

Diagnosi e terapia delle TPSV pediatriche

Mi sei scoppiata dentro il cuore

Gabriele Bronzetti
S.Orsola di Bologna





Ti Penso Sempre Volentieri

Ti Può Sempre Venire

Reductionism

Tachy > Brady

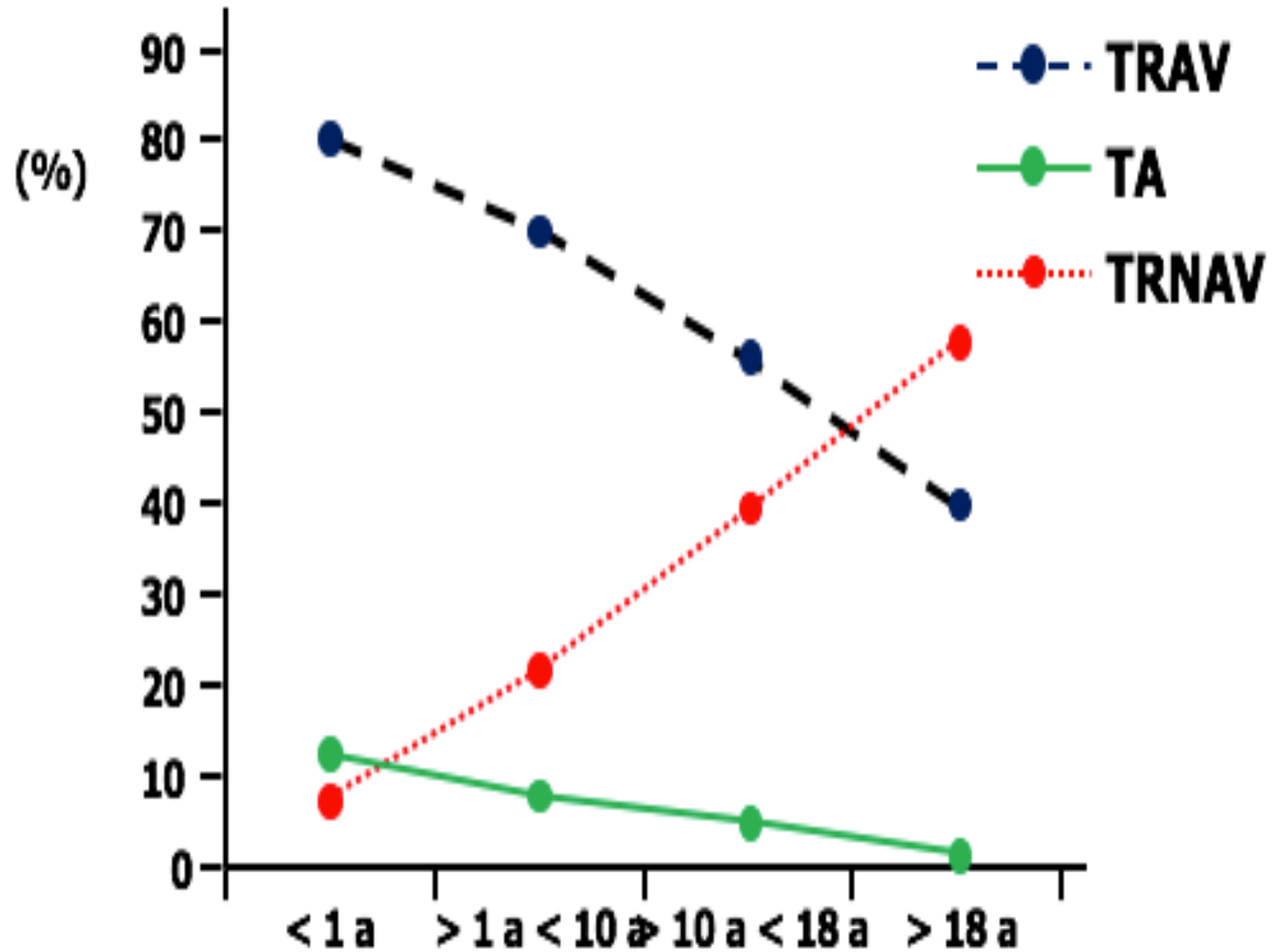
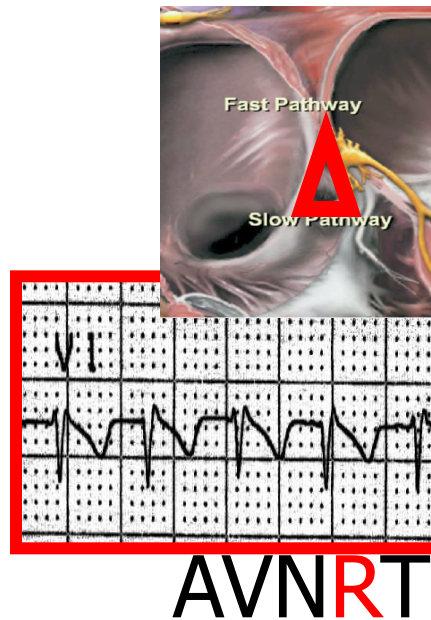
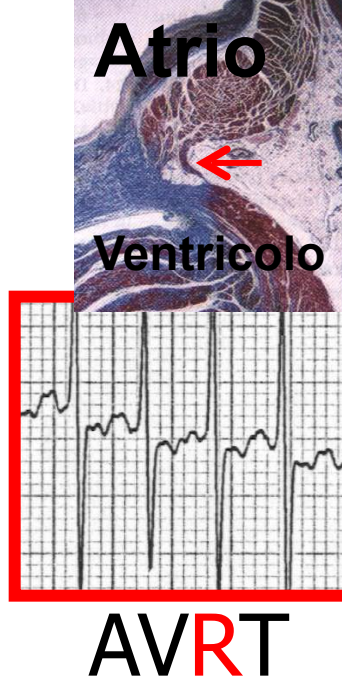
SVT > VT

Reentrant > Automatic

Paroxysmal > Incessant

Adenosine R > *Adenosina NR*

DC shock+ > DC -

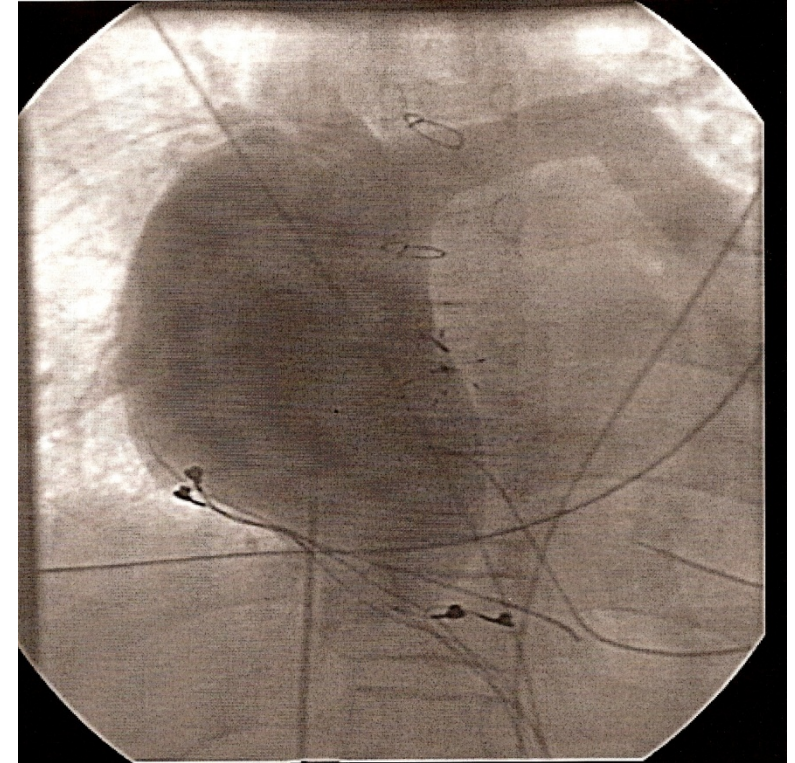


"F" Factor

Feto



Fontan



Fatal

Flutter

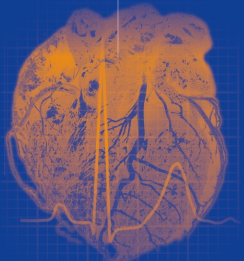
Prematuro, FC 200

7 etti , 1 joule



Gabriele Bronzetti

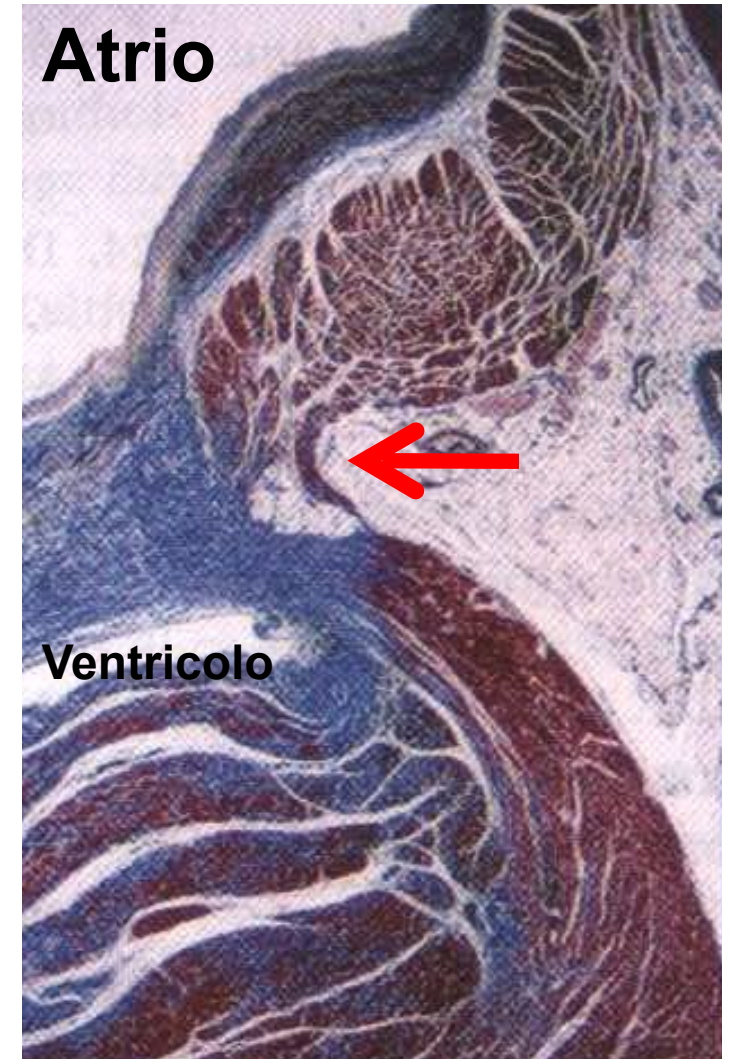
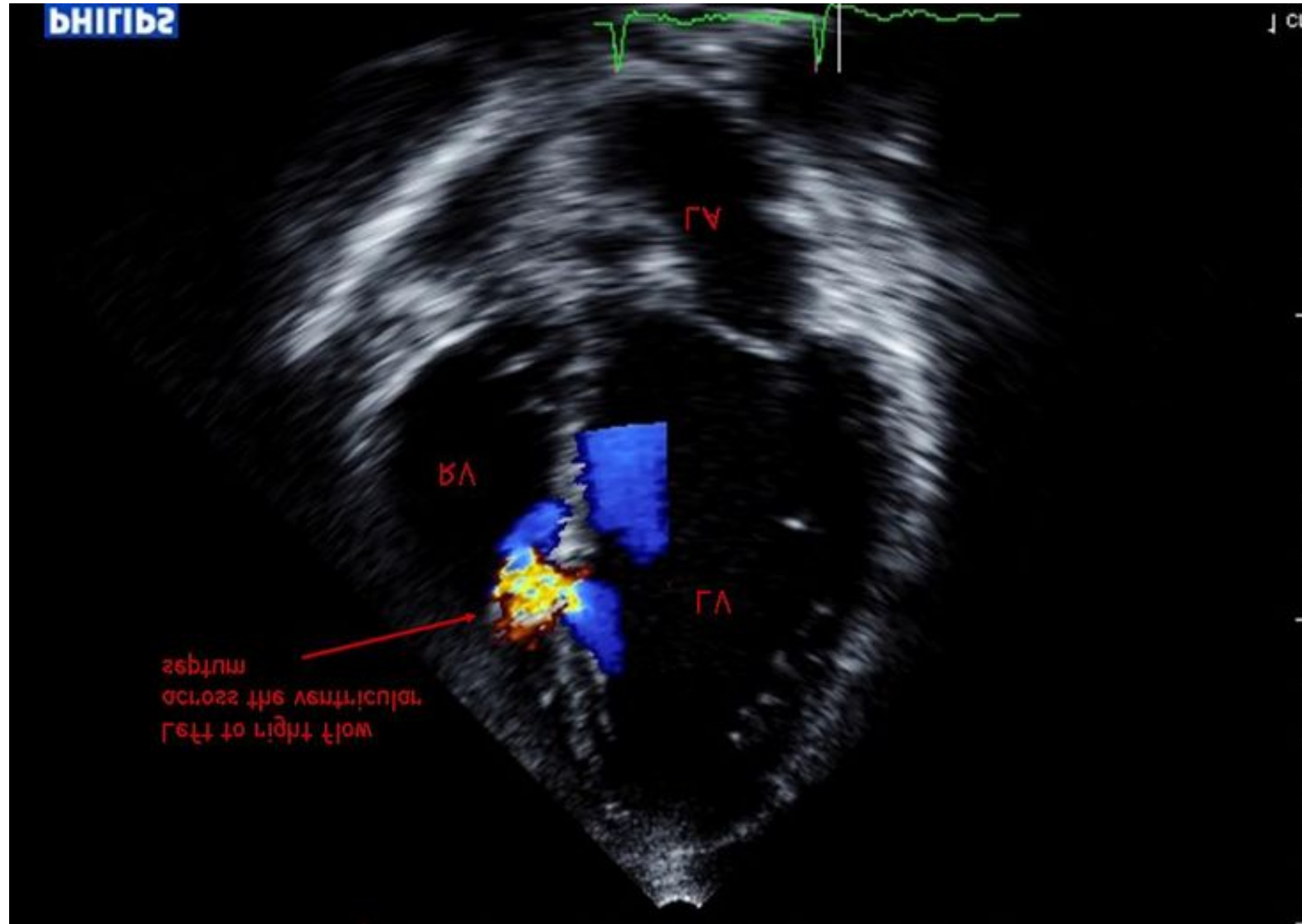
**Atlas of Pediatric
and Youth ECG**

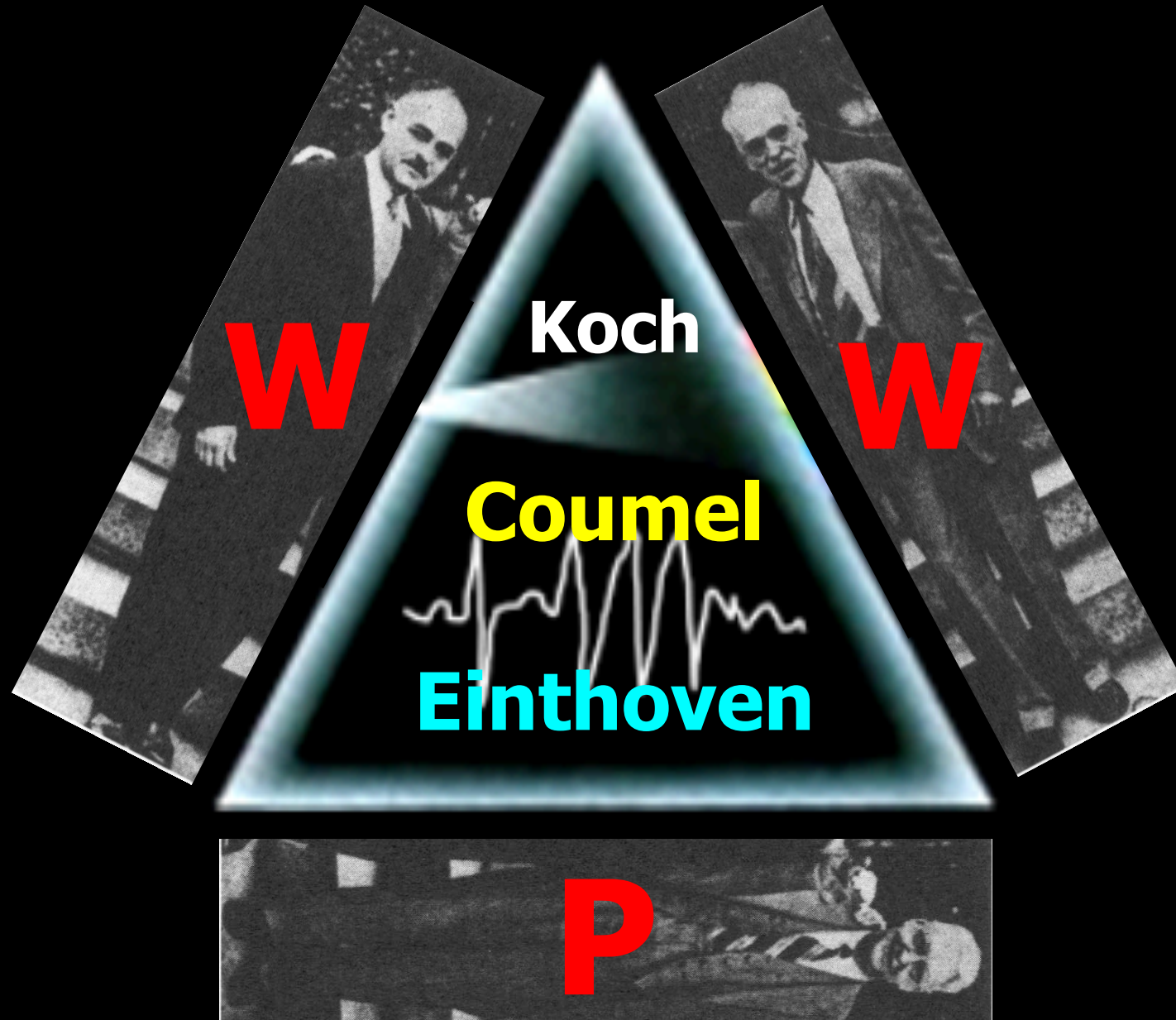


Springer

DaI DIV al

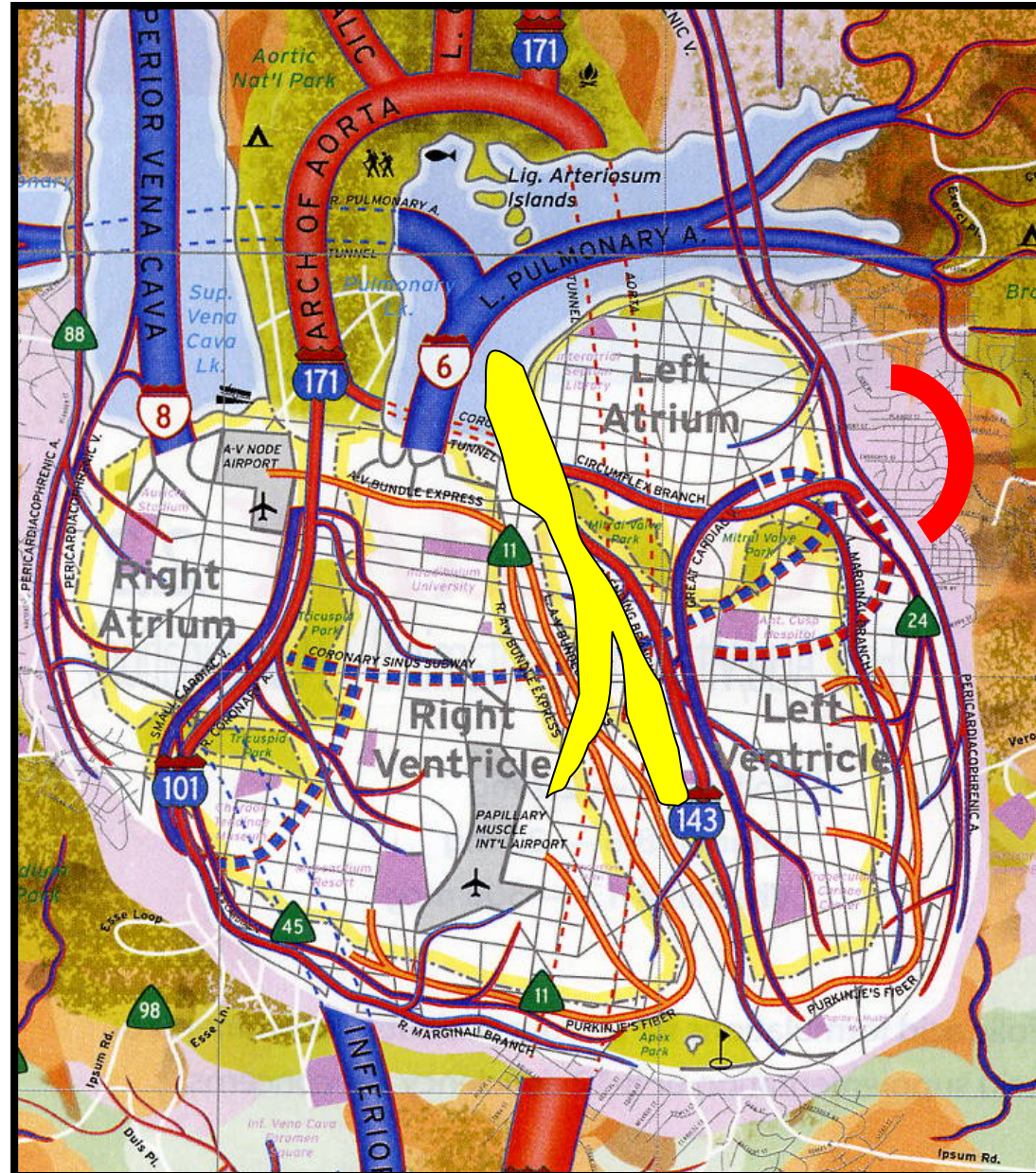
DAV



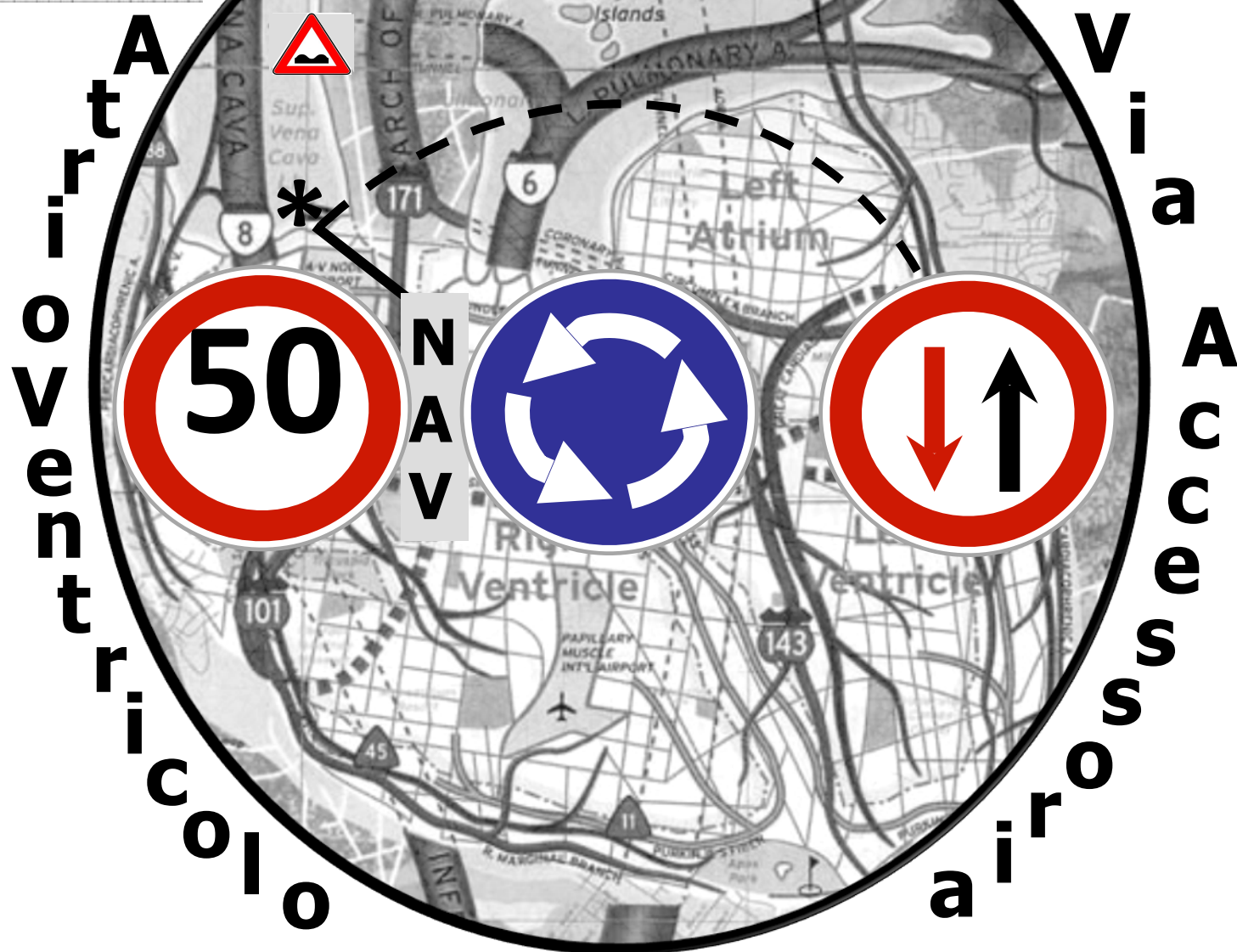


Strade del cuore

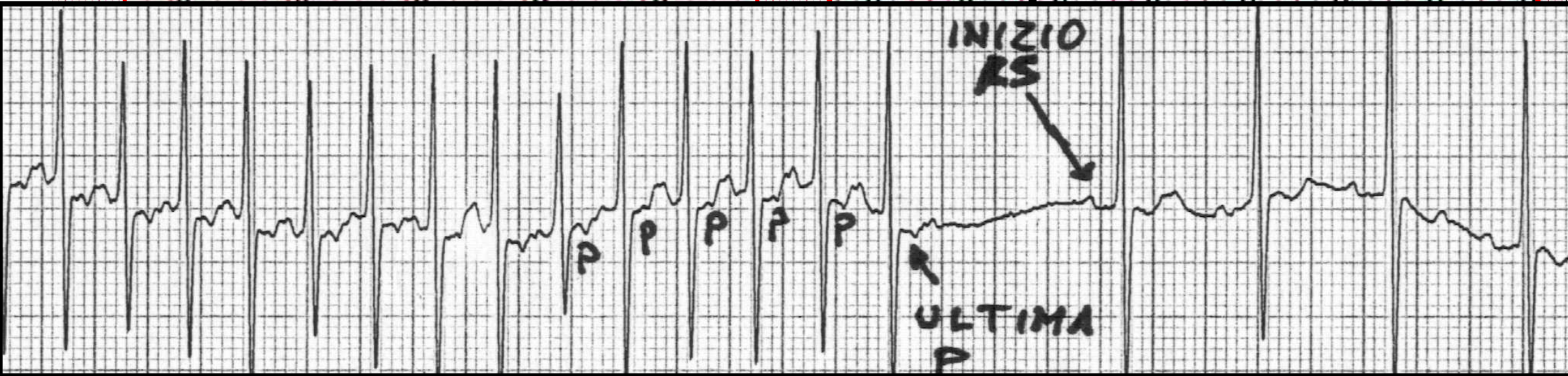
Via del Nodo



Via Accessoria

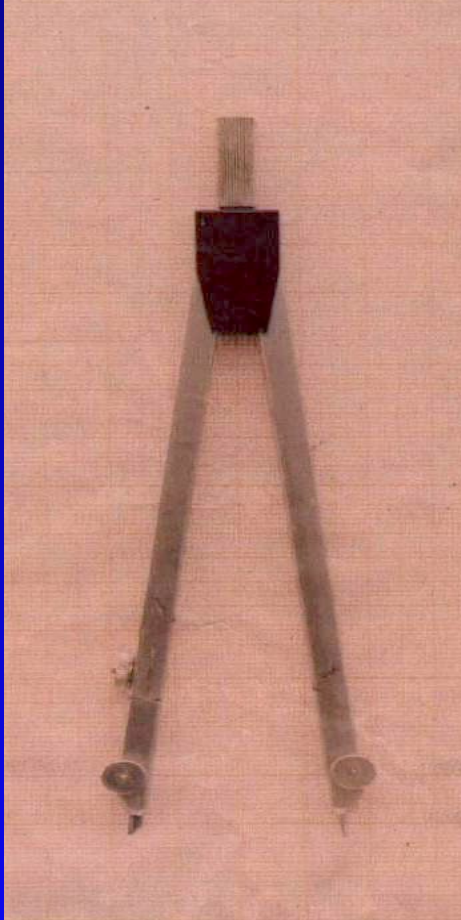


Neonato , 300 bpm Rientro AV



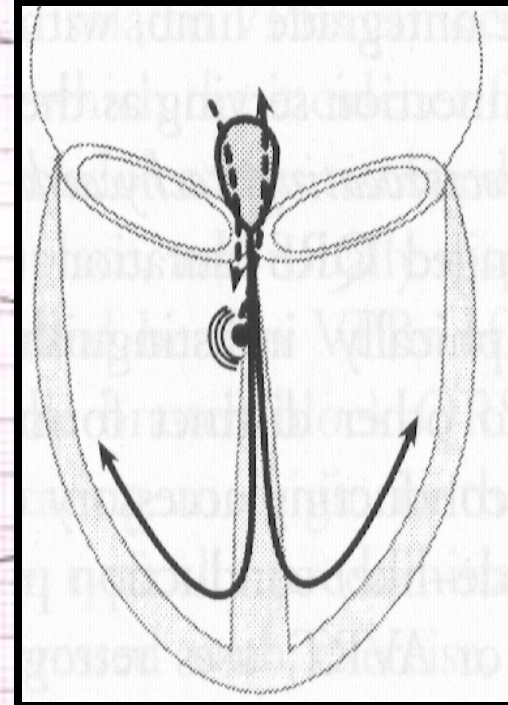
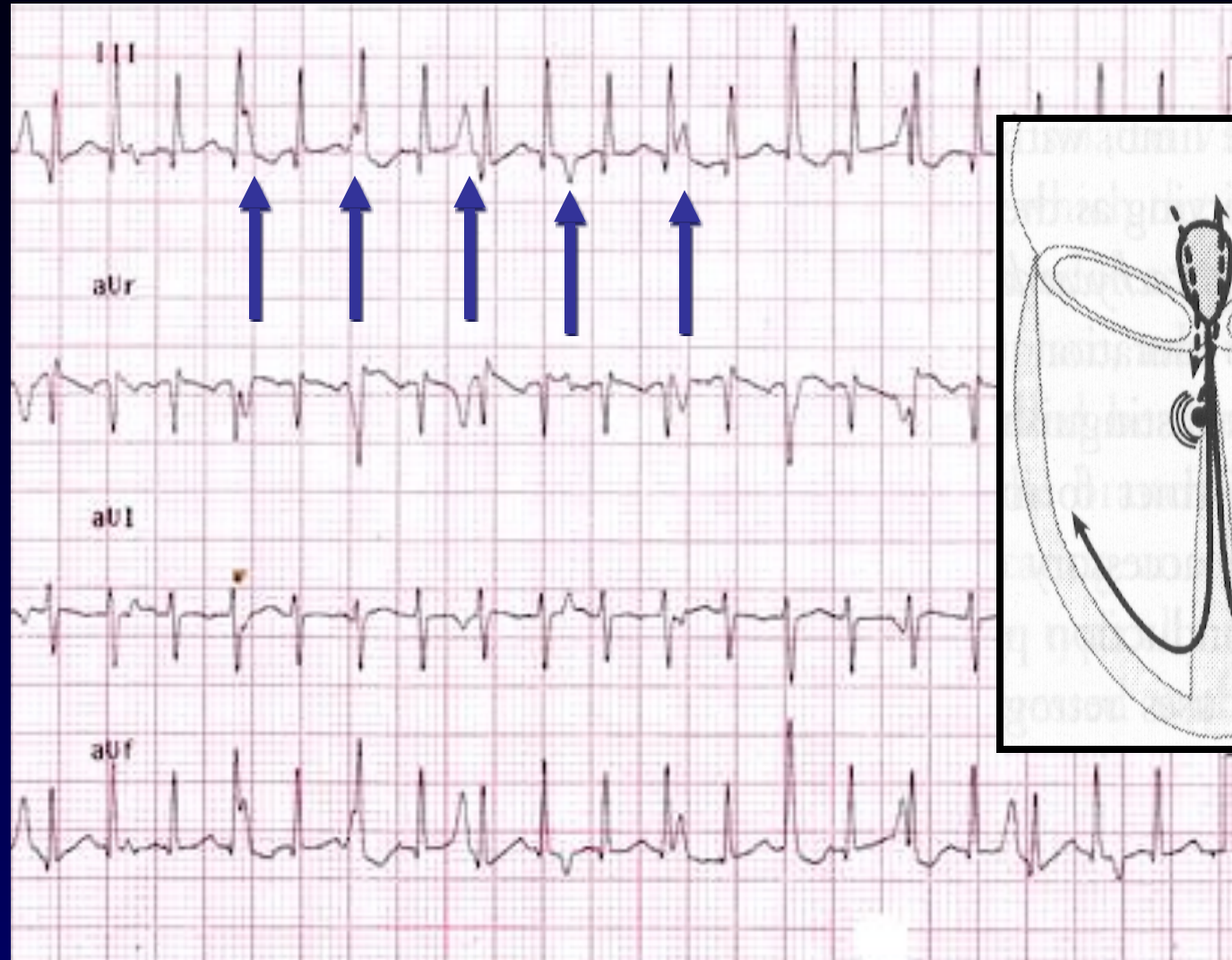
Automatica

**Calma, dignità e classe (e
compasso)**

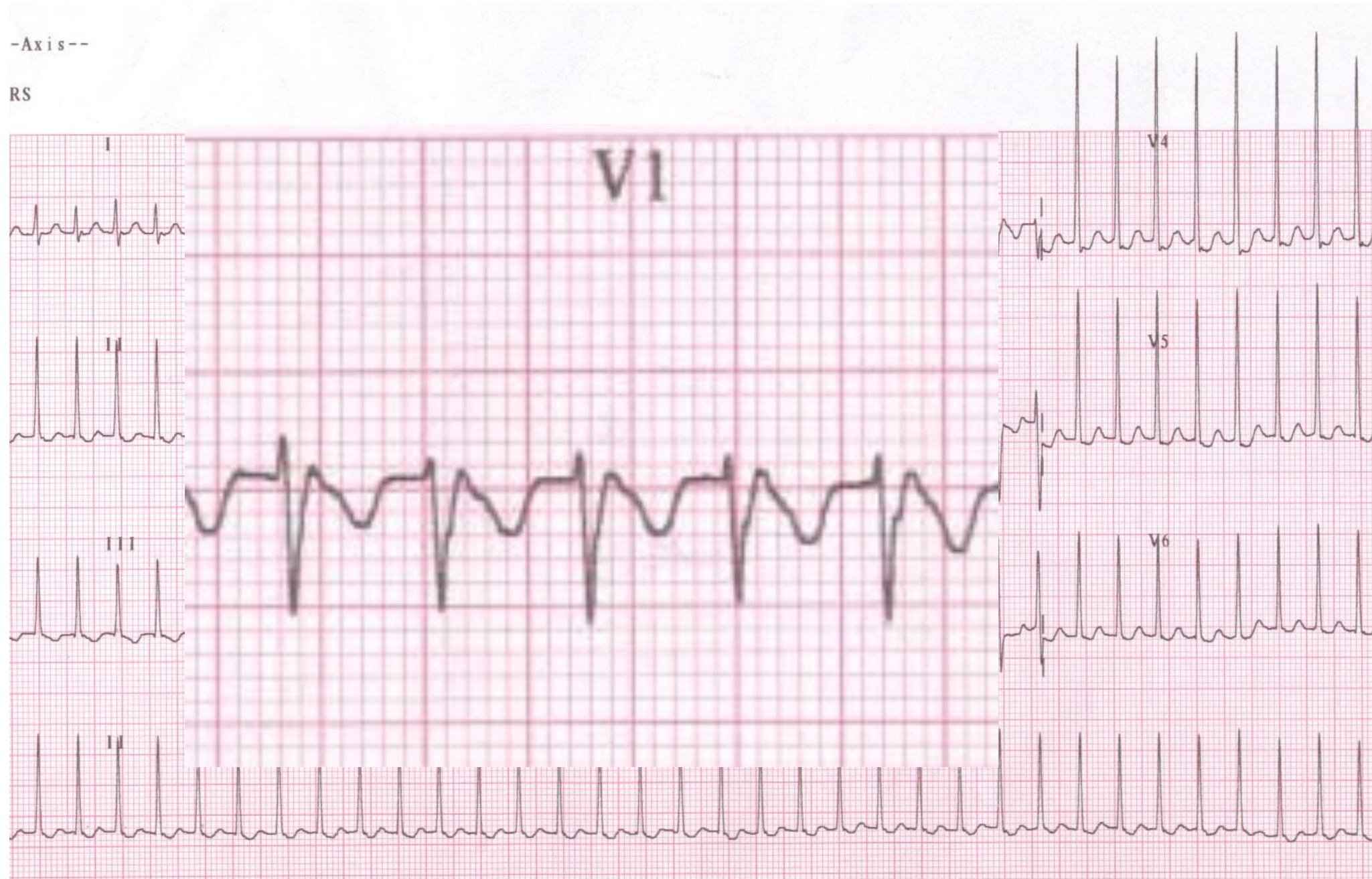


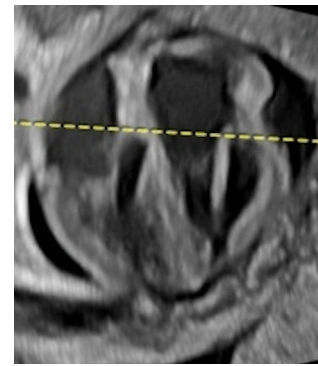
Regola del 220
Regola del 30

JET



Tachicardia da rientro nodale comune





STABLE

HEART FAILURE

VAGAL MANOUVERS

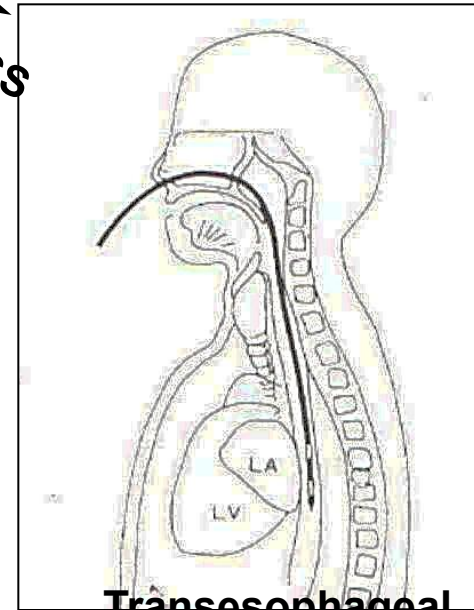
ADENOSINE

NO VEIN ACCESS

DC SHOCK

**β Blockers
Ic
Amiodarone
Ca Ch Blockers**

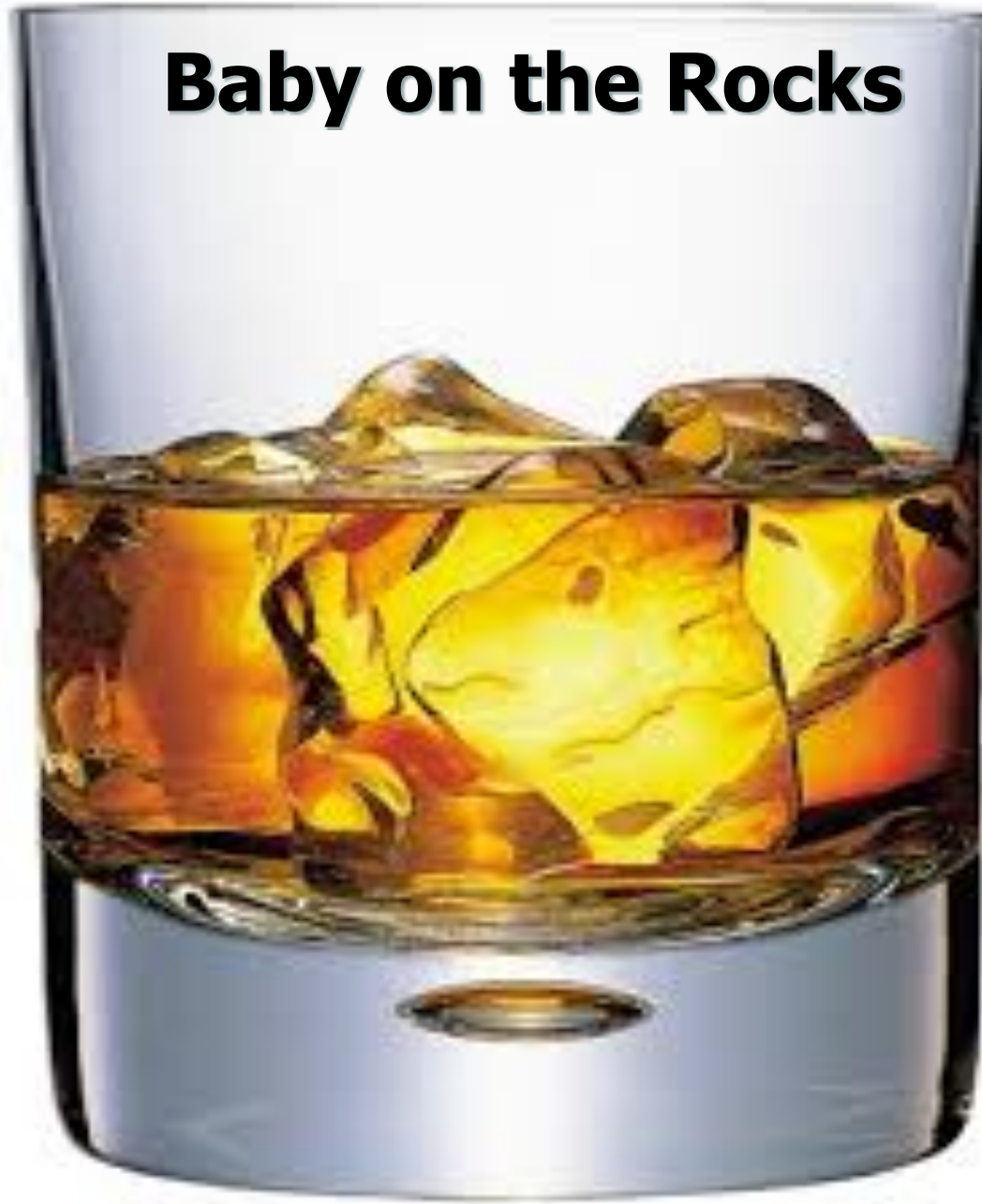
PROph ?



**Transesophageal
overdrive**

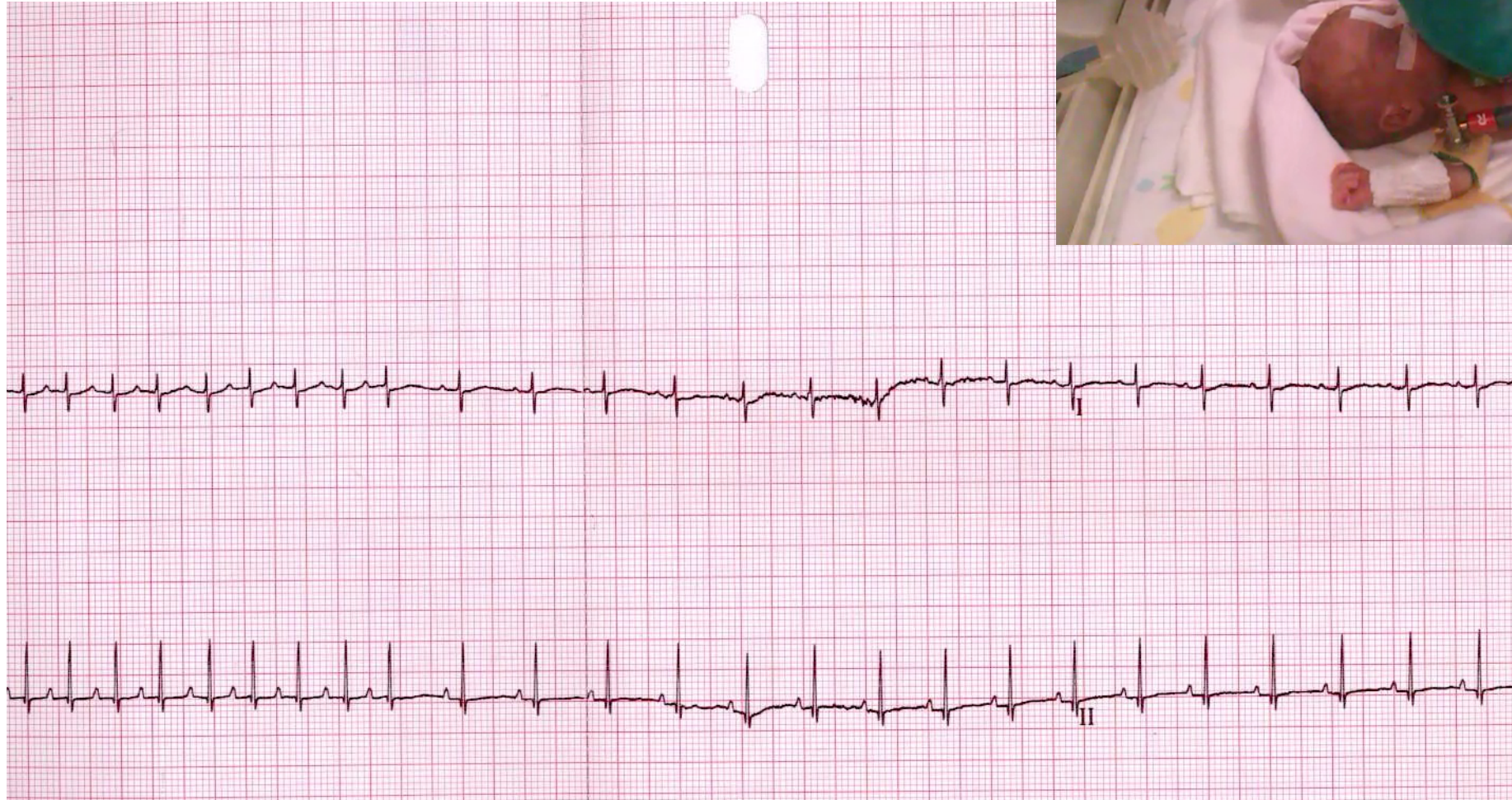


Baby on the Rocks



Baby On the Rocks

**UTIN S.Orsola , M.D. 500 grams,
Severe pulmonary hypertension.
Tp NO, Sildenafil, Milrinone**



Tacchi in alto- Tachi in basso

IL DOTTOR DIVAGO



SOFFIARE
VIGOROSAMENTE



Short communication

Upside-down position for the out of hospital management of children with supraventricular tachycardia★

Gabriele Bronzetti ^a, Maurizio Brighenti ^{b,*}, Elisabetta Mariucci ^a, Marianna Fabi ^c, Marcello Lanari ^c, Marco Bonvicini ^a, Gaetano Gargiulo ^d, Andrea Pession ^b

^a Pediatric Cardiology and GUCH Unit, Department of Experimental, Diagnostic and Specialty Medicine, S. Orsola–Malpighi Hospital, University of Bologna, Bologna, Italy

^b Pediatric Unit, Department of Medical and Surgical Sciences, S. Orsola–Malpighi Hospital, University of Bologna, Bologna, Italy

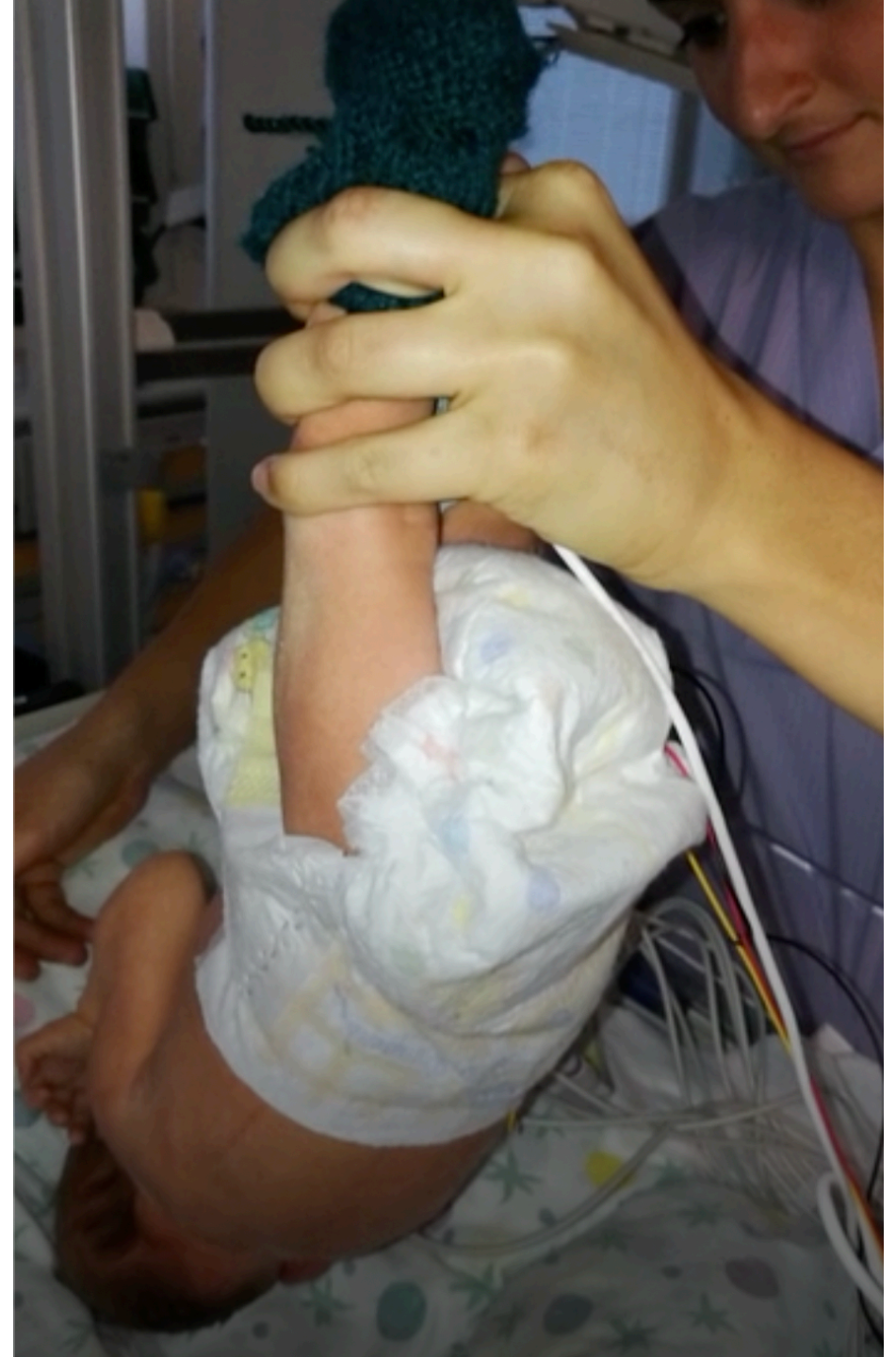
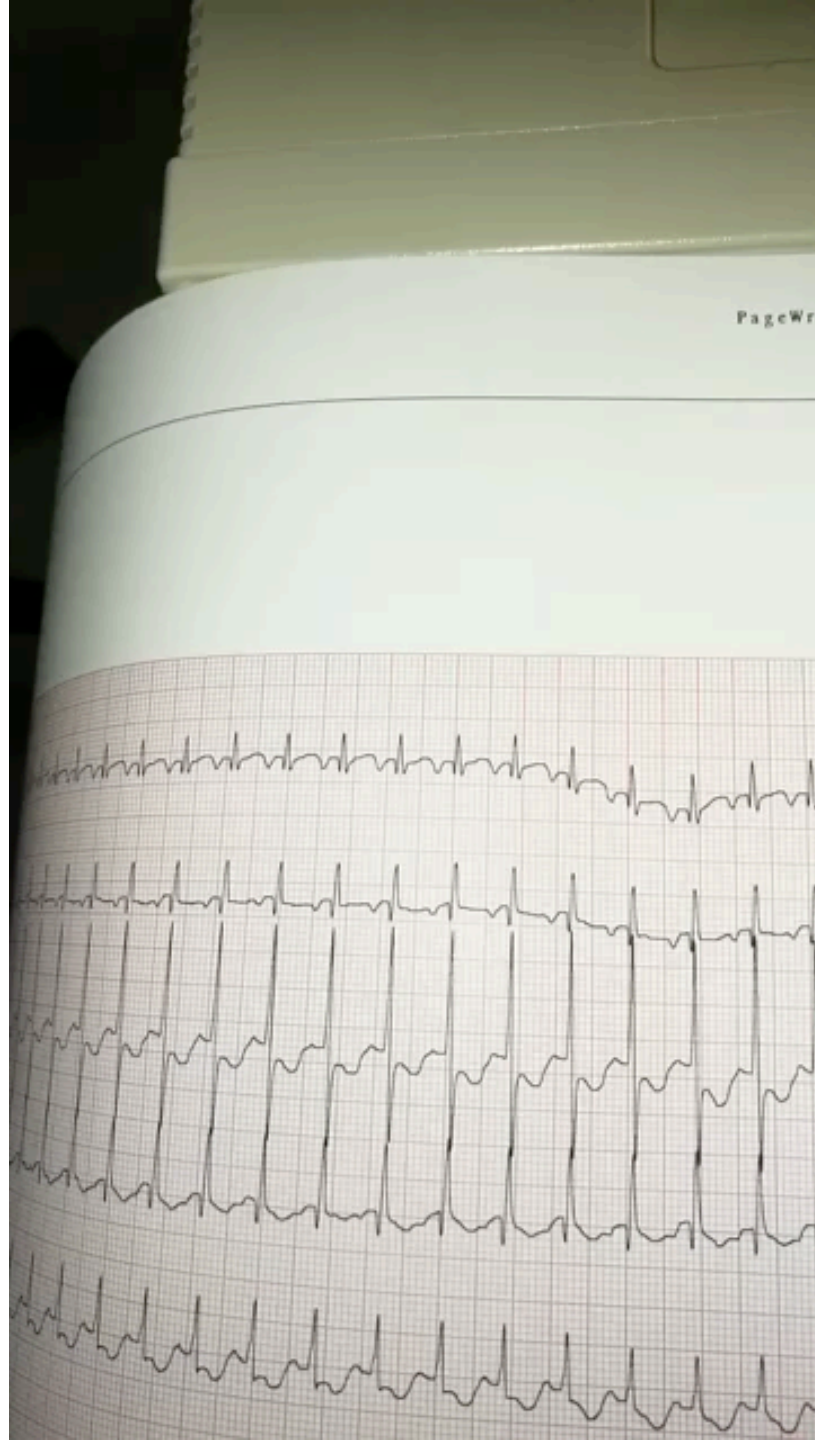
^c Pediatric Emergency Unit, Department of Medical and Surgical Sciences, S. Orsola–Malpighi Hospital, University of Bologna, Bologna, Italy

^d Pediatric Cardiac Surgery Unit, Department of Experimental, Diagnostic and Specialty Medicine, S. Orsola–Malpighi Hospital, University of Bologna, Bologna, Italy



007

**Shaken
(baby)
not
stirred
(drugs)**

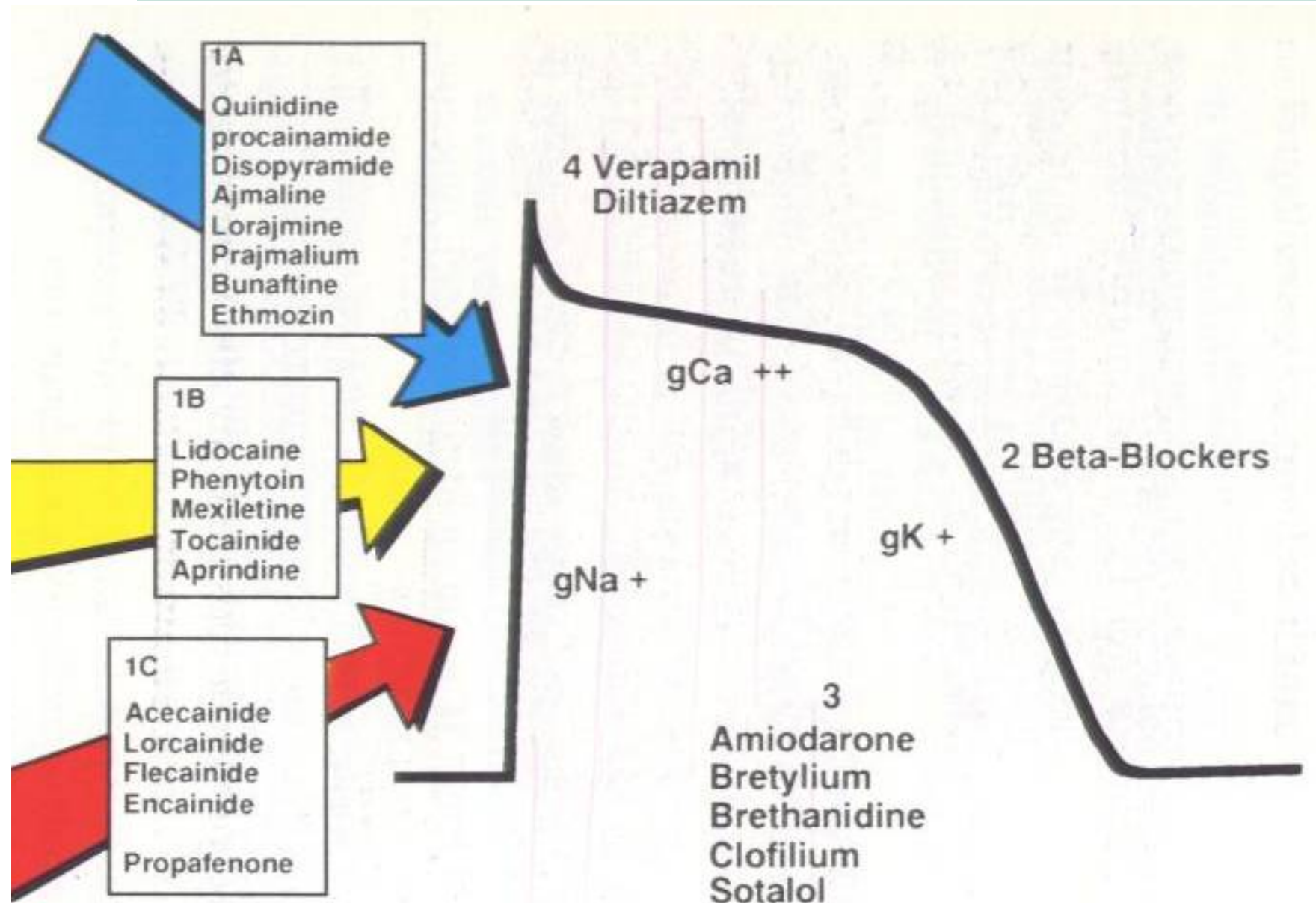




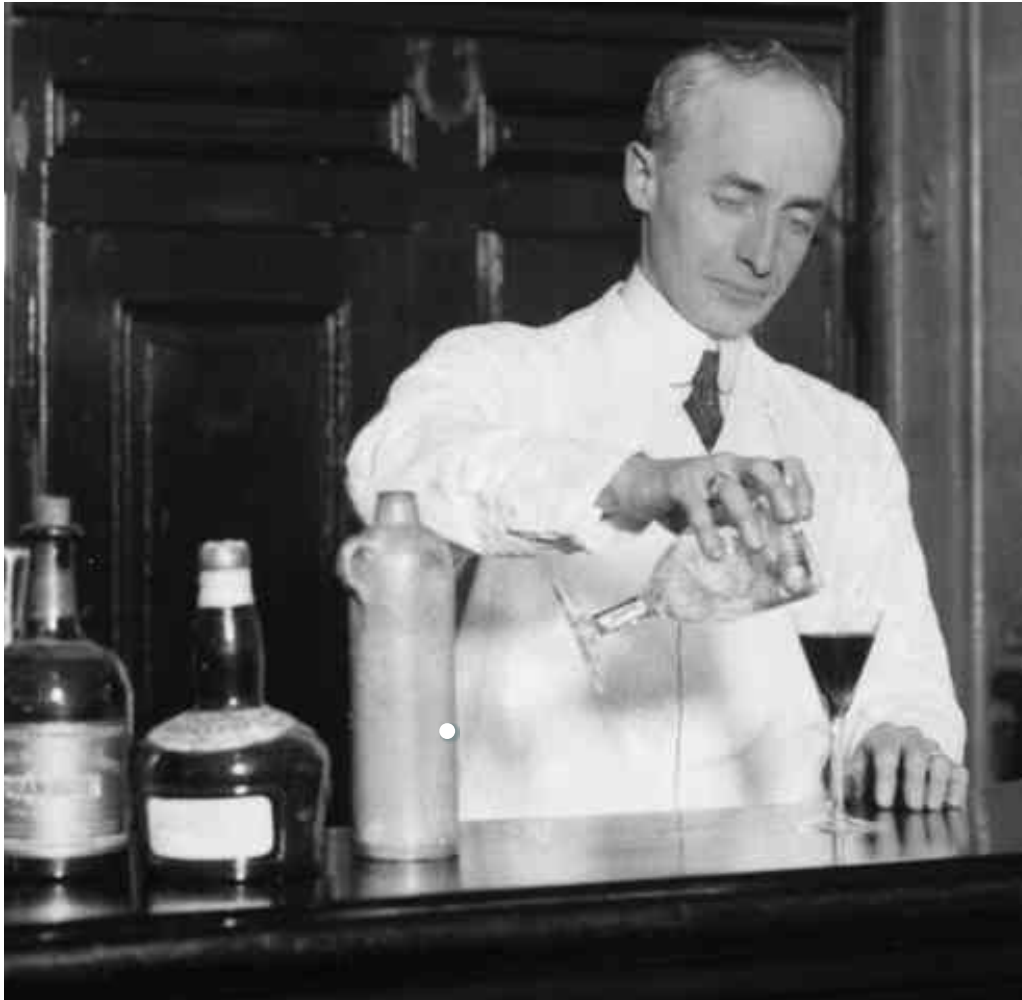
Antiaritmici in età pediatrica

	Dose evento acuto	Infusione	Dose cronica
Adenosina	0.1-0.3 mg/kg in 3"	Bolo rapido	
Amiodarone	5-7 mg/kg in 20'	10-15 mg/kg/die	150/250 mg/m ² /die
Atenololo			1-3 mg/kg/die
Atropina	0.02 mg/kg		
Bicarbonato Na			
Flecainide	1-2 mg/kg in 20'	0.1-0.2 mg/kg/h	50-200 mg/m ² /die
DC shock	0.25-4 J/kg		
Digossina	0.020/0.035 mg/kg		Varia x età e peso
Diltiazem	0.15-0.25 mg/kg in 5'	0.003 mg/kg/min	2-6 mg/kg/die
Disopiramide			10-25 mg/kg/die
Diving Reflex	ghiaccio per 15"	Su naso e bocca	
Esmololo	0.5 mg/kg in 2'	0,05-0.2 mg/kg/min	
Lidocaina	1-2 mg/kg in 5'	0,02-0.05 mg/kg/min	
Magnesio solfato	15 mg/kg in 5'	15-30 mg/kg/h	
Massaggio S.C.	> 3 anni di età		
Metoprololo	0.1 mg/kg in 5'		1-3 mg/kg/die
Mexiletina			5-15 mg/kg/die
Nadololo	0.05 mg/kg		0.5-2.5 mg/kg/die
Procainamide	7-15 mg/kg in 10'	0.04-0.08 mg/kg/min	
Propafenone	0.5-2 mg/kg in 10'	0.004-0.01 mg/kg/min	200-600 mg/m ² /die
Propranololo	0.025-0.2 mg/kg in 5'		2-6 mg/kg/die
Sotalolo	0.2-1.5 mg/kg in 15'		50-200 mg/m ² /die
Verapamil	0.15 mg/kg in 15'	Non usare < 1 anno età	5-15 mg/kg/die

Half-life, death and miracles of AAD



The Bartender: Barrhythmias



**Shaken (baby)
not stirred (drugs)**

The bartender knows the **ice**

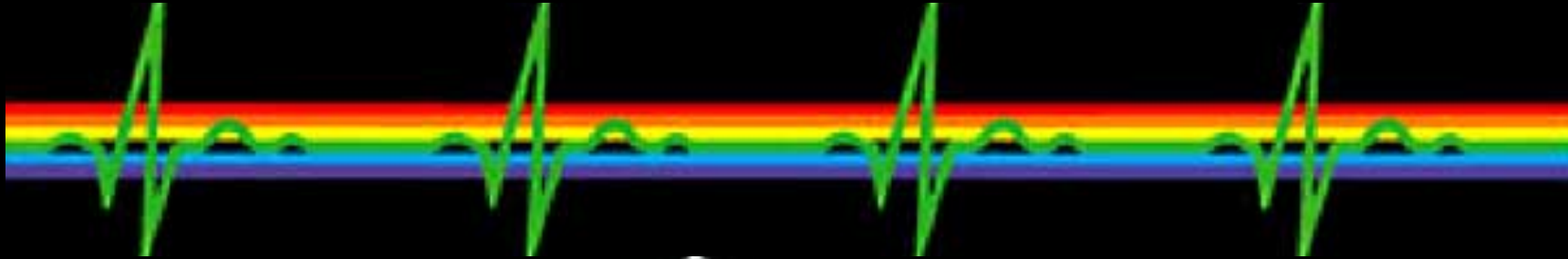
He knows how to shake, he
makes you vomit

He knows what a **baby** is

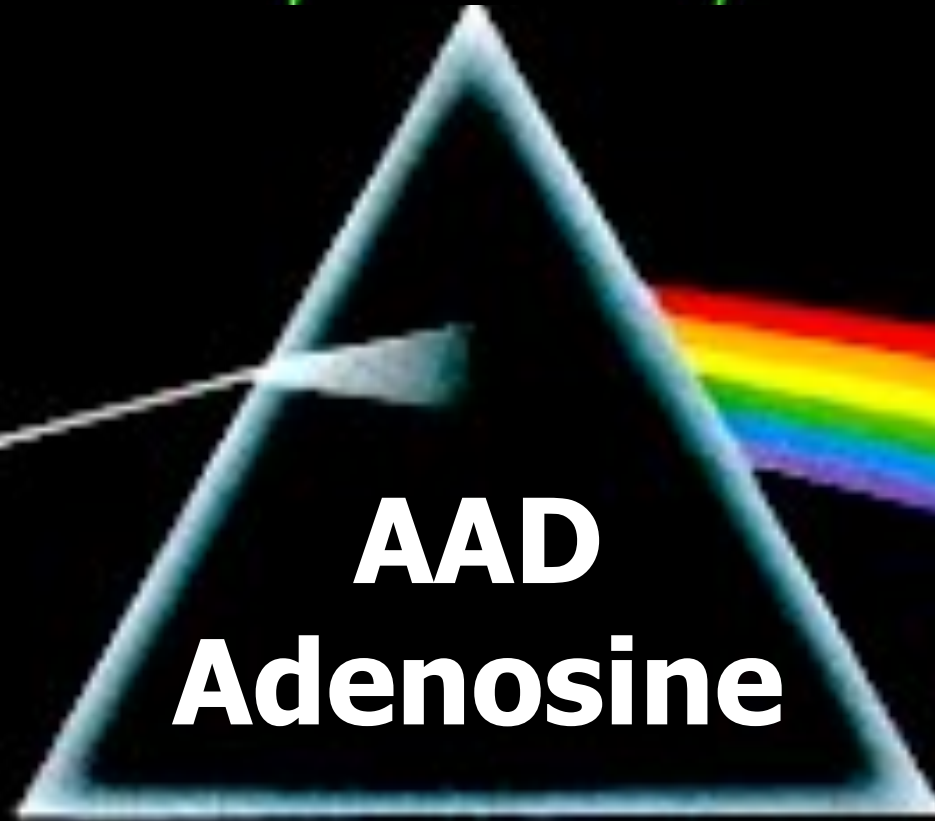
He takes away the acidity, he
uses **bicarbonate**

He knows that a **good cocktail** is
essential and must last a short
time

Doctor as a part of the circuit



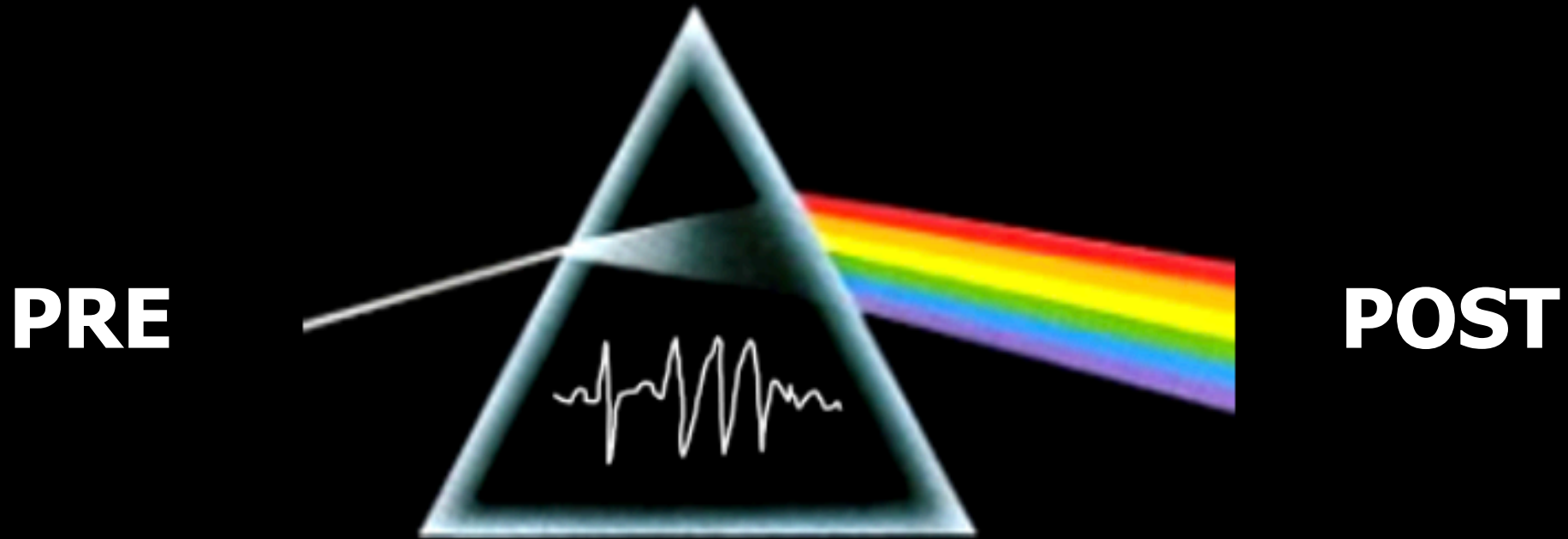
(S)VT



SR

Permanent
SVT

Chi va piano va lontano....



The slower it goes, the more incessant it can be. But the faster it goes, the sooner it can lead to failure



Dal Glen Grant

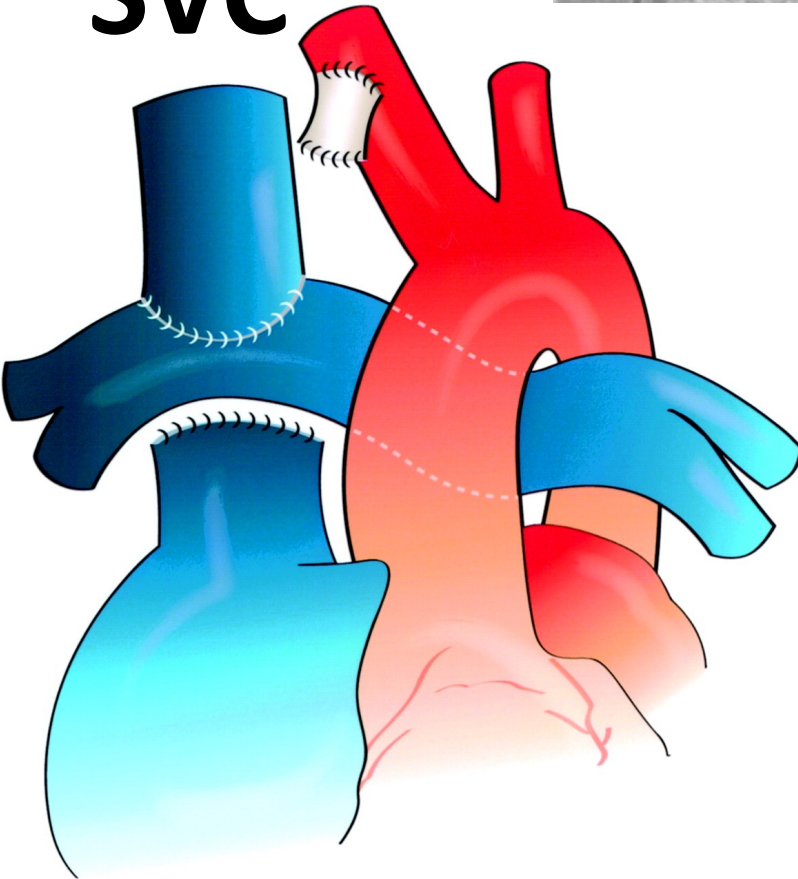
al

Glenn grande

Fare le cose con i piedi...

**Adenosine
works only
from the
legs**

SVC

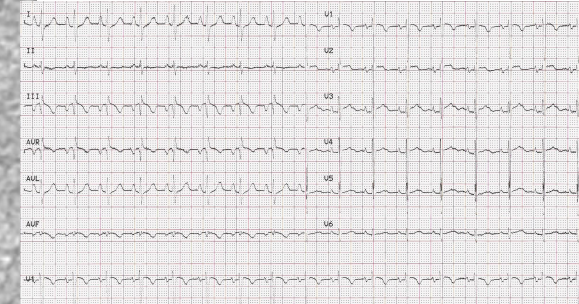
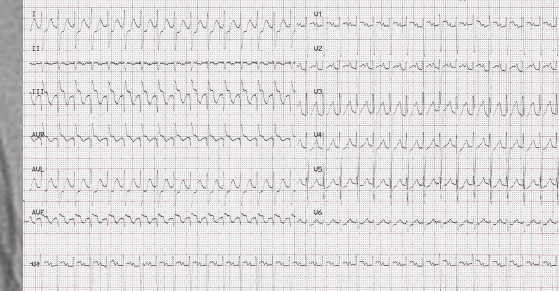
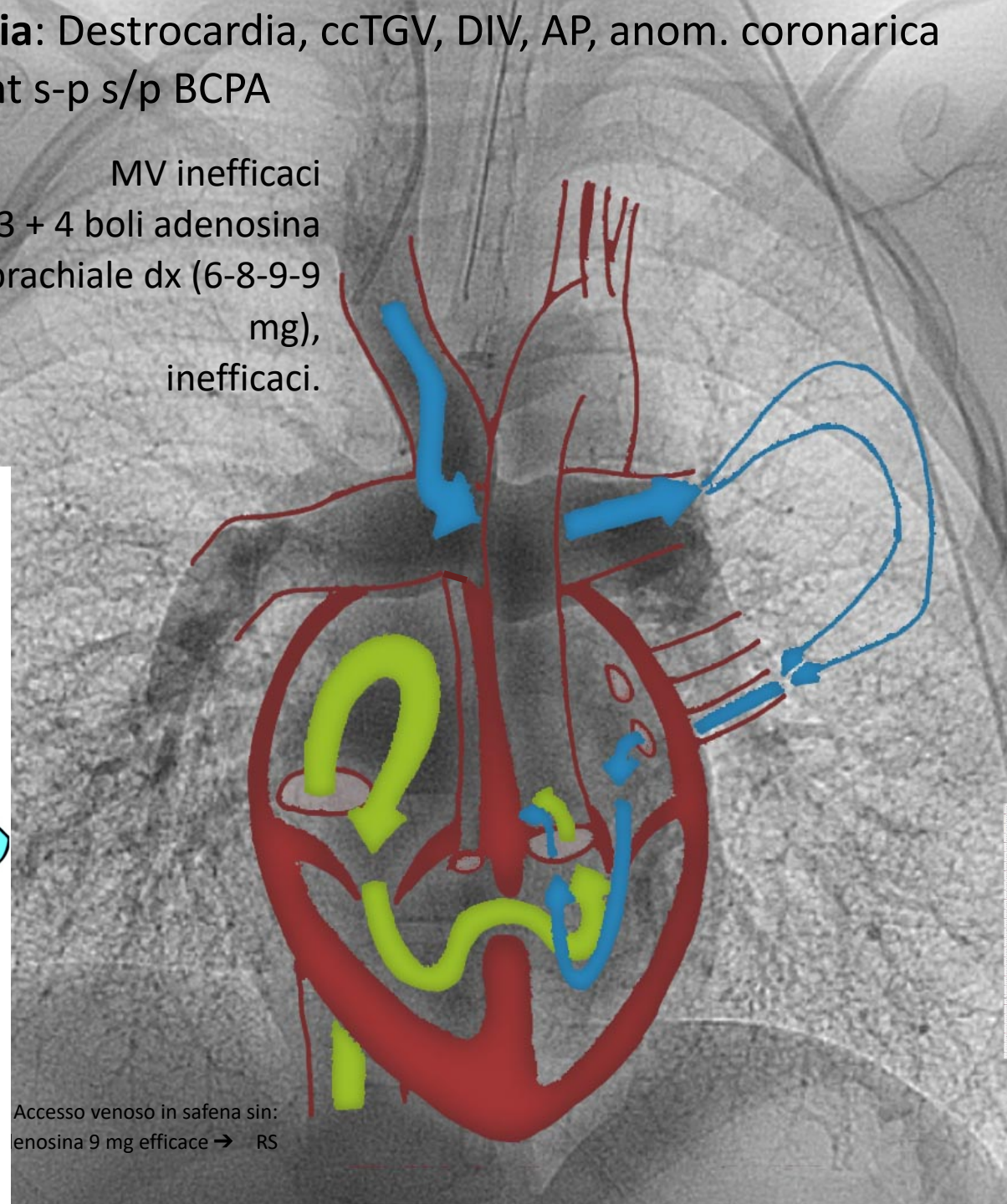


Anatomia: Destrocardia, ccTGV, DIV, AP, anom. coronarica
s/p shunt s-p s/p BCPA

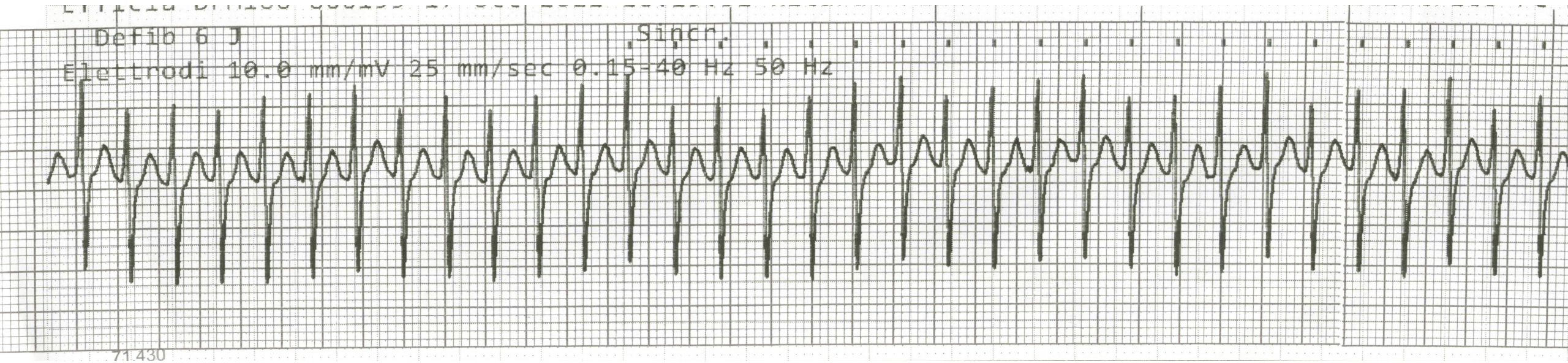
MV inefficaci
NaHCO₃ + 4 boli adenosina
per via brachiale dx (6-8-9-9
mg),
inefficaci.

Accesso venoso in safena sin:
enosina 9 mg efficace → RS

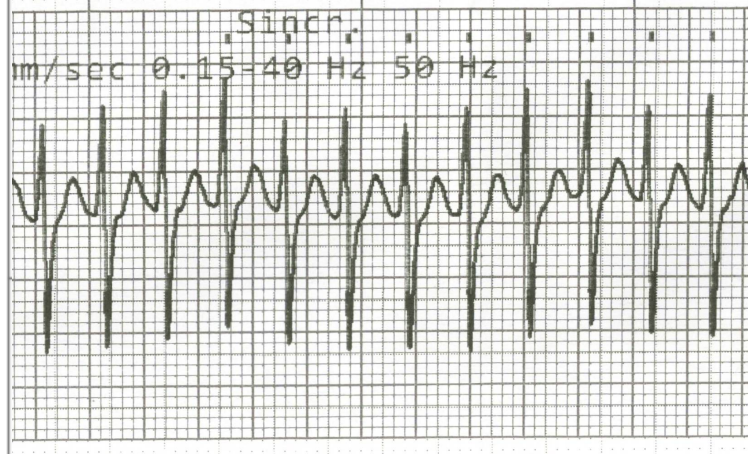
**Glenn
grande**



«the heart beats so fast that you can't count»



Valori emogas			
↓ pH	6,999		[7,320 - 7,420]
↓ pCO ₂	31,6	mmHg	[41,0 - 51,0]
?↑ pO ₂	50,1	mmHg	[20,0 - 40,0]
Valori ossimetrici			
↓ ctHb	12,0	g/dL	[12,0 - 17,5]
sO ₂	65,3	%	[40,0 - 70,0]
FO ₂ Hb	63,7	%	[- -]
FCOHb	1,3	%	[- -]
FHHb	33,8	%	[- -]
FMetHb	1,2	%	[- -]
Valori elettroliti			
↑ cK ⁺	5,2	mmol/L	[3,4 - 4,5]
↓ cNa ⁺	134	mmol/L	[136 - 146]
cCa ²⁺	1,26	mm	
↑ cCl ⁻	107	mm	
Valori metaboliti			
? cGlu	77	mg	
↑ cLac	15	mm	
ctBil	4,1	mg	
Valori corretti con la temperatura			
pH(T) _c	7,011		
pCO ₂ (T) _c	30,3	mm	
? pO ₂ (T) _c	46,8	mm	
Stato di ossigenazione			
ctCO ₂ (B) _c	17,8	Vol	
? ctO ₂ _c	10,8	Vol	
? p50 _c	40,18	mm	
Stato acido-base			
cBase(Ecf) _c	-23,5	mm	
cHCO ₃ ⁻ (P.st) _c	8,3	mm	
cHCO ₃ ⁻ (P) _c	7,8	mm	
? cCa ²⁺ (7.4) _c		mm	
Anion Gap _c	19,5	mm	
Valori calcolati			
? mOsm _c	273,1	mmol/kg	



Pediatric Tachycardia With a Pulse Algorithm

Initial assessment and support

- Maintain patent airway; assist breathing as necessary
- Administer oxygen
- Cardiac monitor to identify rhythm; monitor pulse, blood pressure, and oximetry
- IV/IO access
- 12-Lead ECG if available

Probable sinus tachycardia if

- P waves present/normal
- Variable RR interval
- Infant rate usually <220/min
- Child rate usually <180/min

Evaluate rhythm with 12-lead ECG or monitor

Cardiopulmonary compromise?

Doses/details

Synchronized cardioversion
Begin with 0.5-1 J/kg; if not effective, increase to 2 J/kg. Sedate if needed, but don't delay cardioversion.

Drug therapy

Adenosine IO/IV dose

- First dose: 0.1 mg/kg rapid bolus (maximum: 6 mg)
- Second dose: 0.2 mg/kg rapid bolus (maximum second dose: 12 mg)

Wide (>0.09 sec)
Evaluate S duration.

Possible ventricular tachycardia

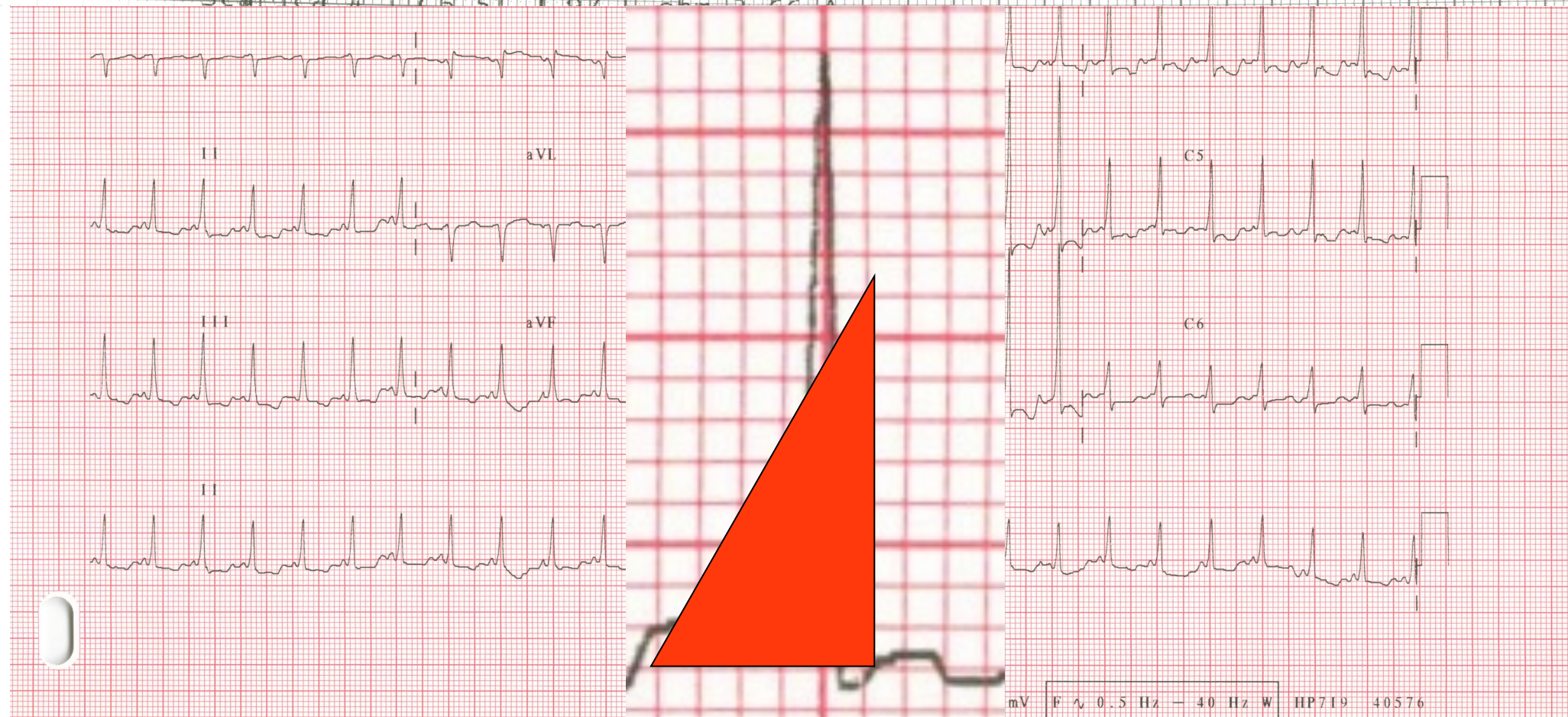
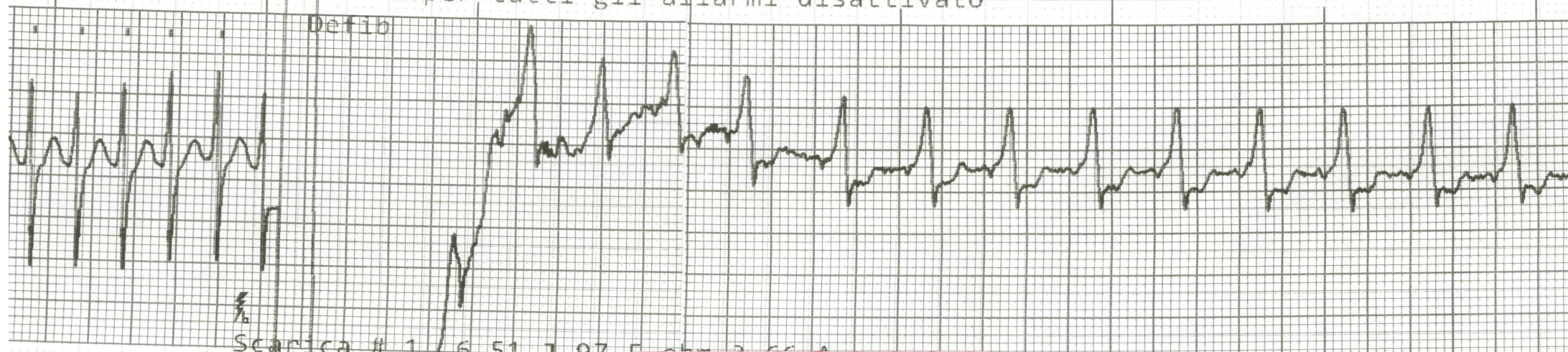
If rhythm is regular and QRS monomorphic consider adenosine.

Expert consultation is recommended.

- If IV/IO access is present, give **adenosine**
- or
- If IV/IO access is not available, or if adenosine is ineffective, perform **synchronized cardioversion**

If IV/IO access is not available, or if adenosine is ineffective, perform synchronized cardioversion

If IV/IO access is present, give **adenosine**.

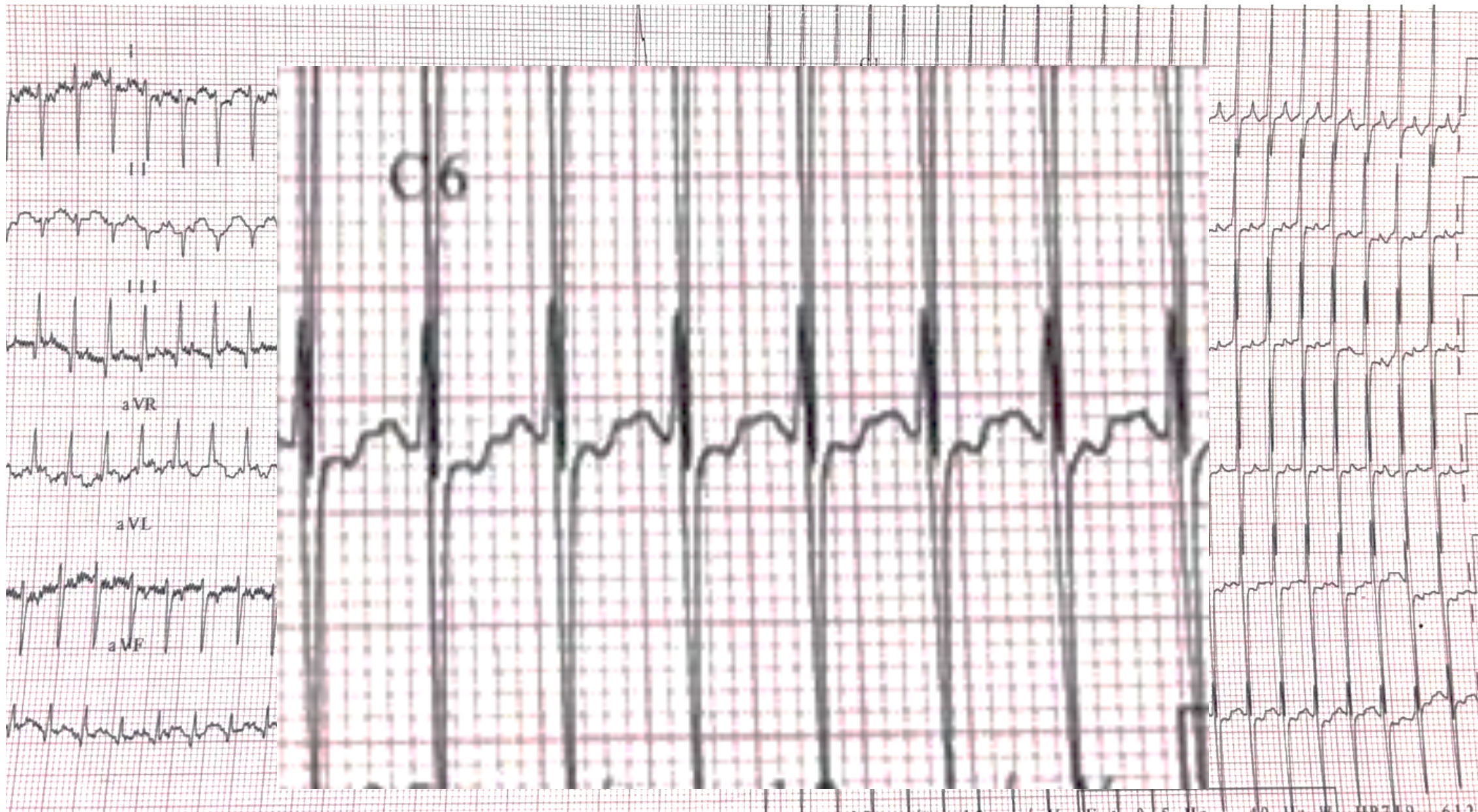


from **WPW** to **CDC**
come **Dio** comanda e senza cani

Arrhythmia, Calm, Dignity and Class

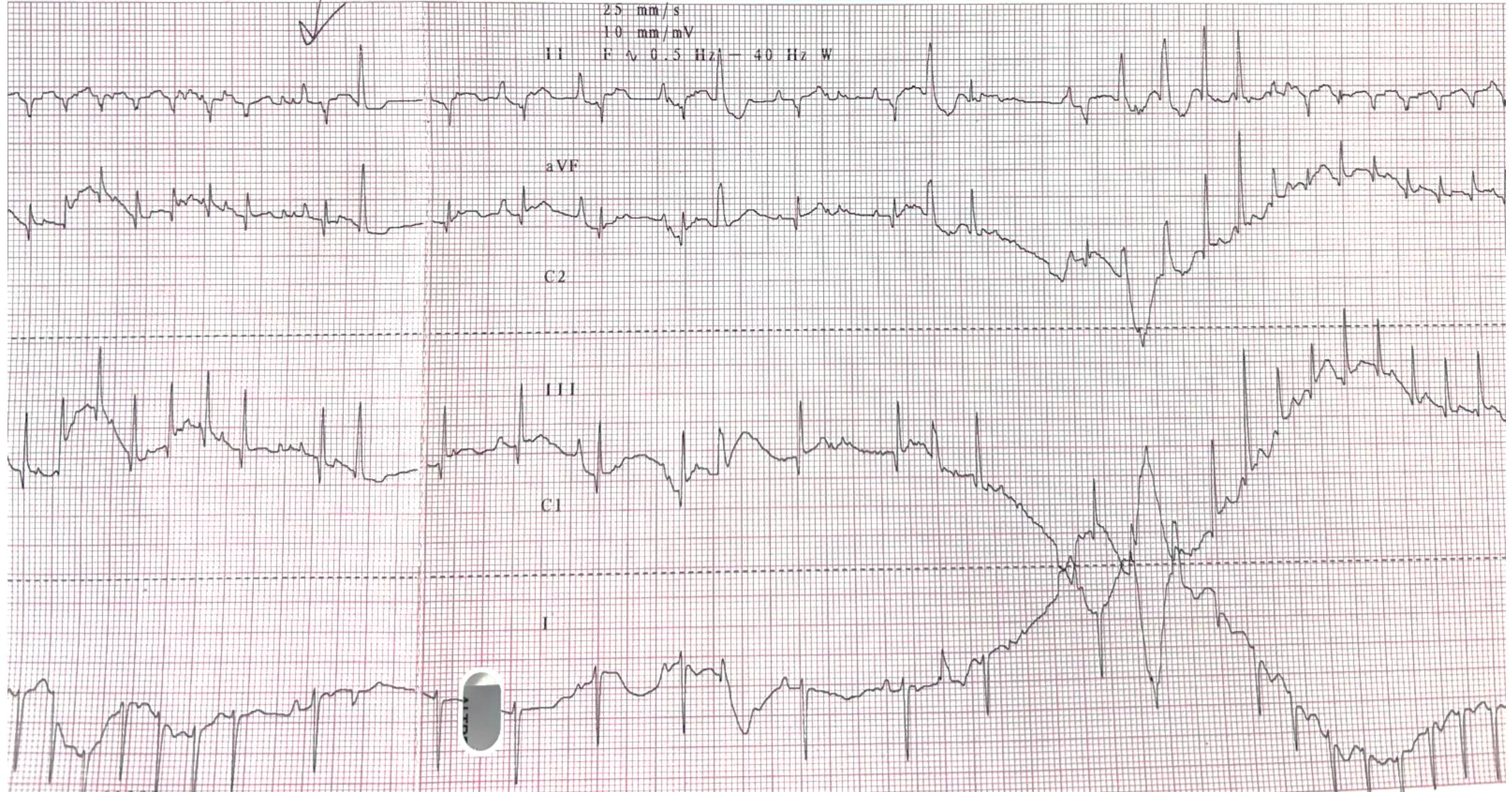


2 weeks baby in shock

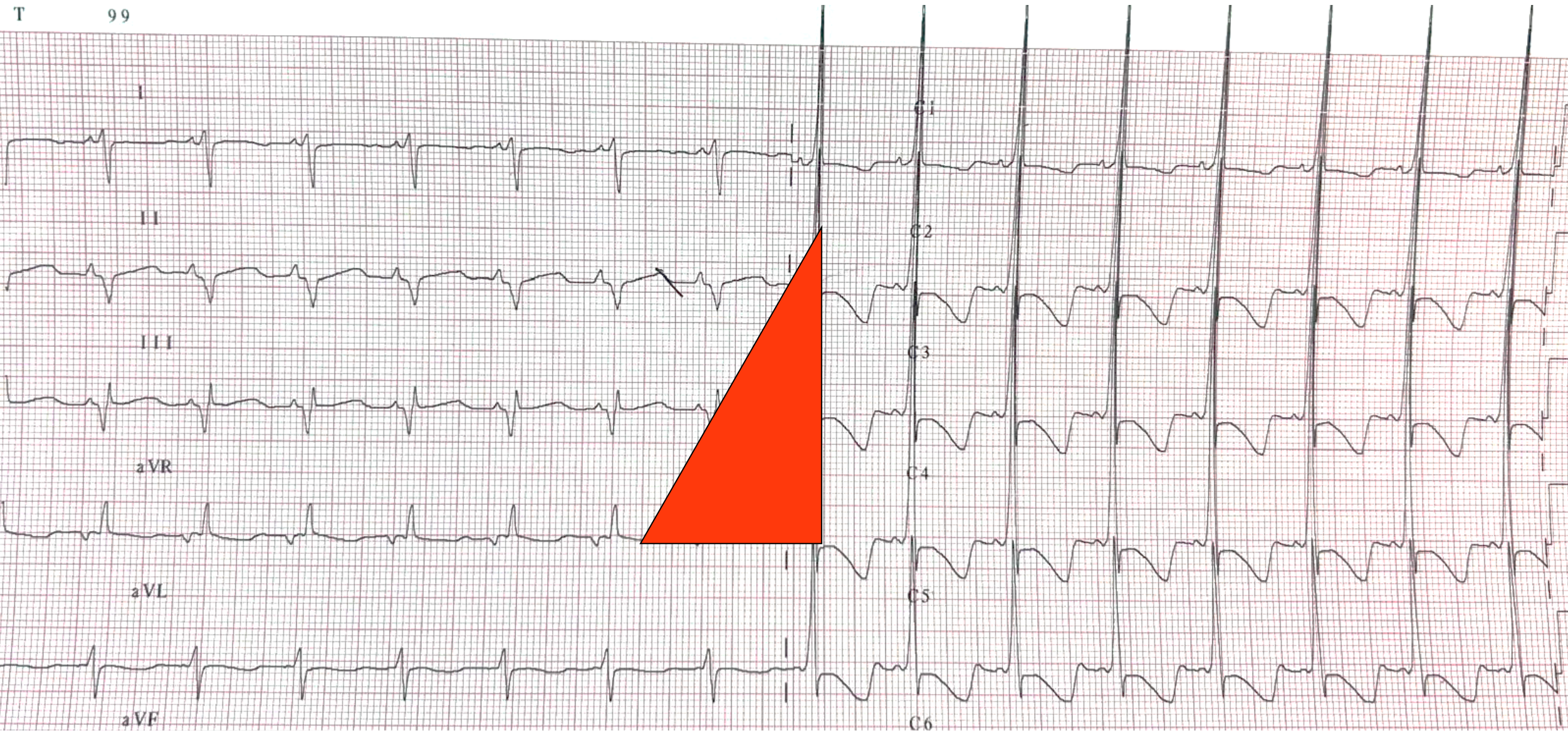


ADENOSINA

**Relapses after adenosine,
ready for ECMO...but**



Preexcited SR



IVA



DINA

IVA-BRA-DINE

J Cardiovasc Electrophysiol. 2013 Jul;24(7):822-4. doi: 10.1111/jce.12081. Epub 2013 Feb 1.

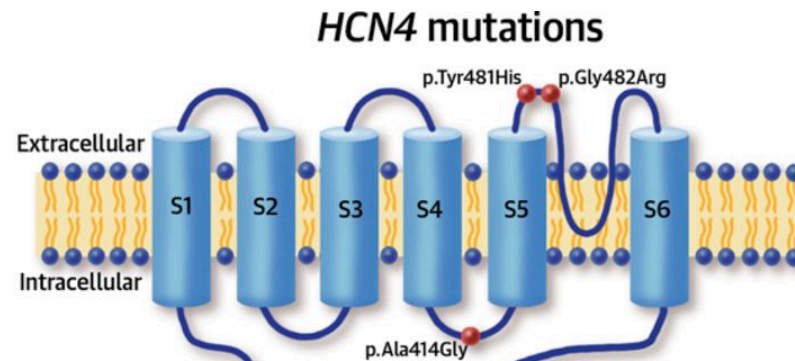
Potential new indication for ivabradine: treatment of a patient with congenital junctional ectopic tachycardia.

Al-Ghamdi S¹, Al-Fayyadh MI, Hamilton RM.

⊕ Author information

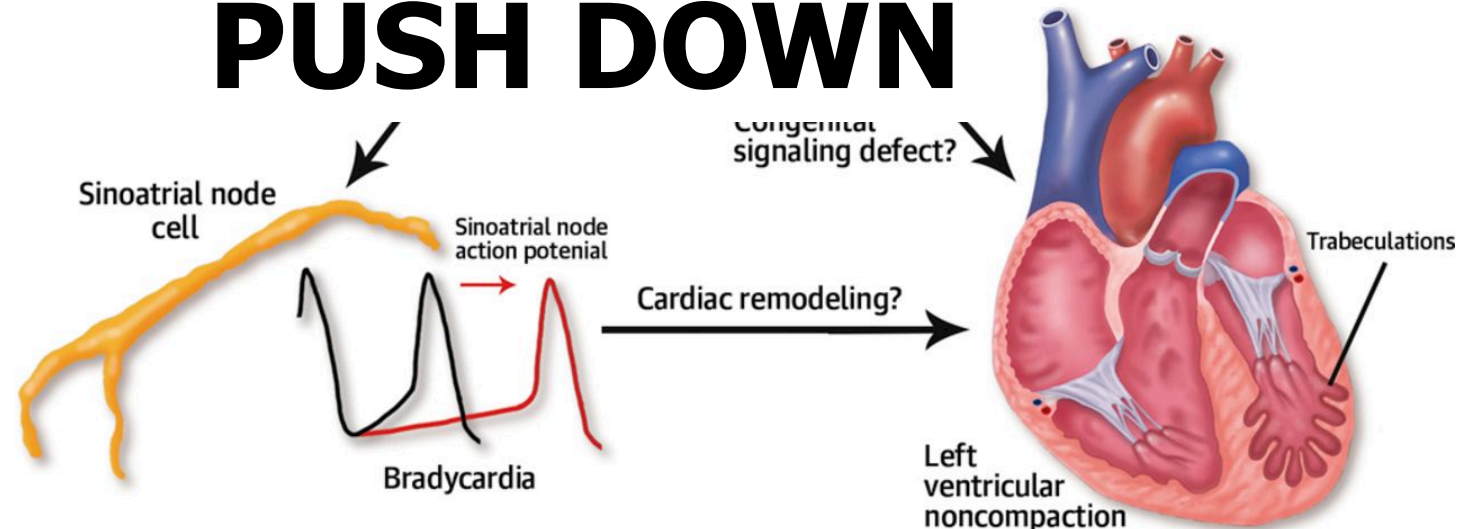
Abstract

Ivabradine is a new antiarrhythmic decrease sinus rate in the treatme we report the case of a 3-year-old antiarrhythmic medications, who v treatment for junctional automatic tachycardia.



**Effective
in AET
and JET**

PUSH DOWN



NaHCO₃

La Pia...Dina



TachipirINA

DigossINA

EroINA

AdenosINA

> CortisONE

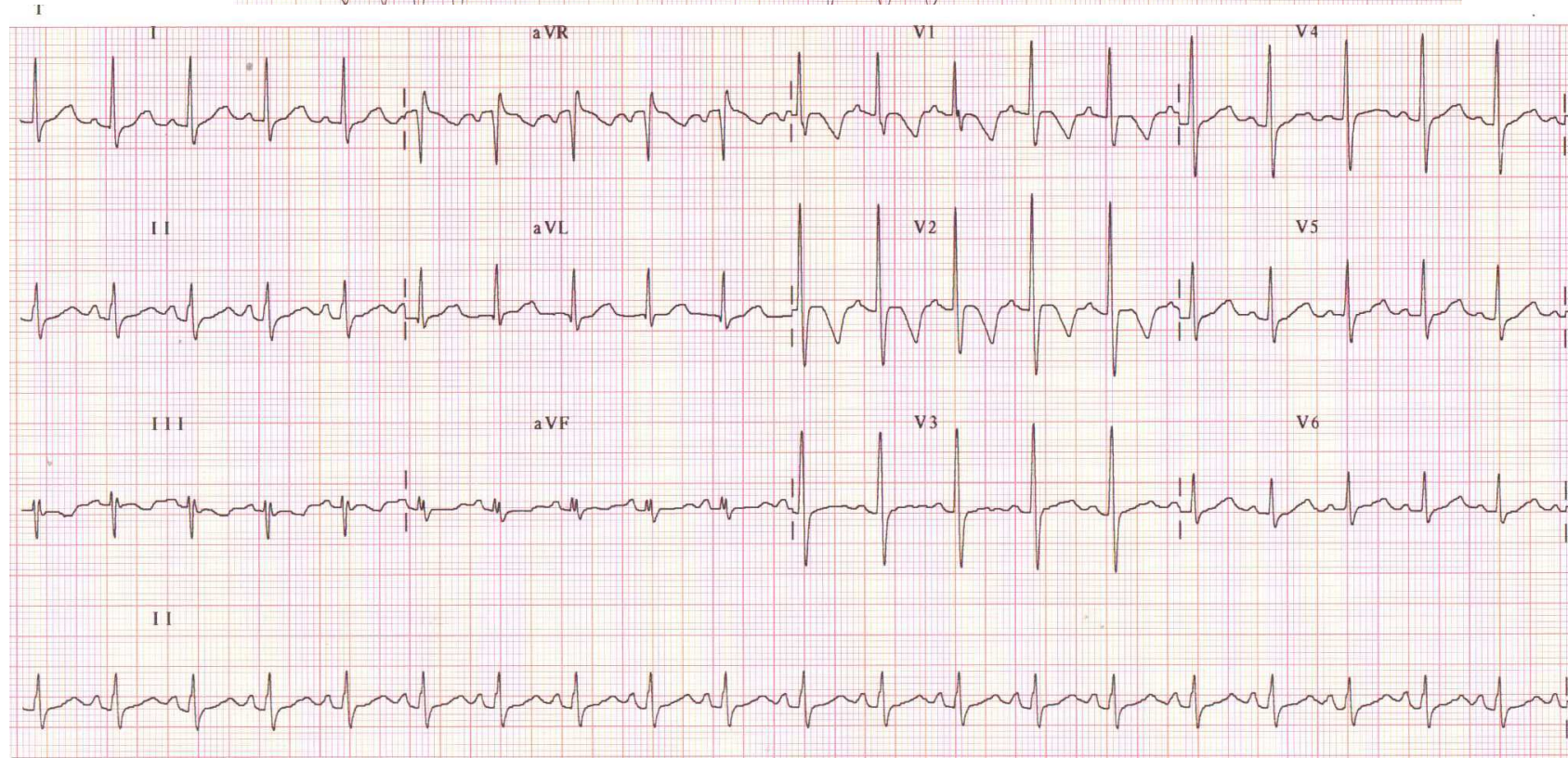
> MilrinONE

> MetadONE

> AmiodarONE



3 yo , Intossicazione da flecainide, rinato col bicarbonato

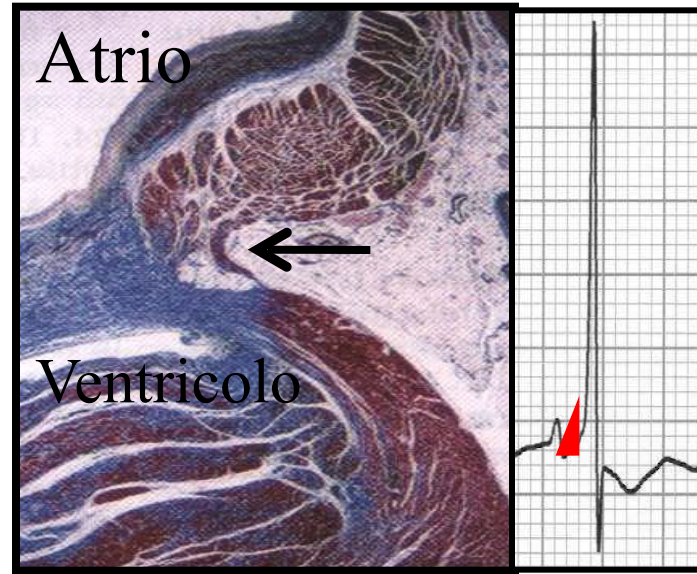


Profilassi TPSV

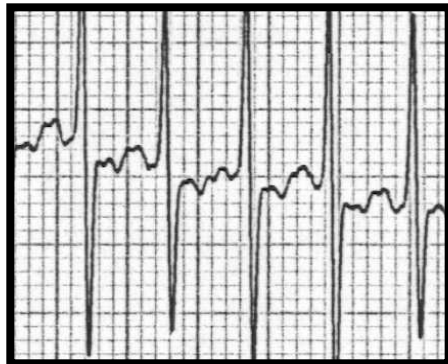
<i>Età</i>	<i>CHI ?</i>	<i>COSA SÌ</i>	<i>COSA NO</i>
1 anno	TUTTI	Ic, BB, III, Dig	Ca anta
>1 anno	SINTO	Ic, BB, III, Ca anta PILL INTP	Nodo attivi in Δ^+
>10 anni	SINTO RISCHIO	PILL IN T P Ca anta ABLAZIONE	ABLAZIONE in Δ^-

Telemedicina, raccomandazioni ai genitori.....

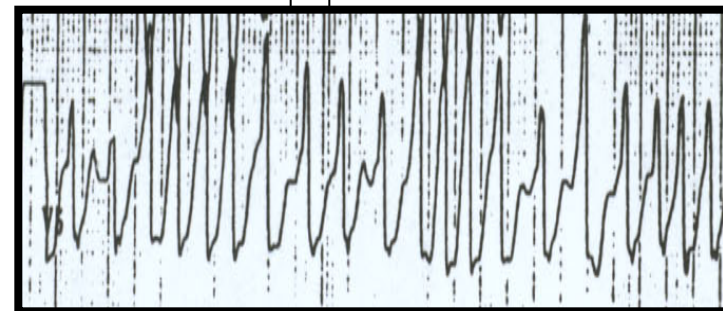
Who When Where What Why P W ?



AVRT



FA Preecitata



12 anni

Sedation

**0.2mg
/kg**



**ADENOSINE
IVABRADINE**

**Timing: VM
AAD
Short HL
Avoid Mix**

**Everything
that ends with
-INE is Fine**

**Fever
Acidosis
Electrolytes**

All you need is slow

Screen more and Beat less

