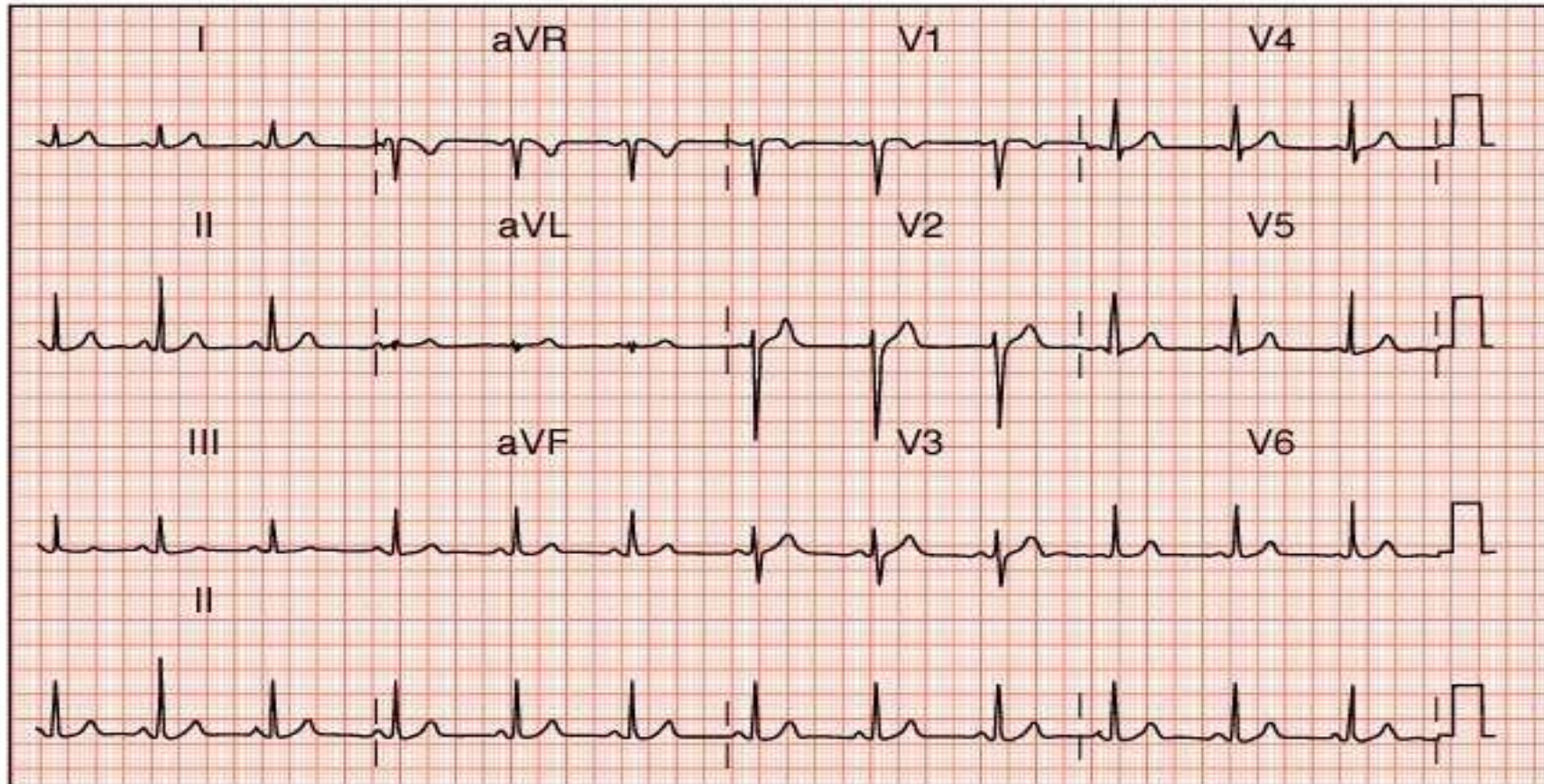


L'ecg normale!!!!



Tienilo a mente e individua negli ecg che vedi ciò che è diverso dal normale

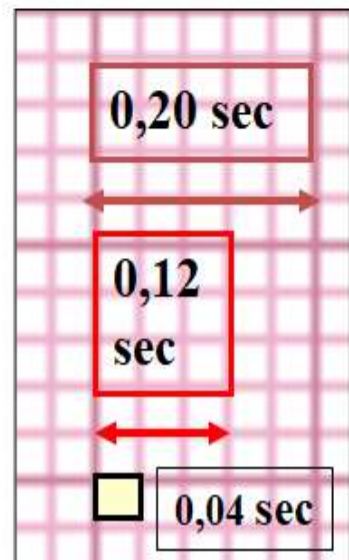
Ricorda

- Frequenza (alta, >100 bpm? attenti a 150bpm!)
- Ritmo (regolare? irregolare?)
- QRS (largo? stretto?)
- Onda P (identificabile? non identificabile?)
- Rapporto P_QRS (ci sono + P che QRS?)

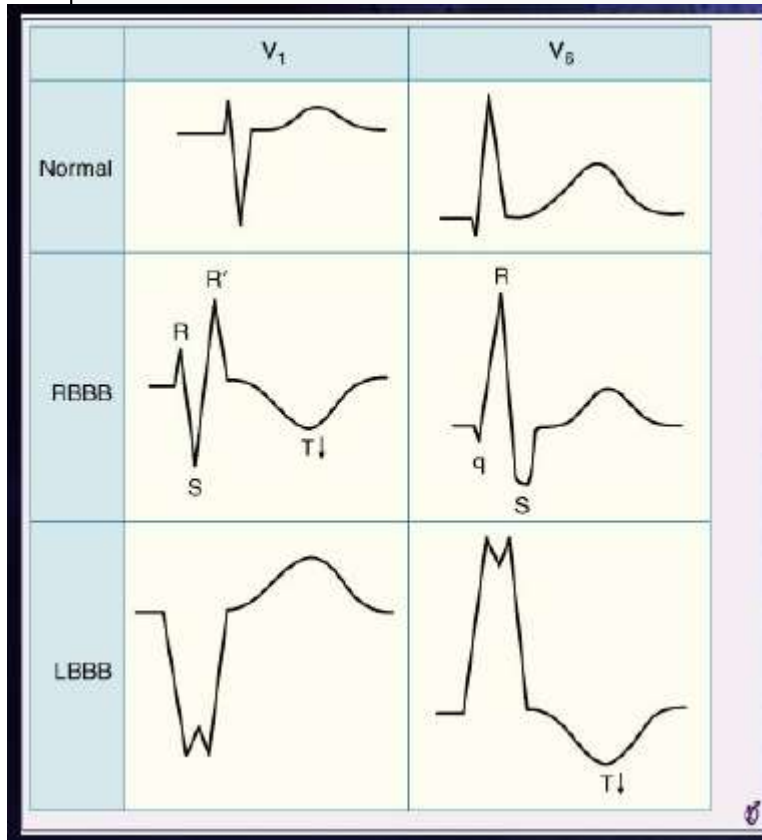
QRS NORMALE: < 0.12 S (=120msec = 3 QUADRETTI PICCOLI):

la depolarizzazione segue le vie naturali e il QRS nasce
PRIMA DELLA BIFORCAZIONE DEL FASCIO DI HIS

IL QRS È NORMALE O ALLARGATO?



QRS largo: valuta la morfologia!!!



BBdx: guarda QRS in V1 («tutto sopra» l'isoelettrica)

QRS >0.12 secondi (completo)

rSr' in V1-V3

alterazioni secondarie della ripolarizzazione

BBsx: guarda QRS in V1 («tutto sotto» l'isoelettrica)
e V6 (manca la q)

QRS >0.12 secondi

QRS negativo in V1-V2

QRS positivo in V5-V6 (bifido)

assenza onde R in V1-V2

assenza onde Q in D1, aVL, V5, V6

alterazioni della ripolarizzazione

Tachiaritmie: classificazione

- Sopraventricolari:
 - origine al di sopra della biforcazione del fascio di His (atrii, giunzione av)
 - complessi usualmente stretti (<120 msec), ripolarizzazione normale
- Ventricolari:
 - origine distalmente alla biforcazione del fascio di His (branche, fibre del Purkinje, miocardio di lavoro)
 - complessi larghi (>120 msec), ripolarizzazione alterata

QRS

Stretto < 0,12 sec

largo > 0,12 sec

R-R regolare

R-R irregolare

R-R regolare

R-R irregolare

Tachicardia sinusale
Tachicardia atriale
TPSV: * rientro nodale
* rientro A-V su via access.
Flutter Atriale

Fibrillazione atriale

Fibrillazione atriale
con blocco di branca

Qrs identico in ecg precedenti: BB documentato

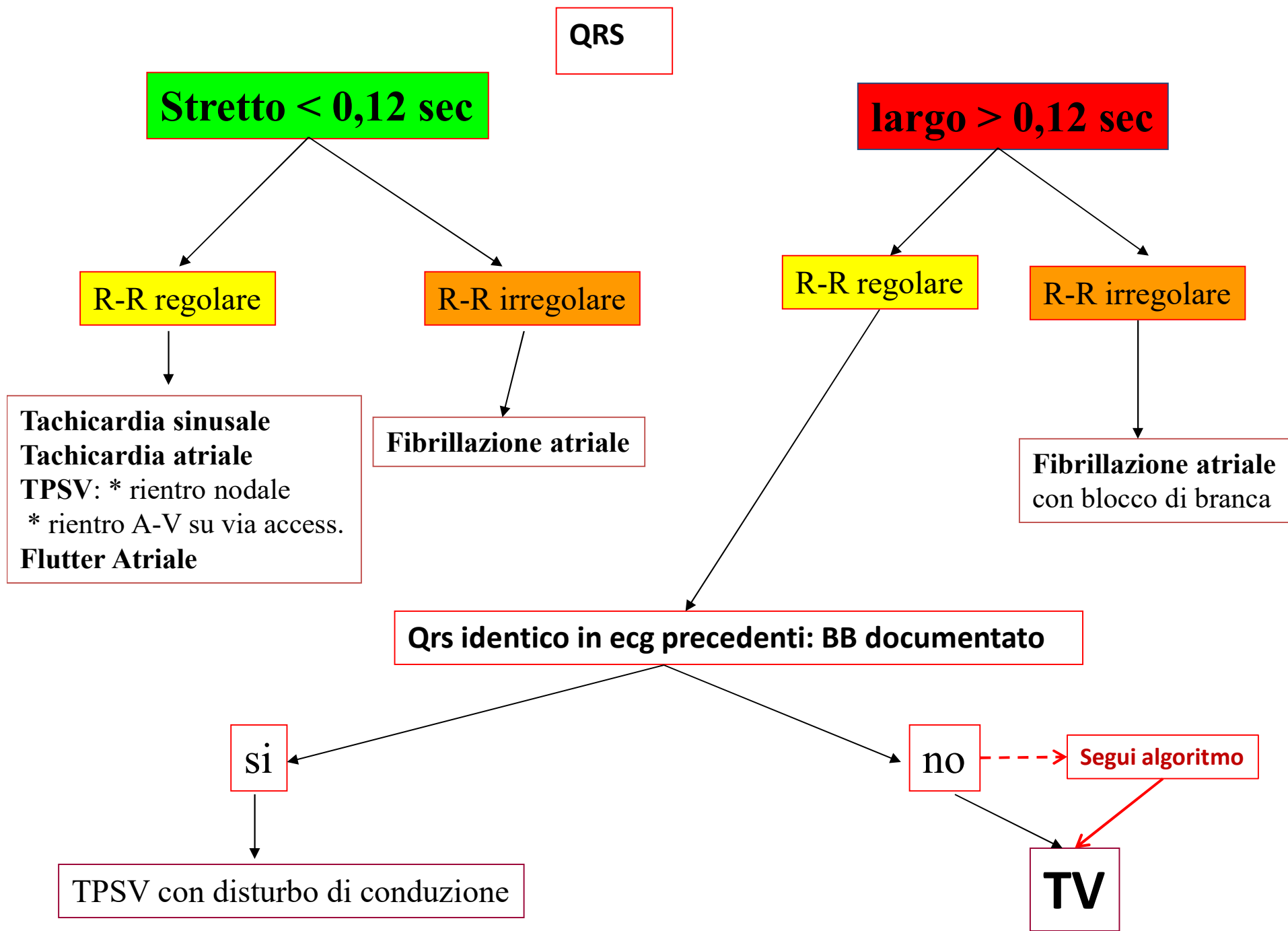
si

no

Segui algoritmo

TPSV con disturbo di conduzione

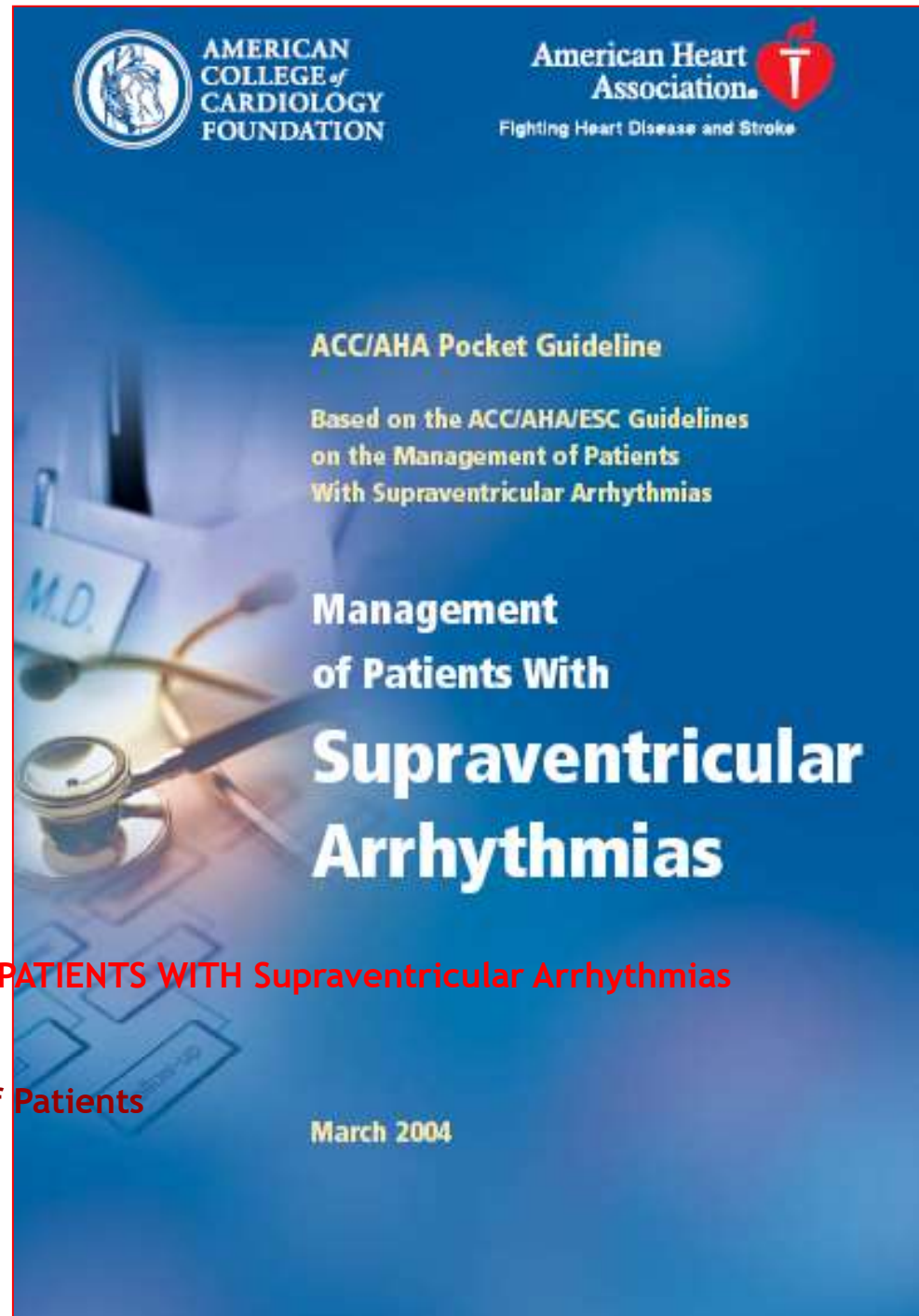
TV



www.acc.org

Blomström-Lundqvist ET AL., MANAGEMENT OF PATIENTS WITH Supraventricular Arrhythmias

J Am Coll Cardiol 2003;42:1493-531
ACC/AHA/ESC Guidelines for the Management of Patients
With Supraventricular Arrhythmias



2015 ACC/AHA/HRS Guideline for the Management of Adult Patients With
Supraventricular Tachycardia: Executive Summary

A Report of the American College of Cardiology/American Heart Association Task
Force on Clinical Practice Guidelines and the Heart Rhythm Society

Circulation. 2015;132:000–000.)



Europace
doi:10.1093/europace/euw301

EHRA POSITION PAPER

**European Heart Rhythm Association (EHRA)
consensus document on the management of
supraventricular arrhythmias, endorsed by Heart
Rhythm Society (HRS), Asia-Pacific Heart
Rhythm Society (APHRS), and Sociedad
Latinoamericana de Estimulación Cardíaca y
Electrofisiología (SOLAECE)**

Europace Advance Access published November 17, 2016

Inquadramento

Tachiaritmie sopraventricolari:

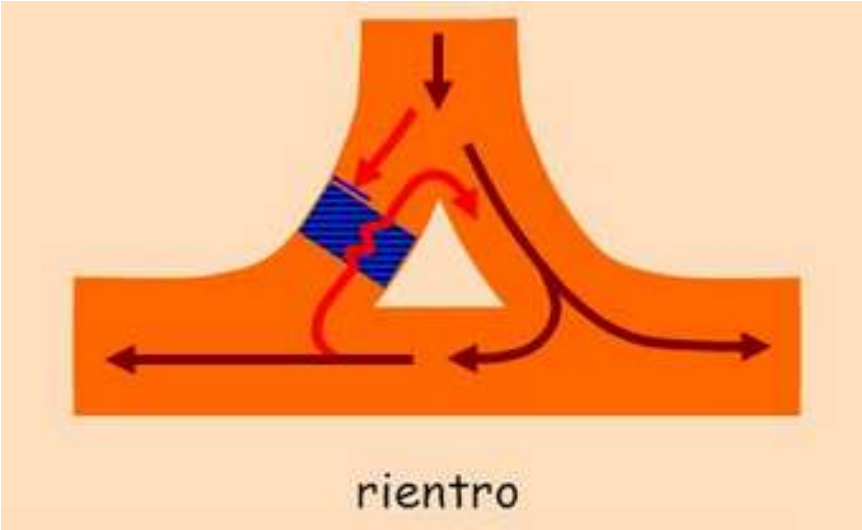
*Fibrillazione atriale

*Flutter atriale

- Tachicardia sinusale (fisiologica, inappropriata)
 - Tachicardia atriale (ectopica, multifocale)
 - Tachicardia giunzionale
- } Bpco, digitale,
Ipossiemia.
- **TPSV:** da rientro nodale
 - da rientro A-V (nel WPW: .ortodromica
 - .antidromica)

Fisiopatologia delle tachicardie sopraventricolari regolari

- Anomalia nella conduzione dell'impulso: ***RIENTRO***
- Anomalia dell'automaticità: **ectopia**
(es: tachicardia atriale)

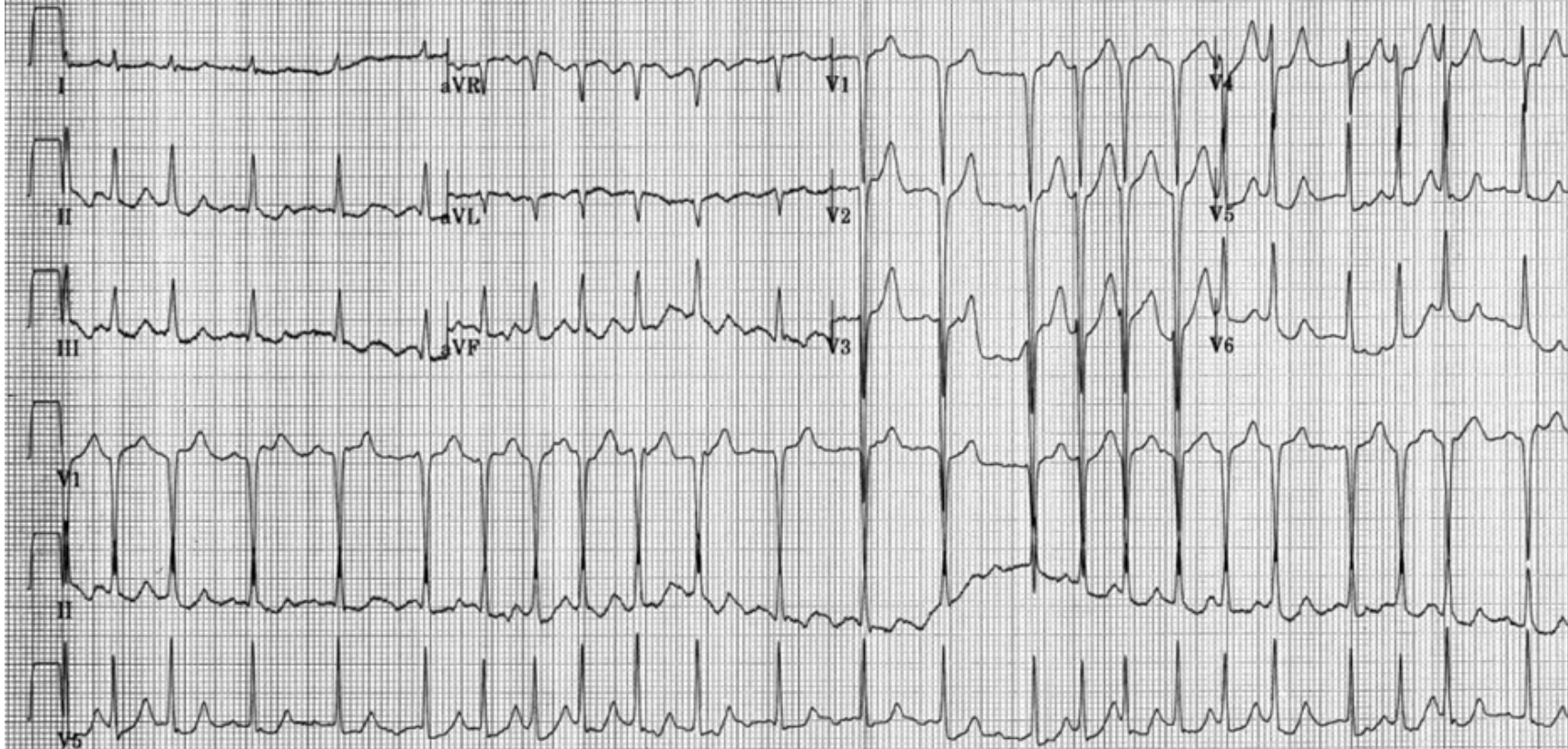


rientro

Iniziamo

Intervallo PR * ms
Durata QRS 78 ms
QT/QTc 262/406 ms
Assi P-R-T * 80 255

Non confermato



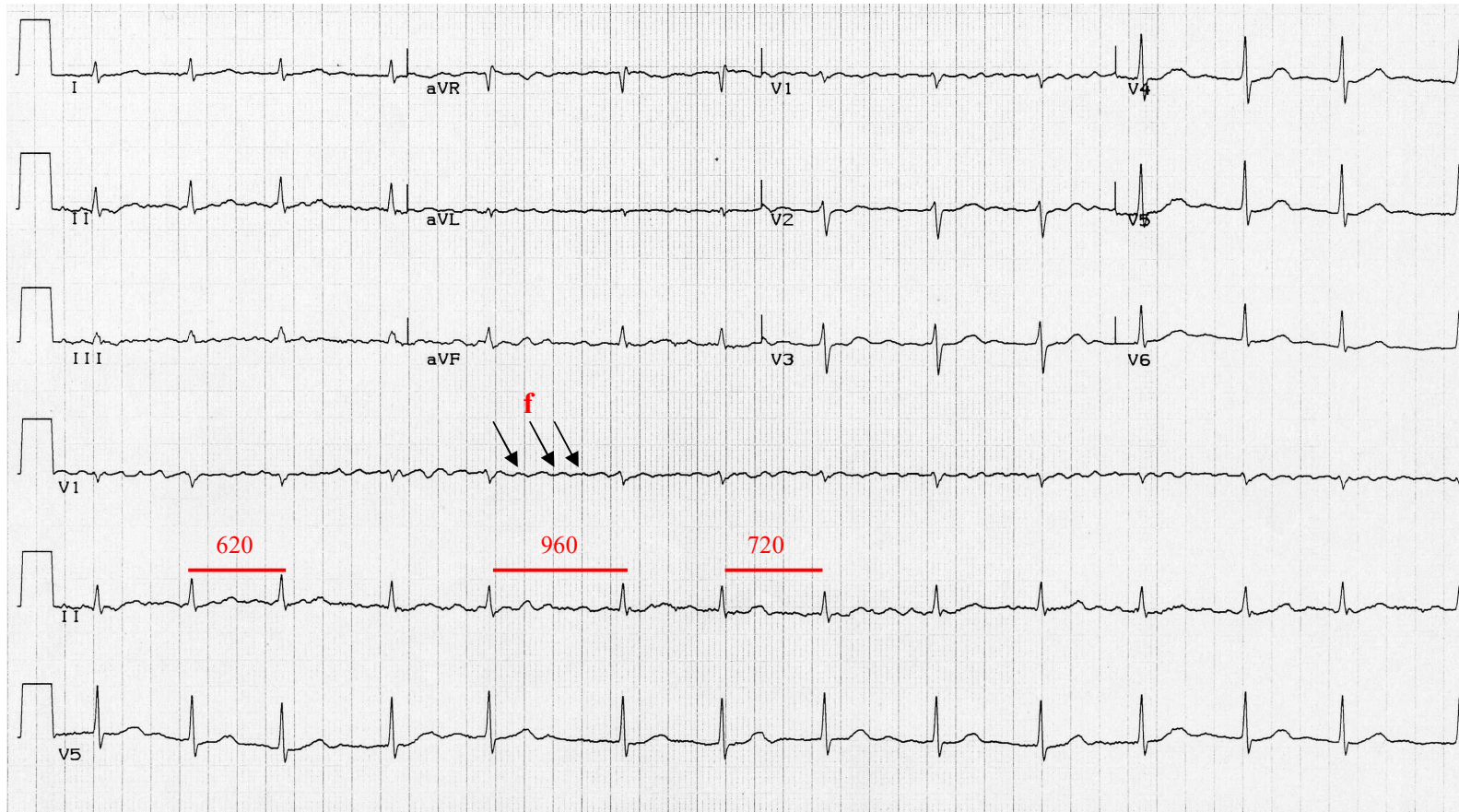
VARIABILE
ALTA
BASSA (farmaci, bav)

IRREGOLARE

STRETTO
LARGO

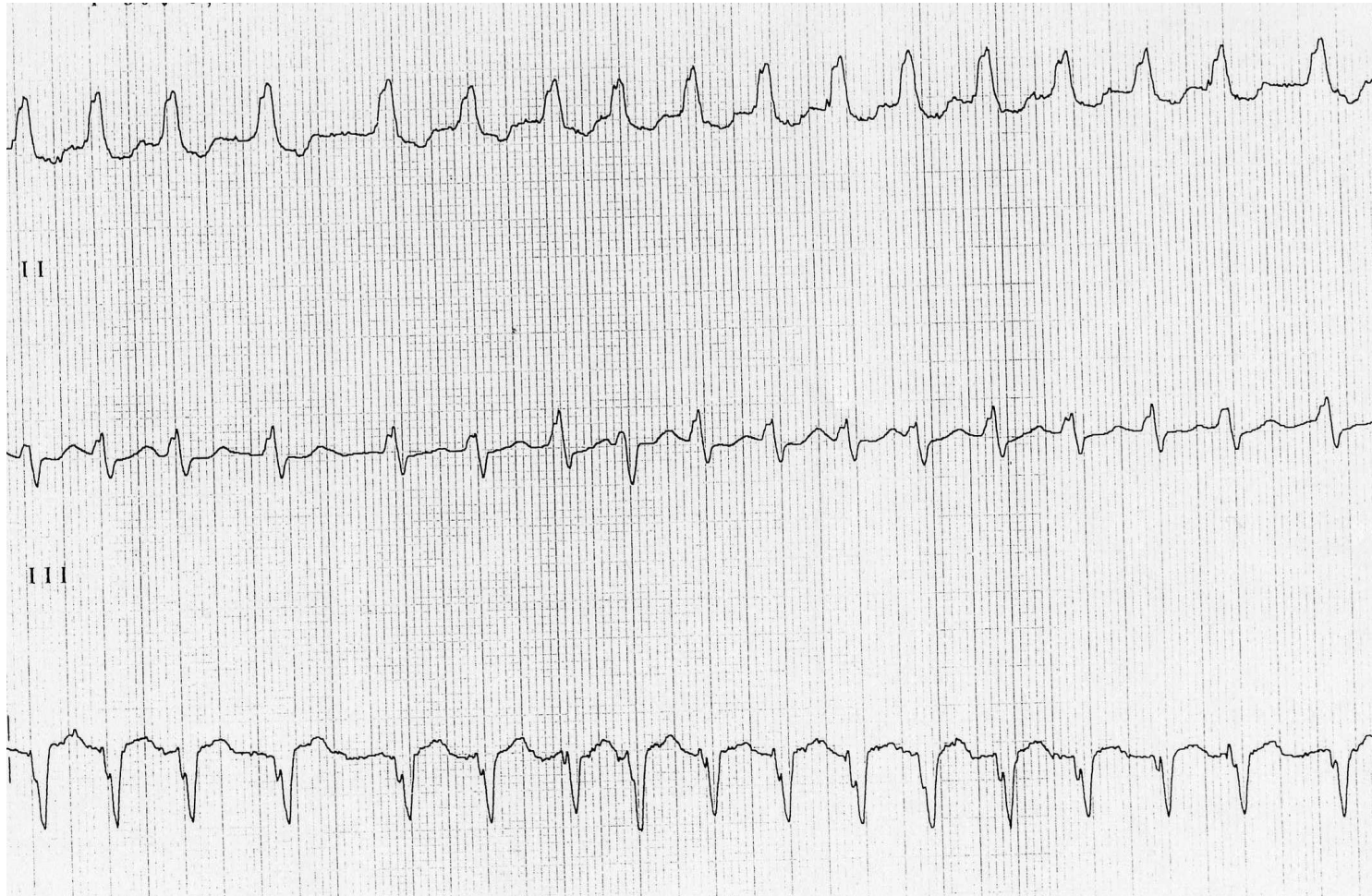
ONDE DI
FIBRILLAZIONE

NON
VISIBILE

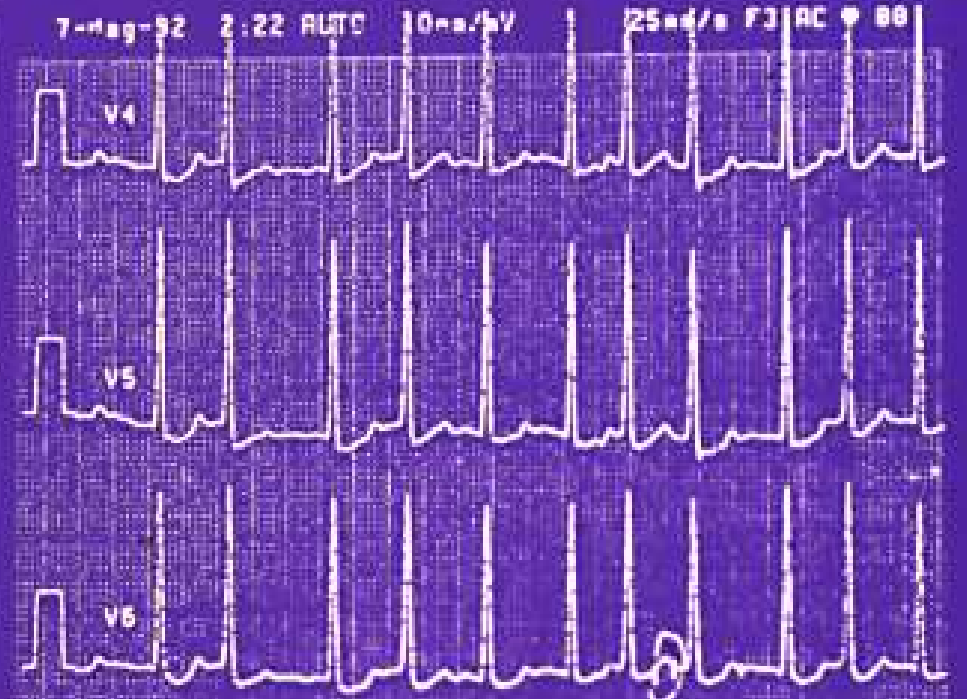
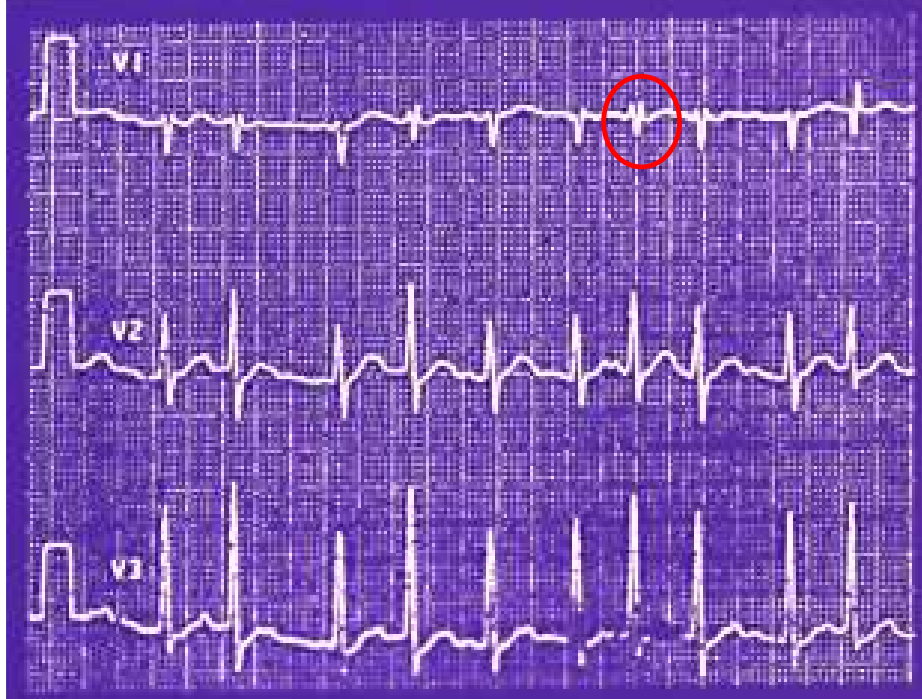
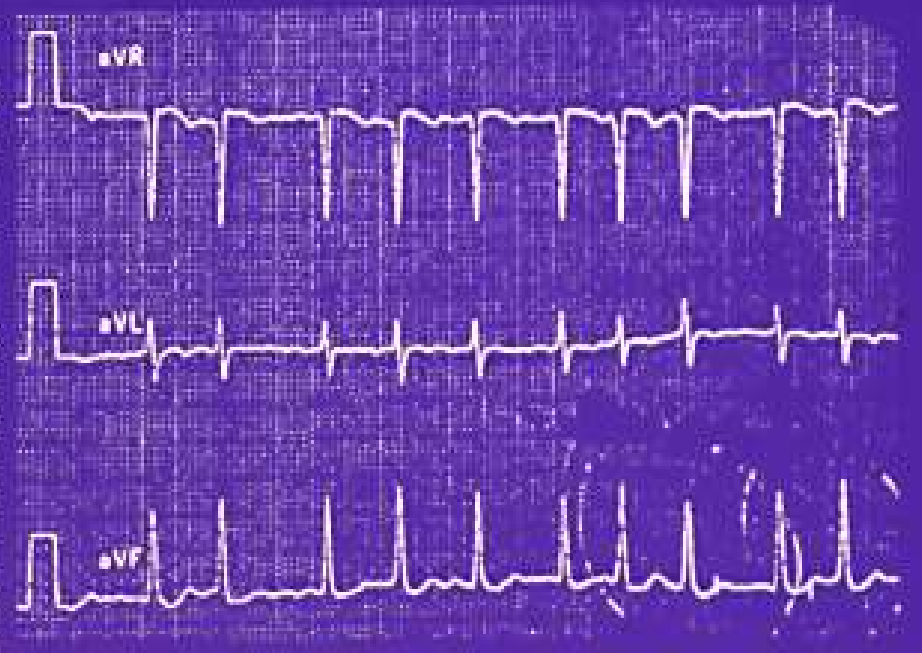
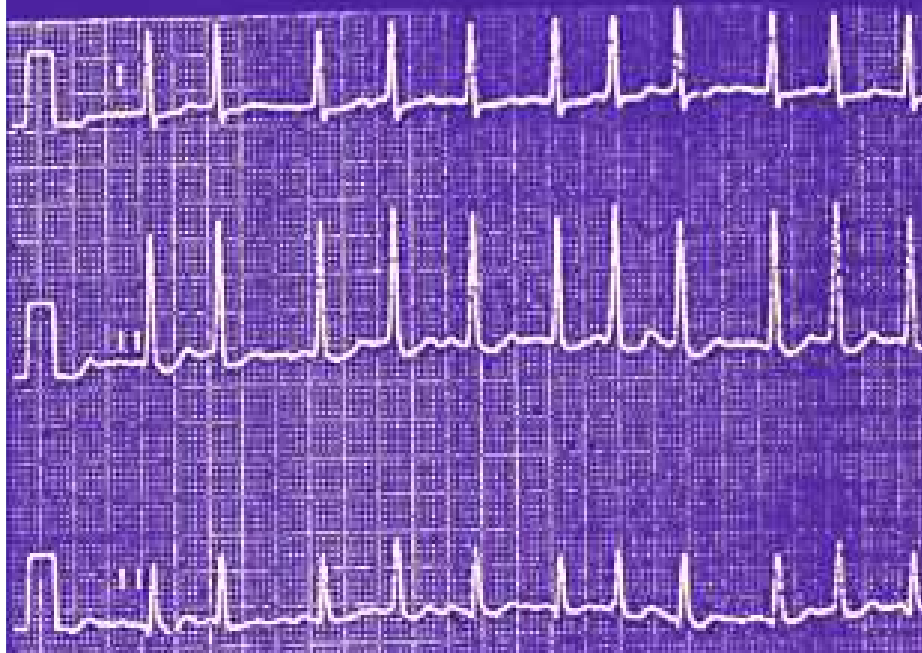


Fibrillazione atriale a frequenza non elevata:

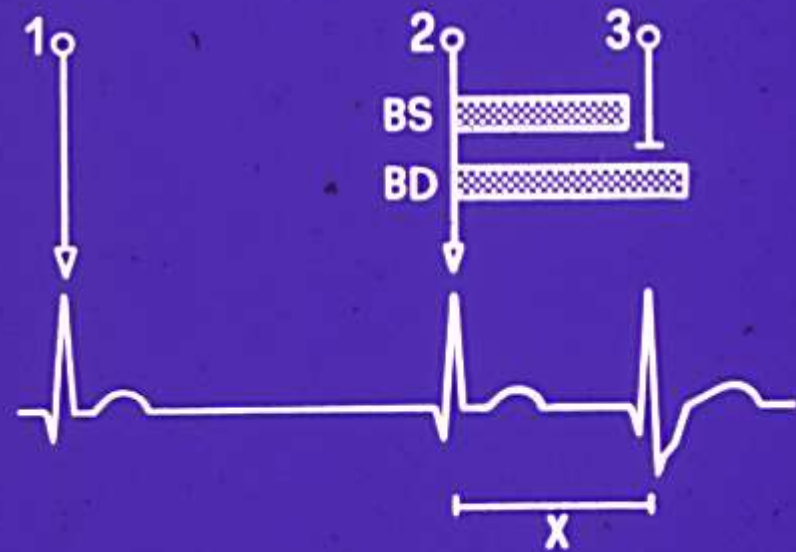
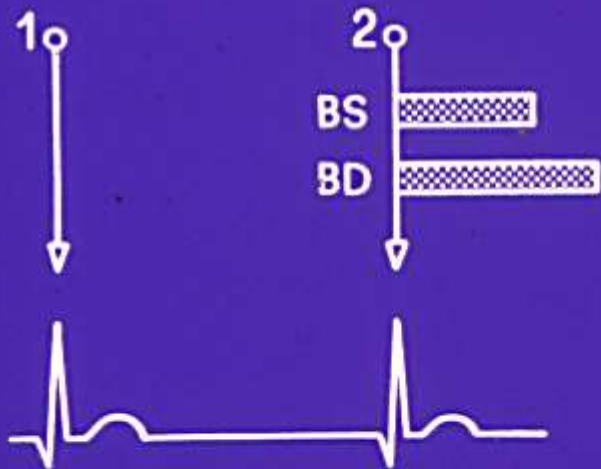
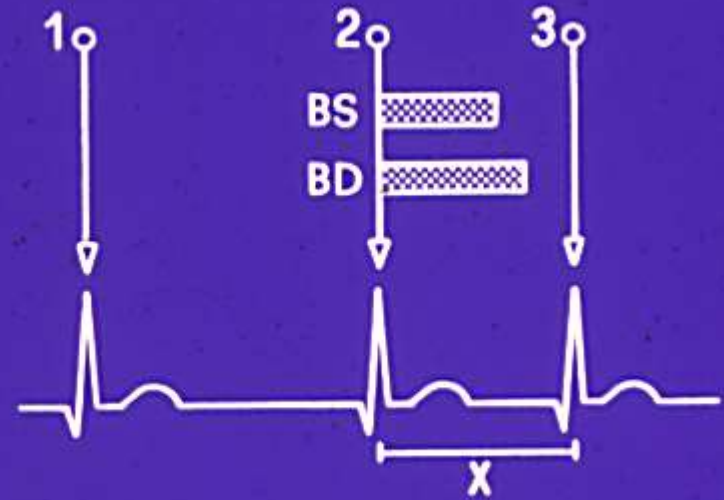
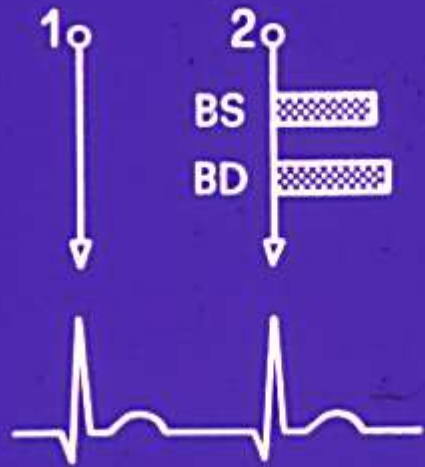
- P assenti;
- onde f;
- ampia variabilità intervallo RR



Fibrillazione atriale + BBS



7-mag-92 2:22 RLTC 10mm/pV 25mg/s F3IAC 88

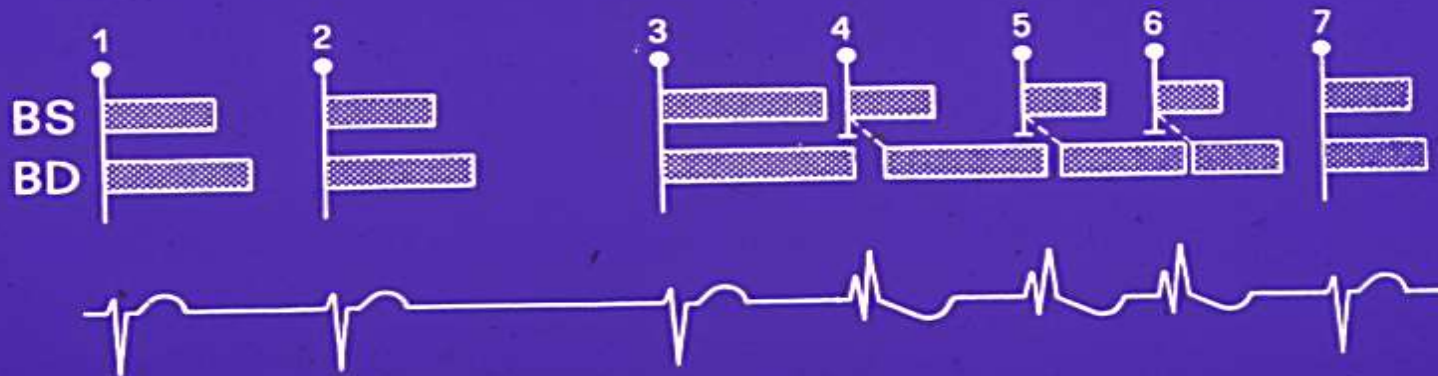
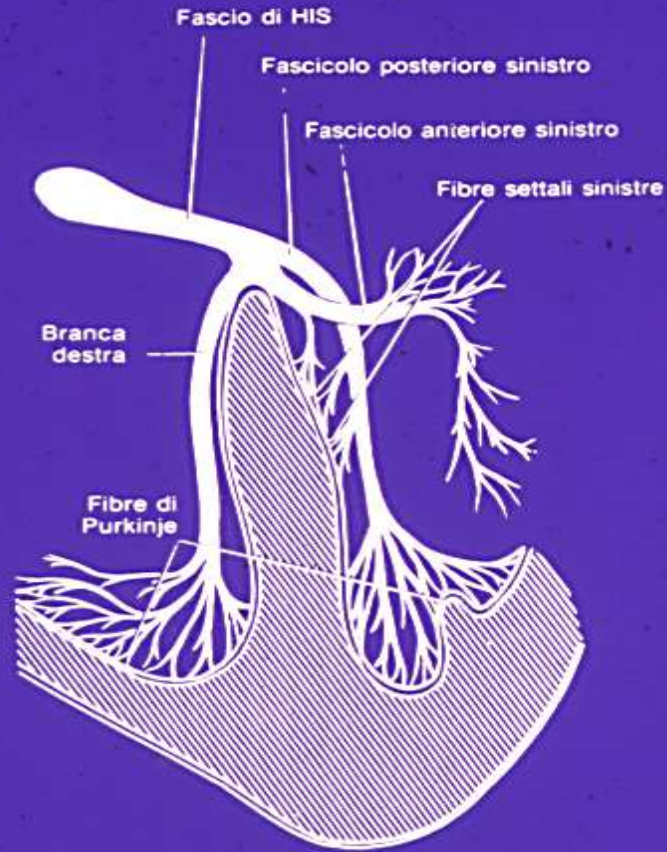


1

Il fenomeno di Ashman

2

Il linking

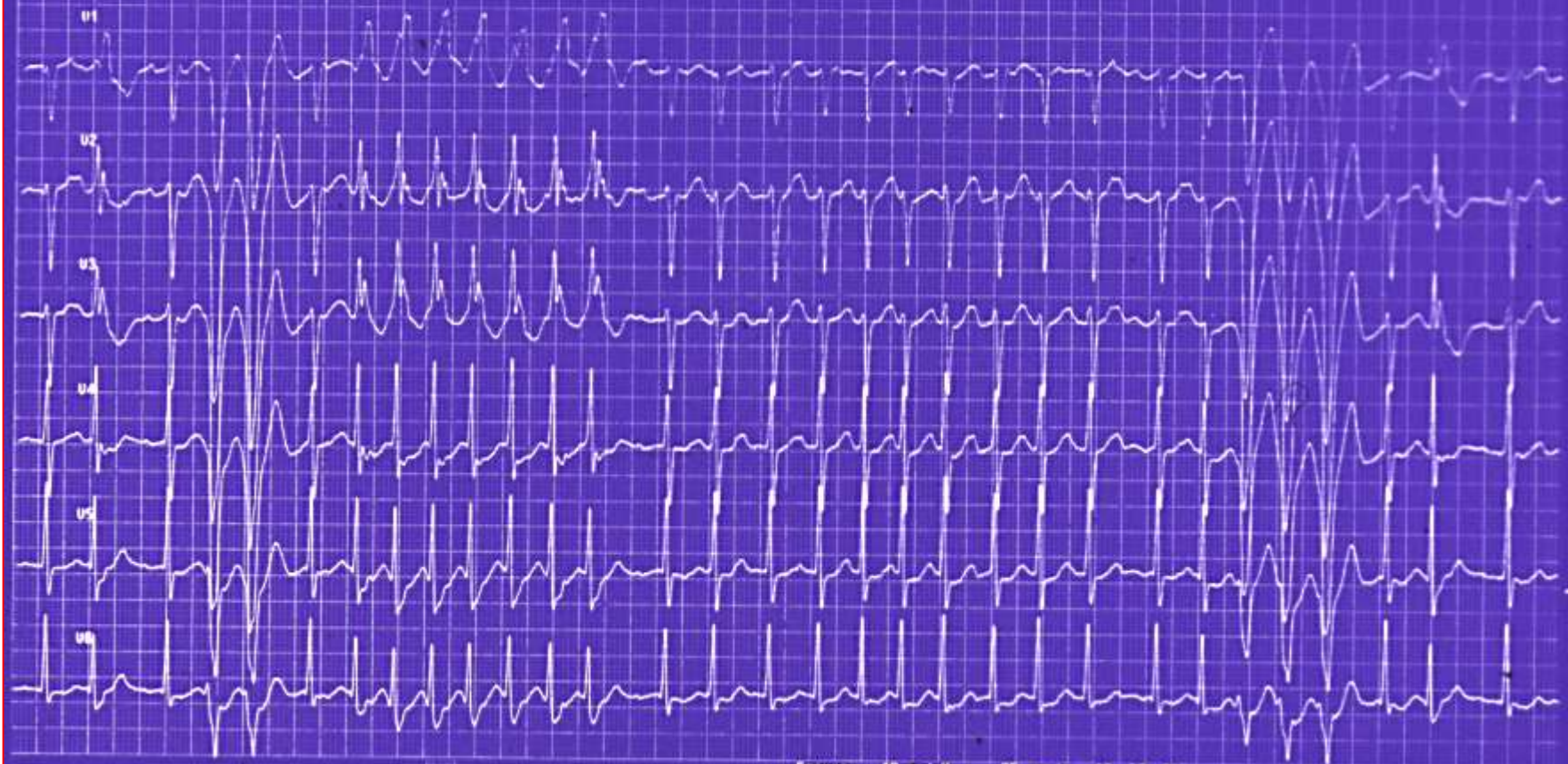


Codice
Cognome
Nome
Nota/II
Età
Sesso
Razza
Altezza
Peso

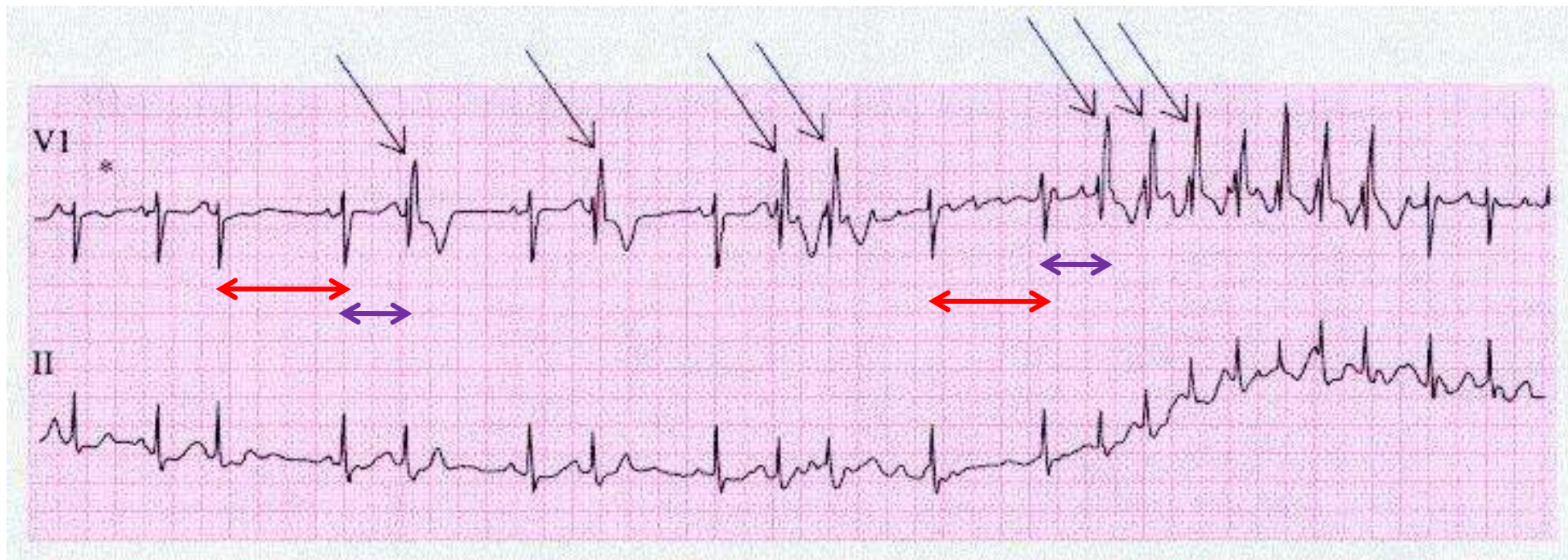
R2/ Mar/2000 10:27 FC 143
P.S. - S. ORSOLA-MALP.

PA :

F2



Sequen. 10 mm/mV 25 mm/s AC F2 BL

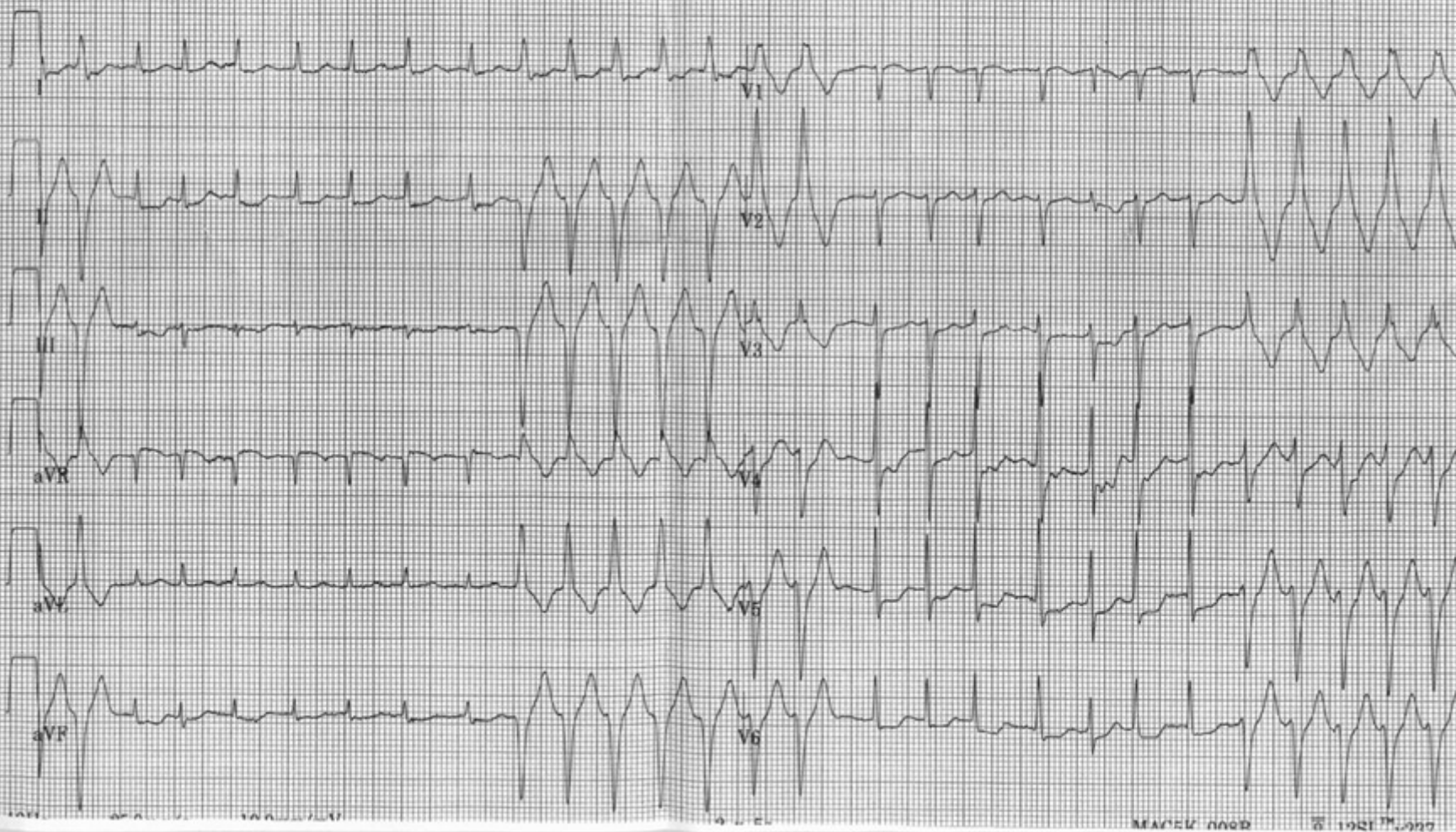


Fenomeno di Ashman Ciclo lungo - ciclo breve

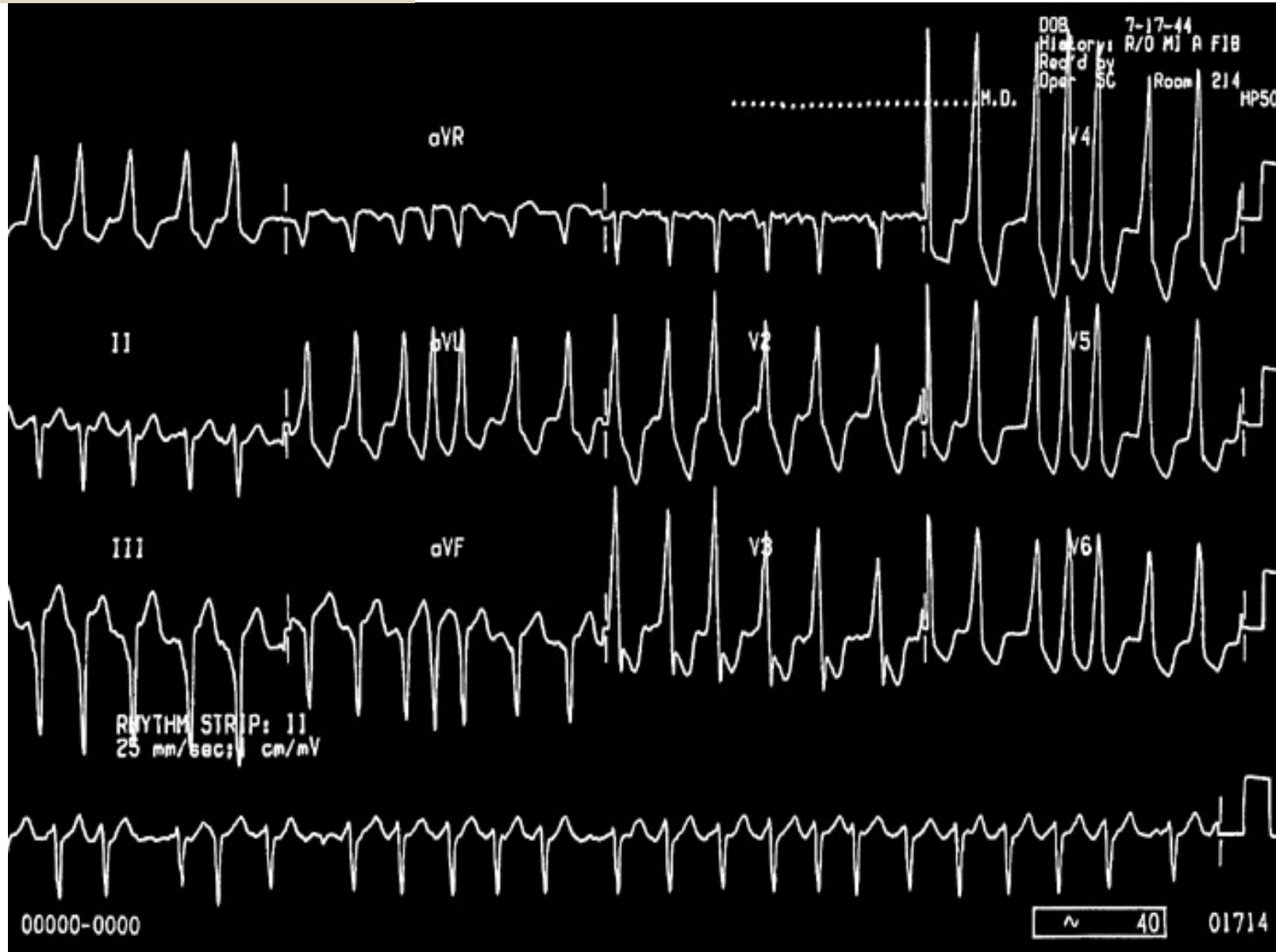
Frequenza 163 bpm
Intervallo PR * ms
Durata QRS 72 ms
QT/QTc 288/474 ms
Assi P-R-T * 16 268

*** Registrazione scadente: possibile errore di analisi
Fibrillazione atriale con risposta ventricolare rapida con complessi prematuri condotti con aberranza
Marcata anomalìa di ST, possibile lesione subendocardica antero-laterale
ECG anormale

Non confermato



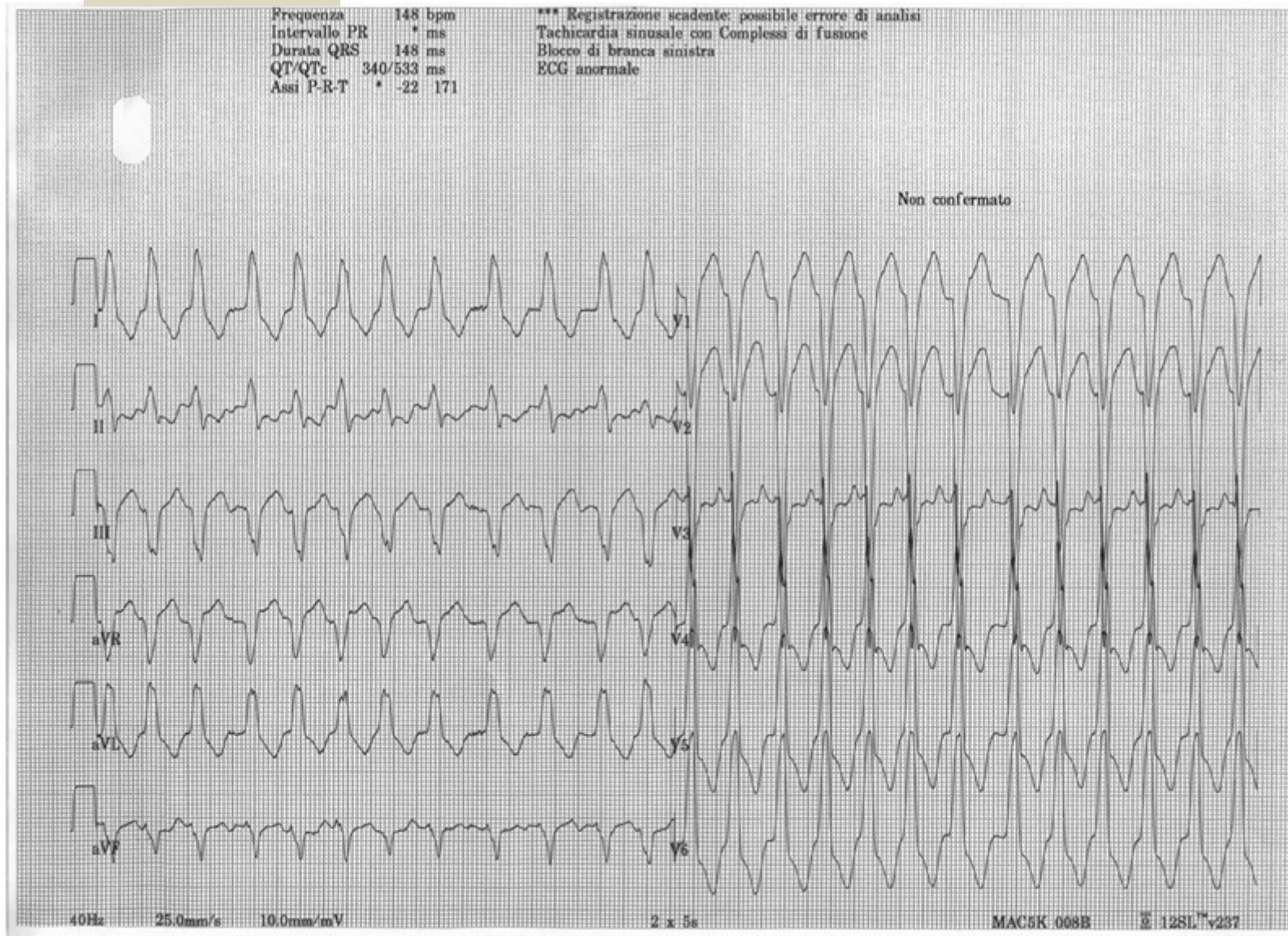
FA in portatore di via accessoria

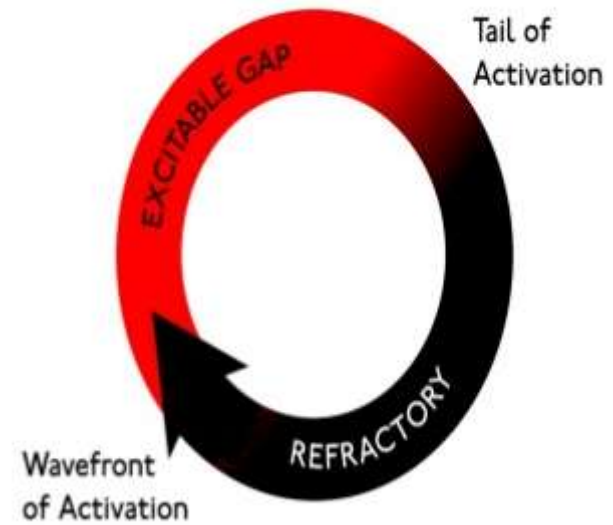
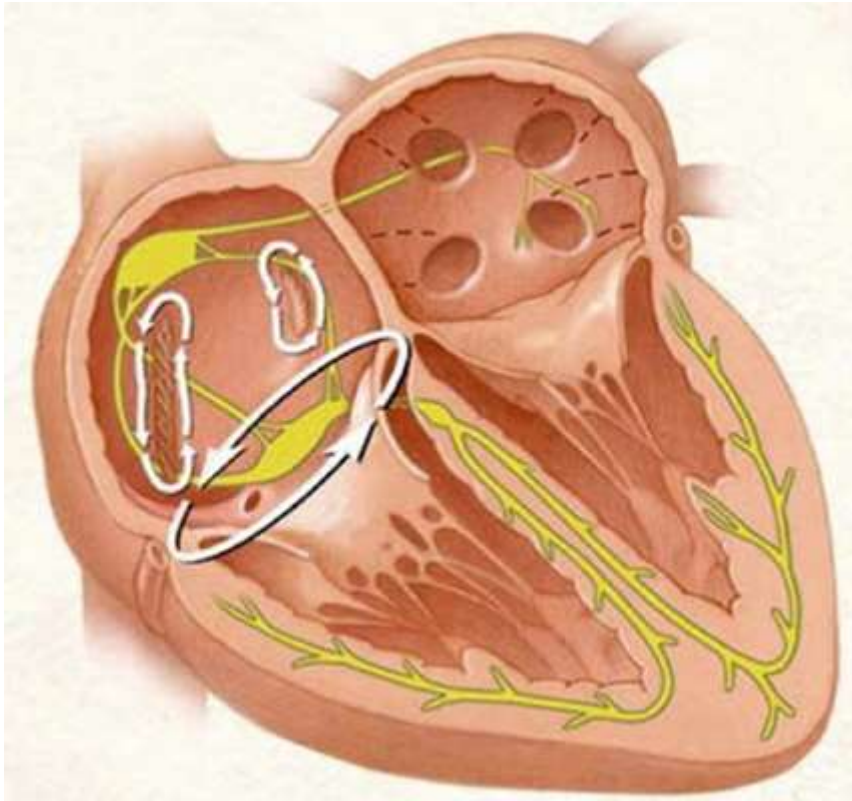


(29 yr)



Guarda il QRS





Substrato del FIA: tipico circuito di macrorientro

- L'impulso circola in senso anti-orario (più comunemente)
- Oppure in senso orario intorno all'anello della tricuspide

FLUTTER ATRIALE

Il Flutter Atriale **TIPICO**

("classico" circuito atriale destro).

Qualunque altra sede del circuito dà luogo a un flutter **ATIPICO**.

ECG:

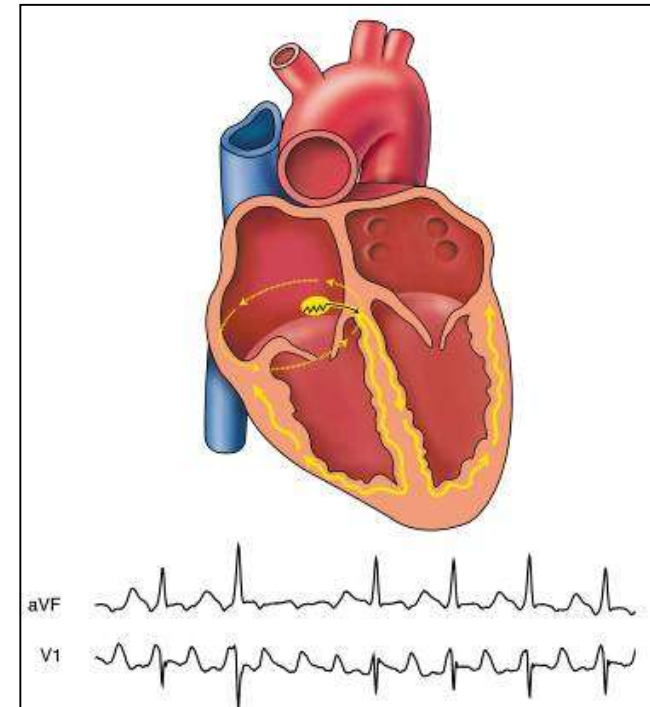
1) Flutter **TIPICO**. Onde F a denti di sega nelle derivazioni inferiori:

a) **COMUNE**: denti di sega asimmetrici, con ascesa ripida e discesa lenta (eccetto nella parte finale, dove la pendenza aumenta bruscamente).

b) **NON COMUNE**: denti di sega simmetrici, con ascesa e discesa di uguale pendenza.

2) Flutter **ATIPICO**. Onde F non a denti di sega nelle derivazioni inferiori (ogni altra configurazione è possibile).

Flutter Atriale:



Definizione:

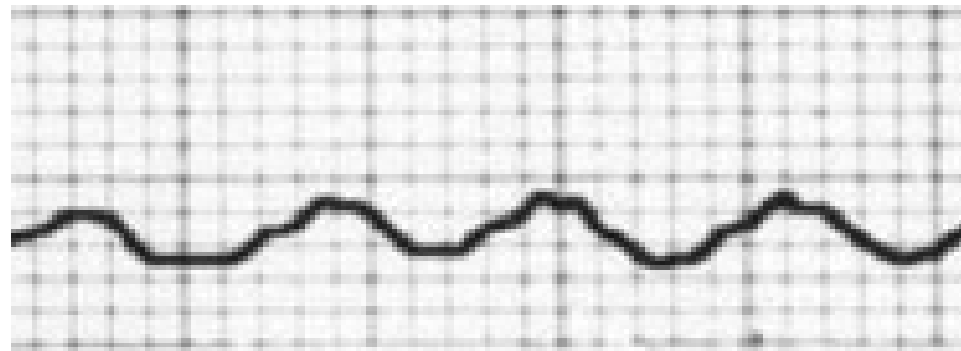
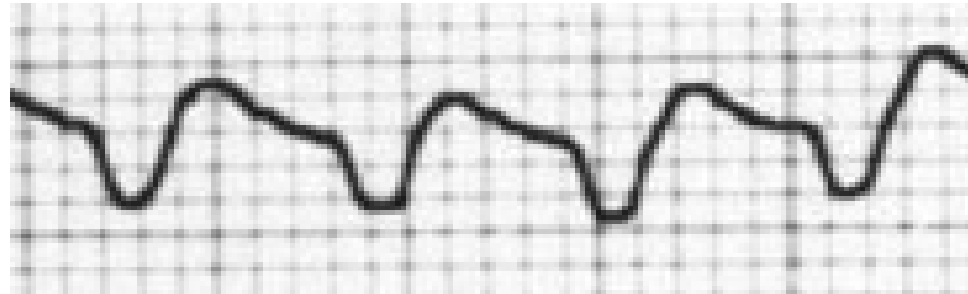
Tachiaritmia atriale da rientro (all'ecg: R-R regolare o "irregolarmente regolare"), dovuta ad un macrocircuito il più delle volte localizzato in atrio destro.

II Derivazione

TIPICO

COMUNE

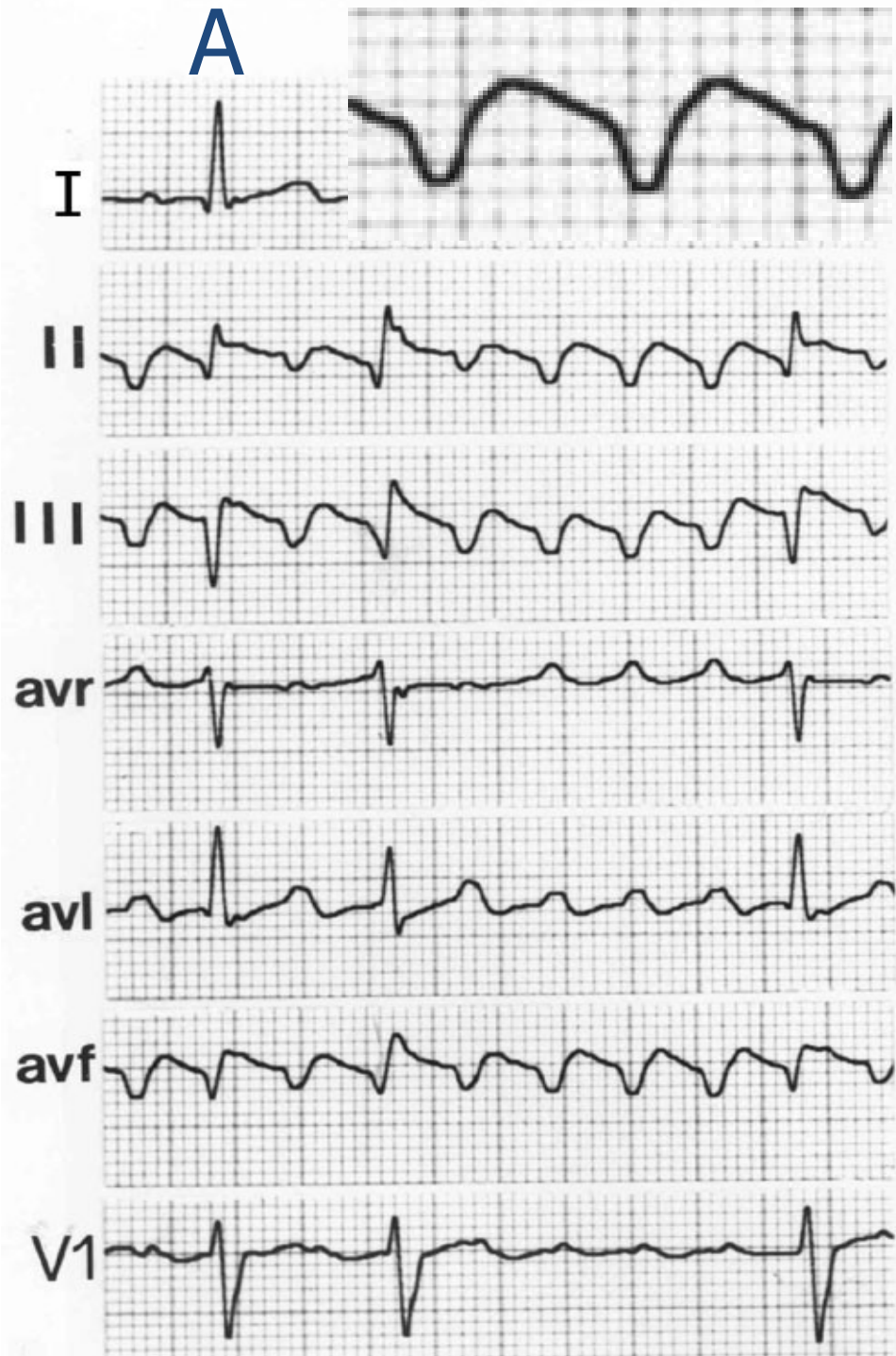
NON COMUNE



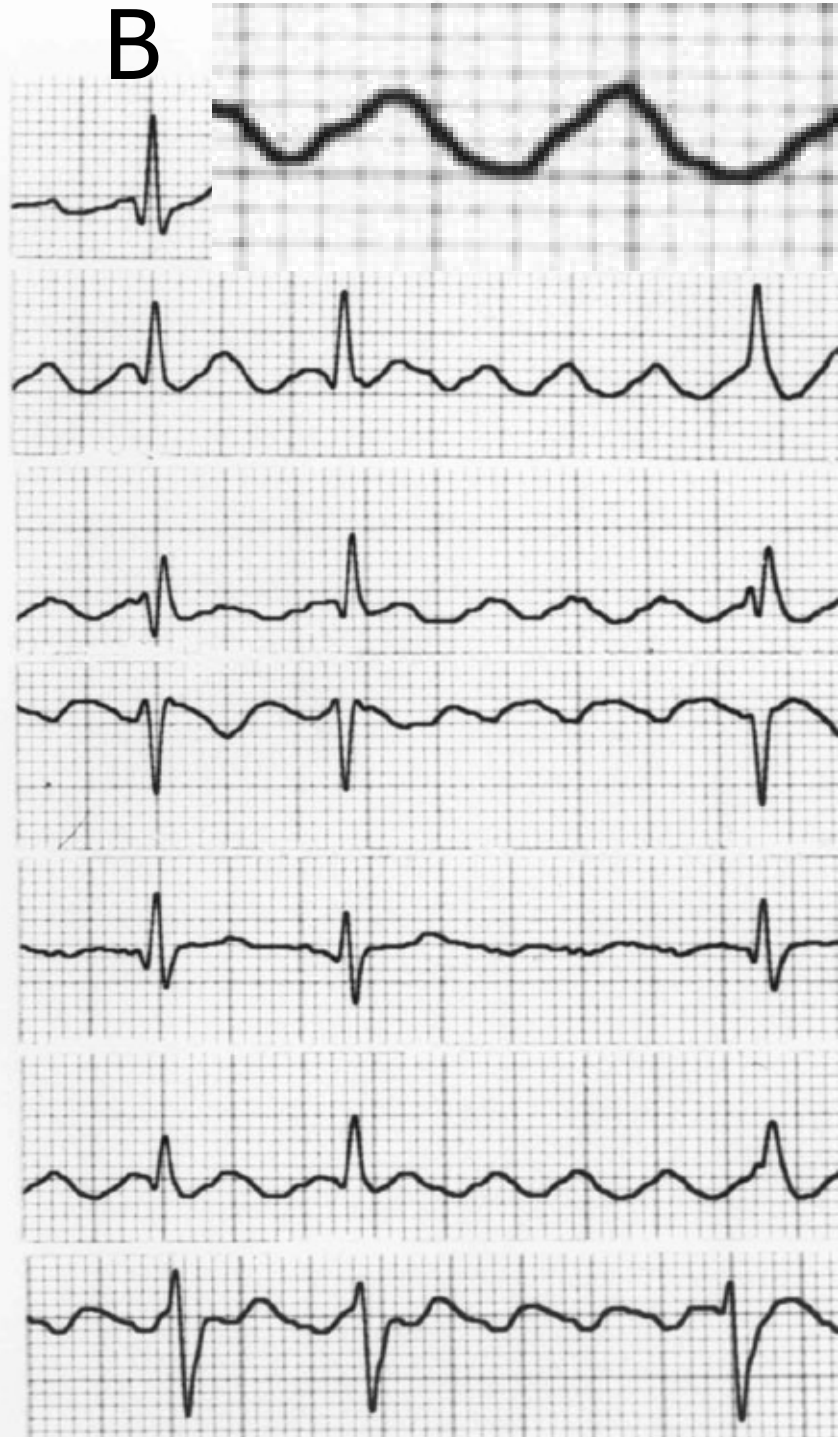
ATIPICO



A

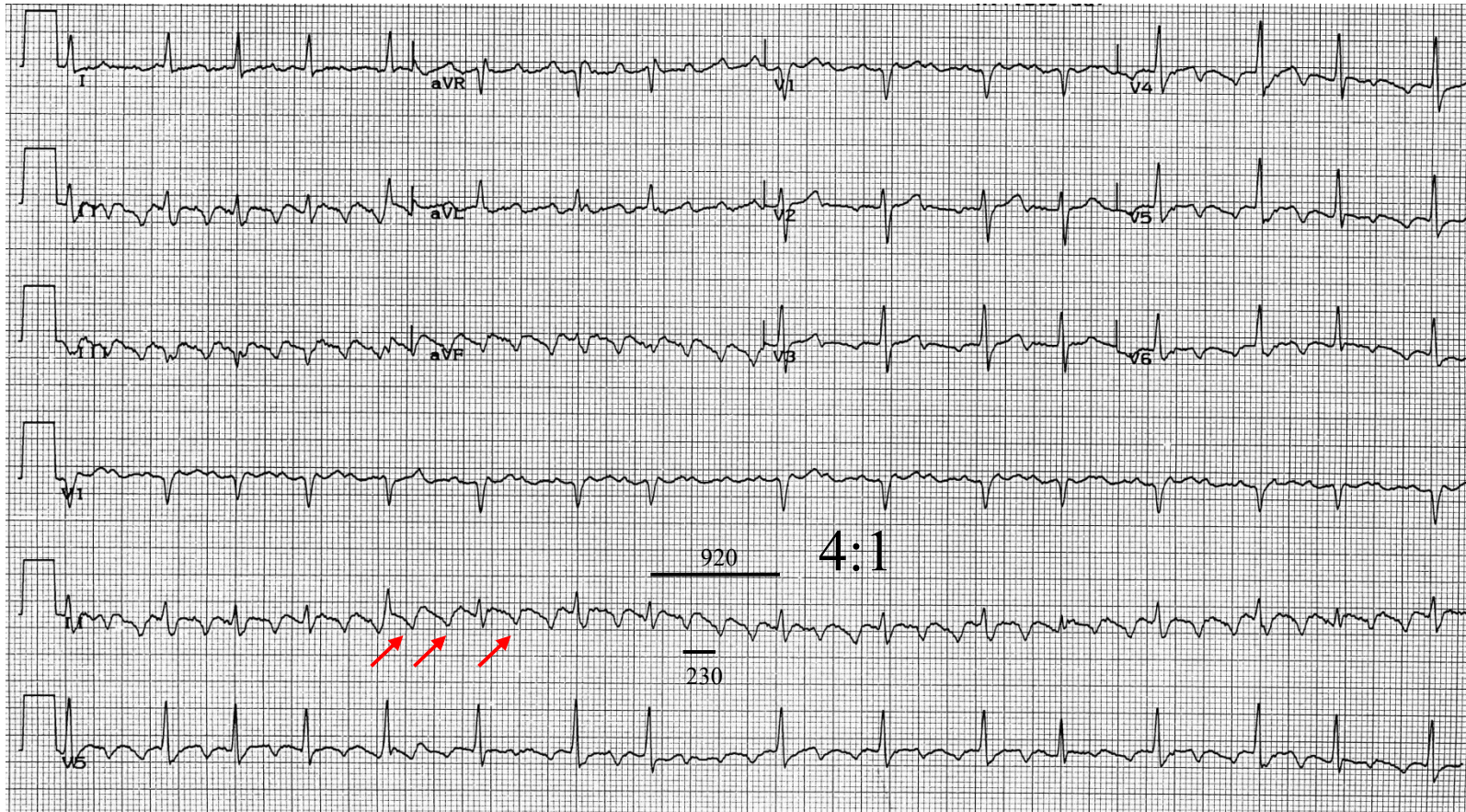


B



Diagnosi di Flutter Atriale

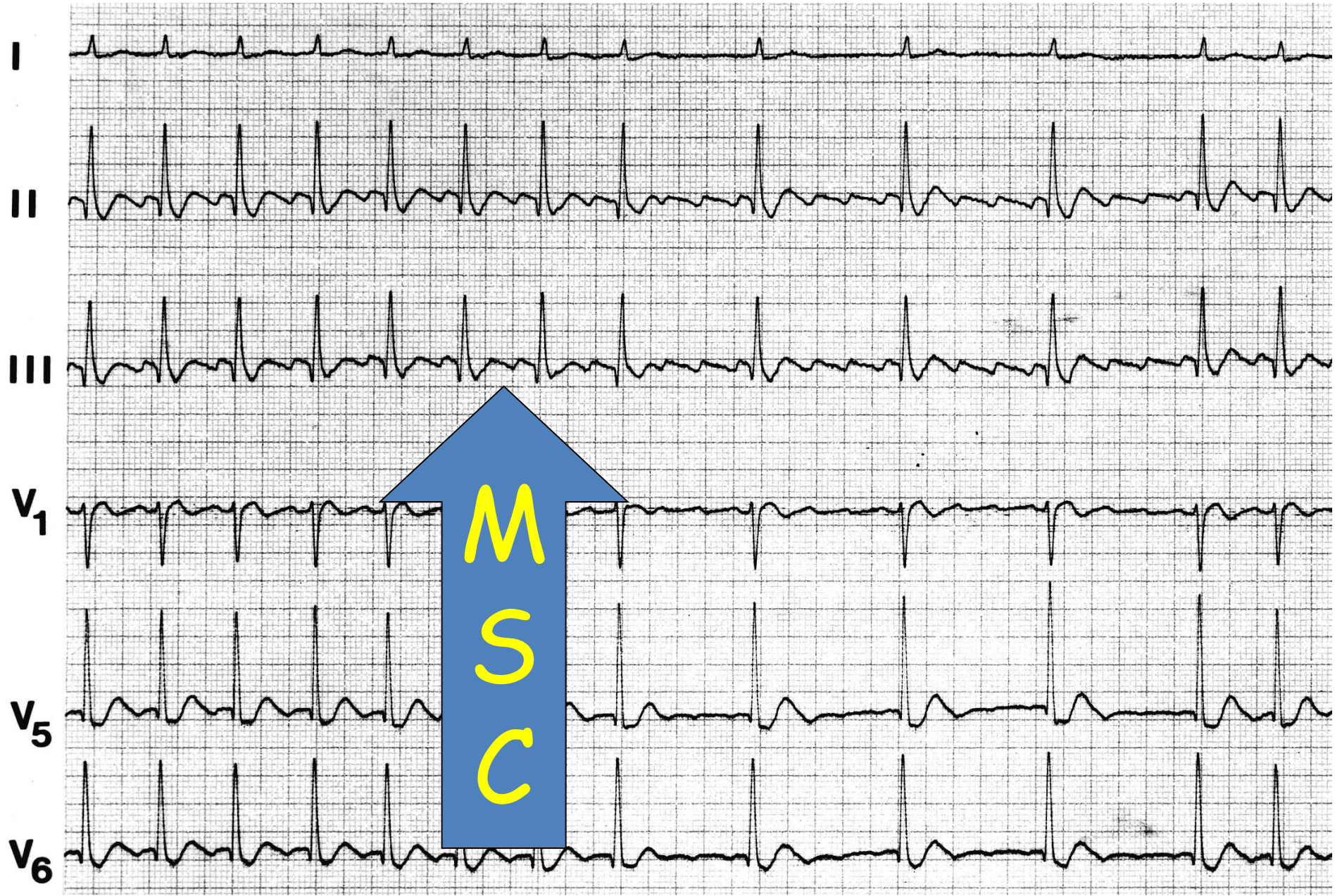
- Costanza degli intervalli F-F
- Costanza della morfologia delle onde atriali
- Aspetto caratteristico delle onde F
- Frequenza atriale (?)

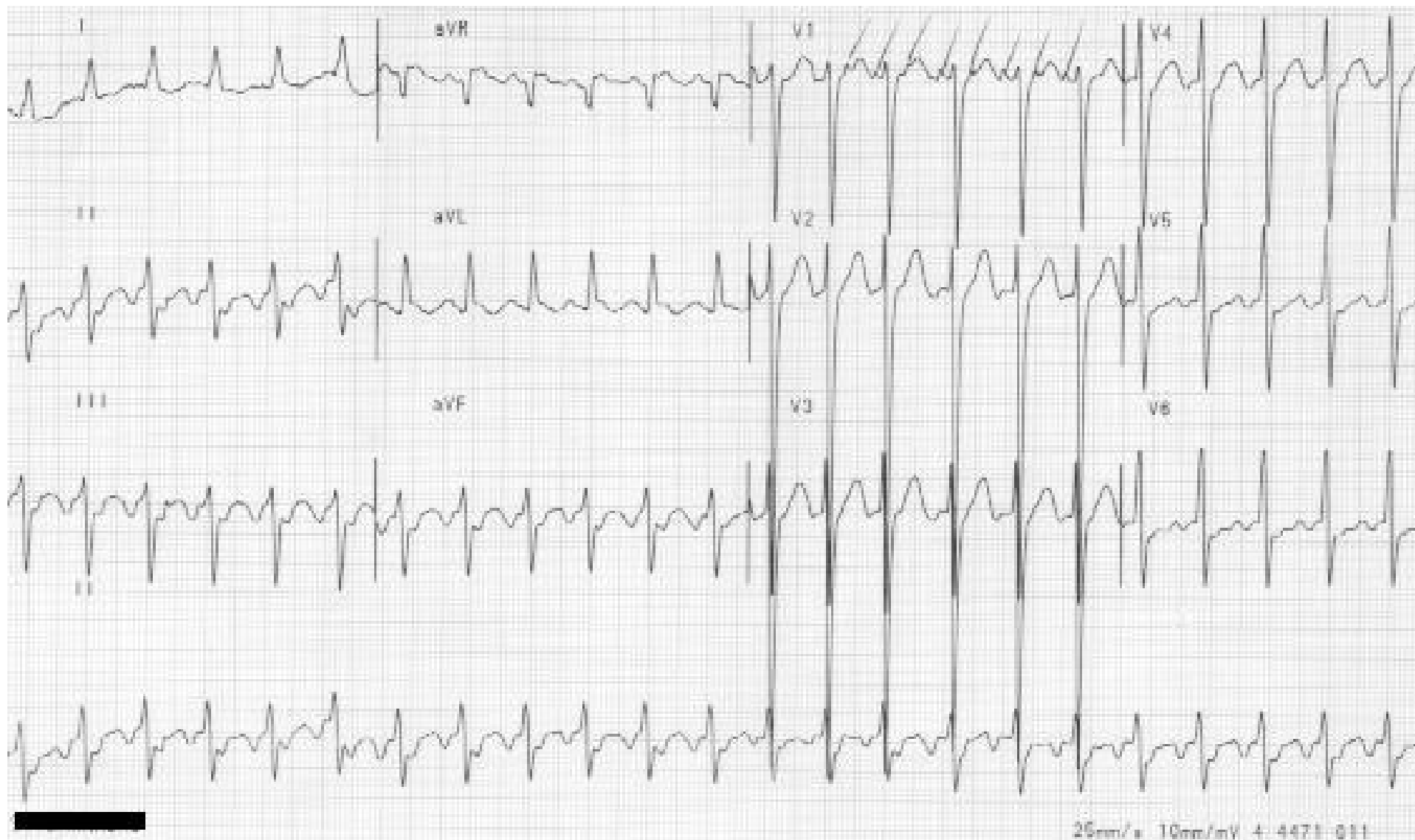


Flutter atriale:

- onde F regolari con frequenza $> 250/m'$;
- ritmo regolare o irregolare con frequenza multiplo di FF.





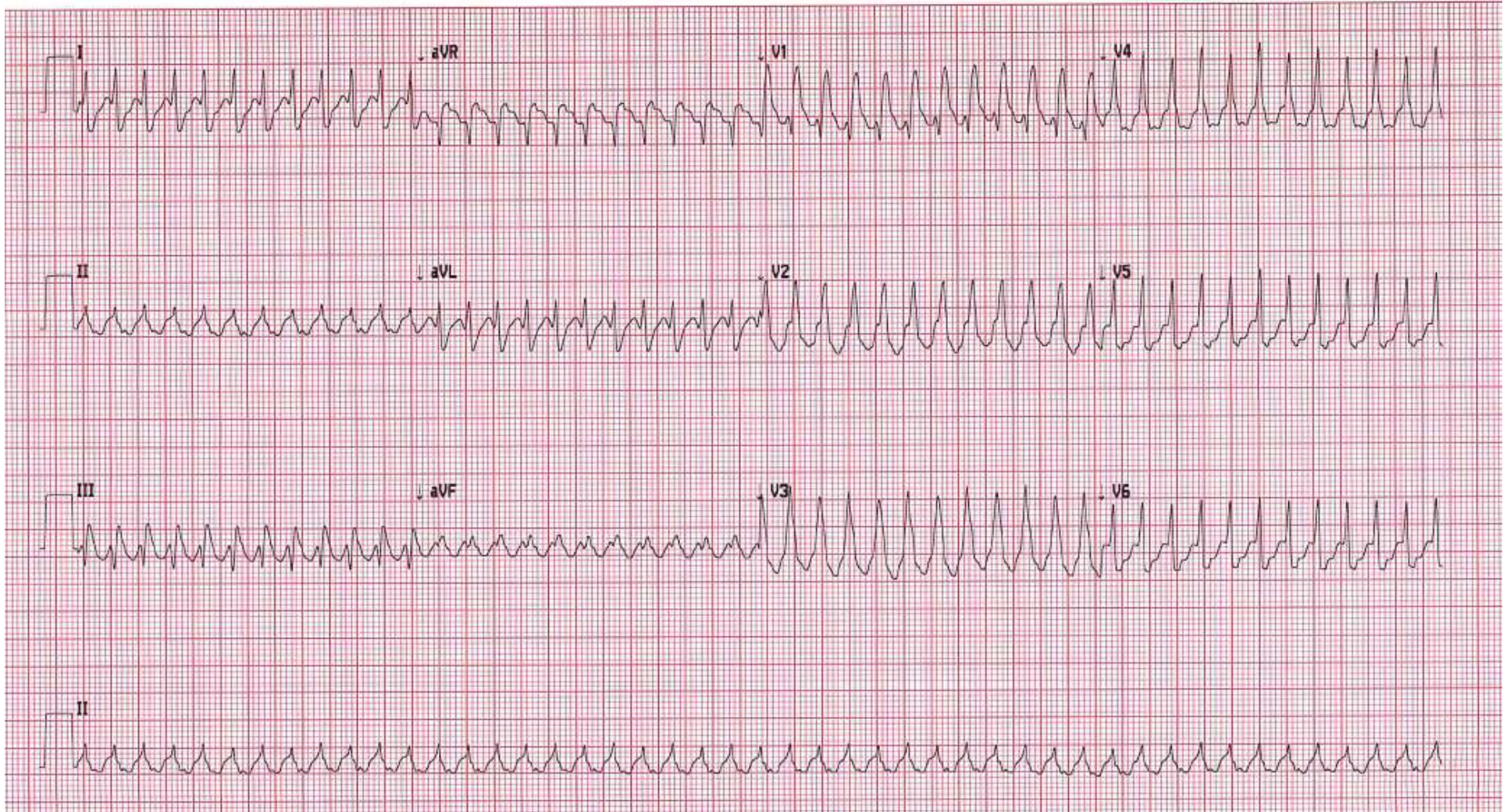


La regola del 150 di frequenza

41 aa; arriva in PS alle 17.30. Da circa 1 ora cardiopalmo

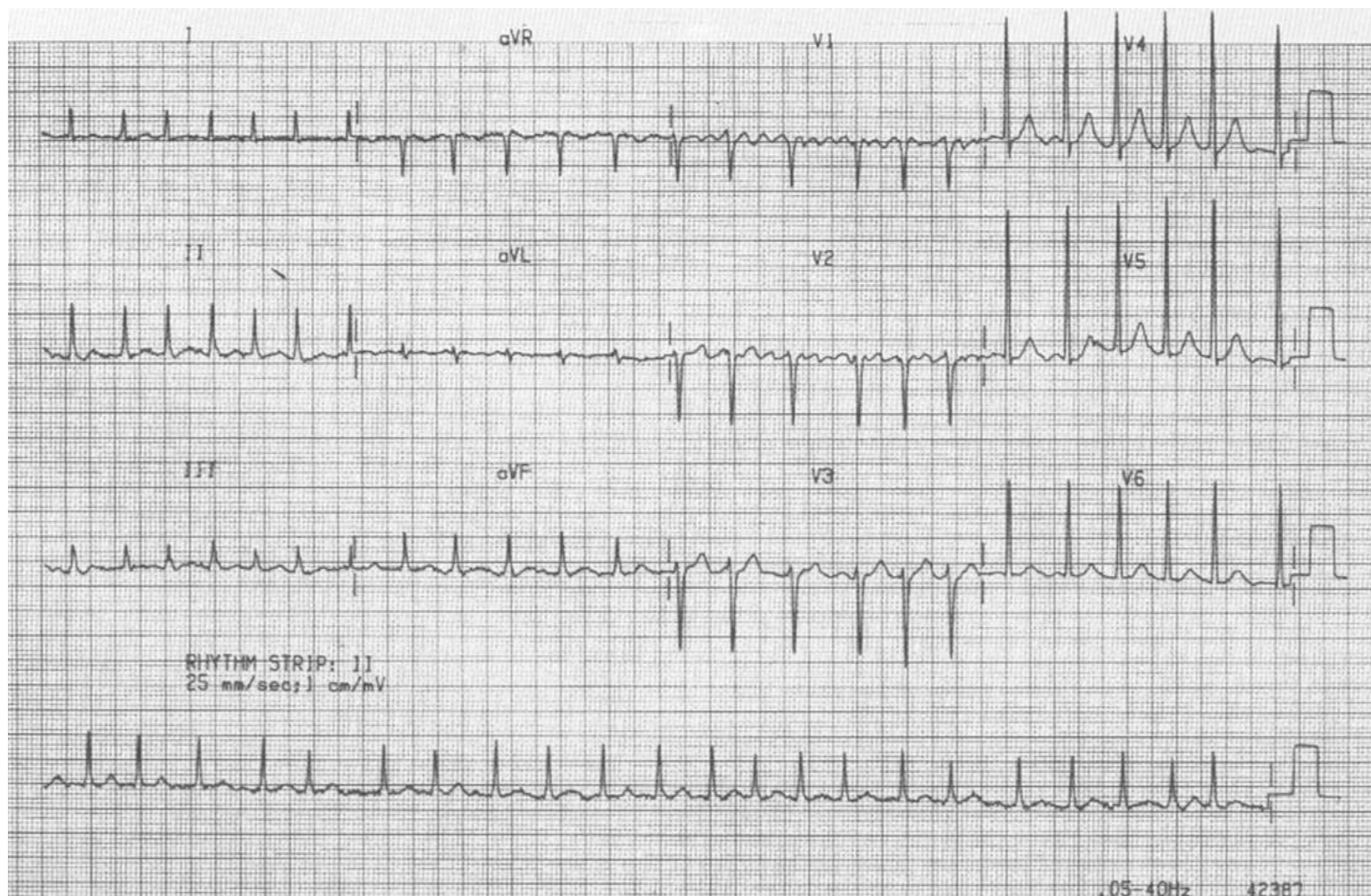
Note:

REPORT NON CONFERMATO

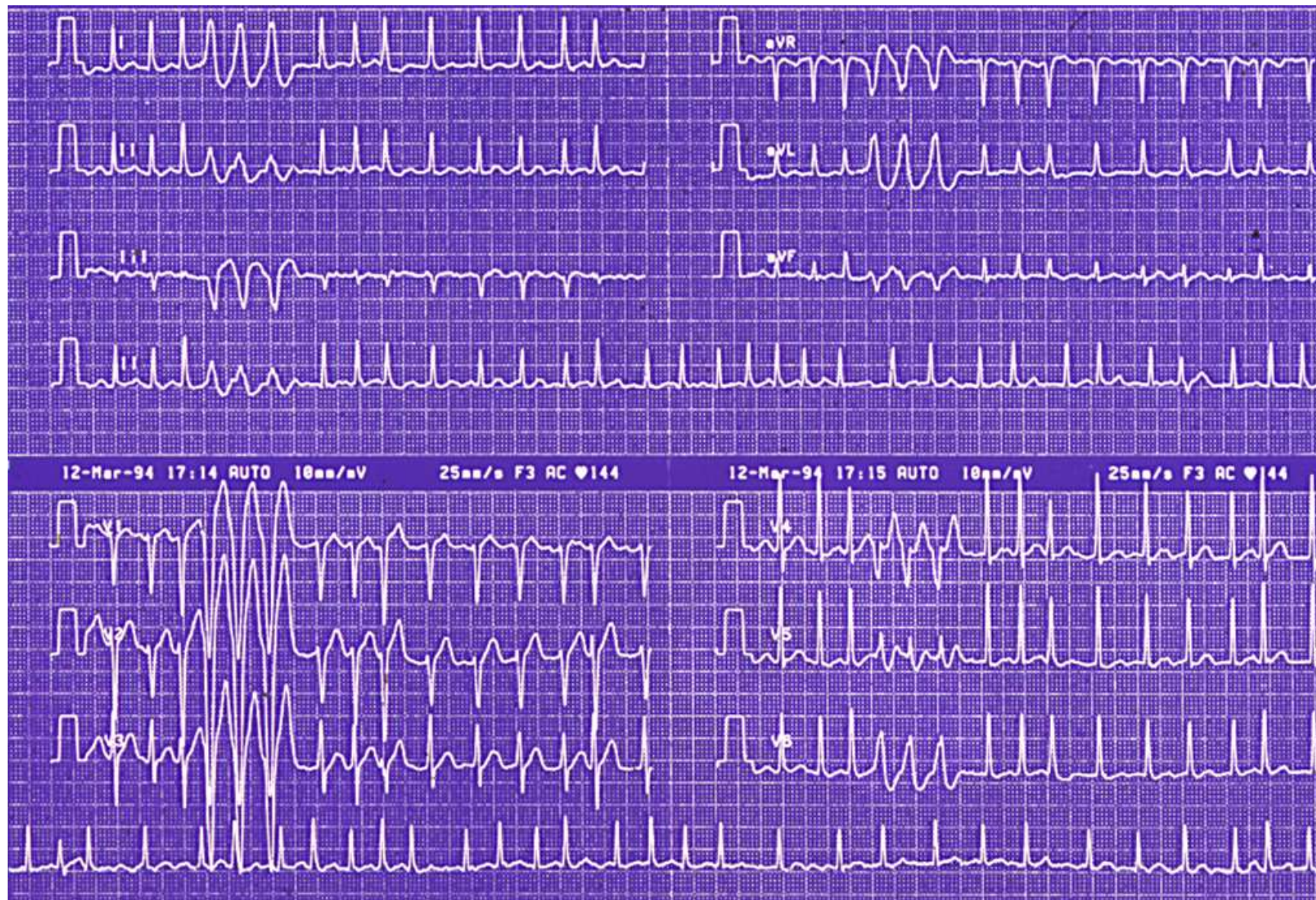


...esercizio

analisi ecg 1



analisi ecg 2



Fibrillazione Atriale

Guidelines for the management of atrial fibrillation, ESC 2010 e 2012

LG AIAC: giac giugno 2010 riviste nel marzo 2013

2014 AHA/ACC/HRS Guideline for the Management of Patients With Atrial Fibrillation

JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

VOL. 64, NO. 21, 2014

2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS

Eur Heart J (2016) 37 (38): 2893-2962.

The Task Force for the management of atrial fibrillation of the
European Society of Cardiology (ESC)

Developed with the special contribution of the European Heart
Rhythm Association (EHRA) of the ESC

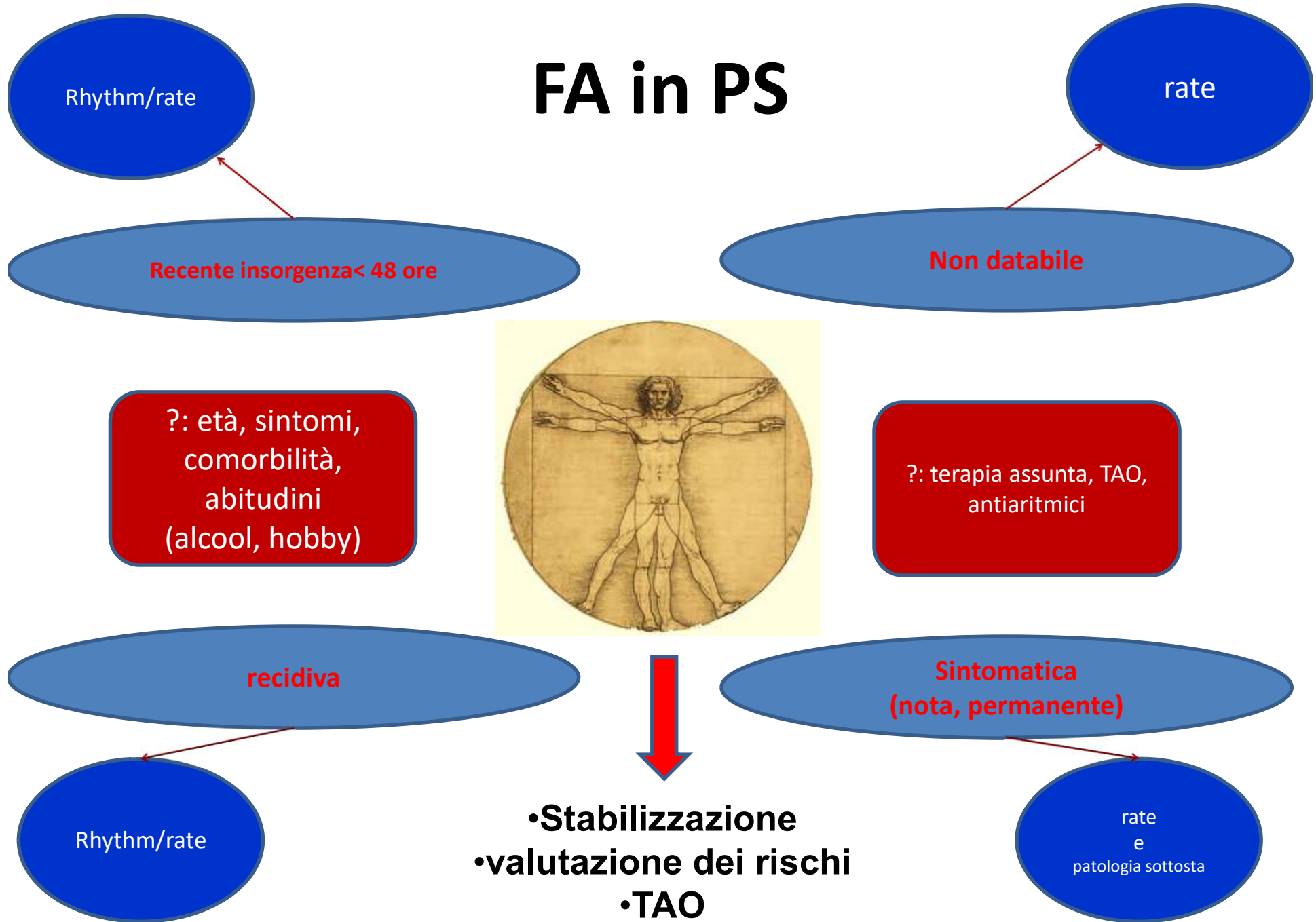
Endorsed by the European Stroke Organisation (ESO)

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS)



2020 ESC Guidelines for the diagnosis and management of atrial fibrillation
(European Heart Journal 2020-[doi/10.1093/eurheartj/ehaa612](https://doi.org/10.1093/eurheartj/ehaa612))

FA in PS

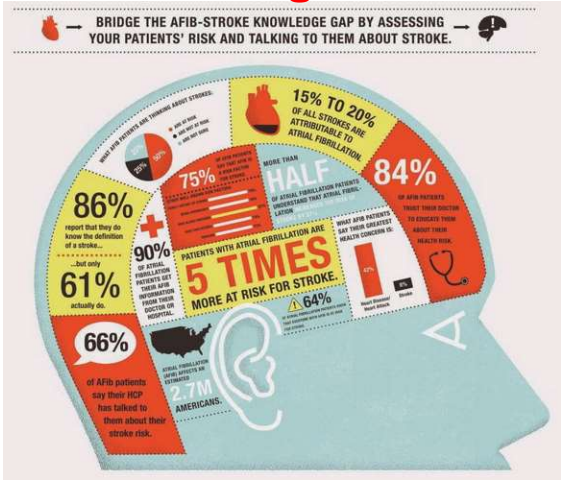




Sguardo d'insieme al paziente

Rhythm control

Rate control

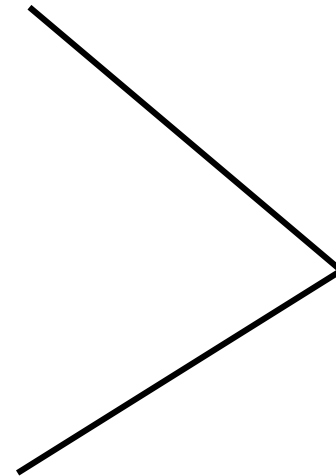


Dominant Strategy



Happy Face

- Asymptomatic
- Marginaly symptomatic
- Older
- Relatively sedentary
- Risk of proarrhythmia

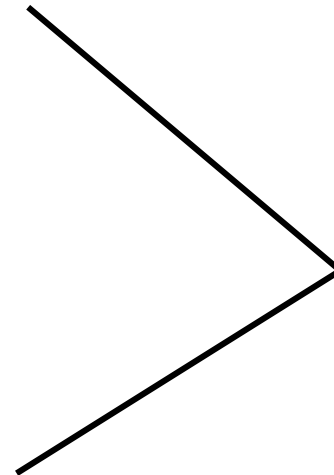


Rate



Sad /Angry Face

- When rate control inefficient
- Moderate – severe symptoms
- Younger
- Active
- First episode
- Reversible cause



Rhythm

prevenzione del tromboembolismo:

- **In acuto**
- **Alla dimissione**

Prevenzione del tromboembolismo alla dimissione

- **TAO?**

CHA₂DS₂-VASc Calculator for Atrial Fibrillation

Evaluates ischemic stroke risk in patients with atrial fibrillation

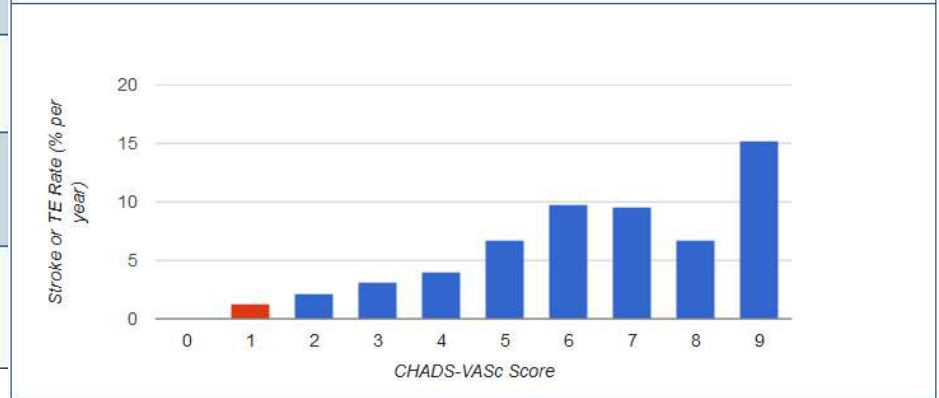
Criteria		Poss. Point
Congestive heart failure Signs/symptoms of heart failure confirmed with objective evidence of cardiac dysfunction	<input type="checkbox"/> Yes <input type="checkbox"/> No	+1
Hypertension Resting BP > 140/90 mmHg on at least 2 occasions <u>or</u> current antihypertensive pharmacologic treatment	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	+1
Age 75 years or older	<input type="checkbox"/> Yes <input type="checkbox"/> No	+2
Diabetes mellitus Fasting glucose > 125 mg/dL or treatment with oral hypoglycemic agent and/or insulin	<input type="checkbox"/> Yes <input type="checkbox"/> No	+1
Stroke, TIA, or TE Includes any history of cerebral ischemia	<input type="checkbox"/> Yes <input type="checkbox"/> No	+2
Vascular disease Prior MI, peripheral arterial disease, or aortic plaque	<input type="checkbox"/> Yes <input type="checkbox"/> No	+1
Age 65 to 74 years	<input type="checkbox"/> Yes <input type="checkbox"/> No	+1
Sex Category (female) Female gender confers higher risk	<input type="checkbox"/> Yes <input type="checkbox"/> No	+1
<input type="button" value="Reset"/> <input type="button" value="Calculate"/>		

Total Points	Thromboembolism Risk	Thromboembolism Rate ¹ (% per year, no aspirin)
1	Intermediate Risk	1.3% (95% CI, 0.28% to 3.72%)

Antithrombotic Therapy Recommendation

Based on the 2012 ESC Guidelines, consider oral anticoagulation for antithrombotic therapy (class IIa, level A).²

Note that this recommendation is a generalization based on stroke risk. Patient-specific considerations, such as other uncontrolled risk factors for stroke and bleeding risk, should be considered on a case-by-case basis. The 2012 CHEST Guidelines do not provide recommendations for CHA₂DS₂-VASc.³



Profilassi antitrombotica e rischio di sanguinamento

Letter	Clinical characteristic ^a	Points awarded
H	Hypertension	1
A	Abnormal renal and liver function (1 point each)	1 or 2
S	Stroke	1
B	Bleeding	1
L	Labile INRs	1
E	Elderly (e.g. age >65 years)	1
D	Drugs or alcohol (1 point each)	1 or 2
		Maximum 9 points

score > 3: alto rischio di sanguinamento

...della CVE: indicazioni

- Compromissione emodinamica
- Fibrillazione resistente ai farmaci
- Controindicazioni ai farmaci antiaritmici
- Tachiaritmia in WPW



Impedance compensated biphasic waveforms for transthoracic cardioversion of atrial fibrillation: a multi-centre comparison of antero-apical and antero-posterior pad positions

Eur Heart Journal (2005) 26, 1298-1302

Conclusioni: l'influenza della posizione dell'elettrodo per la CVE di FA, può essere meno significativa con la forma d'onda del "bifasico con compenso all'impedenza", che con il monofasico.



Fattori predittivi e indipendenti di successo per la CVE

- **Il peso del paziente**
- **La breve durata della Fibrillazione Atriale**

Frick M, Factors predicting success rate and recurrence of atrial fibrillation after electrical cardioversion in patients with persistent atrial fibrillation. Clin Cardiol 2001; 24(3): 238-244

Kerber RE, Transthoracic resistance in human defibrillation. Influence of body weight, chest size, serial shocks, paddle size, and paddle contact pressure. Circulation 1981; 63: 676-682

Fattori che non hanno dimostrato essere correlati con il successo della CVE

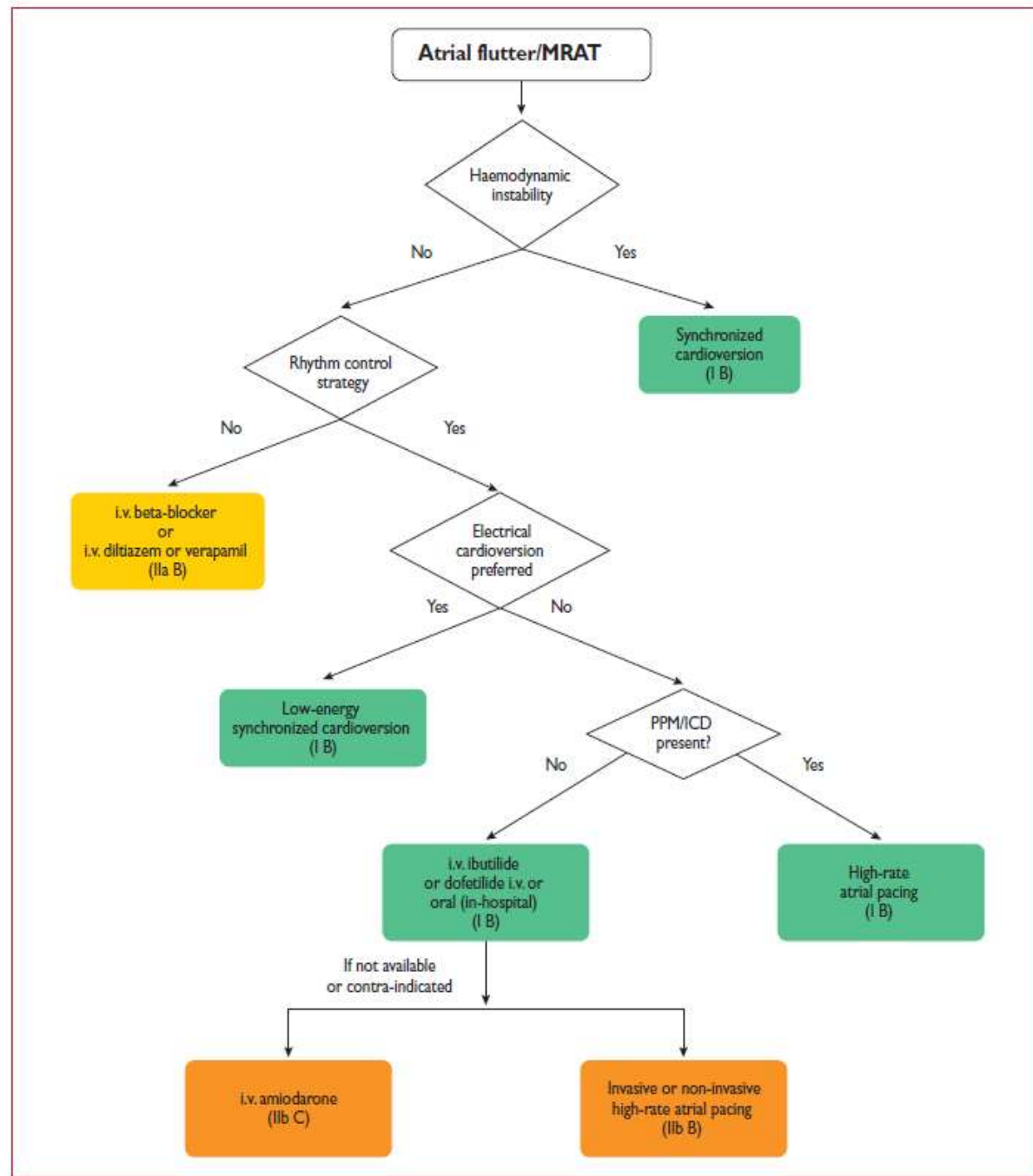
- **Età**
- **Cardiopatìa sottostante**
- **Classe NYHA**
- **Valvulopatìa mitralica**
- **Ingrandimento del ventricolo sx**

Carlsson J, Am J Cardiol 1996; 78:1380-1384

...della CVE

- Fa male (sedazione !)
- Training minimale assistito
- Ripartono tutti
- Bagaglio dei reparti d'Emergenza
- Indicazioni e controindicazioni
- Necessità di istruzioni operative
- Consenso





©ESC 2019

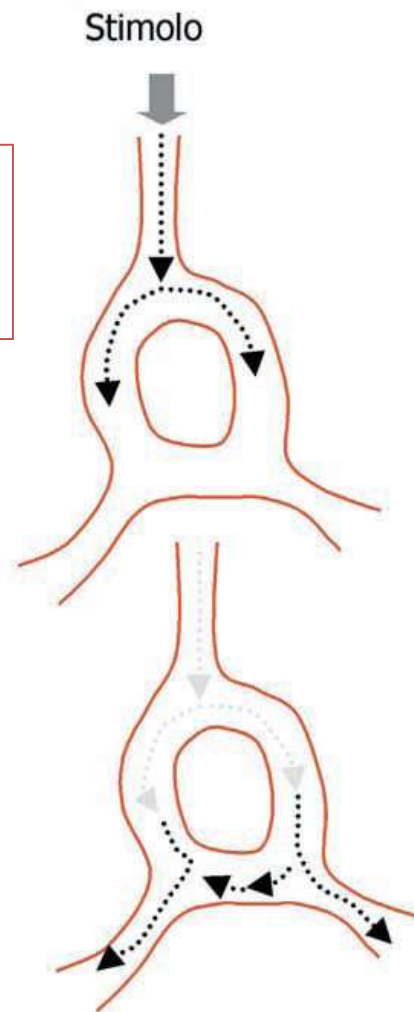
Figure 11 Acute therapy of stable atrial flutter or macro-re-entrant atrial tachycardia.
 ICD = implantable cardioverter defibrillator; i.v. = intravenous; MRAT = macro-re-entrant atrial tachycardia; PPM: permanent pacemaker.

Le tachicardie sopraventricolari

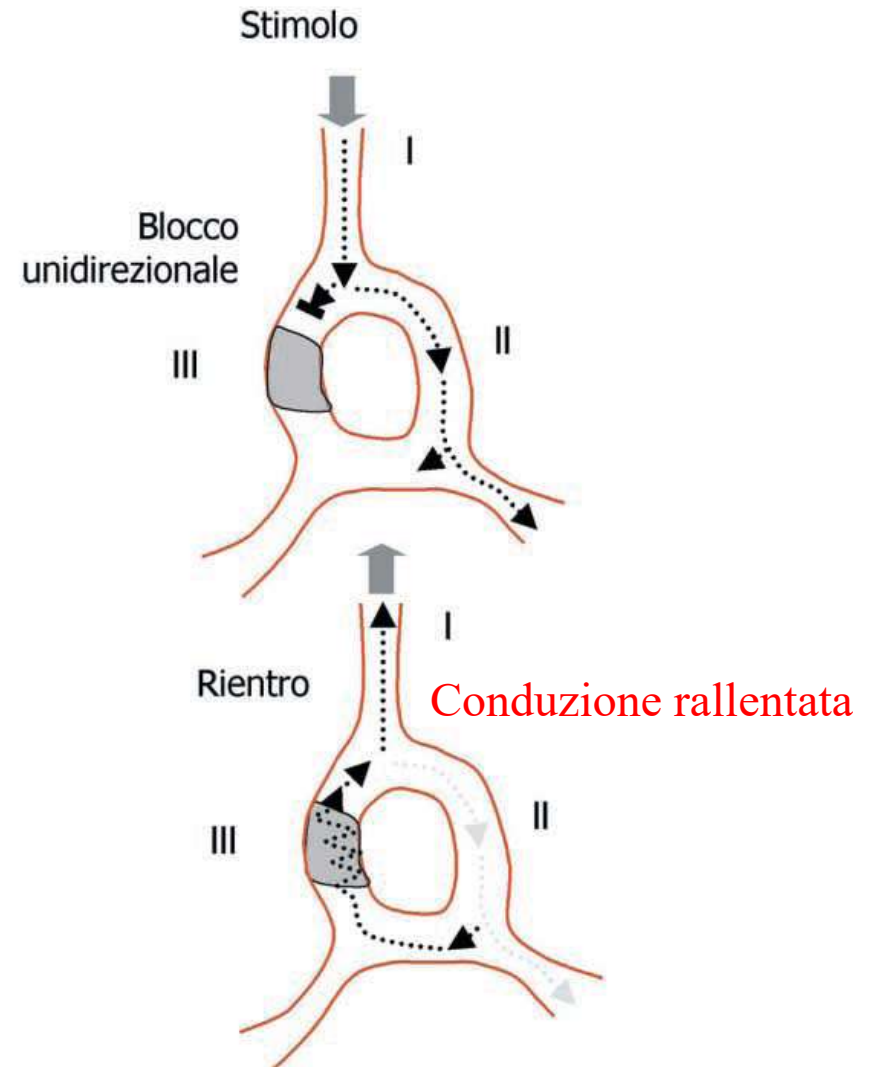
Presupposti elettrofisiologici del rientro nelle TPSV:

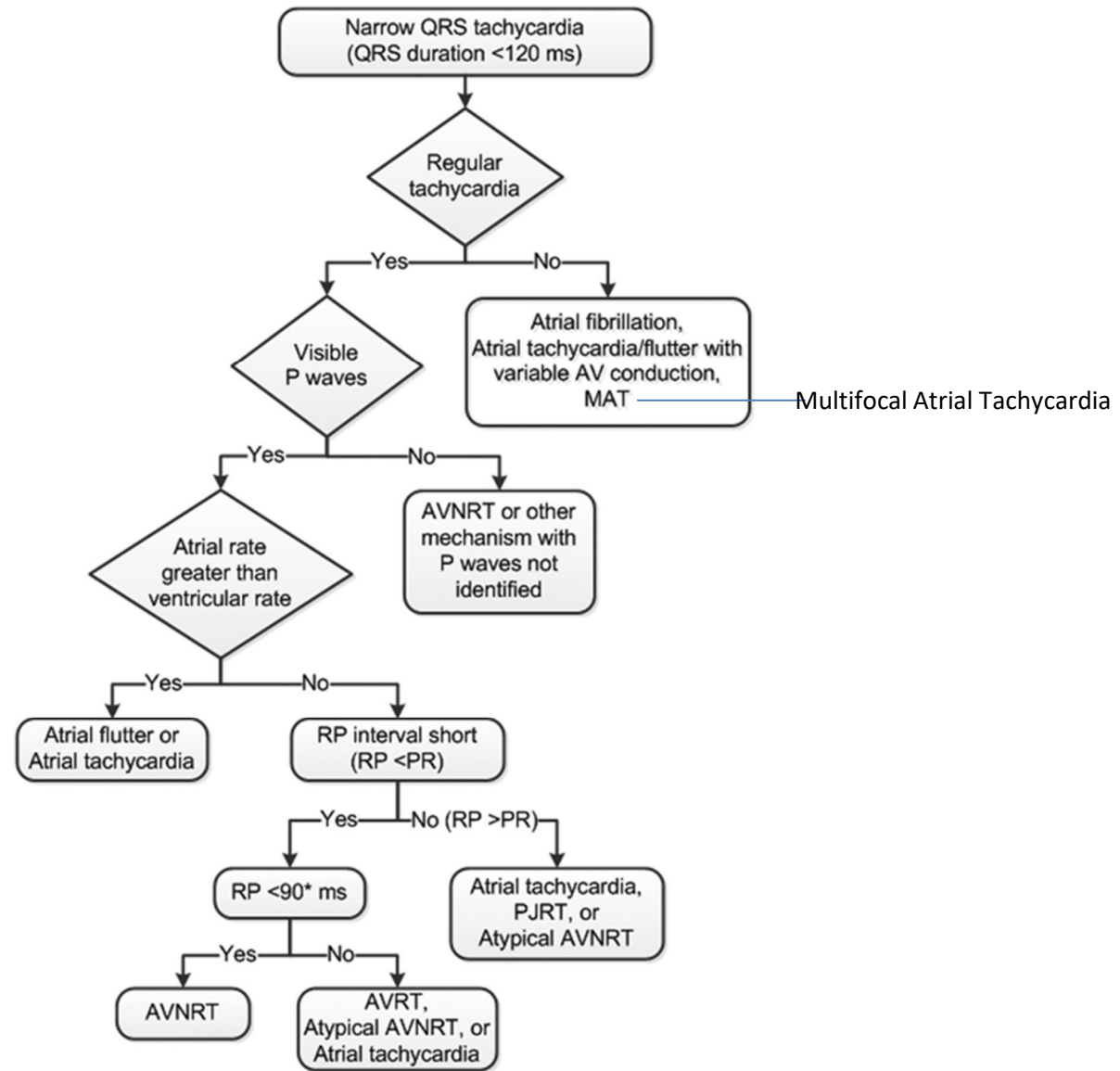
due vie separate,
anatomicamente o
funzionalmente.

A Normale

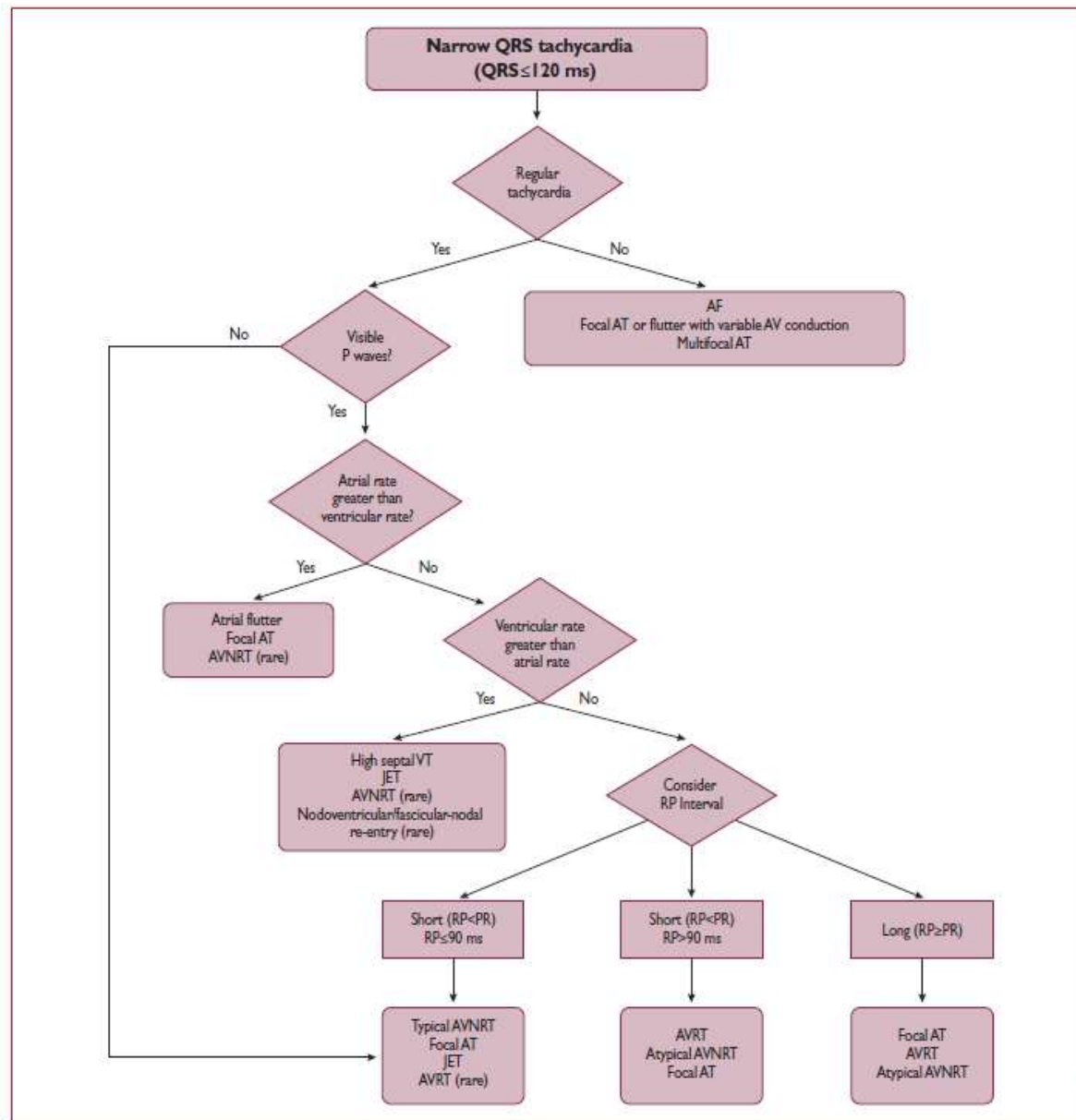


B Patologico





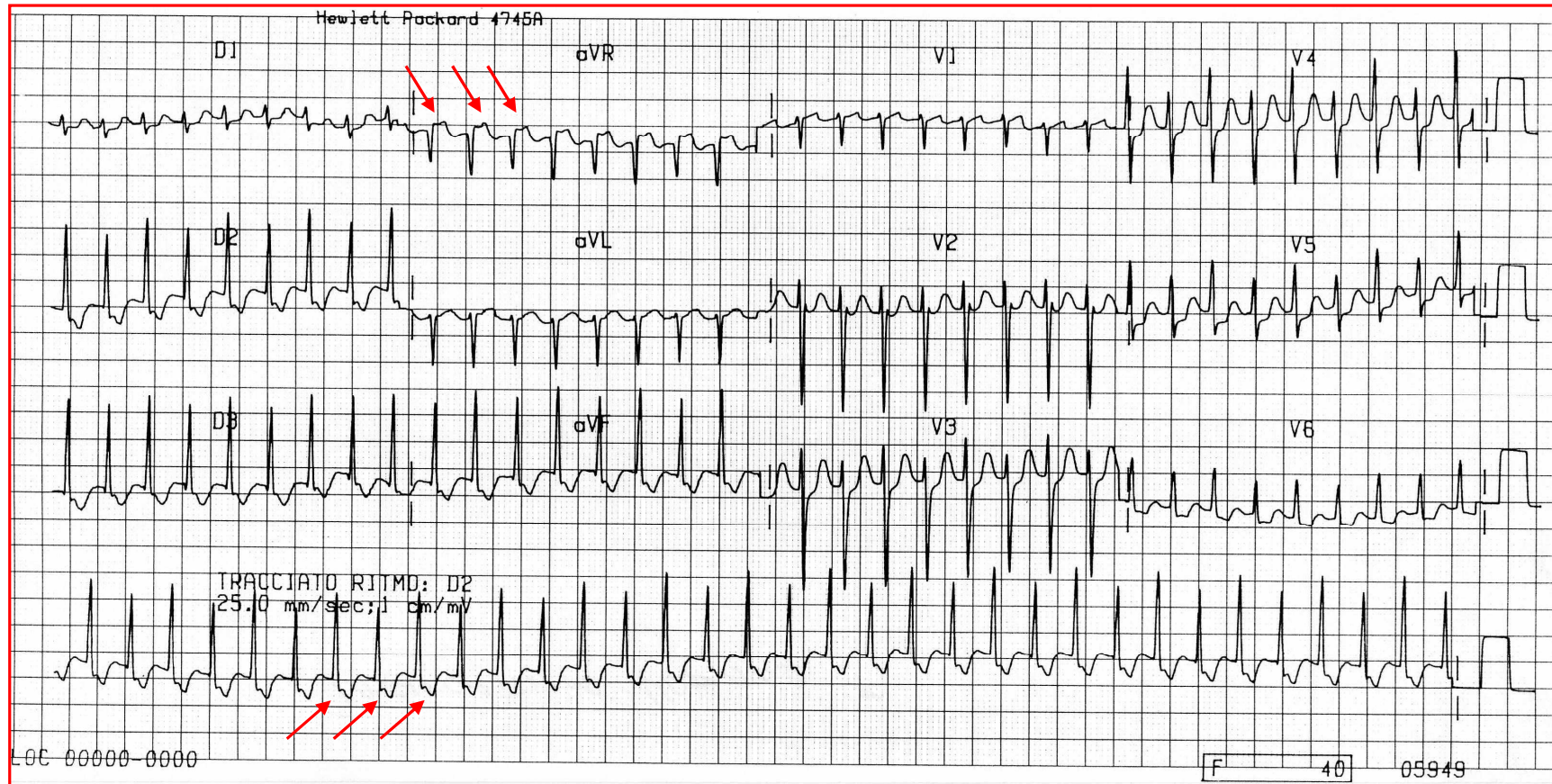
Circulation. 2016; vol 133:e506–e574



©ESC 2019

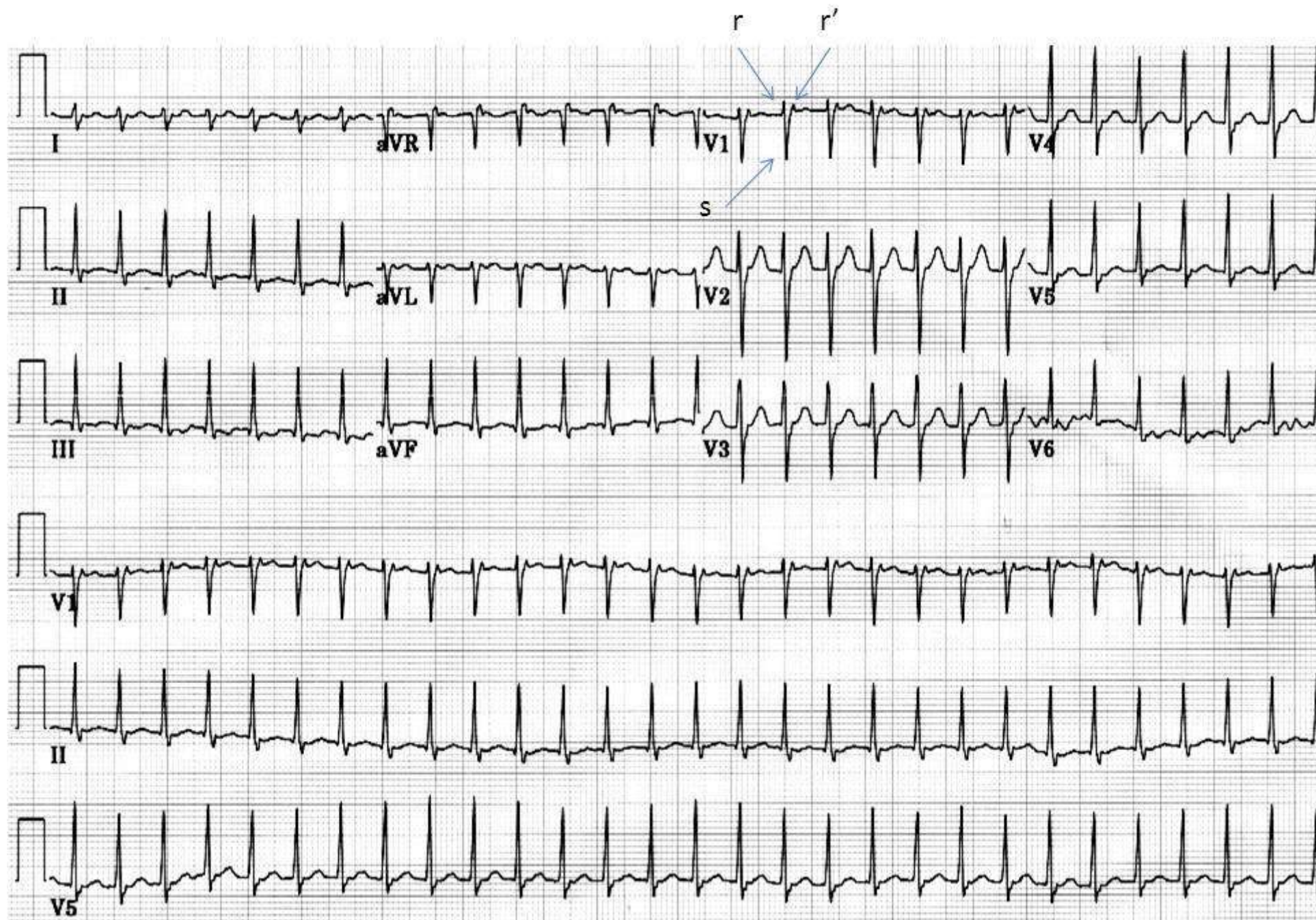
Figure 1 Differential diagnosis of narrow QRS tachycardia. Recording of a retrograde P wave should be sought by obtaining a 12 lead Electrocardiogram and, if necessary, using the Lewis leads or even an oesophageal lead connected to a pre-cordial lead (V1) with use of alligator clamps. The 90 ms cut-off is a rather arbitrary number used for surface electrocardiogram measurements if P waves are visible and is based on limited data. In the electrophysiology laboratory, the cut-off of the ventriculoatrial interval is 70 ms. Junctional ectopic tachycardia may also present with atrioventricular dissociation.

AF = atrial fibrillation; AT = atrial tachycardia; AV = atrioventricular; AVNRT = atrioventricular nodal re-entrant tachycardia; AVRT = atrioventricular re-entrant tachycardia; JET = junctional ectopic tachycardia; RP = RP interval; VT = ventricular tachycardia.



TPSV da rientro nodale:

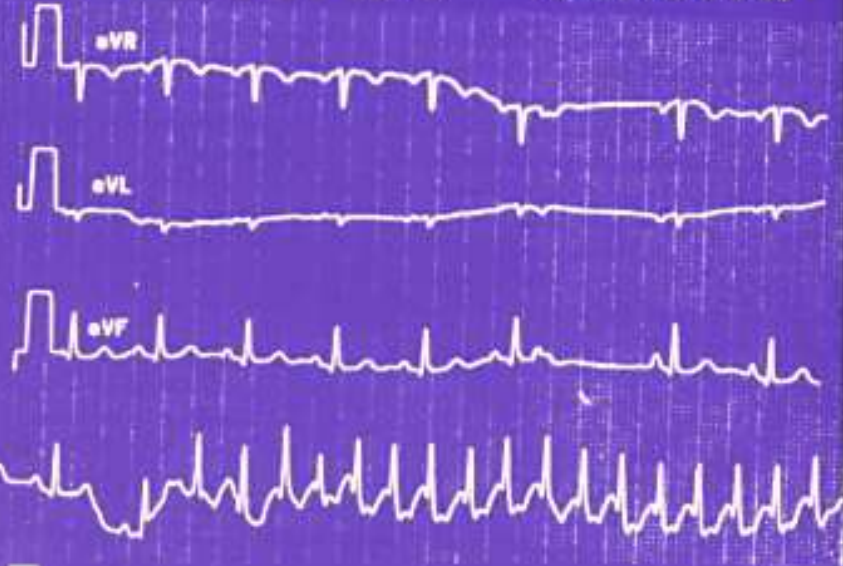
- QRS stretti e ritmici;
- P' non identificabili o retrograde (sono quasi contemporanee al qrs)
- QRS : P' = 1 : 1



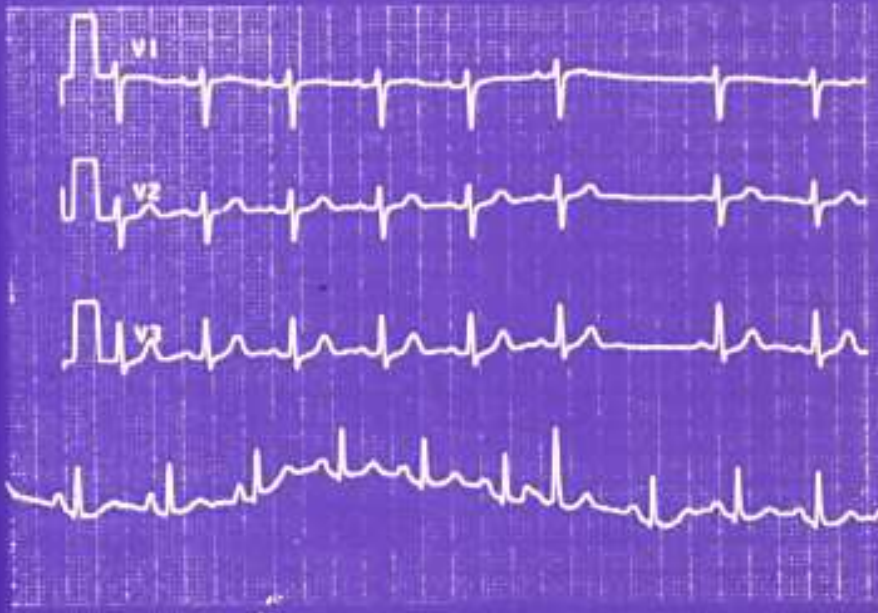
16-Mag-95 12:06 AUTO 10mm/mV 25mm/s F3 AC 00



16-Mag-95 12:06 AUTO 10mm/mV 25mm/s F3 AC 00

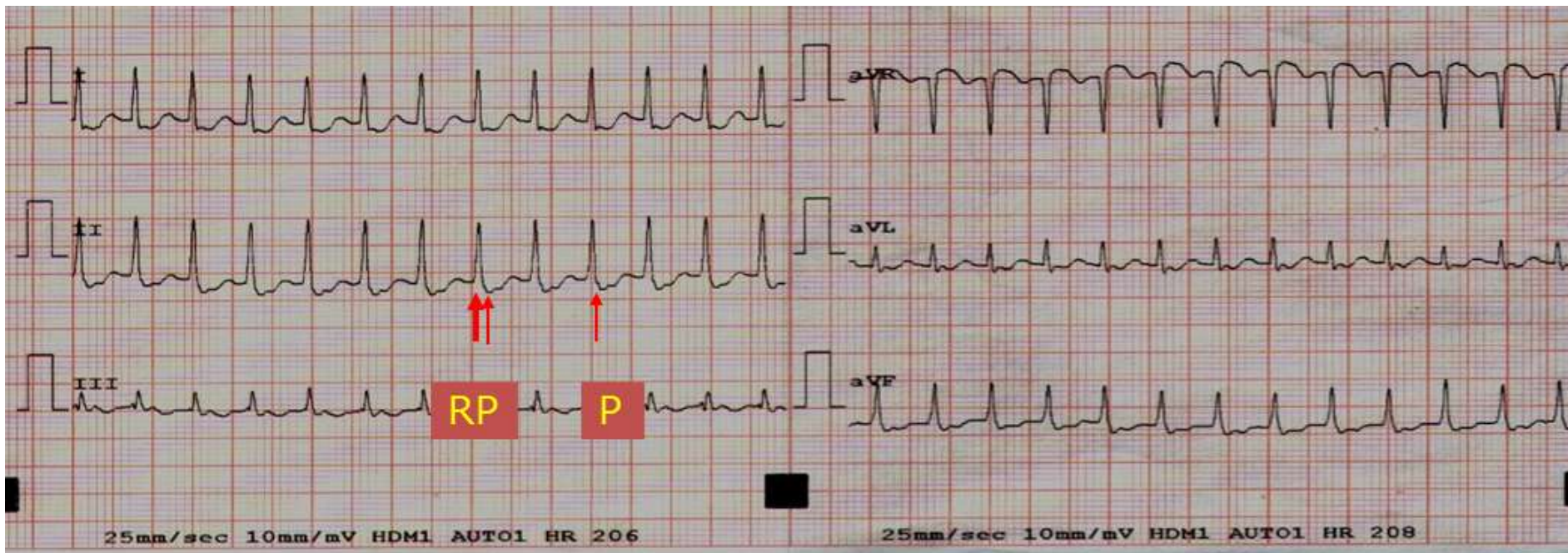


16-Mag-95 12:07 AUTO 10mm/mV 25mm/s F3 AC 120



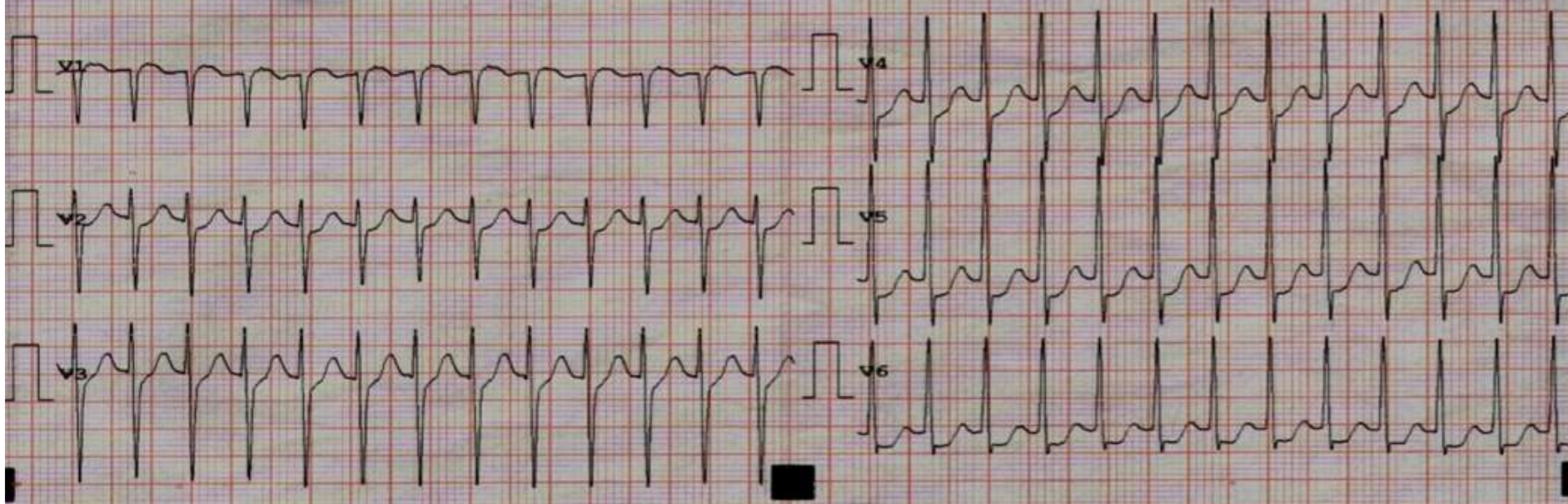
16-Mag-95 12:07 AUTO 10mm/mV 25mm/s F3 AC 115



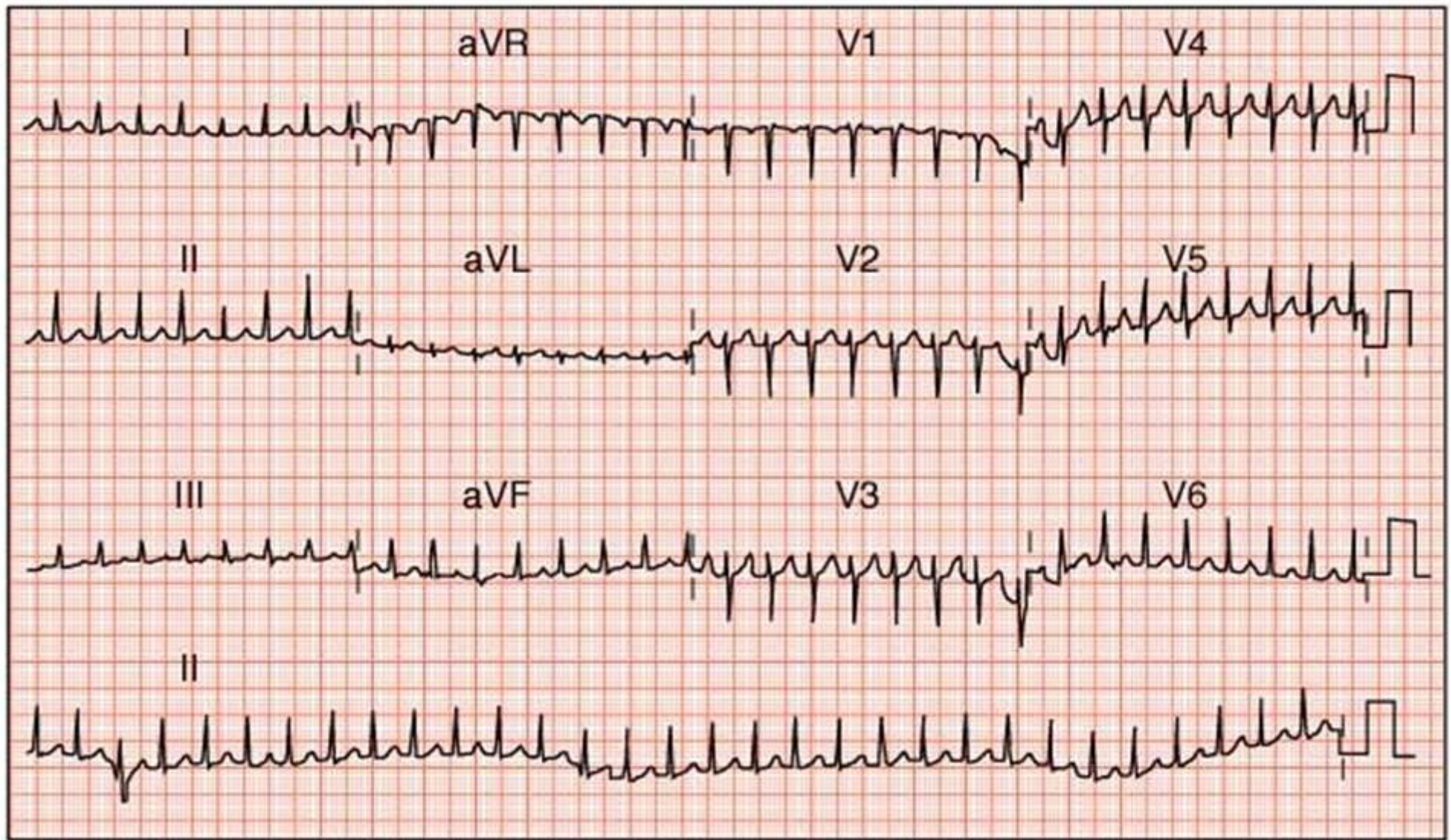


CARDIOLINE DELTA3 18:25 24-JUL-02
GEMCO ITALIA

CARDIOLINE DELTA3 18:25 24-JUL-02
GEMCO ITALIA



Guarda V1: quell'r' può essere una P?

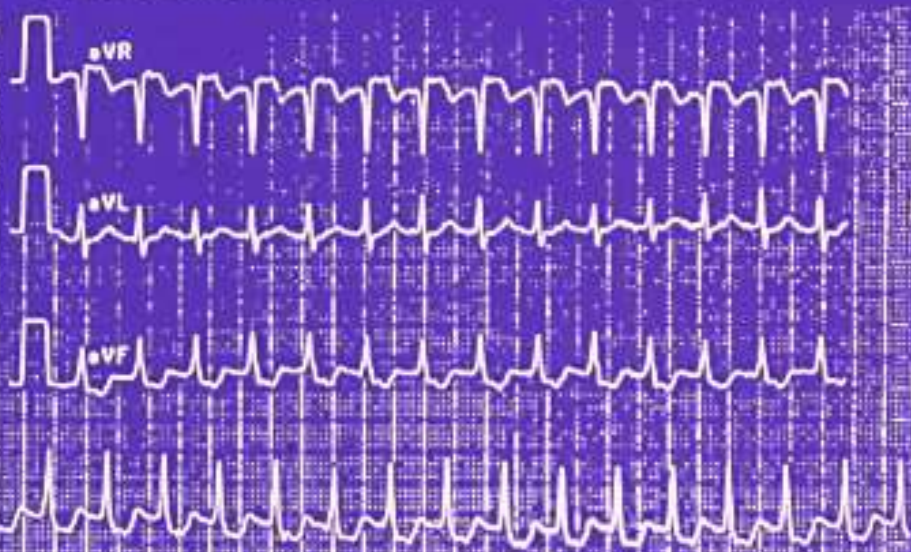
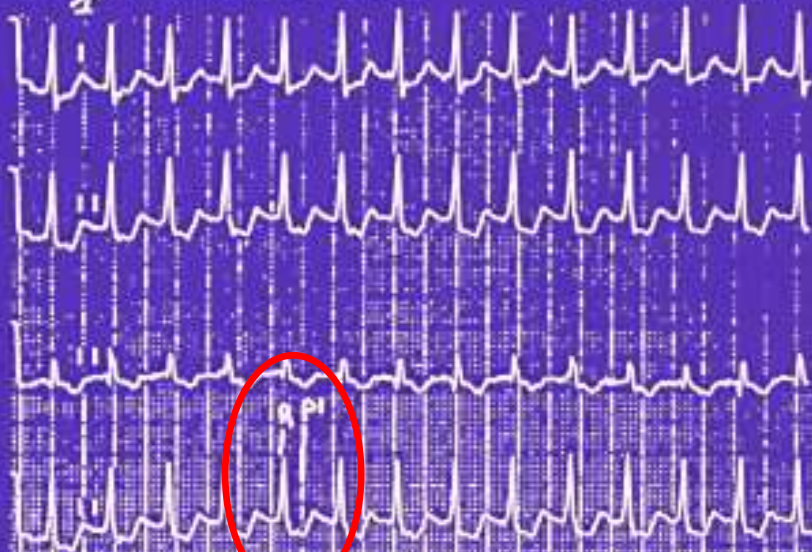


1
-Gen-93 14:28 AUTO 10mm/mV

25mm/s F3 AC V 94

21-Gen-93 14:28 AUTO 10mm/mV

25mm/s F3 AC V 94

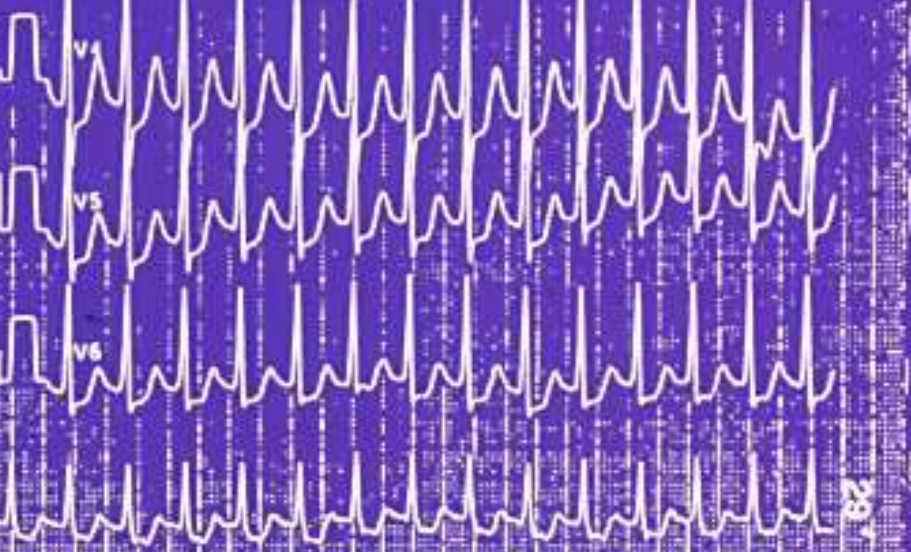
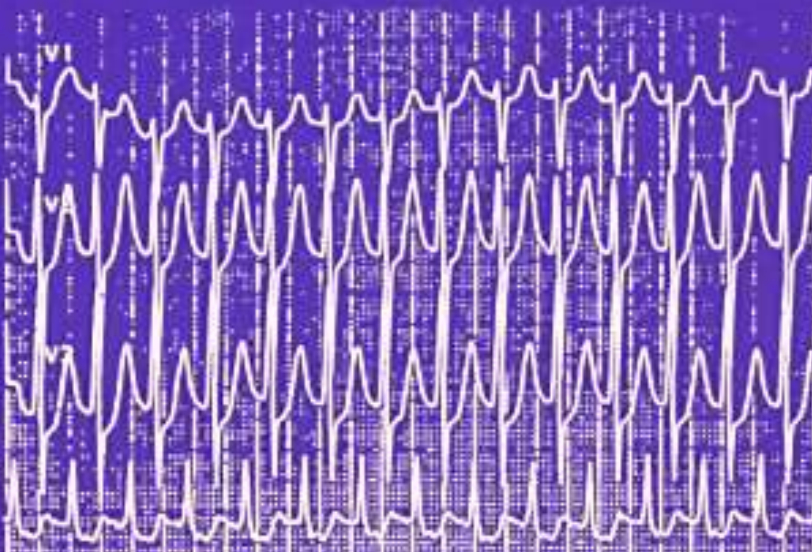


1-Gen-93 14:28 AUTO 10mm/mV

25mm/s F3 AC V 94

21-Gen-93 14:28 AUTO 10mm/mV

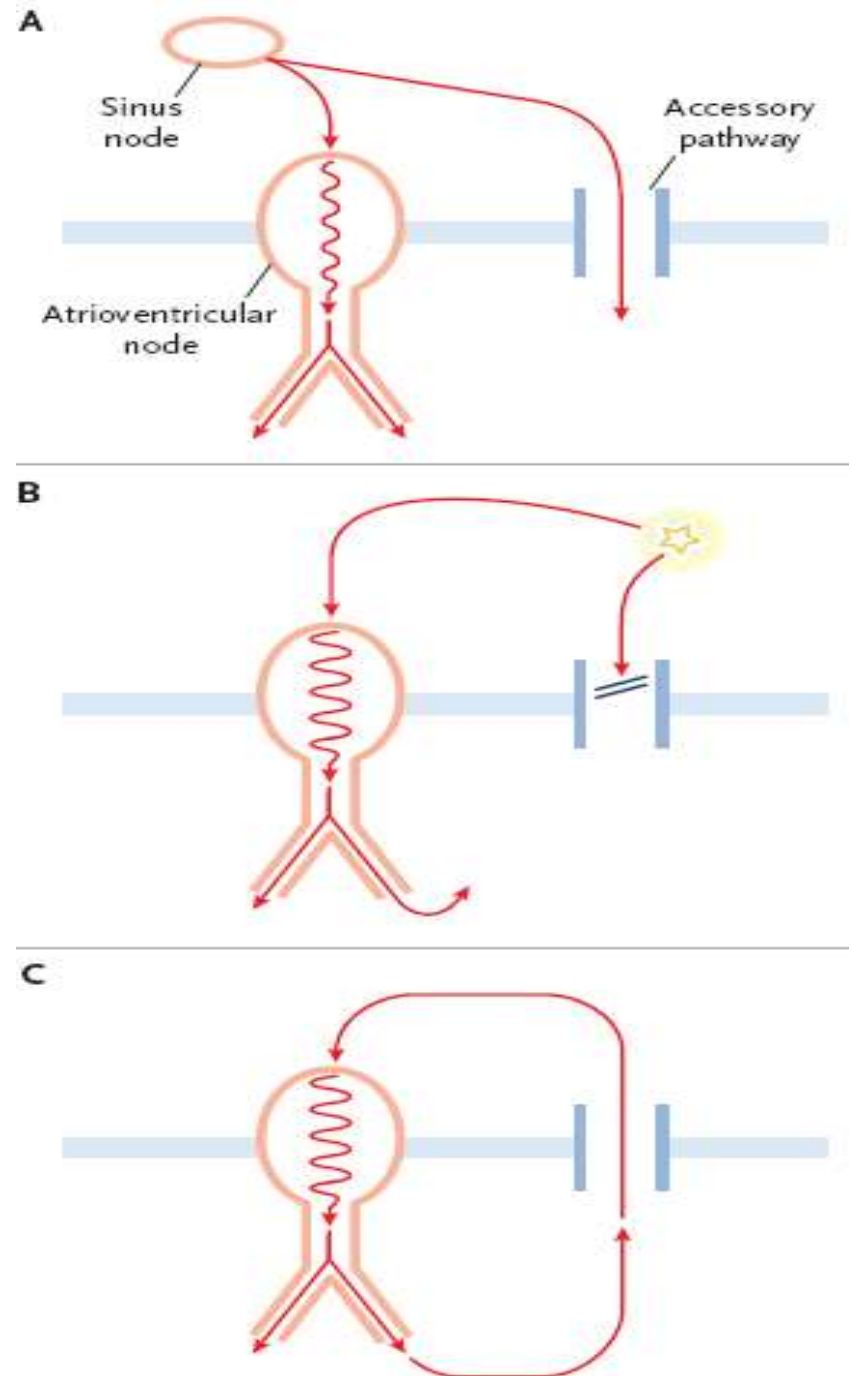
25mm/s F3 AC V 94

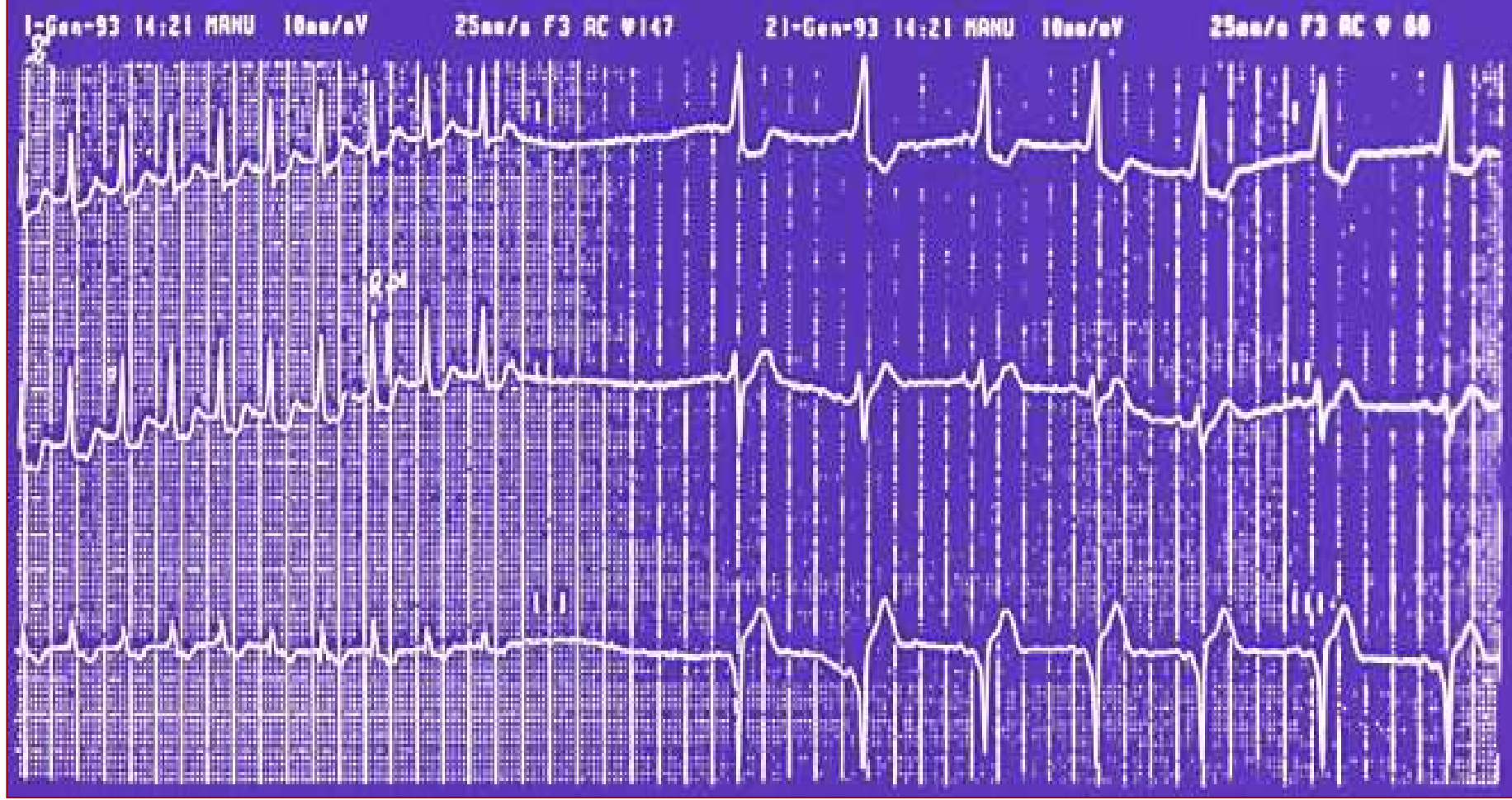


Atrioventricular reentrant tachycardia (**AVRT**) is the second most common type of SVT, accounting for about 30% of all SVTs.

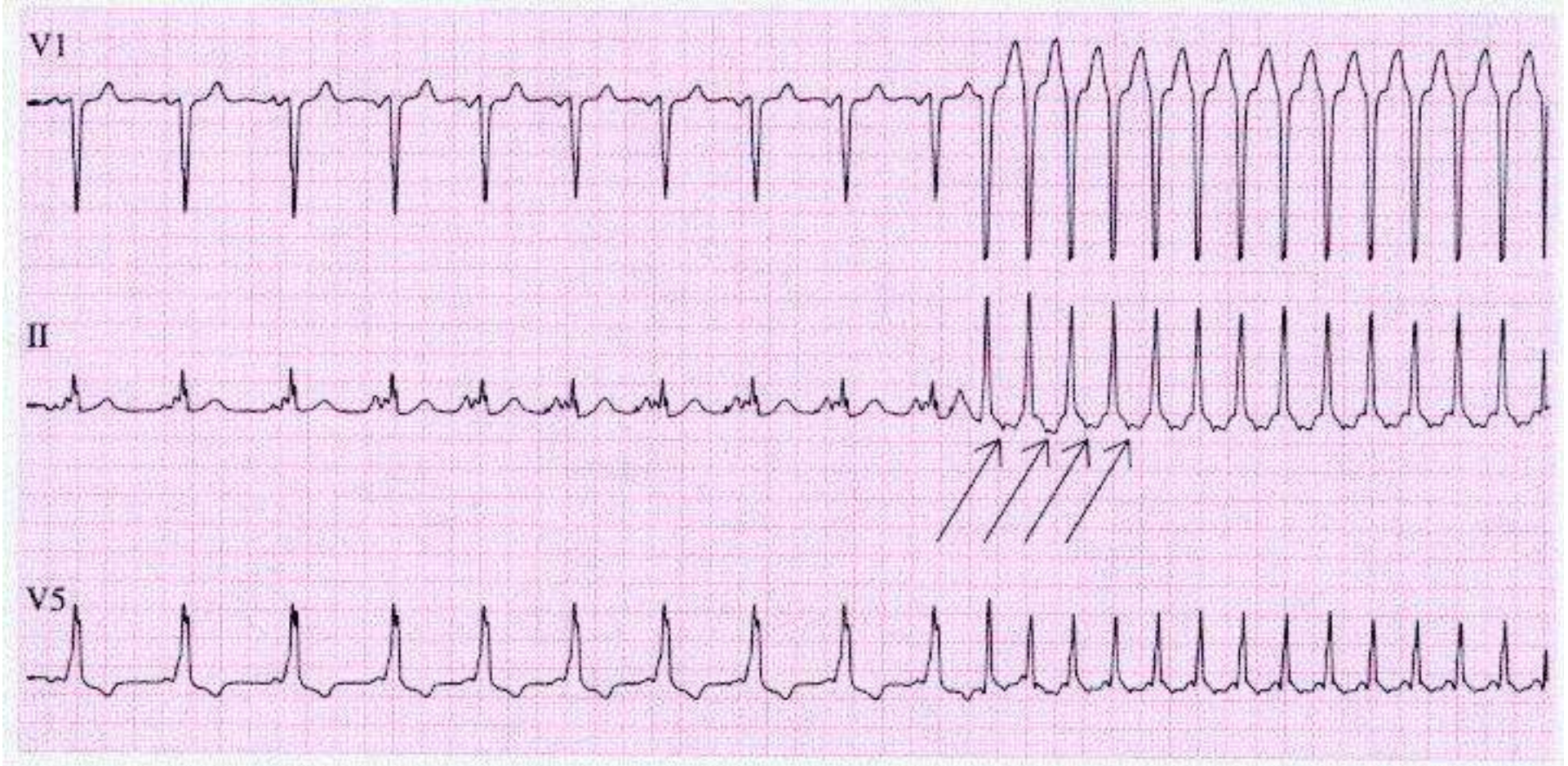
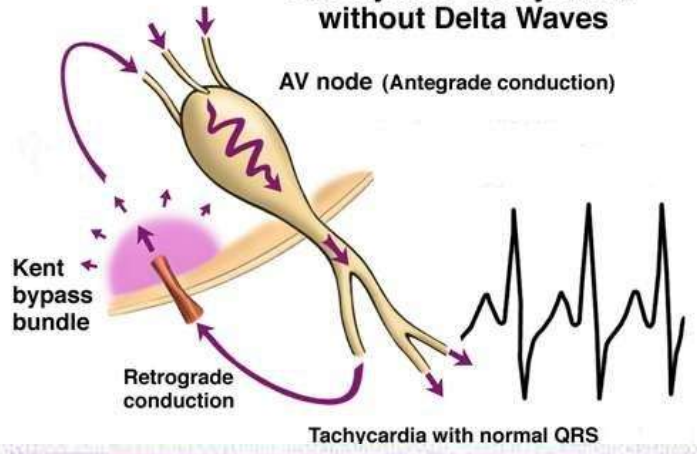
La TRAV è una tachicardia da rientro il cui circuito è costituito da:

- 1)miocardio atriale;
- 2)normale sistema di conduzione;
- 3)miocardio ventricolare
- 4)**via anomala** (con le sue diverse localizzazioni: laterale, posteriore, settale, anteriore –

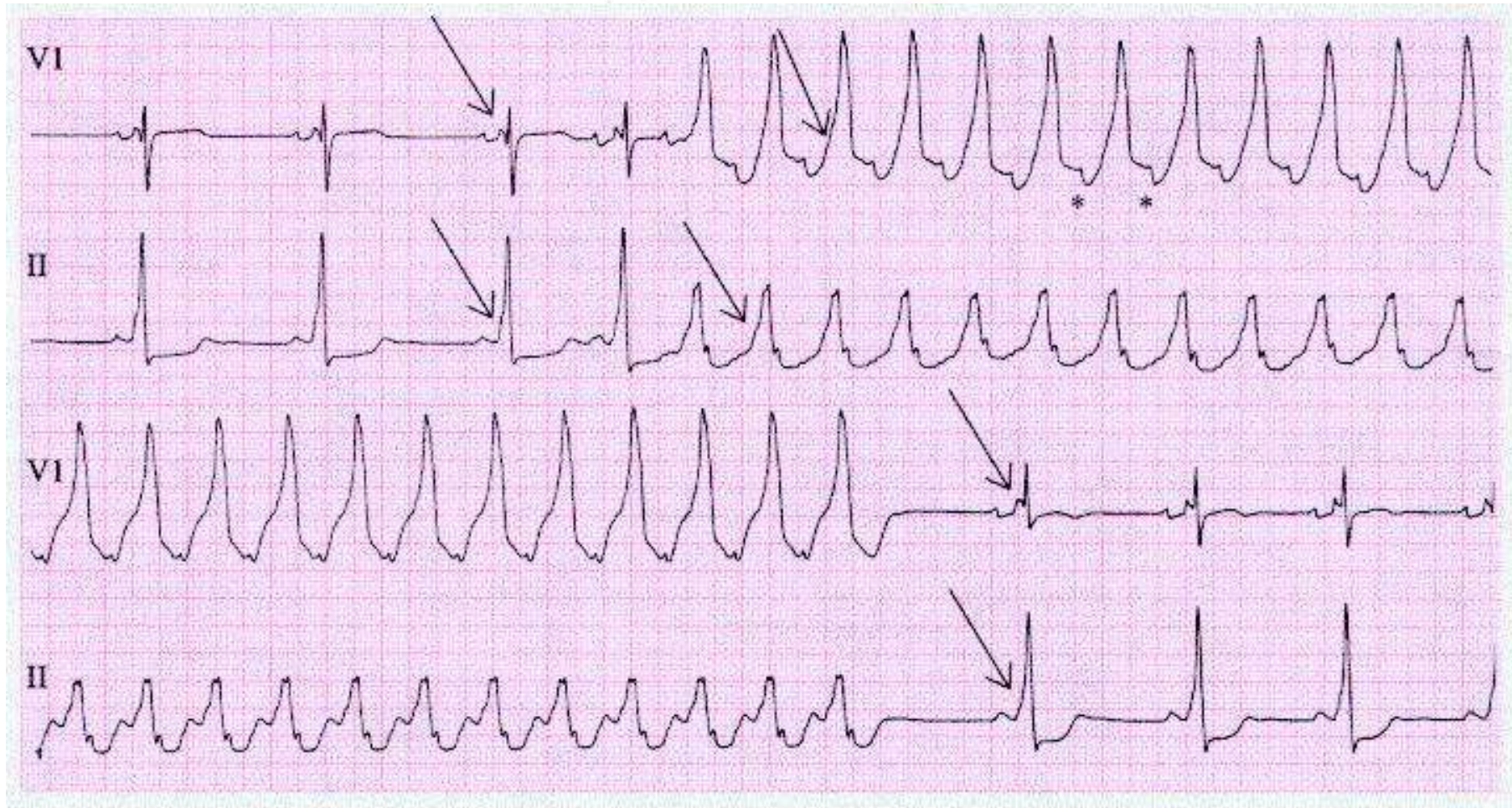
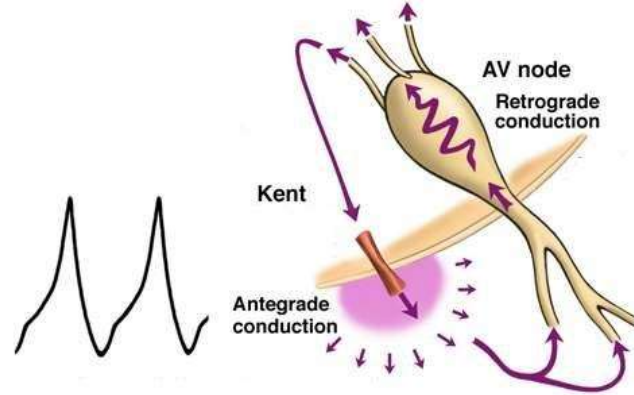




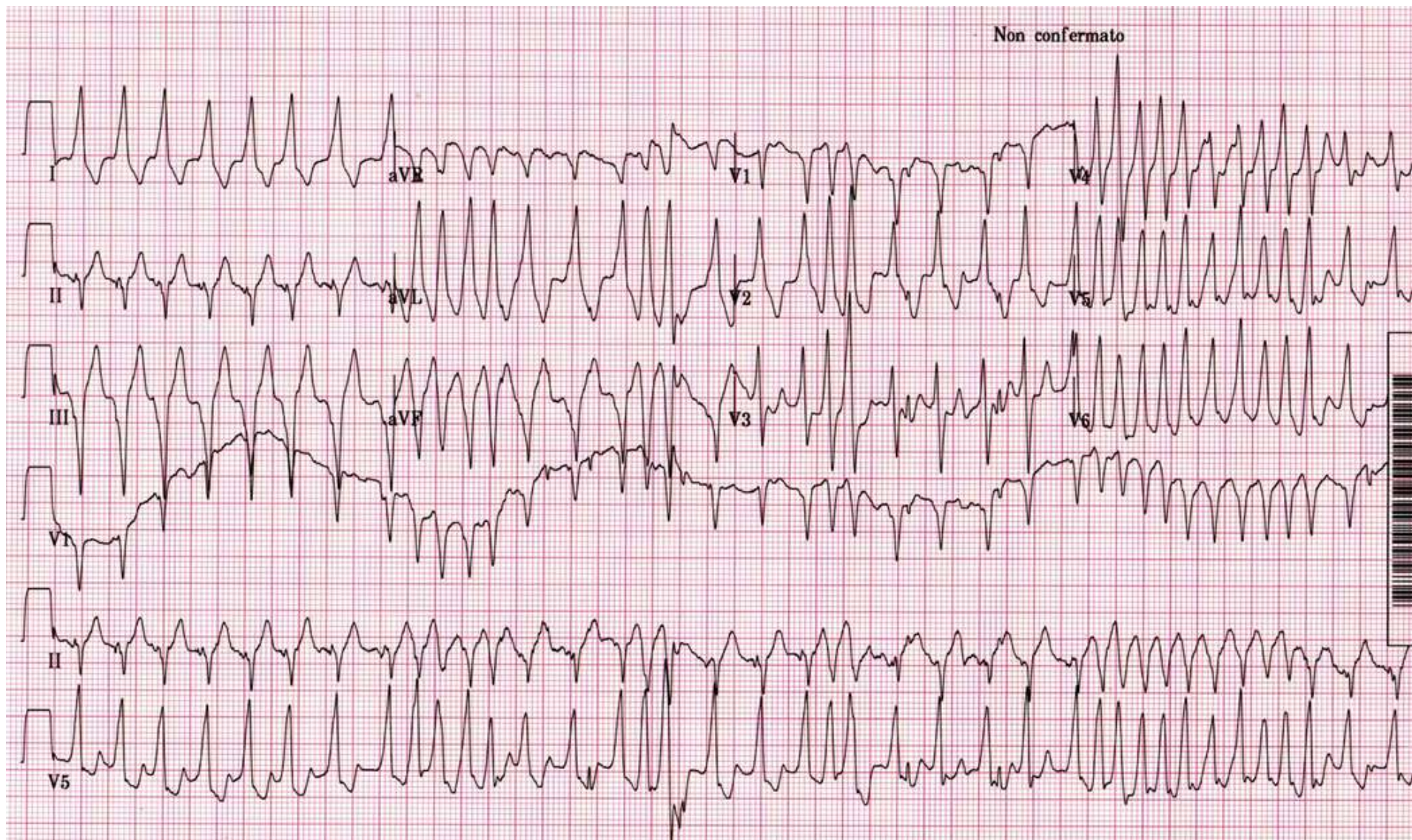
Paroxysmal Tachycardia without Delta Waves



Paroxysmal Tachycardia with Delta Waves and Wide QRS Complex



analisi ecg 3

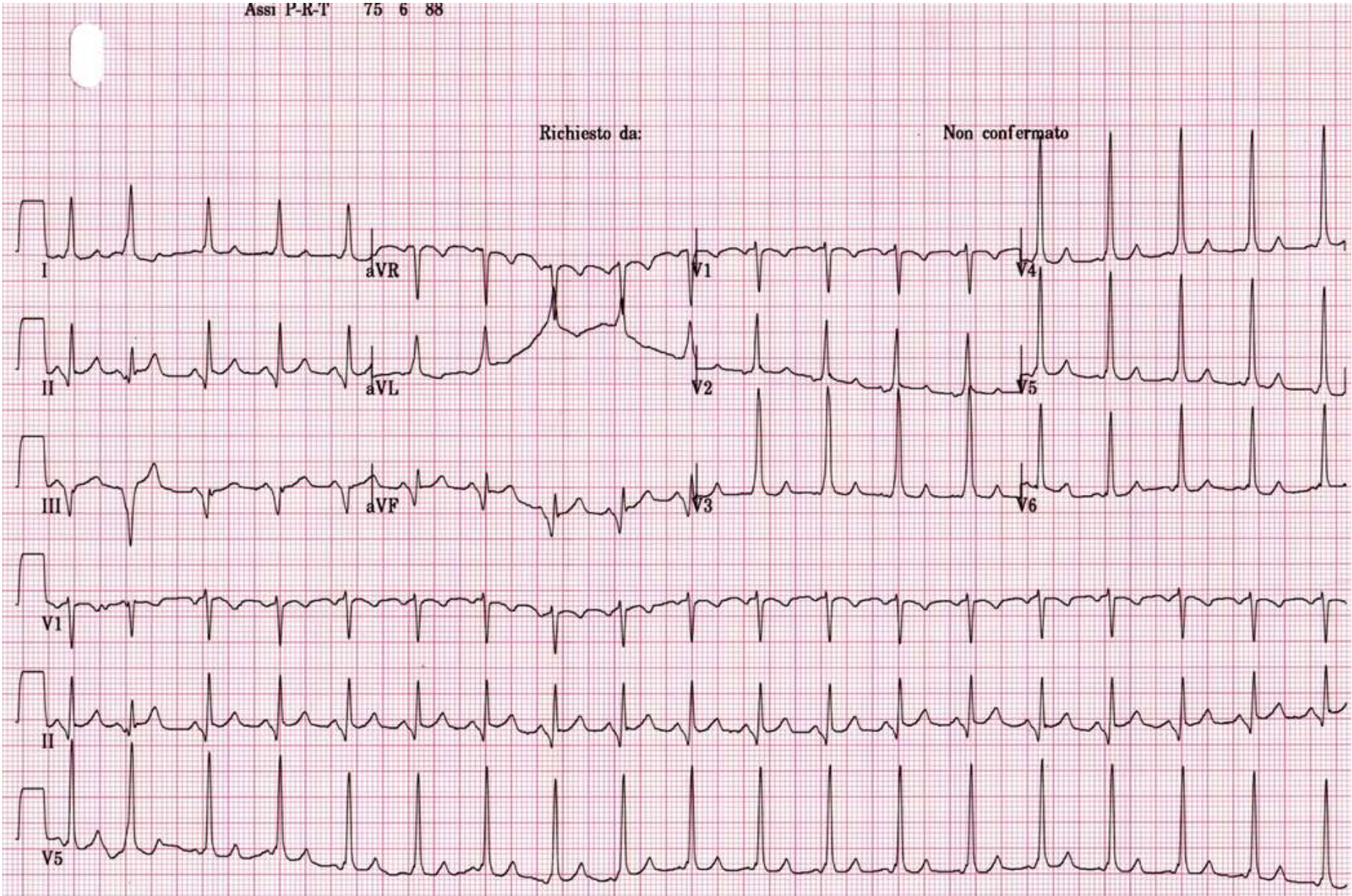


Al ripristino del RS

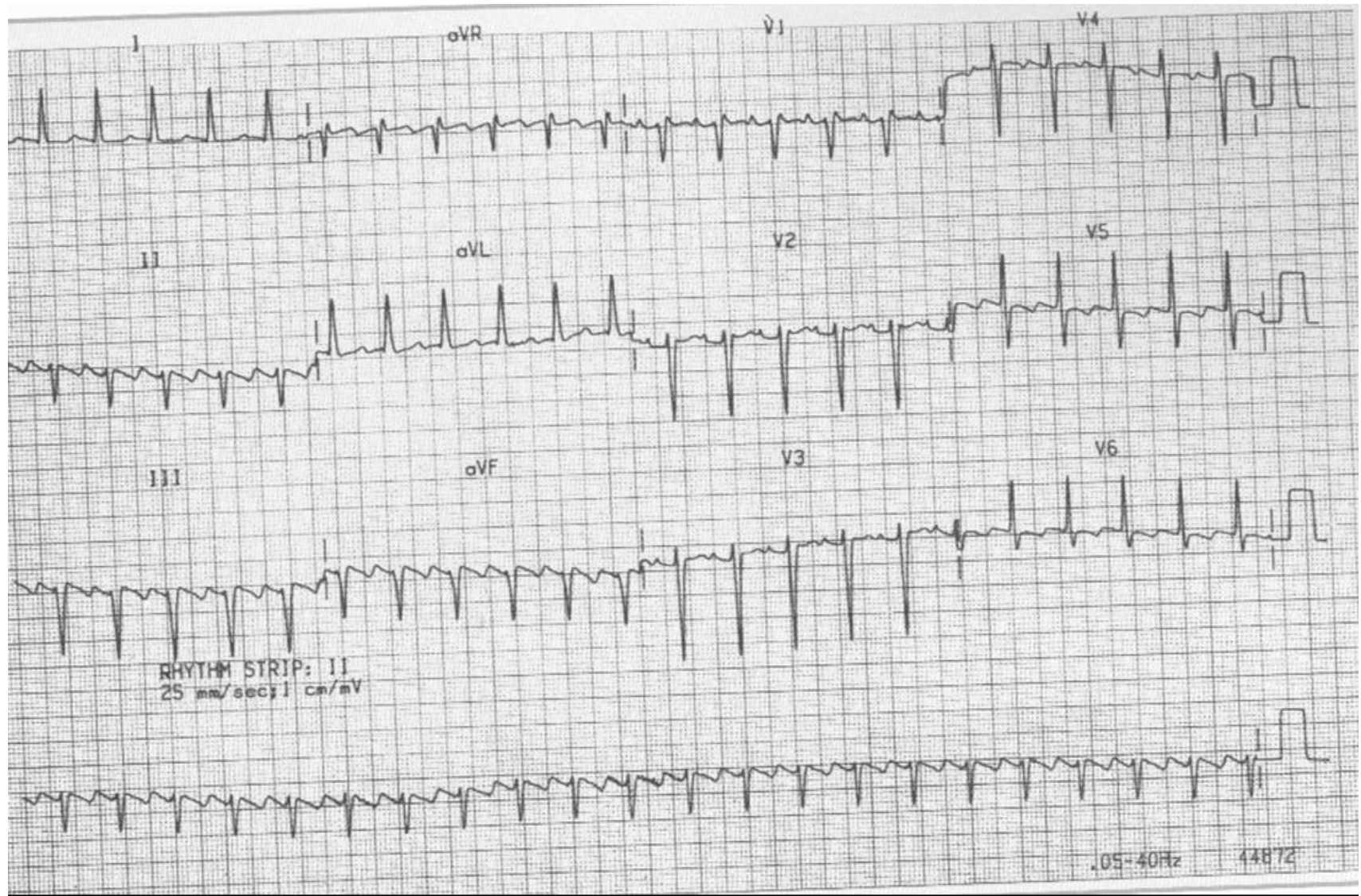
Assi P-R-T 75 6 88

Richiesto da:

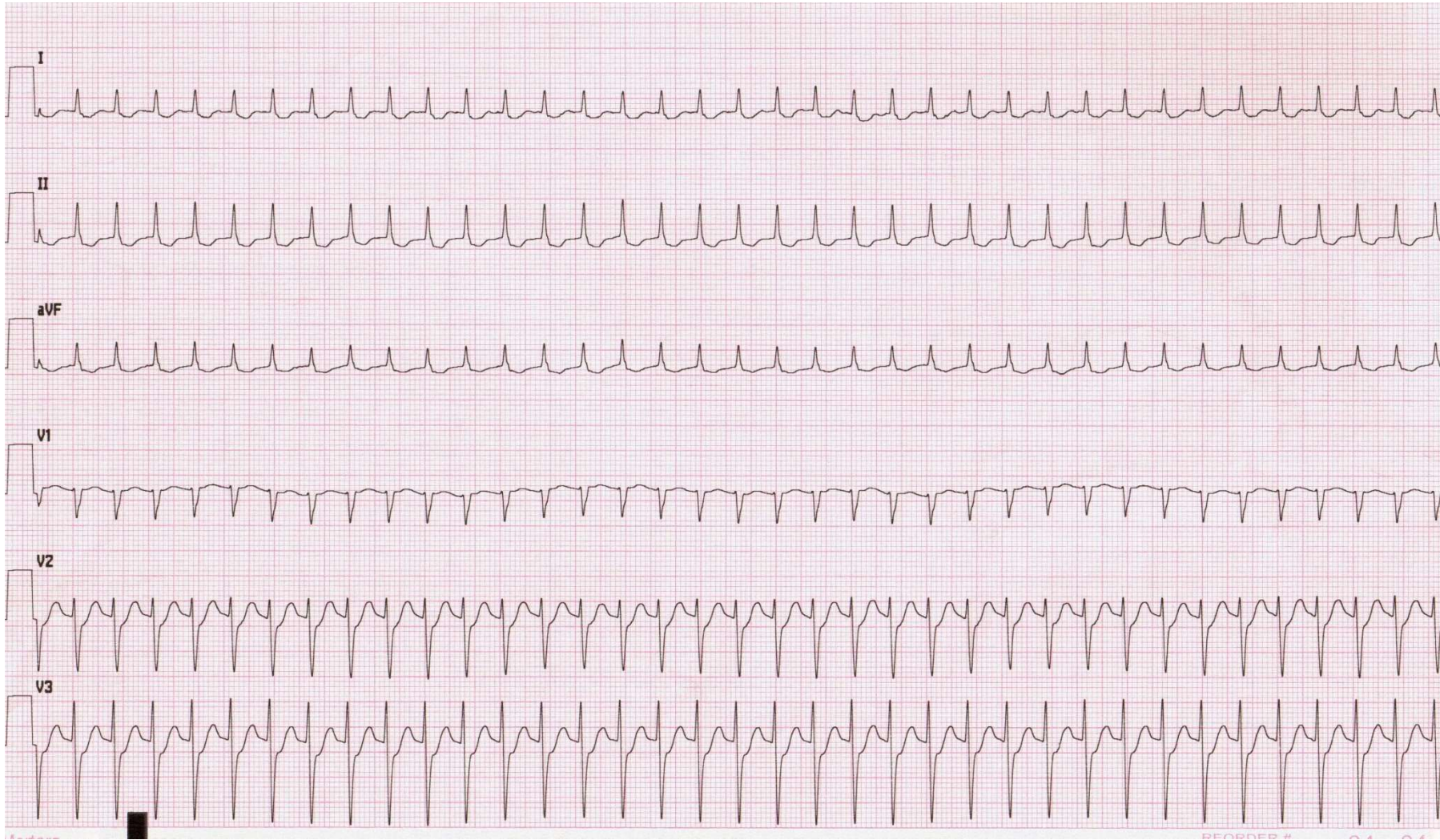
Non confermato



analisi ecg 4



analisi ecg 5



SPERIAMO CHE MI VENGA
UN ATTACCO DI PANICO,
COSÌ REAGISCO
ALLO SCONFORTO.



Tachicardia sinusale inappropriata:

Persistente incremento della f.c. in un cuore a riposo, non correlata allo stress fisico, emozionale, patologico o farmacologico

Escludi le possibili cause

Recommendations for Treatment of Inappropriate Sinus Tachycardia

Treatment	Recommendation	Class	Evidence
Medical	Beta blockers	I	C
	Verapamil, diltiazem	IIa	C
Interventional	Catheter ablation-sinus node modification/elimination*	IIb	C

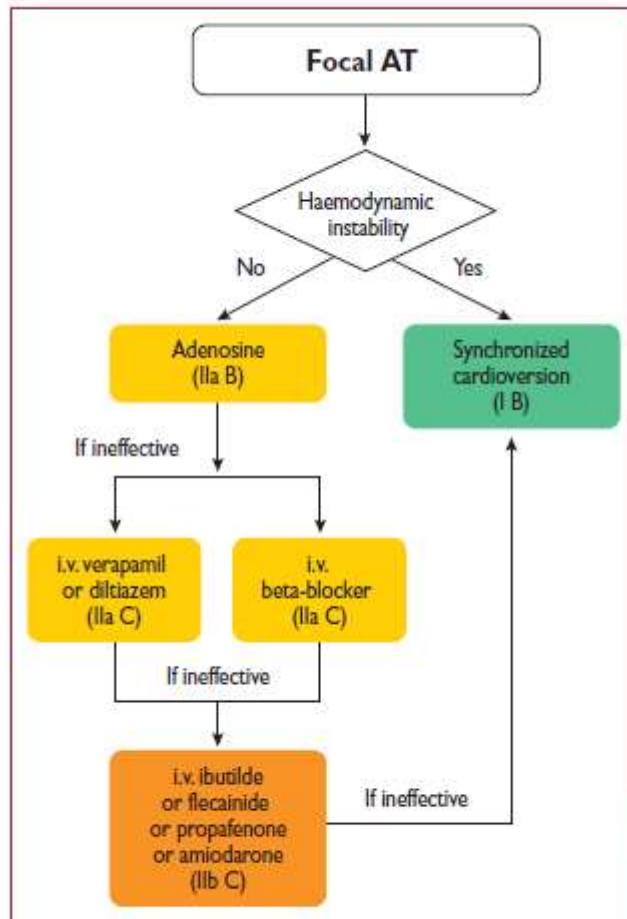


Figure 8 Acute therapy of focal atrial tachycardia. AT = atrial tachycardia; i.v. = intravenous.

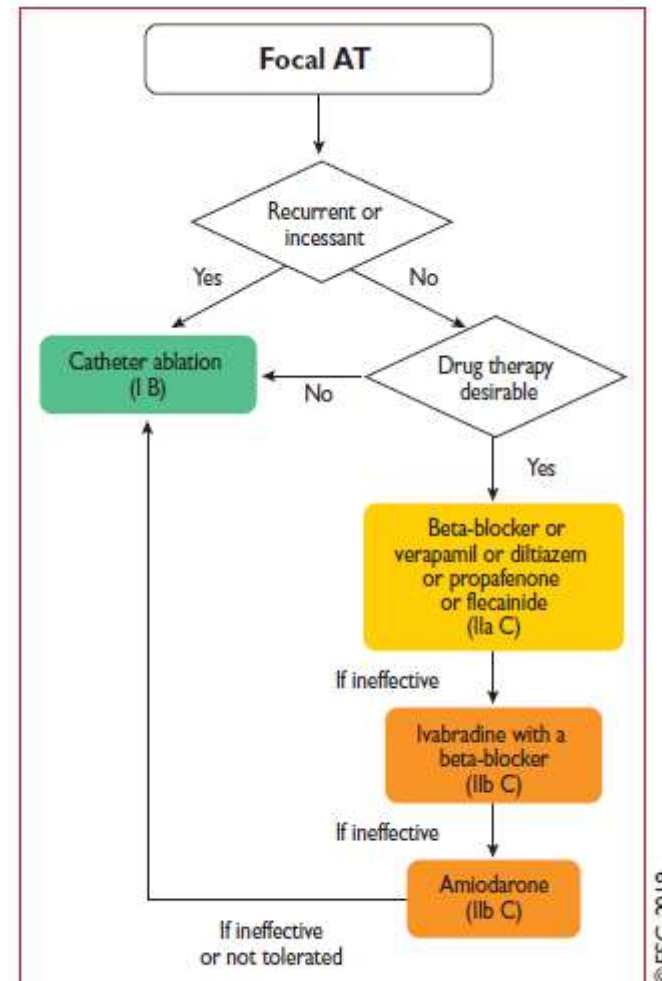
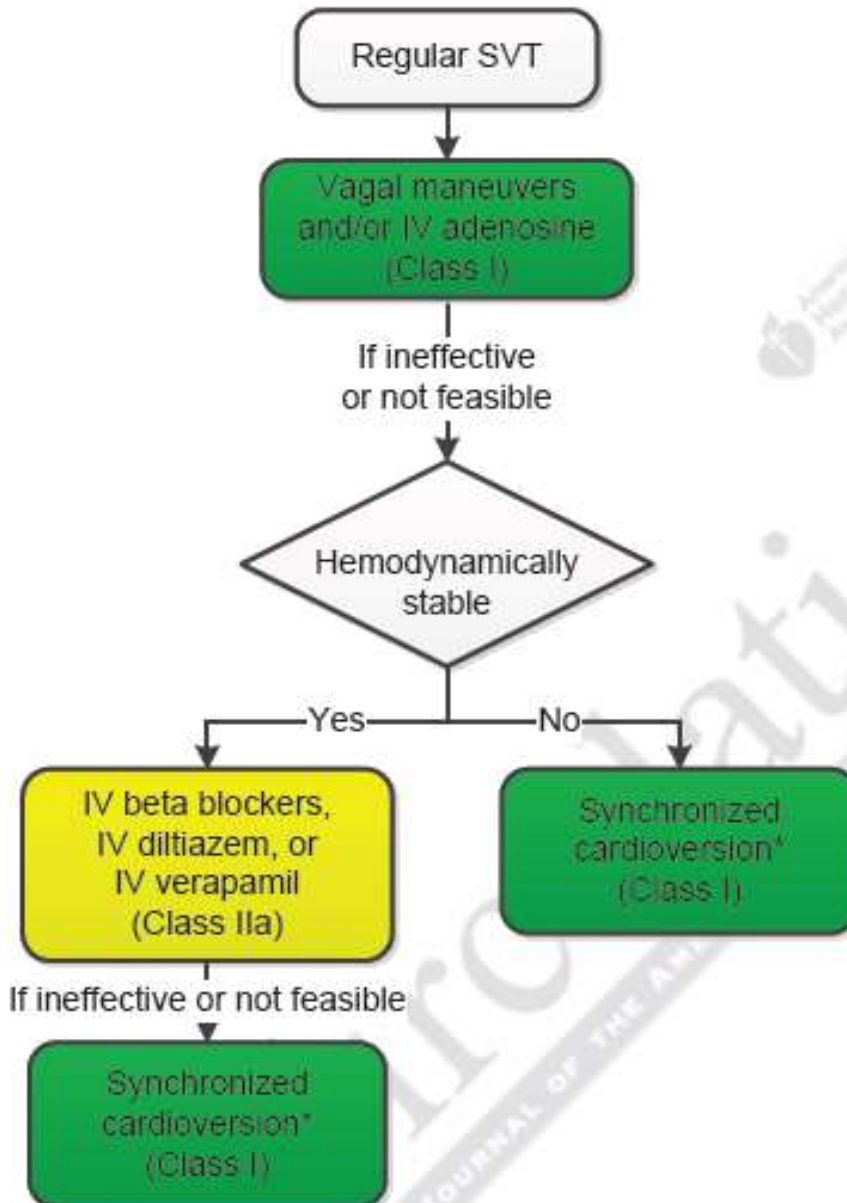


Figure 9 Chronic therapy of focal atrial tachycardia. AT = atrial tachycardia.



Colors correspond to Class of Recommendation in Table 1; drugs listed alphabetically.

*For rhythms that break or recur spontaneously, synchronized cardioversion is not appropriate.

IV indicates intravenous; and SVT, supraventricular tachycardia.

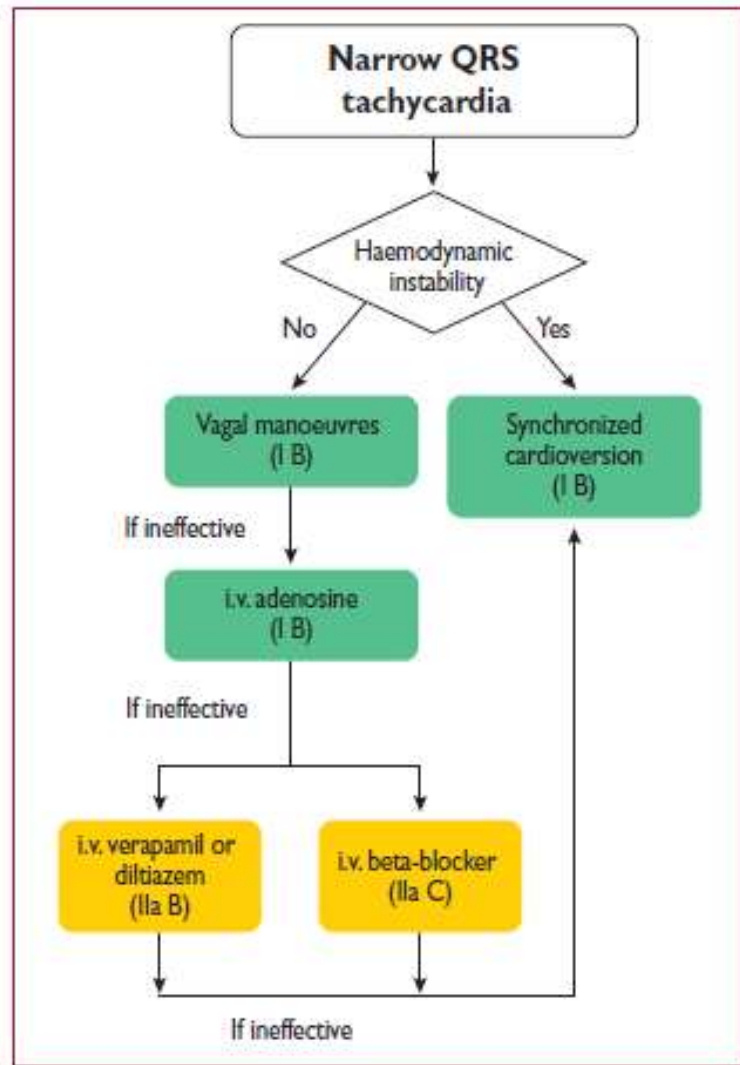


Figure 4 Acute therapy of narrow QRS tachycardia in the absence of an established diagnosis.

i.v. = intravenous.

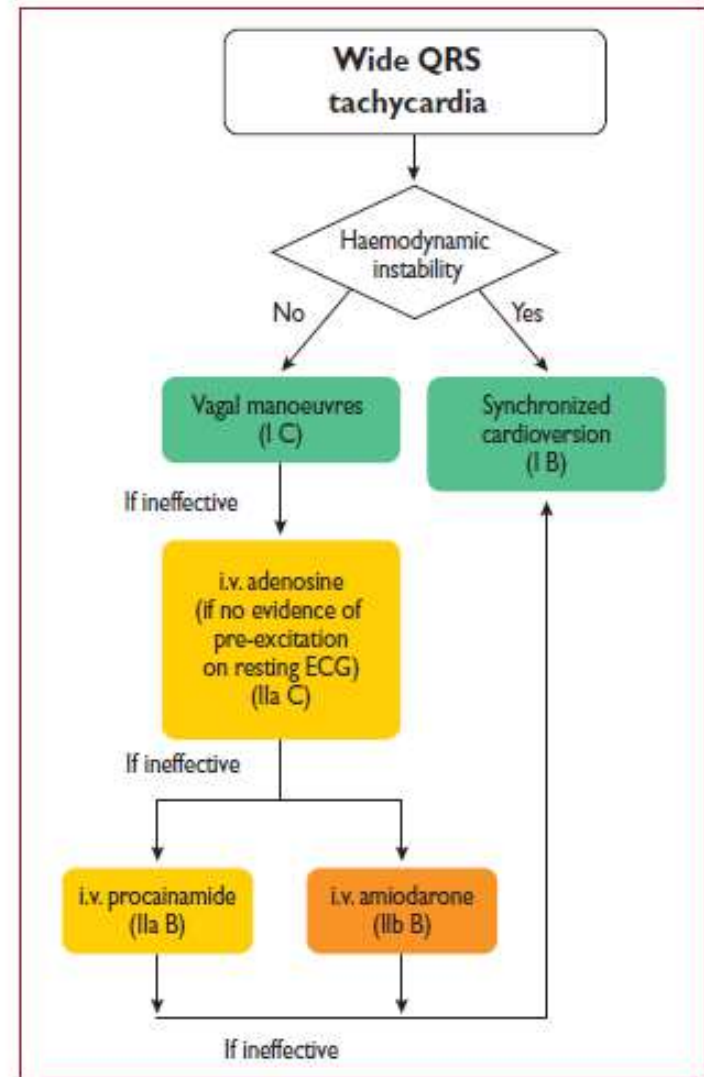


Figure 5 Acute therapy of wide complex tachycardia in the absence of an established diagnosis.

AVRT = atrioventricular re-entrant tachycardia; i.v. = intravenous.

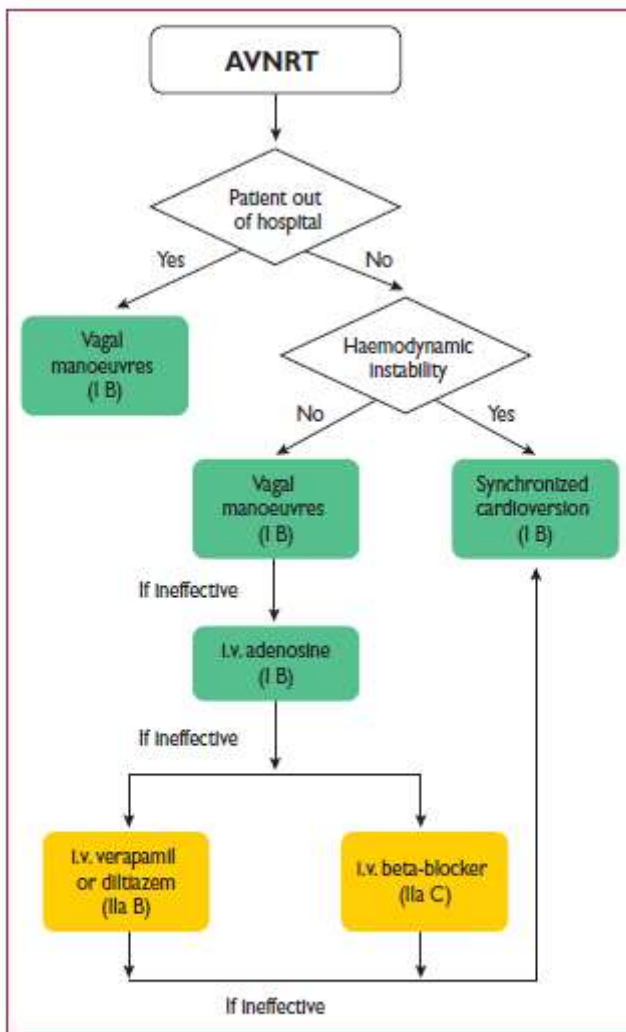
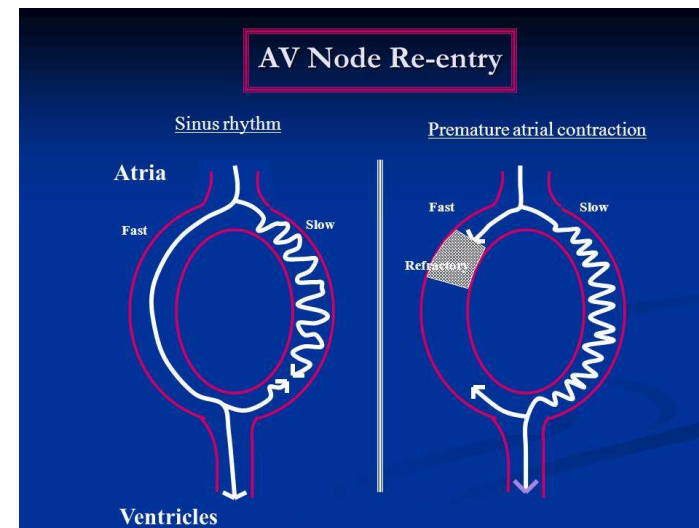


Figure 14 Acute therapy of atrioventricular nodal re-entrant tachycardia.
 AVNRT = atrioventricular nodal re-entrant tachycardia; i.v. = intravenous.



Recommendations for Acute Treatment of AVRT (AtrioVentricular Reentry Tachycardia)

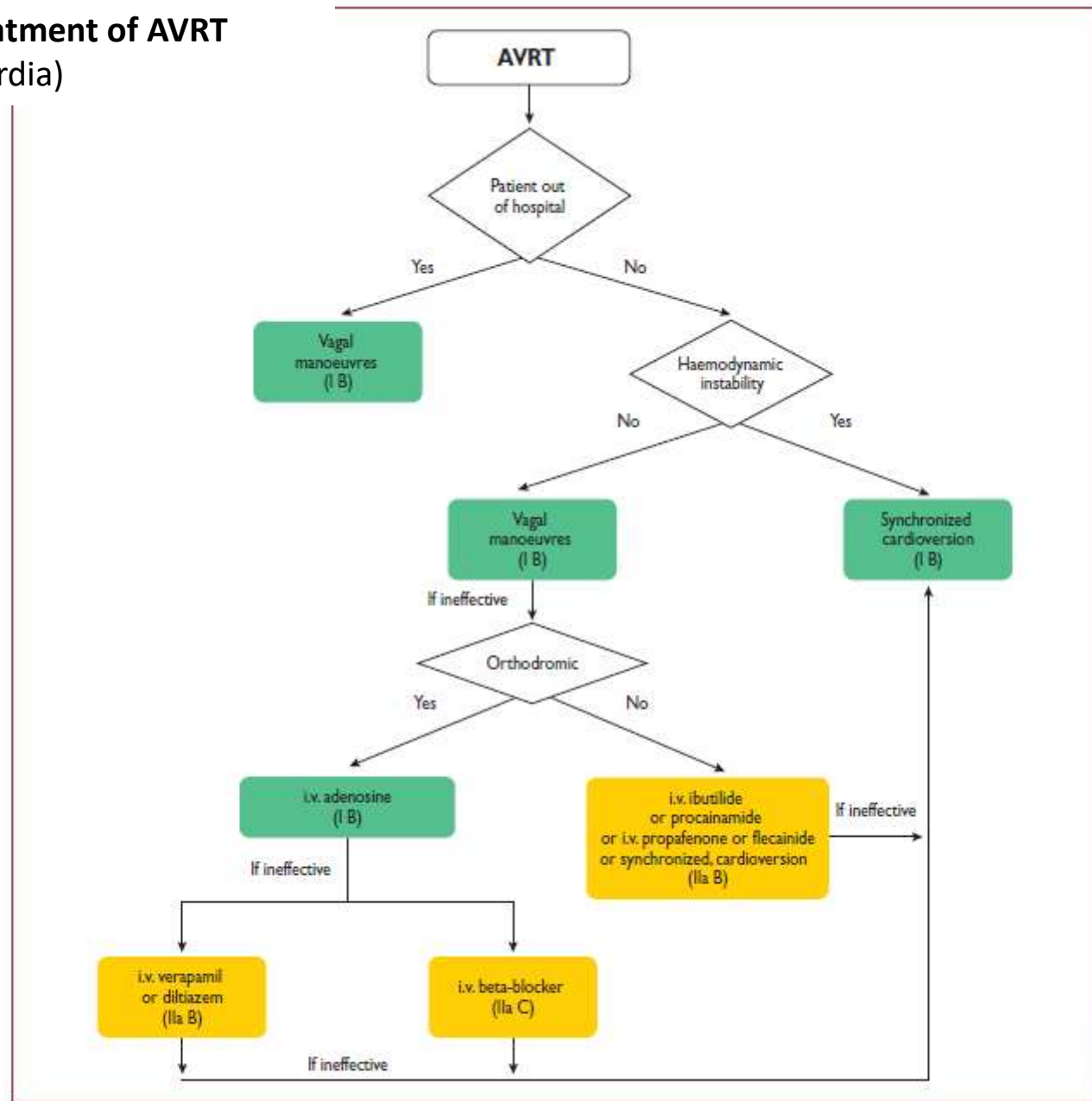


Figure 19 Acute therapy of atrioventricular re-entrant tachycardia.
AVRT = atrioventricular re-entrant tachycardia; i.v. = intravenous.

Recommendations for Treatment Strategies for SVT During Pregnancy (PC1)

Treatment Strategy	Recommendation	Class	Evidence
Acute conversion of PSVT	Vagal maneuver	I	C
	Adenosine	I	C
	DC cardioversion	I	C
	Metoprolol, propranolol	IIa	C
	Verapamil	IIb	C
Prophylactic therapy	Digoxin	I	C
	Metoprolol*	I	B
	Propranolol*	IIa	B
	Sotalol,* flecainide [†]	IIa	C
	Procainamide	IIb	B
	Quinidine, propafenone, [†] verapamil	IIb	C
	Catheter ablation	IIb	C
	Atenolol [‡]	III	B
Amiodarone	III	C	

TPSV nel paz pediatrico

- Manovre vagali
- **Adenosina**: 0,1 mg/Kg sino ad un max di 0,3 mg /kg
- 2a scelta (amiodarone, esmololo)
- **Cardioversione sincronizzata:**
0,5-1 Joule/Kg

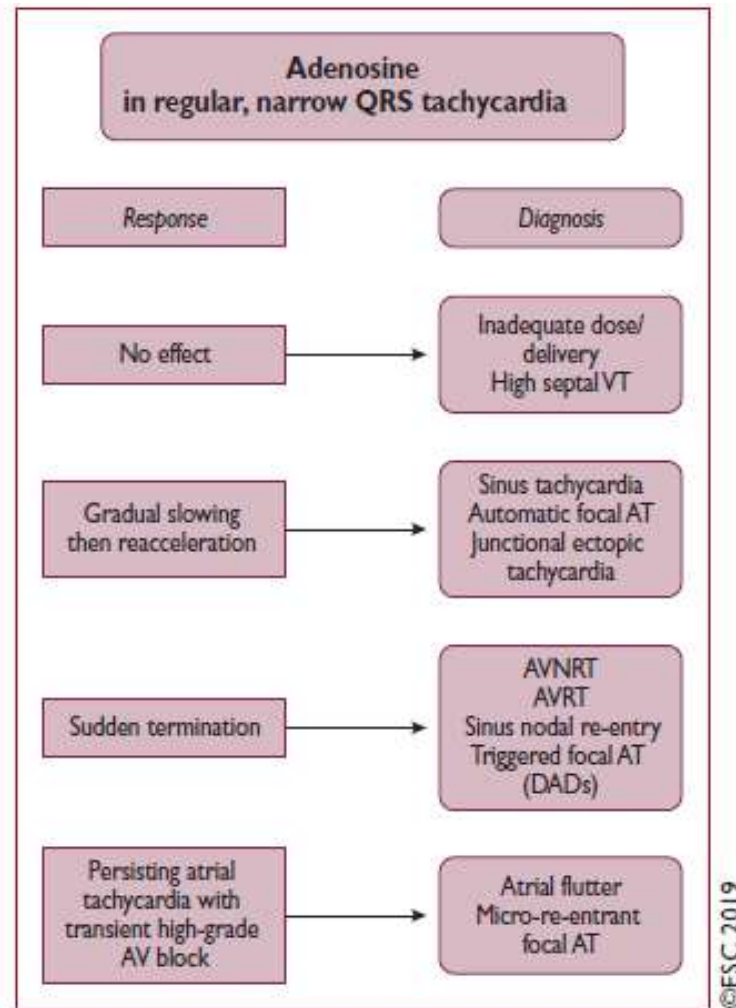


Figure 2 Responses of narrow-complex tachycardias to adenosine. AT = atrial tachycardia; AV = atrioventricular; AVNRT = atrioventricular nodal re-entrant tachycardia; AVRT = atrioventricular re-entrant tachycardia; DADs = delayed after-depolarizations; VT = ventricular tachycardia.

?



Problemi?

CIAO. CI VEDIAMO
DOMANI.

FINALMENTE
UN PO'
DI OTTIMISMO.



....Grazie