2022 Hospital Medicine Update
May 11-14

Hey Bing – Got A Minute?

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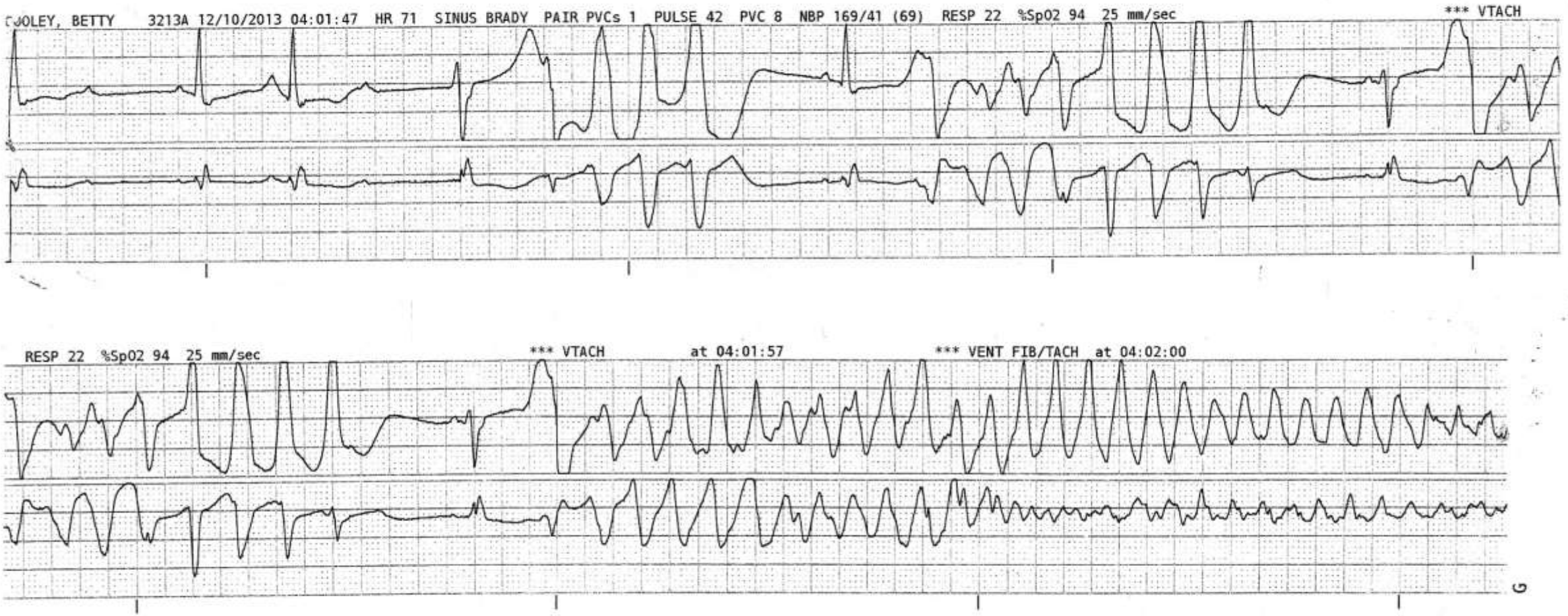
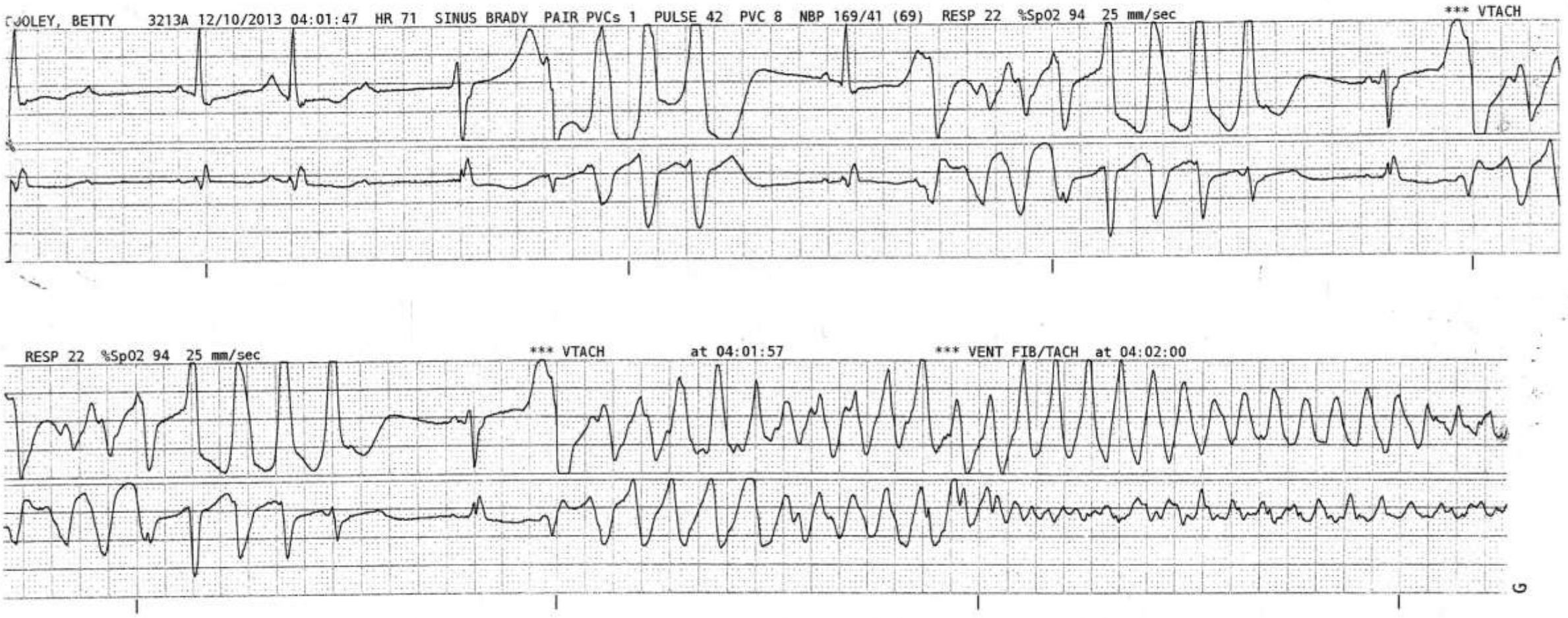
Disclosures

Artiste in Residence – Taste of Talent, San Francisco, CA
Major Sponsor – San Francisco Chamber Music Society
Member – Ackerman Family Vineyard, Napa, CA
Proud Sponsor – Michael Andreas Häringer
(virtuoso pianist/composer, Barcelona, Spain)

Bing, this looks very scary. What the heck is it?



Long QT → torsade de pointes



67 y/o woman with URI → pneumonia
poor appetite → malnourished → electrolyte imbalance
on QT-prolonging decongestants and antibiotics
coincidental progressive AVB → bradycardia

Long QT Syndrome

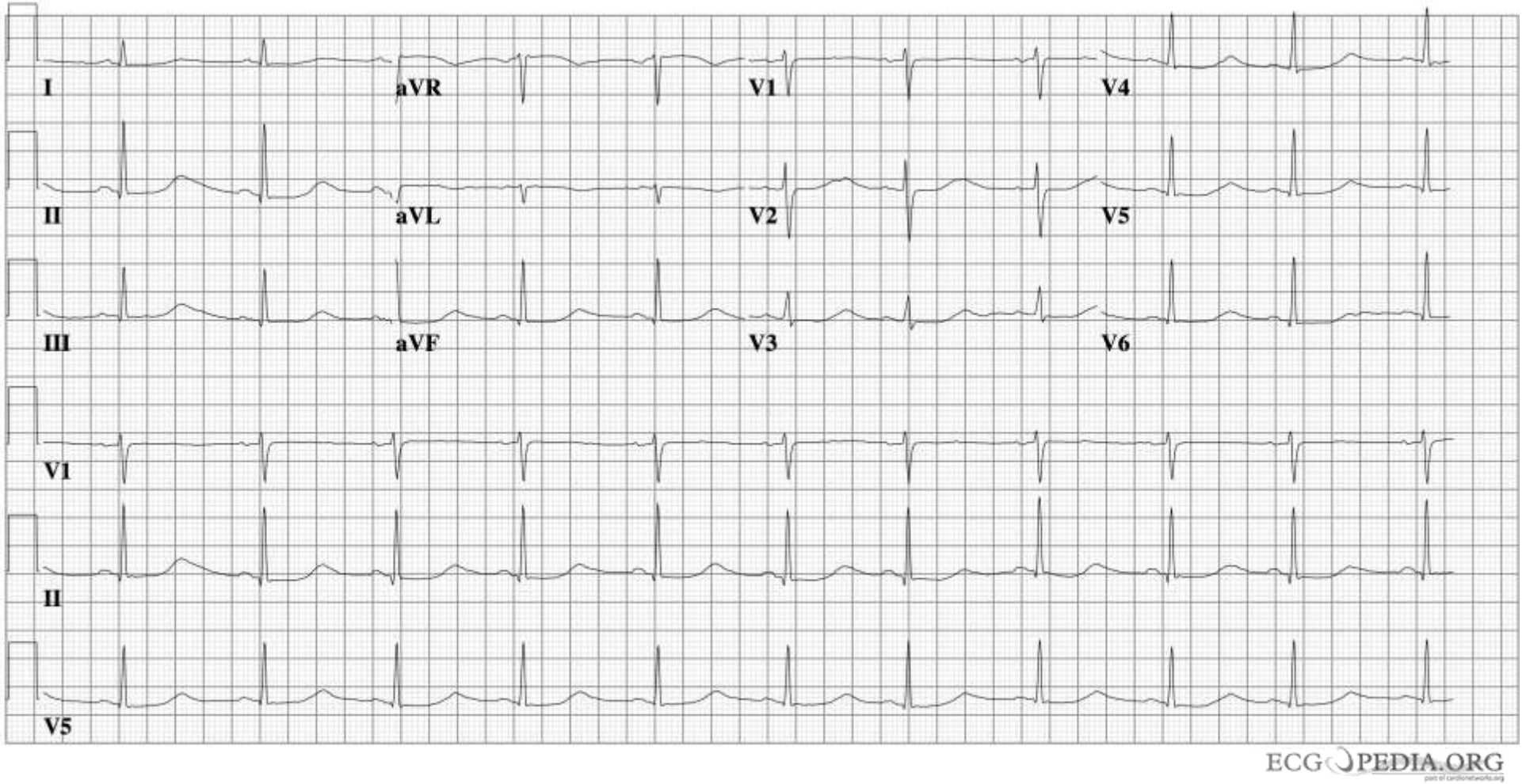
- The most common inherited arrhythmia
  - 1 in 2,000 births
- 13 genetic forms identified; LQTS 1-3 most common
- Arrhythmic events trigger:
  - LQTS 1: physical, emotional stress – KCNQ1 (decreased I_{Ks})
  - LQTS 2: sudden noises at rest – KCNH2 (decreased I_{Kr})
  - LQTS 3: at rest or during sleep – SCN5A (increased I_{Na})
- Diagnosis:
  - Pathogenic mutation is found
  - LQTS risk score of $\geq$ 3.5
  - Prolonged or abnormal QT
    - QTc $\geq$ 500 ms in the absence of secondary cause
    - QTc 480 – 499 ms in the absence of secondary cause + syncope

Long QT Syndrome

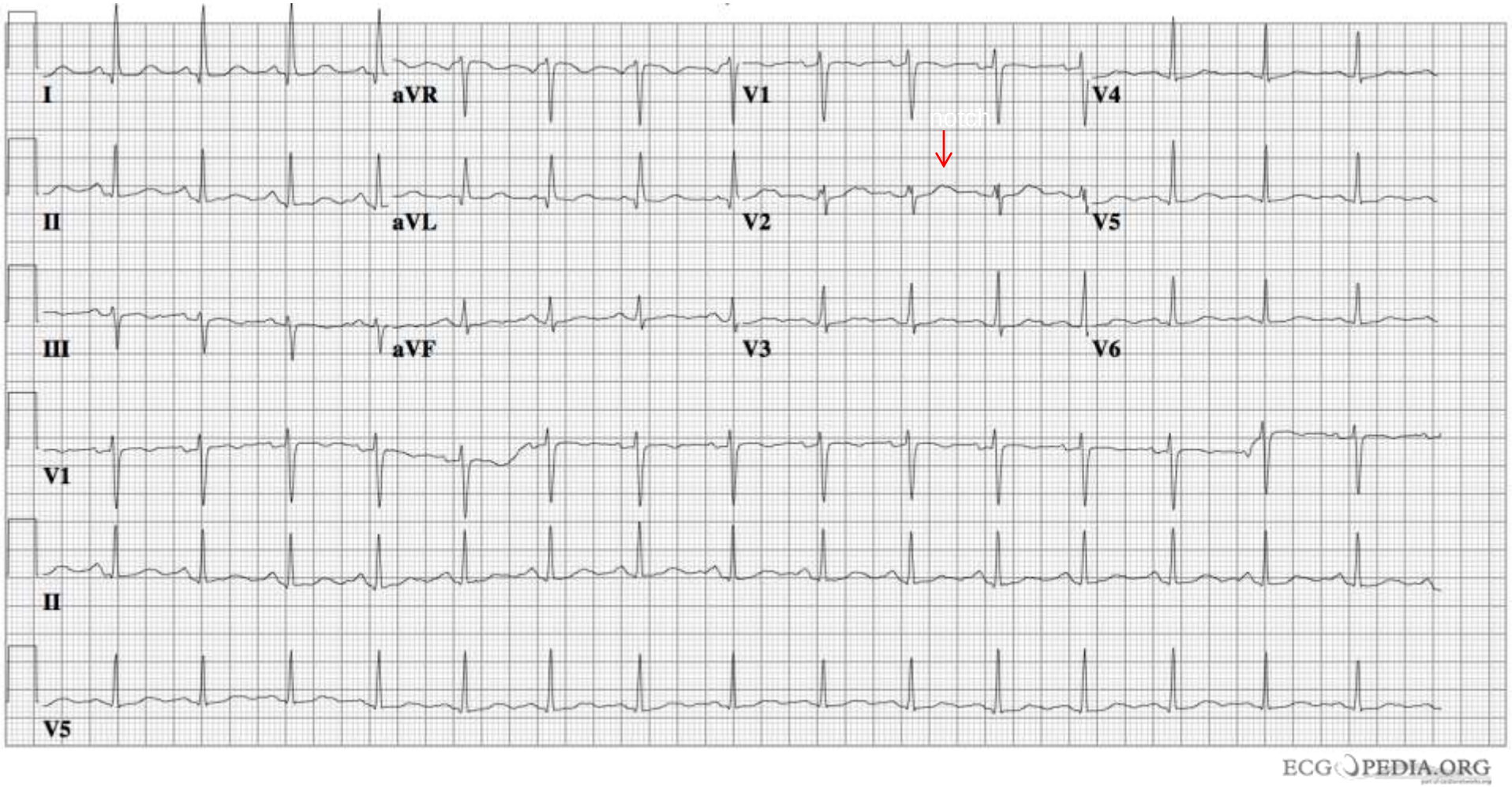
Table 2 Diagnostic Criteria for LQTS

Finding	Score
Electrocardiographic†	
Corrected QT interval, ms	
≥480	3
460–470	2
450 (in males)	1
Torsades de pointes‡	2
T-wave alternans	1
Notched T-wave in 3 leads	1
Low heart rate for age§	0.5
Clinical history	
Syncope‡	
With stress	2
Without stress	1
Congenital deafness	0.5
Family history‖	
Family members with definite LQTS	1
Unexplained SCD in immediate family members <30 yrs old	0.5

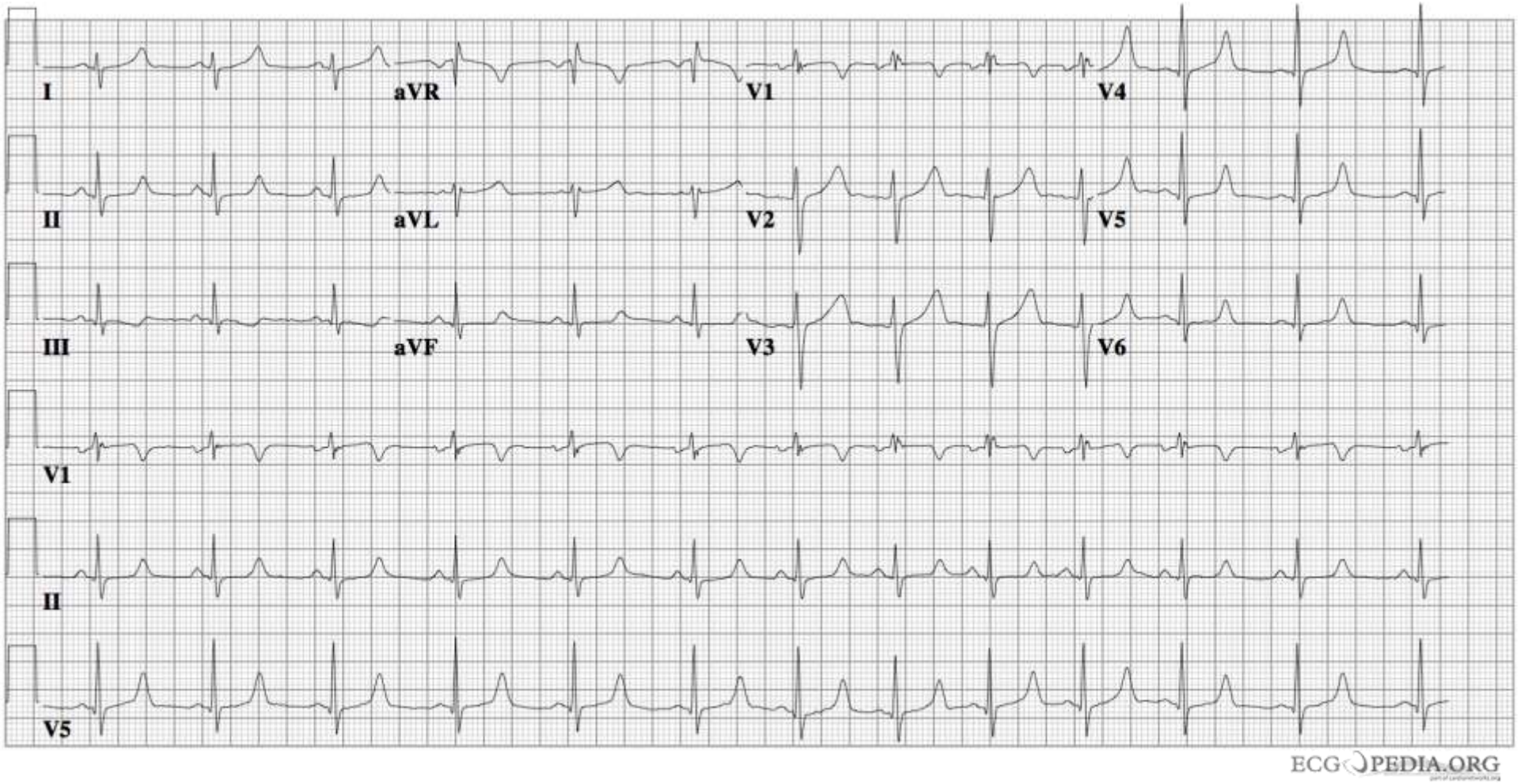
Long QT Syndrome – LQTS1



Long QT Syndrome – LQTS2



Long QT Syndrome – LQTS3



Long QT Syndrome – Therapy

- Lifestyle changes:
  - Avoidance of QT-prolonging drugs www.qtdrugs.org
  - Correction of electrolyte imbalance from diarrhea, vomiting, metabolic conditions, imbalance diet
  - Limitation from competitive sport (? for all – no consensus)
    - Definitely in LQT1, especially swimming
- Beta blockers – all (including genetic diagnosis + normal QTc)
  - Long-acting preferred (nadolol, sustained-release propranolol)
- Left cardiac sympathetic denervation (LCSD)
  - If ICD refused/contra-indicated (infant or small children)
  - If BB refused/contra-indicated/ineffective
- Implantable cardioverter-defibrillator (ICD)
  - Prior cardiac arrest
  - Recurrent syncope on beta blocker
- Na-channel blockers – can be useful for LQTS3
  - Mexiletine, flecainide, ranolozine (in QTc > 500 ms if ↓ by 40 ms)

Long QT Syndrome – Therapy

- Genetic Testing
  - Class I
    - Strong clinical index of suspicion for LQTS
    - Asymptomatic QT prolongation (>500m) on serial ECG
    - Family members of genetically-diagnosed index case
  - Class IIb
    - Asymptomatic QTc prolongation (>480 ms) on serial ECG

My first EP rotation:

Fred Morady, MD

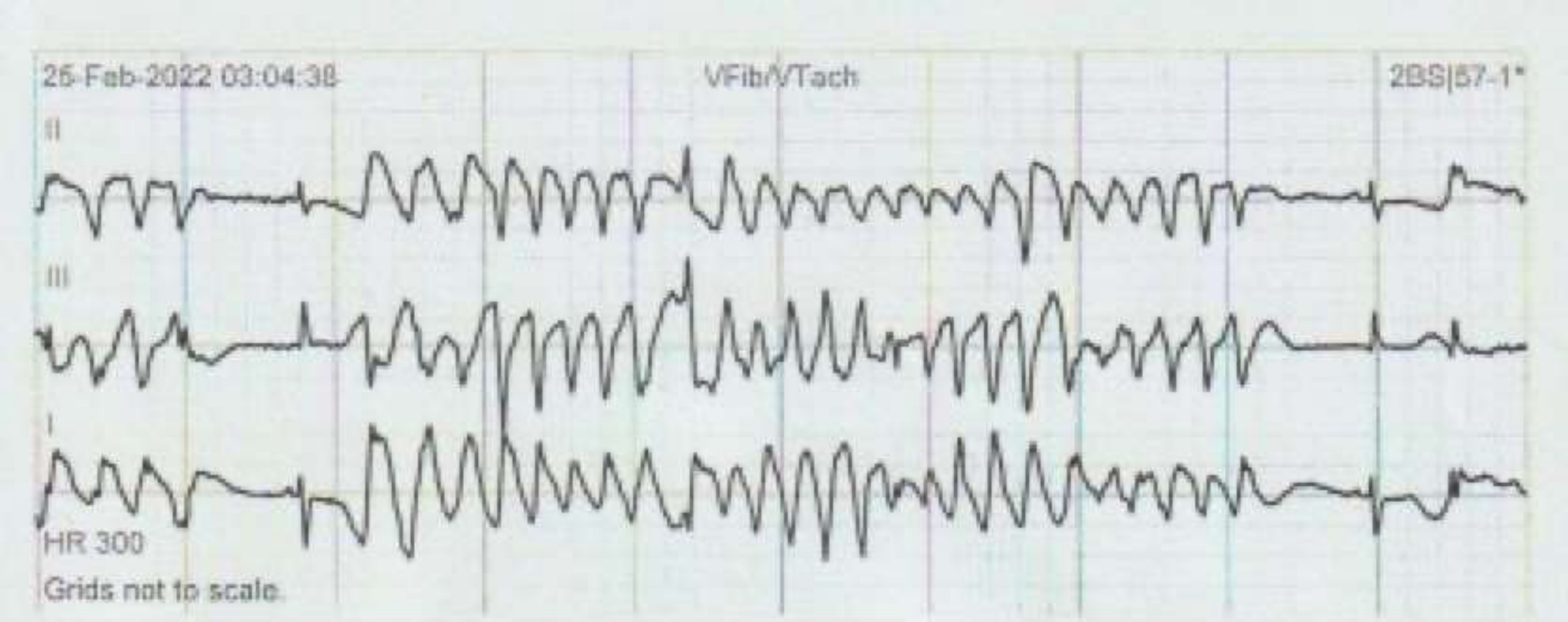
Director, Cardiac Electrophysiology

University of Michigan:

Bing, you will not need that stethoscope anymore

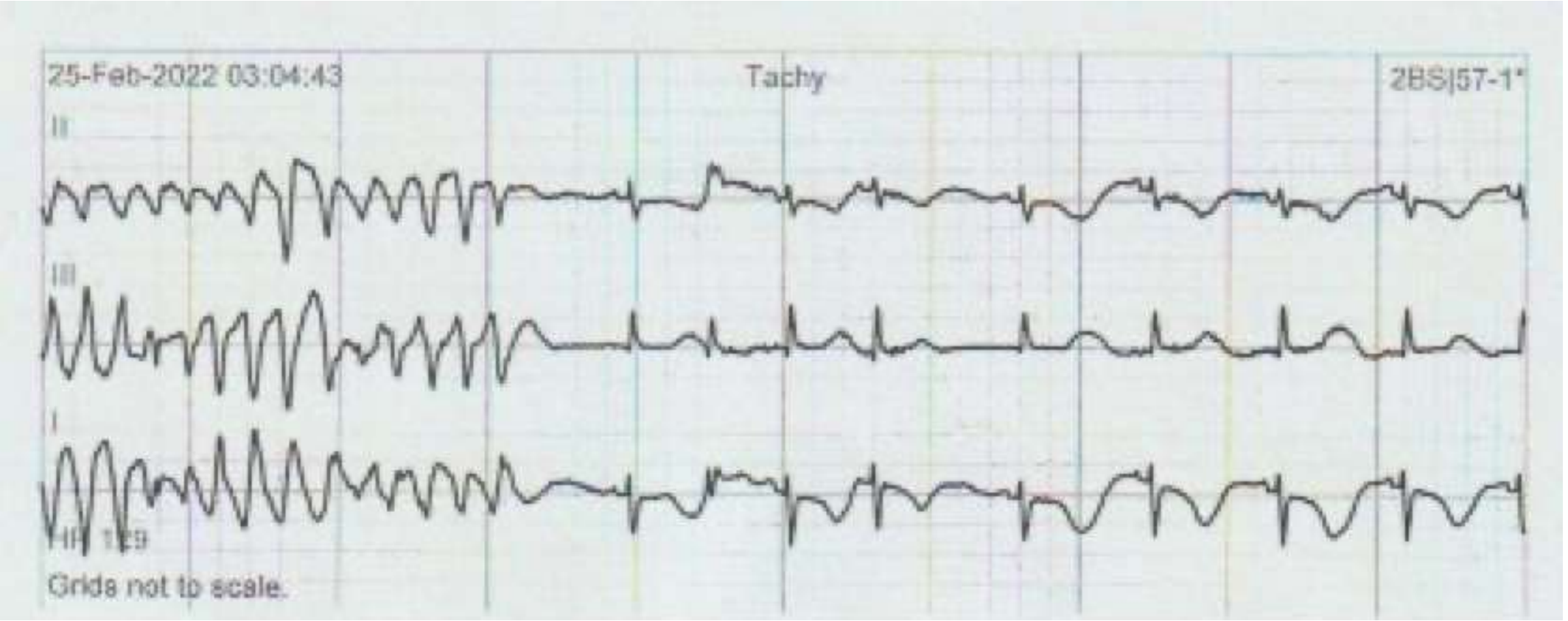
TdP from Ischemia?

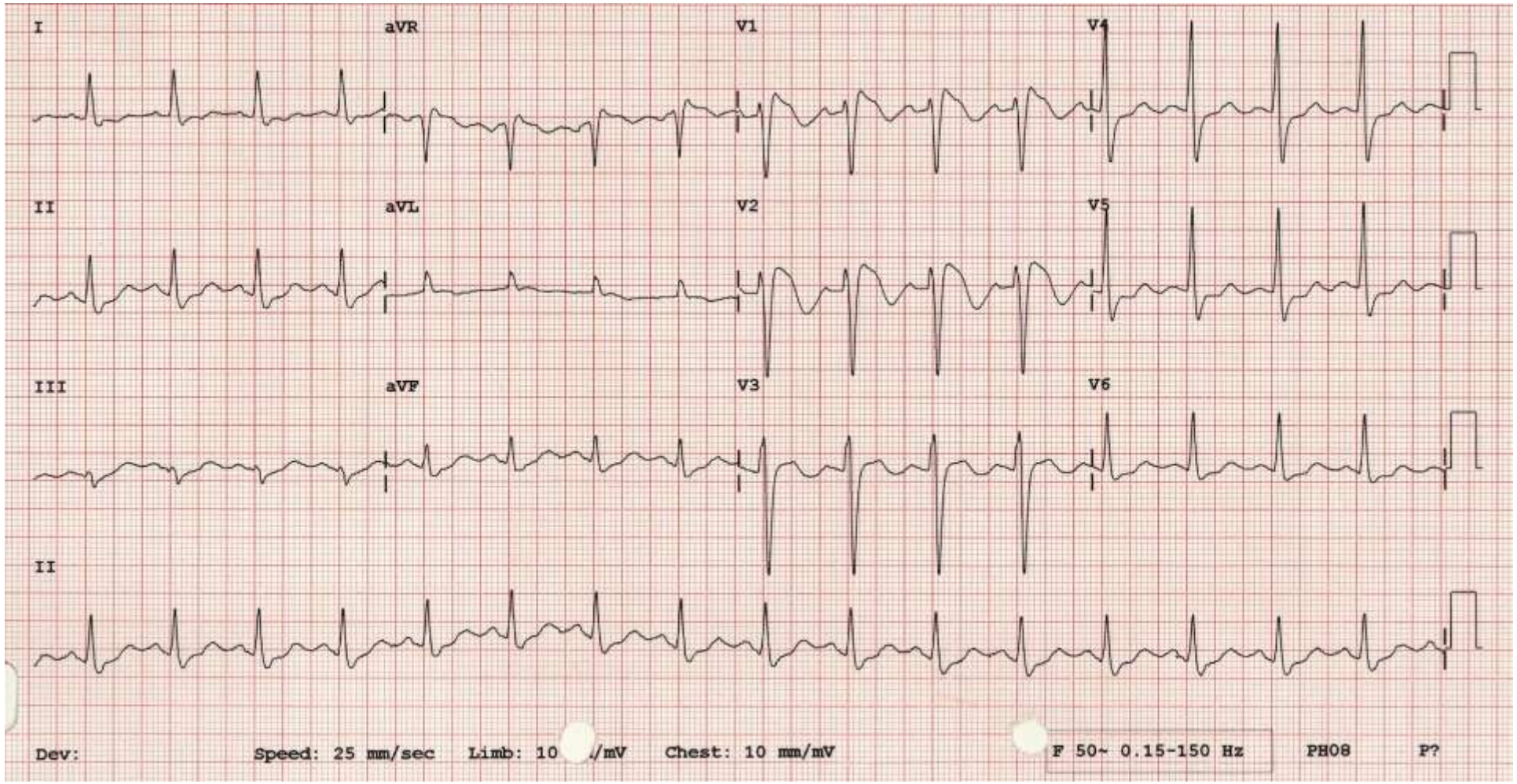
67 y/o male with aortic endocarditis



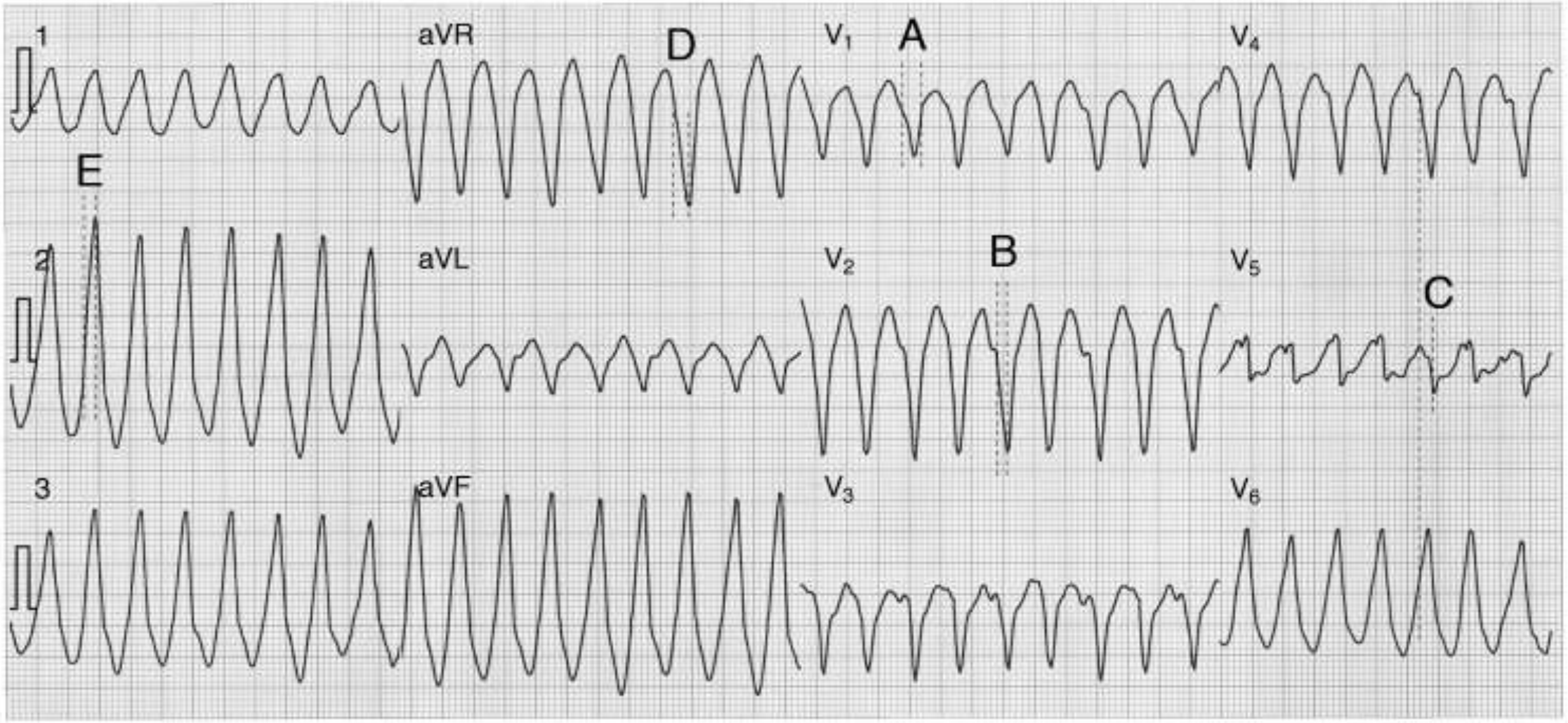
TdP from Ischemia?

67 y/o male with aortic endocarditis
Long QT with deeply-inverted T-waves




I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II
Dev:
Speed: 25 mm/sec
Limb: 10
/mV
Chest: 10 mm/mV
F 50~ 0.15-150 Hz
PH08
P?

Bing, is this VT or SVT with aberrancy?



VT versus SVT with aberrancy

(simplified) **Wellen's** criteria for wide-complex tachycardia favoring VT:

AV dissociation (strongest but not easily identified)

QRS duration > 140 ms or intrinsicoid deflection > 100 ms

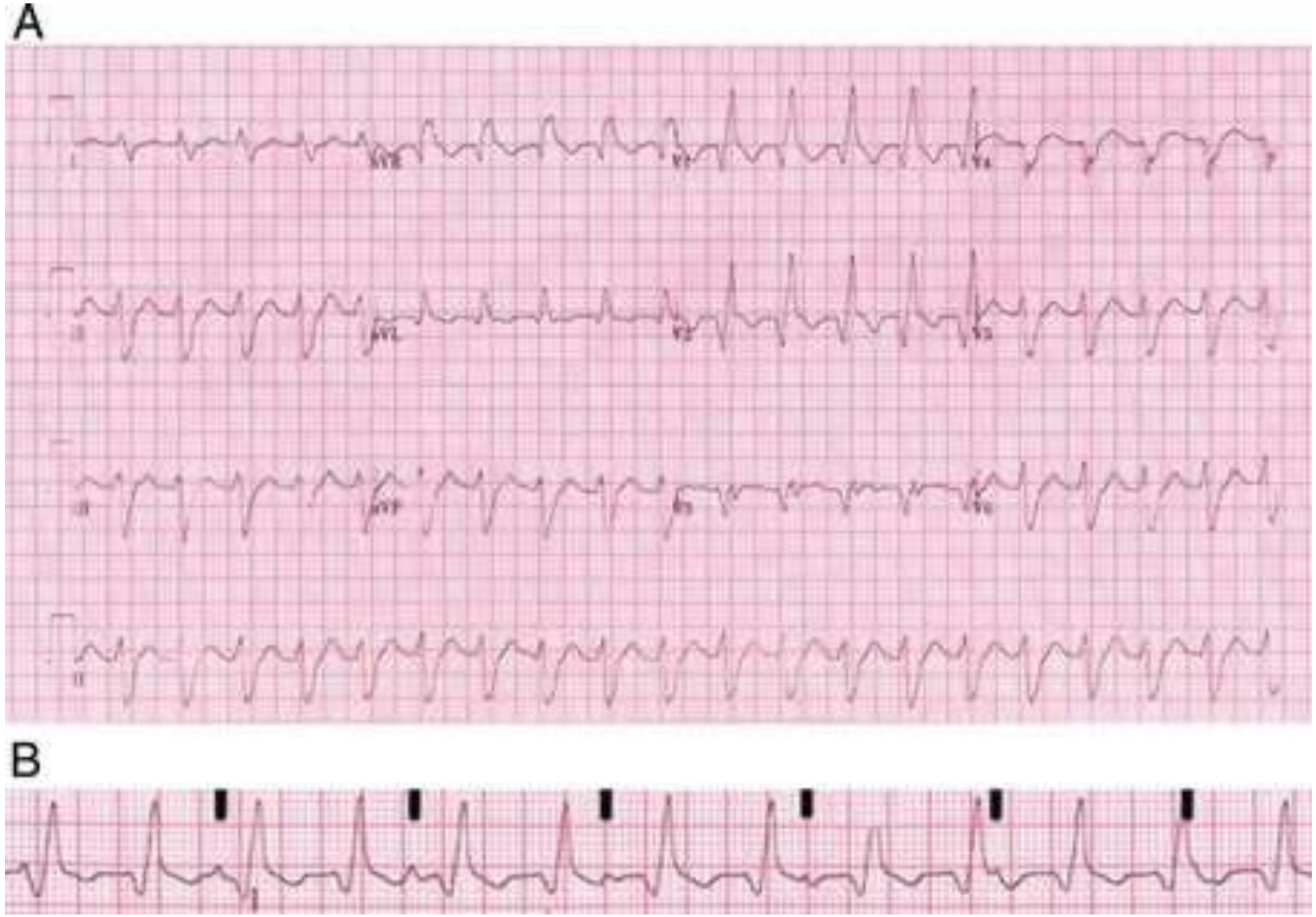
QRS pattern not typical RBBB or LBBB

QRS concordance (all positive/negative) in precordial leads

Northwest axis

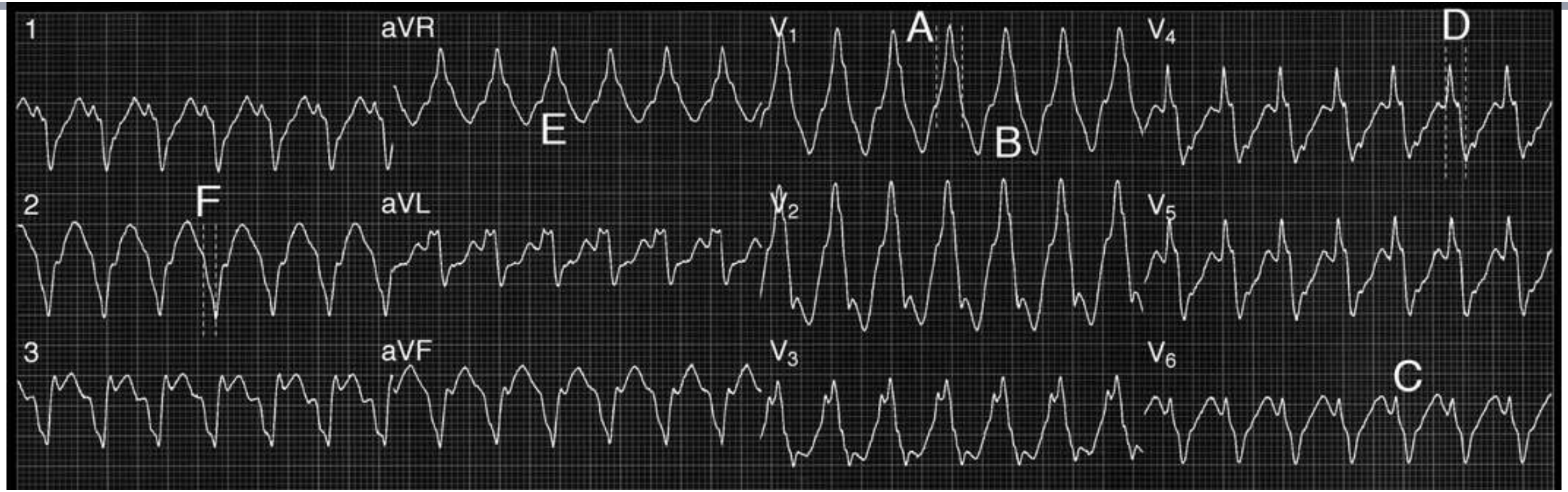
VT versus SVT with aberrancy

AV dissociation



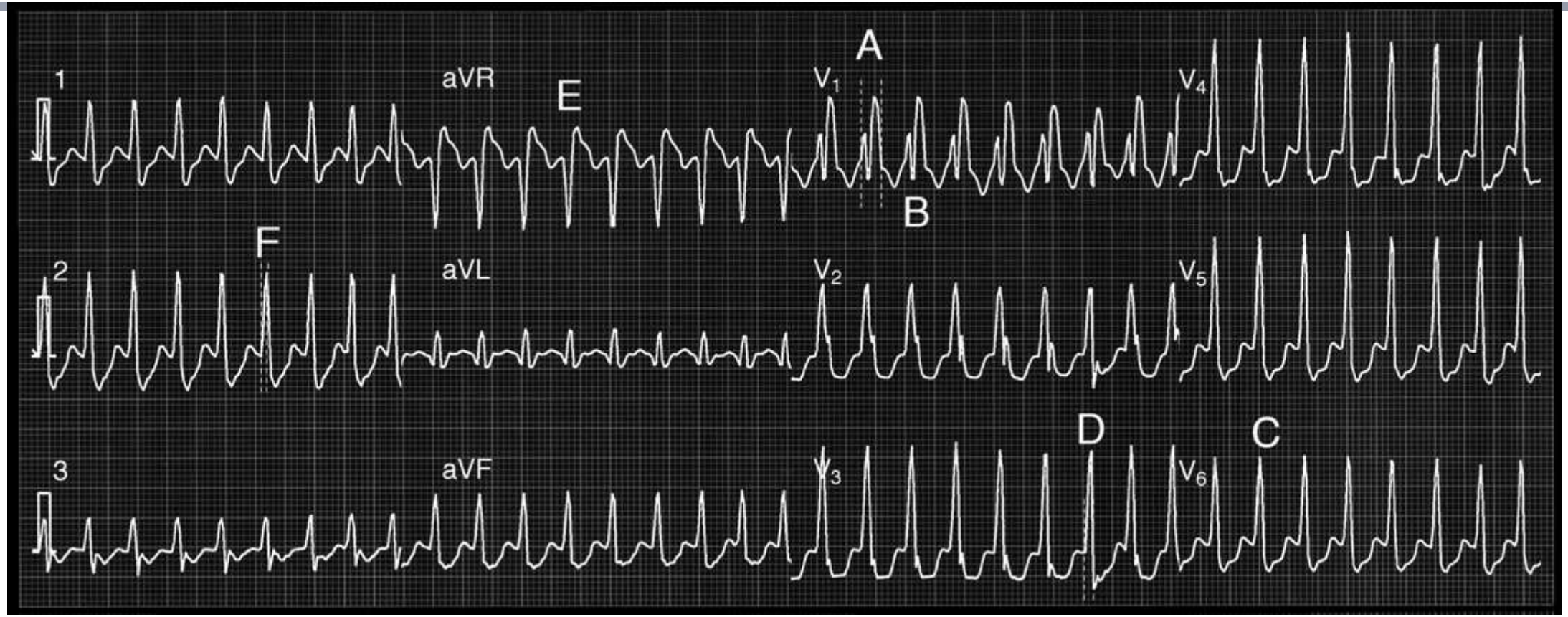
VT versus SVT with aberrancy

QRS duration of 200 ms
Atypical RBBB



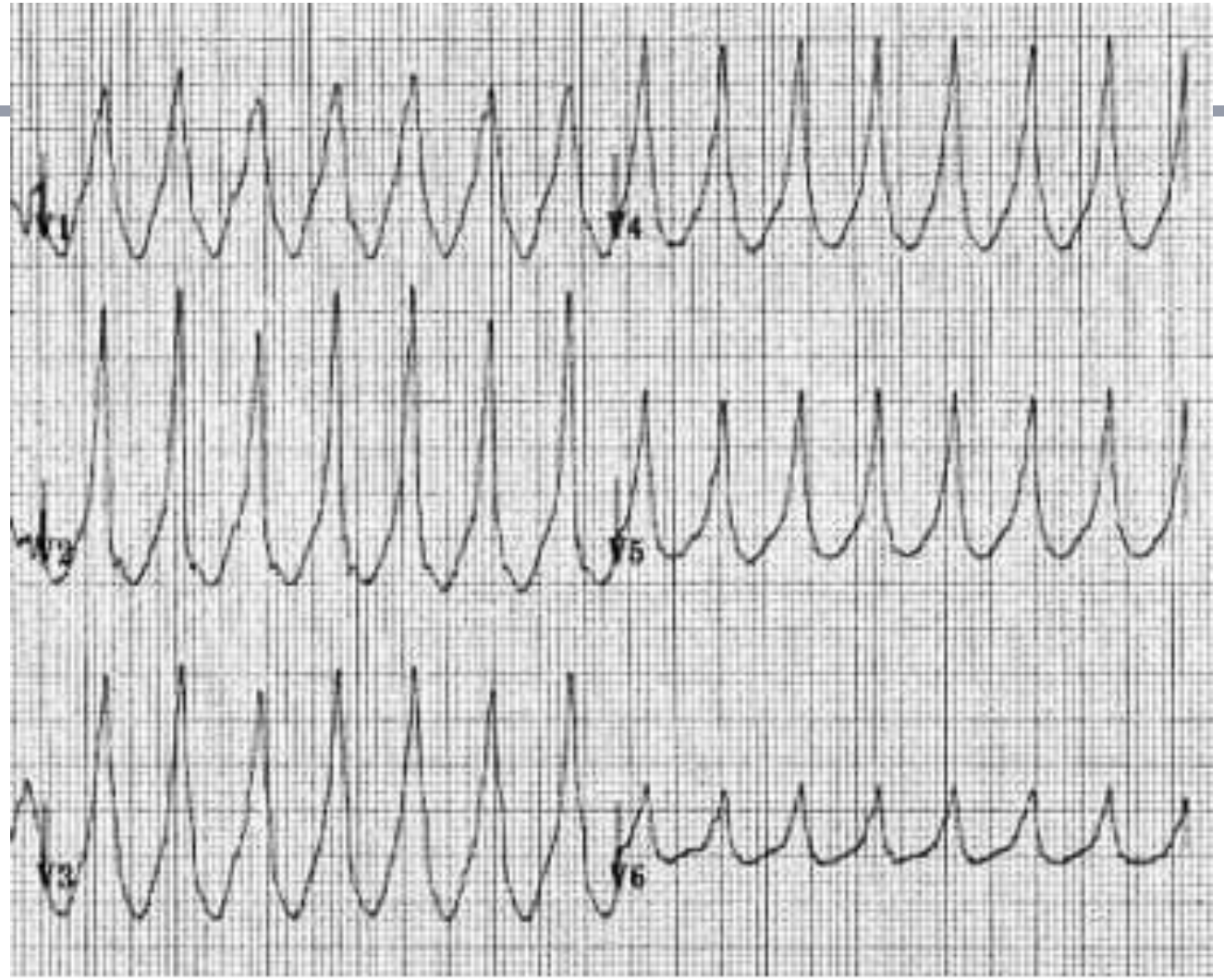
VT versus SVT with aberrancy

QRS duration <140 ms ms
Typical RBBB

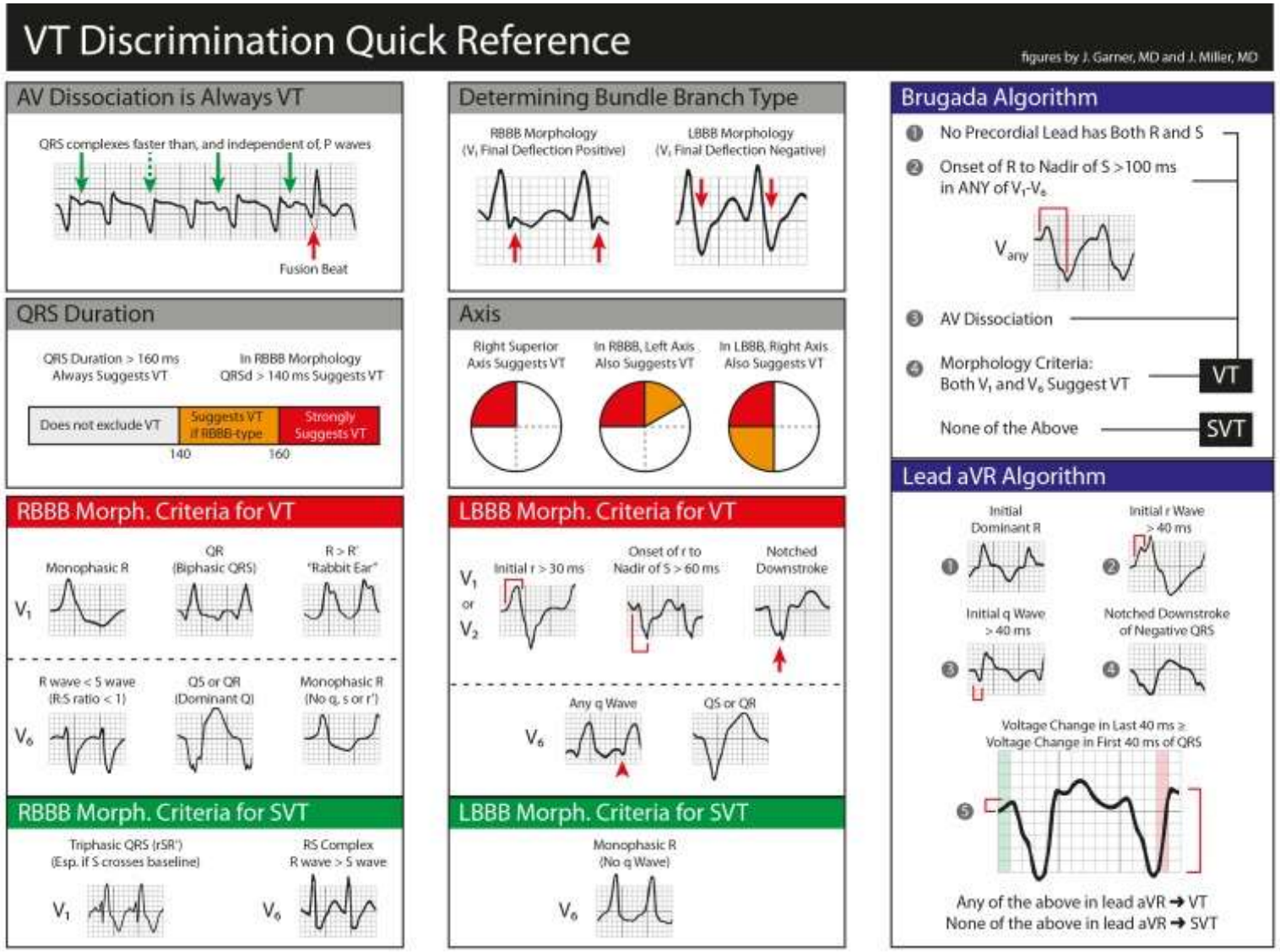


VT versus SVT with aberrancy

Positive concordance in precordial leads

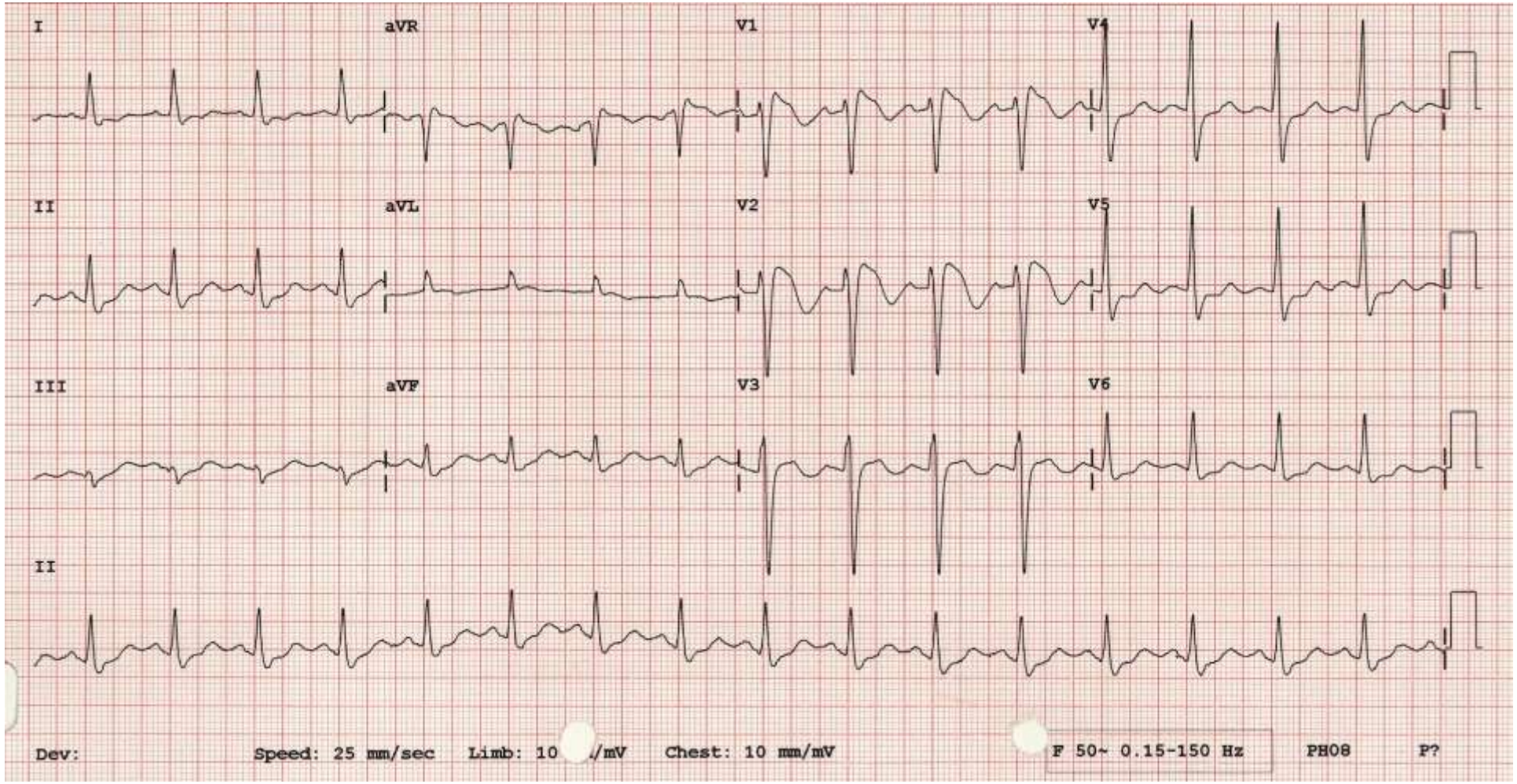


VT versus SVT with aberrancy

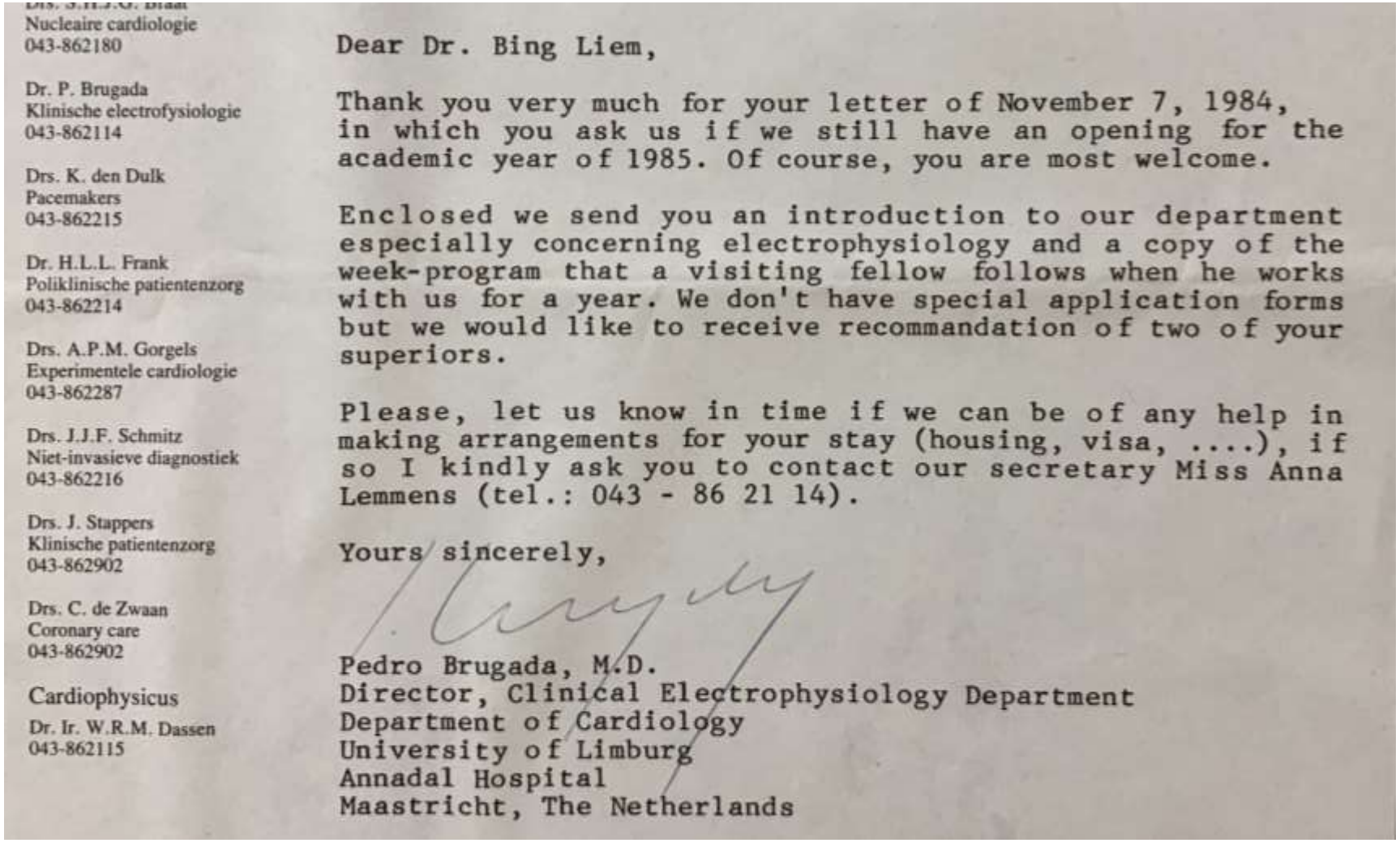


VT versus SVT with aberrancy

Brugada Syndrome



VT versus SVT with aberrancy



Nucleaire cardiologie
043-862180

Dr. P. Brugada
Klinische electrofysiologie
043-862114

Drs. K. den Dulk
Pacemakers
043-862215

Dr. H.L.L. Frank
Poliklinische patientenzorg
043-862214

Drs. A.P.M. Gorgels
Experimentele cardiologie
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Niet-invasieve diagnostiek
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Drs. C. de Zwaan
Coronary care
043-862902

Cardiophysicus
Dr. Ir. W.R.M. Dassen
043-862115

Dear Dr. Bing Liem,

Thank you very much for your letter of November 7, 1984, in which you ask us if we still have an opening for the academic year of 1985. Of course, you are most welcome.

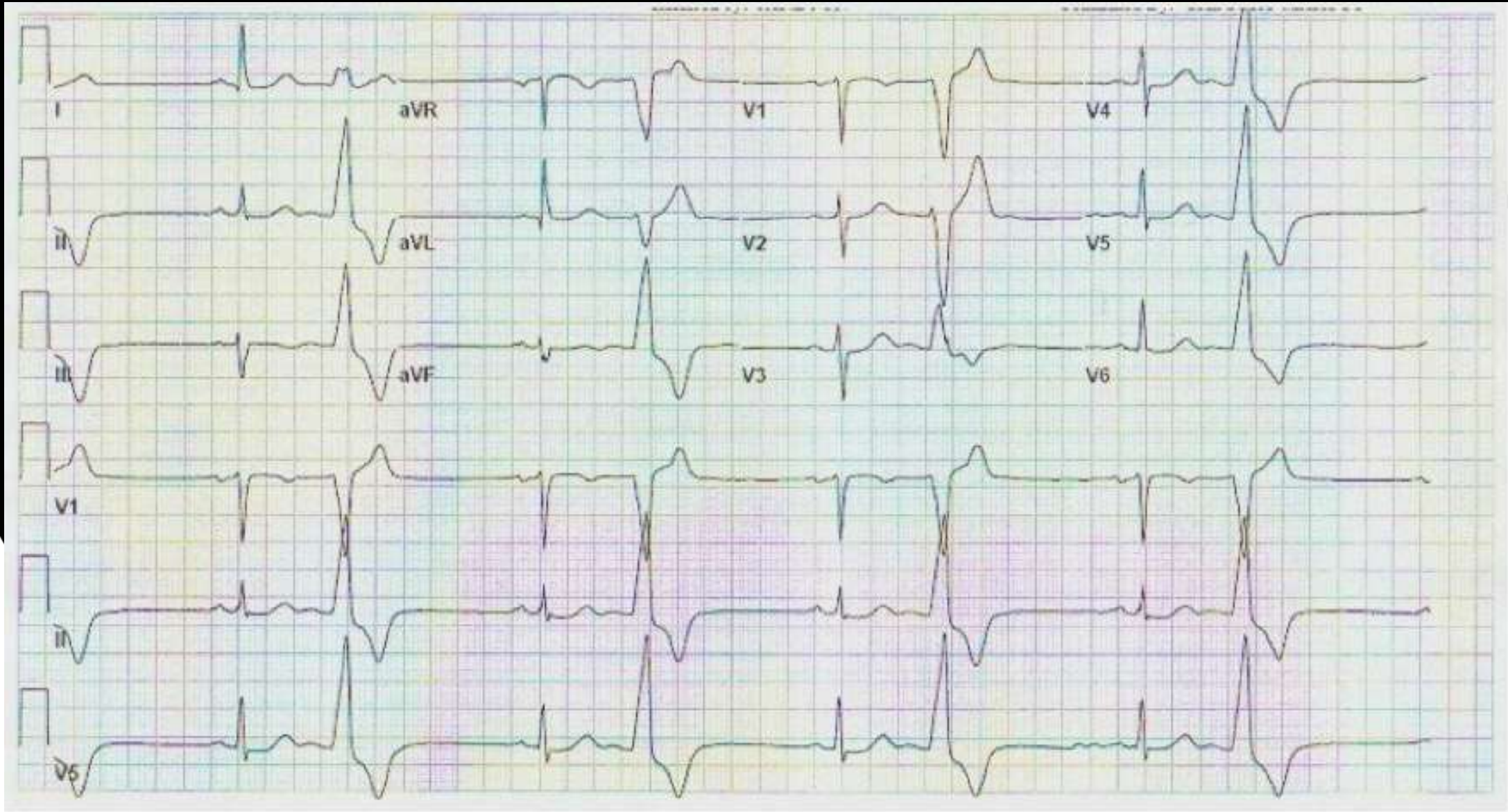
Enclosed we send you an introduction to our department especially concerning electrophysiology and a copy of the week-program that a visiting fellow follows when he works with us for a year. We don't have special application forms but we would like to receive recommandation of two of your superiors.

Please, let us know in time if we can be of any help in making arrangements for your stay (housing, visa, ...), if so I kindly ask you to contact our secretary Miss Anna Lemmens (tel.: 043 - 86 21 14).

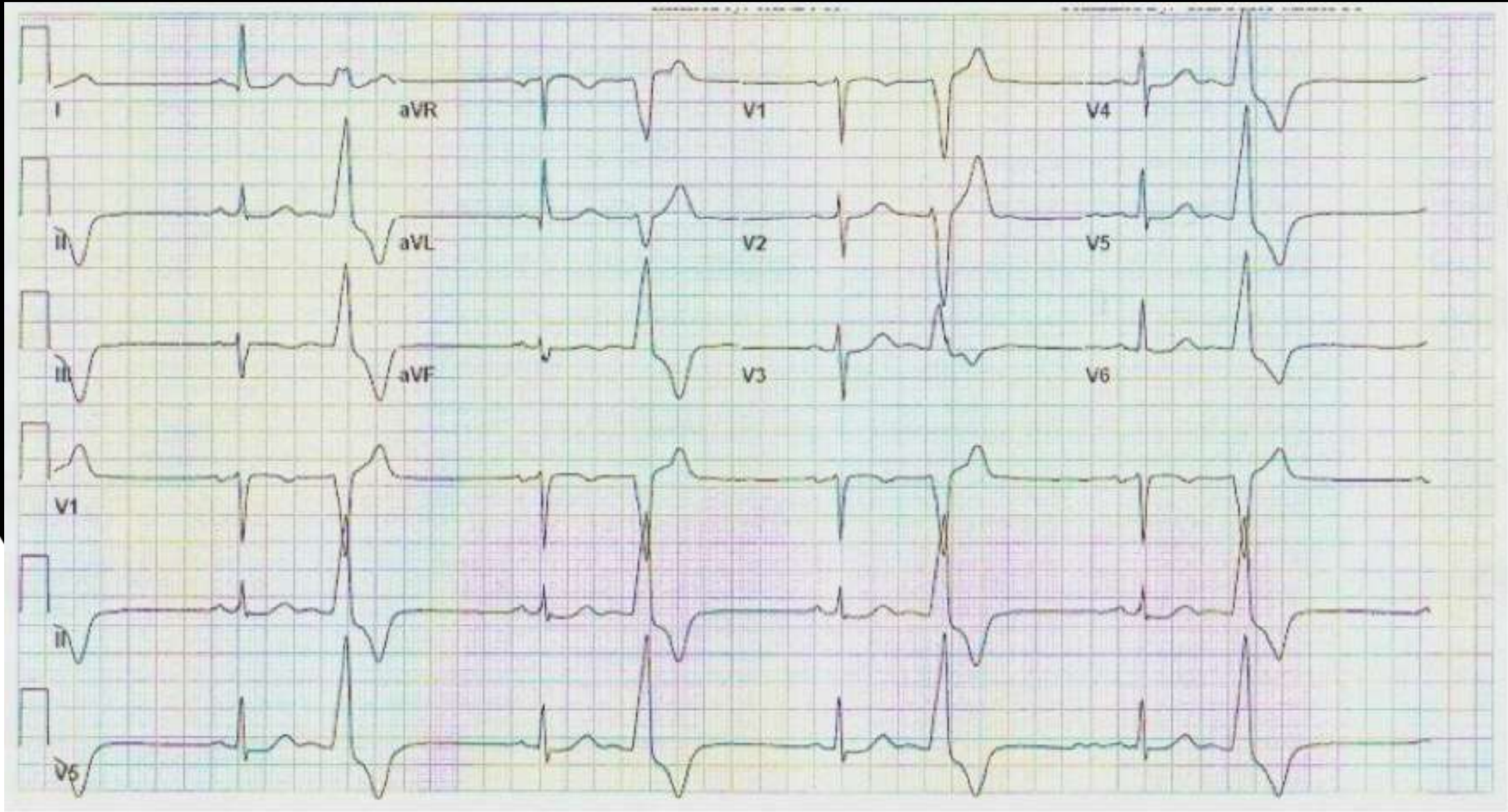
Yours sincerely,

Pedro Brugada, M.D.
Director, Clinical Electrophysiology Department
Department of Cardiology
University of Limburg
Annadal Hospital
Maastricht, The Netherlands

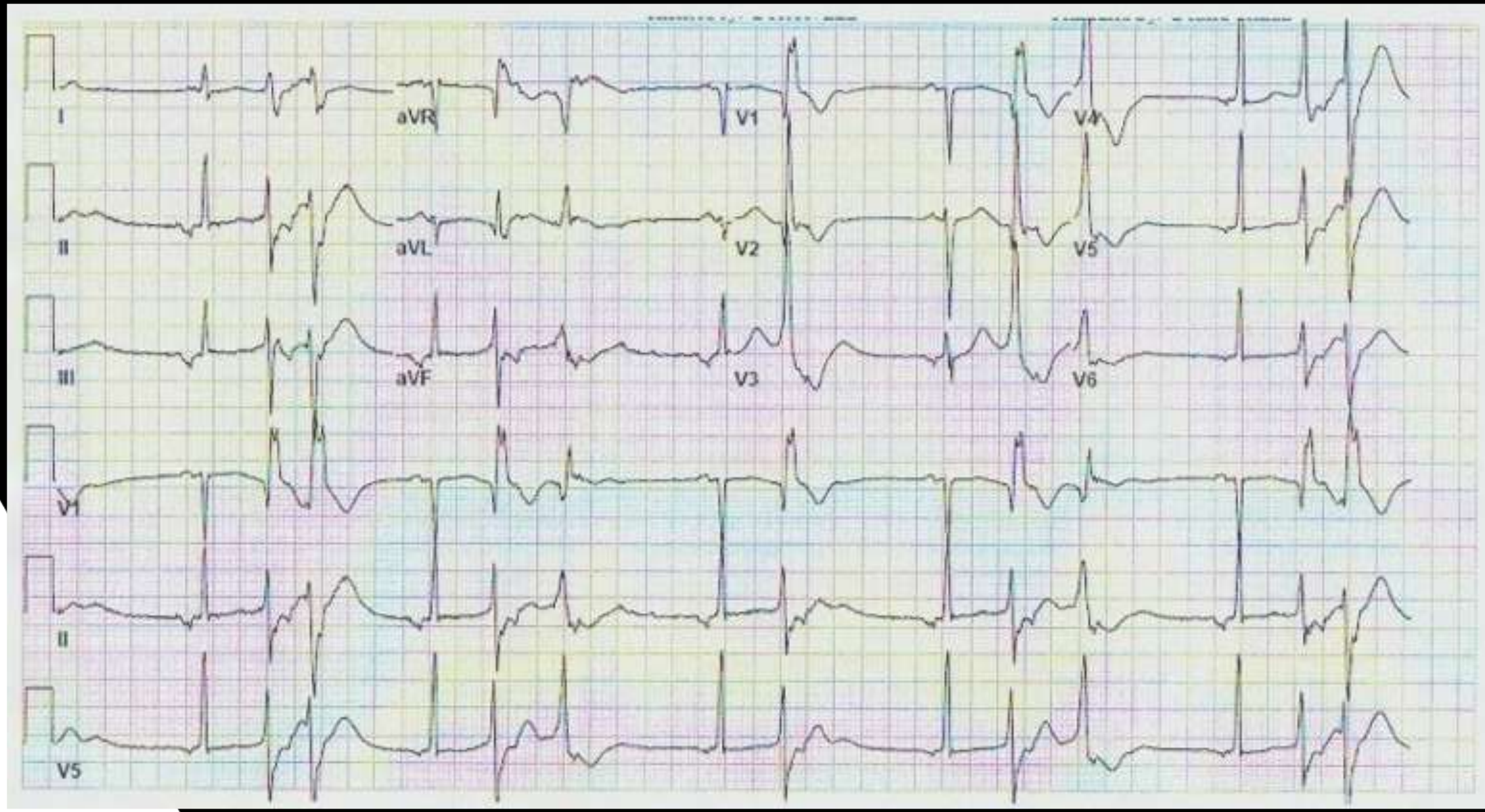
Bing, should I be worried about these PVCs?

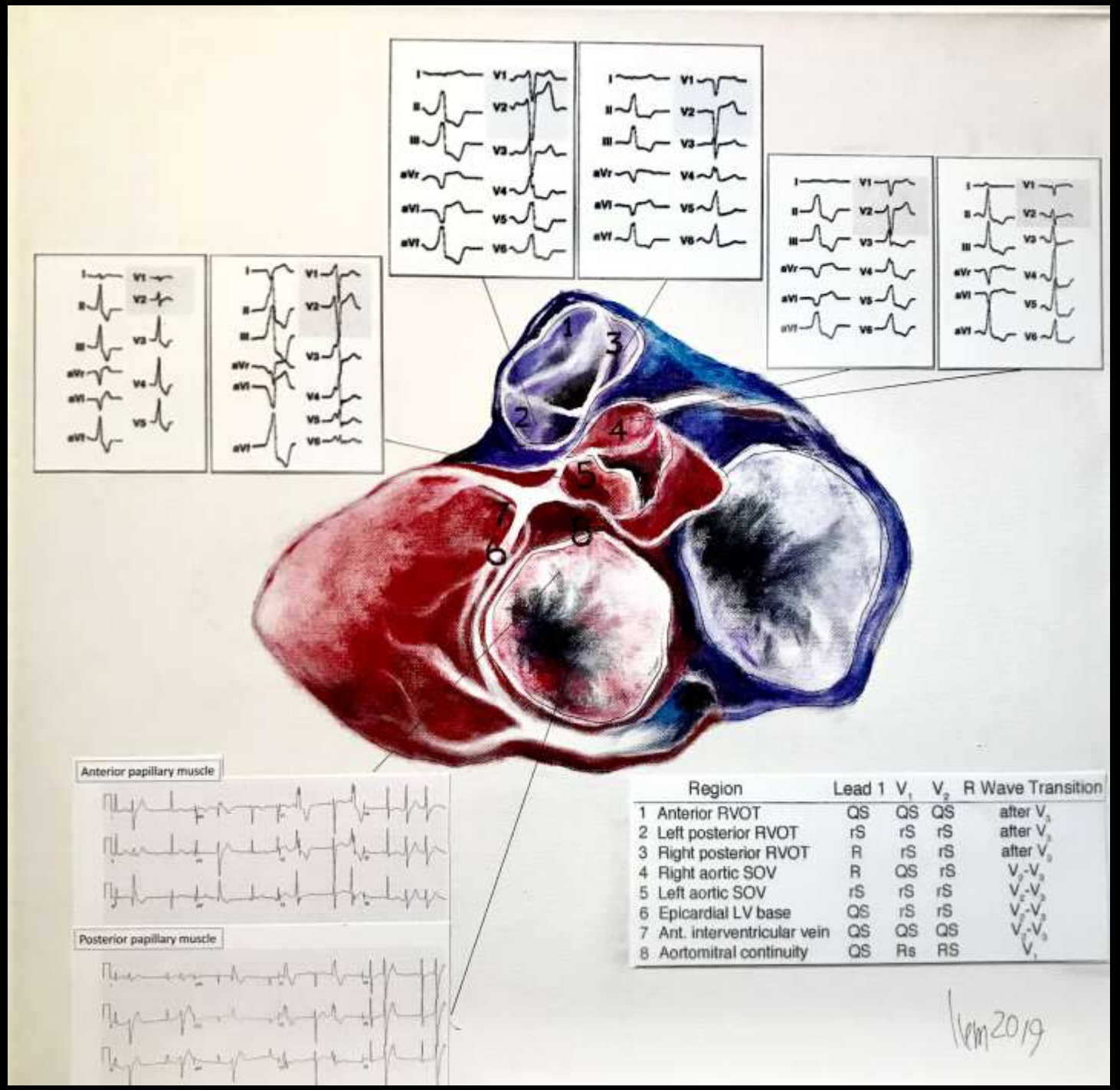


Idiopathic PVC – VT RVOT PVC

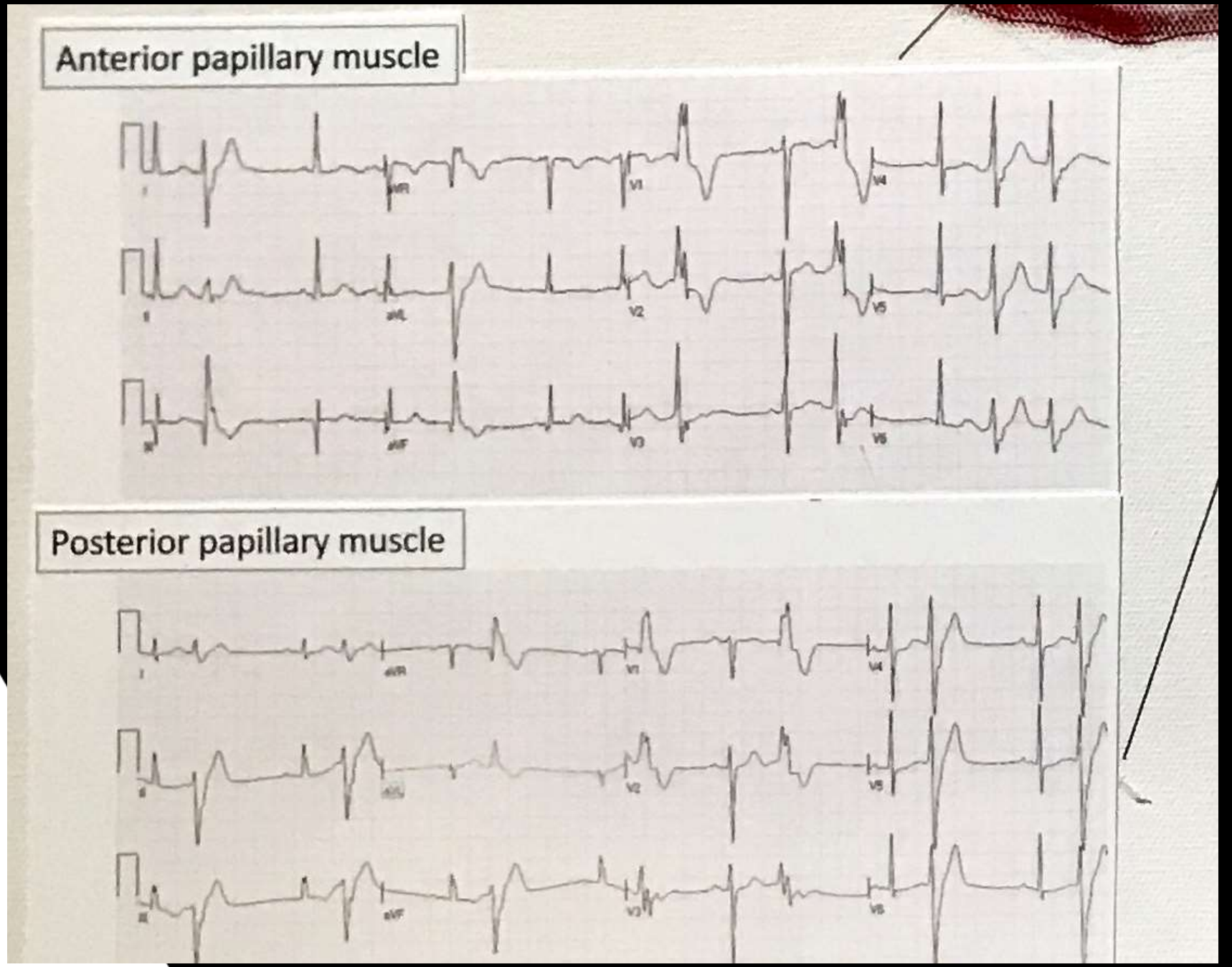


Idiopathic PVC – VT Papillary Muscle PVCs





	Region	Lead 1	V_1	V_2	R Wave Transition
1	Anterior RVOT	QS	QS	QS	after V_3
2	Left posterior RVOT	rS	rS	rS	after V_3
3	Right posterior RVOT	R	rS	rS	after V_3
4	Right aortic SOV	R	QS	rS	V_2-V_3
5	Left aortic SOV	rS	rS	rS	V_2-V_3
6	Epicardial LV base	QS	rS	rS	V_2-V_3
7	Ant. interventricular vein	QS	QS	QS	V_2-V_3
8	Aortomitral continuity	QS	Rs	RS	V_1


Anterior papillary muscle
Posterior papillary muscle

Idiopathic PVC – VT

Mechanism – automatic or triggered
- not reentry
- unlikely to be sustained

Usually without underlying heart disease
- normal LVEF
- no need for ICD

High burden (> 20%) → cardiomyopathy

Ablation is effective
Otherwise → AAD (Na-channel blockers)

Idiopathic PVC – VT

A patient's perspective:

Patient: Doc, I know what **"idiopathic"** means
Doctor: Oh? Tell me
Patient: It means that
- the doctor is an **idiot**
- and the patient is **pathetic**

EP is a very common curbside consult

- mostly ECG interpretation
- ECG usually reveals diagnosis
- physical patient interaction is rarely needed
- it's ideal during COVID