Electrophysiology Testing
EPS & Catheter Ablation
- Diagnosis and mechanism
- Curative radiofrequency ablation

Minimally invasive procedure to evaluate electrical health

Appropriate Patients

- Syncope
- Any Regular Arrhythmia except Sinus tachy.
  - SVT, VT, Flutter
- Evaluate for need for pacemaker or ICD
- Atrial fibrillation – ablation therapy
Femoral Vein Access with Local Anesthetic and Twilight Sedation
Electrocardiogram vs. Intracardiac Electrogram

- Electrocardiogram (ECG):
  - Recorded on body surface.
  - Reflects the electrical activity of the whole heart.

- Intracardiac Electrogram (EGM):
  - Recorded within the heart.
  - Usually filtered differently.
  - Reflects local electrical activity in the heart near the recording electrodes.
Baseline Recording

- Surface ECG
  - I
  - AVF
  - V1
  - V6
- Intracardiac electrograms
  - HRA
  - HBE
  - CS
  - RVA
- Electrode numbering convention: distal = 1
Normal Cardiac Conduction via the AVN

- Decremental conduction
- Midline ventricular activation pattern

Anterograde

Retrograde
AVNRT

Initiation of reentry

S F

S F

S F

S F
Initiation of AVNRT – Single APD4

- Antegrade block in fast pathway with conduction down the slow pathway
- Short VA time (<70 msec)
Typical multi-polar catheter placement

- High right atrium
- Coronary sinus
- His bundle
- RV apex, RV outflow tract
Accessory Pathway with Ventricular Preexcitation

Sinus beat

“Delta” Wave

Fusion activation of the ventricles

Hybrid QRS shape

PR < 120 ms

QRS ≥ 120 ms

Negative T
AVRT

ORTHODROMIC

ANTIDROMIC
A three-lead ECG rhythm strip during SR and the abrupt onset of ORT.

Arrows indicate the retrograde P waves visible in lead II.
Orthodromic AVRT – Left sided AP
62 yo with ischemic CM EF 42% presents with near syncope while watching the last 2 minutes of OSU football.

You recommend: 1) amiodarone; 2) LHC; 3) EPS; 4) TTT; 5) beta-blocker and assure that ICD not necessary since EF is >35%

This tracing shows: 1) AVNRT with aberrancy; 2) AT; 3) AVRT; 4) VT
THANK YOU
19 yo M brought to ER by squad after syncope while running
BP = 80 / 50
ECG after DCCV
Atrial Flutter: Typical 12-lead ECG
Typical AFL: Intracardiac EGM with Halo catheter placed along crista
Typical AFL: Termination during RFA