

## **UW Cardiology EP Consultation Service**

Location: UWMC

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## **INTRODUCTION**

The Electrophysiology Service consists of the electrophysiology procedure labs, inpatient consultations, outpatient clinic, and an inpatient post-procedure consults (Cards E). Inpatient consults are focused predominantly on patients with procedural management issues: complex arrhythmia evaluations, including assessment of pacemaker/defibrillator candidacy, implantable pacemaker or defibrillator device evaluation, and complex arrhythmia diagnosis and management.

## **LEARNING OBJECTIVES**

### *Medical Knowledge and Patient Care:*

- Demonstrate a basic understanding of the evaluation and management of complex rhythm disorders; coordinate management
- Evaluate ECG patterns of common rhythm abnormalities (SSS, heart block, SVT, VT, channelopathies)
- Specify the signals of the basic intracardiac electrogram.
- Apply the indications for CIED implantation (for bradycardia, NCS, or heart failure), assess procedural risk/benefits for the individual patient
- Apply the indications for electrophysiology diagnostic studies and catheter ablation procedures (AF, AFL, SVT, PVC, VT), and assess procedural risk in the individual patient
- Analyze the indications, risks and benefits of CIED extraction
- Perform appropriate cardioversion procedures including risk assessment for stroke.
- Observe electrophysiology procedures.
- Assess appropriateness of, and manage common antiarrhythmic agents
- Perform pacemaker/ICD interrogation, testing of pacemaker function, and basic programming;
- Apply selected literature, and guidelines/consensus documents for arrhythmia management; coordinate care

### *System based practice and practice based learning*

- Participate in team-based care in patients with arrhythmia
- Effectively utilize electronic medical record systems, including clinical protocols
- Recognize/address social, cultural, and financial barriers to patient compliance
- Seek feedback. Identify knowledge gaps and carry out education activities to address them
- Examine evidence for common practice decisions and review existing practice guidelines.

### *Professionalism and communication*

- Practice patient-centered care with shared decision-making and appreciation of patients' values and preferences
- Interact respectfully with patients, families, and members of the healthcare team, including

- ancillary and support staff
- Communicate effectively with patients and families
- Concisely report diagnostic and therapeutic reasoning in documentation.

**To achieve these goals, we have the following recommendations for the two months that you will spend on the EP service:**

1. **Perform inpatient consults** on patients with complex arrhythmia diagnostic and/or management questions. The fellow should perform a thorough history and physical exam directed at the consult requested question. **Often, it is critical to examine outside records (particularly outside EP procedure notes) independent of what may already have been summarized by the inpatient service.** Examination of ECGs, ICD and pacemaker notes, and other diagnostic evaluations (echocardiograms, cath reports, etc.) should be independently performed by the fellow.
  - Documentation rules are the same as on other cardiology rotations. Please attend to appropriate documentation with complete ROS, FH, and PE, as well as the other required components.
2. **Consider spending time in the EP lab for patients you are following as this may enhance your understanding of the intra-procedural approach to EP care relevant to the floor care and consultation environment**
  - Wear scrubs to facilitate contact with attending and other EP resources.
  - Observe device cases, electrophysiology studies, and ablations with the attending and EP fellow. Most cases will allow for concentrated teaching time, although it is not expected that you stay from beginning to end in a case that is no longer providing educational content. Please let the consult attending know if you would like to scrub into any EP cases. The EP faculty are happy to help facilitate this.
  - Perform periprocedural programming in the lab. Often, device company representatives are available to demonstrate specialized programming and troubleshooting.
3. **Friday Afternoon EP Rounds.** Every Friday at 5 p.m.
  - The EP consult fellow will present the consult list for pass off to the next attending. The current EP attending will be present to support in any way. Prepare relevant supporting data (bring ECG, CIED programming printouts, etc..).
  - This interactive format also may allow for brief presentation of interesting outpatient cases and curbside consults.
4. **Perform pacemaker and ICD interrogations** on inpatients, outpatients, and emergency room consults and support perioperative management of cardiac rhythm devices for patients undergoing surgical procedures (*see additional information below*).
  - Independence will be achieved following didactic teaching and observation by an EP faculty member that the fellow is able to perform independently. EP fellows, attendings, and device clinic nurses are often available to help.
  - At the start of the rotation, you will receive an email from the general fellowship administrator connecting you to a device representative with whom you will coordinate two 1-hour teaching sessions that will be hands-on programmer-based didactics.

- **Your online MedHub log should document these procedures.** All device interrogations performed for clinical reasons must have a note entered into the EMR (please see template).
  - Please keep all strips to review with the attending, including when you think you lost capture when checking thresholds.
  - Please always page an EP fellow or the EP attending before trying to ATP a patient out of VT.
  - **Interrogations by device company representatives** - Included below are the phone numbers for the device company representatives who might help with interrogations. This service can be used when the interrogations are for simple device troubleshooting; and when EP consult service is busy. Kindly note that if there is a strong suspicion for a clinical problem, then these interrogations should not be deferred to the device representative. If any device interrogation is redirected to the device representative, there should be a follow-up communication by the fellow to the device representative and/or primary team to ensure no clinical need remains after the interrogation is performed.
    - Medtronic: 1(800)633-8766
    - Boston Scientific: 1(800)227-3422
    - St Jude/Abbott: 1(800)722-3423
    - Biotronik: 1(800)547-0394
5. **Read selected literature** on electrophysiology and arrhythmias. There is a compendium of articles (reviews, primary literature) available on the shared drive for the general fellowship.
6. **Perform elective DC cardioversions with periprocedural device programming in patients with CIEDs.**
- The patient must be evaluated prior to the cardioversion, checking the labs and INRs, and checking on follow-up arrangements.
  - PCCs will send requests to the anesthesia service, document appropriate anticoagulation and presence of CIED. She will notify the General Cardiology consult fellow at the beginning of each week for scheduled cardioversions.
  - EP attendings are generally not involved in cardioversions, even in patients with CIED. If an EP attending specifically requests involvement, then they will communicate this.
  - Only one CIED interrogation post DCCV is required before the patient is discharged back to their unit or to home.
7. **Attend Tuesday Morning EP Conference.** You will get a weekly reminder email. Conference is from 7:30-8:30 a.m. This conference provides valuable teaching in many areas of electrophysiology and arrhythmia management. It is a combination of didactic presentation and case/EGM presentations. Frequently, intracardiac electrograms from recent interesting cases are reviewed. The fellows are encouraged to ask questions and discuss the cases during this conference.

## THE TEAM

Attendings: J. Poole (206-390-1505), K. Patton (206 910-0474), J. Prutkin (206 375-5586), N. Akoum (801 580-2617), Arun Sridhar (425 289-8835), Neal Chatterjee (919-280-7372), Julie He (414-418-7943), Christian Ngo (646) 243-8521.

EP Fellows: Bishoy Hanna, Fima Macharet

PSS: 8-2441

Device Clinic: Shelly Boast, Christine Mitchell

EP Lab: 8 2873

## DAILY SCHEDULE

The attending on service also performs most of the procedures that result from the consults. They can be found in the EP lab, in clinic, or in their offices. EP attendings each have different clinic and procedural schedules. However, it is the clear commitment of the EP faculty to designate a clear rounding time during the day with the fellows rotating on the EP rotation. This will be established at the start of each week that an attending starts.

Morning conferences: Tuesday 7:30 AM EP conference, Wednesday 7:30 AM conference, Some Thursday 7:00 AM ACHD conference, Friday 7:30-10:30 AM grand rounds and didactics.

Most days there will be new consults to see, device evaluations, and patients to follow-up on. Cases for the lab should be scheduled through the EP charge nurse at 8-2873.

When you are in clinic or attending didactic sessions, sign out your pager to the faculty attending. Please remind the attending when you're in clinic.

The EP fellow will be on service with you approximately one week a month, to provide teaching and guidance on management.

Friday 5:00 PM- EP service rounds.

## Fellow Evaluation:

Fellows are evaluated by each of the EP attendings, who are usually on service for one week (Thursday through Wednesday). The Cardiology Divisions forms are used, and are based on ACGME competency areas. **Medical Knowledge** is assessed by direct questioning and observation. **Patient Care** is assessed by observation of the application of knowledge to patient management. **Professionalism** is assessed by direct observation. **Systems Based Practice** is assessed by the fellow's ability to effectively negotiate the EP service demands and attention to quality care. **Practice Based Learning and Improvement** is assessed by the fellow's ability to identify learning gaps and individualized reading. **Interpersonal and Communication Skills** are assessed by observing interactions with patients, families, staff, and colleagues.

## TIPS AND TRICKS

- Try to do your documentation in the EP lab instead of upstairs – there's lots of intermittent learning opportunities there
- It's ok to not treat non-emergencies as non-emergencies (ie. you don't have to do every requested interrogation right away. If the eval is not indicated, you can refuse)

- Try to read one thing for every patient
- Keep paper and telemetry buttons available on the interrogation carts so they are always immediately available.
- Magnets render pacemakers asynchronous but only disable tachytherapies in defibrillators (and make no changes to pacing programming – so if an ICD patient is pacemaker dependent and going to a surgery with EMI – they need to be reprogrammed VOO/DOO (and tachytherapy detection off)).
- Elaborate on EP history in depth. i.e. not just “h/o VT” but when/how fast/in what context/was it shocked etc... or “A fib” parox/persistent/permanent, rhythm control strategies attempted, prior ablations, etc...
- EP lab schedule is always accurate on the white boards in the EP Lab for that day and the subsequent day. It is less up-to-date but also available in ORCA under “HOV-E/PROC” with resource “UW EPS Lab”
- The EP charge nurse will know details for today’s schedule at 8-2873.
- Heparin products are to be avoided unless cleared with the implanting attending on any device implant or revision. Therapeutic warfarin or anti platelets are generally ok but can be held if no bridging is required.
- Post AF ablation patients frequently retain fluid
- People calling will always ask to have the device “turned off”. You will have to figure out what is really good for the patient (truly leave VVI or VOO/DOO or just tachy therapies off). See how much they are pacemaker dependent and make the decision, please consult EP attendings as needed.
- Simple arrhythmia consults (post-op AF) go to general consults.
- You can call Chris/Shelley from device clinic to have them go with you for interrogations for teaching. Pager: 314-1989

### **Recommended Reading:**

1. Electrophysiology: the Basics. A Companion Guide for the Cardiology Fellow During the EP Rotation. Jonathan Steinberg, Suneet Mittal. (A copy is available from Jordan Prutkin).
2. Braunwald or other general cardiology textbook (Current Diagnosis and Treatment Cardiology 3rd edition is online).
3. Up-to-Date.
4. ACC/AHA/HRS Guidelines (Device, VT, AF, SVT, consider HF, HCM, channelopathies)
5. Electrophysiology Testing. Fogoros.
6. Online literature compendium in shared fellows drive

Please ask the attendings/EP fellows for further suggestions or specific areas of interest.

### **EP Curriculum Website**

Source for EP and General Cardiology Fellow information

<https://catalyst.uw.edu/workspace/krpatton/43342/>