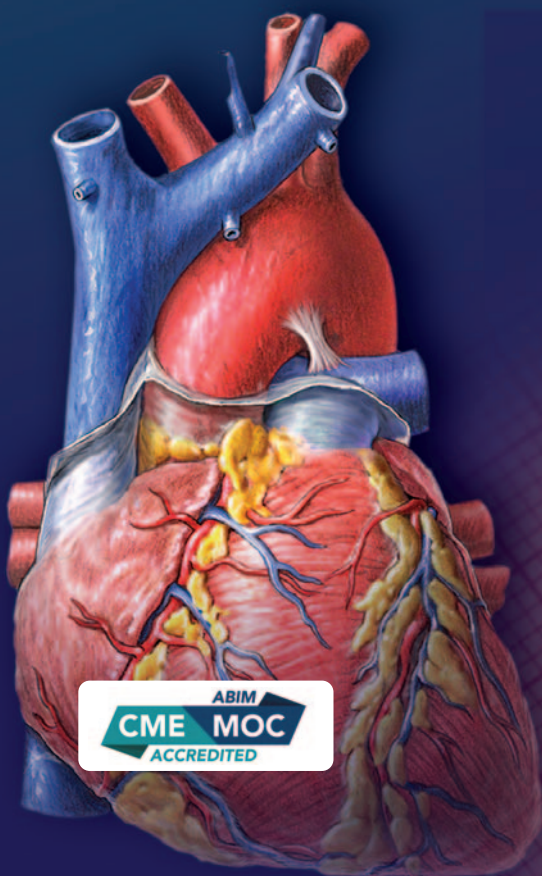


Wendy Tzou, MD

Leonard N. Horowitz, MD Lecture



William Sauer, MD



A CME/CNE-ACCREDITED SYMPOSIUM

Saturday, September 6, 2025

7:30 AM – 5:00 PM EST

In-Person Meeting Location

Marriott Old City

One Dock Street

Philadelphia, PA 19106

Recognized by



**Heart
Rhythm
Society**
SM

**SYNCHRONY
PROGRAM**

<https://upenn.cloud-cme.com/arrhythmia2025>



PROGRAM OVERVIEW & TARGET AUDIENCE

This is the 32nd 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. This year we are featuring two keynote speakers for the Leonard N. Horowitz, MD Memorial Lecture and the Mark E. Josephson, MD ECG Lecture given by leaders in cardiology, Dr. Wendy Tzou (Director of Cardiac Electrophysiology at the University of Colorado) and Dr. William Sauer (Section Chief, Cardiac Arrhythmia Service, Brigham and Women's Hospital). The course is structured to meet the educational needs of electrophysiologists, cardiologists, internists, 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 aimed at 1) associated professionals 2) general cardiology and 3) an advanced electrophysiology session aimed at EP fellows, electrophysiologists, and EP lab staff.

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.
- Recognize ECG clues to detect patients at risk for serious arrhythmias and sudden death.
- Apply in practice the newest information regarding evaluation and treatment of atrial arrhythmias including screening for episodes and ablation indications, techniques, and endpoints.
- Review the indications for “leadless” pacing and defibrillating devices and describe optimum implantation techniques.
- Discuss the indications, contraindications, and complications associated with left atrial (LA) appendage occlusion and closure.
- Describe the methods, techniques, associated tools, and equipment including emerging technologies to perform to catheter ablation of atrial fibrillation and flutter.
- Recognize use and value of new techniques and technologies employed for complex EP device and ablation cases.
- Apply into practice the ECG patterns/clinical characteristics, evaluation, and treatment of patients with genetically linked arrhythmia syndromes.
- Describe appropriate management of post-operative pain to avoid use of opioid analgesics.
- Recognize the use and value of ambulatory monitoring for screening/treating arrhythmias and assessing clinical status.
- Indicate the latest advances in device therapy for the treatment of patients with heart failure including cardiac contractility modulation and conduction system pacing.

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Hosting Department

The Mark E. Josephson Thirty-Second 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

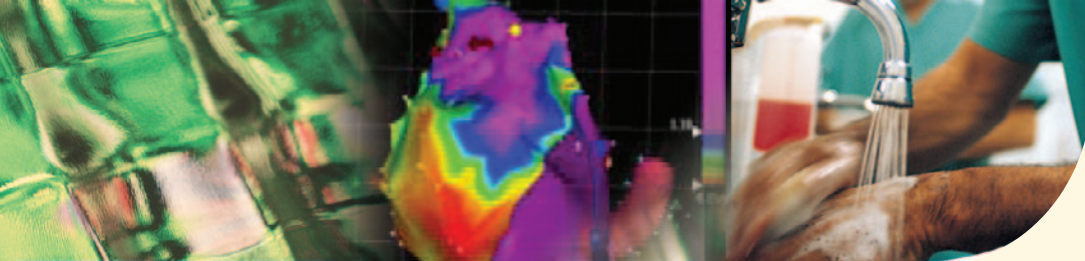
Physicians: Penn Medicine designates this live activity for a maximum of 7.75 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

ABIM MOC: Successful completion of this CME activity, which includes participation in the evaluation component, enables the participant to earn up to 7.75 MOC points in the American Board of Internal Medicine's (ABIM) Maintenance of Certification (MOC) program. Participants will earn MOC points equivalent to the amount of CME credits claimed for the activity. It is the CME activity provider's responsibility to submit participant completion information to ACCME for the purpose of granting ABIM MOC credit.

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.



LIVE AND VIRTUAL PRESENTATIONS

The Mark E. Josephson Thirty-Second Annual State-of-the-Art Arrhythmia Symposium will be held Saturday, September 6, 2025 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

Parking Options

Your registration includes complimentary parking at the Marriott Old City. Please note this hotel offers valet-only parking. During peak hours, wait times for car drop off/pick up can be >30 minutes. If you plan to valet park, please plan accordingly and arrive early.

If you prefer to self-park, you may do so at The Autopark at Old City Garage located at 125 S 2nd Street, Philadelphia, PA 19106. This garage is a 3-minute walk to the Marriott Old City. The cost for parking at this garage is \$25 for up to 10 hours. Please note that self-parking at this garage is not validated or reimbursed by the symposium.

REGISTRATION INFORMATION AND FEES

Please register online at <https://upenn.cloud-cme.com/arrhythmia2025>.

Pre-registration is required to attend. Walk-ins are discouraged. Please be sure to register in advance.

In-person and virtual attendees will be required to "sign-in" to receive credit and view the recorded content.

Registered attendees will have access to view the presentations online for three years.

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 faculty and staff to attend.

*Penn Medicine faculty and staff must register using a valid Penn Medicine email address to receive the discounted registration fee.

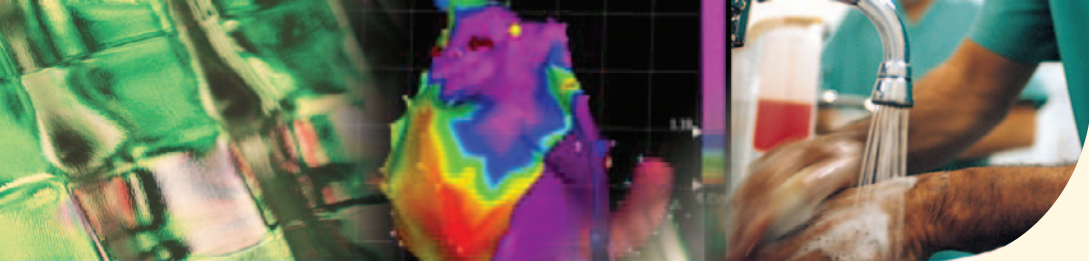
LIVE-STREAM (VIRTUAL) REGISTRATION:

The fee to attend virtually is \$75 for all US-based virtual attendees, including Penn Medicine faculty and staff. 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 receive credit and view the recordings.

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 4, 2025.

Please save our Penn Medicine email (penncme@upenn.cloud-cme.com) to prevent our emails from going to your junk folder.



ATTENTION INTERNATIONAL (NON-U.S.) LEARNERS:

The 32nd *State-of-the-Art Arrhythmia Symposium* is offering complimentary virtual registration to the 1st 1,000 international learners unable to travel to the U.S. To receive complimentary virtual registration, you must register using a special code that will be provided to you. To qualify, send an email to carolyn.siwinski@pennmedicine.upenn.edu using the subject line “Arrhythmia Symposium 2025 International Learner” and include your name, affiliation and country of origin. You will receive an email with a code that allows you to register to attend the symposium virtually at no charge. Do not register until you have received an email response that includes the special code! This offer is only available to international (non-U.S.) learners.

Cancellation Policy

In order to process refunds for course withdrawals, cancellations must be received in writing by August 22, 2025 (subject to a service charge equivalent to 10% of the registration fee, but no less than \$25). 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.

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 22, 2025, 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.

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

William Sauer, MD

Professor of Medicine
Section Chief, Cardiac Arrhythmia Service
Brigham and Women’s Hospital
Harvard Medical School
Boston, MA

Maully Shah, MBBS

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

Wendy Tzou, MD

Professor of Medicine
Director of Cardiac Electrophysiology
University of Colorado
Anschutz Medical Campus
Aurora, CO

Faculty

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

Jeffrey S. Arkles, MD

Assistant Professor of Medicine
Cardiac Electrophysiology
Penn Medicine Lancaster General Health

Trevor Bonney, PA-C

Physician Assistant
Cardiac Electrophysiology
Hospital of the University of Pennsylvania/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

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

Professor of Medicine
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

Stephen Keane, MD

Assistant Professor of Clinical Medicine
Cardiac Electrophysiology
Penn Presbyterian Medical Center/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
University of Pennsylvania Health System/UPHS

Tracey Munson, CRNP

Nurse Practitioner
Cardiac Electrophysiology
University of Pennsylvania Health System

Saman Nazarian, MD, PhD

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

Lauren Novak, CRNP

Nurse Practitioner
Cardiac Electrophysiology
University of Pennsylvania Health System

Tara Parham Graham, DNP, CRNP

Nurse Practitioner
Cardiac Electrophysiology
University of Pennsylvania Health System

Emily Perovich, PA-C

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

Cynthia Ramos, CRNP

Nurse Practitioner
Cardiac Electrophysiology
University of Pennsylvania Health System

Michael Riley, MD, PhD

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

Andrea Rosso, RN

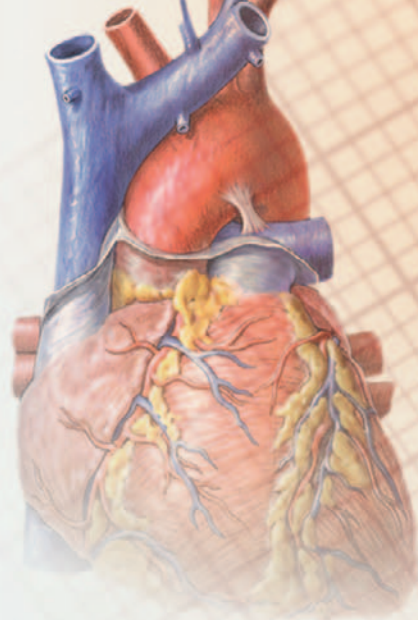
Manager/Clinical Coordinator
Cardiac Device Remote Monitoring Service
Hospital of the University of Pennsylvania/UPHS

Robert Schaller, DO

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

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

Jeff Stiffler, BA

Principal Cardiac Ablation Specialist
Healthworks, Inc
Douglassville, PA

Gregory Supple, MD

Associate Professor of Clinical Medicine
Co-Director, Electrophysiology Laboratory/HUP
Director, Cardiac Electrophysiology
Fellowship Program
University of Pennsylvania Health System

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

Amaryah Yaeger, CRNP

Nurse Practitioner
Cardiac Electrophysiology
University of Pennsylvania Health System

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 disclosure information will be made available in the conference materials and syllabi. Faculty members are also expected to disclose to participants any discussions of off-label and/or investigational uses of products or devices within their presentations.

AGENDA

Saturday, September 6, 2025

7:00 – 7:30 AM

In-person Sign-in and Continental Breakfast

7:15 – 7:30 AM

Virtual Attendee Sign-in | Join the Live Stream Broadcast

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 – 8:00 AM

Managing Asymptomatic Atrial Fibrillation: Important Considerations

- Role of cardioversion for symptom assessment
- EAST-AFNET
- When to consider catheter ablation?
- Symptom impact of changing atrial fibrillation to atrial flutter

Francis Marchlinski, MD

8:00 – 8:40 AM

Mark E. Josephson, MD Lecture

How to Identify Critical Substrate and Best Ablate VT

- How to record (which tools) and in which rhythm?
- Role of pace mapping and entrainment mapping
- Which endpoint for ablation?

Wendy Tzou, MD

8:40 – 9:40 AM

Focused Updates on the Management of PVCs

(12 minute presentations + 3 minute Q&A)

Moderator: Francis Marchlinski, MD

Role of Drug Therapy for PVC Suppression

- Which beta blocker and what dose?
- When to use flecainide/propafenone
- What role for amiodarone/dofetilide?

Dave Frankel, MD

Short-coupled PVCs Triggering VF?

- Characteristic ECG patterns
- Anatomic targets for ablation
- Role of quinidine?

Fermin Garcia, MD

How PVCs Interfere with Normal Device Function

- Tips for accurately assessing PVC burden
- PVC burden that prevents resynchronization therapy
- Lethal PVCs with “normal” and abnormal pacemaker function

Ramanan Kumareswaran, MD

Ablation of Parahisian PVCs

- Definition of parahisian PVC
- Logical approach to localization
- Ablating from adjacent structures
- Rescue ablation strategies for resistant arrhythmias

Andres Enriquez, MD

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

10:10 – 10:45 AM

Panel Discussion: PVC Mapping and Ablation (Case-based presentation/audience response)

- What testing should be done in patients with frequent PVCs?
- How to best monitor patients with PVCs?
- How will pulsed field ablation influence PVC ablation?

Moderator: Francis Marchlinski, MD

Panelists: Andres Enriquez, MD, David Frankel, MD, Fermin Garcia, MD,

Ramanan Kumareswaran, MD, William Sauer, MD, Wendy Tzou, MD

10:45 – 11:20 AM

Debate: Patients with Afib Who Want to be Off Anticoagulation Should Undergo Simultaneous Left Atrial Appendage Occlusion with their Ablation Procedure

Pro: Robert Schaller, DO (15 minutes)

Con: David Lin, MD (15 minutes)

Rebuttal and Q&A: 5 minutes

11:20 AM – 12:00 PM

Leonard N. Horowitz, MD Memorial Lecture

Understanding Catheter Ablation Energy Delivery to Improve Patient Outcomes

- What are the optimal settings for delivering radiofrequency energy in different arrhythmia substrates?
- How can we modify existing ablation equipment to improve energy delivery?
- What are the safety concerns with pulsed field ablation and how can we mitigate risk?

William Sauer, MD

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

Afternoon Breakout Sessions

1:00 – 3:15 PM

General Cardiology Afternoon Session – PART I

Moderator: David Callans, MD

1:00 – 1:25 PM

Atrial Fibrillation Burden: Why is it Important in Medical Decision Making?

- Definition?
- How best to document AF burden?

David Callans, MD

1:25 – 1:50 PM

Arrhythmia Related Genetic Testing: When to order? Which Test? What to do With Results?

- What to do with positive results?
- Must know genetic arrhythmia syndromes
- Complimentary testing that should be considered when testing is abnormal
- Variants of uncertain significance (VUS)?

Rajat Deo, MD

1:50 – 2:15 PM

Don't Miss ECG Clues for Serious Arrhythmia Risk!!

- Phase 4 block
- Early repolarization and QRS fractionation
- Transient repolarization abnormalities
- WPW with Afib

Ramanan Kumareswaran, MD

2:15 – 3:15 PM

Focused Overview and Case Presentations/Panel Discussion – Advances in Device Therapy for Heart Failure Patients

- Focused Overview on Standard of Care: New Techniques + Technology/Indications/Future (20 minutes with 5 minute Q&A)

Balaram Hanumanthu, MD

Device Therapy for the Patient with Systolic Dysfunction
(Case Discussions/Audience Participation 35 minutes)

- Patient selection for cardiac contractility modulation (CCM), conduction system pacing (CSP), “traditional” CRT
- Management of patients with refractory heart failure despite device therapy

Moderator: Saman Nazarian, MD, PhD

Panelists: Jeffrey Arkles, MD, MA, Andrew Epstein, MD, Jeffrey Luebbert, MD, Robert Schaller, DO, Balaram Hanumanthu, MD, Benjamin D’Souza, MD, Matthew Hyman, MD, PhD

3:15 – 3:30 PM **Break and Visit Exhibits**

3:30 – 5:00 PM
General Cardiology Afternoon Session - PART II

Moderator: Saman Nazarian, MD, PhD

3:30 – 4:00 PM
Leadless Devices: When, How, Outcomes, Limitations?
Prerecorded Implantation

- Which patients should get a leadless device?
- Optimum implantation technique (Prerecorded implantation highlights)
- Current challenges

Robert Schaller, DO

4:00 – 5:00 PM
Case Presentations/Audience Response – Atrial Fibrillation Management
Prerecorded Highlights from PFA Cases – Michael Riley MD (20 minutes)

- Lowering threshold for ablation – Which patients?
- Stopping anticoagulation therapy – Which patients?
- Implantable loop monitors – Which patients, how to program?

Moderator and Case Presentation: Saman Nazarian, MD, PhD

Panelists: John Bullinga, MD, Sanjay Dixit, MD, Gustavo Guandalini, MD, Stephen Keane, MD
David Lin, MD, Michael Riley, MD, PhD, Vincent See, MD

1:00 – 3:15 PM
Advanced EP Afternoon Session – PART I

Moderator: Gregory Supple, MD

1:00 – 1:25 PM
Lines of Blocks - How to Identify and Incorporate into Your Ablation Strategy

- Functional versus fixed lines of block?
- Relationship to hyperboloid model
- What is best ablation strategy?
- Core isolation versus small electrode remapping?

Wendy Tzou, MD

1:25 – 1:50 PM
PFA Tips and Tricks to Improve Outcome: Why not Just Ablate More With PFA?

- Avoiding complications?
- Are all PFA systems similar enough?
- Will there be a role for focused PFA delivery?

William Sauer, MD

1:50 – 2:15 PM
Pacing/Entrainment for Diagnosis of Arrhythmia Mechanism and Localization of Best Ablation Site

- Triggered versus reentrant circuits
- How to diagnose inner loop sites?
- When is VT termination a good thing?
- Do you need a stable tachycardia cycle length to identify good ablation sites?

Gregory Supple, MD

2:15 – 2:40 PM
Ablation Tips for Arrhythmias Associated with Common Congenital Anomalies

- Focal tachycardia vs. reentrant circuits
- Anatomic considerations - understanding surgical scars and arrhythmogenic isthmuses
- Vascular approaches - when standard routes are obstructed
- Ablation endpoints

Maully Shah, MBBS

2:40 – 3:15 PM
Predicting Reversibility of LV Dysfunction – What is the Role of Electrophysiologist?

- Reversibility of arrhythmia/pacing induced LV dysfunction
- eMAP trial results

David Frankel, MD

3:15 – 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/Techniques/EP Science Updates (12 minute presentations, 3 minute Q&A)
- Surgeon's Role in VT Ablation: Gaining Epicardial Access, PIVOTAL Trial and Beyond – Gregory Supple, MD
 - Alcohol Venous Ablation: Tips to Prevent Harm – Fermin Garcia, MD
 - CO2 Insufflation to Identify Adhesions and Facilitate Epicardial Access – Matthew Hyman, MD, PhD
 - Cardio-neural Ablation – Basic Primer: Targets/How to Recognize GPS – Timothy Markman, MD

4:30 – 5:00 PM

Translational Science- What We Learned in 2024-2025 that Every Clinician Should Know

- Enhancing RF ablation lesion size
- PFA for VT ablation
- Emerging techniques and technologies

Cory Tschabrunn, PhD

1:00 – 3:10 PM

Associated Professionals Afternoon Breakout Session – PART I

Moderator: Jeffrey Stiffler, BA and Erica Zado, PA-C

1:00 – 1:30 PM

Managing Post-operative Pain in Patients Undergoing CIED Implantation

- Avoiding opioids
- Role of tumescent local anesthesia
- Importance of pre-operative teaching and setting expectations
- Non-opioid pain management techniques

Trevor Bonney, PA-C

1:30 – 2:10 PM

Pulsed Field Ablation Update

- Expected results compared to RF and cryo ablation techniques
- Patient selection
- Complications to be avoided: hemolysis (how to diagnose/prevent injury?), coronary vasospasm (how to diagnose/prevent injury?), other potential unique complications

Robert Hipp, PA-C

2:10 – 3:10 PM

Panel Discussion/Audience Response: Case Presentations Highlighting the Utility of Ambulatory Monitoring

- Remote monitoring of CIEDs-arrhythmias, hemodynamics and clues to clinical status
- Choice of ambulatory monitor
- How to incorporate information from personal wearable devices
- Reprogramming ILRs to optimize arrhythmia detection
- Use of electrogram information from devices in procedure planning

Moderator: Christian Yacono, PA-C

Panelists: Tracey Munson, CRNP, Lauren Novak, CRNP, Andrea Rosso, RN, Erica Zado, PA-C

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

3:30 – 5:00 PM

Associated Professionals Afternoon Breakout Session – PART II

Moderator: Cynthia Ramos, CRNP and Amaryah Yaeger, CRNP

3:30 – 4:00 PM

Antiarrhythmic Medications in Special Circumstances

- Pregnancy
- Flecainide for PVC cardiomyopathy and patients with ARVC
- Choice of beta blocker in patients with LQTS
- Reinitiating dofetilide post brief interruption

Tara Parham Graham, DNP, CRNP

4:00 – 4:35 PM

Managing Patients With Defibrillator Problems

- Failed defibrillation shocks (high DFTs)
- VT below rate cut off
- ICD broken lead – How to recognize and treat?
- What to watch for with MR imaging or radiation therapy?
- Troubleshooting new technology (SQ and EV ICD)

Poojita Shivamurthy, MD

4:35 – 4:47 PM

My Most Challenging ICD Case

Alanna Miller, DNP, CRNP

4:47 – 5:00 PM

My Most Challenging Antiarrhythmic Drug or Arrhythmia Diagnosis Case

Emily Perovich, PA-C

5:00 PM

Join Us for the 32nd State-of-the-Art Arrhythmia Symposium Reception

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Arrhythmia Diagnosis & Treatment Standards 2025

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

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Name (First)		(Last)
Academic Degree		
Medical Specialty		
Affiliation (Hospital, Office, or Company)		
Address (☐ affiliation ☐ 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 faculty and staff to attend.

*Penn Medicine staff must register using a valid Penn Medicine email address to receive the discounted registration fee.

LIVE-STREAM (VIRTUAL) ATTENDANCE:

- ☐ \$75 for all all U.S.-based virtual attendees, including Penn Medicine faculty and staff

ATTENTION INTERNATIONAL (NON-U.S.) LEARNERS:

The 32nd State-of-the-Art Arrhythmia Symposium is offering complimentary virtual registration to the 1st 1,000 international learners unable to travel to the U.S. To receive complimentary virtual registration, you must register using a special code that will be provided to you. To qualify, send an email to carolyn.siwinski@pennmedicine.upenn.edu using the subject line “Arrhythmia Symposium 2025 International Learner” and include your name, affiliation and country of origin. You will receive an email with a code that allows you to register to attend the symposium virtually at no charge. Do not register until you have received an email response that includes the special code! This offer is only available to international (non-U.S.) learners.

PAYMENT METHOD

- If you are paying by check or credit card, please register online at
<https://upenn.cloud-cme.com/arrhythmia2025>
- 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.