

Diagnòstic i maneig de les taquicàrdies

Prof. Josep Brugada

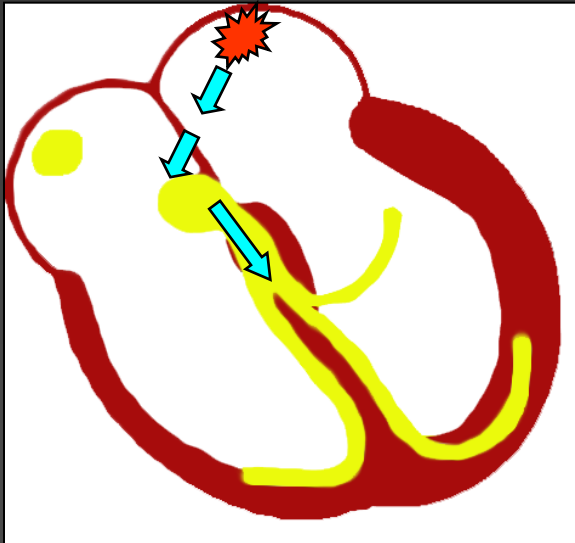
Catedràtic de Cardiologia, Universitat de Barcelona
Hospital Clínic, Hospital Pediàtric Sant Joan de Déu



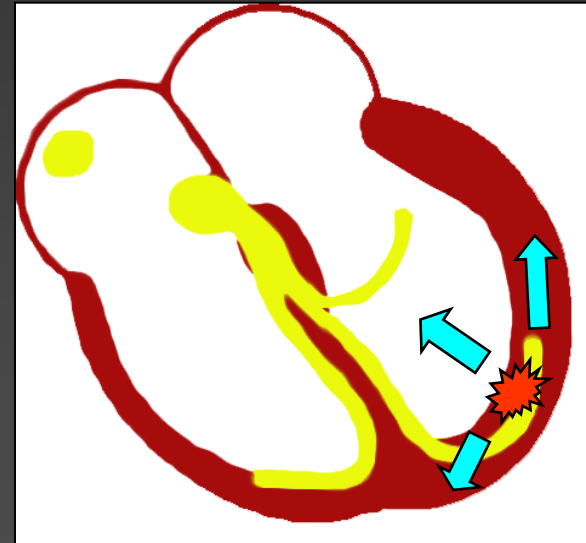
Taquicàrdia. Classificació

- Lloc d'origen:

Supraventricular

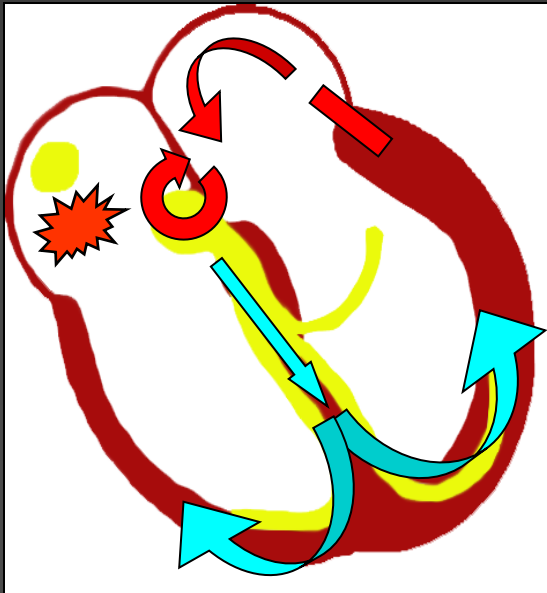


Ventricular



Taquicàrdies supraventriculars

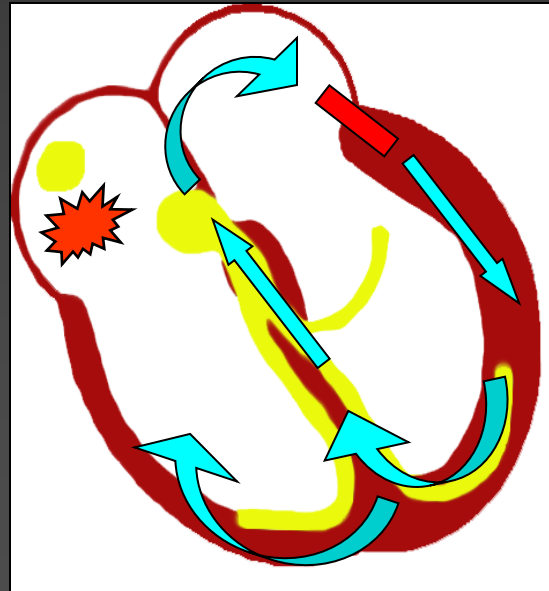
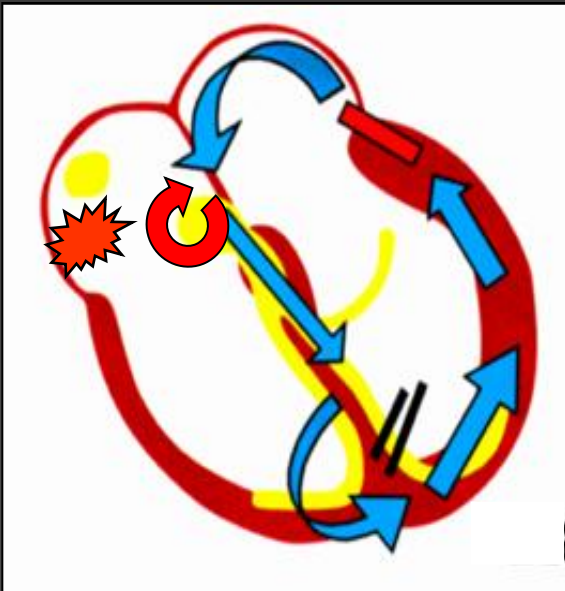
- Són aquelles quin origen es situa per sobre del feix de His, i/o que incorporen el nodo aurículo-ventricular en el seu circuit.
- La conducció pel nodo AV implica que l'activació del ventricle es realitza de forma fisiològica i per tant el complex QRS durant la taquicàrdia serà estret (< 120 mseg)



↑ ↑
80 mseg

Taquicàrdies supraventriculars

- QRS estret excepte:
 - 1. Bloqueig de branca preexistent
 - 2. Bloqueig de branca freqüència depenent
 - 3. Conducció anterògrada per una via accessòria AV

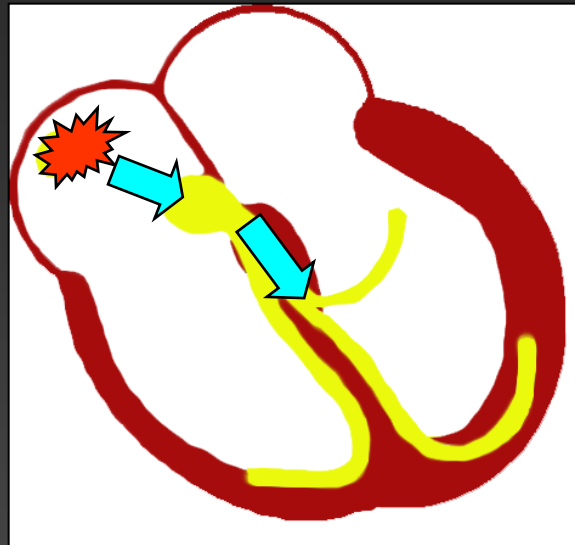
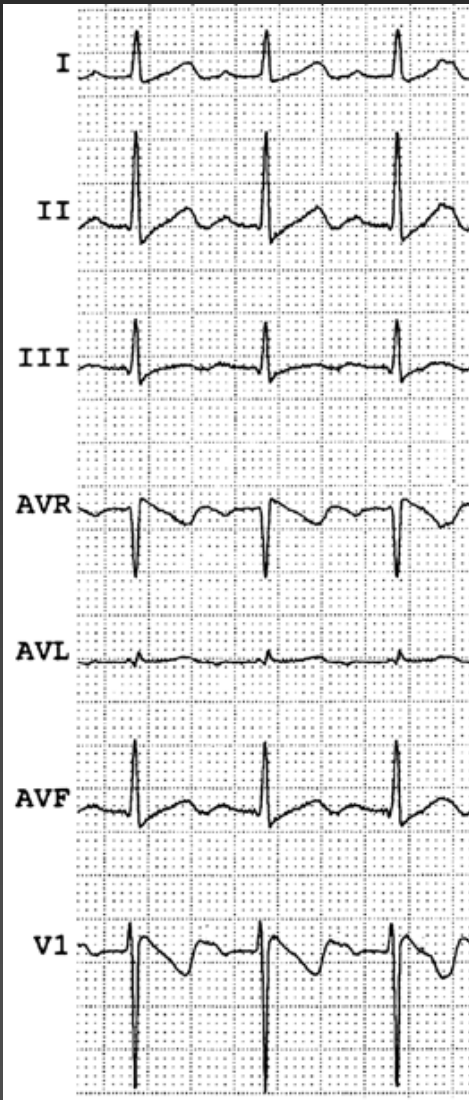


↑ ↑
140 mseg

Taquicardies supraventriculars

- Taquicàrdia sinusal
- Taquicàrdia auricular
- Flutter auricular
- Taquicàrdia per reentrada nodal
- Taquicàrdia per reentrada aurículo-ventricular
- Fibril·lació auricular (irregular)

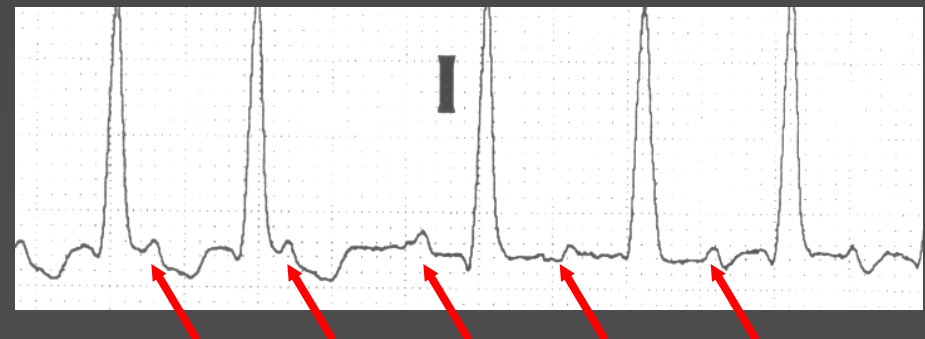
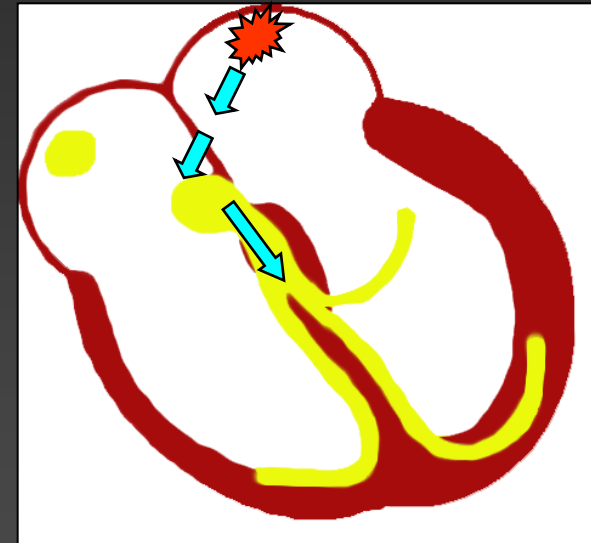
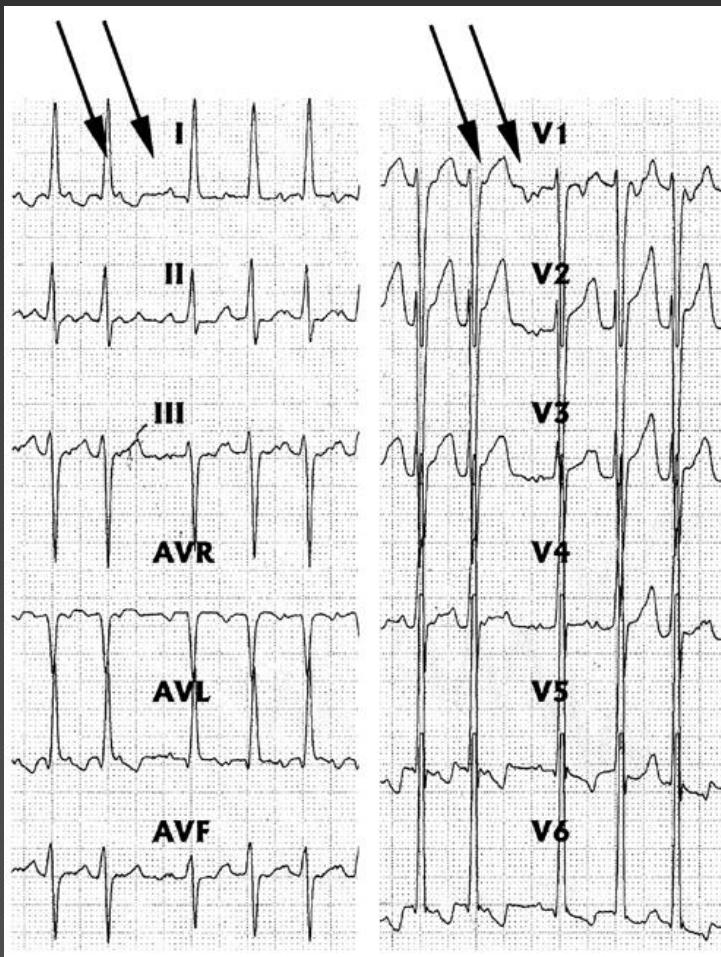
Taquicàrdia sinusal



- Frecuencia sinusal mayor de 100 lpm
- Fisiológica: esfuerzo, emoción
- Secundaria a condiciones patológicas: fiebre, hipertiroidismo
- Secundaria a fármacos: betaestimulantes, cafeína, etc

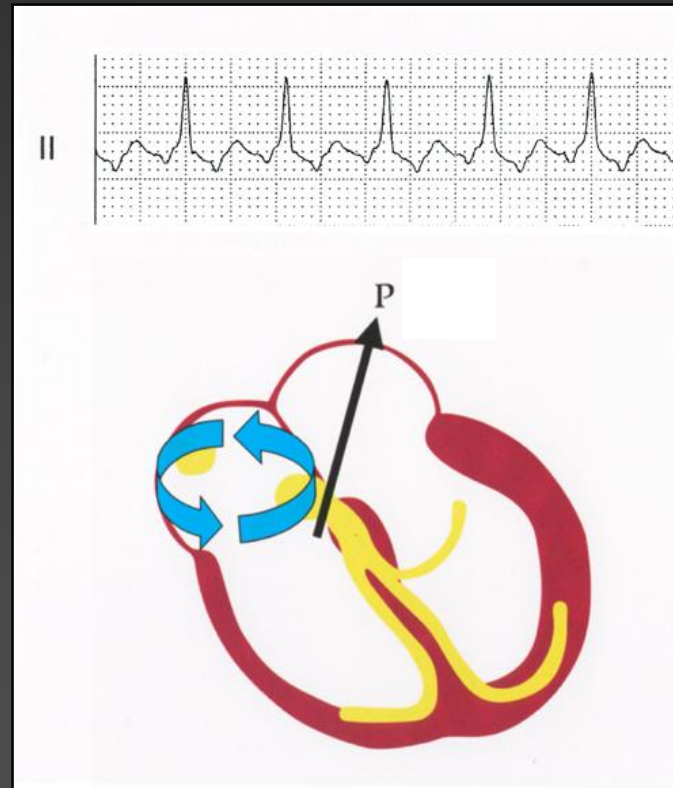
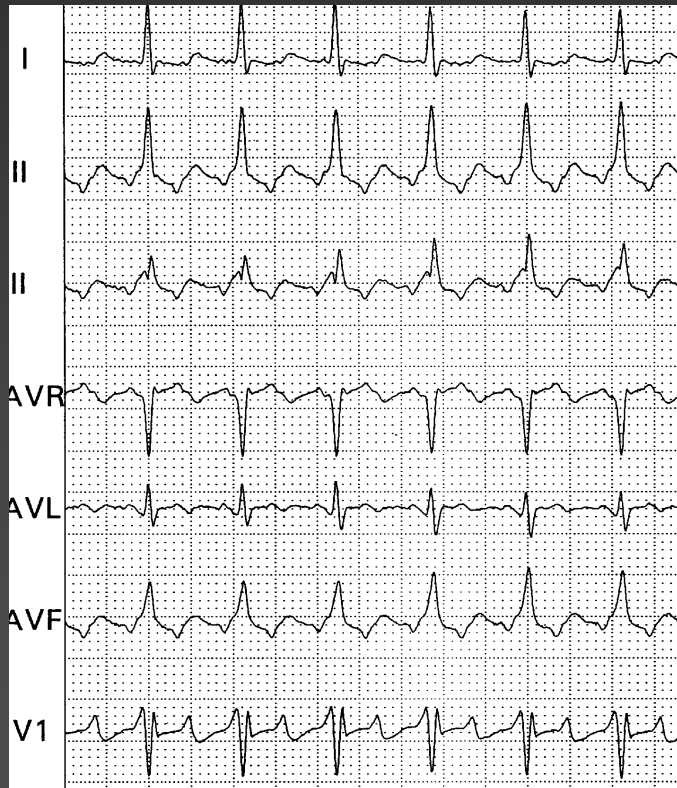
Taquicardia auricular

- Frecuencia auricular > 100 lpm por activación de un foco ectópico auricular, distinto del nodo sinusal. La frecuencia ventricular dependerá de la capacidad de conducción del nodo AV

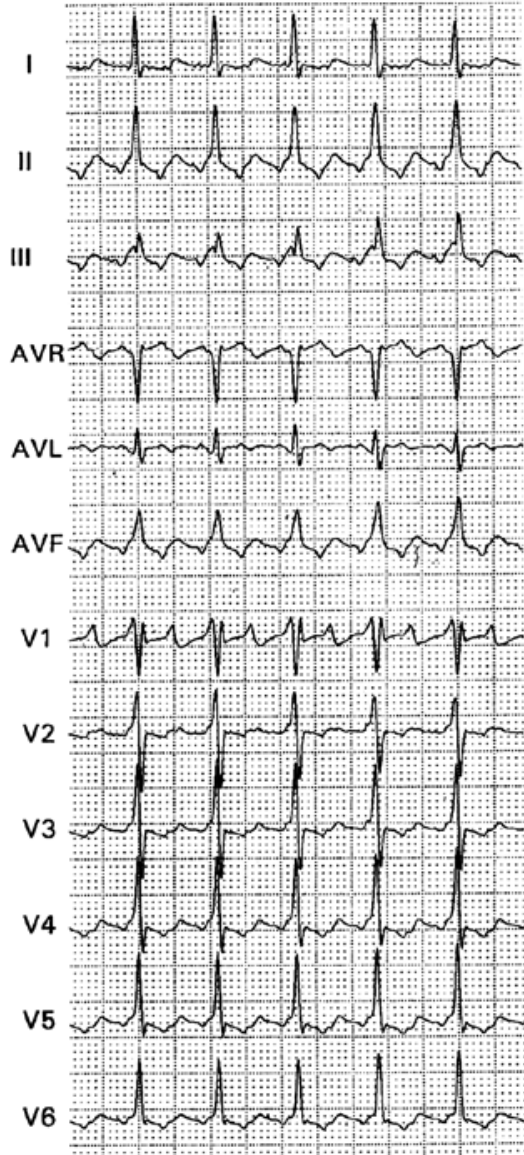


Aleteo auricular

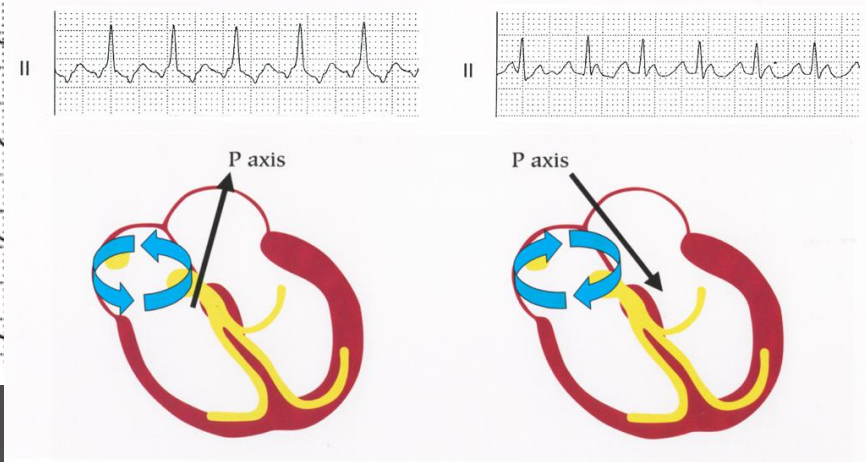
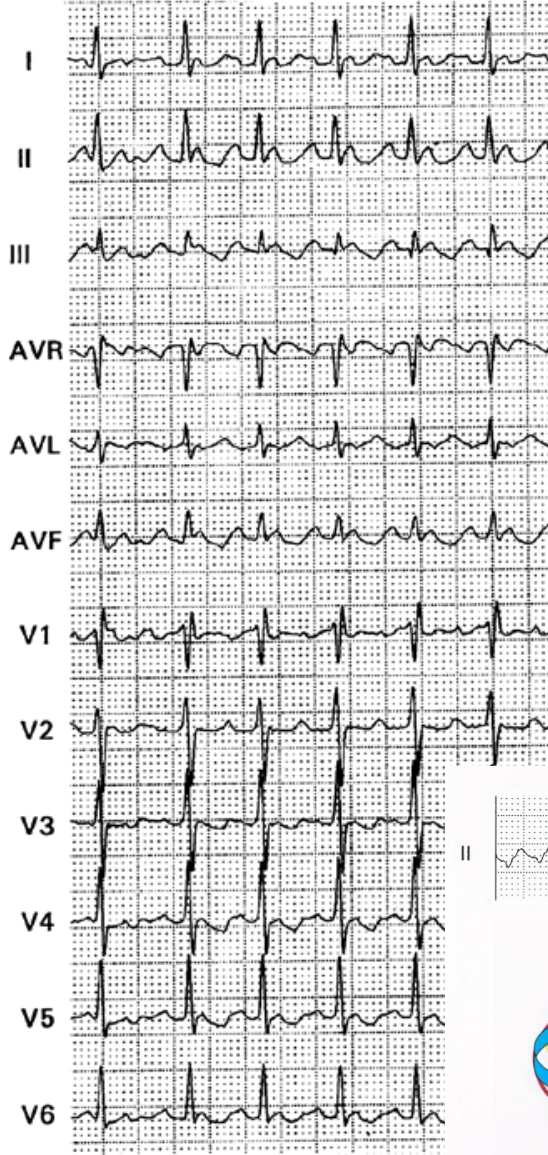
- Circuito de reentrada en la aurícula derecha. Frecuencia auricular a 300/min, frecuencia ventricular habitualmente a 150/min por conducción 2:1 en el nodo AV



A

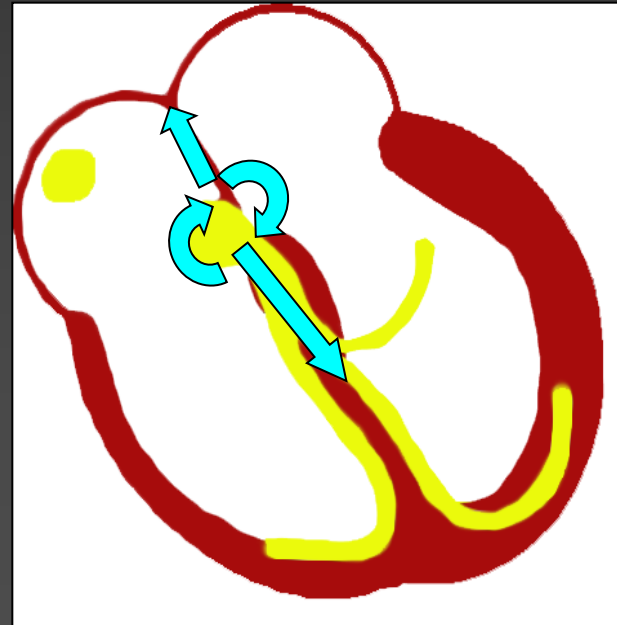


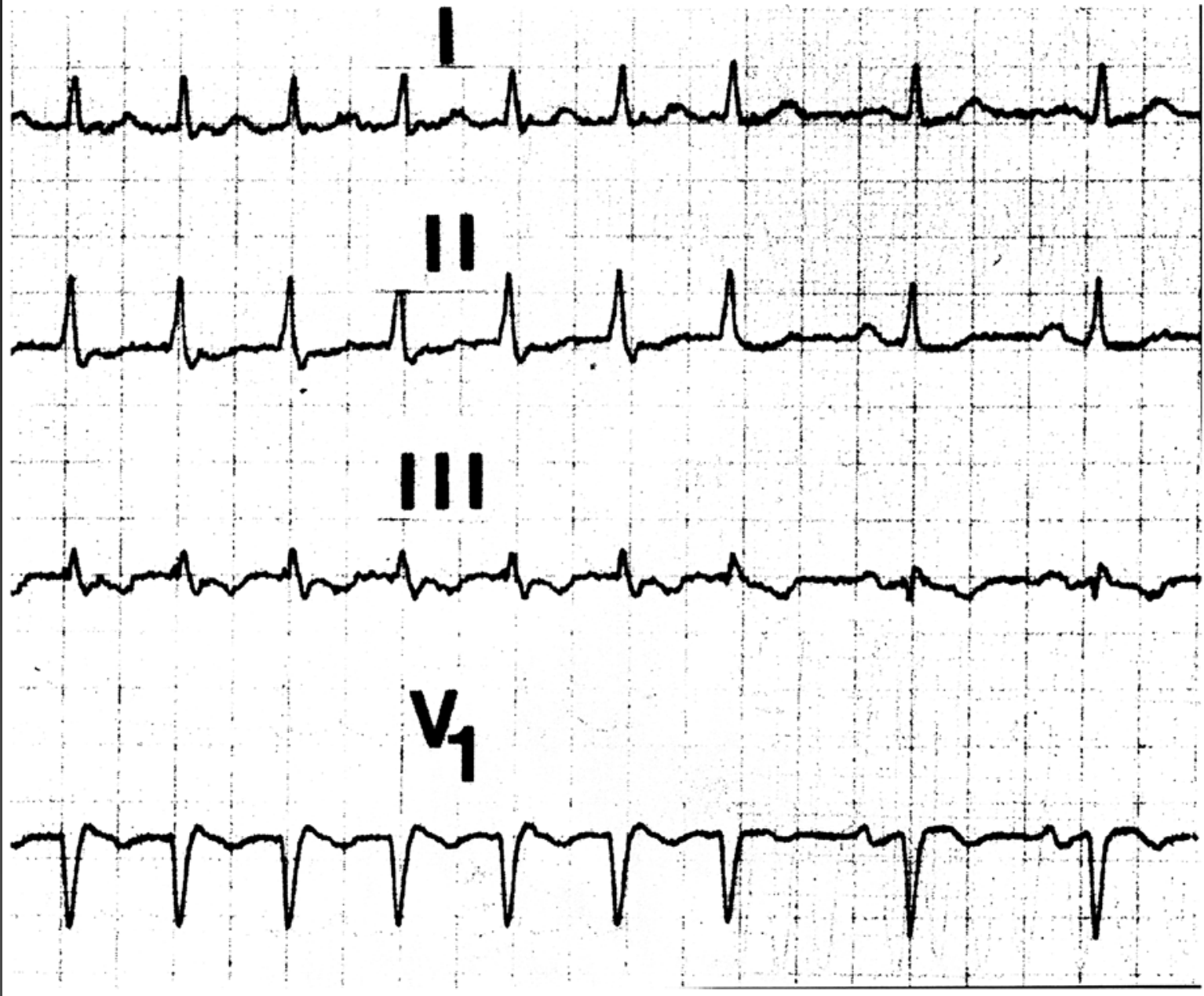
B



Taquicardia por reentrada nodal

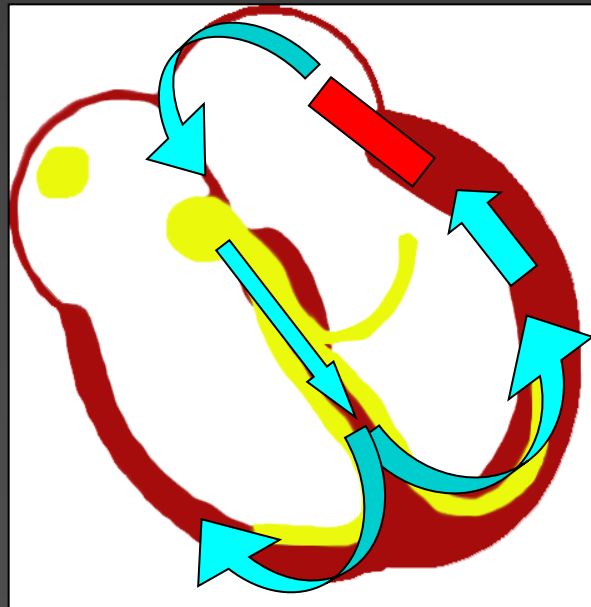
- Circuito de reentrada en el nodo AV por la presencia de una doble vía nodal (vía lenta + vía rápida). Activación simultánea de las aurículas y los ventrículos. La onda P se sitúa dentro del complejo QRS

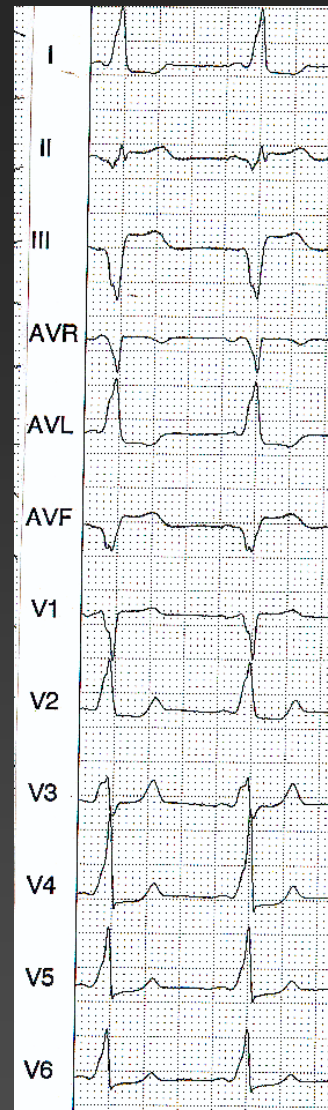
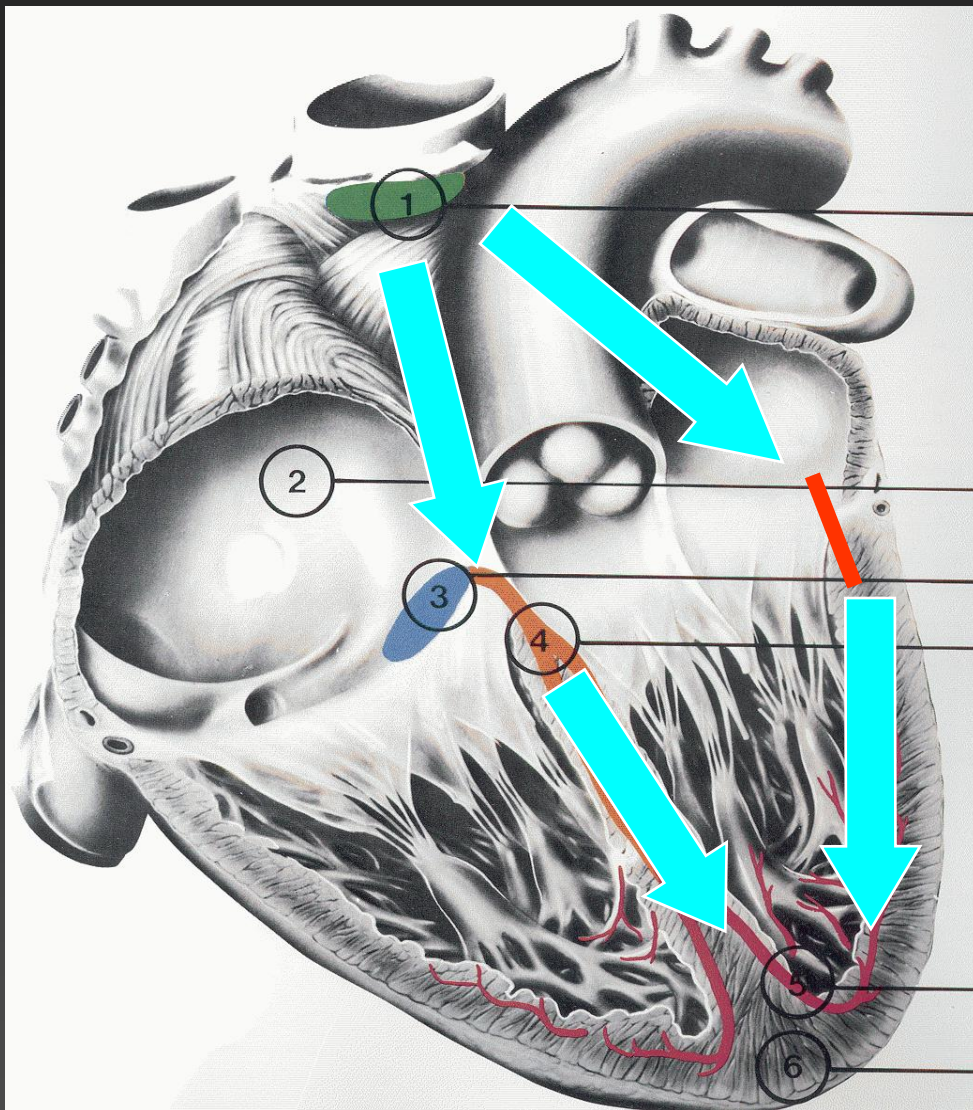




Taquicardia por reentrada aurículo-ventricular

- Circuito de reentrada por la presencia de una vía accesoria aurículo-ventricular. Primero se activan los ventrículos y posteriormente las aurículas. La onda P está retrasada unos 140 mseg con respecto al ventrículo



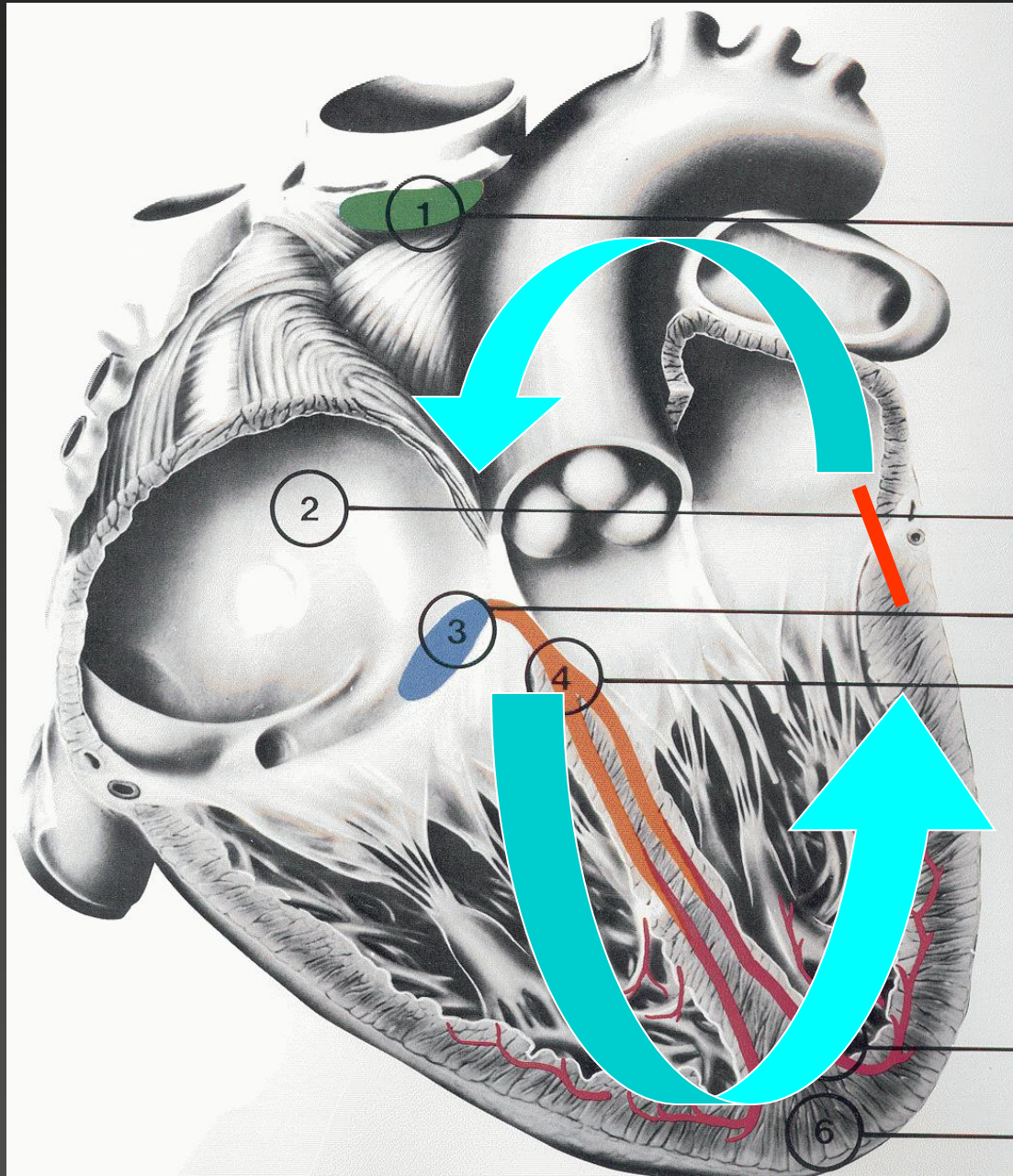


Onda delta



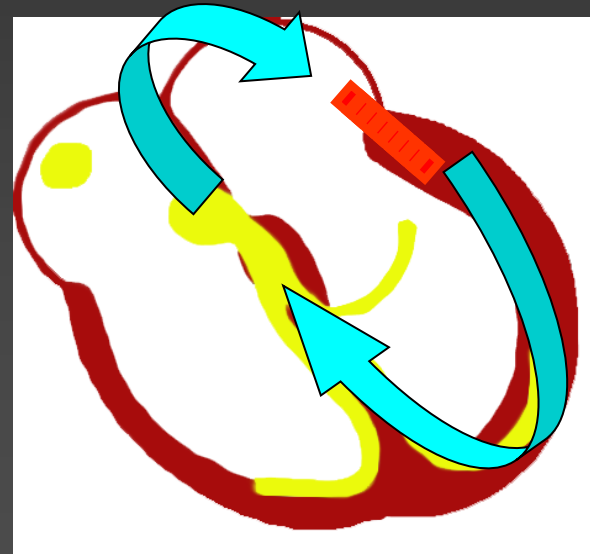
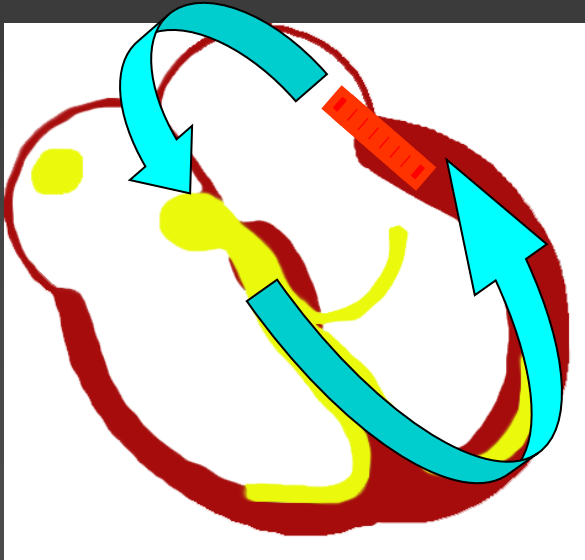
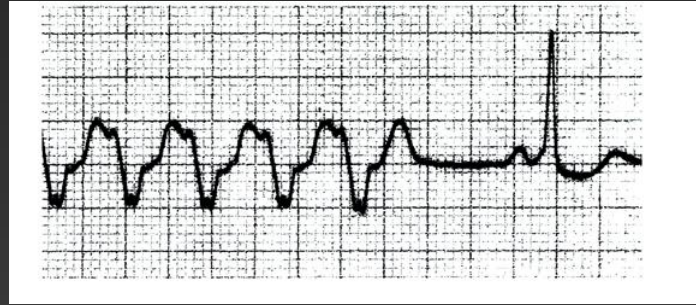
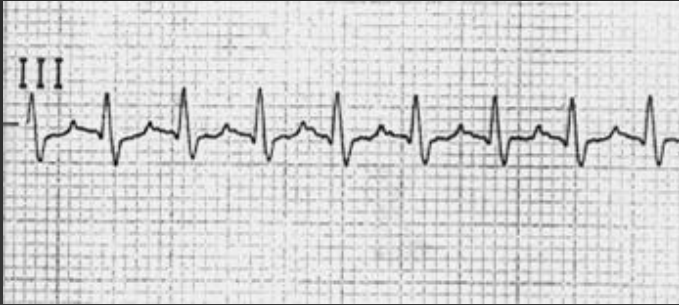
PR corto
(100ms)

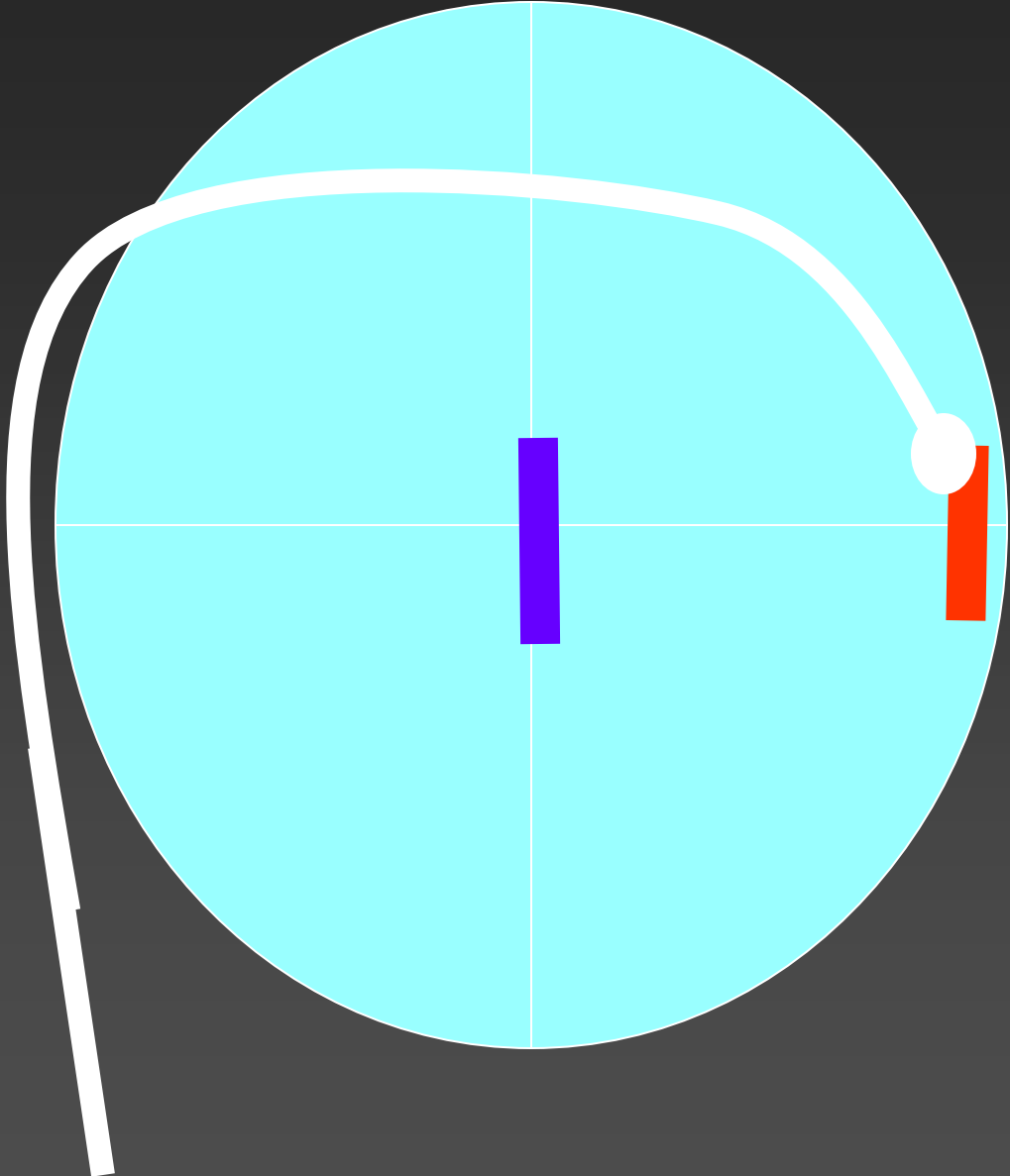
QRS ancho
(120 ms)

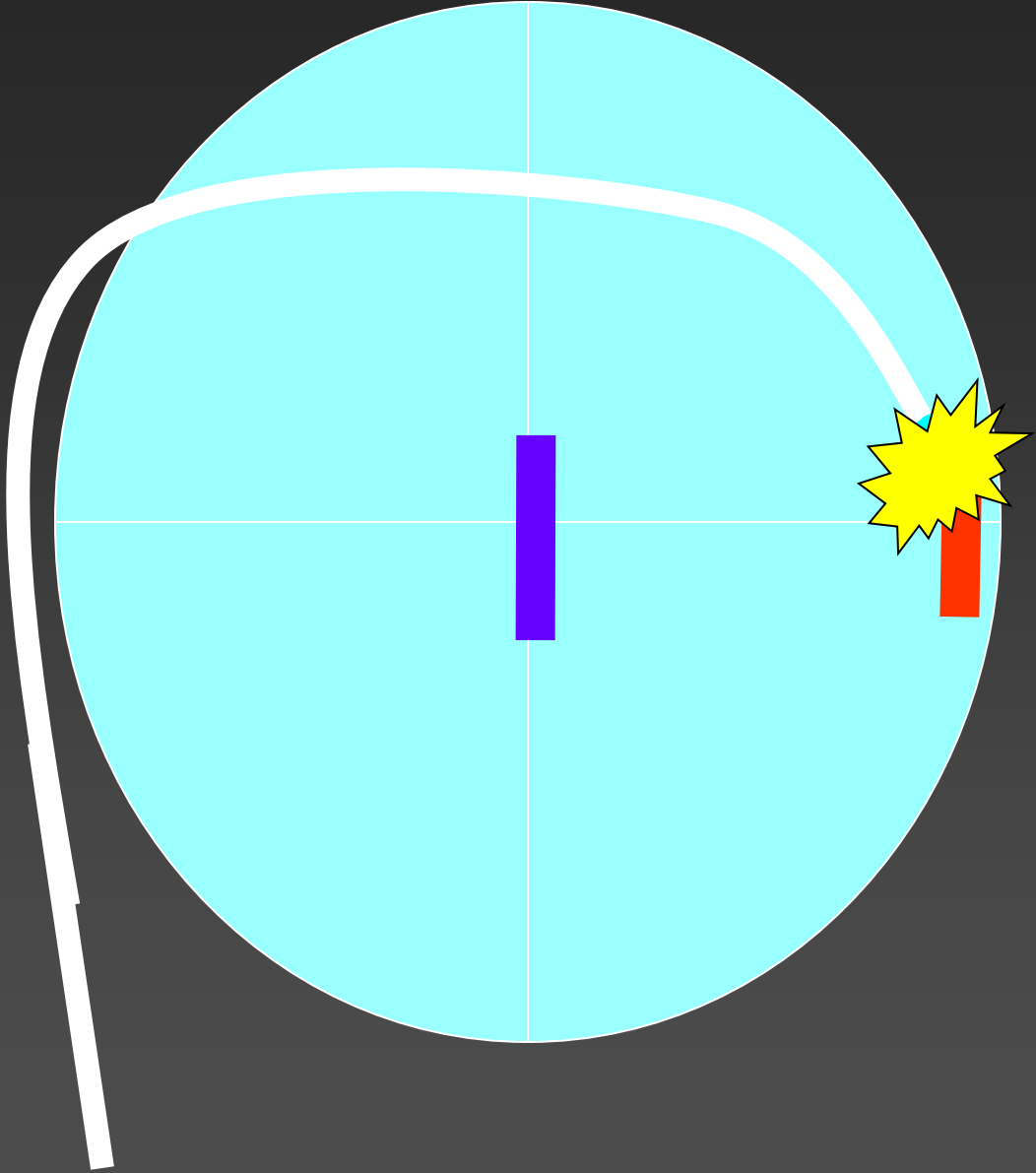


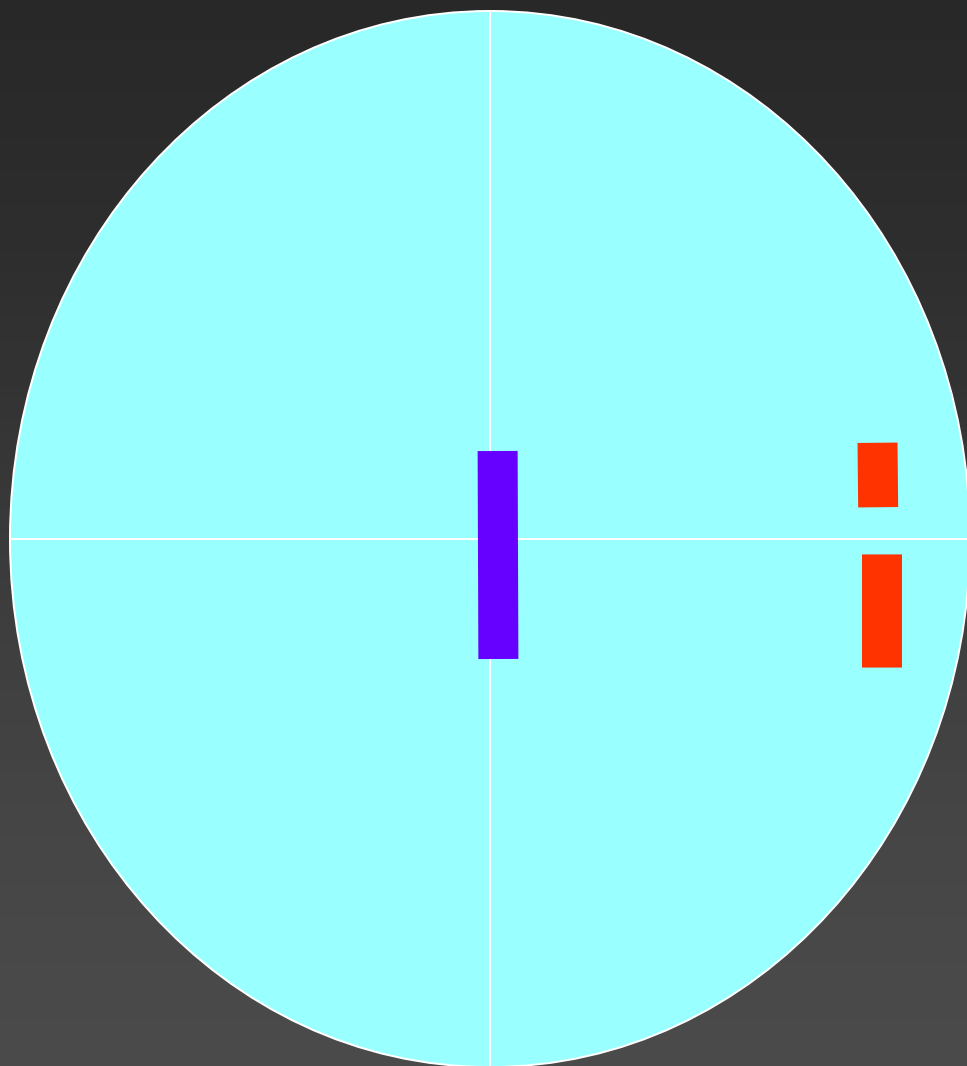
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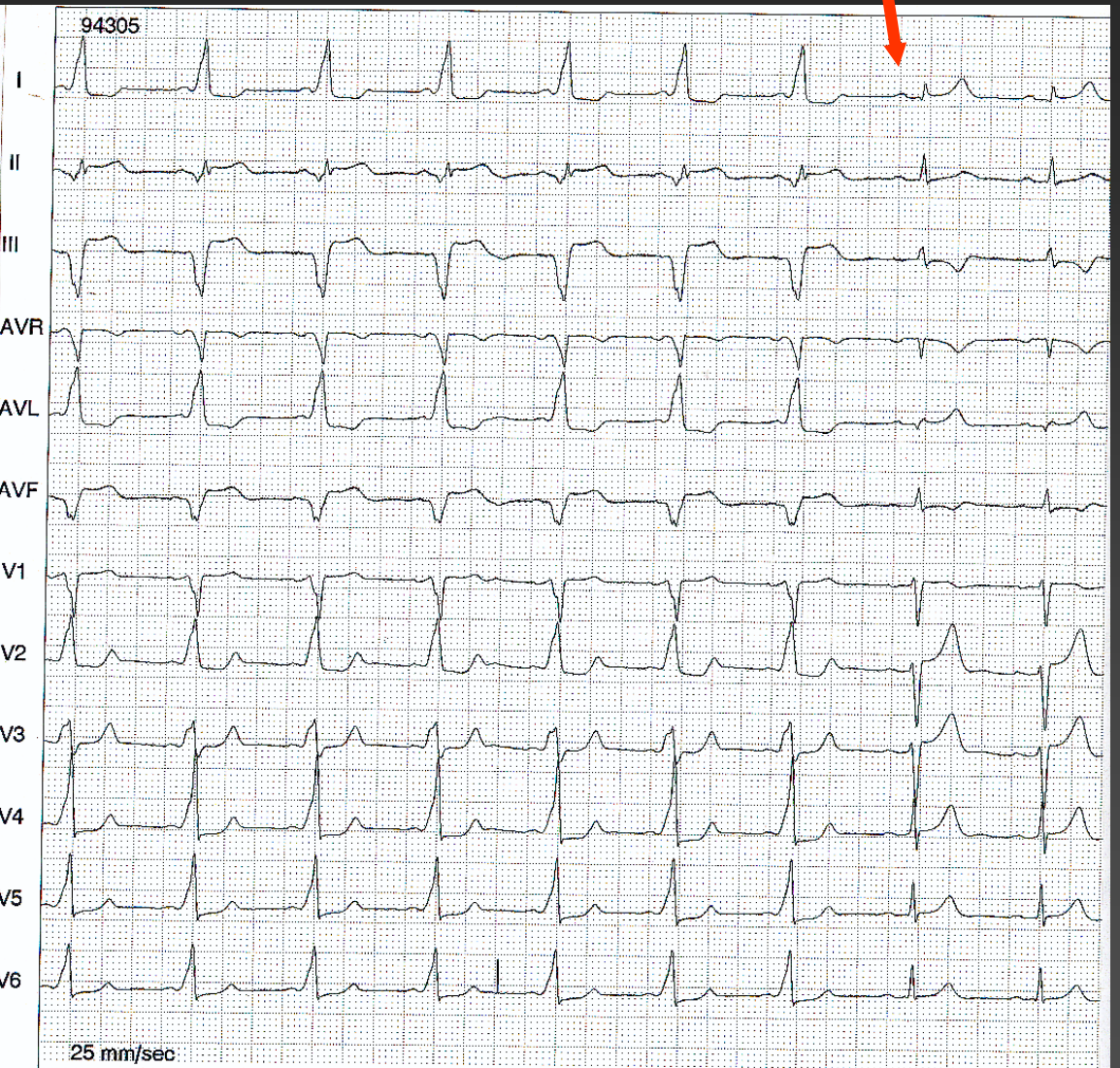
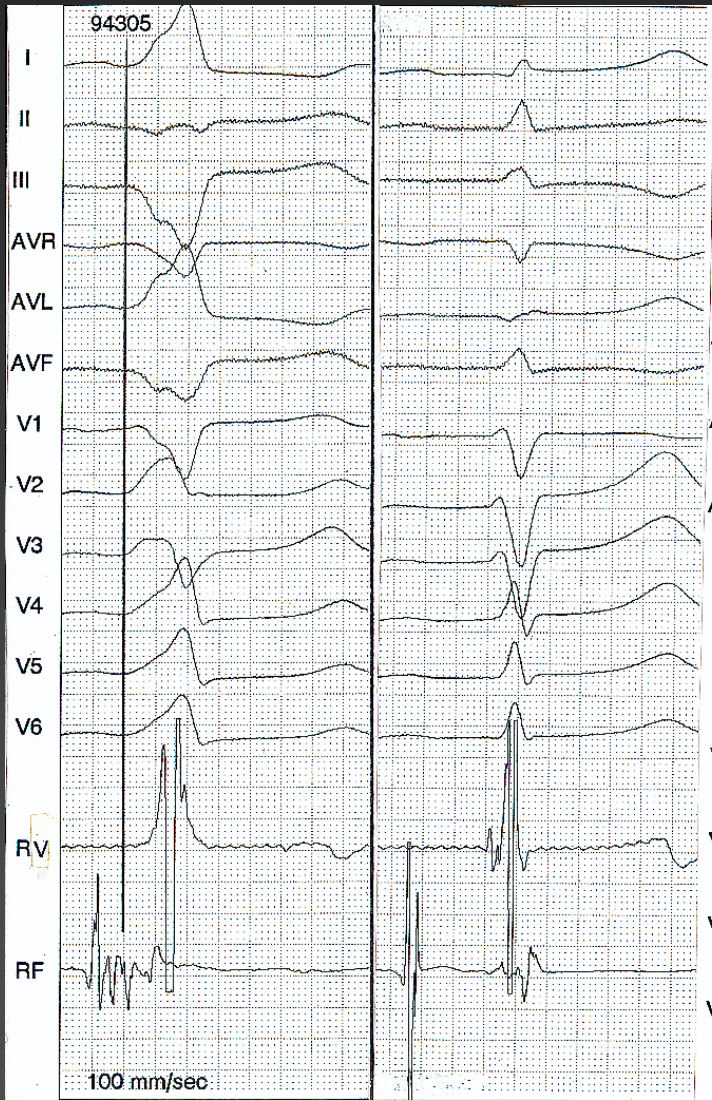
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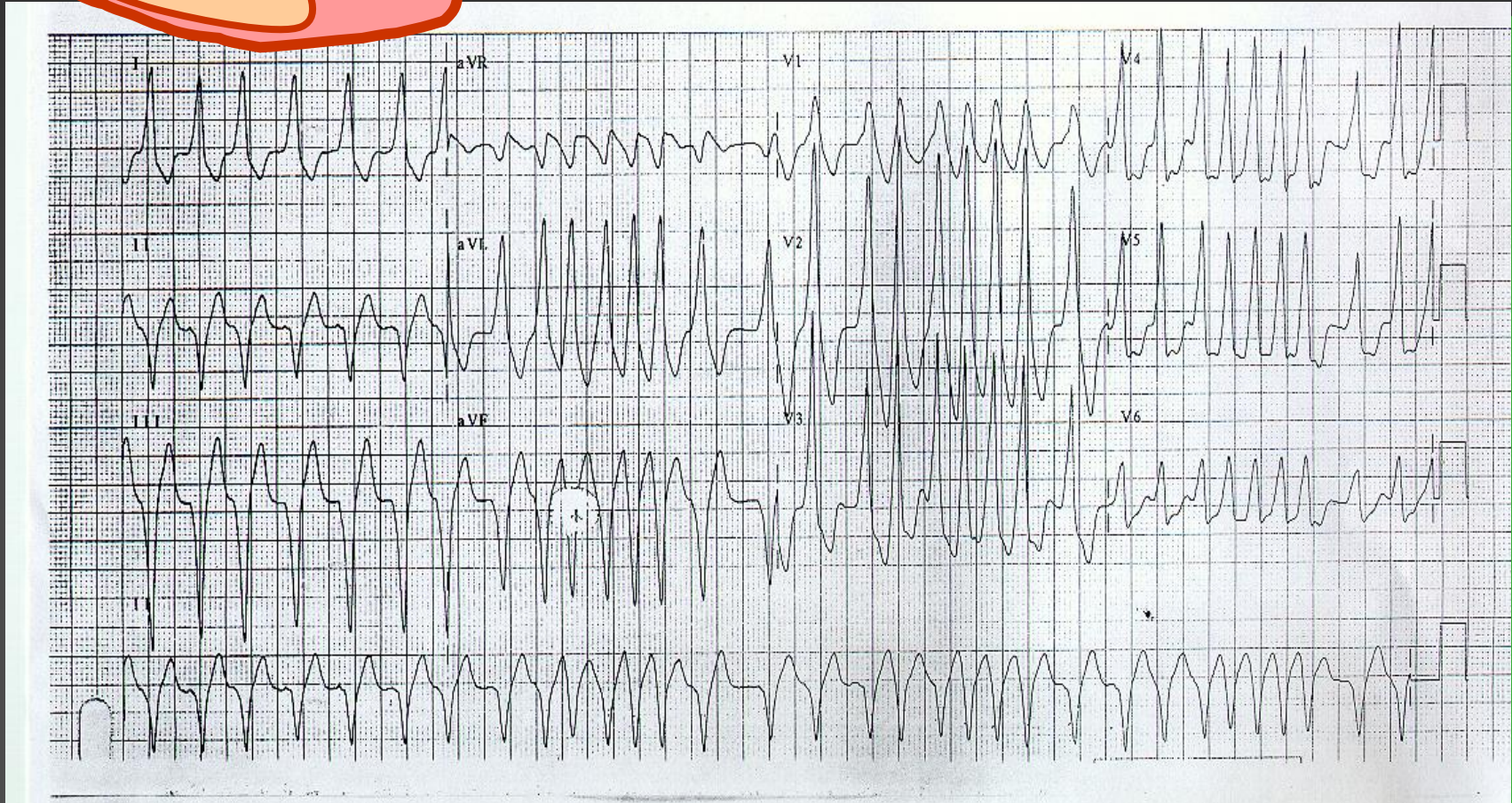
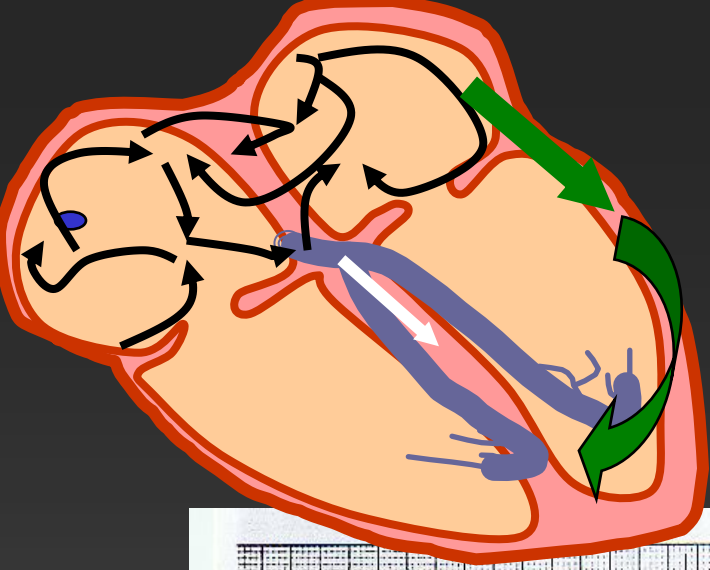


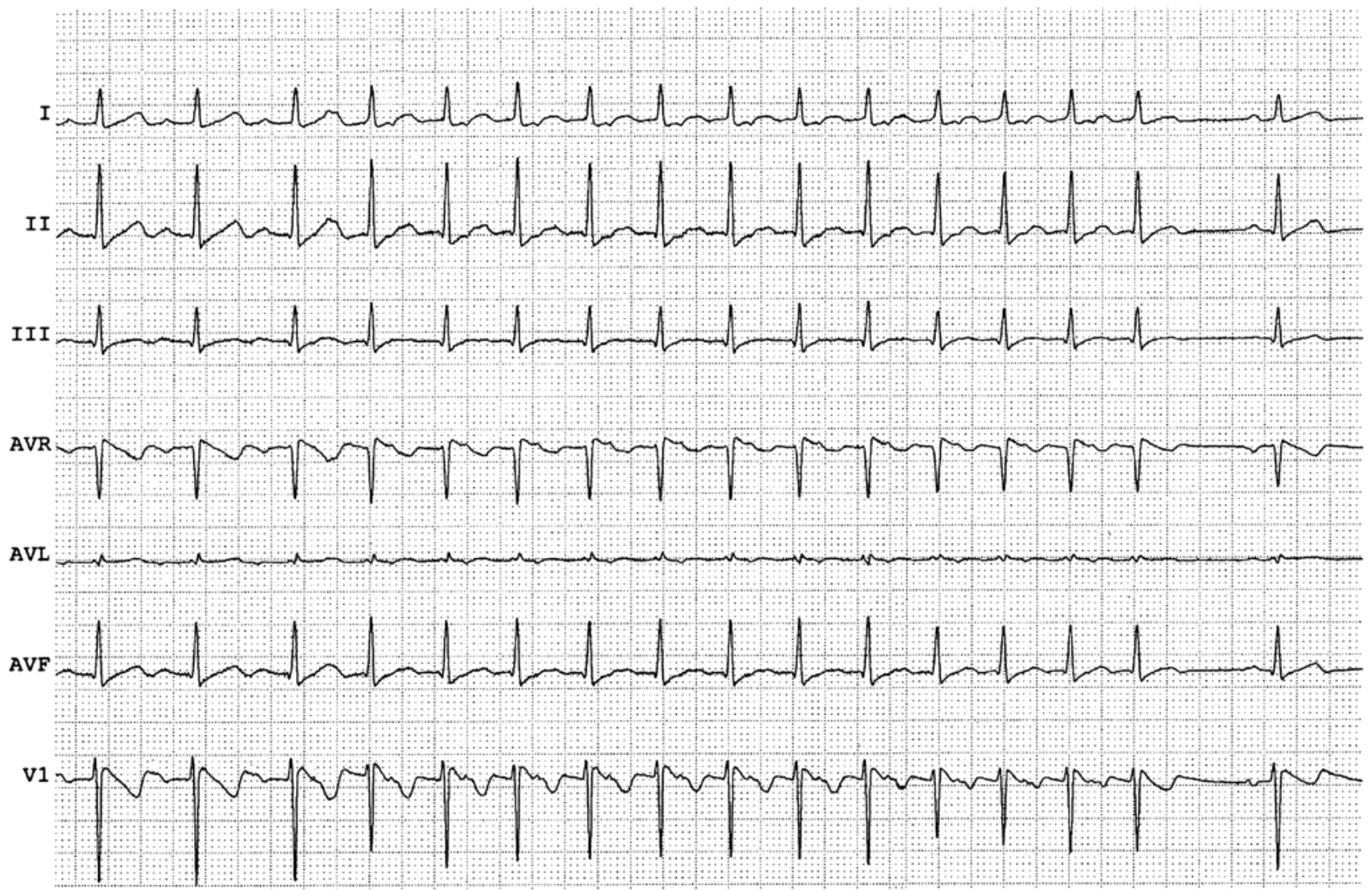


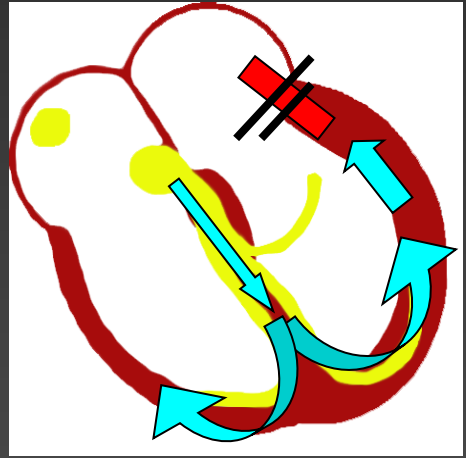
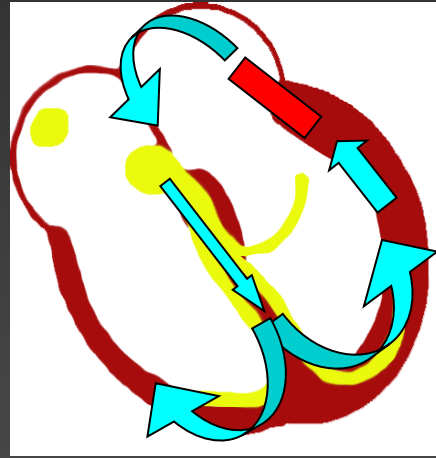
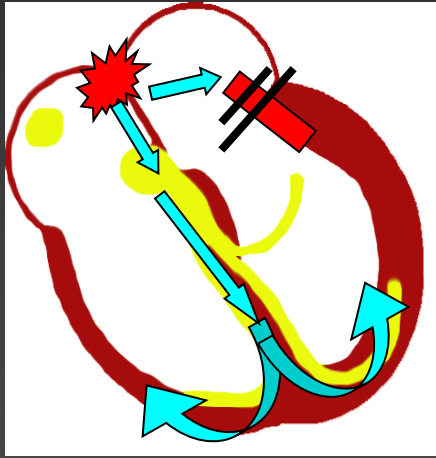
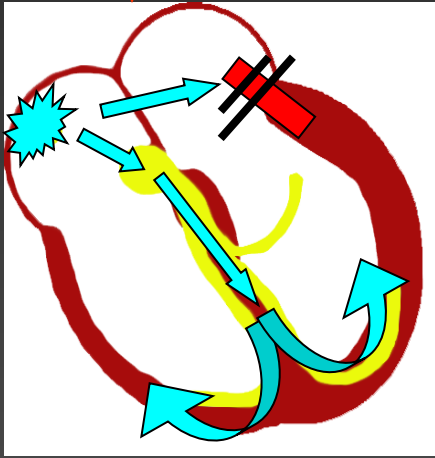
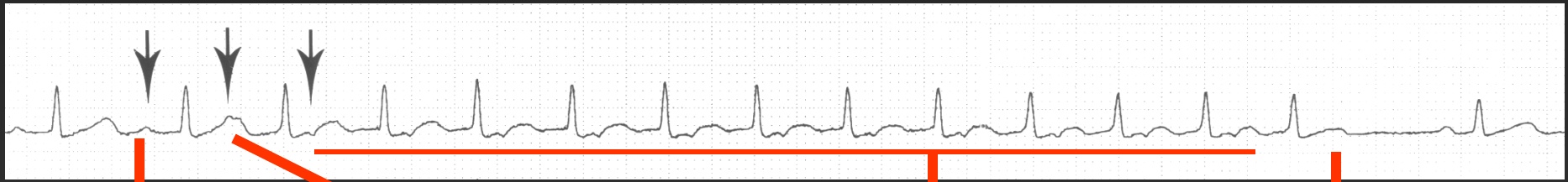


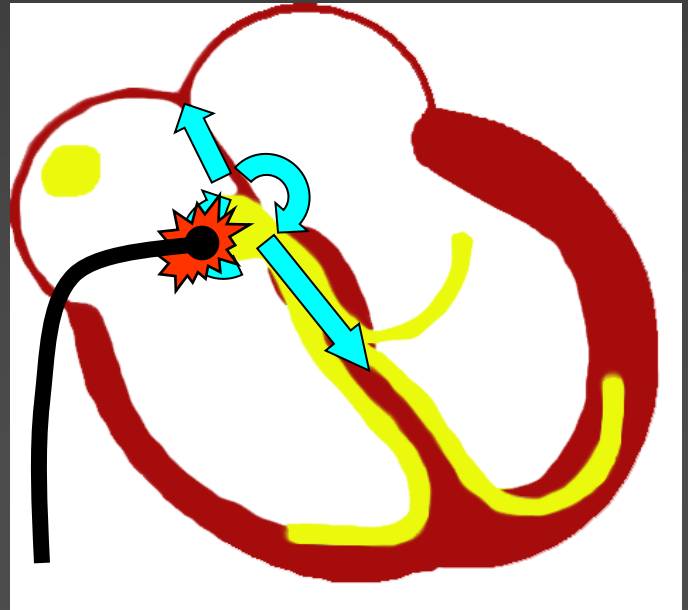
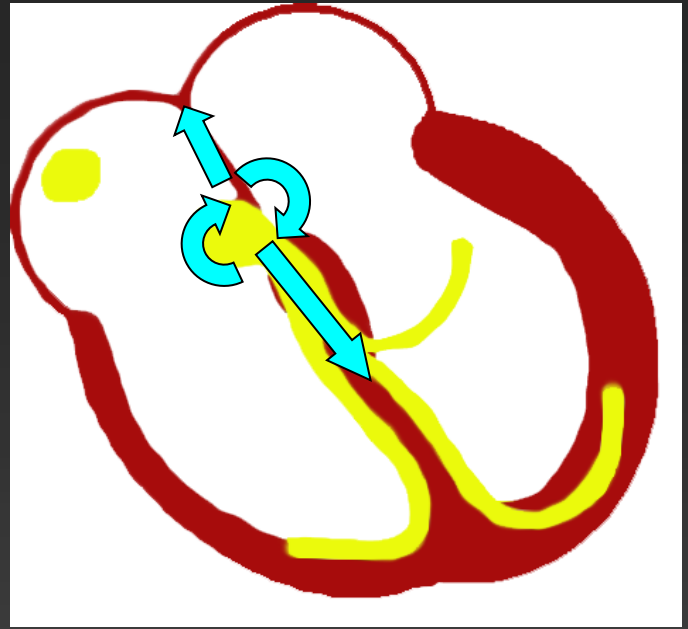
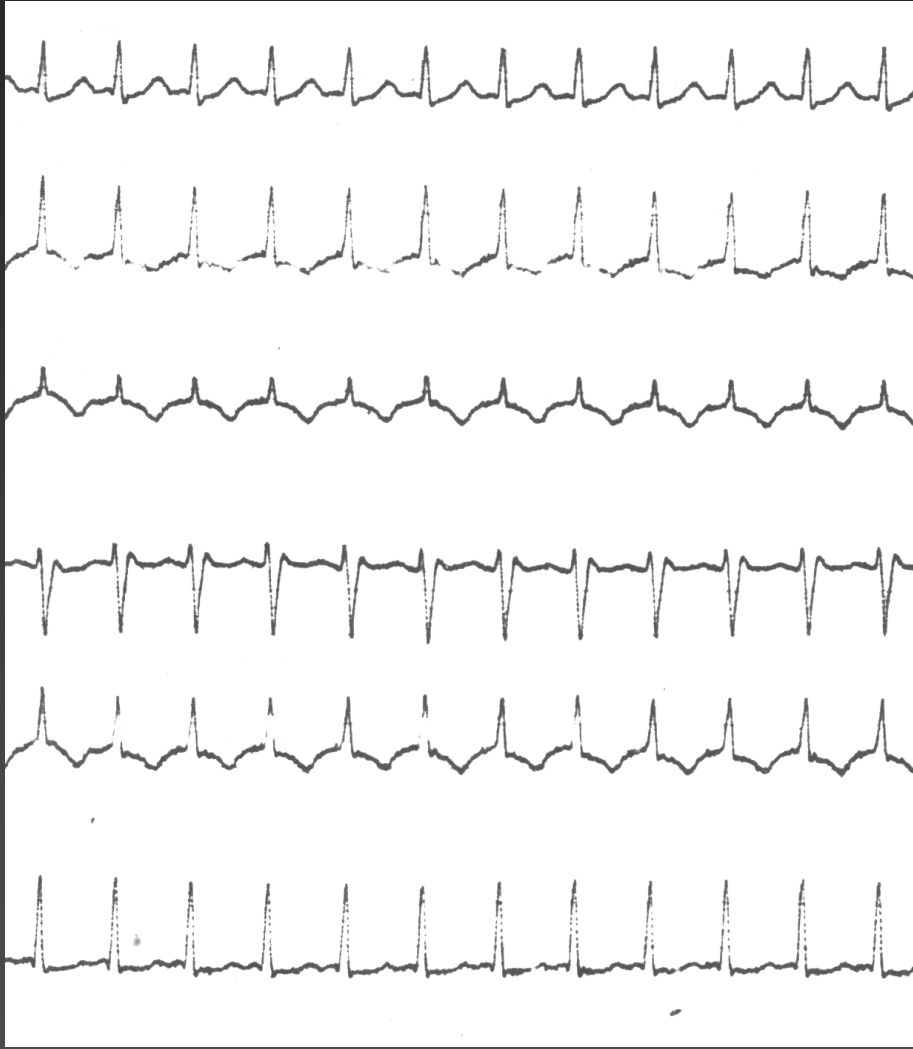


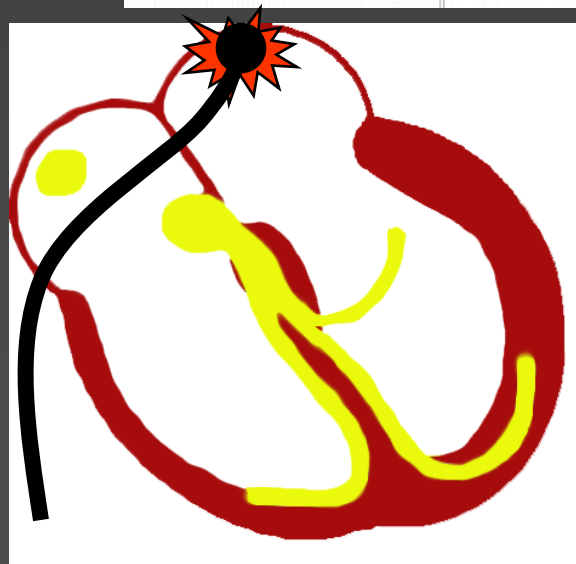
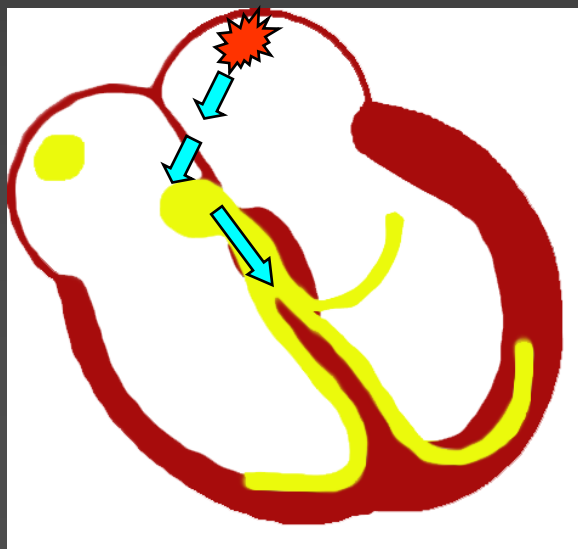
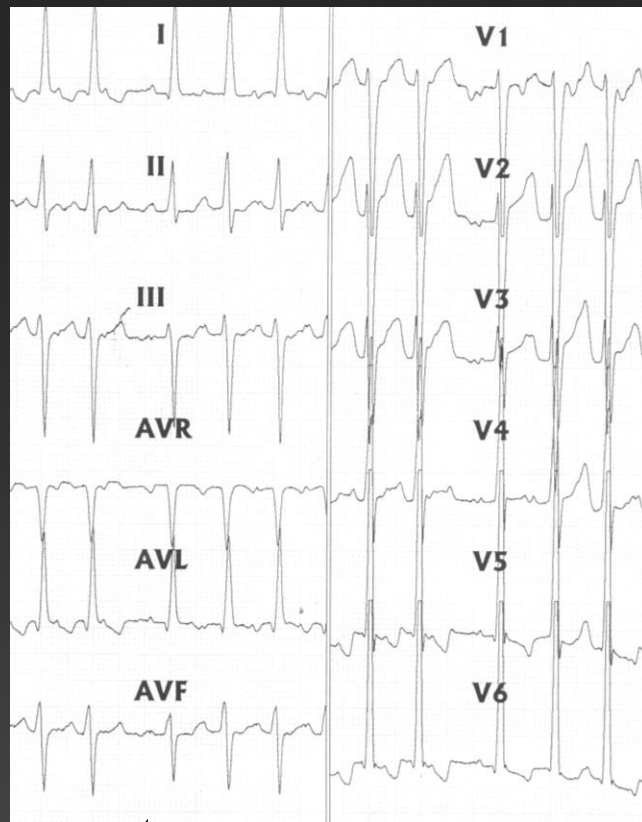
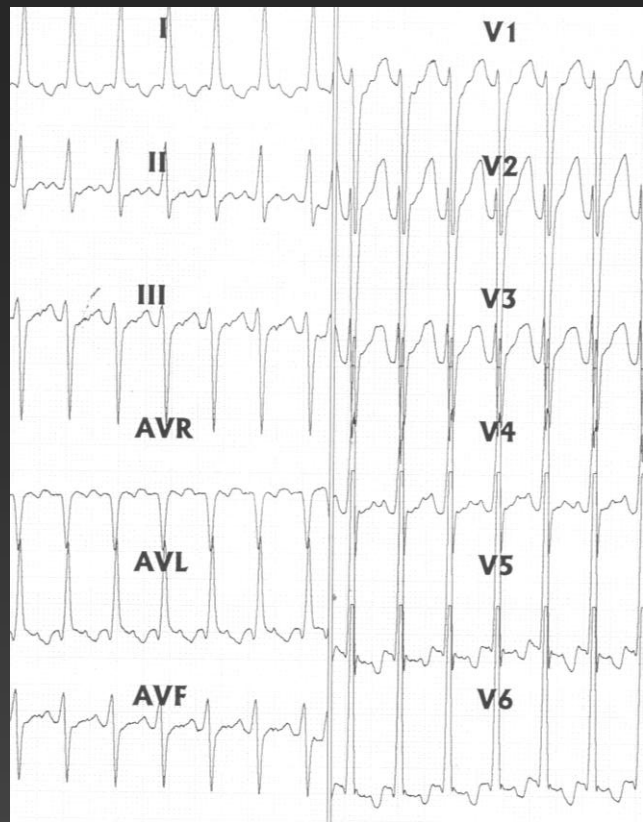


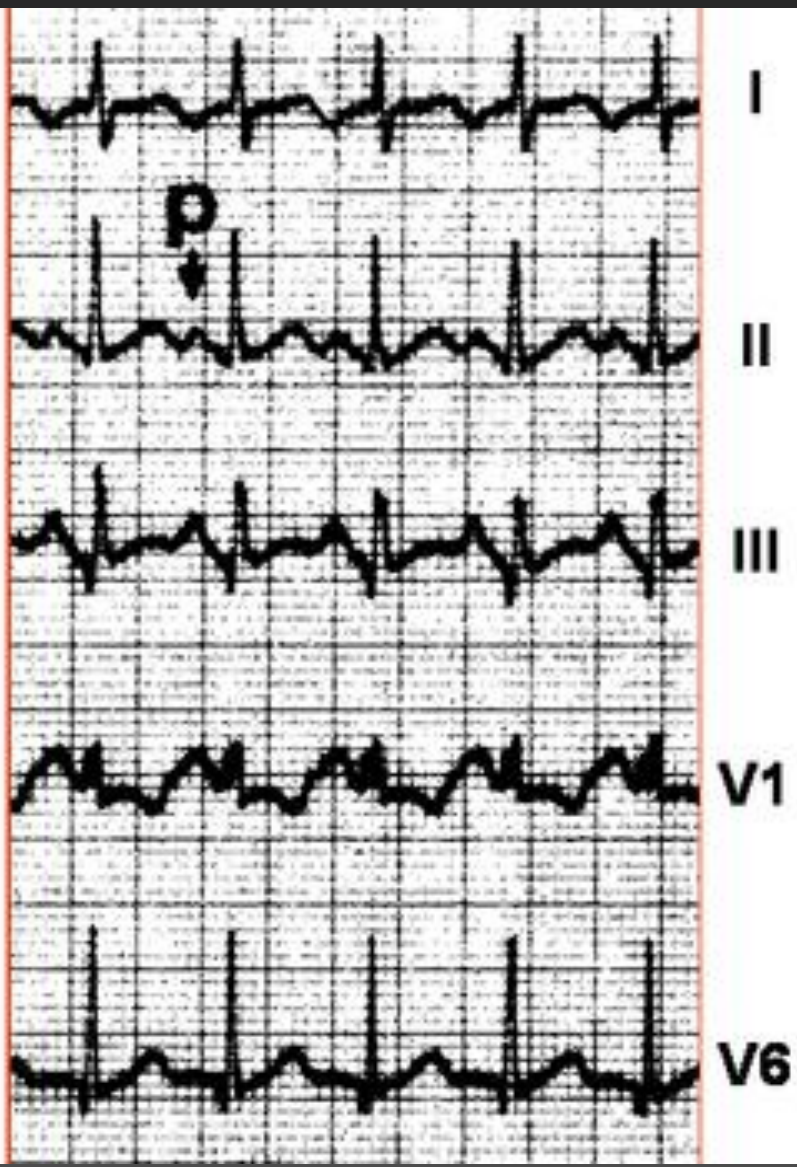


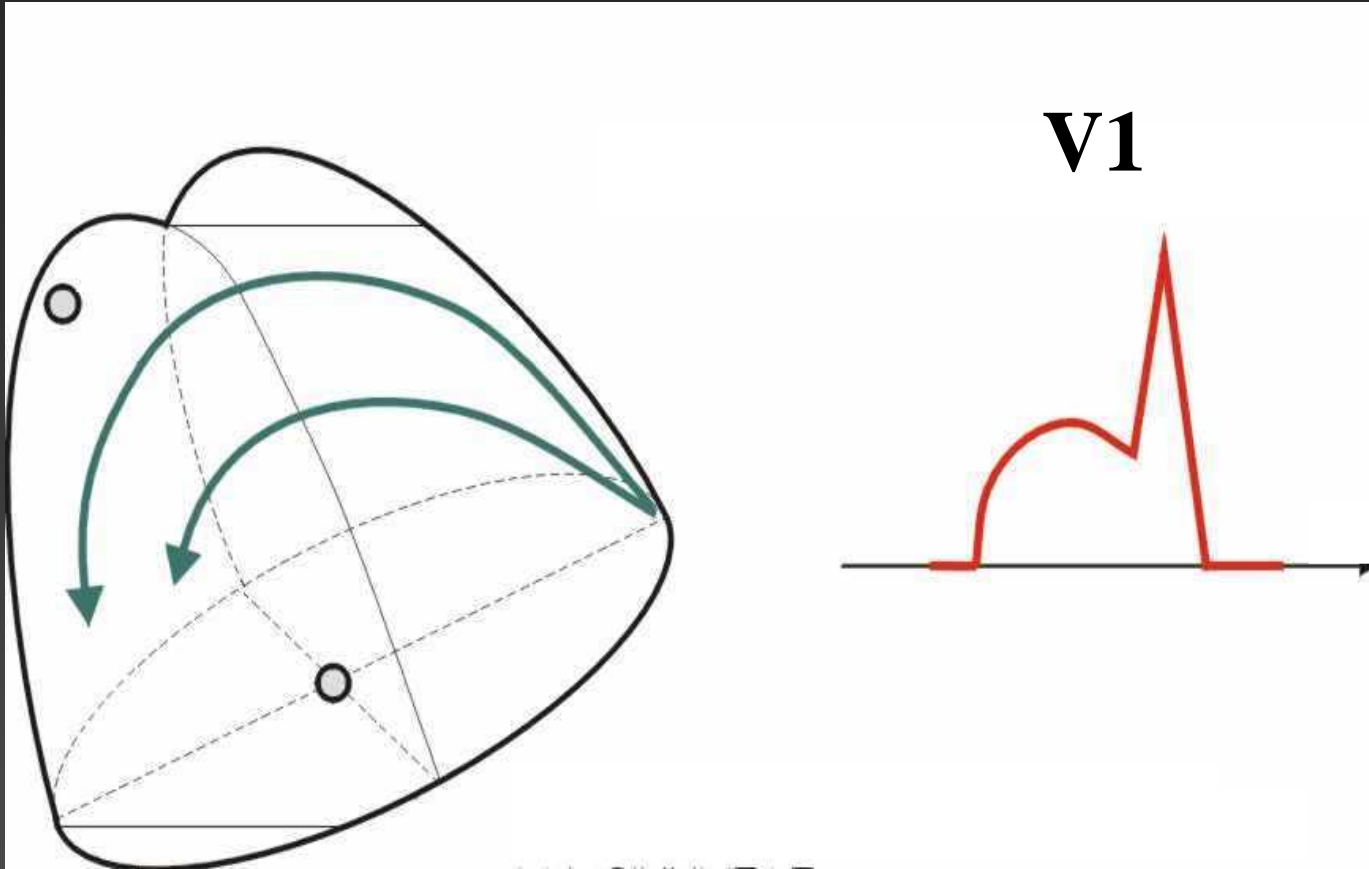


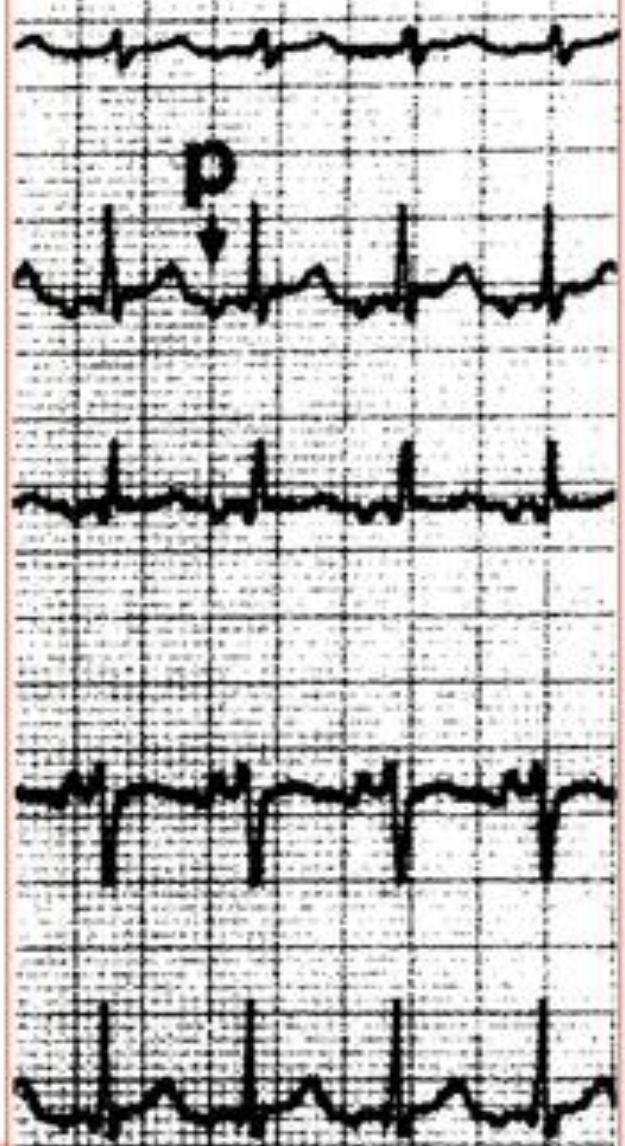
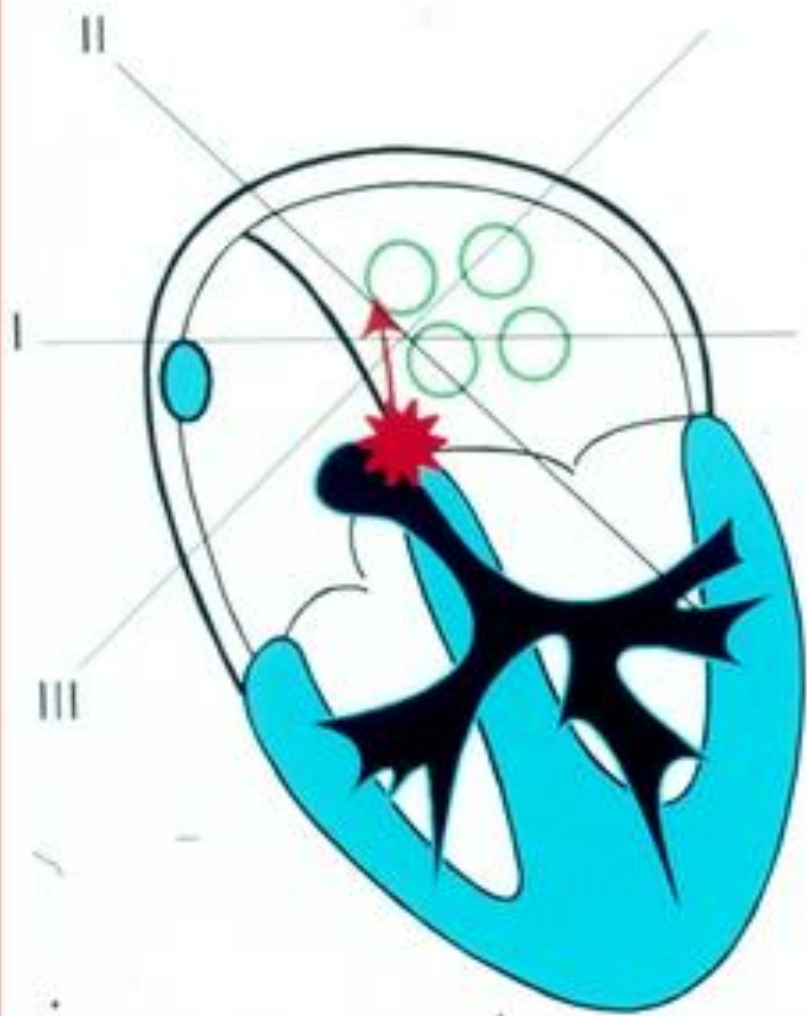




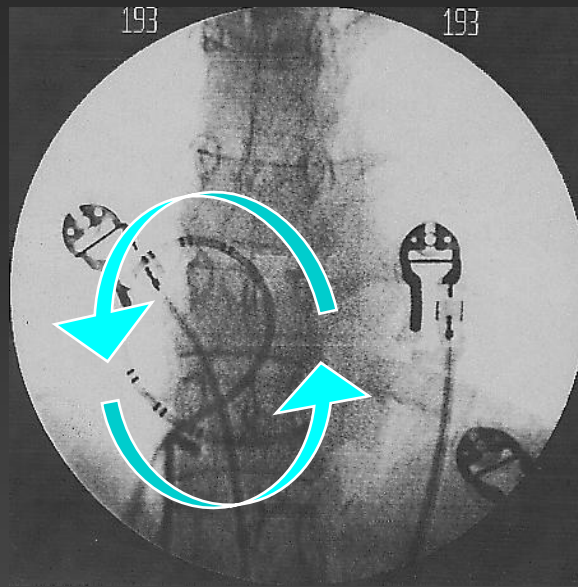
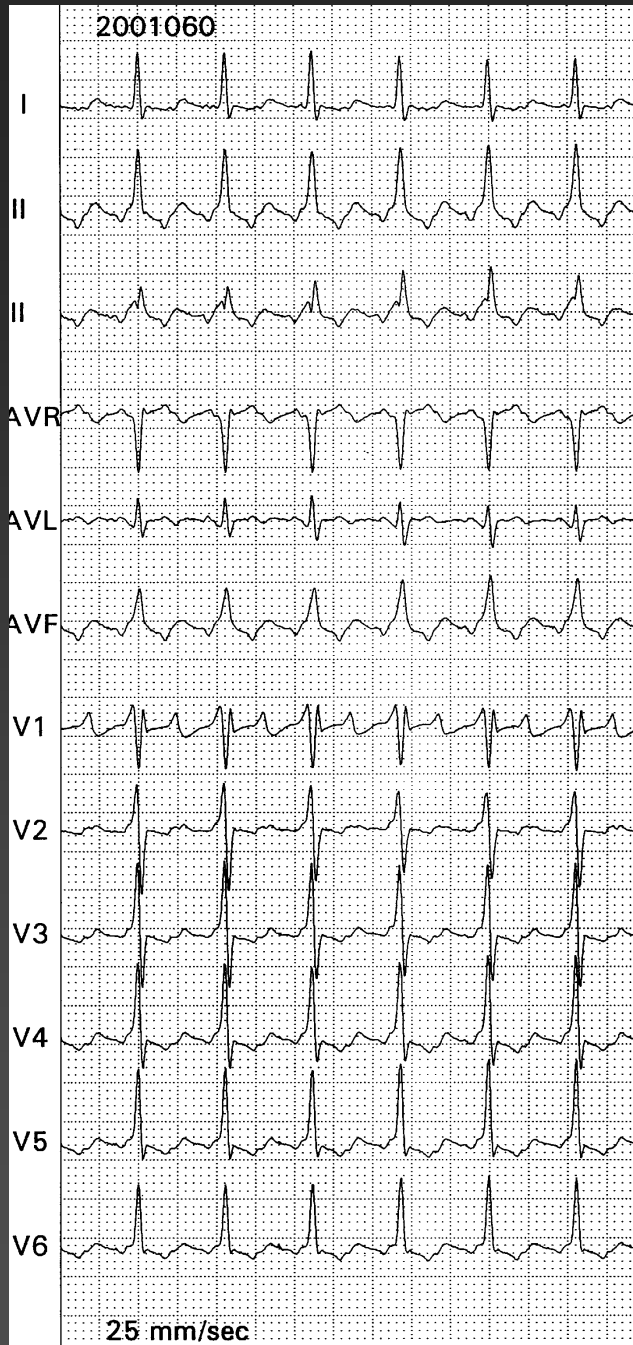


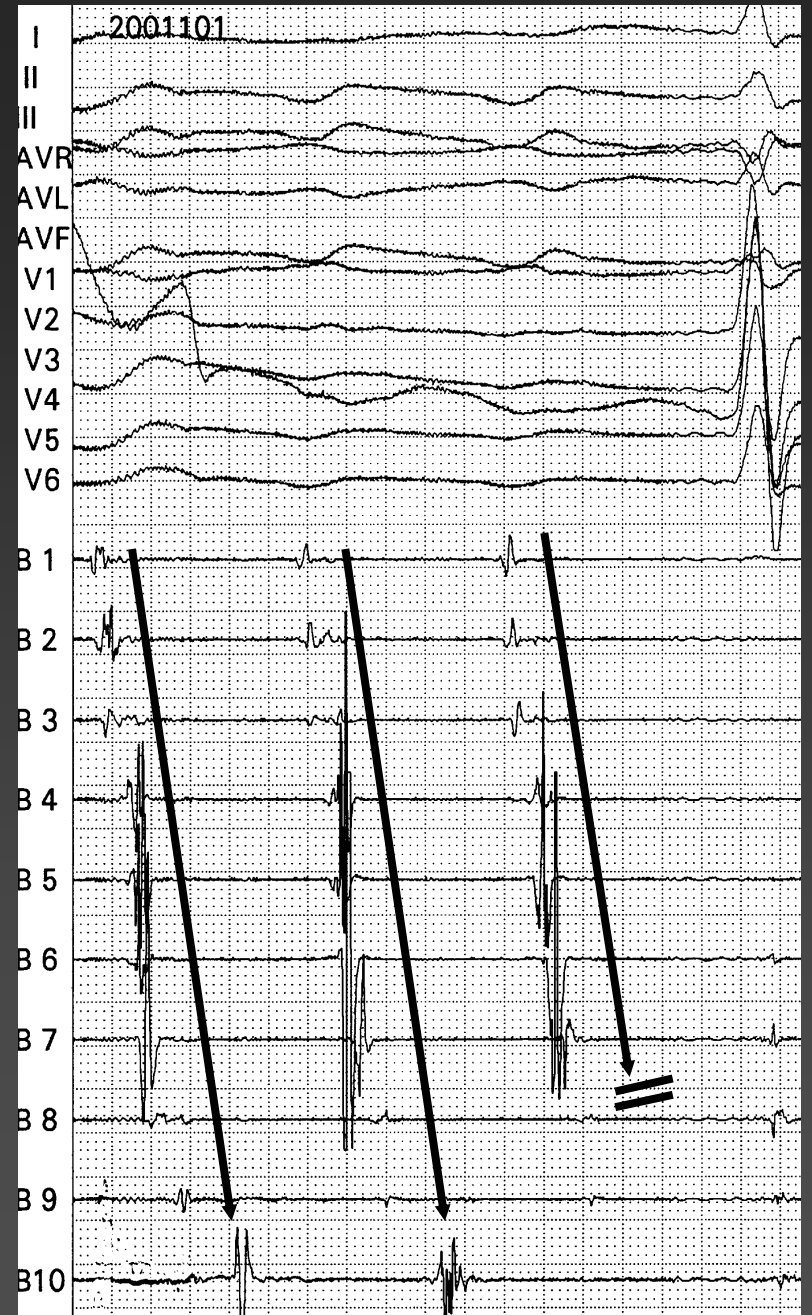
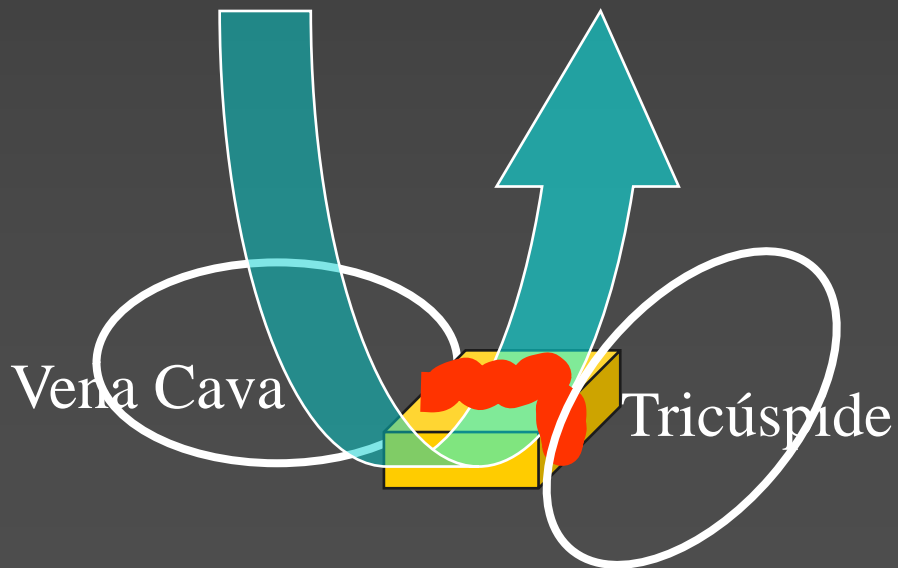
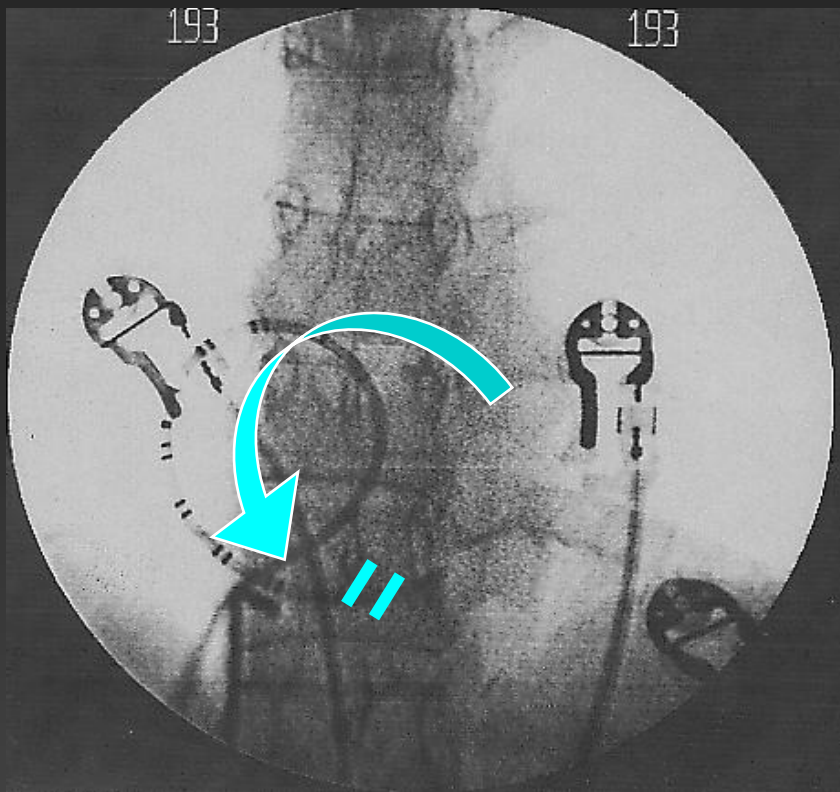


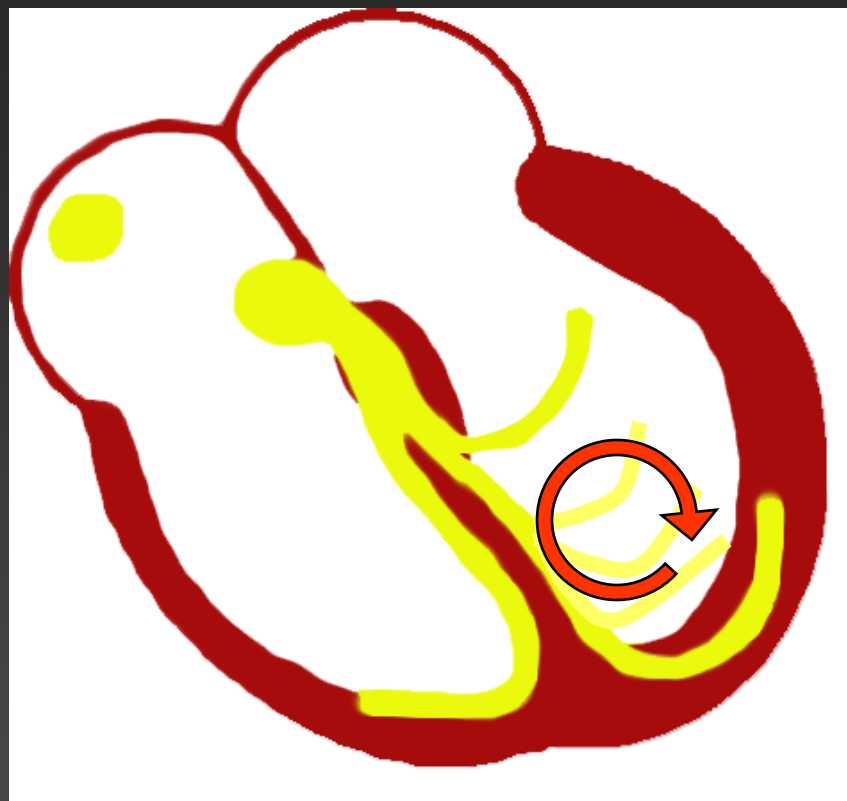
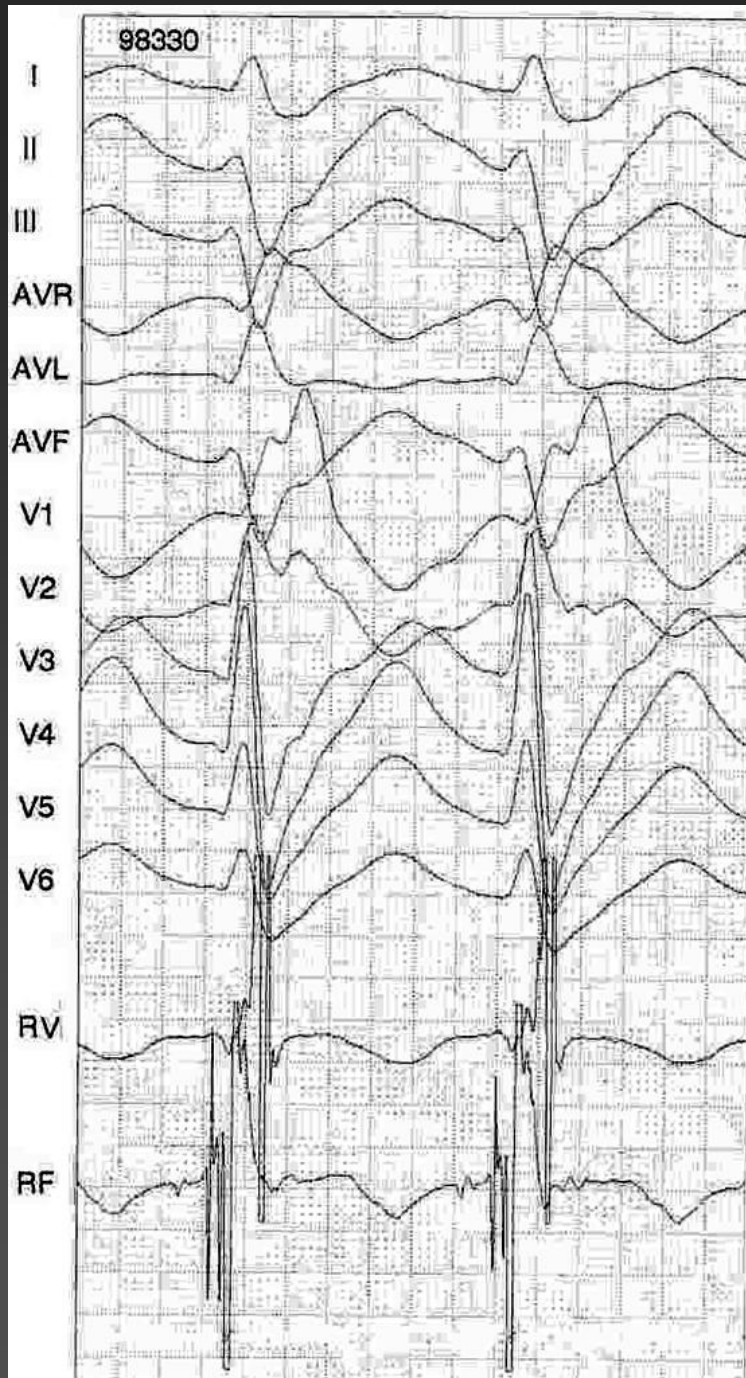


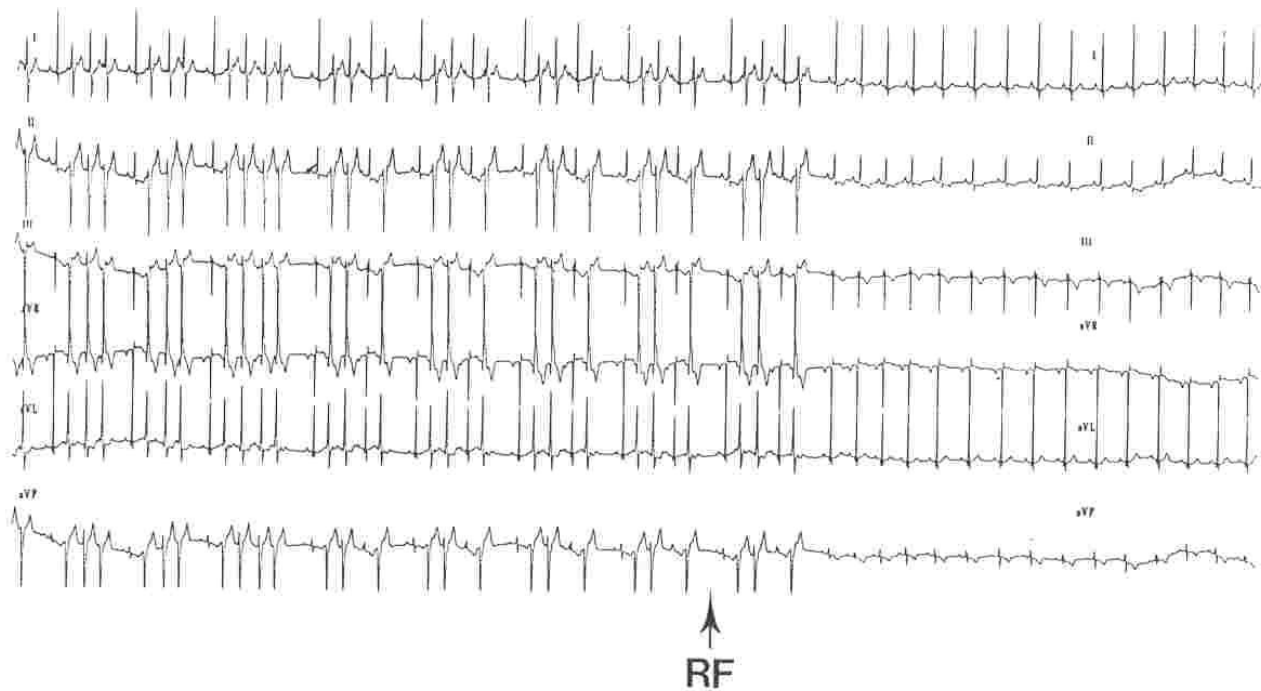
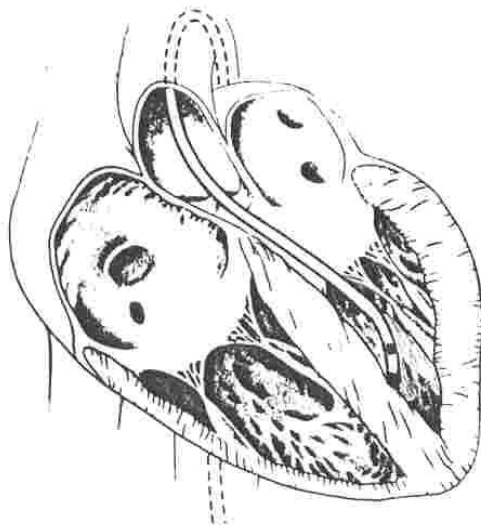


I
II
III
V1
V6



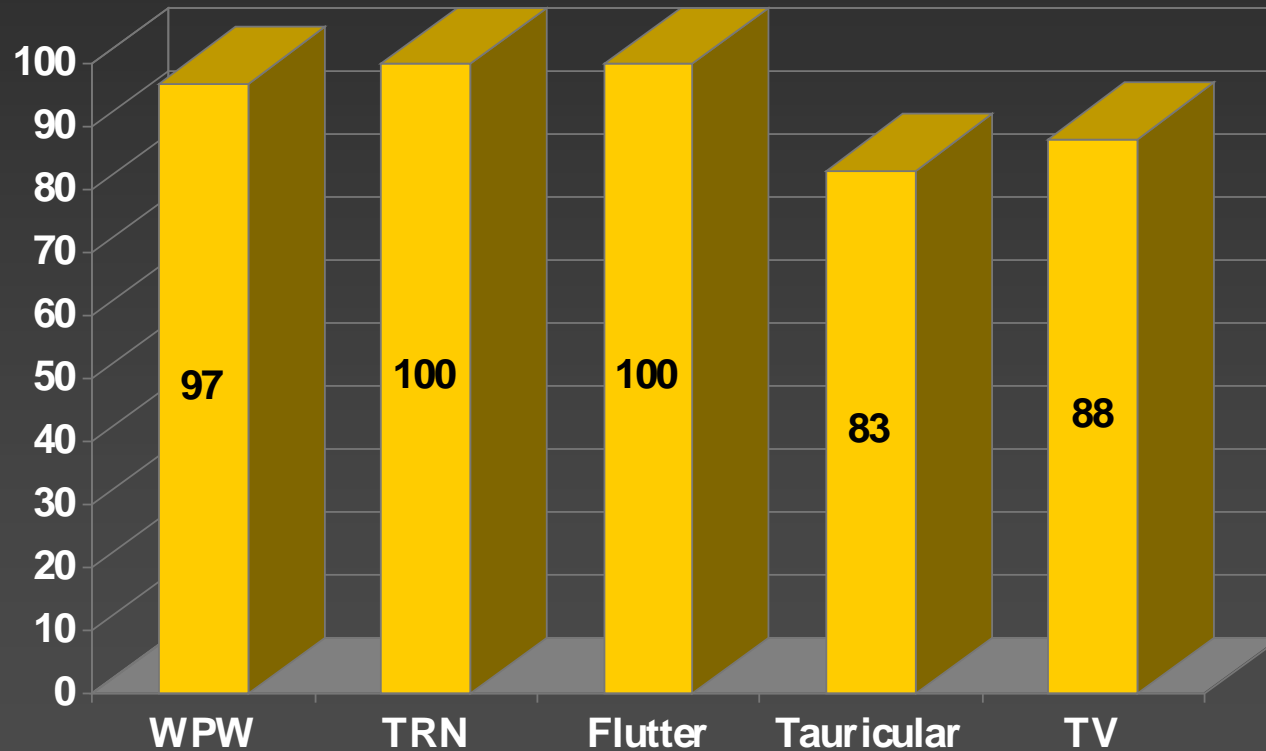




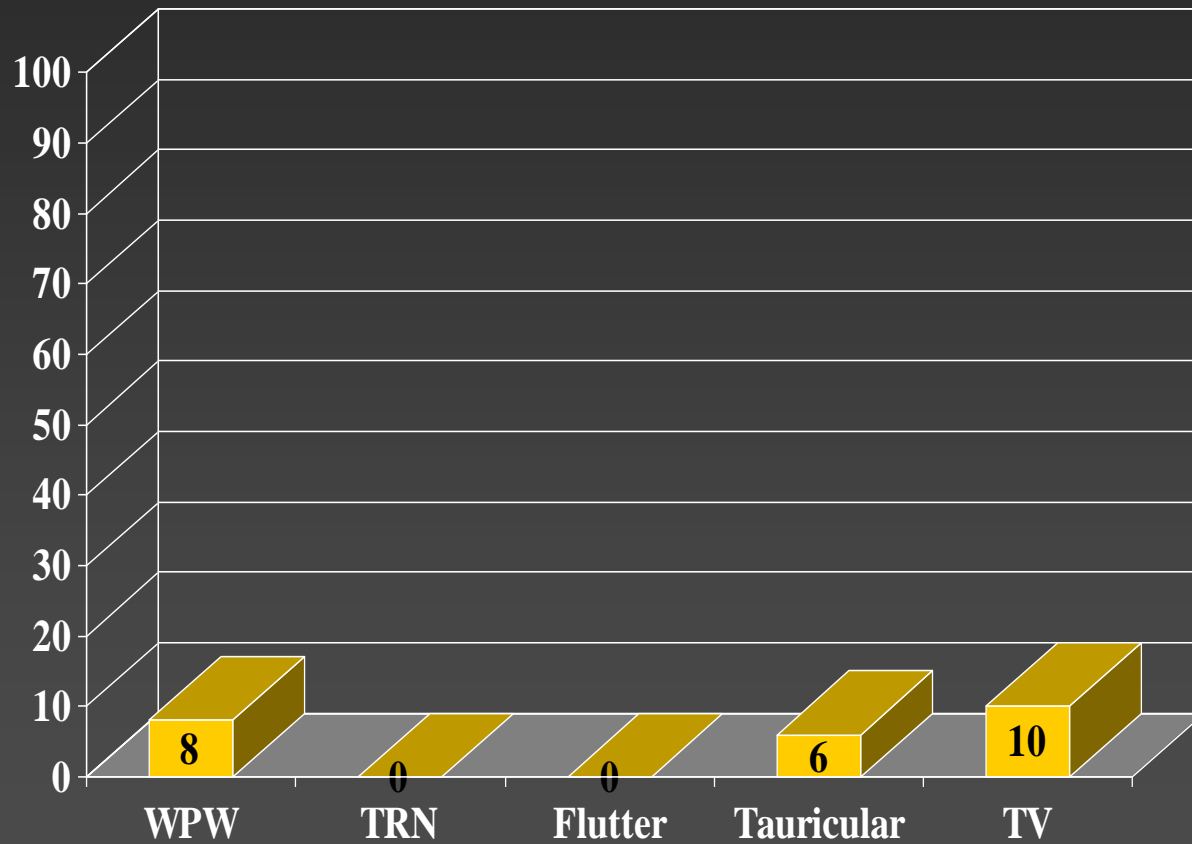


Ablación

Efectividad final



Ablación Recurrencias



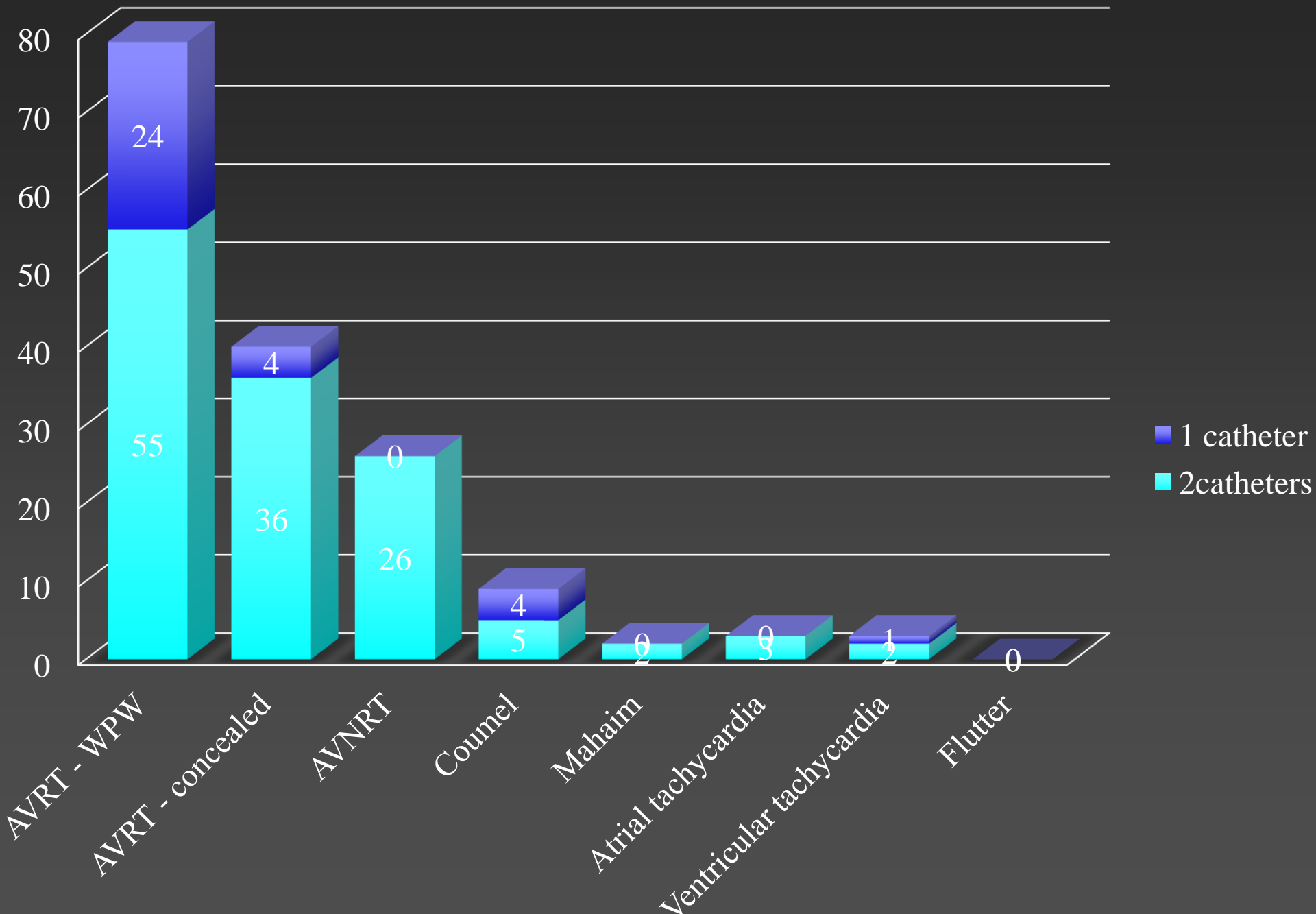
Ablación con radiofrecuencia

- 14.000 ablaciones consecutivas entre 1992 y 2012
 - 53% hombres, 47% mujeres
 - Edad media: 45 ± 19 años (3 días – 91 años)

Procedimientos especiales

- Ablación recién nacidos
- Ablación de FA de venas pulmonares
- Ablación en cardiopatías congénitas

Ablations in children in 2016



RF Ablation

2 catheters

Single catheter

Weigh (kg.)	54 ± 17	20 ± 13 (1,5-51)	
Total procedure time (min)	23 ± 27	25 ± 31	NS
Xray time (min)	$6,9 \pm 8,7$	$8,1 \pm 11$	NS
Recurrence rate	5%	6%	NS

Complications

1686 RF ablations

1 Vein Thrombosis

1 AVB

585 Single catheter

1 MI (III/IV)

1 atrial perforation

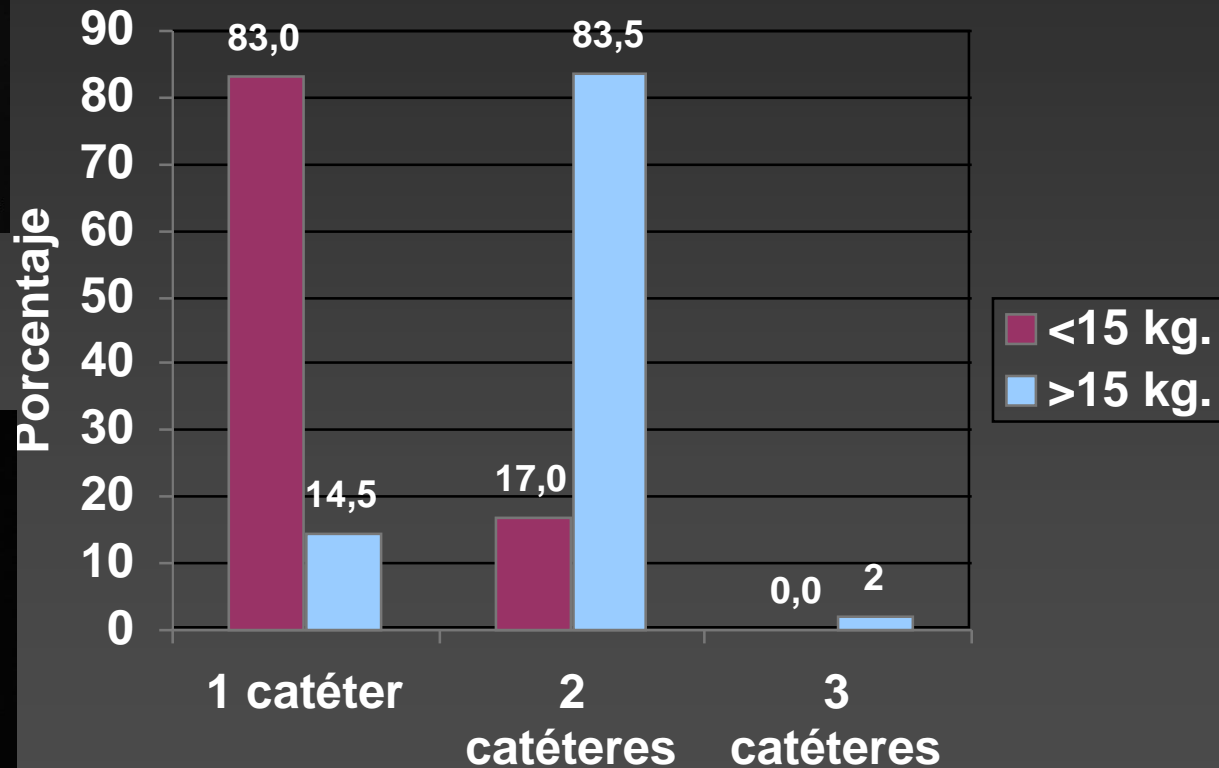
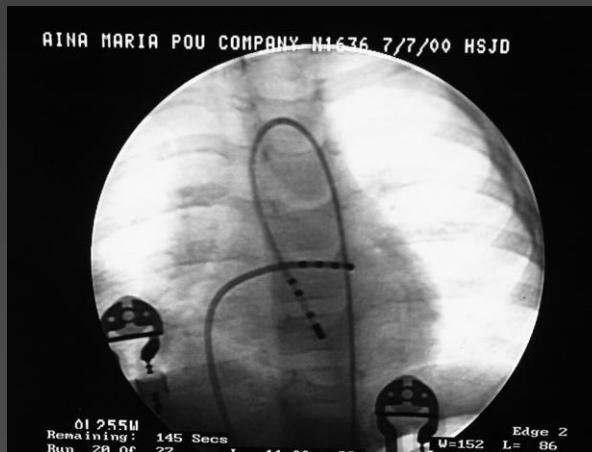
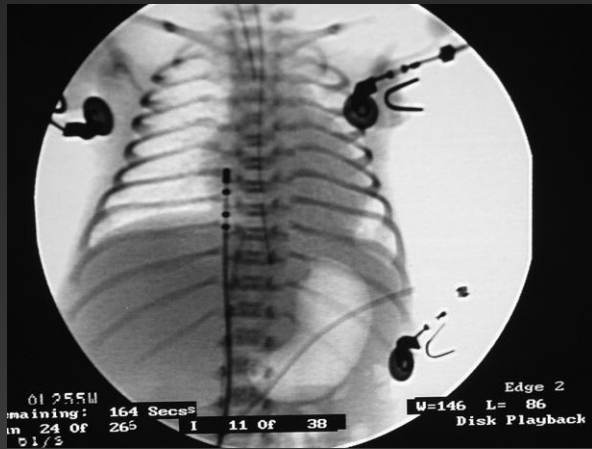
Ablación en pediátricos

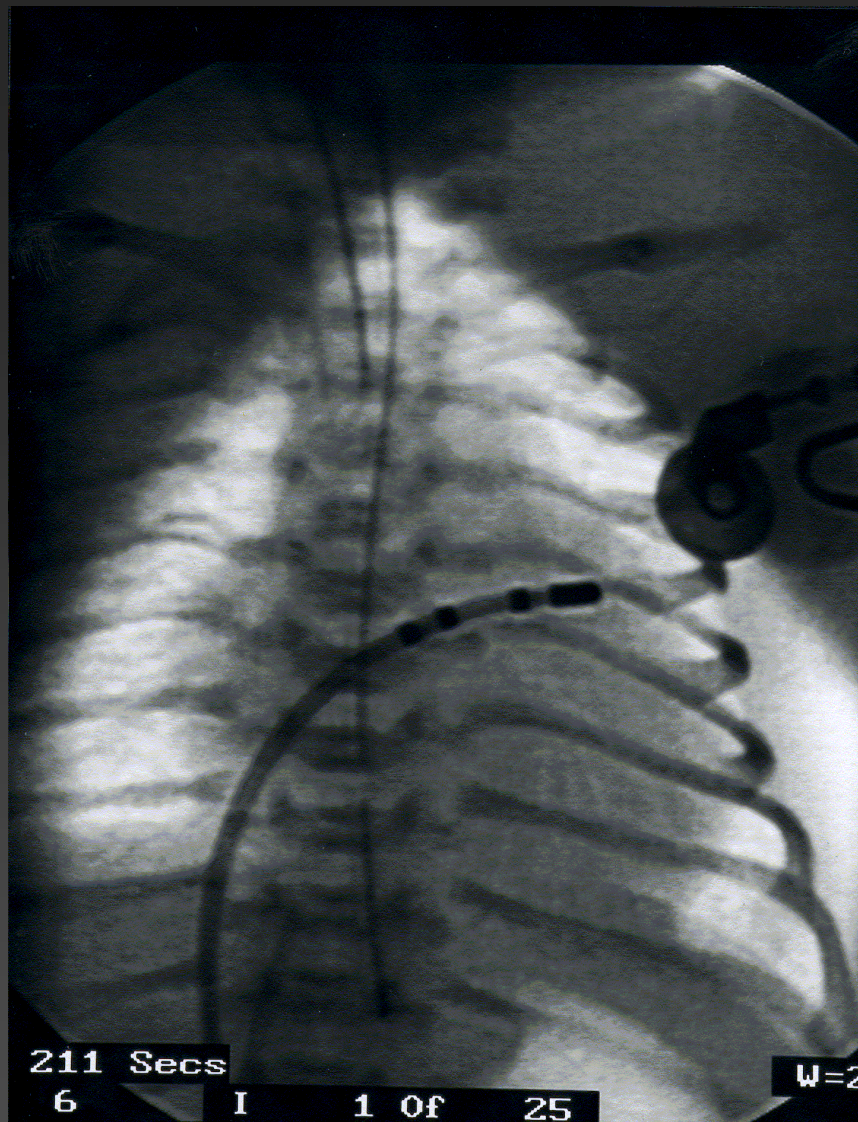
- 1.000 pacientes < 18 años de edad
- 618 pacientes < 14 años de edad
- 264 pacientes < 10 años de edad
- 172 pacientes < 6 años de edad

Ablación en pediátricos. Complicaciones

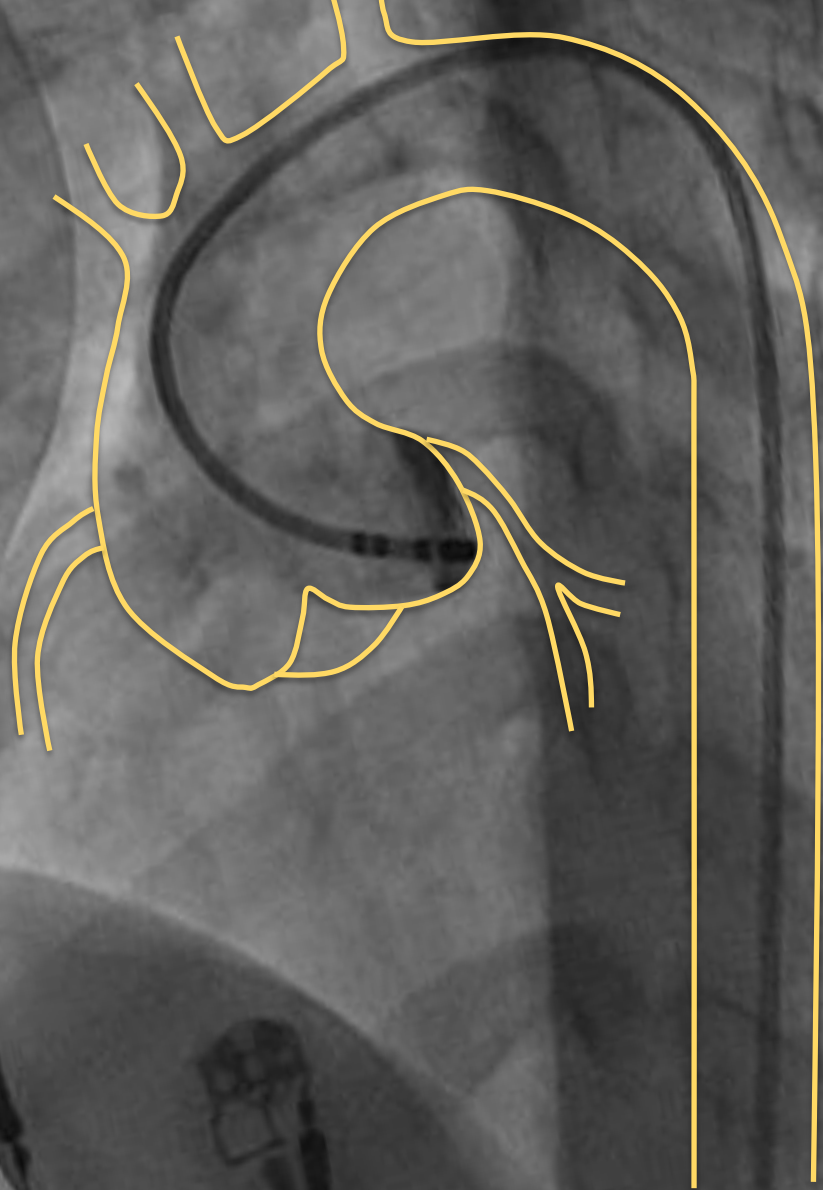
- 3/1.750
 - 1 embolia arterial femoral
 - 1 insuficiencia mitral
 - 1 bloqueo AV de 2do grado

Número de catéteres utilizados



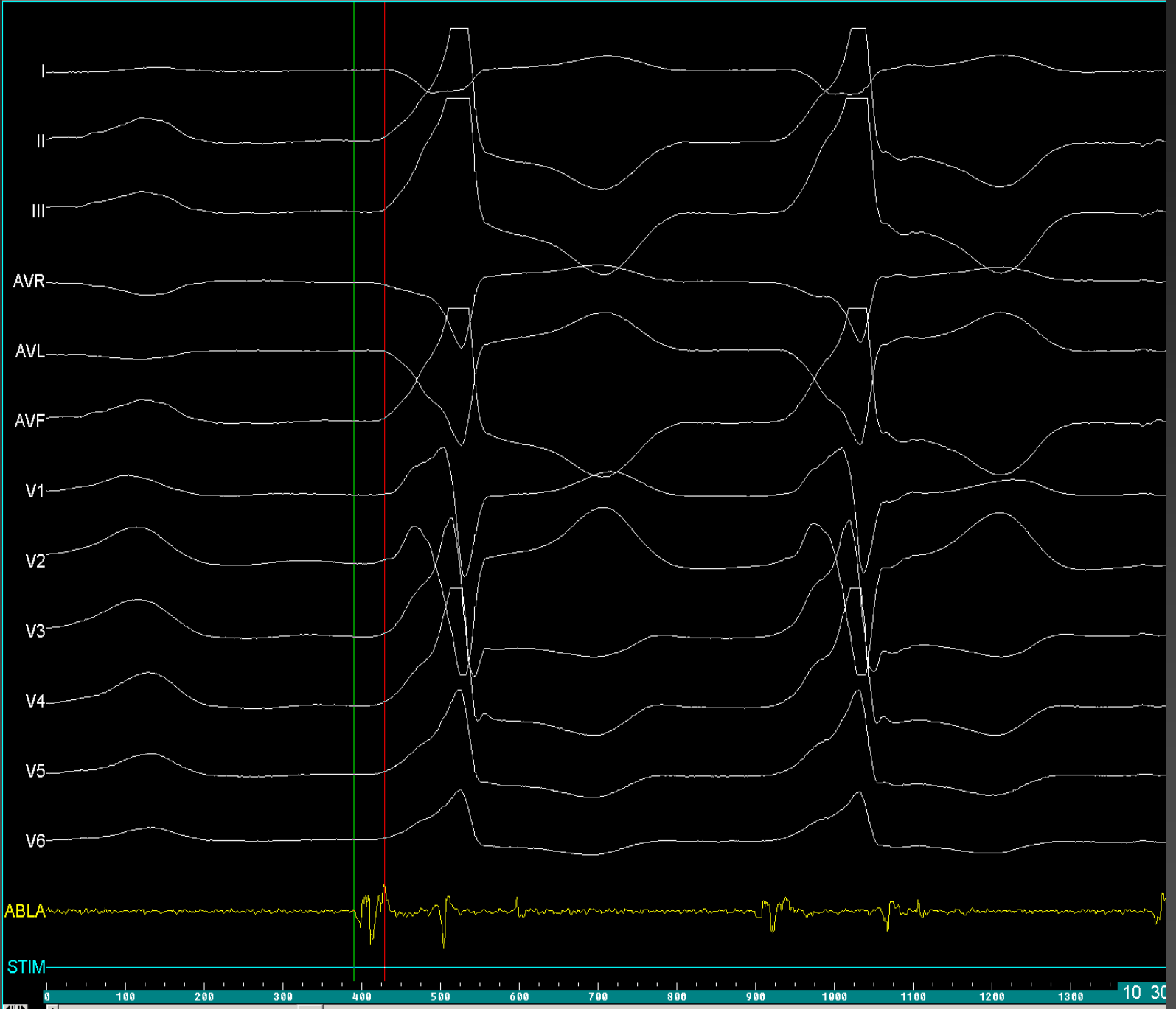


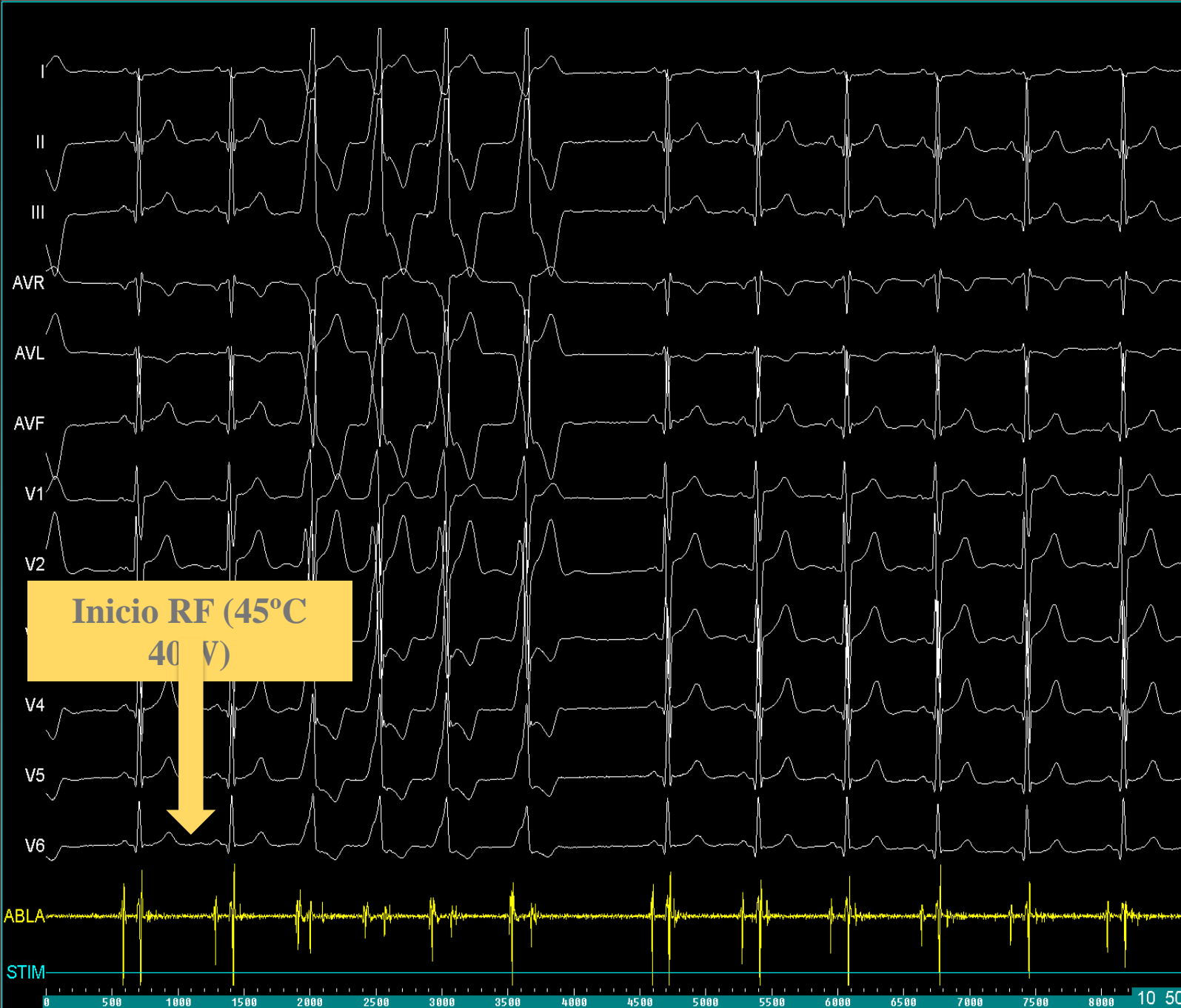
Prematuro 32 semanas, 1.520 gramos de peso



Mapeo de las cúspides

Árticos





**Inicio RF (45°C
40 V)**

SJD2016-097-1830

I

II

III

AVR

AVL

AVF

V1

V2

V3

V4

V5

V6



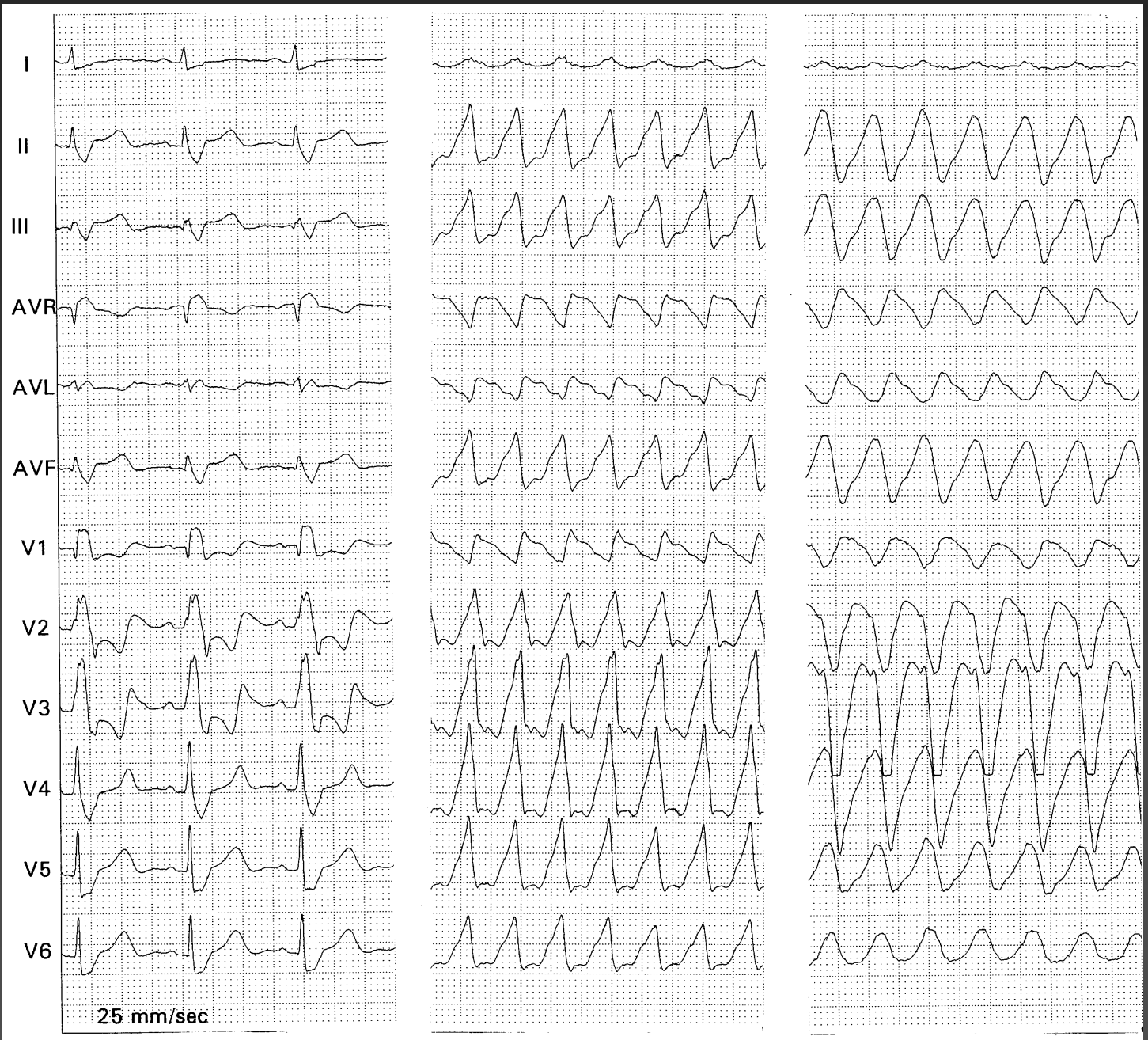
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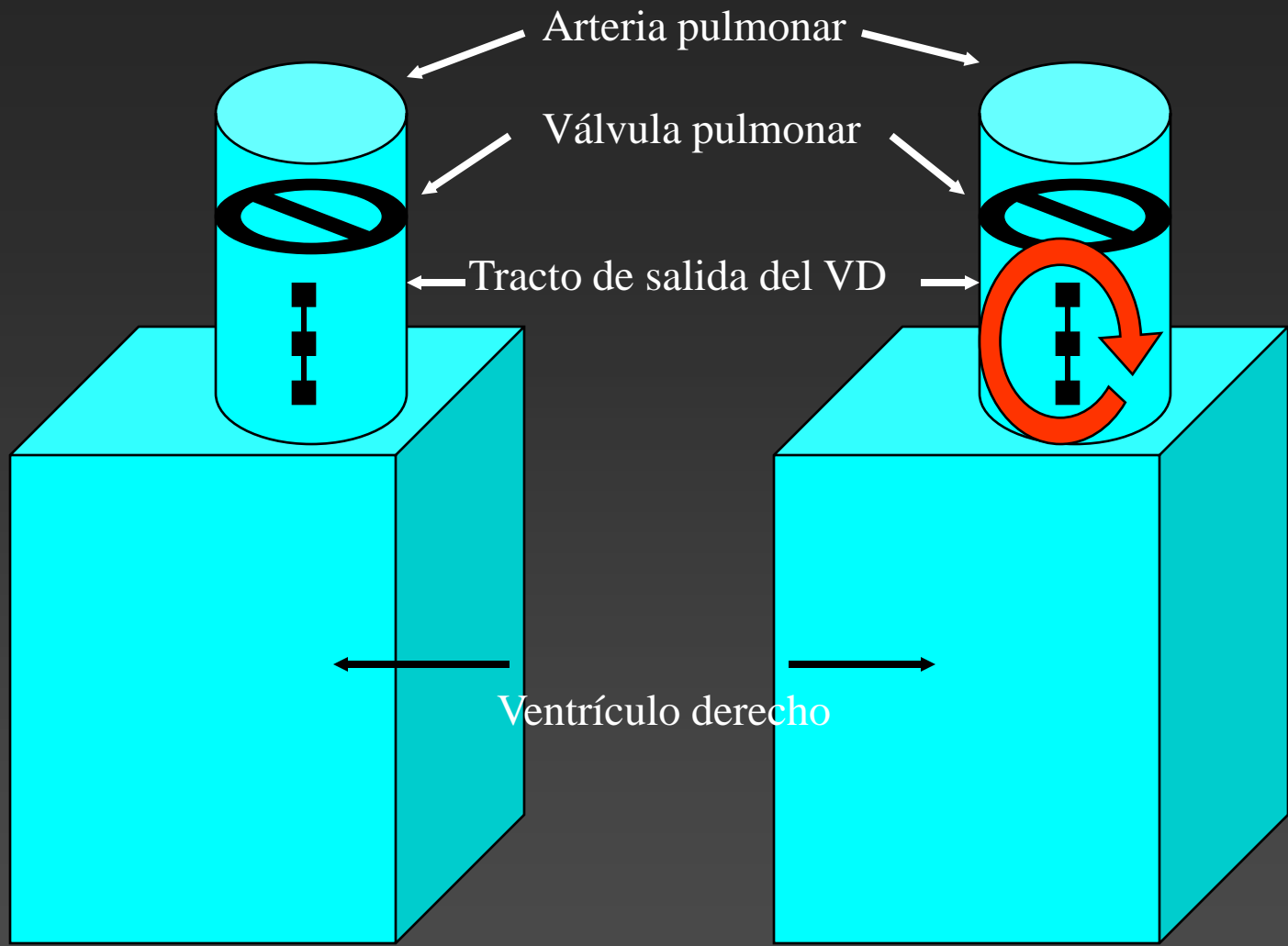


16-097-1830

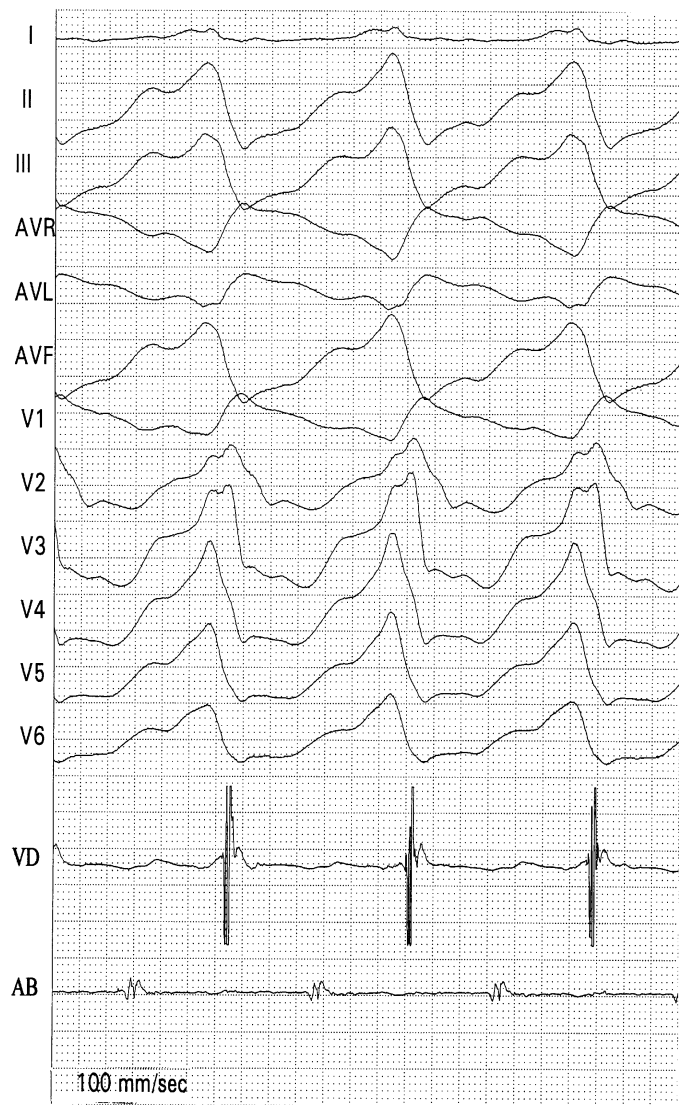


TV en Fallot

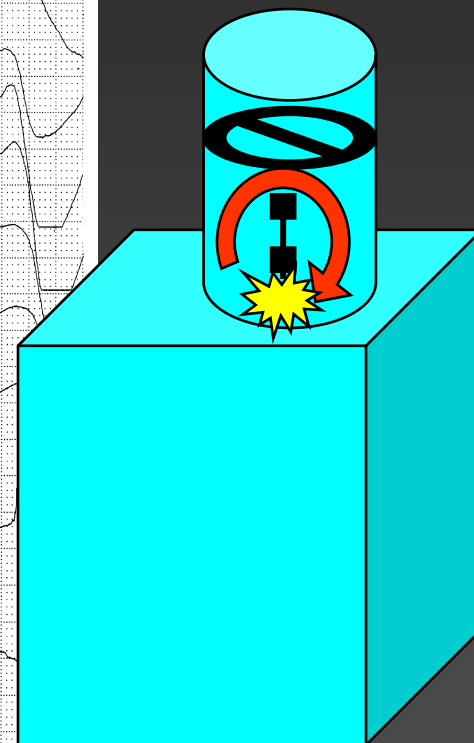
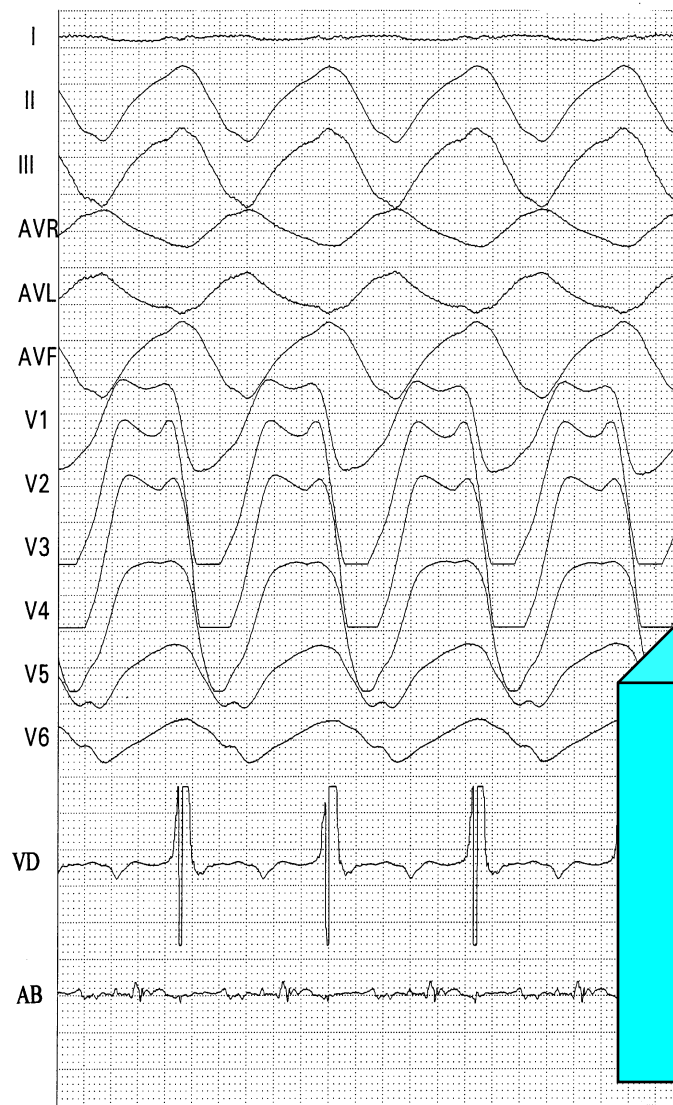


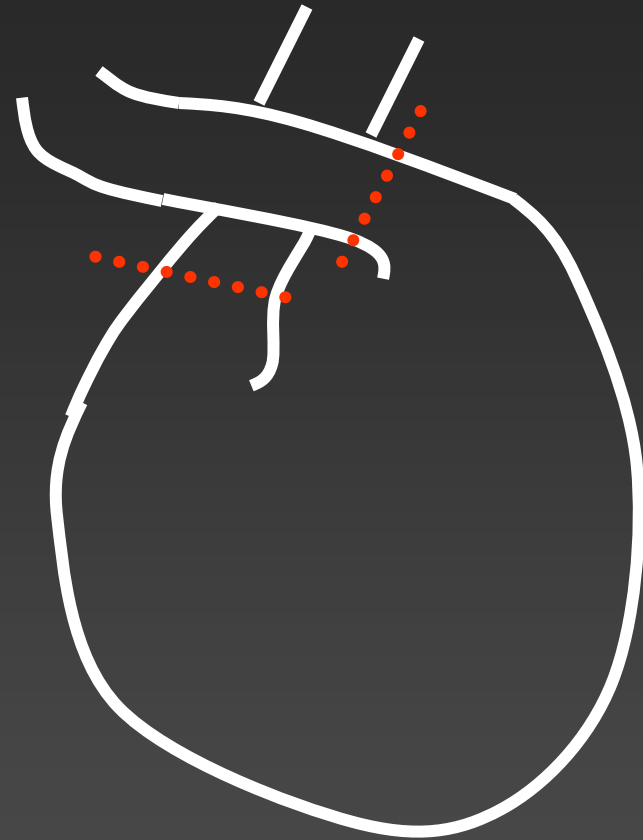
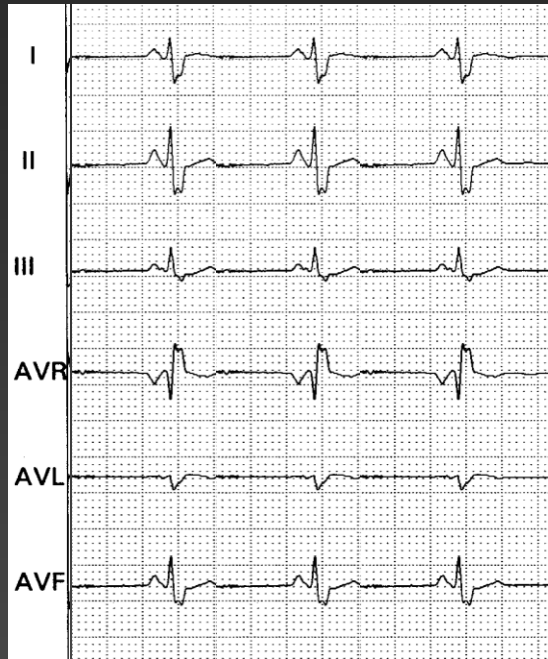


PACIENTE 1

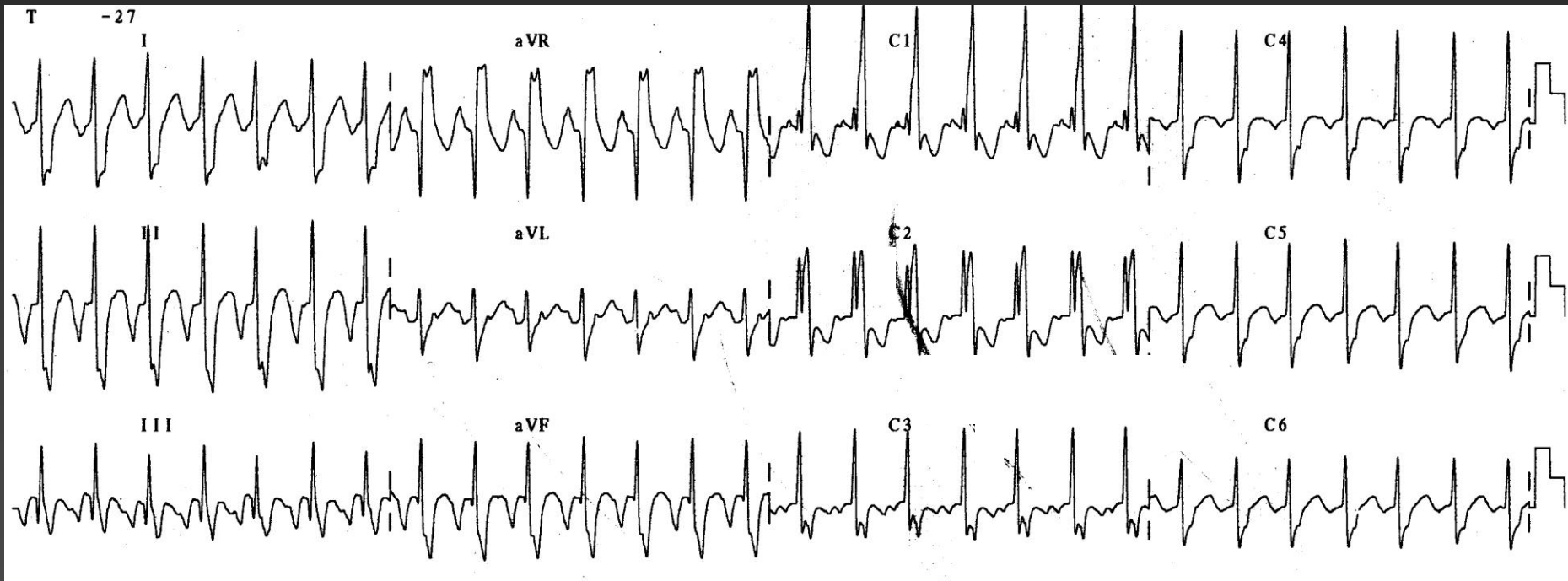


PACIENTE 2



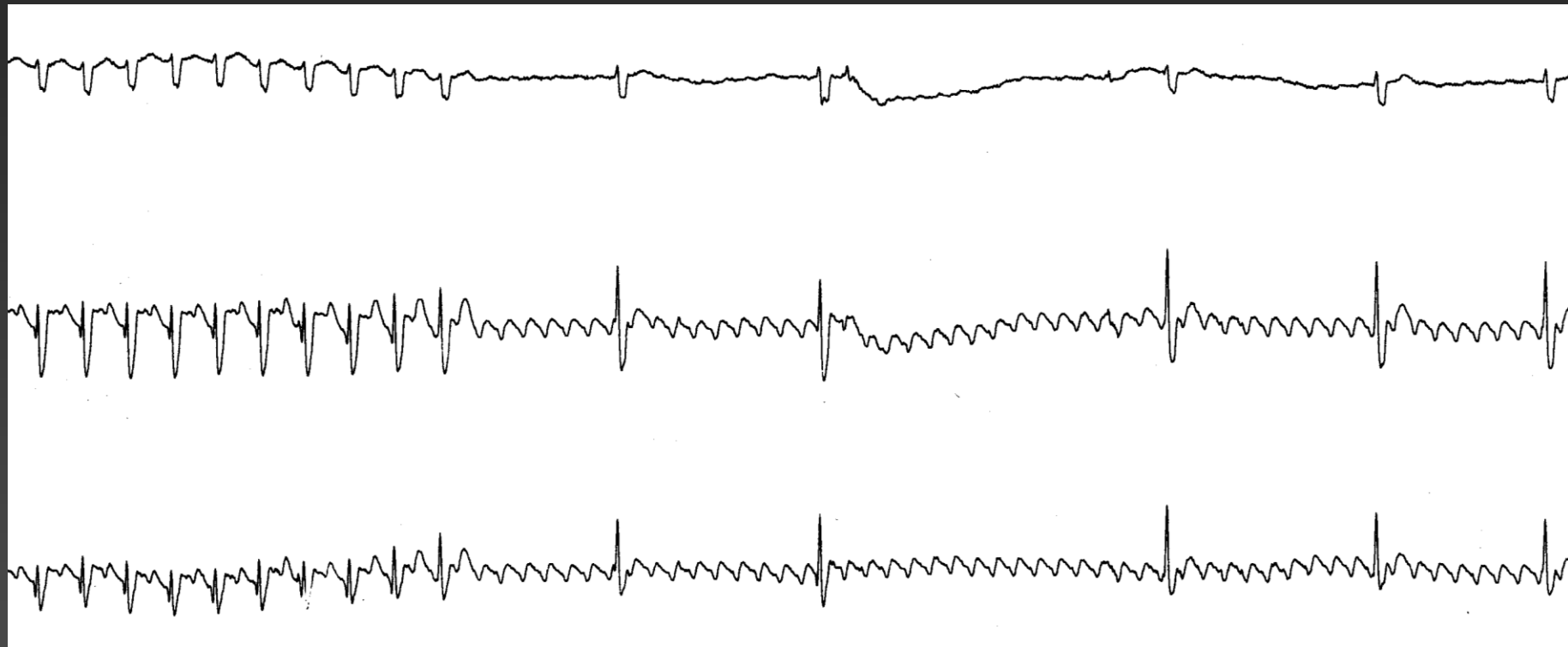


6 meses de edad, switch arterial al mes de edad por trasposición de grandes arterias

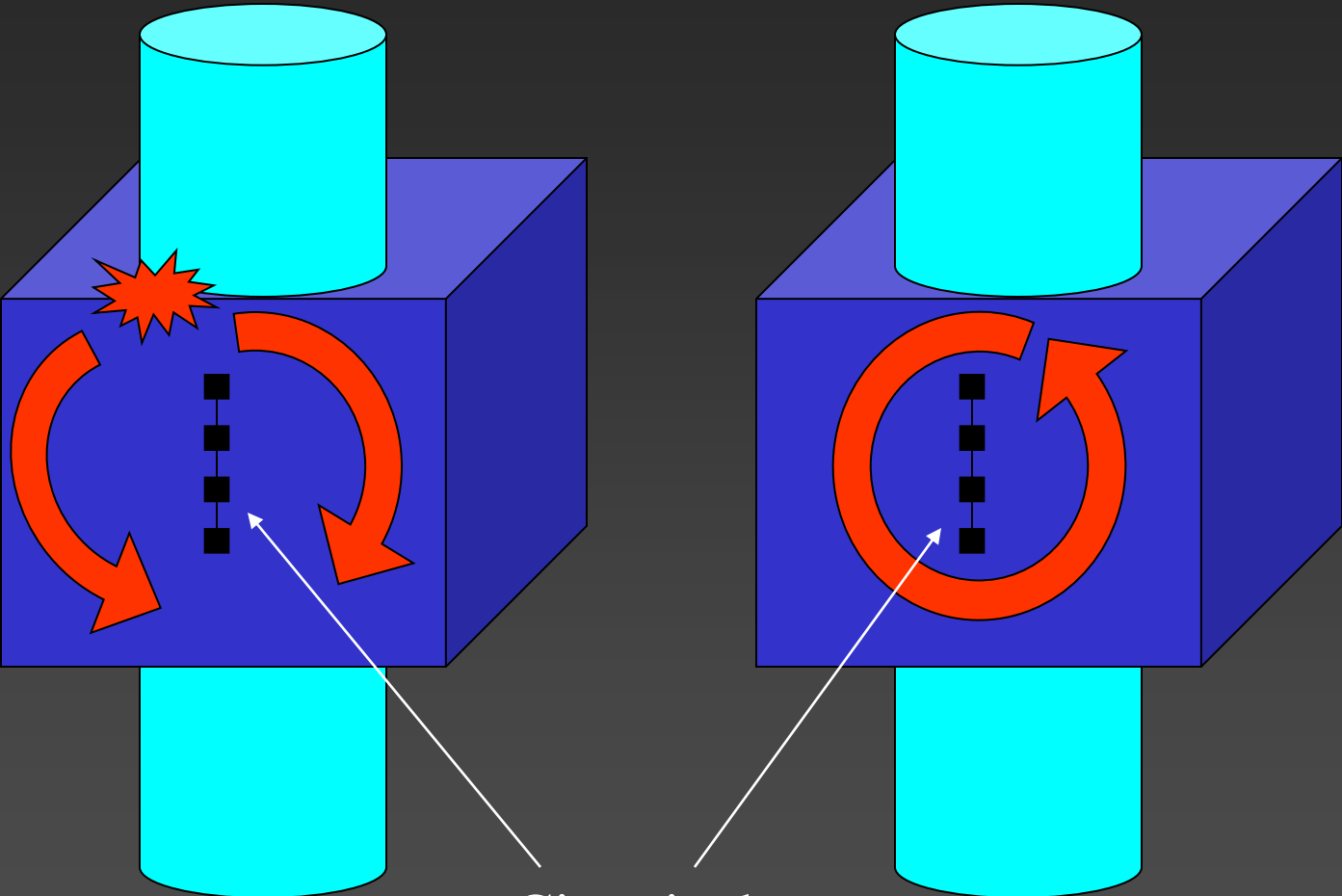


Ingresa en taquicardia a 187/min, incesante

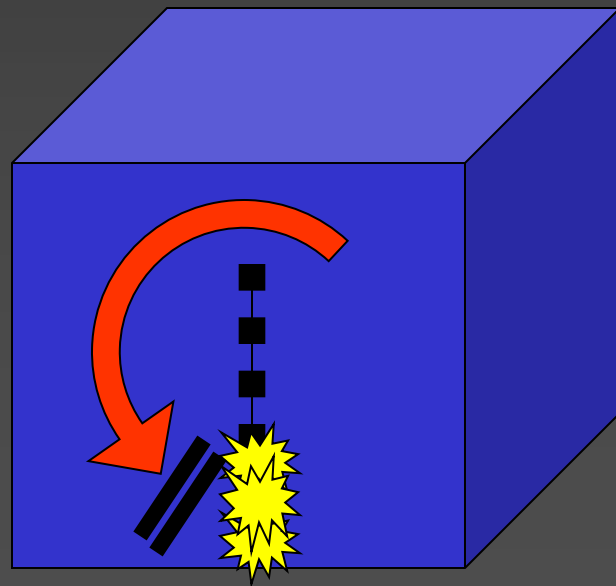
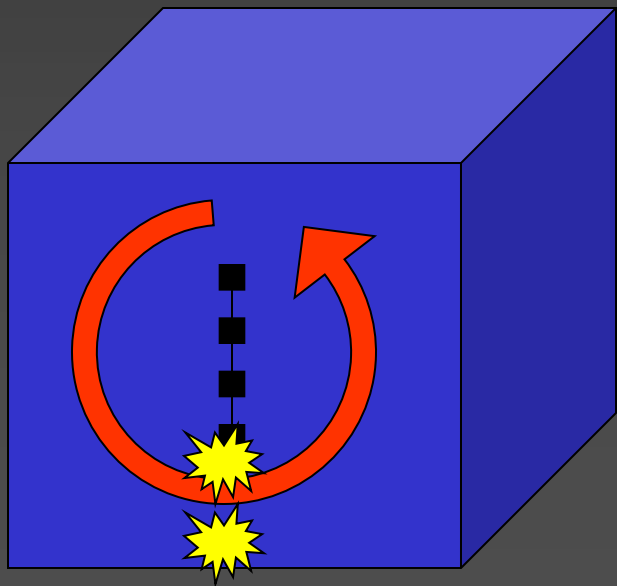
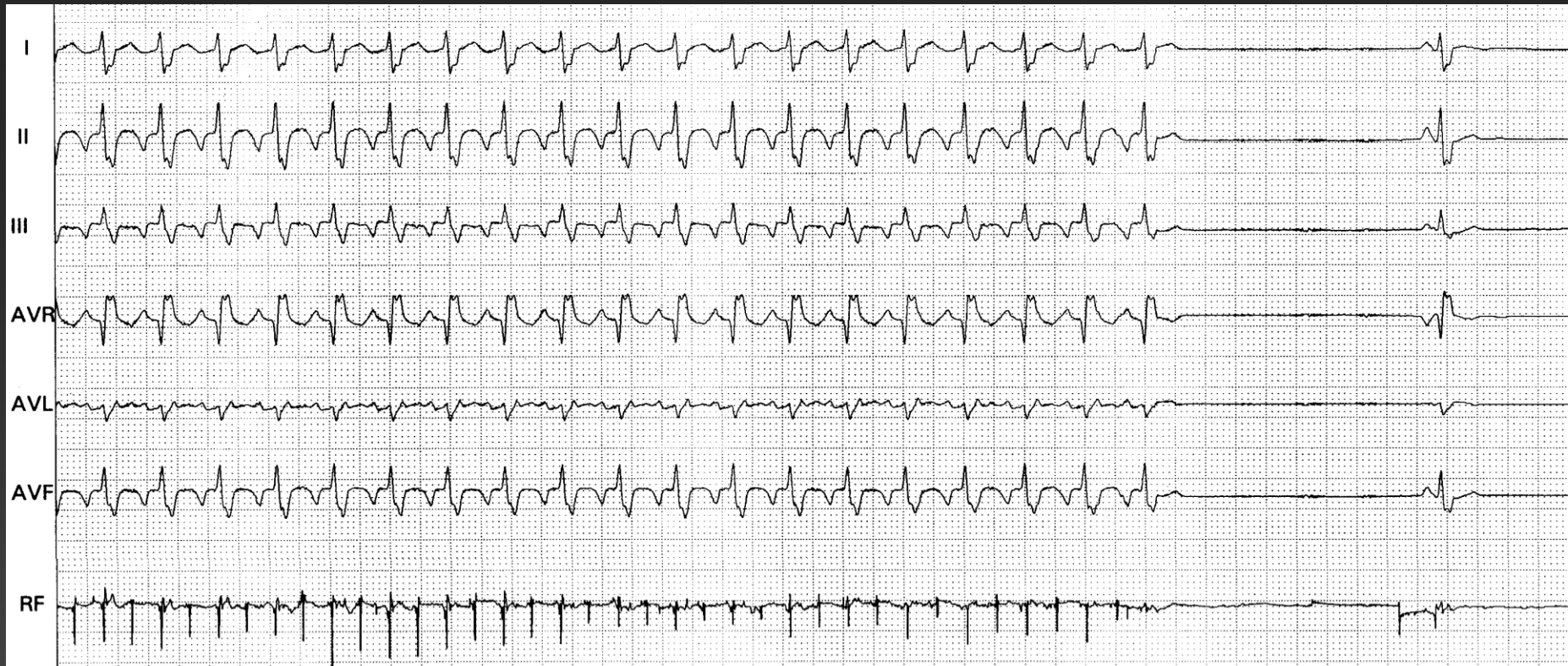
ATP i.v.



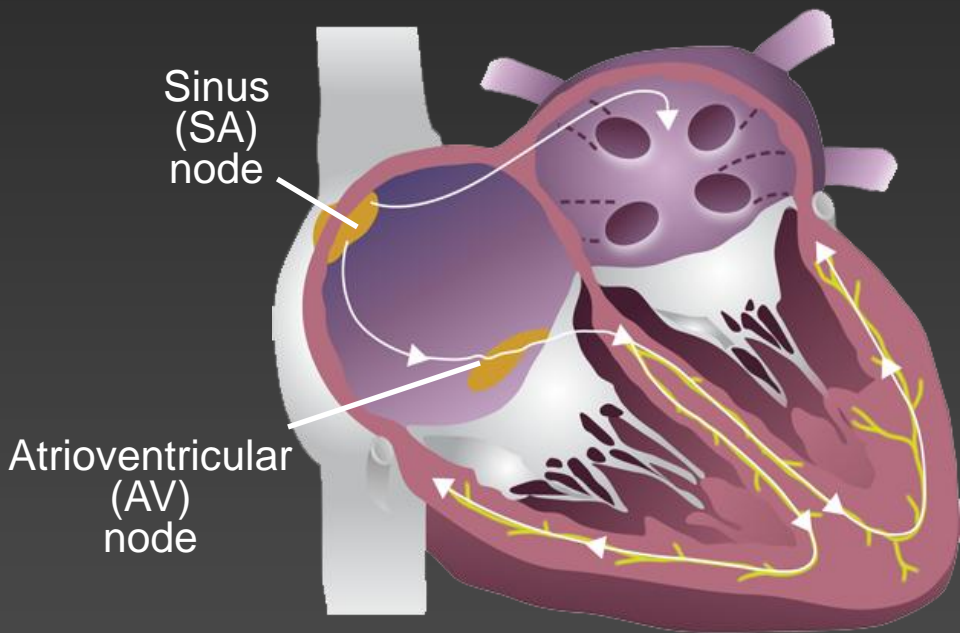
Aurícula derecha



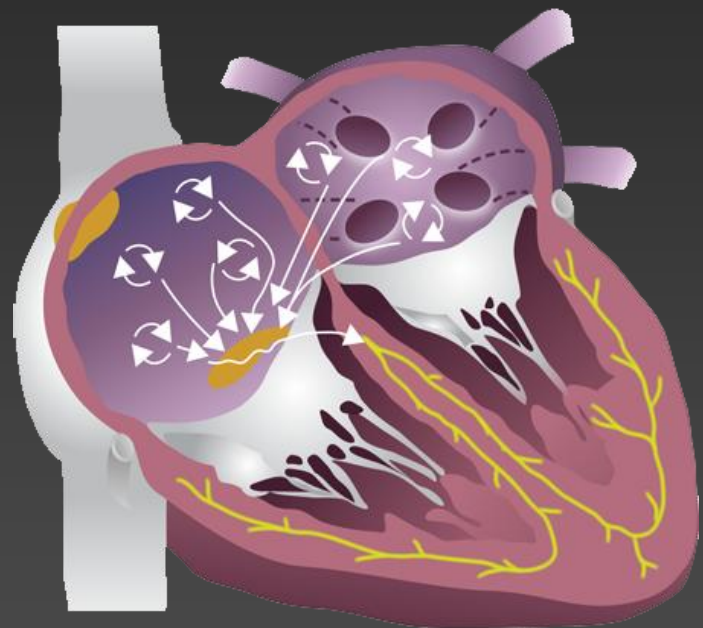
Cicatriz de atriotomía



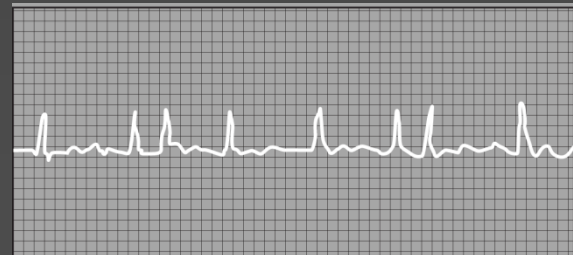
Atrial Fibrillation



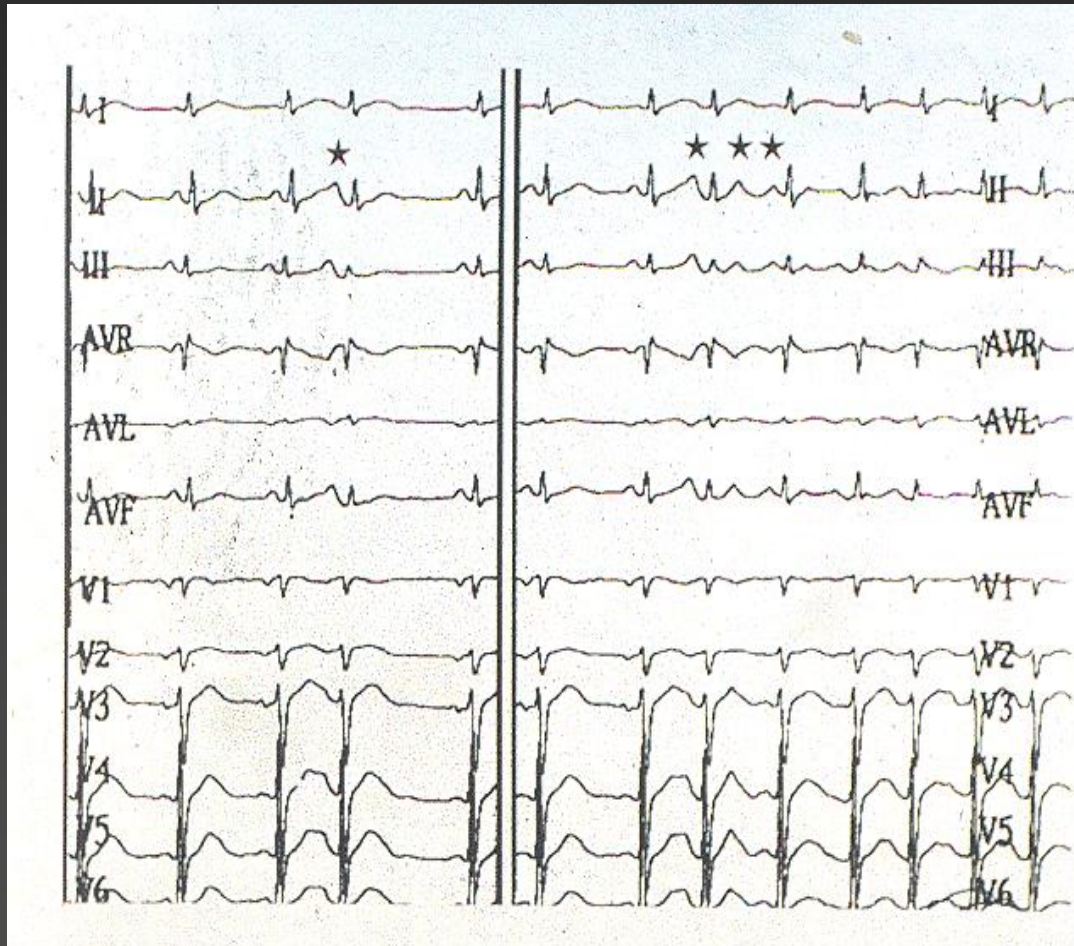
Normal sinus rhythm



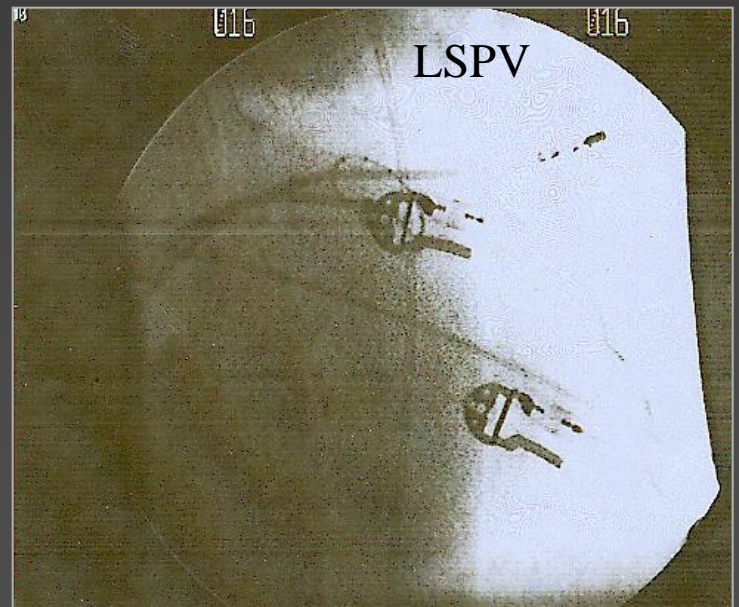
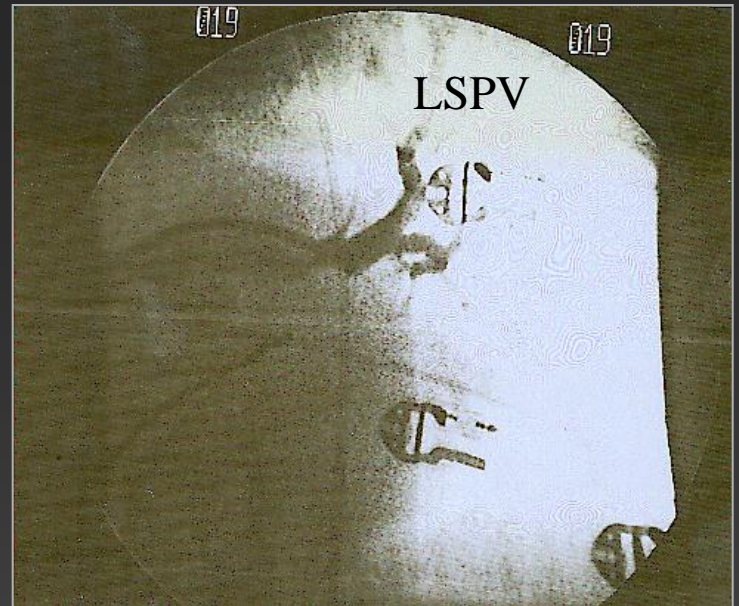
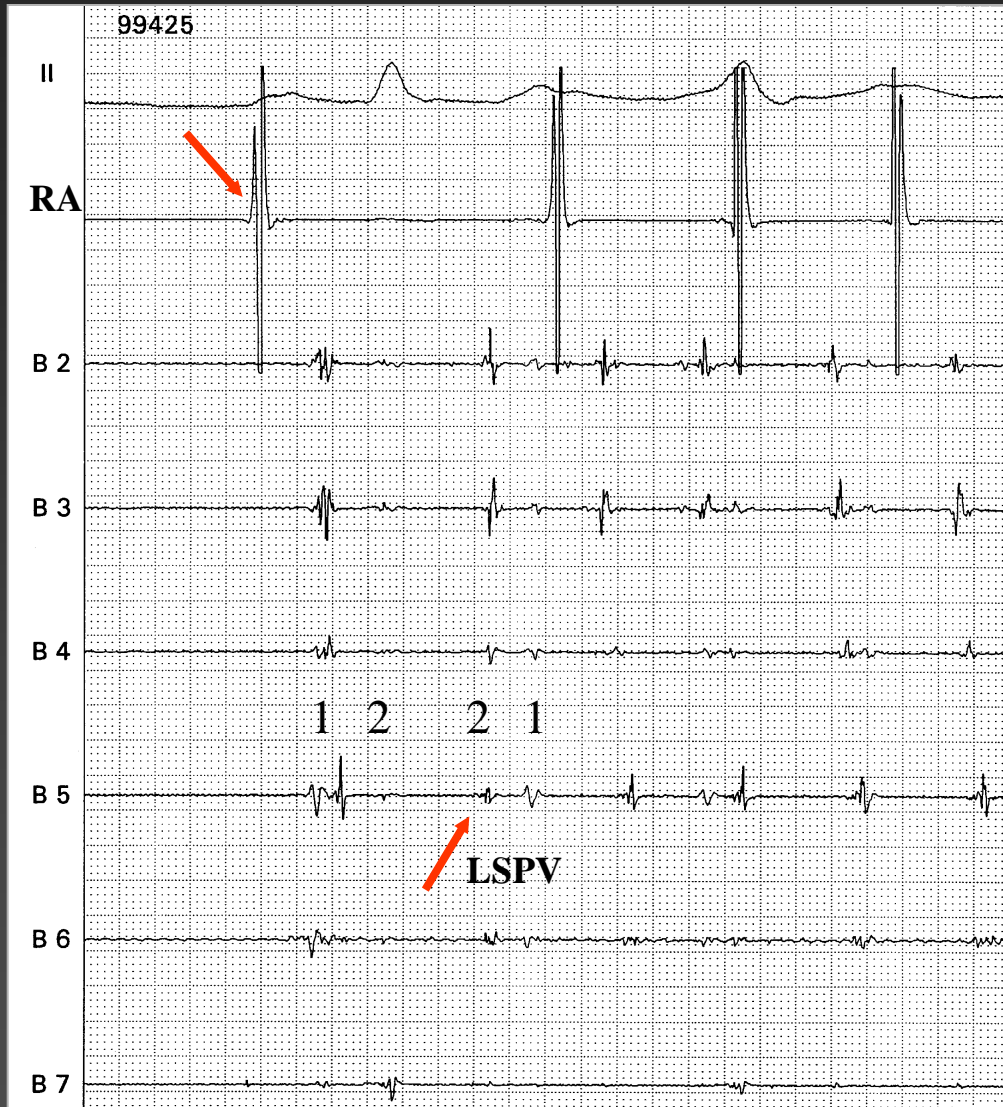
Atrial fibrillation

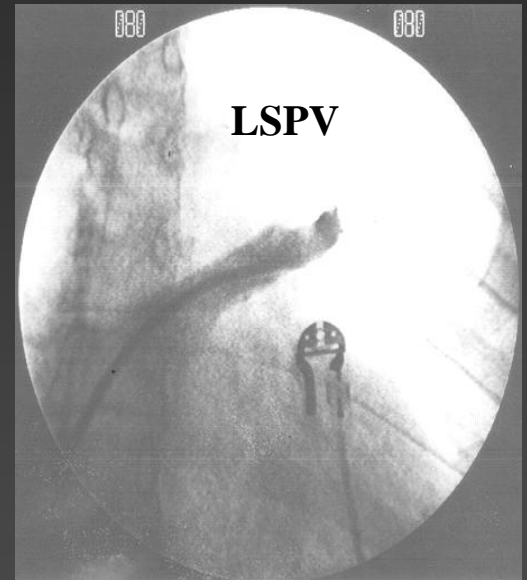


Fibrilación auricular focal

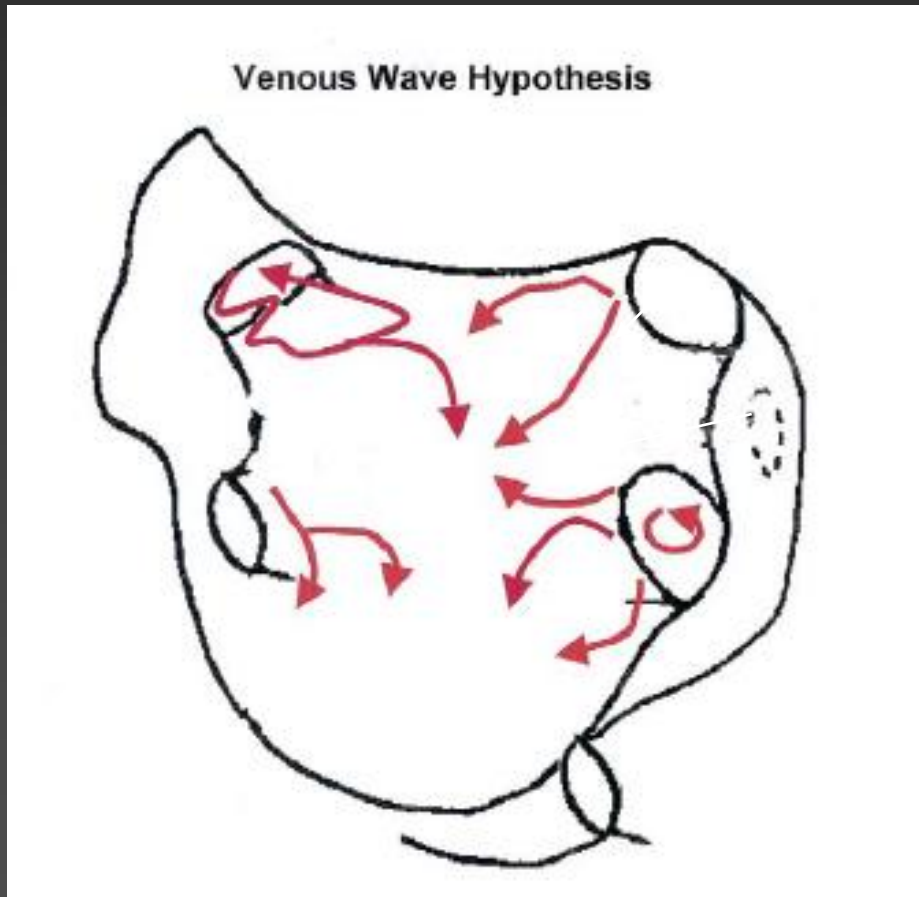


Haissaguerre et al., 1998





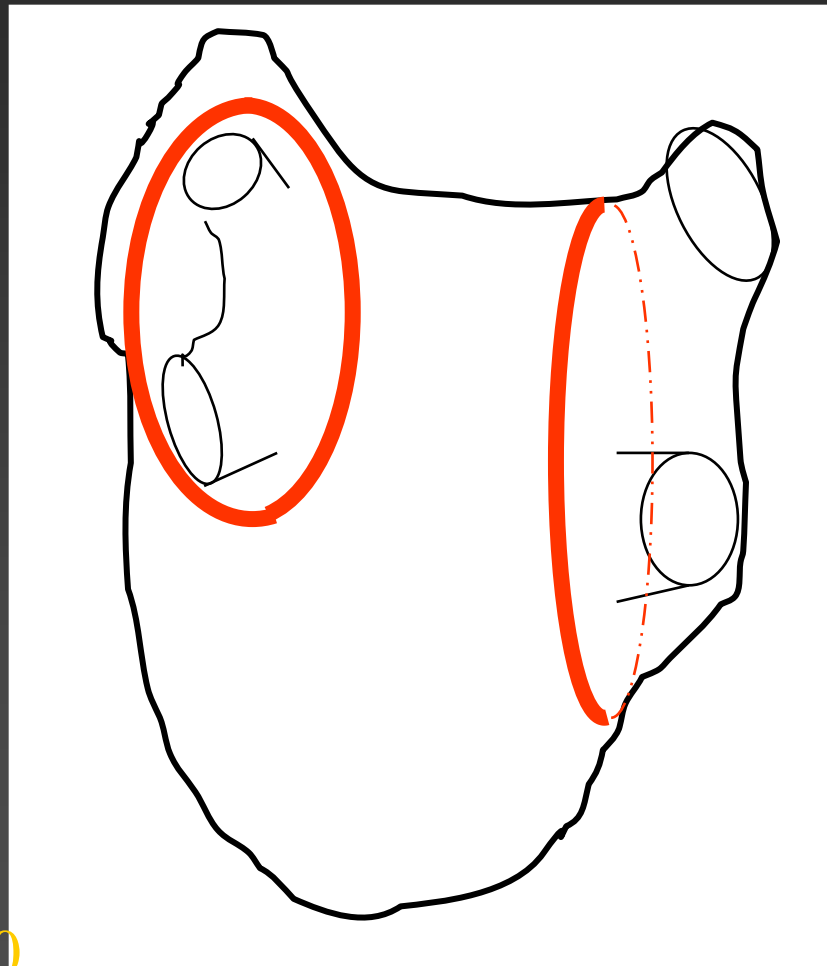
- La ectopia de VP dispara la FA.
 - Si se aíslan estos focos, se evita la FA.
-



Actividad VP HF

Conducción fibrilatoria

Aislamiento de venas pulmonares



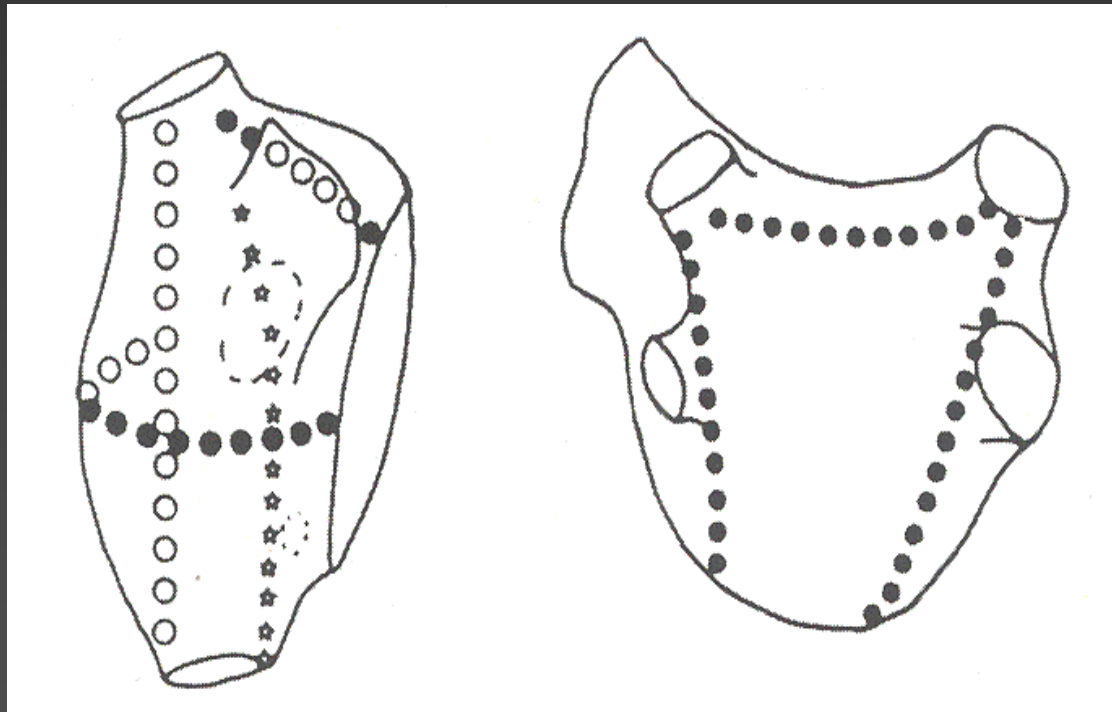
Pappone et al, 2000

CLÍNICA

BARCELONA

Ablación Linear

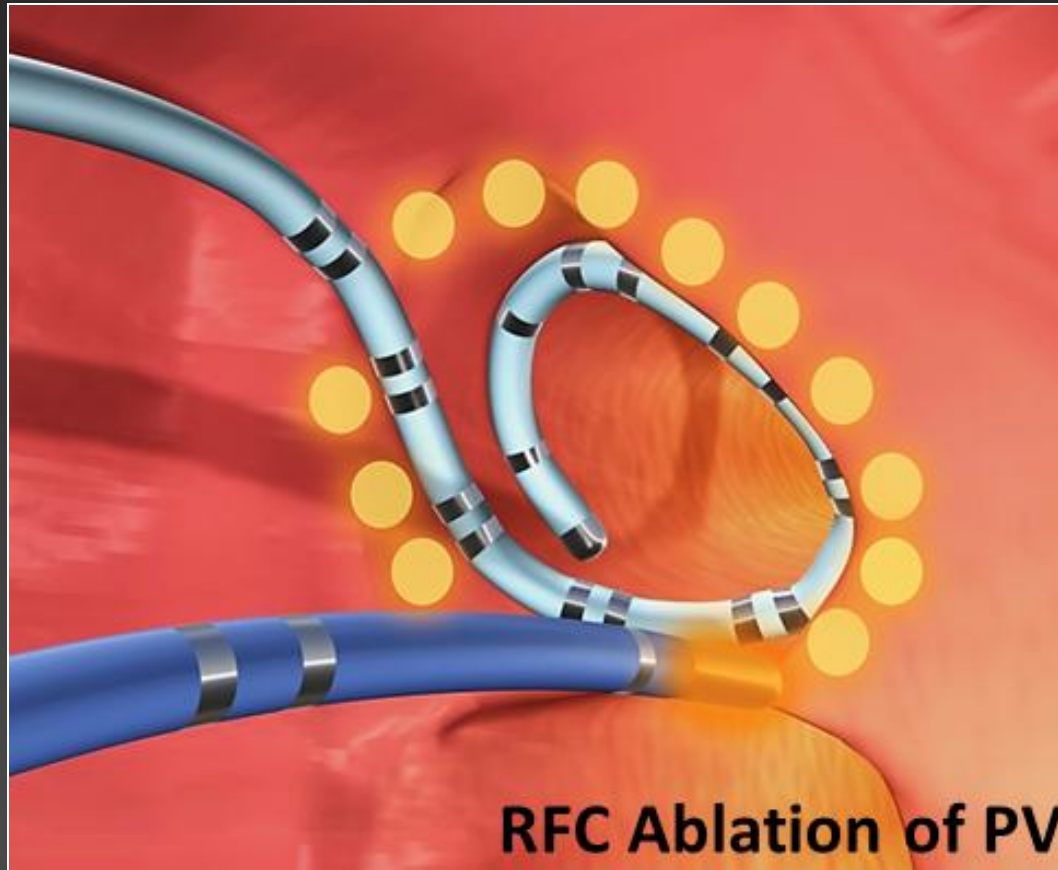
- Procedimiento del laberinto (Maze)



CLÍNICA

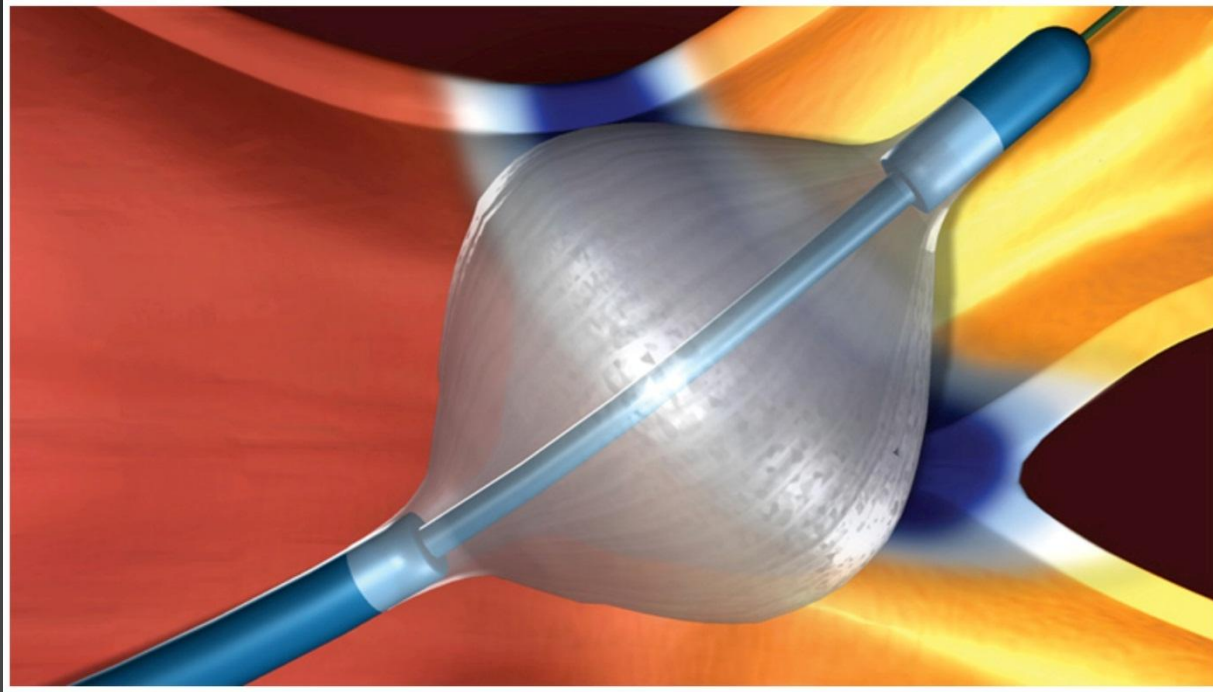
BARCELONA

RF ablation



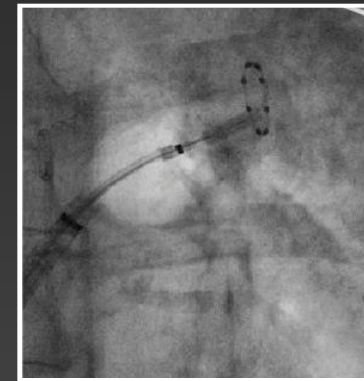
- Heats the tissue
- Point by point ablation
- Requires 3D electroanatomical mapping

Cryoablation



- Removes heat from the tissue
- Ablates tissue at balloon contact

Mapping Catheters allow for real time assessment of Pulmonary Vein Isolation



Arctic Front is positioned here against the LIPV ostium, with Achieve Mapping Catheter inside to read signals at the same time.

Catheter Ablation is indicated for Symptomatic Patients after Failure of One Antiarrhythmic Drug

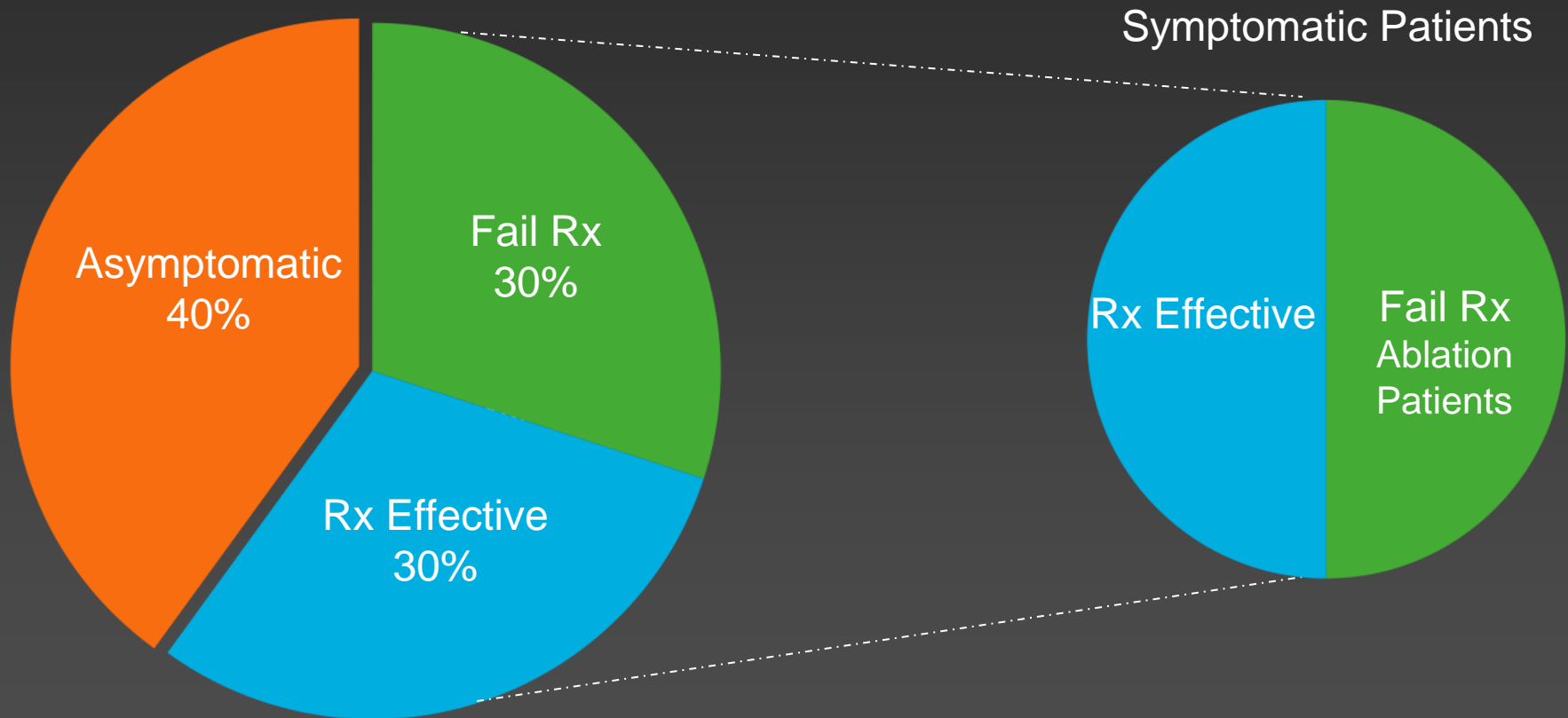
Class IA Level Evidence

HRS/EHRA/ECAS/APHRS/SOLAECE AF Ablation Guidelines

Indications for catheter ablation of AF	Class	Level
Symptomatic AF refractory or intolerant to at least one Class 1 or 3 antiarrhythmic medication		
Paroxysmal: Catheter ablation is recommended*	I	A
Persistent: Catheter ablation is reasonable	IIa	B
Longstanding Persistent: Catheter ablation may be considered	IIb	B
Symptomatic AF prior to initiation of antiarrhythmic drug therapy with a Class 1 or 3 antiarrhythmic agent		
Paroxysmal: Catheter ablation is reasonable	IIa	B
Persistent: Catheter ablation may be considered	IIb	C
Longstanding Persistent: Catheter ablation may be considered	IIb	C

**Catheter ablation of symptomatic paroxysmal AF is considered a Class 1 indication only when performed by an electrophysiologist who has received appropriate training and is performing the procedure in an experienced center.*

Half of Symptomatic AF Patients Fail Drug Therapy



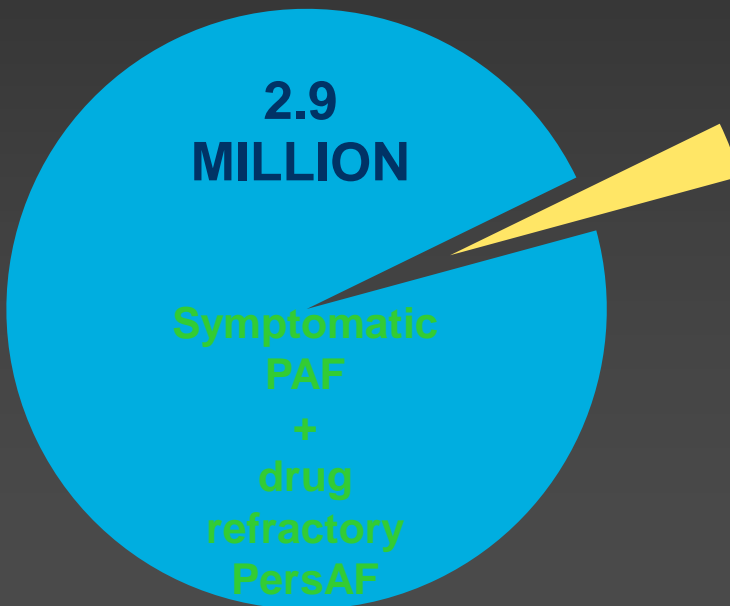
estimates

Current State of AF

AF Ablation Candidates Are Undertreated

European Symptomatic AF Prevalence¹ 6 million

- Patients are looking for symptom relief
- Indicated patients include all symptomatic PAF + drug resistant PersAF
- Catheter ablation is underutilized for indicated patients



~3%³ Annual ablation rate

(EU ablation volume >90,000)

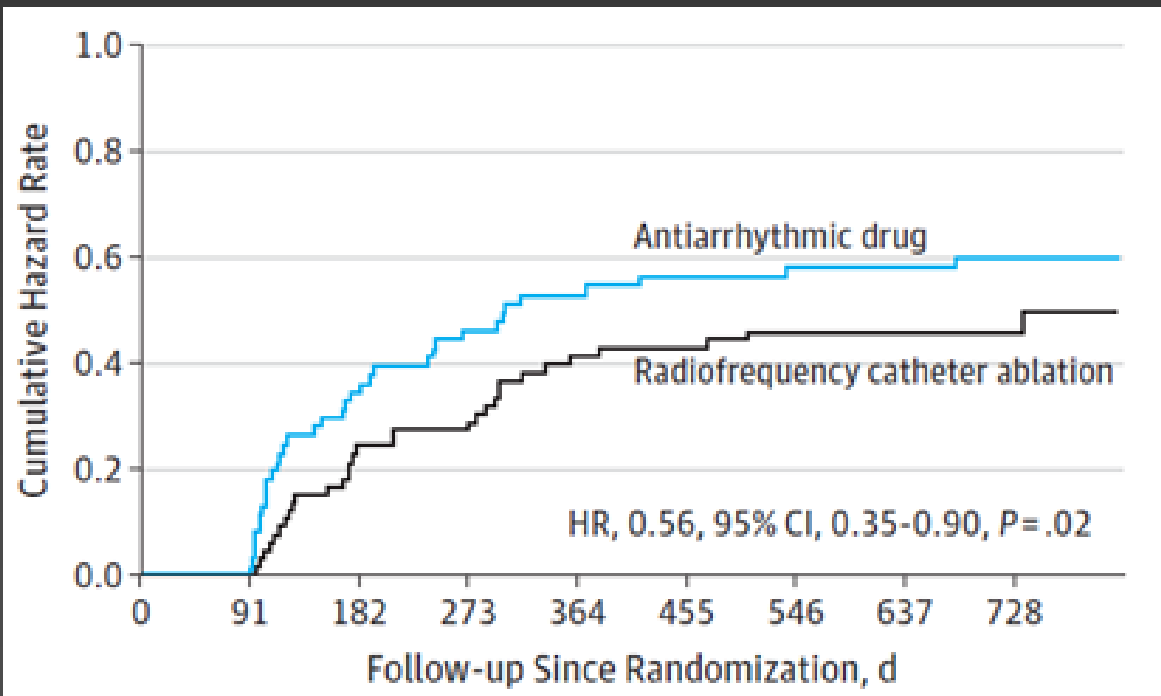
¹ B.P. Krijthe et al. Euro Heart J 2013 Sep;34(35):2746-51.

² Zoni-Berisso, et al. Clinical Epidemiology 2014;6 213-220

³ Medtronic internal estimates taking into account of clinical and economic exclusion.

Ablation is Superior vs AA Drugs for First-Line Therapy in Paroxysmal AF ¹

RAAFT-2 study: 127 paroxysmal AF patients randomized to either RF ablation or AA drugs



Results

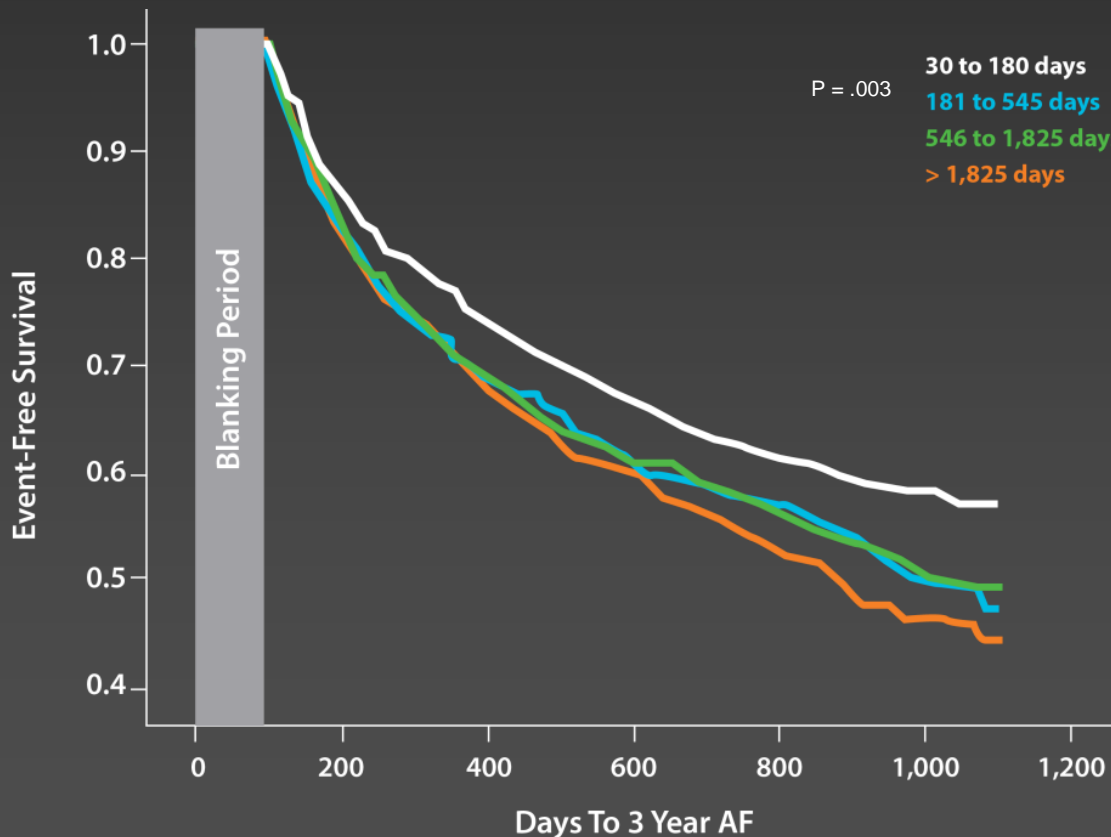
Lower rate of AF recurrence after 2 years with ablation (HR 0.56 / p=0.02)

- **RF Ablation: 54.5%**
- **AA Drugs: 72.1%**

Earlier Catheter Ablation Treatment Leads to a Decrease in Recurrence and Event-Free Survival

Retrospective analysis of 4,535 consecutive AF patients

Event-Free Survival



Results

- Patients who underwent earlier treatment had improved 3-year survival free of AF (log rank $P = .003$)
- Delays in catheter ablation treatment led to higher 1-year AF recurrence post ablation for entire population (P trend = .02)
- No difference in stroke rate demonstrated