Palpitations

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Objectives

- Identify clinical presentation of arrhythmias and generate a differential diagnosis
- Learn the appropriate sequence of diagnostic testing and subsequent management

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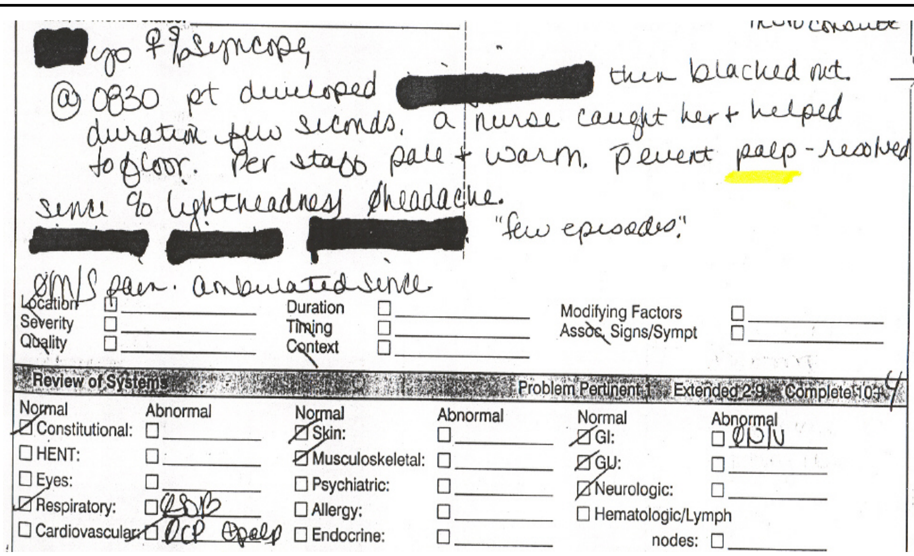
Approach

- HPI/PMH critical to narrowing diagnosis and determining best diagnostic approach
- SCARAT—highly variable
- Baseline ECG: any abnormality?
- Treatment will depend on frequency, severity, perception of symptoms, and overall risk/benefit
- Gender specific differences



[redacted] yo ♀ c/o syncope
@ 0830 pt developed [redacted] then blacked out.
duration few seconds. a nurse caught her + helped to floor. Per staff pale + warm. Recent palp - resolved since ∅ lightheadness/headache.
"few episodes"
[redacted]
∅ M/S pain. ambulated since

Location ☐ | Severity ☐ | Quality ☐ | Duration ☐ | Timing ☐ | Context ☐ | Modifying Factors ☐ | Assoc. Signs/Sympt ☐

Review of Systems — Problem Pertinent 1 — Extended 2-9 — Complete 10+

Normal	Abnormal	Normal	Abnormal	Normal	Abnormal
☑ Constitutional:	☐	☑ Skin:	☐	☑ GI:	☐ ∅N/V
☐ HENT:	☐	☑ Musculoskeletal:	☐	☑ GU:	☐
☐ Eyes:	☐	☐ Psychiatric:	☐	☑ Neurologic:	☐
☑ Respiratory:	☐ ∅SOB	☐ Allergy:	☐	☐ Hematologic/Lymph nodes:	☐
☐ Cardiovascular:	☐ ∅CP ⊕palp	☐ Endocrine:	☐		

palp. "feeler," 1842, from French palpe, from Latin palpus "feeler," related to palpare "to touch, feel" (see feel (v.)). A segmented organ extending from the mouthparts of arthropods, used for touch or taste.

4

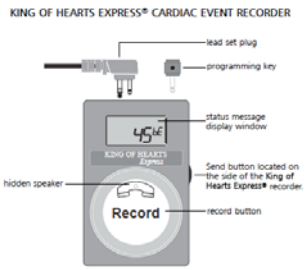
Differential Diagnosis

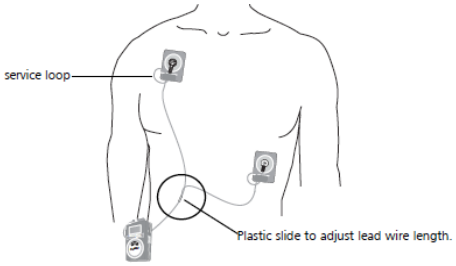
A-V nodal tachycardia	Ventricular Tachycardia
Atrial Flutter	PVCs
AVRT (accessory pathway)	High Grade AV block
Atrial Tachycardia/APCs	TdP
Atrial Fibrillation	

OR

JUST SINUS RHYTHM

Event Monitor

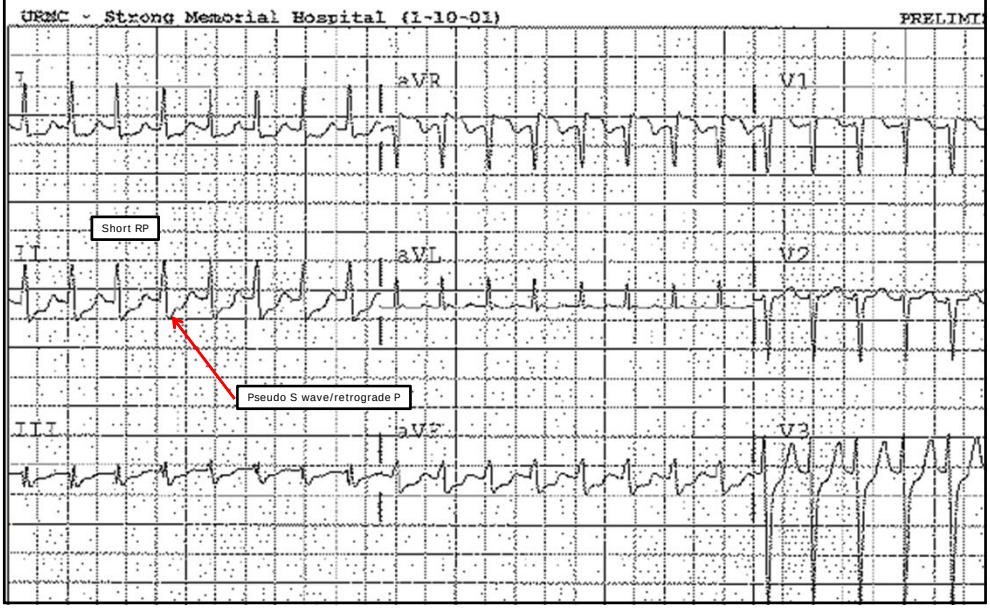




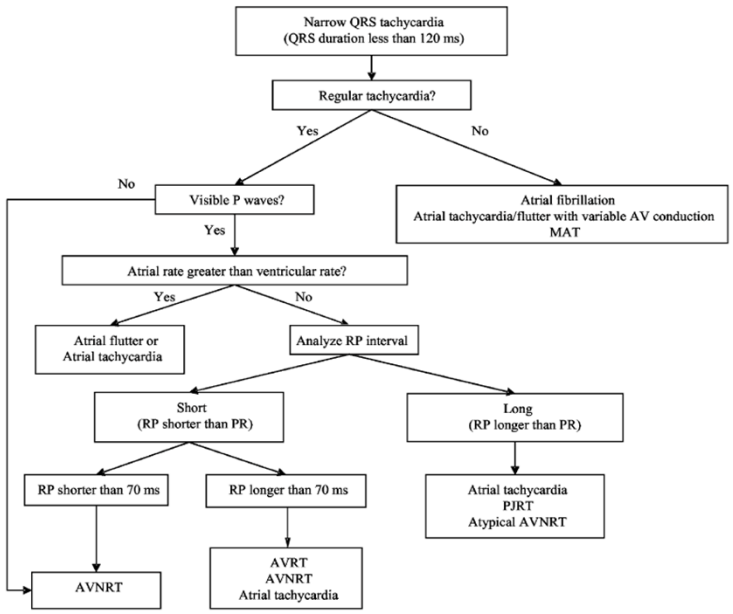
Is the heart structurally normal? Echocardiogram

6

Narrow Complex, Regular Tachycardia



ECG Interpretation



Diagnostic Maneuvers

GOAL: To produce transient slowing of AV conduction (Adenosine, CSM, vagal maneuvers)

- No Change
- Transient and gradual slowing
- Sudden termination
- Persistent Atrial tach with variable block: consider AT/A Flutter

Treatment of SVT/VT

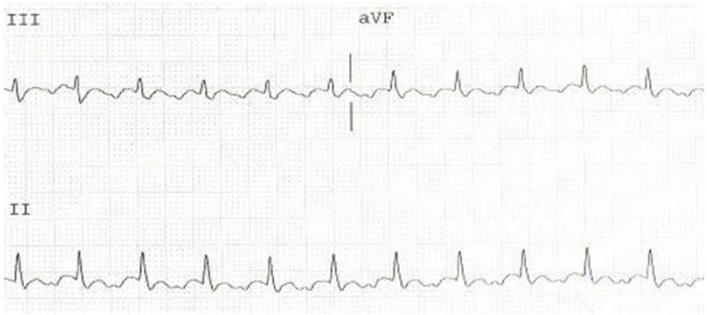
Indications

- Symptoms: frequency, severity, QOL
- Hemodynamic intolerance, exacerbation of other diseases (i.e. angina)
- Prevention of thromboembolic events (Atrial fibrillation, atrial flutter)

Goals of Therapy

Cure	---------- Ablation, surgery
Prevention	---------- Drugs, pacing
Rate Control	---------- Ablation, pacing

Atrial Flutter



Atrial Flutter

- Can be seen in isolation or associated with Atrial fibrillation
- Associated with thromboembolic stroke
- Anticoagulation consideration
- Rate control is important
- Consider ablation as initial therapy

- Randomized, multi-center
- 2 episodes prior 4 months
- Drug vs. RFA
- Followed 21 mts

Table 1. Baseline Characteristics of the Two Patient Groups

	RF Ablation (n = 31)	Drug Therapy (n = 30)	p Value
Age (yr)	67 ± 8	66 ± 11	NS
Male gender	20	22	NS
Mean EF (%)	49.4 ± 5.1	49.6 ± 3.1	NS
Structural heart disease:			
Absent	16	17	
IHD	12	11	
IDC	2	1	
VD	1	—	
Other	—	1	
Paroxysmal atrial flutter (n)	1	2	NS
Persistent atrial flutter (n)	30	28	NS
Median episodes per month of atrial flutter (range)	1 (0–3)	1 (0–2)	NS
Mean No. of cardioversions before entering the study	2.3 ± 0.5	2.2 ± 0.5	NS
Mean No. of cardioversions after entering the study	0.5 ± 1.2	4.4 ± 1.7	< 0.01
Percentage of patients with atrial flutter recurrence after entering the study	6% (2)	93% (28)	< 0.01
Percentage of patients with atrial fibrillation after entering the study	29% (9)	60% (18)	< 0.05
Mean No. of arrhythmia episodes at follow-up	0.7 ± 1.4	5.1 ± 2.0	< 0.01
Percentage of patients requiring arrhythmia-related hospitalization at follow-up	22% (7)	63% (19)	< 0.01

EF = ejection fraction; IDC = idiopathic dilated cardiomyopathy; IHD = ischemic heart disease; RF = radiofrequency; VD = valvular disease.

Andrea Natale MD, et al. *J Am Coll Cardiol.:Volume 35, Issue 7 , June 2000, Pages

Standard Treatment Group

Table 3. Quality of Life and Symptoms Scores in the Drug Therapy Group

	Pretreatment	Posttreatment (6 mo)	Posttreatment (12 mo)	Overall p Value
Sense of well being	1.9 ± 0.4	2.0 ± 0.4	2.1 ± 0.3	NS
Function in daily life	2.1 ± 0.4	2.1 ± 0.3	2.3 ± 0.3	NS
Palpitation	3.2 ± 0.6*	2.0 ± 0.5	2.1 ± 0.7	< 0.05
SOB with exercise	3.4 ± 0.4	3.2 ± 0.4	3.0 ± 0.5	NS
Feeling weak	2.9 ± 0.3	3.0 ± 0.4	3.1 ± 0.4	NS
QOL total score	29 ± 3	28 ± 6	31 ± 5	NS

*$p < 0.001$. Pretreatment versus posttreatment 6 months and posttreatment 12 months. All other comparisons did not show statistical significance.

QOL = quality of life overall score; SOB = shortness of breath.

Ablation Treatment Group

Table 4. Quality of Life and Symptoms Scores in the Catheter Ablation Group

	Preablation	Postablation (6 mo)	Postablation (12 mo)	Overall p Value
Sense of well being	2.0 ± 0.3*	3.9 ± 0.3	3.8 ± 0.5	< 0.01
Function in daily life	2.3 ± 0.4*	3.8 ± 0.5	3.6 ± 0.6	< 0.01
Palpitation	3.1 ± 0.6*	1.0 ± 0.4	1.0 ± 0.5	< 0.01
SOB with exercise	3.0 ± 0.4*	1.0 ± 0.5	1.2 ± 0.3	< 0.01
Feeling weak	2.9 ± 0.5*	0.8 ± 0.4	0.8 ± 0.5	< 0.01
QOL total score	30 ± 4†	59 ± 7	57 ± 6	< 0.001

*p < 0.001. Preablation versus postablation 6 months and postablation 12 months. †p < 0.0001. Preablation versus postablation 6 months and postablation 12 months. Postablation 6 months versus postablation 12 months, p = NS.
QOL = quality of life overall score; SOB = shortness of breath.

Pre-excitation Syndrome: WPW

Symptomatic / frequent

Ablation Class I indication

Asymptomatic / Infrequent

No RX - Class I

Vagal Maneuvers- Class I

Pill in the Pocket- Class I (CCB, BB)

Ablation – Class II a

Medications – Class IIb indication (flecainide, Propafanone)

Digoxin –**CLASS III**

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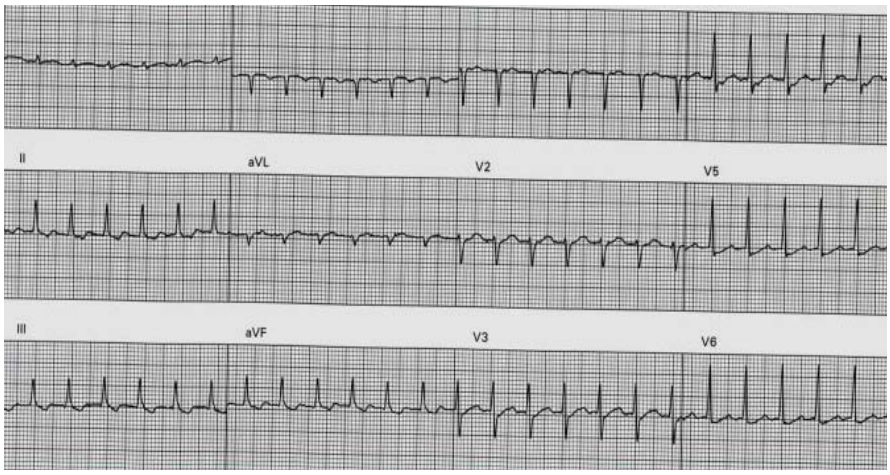
The Wide Complex Tachycardia

- Consider baseline ECG—is there LBBB,RBBB, frequent PVC's
- Hemodynamically tolerated?
- Prior medical history of MI, CAD, cardiomyopathy?

Tachycardia Case 1



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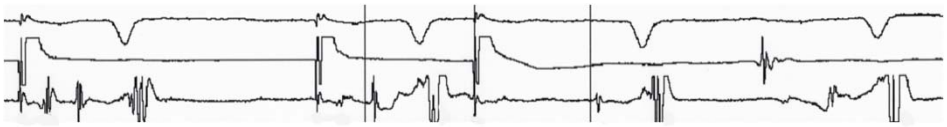
What Next?

- Holter Monitoring
- Event monitor for 30 days
- Treadmill Test
- Beta blocker
- EP study/RF ablation
- Follow up in 6 months: prn for symptoms.

Jump: Dual AV nodal physiology

~90-95% Lifetime Cure Rate



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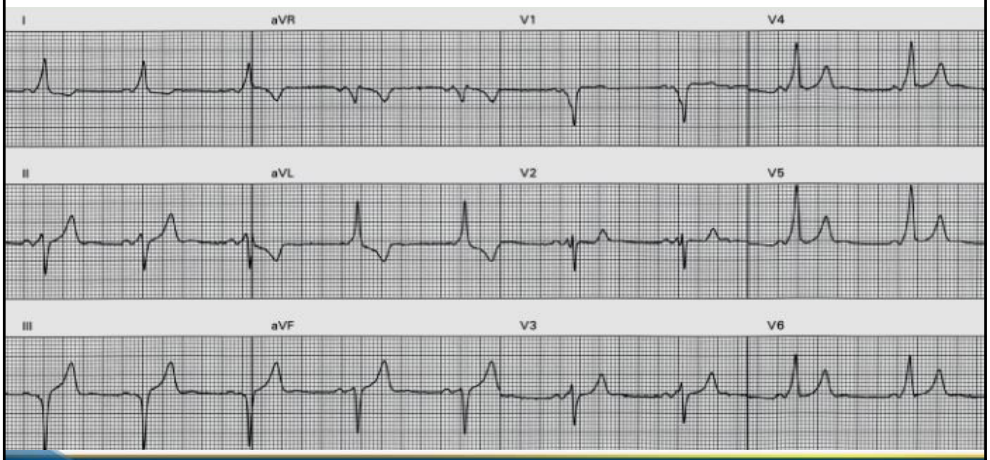
Case #2

26 year old asymptomatic man presents for routine physical examination. The following ECG is seen.

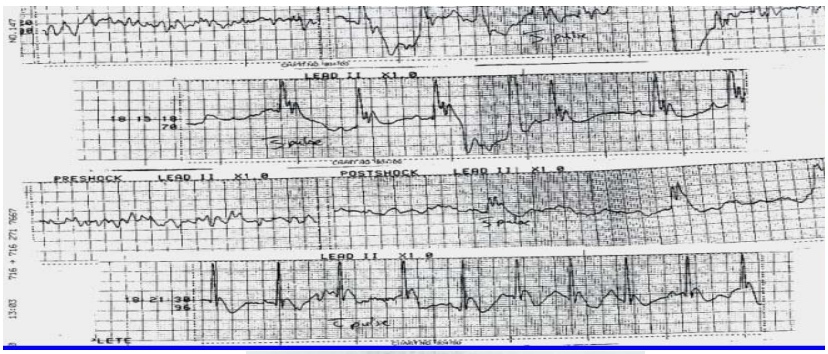


What Next?

- Holter Monitoring
- Event monitor for 30 days
- Treadmill Test
- Beta blocker/AVN blocker
- EP study
- Follow up in 6 months: prn for symptoms.

Treadmill

- Uneventful--AP blocks at higher HR
- Follow up prn



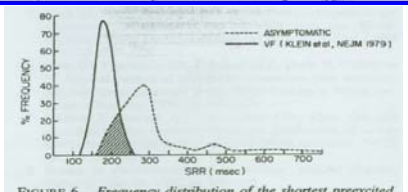


FIGURE 6. *Frequency distribution of the shortest preexcited RR intervals (SRR) during induced atrial fibrillation (---) compared with the frequency distribution of the SRR values for the patients who experienced ventricular fibrillation in the study reported by Klein et al[3] (—). Area of overlap between the two distributions is indicated by the hatched area.*

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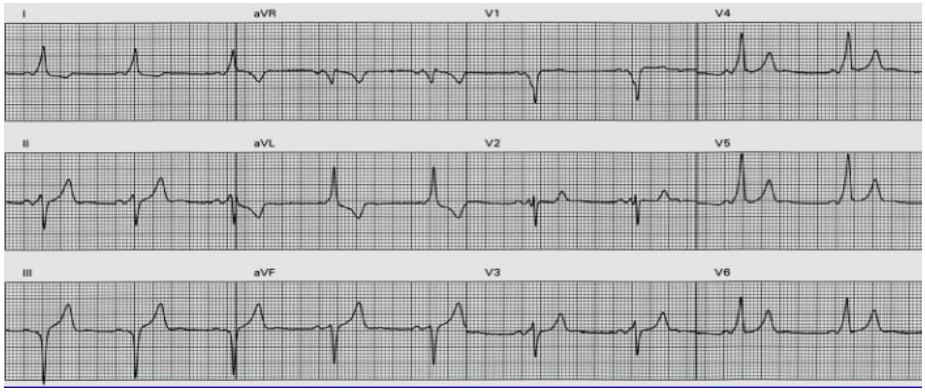
WPW: Baseline

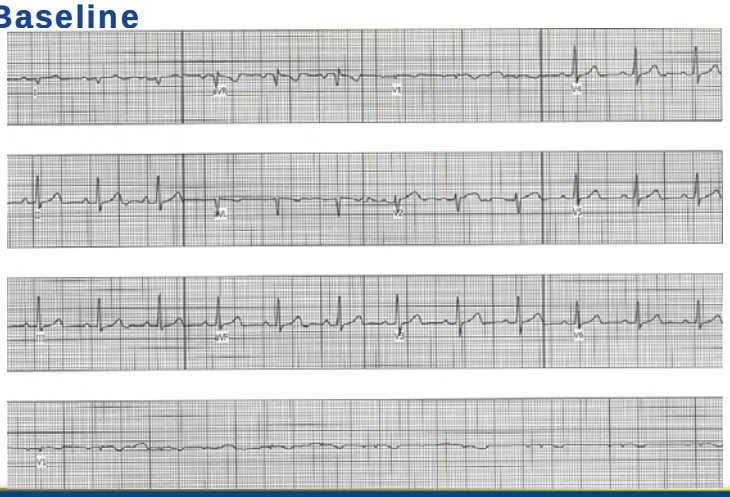


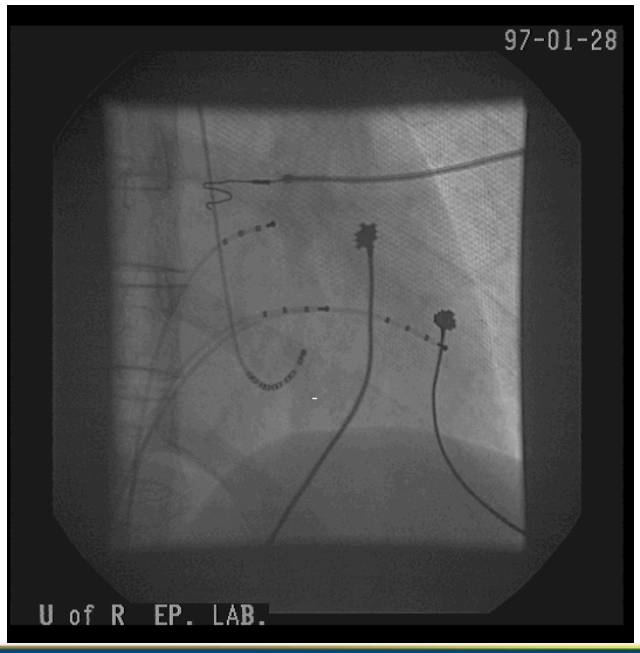
WPW: Post Ablation (Loss of Delta wave)
>90% Cure

Case 3

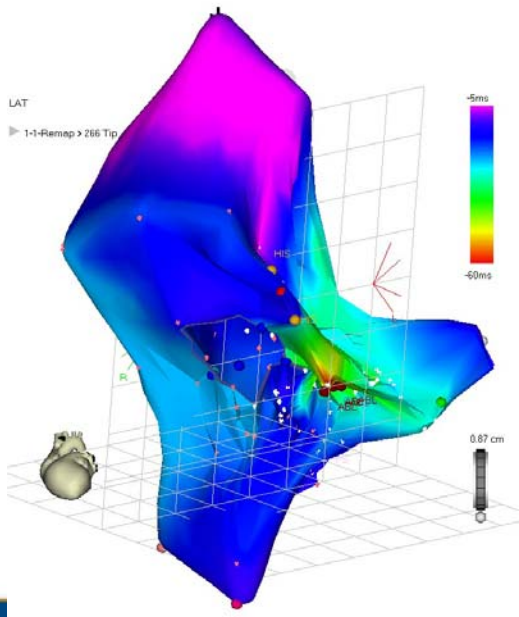
16 year old Female with neurocardiogenic syncope, orthostatic hypotension, and palpitations

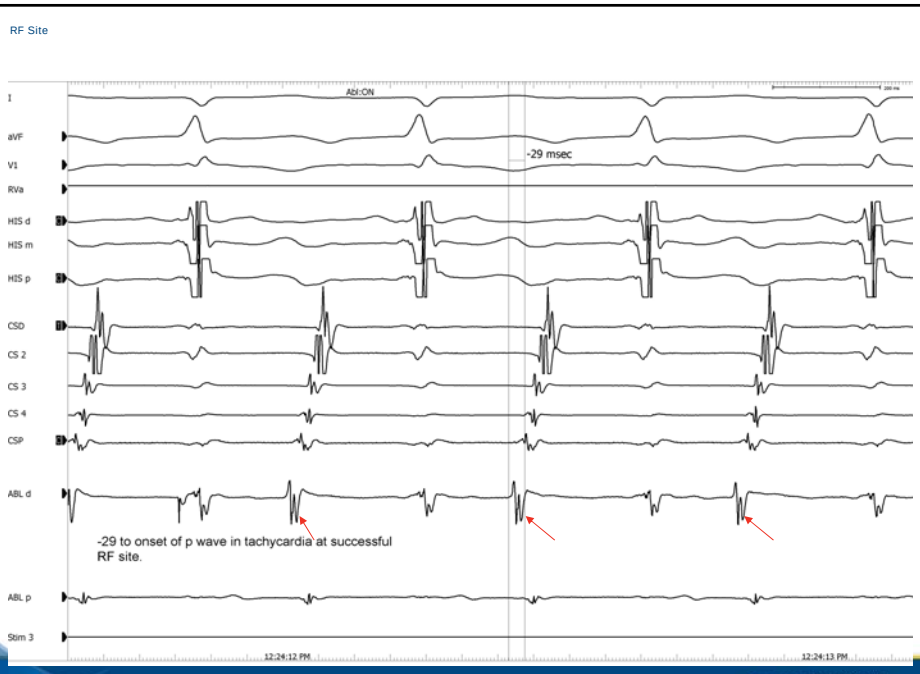
Baseline



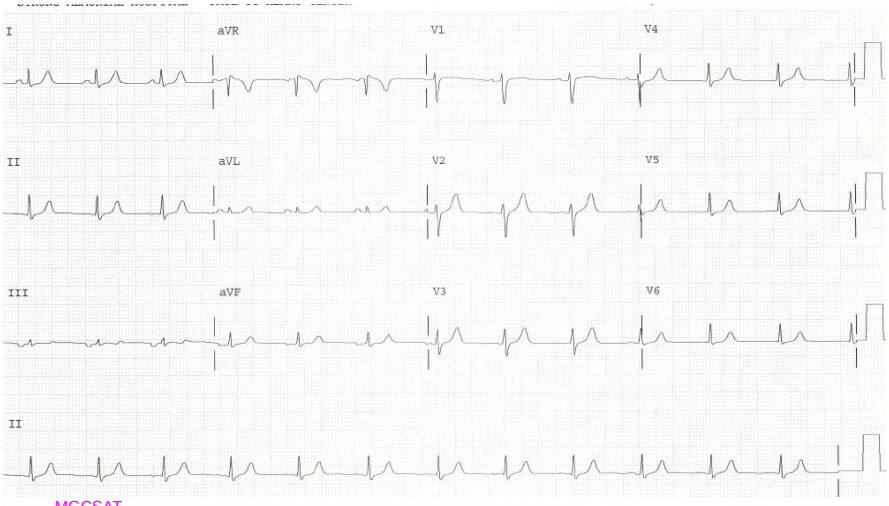


LAO


LAT
1-1-Remap > 266 Tip
-5ms
-60ms
HIS
0.87 cm

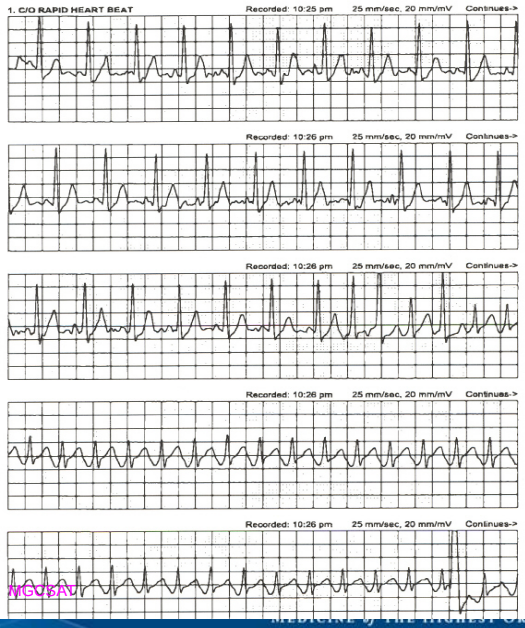

RF Site
Abl:ON
-29 msec
I
aVF
V1
RVa
HIS d
HIS m
HIS p
CSD
CS 2
CS 3
CS 4
CSP
ABL d
-29 to onset of p wave in tachycardia at successful RF site.
ABL p
Stim 3
12:24:12 PM
12:24:13 PM

Case 4: 39 y/o woman with palpitations, syncope



MGCSAT

Palpitations



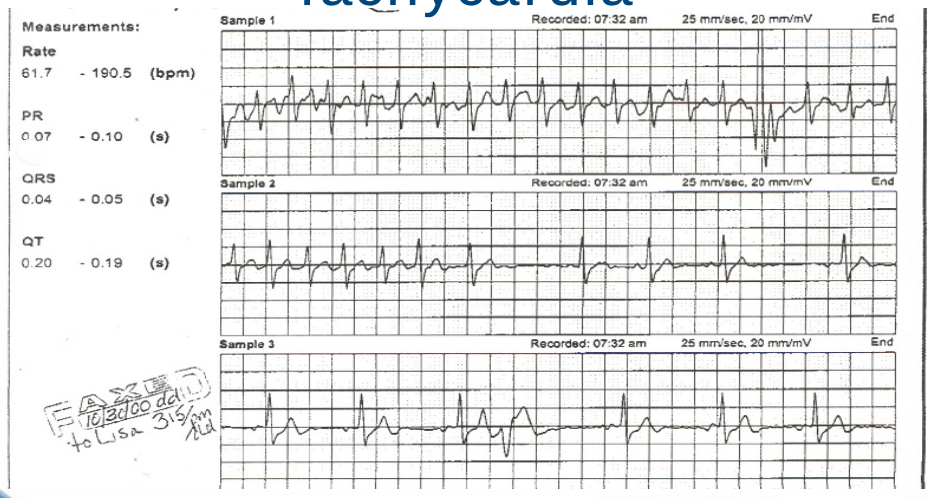
Sudden onset?

Regular?

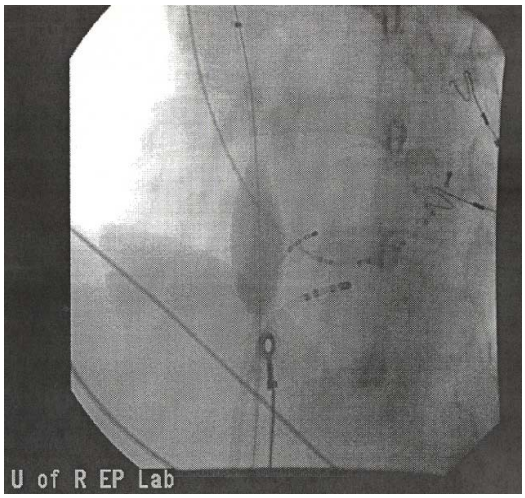
Atrial Flutter ?

Short or long RP??

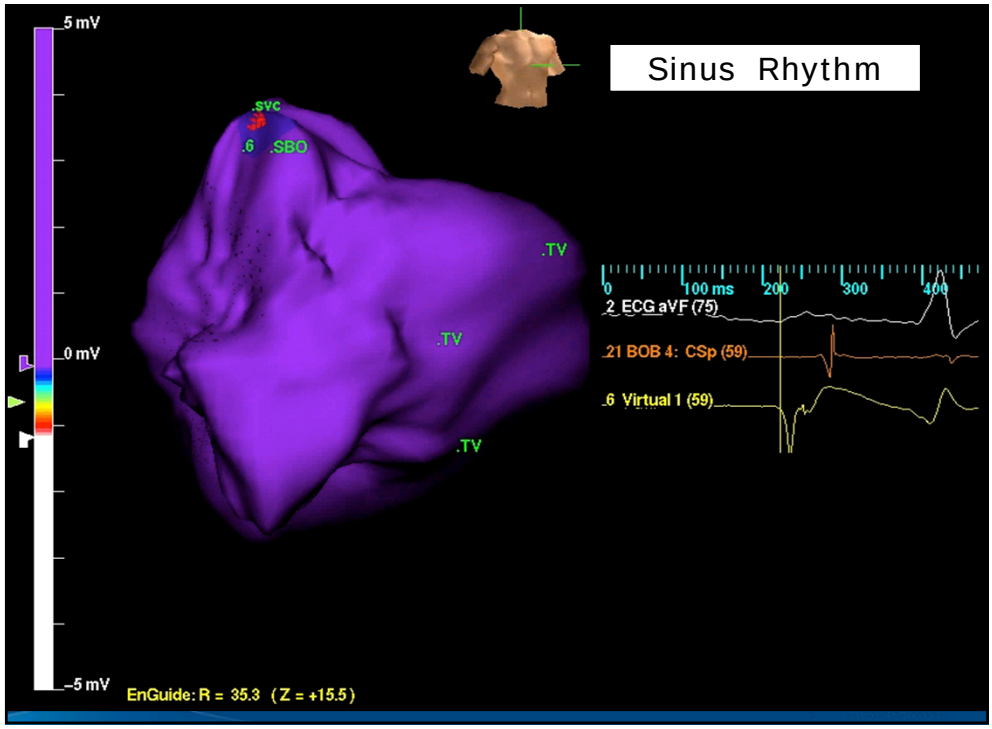
Palpitations—Atrial Tachycardia

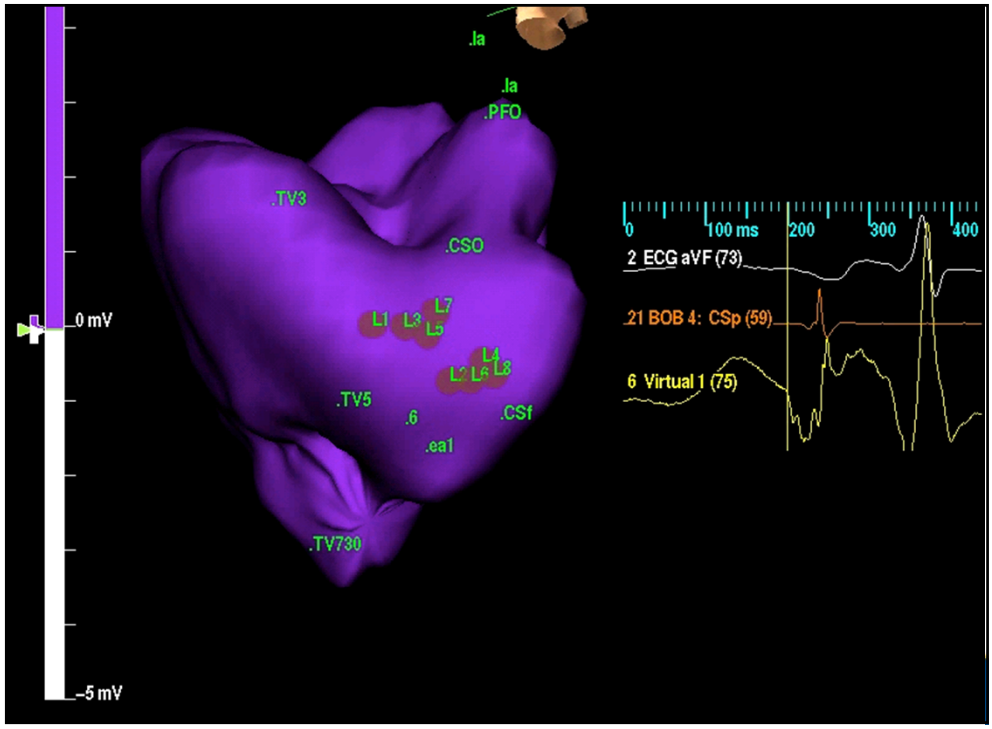


ESI: Non Contact Mapping



MGCSAT


.5 mV
0 mV
-5 mV
Sinus Rhythm
.svc
.6
.SBO
.TV
.TV
.TV
0
100 ms
200
300
400
.2 ECG aVF (75)
.21 BOB 4: CSp (59)
.6 Virtual 1 (59)
EnGuide: R = 35.3 (Z = +15.5)


.la
.la
.PFO
.TV3
.CSO
L1
L3
L7
L5
L4
L2
L6
L8
.TV5
.6
.CSf
.ca1
.TV730
0 mV
-5 mV
0
100 ms
200
300
400
2 ECG aVF (73)
.21 BOB 4: CSp (59)
6 Virtual 1 (75)

RF Ablation Success Rates

WPW >95%	<10% recurrence
AVNRT >95%	<5% recurrence
Atrial Flutter >85-90%	~10% recurrence
Atrial Tach > 75-85%	variable
RVOT VT 65%-97%	<10% recurrence
Ischemic VT 50-70%	Variable*
Non Ischemic VT %35-60%	Control-Variable*

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