Basiscursus ECG voor co-assistenten

Jonas de Jong
Voorzitter Stichting Cardionetworks
AIOS Cardiologie AMC

Cursusoverzicht

- **Stichting Cardionetworks**
- **Basics van het ECG**
- **7+2 stappenplan**
- **Ischemie**
- **Geleidingsstoornissen**
- **Ritmestoornissen**
- **Quiz**

De cursus is interactief. Onderbreek gerust!

ECGPEDIA.ORG
part of cardionetworks.org

Aanmelden / registreren

pagina | overleg | brontekst bekijken | geschiedenis

zoeken

OK Zoeken

navigatie

- Hoofdpagina
- Voorbehoud
- Veelgestelde vragen
- Donateurs
- Inhoudelijk bijdragen
- Powerpoint presentaties
- Suggesties
- Contact

de ecg cursus

- Grondbeginselen
- Ritme
- Hartfrequentie
- Geleidingstijden
- Hartas
- P top
- QRS morfologie
- ST morfologie

het ecg tekstboek

- Het normale ECG
- Technische problemen
- AV geleiding
- Ventriculaire geleiding
- Ritmestoornissen
- - Supraventriculair
- - Nodaal
- - Ventriculair
- - Congenitaal
- - Ectopische slagen
- Infarct/Ischemie
- Hypertrofie
- Elektrolytstoornissen
- Pacemakers
- Overigen

voorbeeld ecg's

- De ECGpedia ECG collectie

Hoofdpagina

Welkom bij ECGpedia, een wiki electrocardiografie (ECG) cursus en tekstboek gericht op artsen en verpleegkundigen. Er is ook een Engelstalige versie van deze site die op sommige complexere onderwerpen dieper ingaat.

De ECG cursus

Ga naar de ECG cursus voor de Grondbeginselen en

- het 7+2 stappenplan:
  1. Ritme
  2. Hartfrequentie
  3. Geleidingstijden
  4. Hartas
  5. P top
  6. QRS morfologie
  7. ST morfologie
  1. vergelijking met het oude ECG
  2. conclusie
- Download en print dit handige ECG zakkaartje **als PDF** (verbeterde versie van april 2009!, let op de printinstructies). U kunt er ook een laten toesturen.
- Powerpoint presentaties van ECG cursussen
- ECGpedia cursus in levende lijve

Het ECG zakkaartje

Het ECG tekstboek

Bekijk het ECG Tekstboek met o.a.:

- Het normale ECG
- De geschiedenis van het ECG
- Technische problemen
- Geleidingsstoornissen
  - AV geleiding
  - Ventriculaire geleiding
- Ritmestoornissen
  - Supraventriculair
  - Nodaal
  - Ventriculair
  - Congenitaal
  - Ectopische slagen
- Infarct/Ischemie
- Inspanningstesten
- Hypertrofie
- Elektrolytstoornissen
- Pacemakers
- ECG veranderingen bij sporters
- Overigen

Casus

Casus:

- Oefen ECG's
- Raad de culprit van deze infarct-ECG's
- Bijzondere ECG's
- Rhythm Puzzles van Prof. Dr. A.A.M. Wilde (op de Engelstalige site)
- Bekijk ook de case reports van Dr. De Voogt
- Het ECG archief van Dr. De Voogt met meer dan 2000 ECG's is nu gerubriceerd en online op de Engelstalige site.

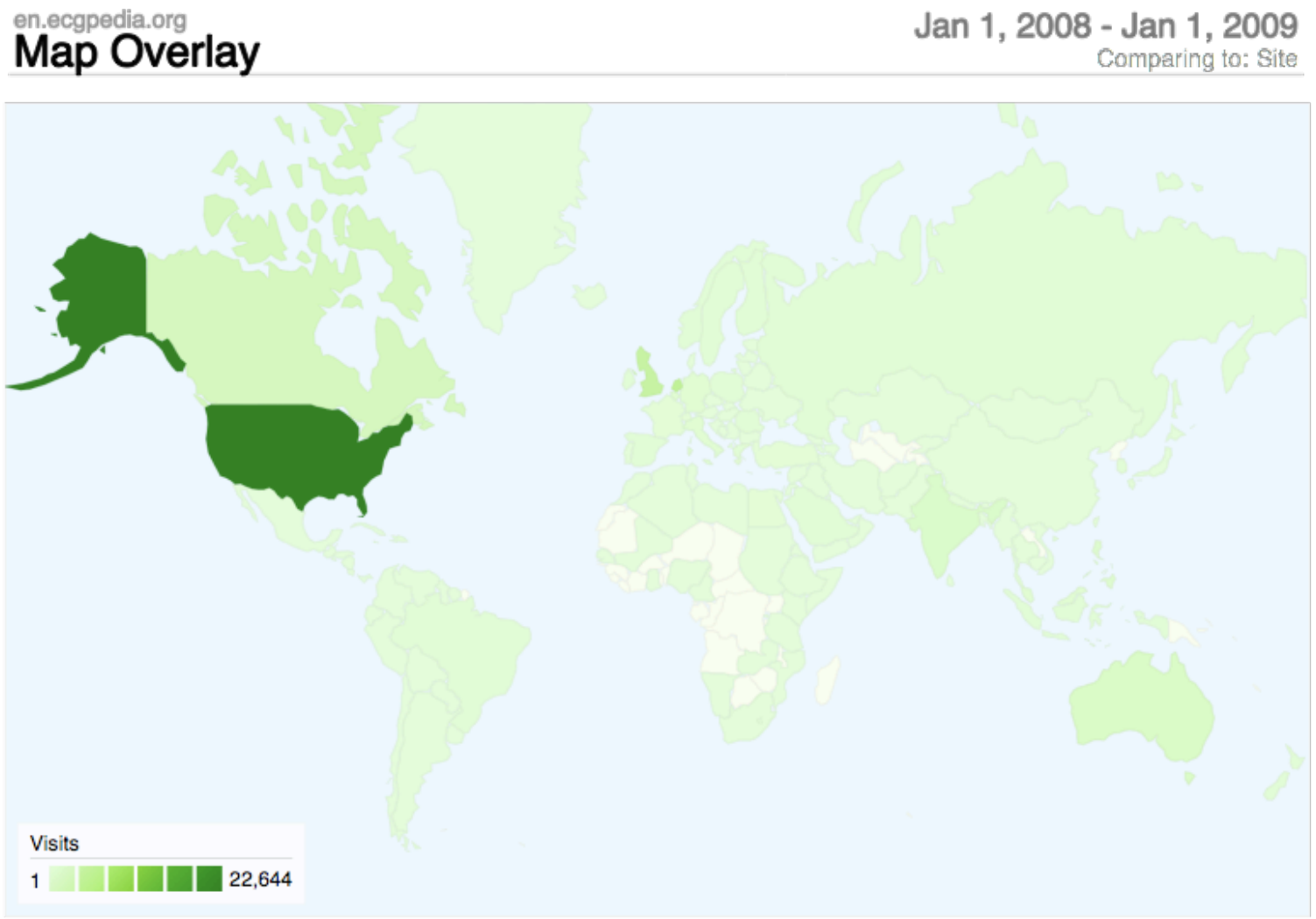
Casus van de maand

Wat voor pauze?

CARDIONETWORKS.ORG

non-profit / open access / physician moderated / up-to-date

Bezoekers uit 177 landen



top 20

COUNTRY	VISITS
United States	22644
Netherlands	5013
United Kingdom	4287
Canada	2301
Australia	1718
India	1343
Philippines	886
Italy	698
Belgium	686
Malaysia	608
Israel	564
Germany	551
Taiwan	543
Singapore	541
Greece	503
Hong Kong	491
Russia	454
Sweden	452
Finland	418

Cardionetworks

Auteurs:

- Jonas de Jong
- Ivo van der Bilt
- Dr. Martijn Meuwissen
- Dr. Renée van den Brink
- Dr. Joris de Groot

Illustraties:

- Rob Kreuger
- Bart Duineveld
- Jonas de Jong

Met dank aan:

- Prof. Dr. Arthur Wilde
- Dr. Rudolph Koster

Boeken:

- Wellens: *The ECG in Emergency Decision Making*
- Garcia / Miller: *Arrhythmia Recognition*
- *Braunwald Heart Disease*

JIJ?

Basics van het ECG

Grondbeginselen

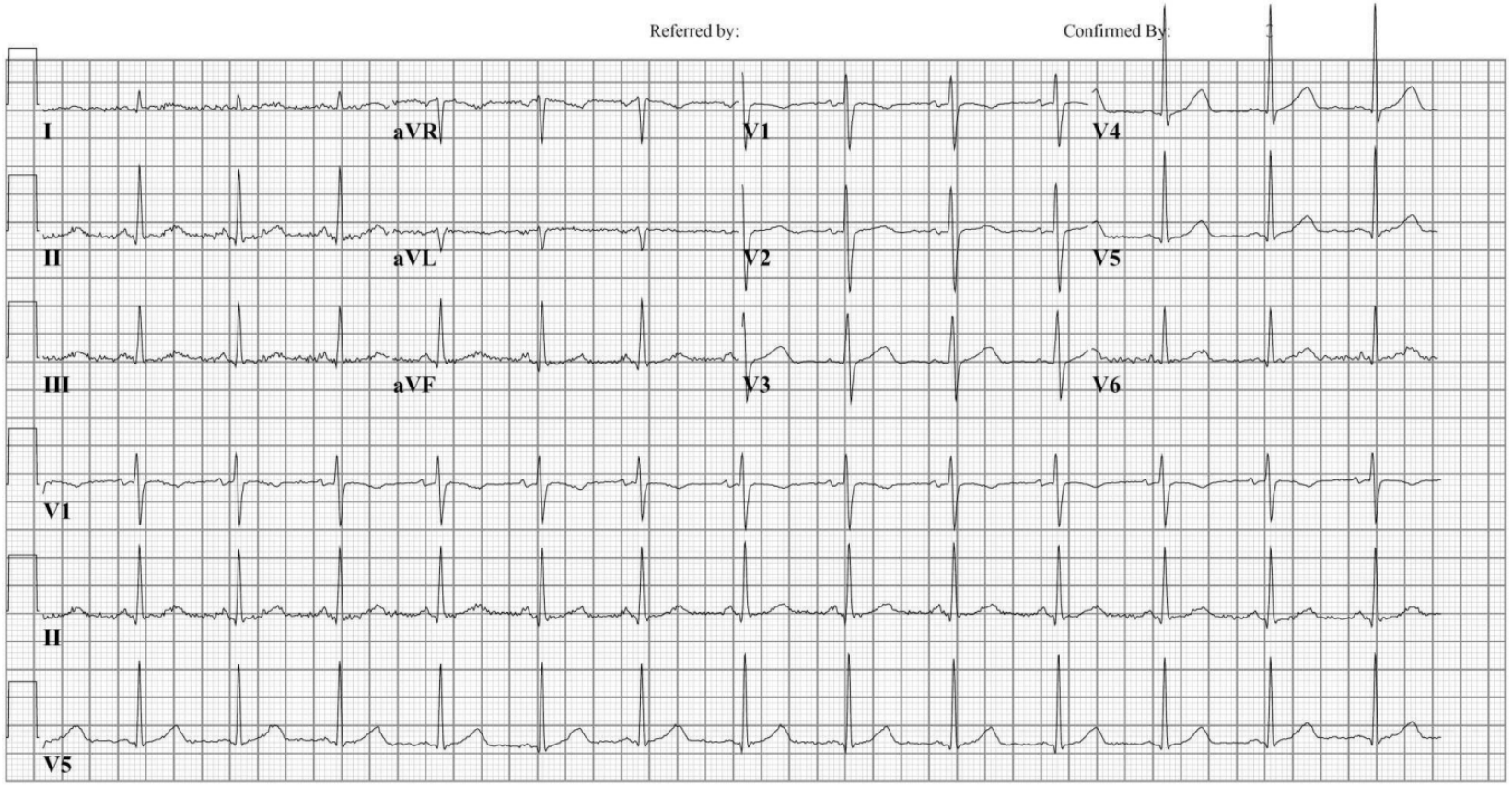
Vent. rate	81	BPM	*** Leeftijds en geslacht specifieke ECG analyse ***
PR interval	120	ms	Normaal sinusritme
QRS duration	80	ms	Normaal ECG
QT/QTc	376/436	ms	Geen oud ECG aanwezig
P-R-T axes	81 80	73	

Loc:23

Technician:

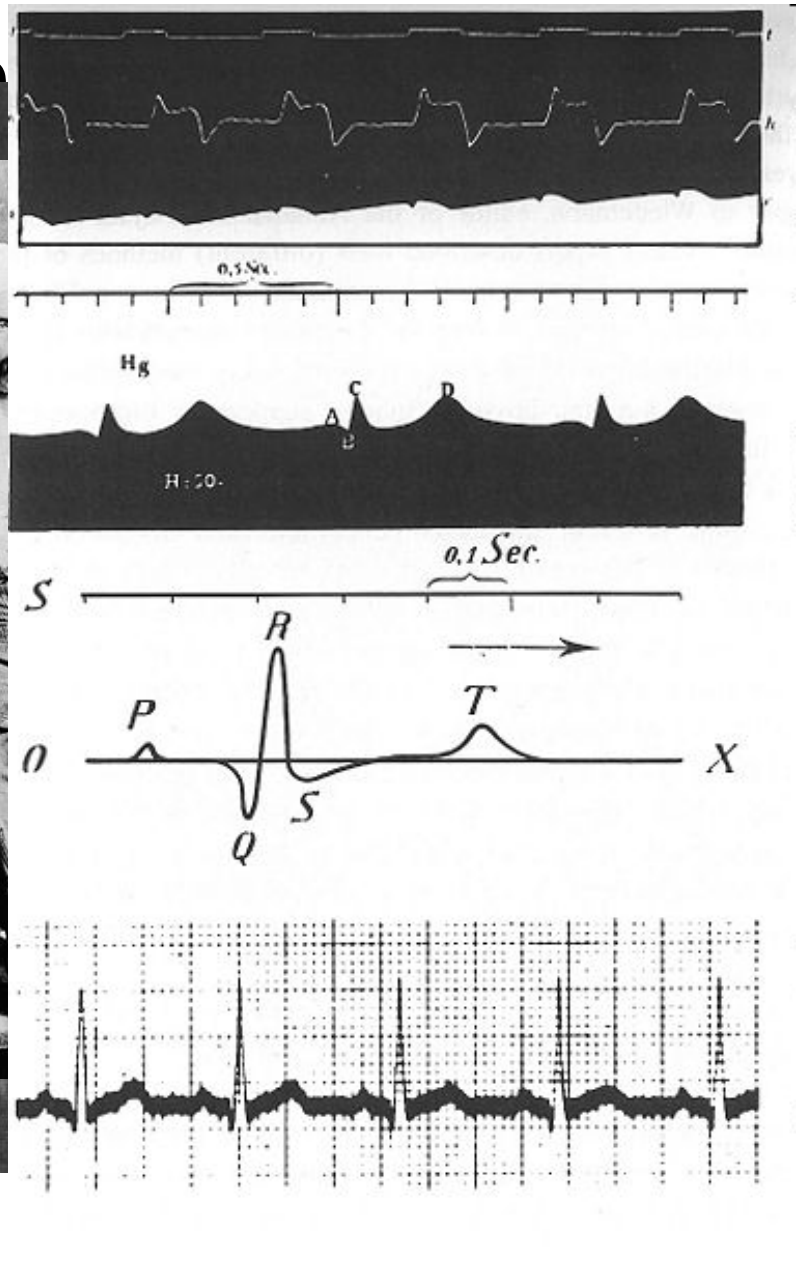
Referred by:

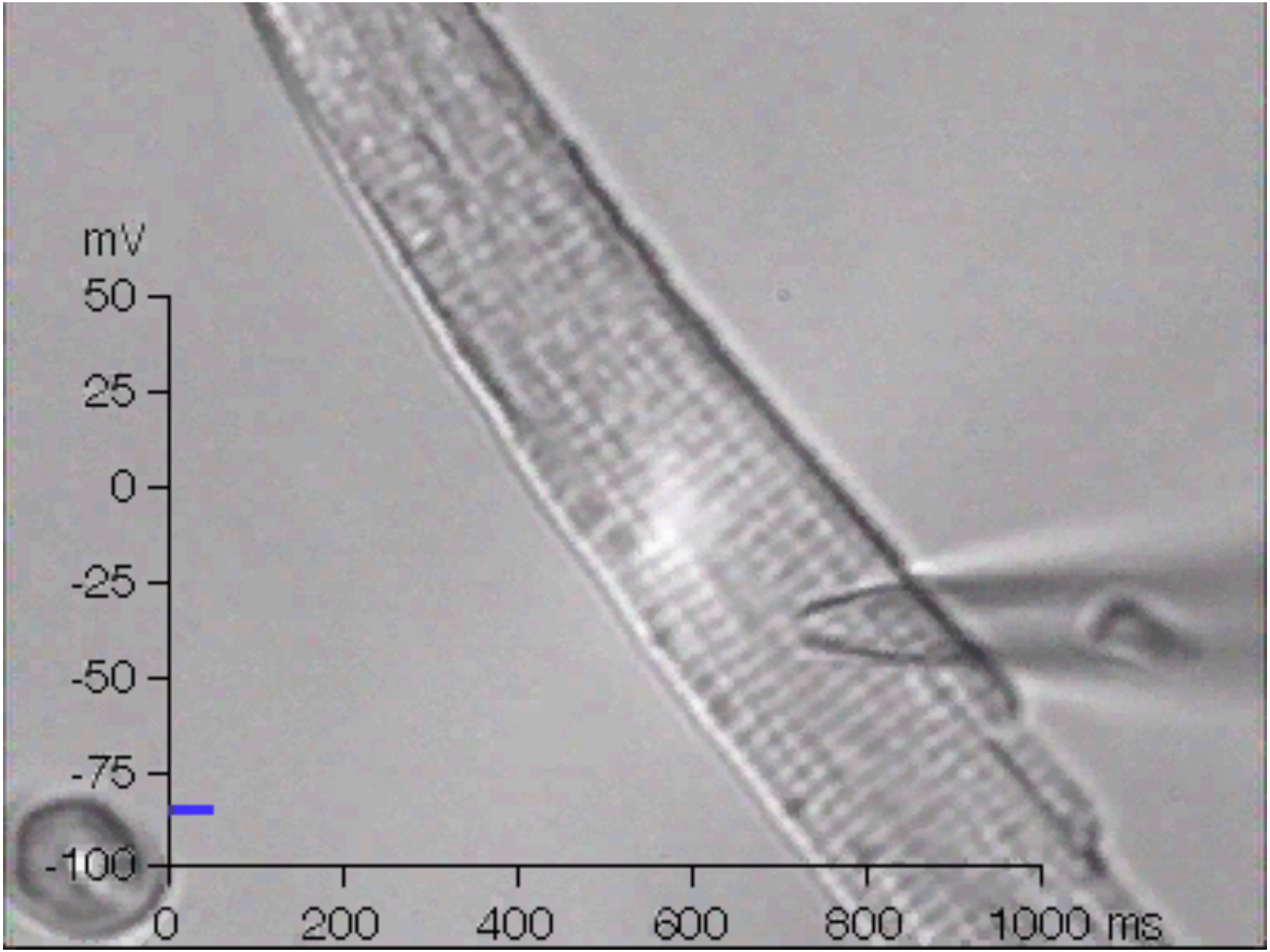
Confirmed By:



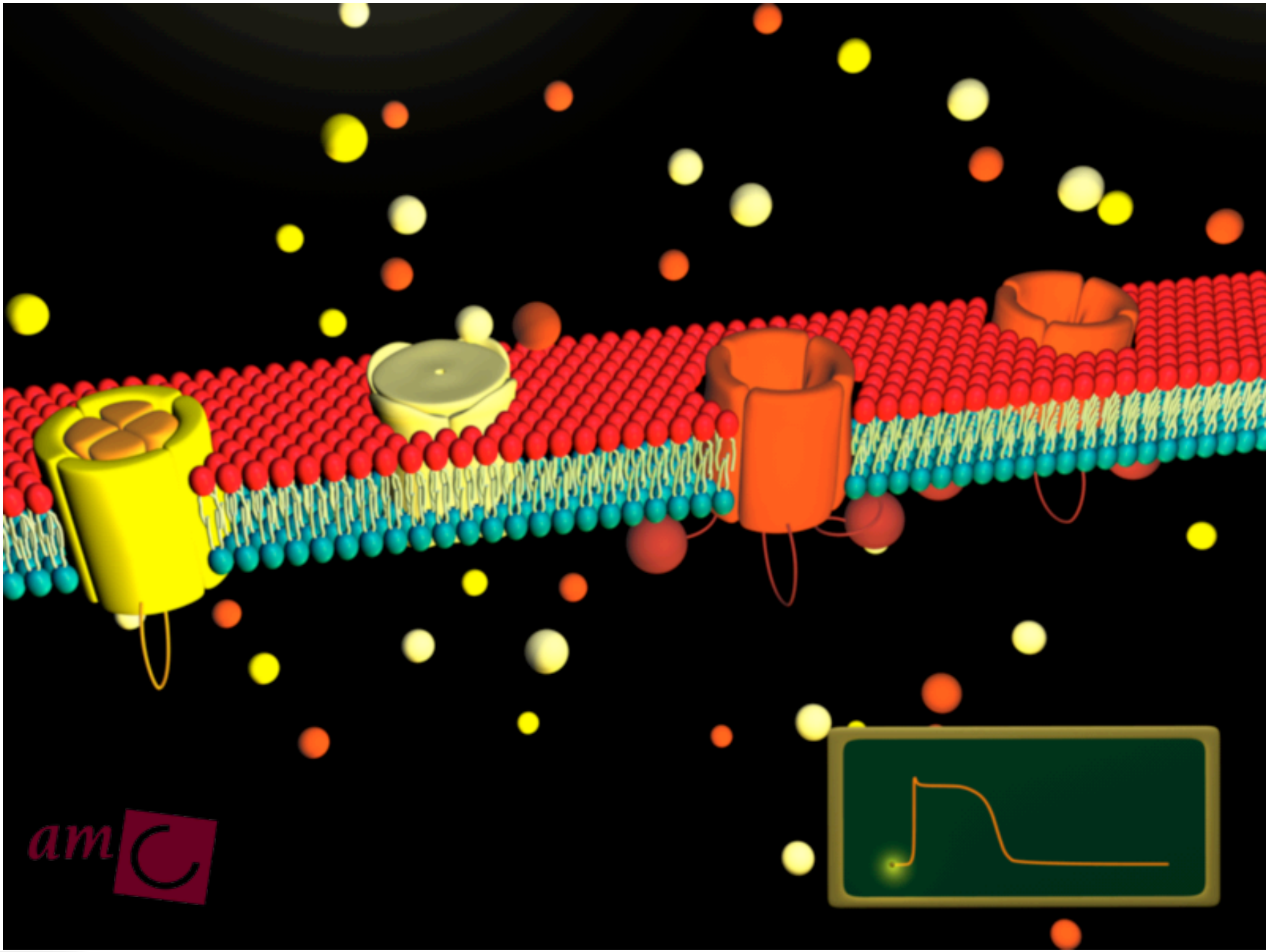
25mm/s 10mm/mV 40Hz 005E 12SL 233 CID: 10

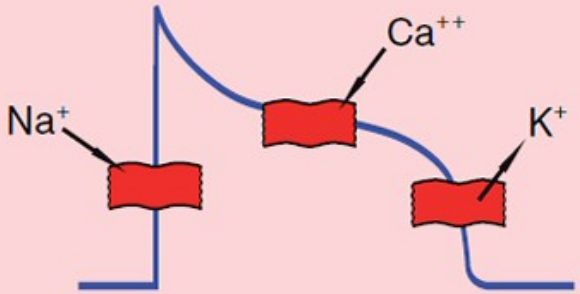
Gesch



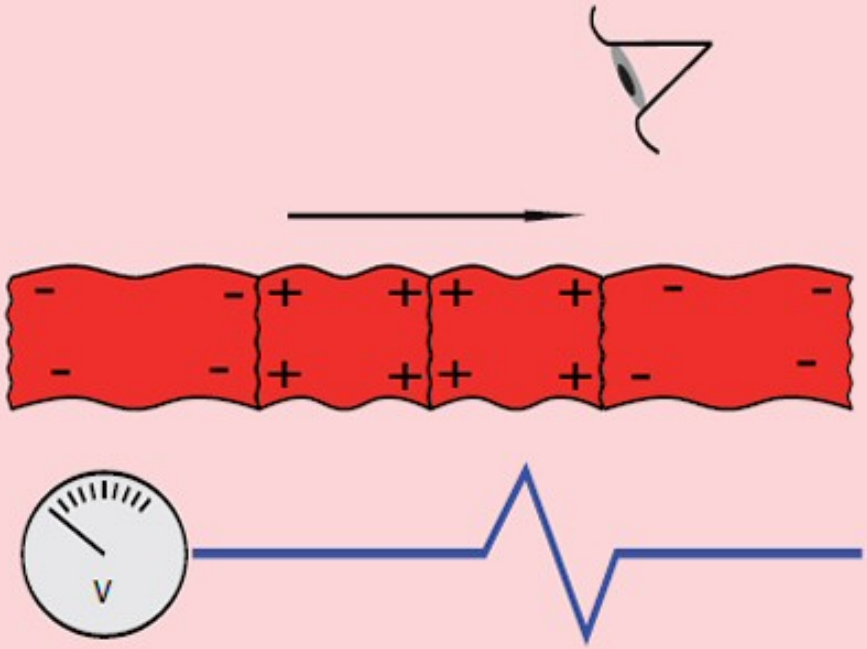


courtesy of Antoni van Ginneken

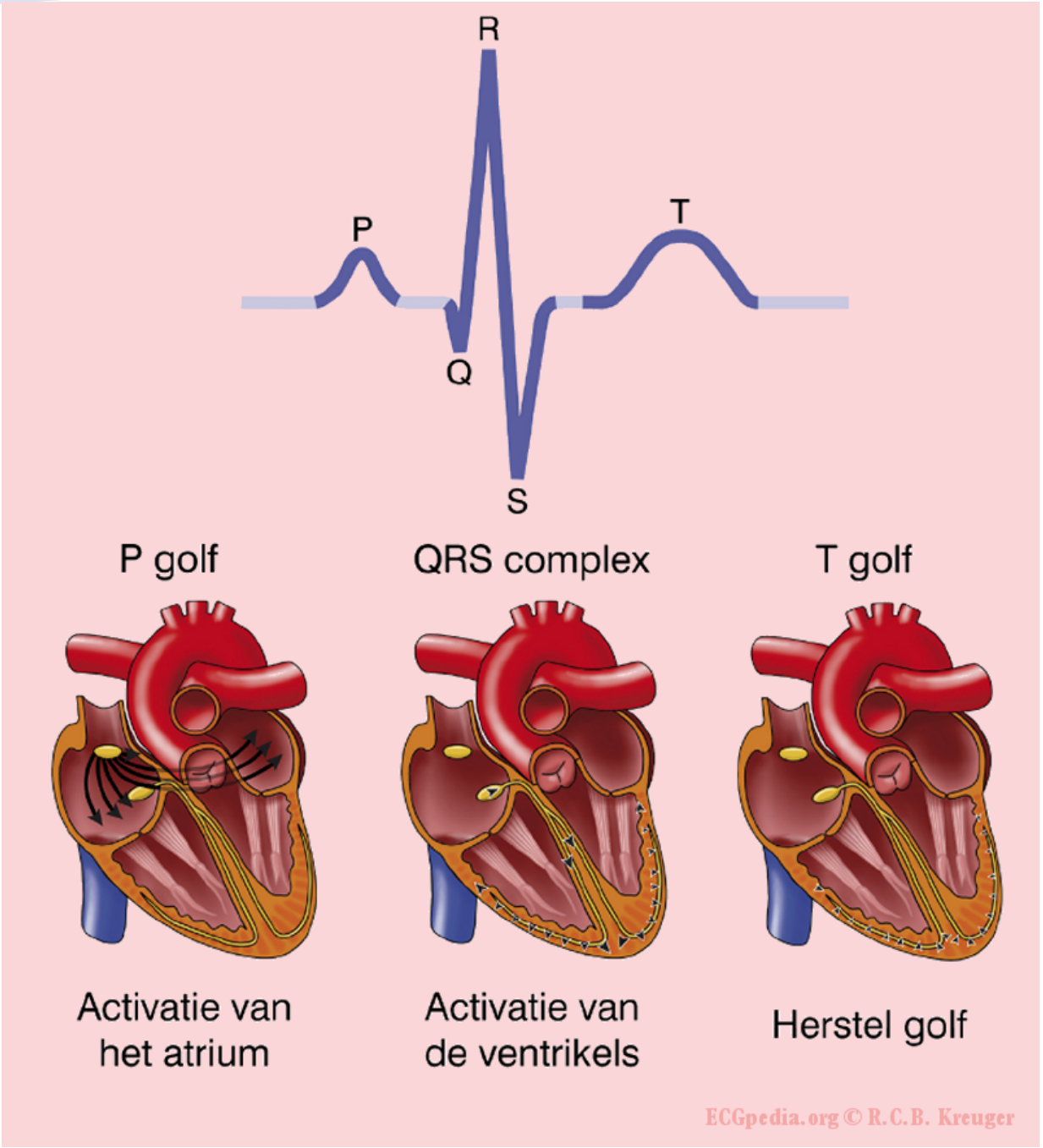


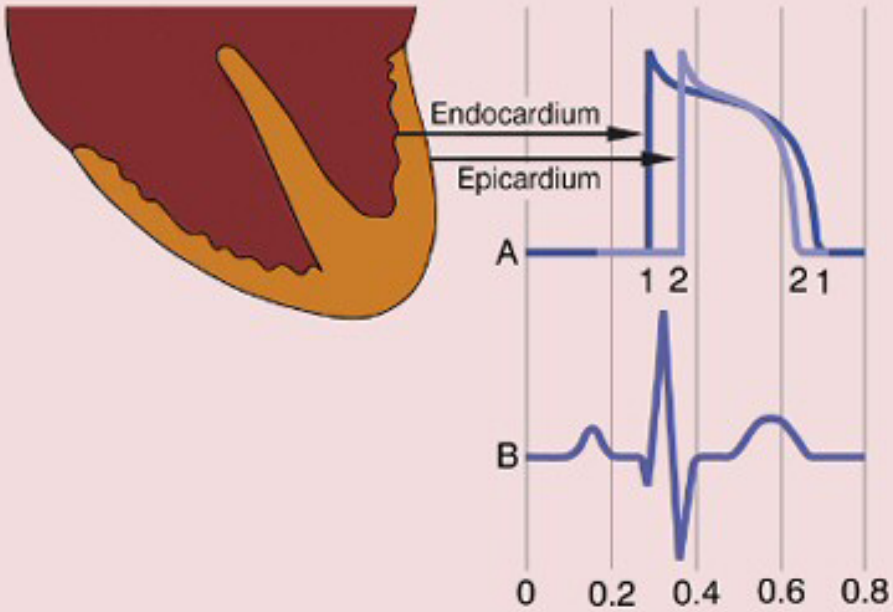


De lading verandering zorgt voor ion stromen over de hartcelwand.
Eerst Na^+ stromen naar binnen, dan Ca^{++} en daarna K^+ naar buiten



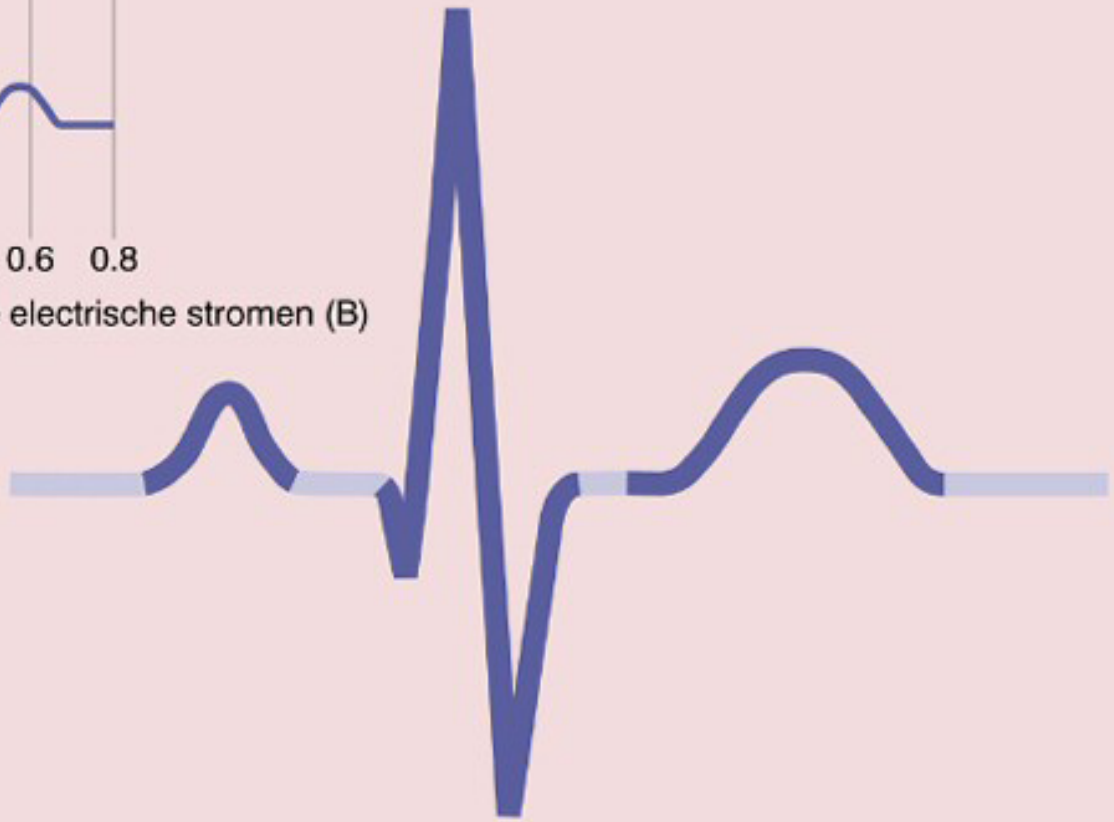
Signaal naar je toe is positieve uitslag

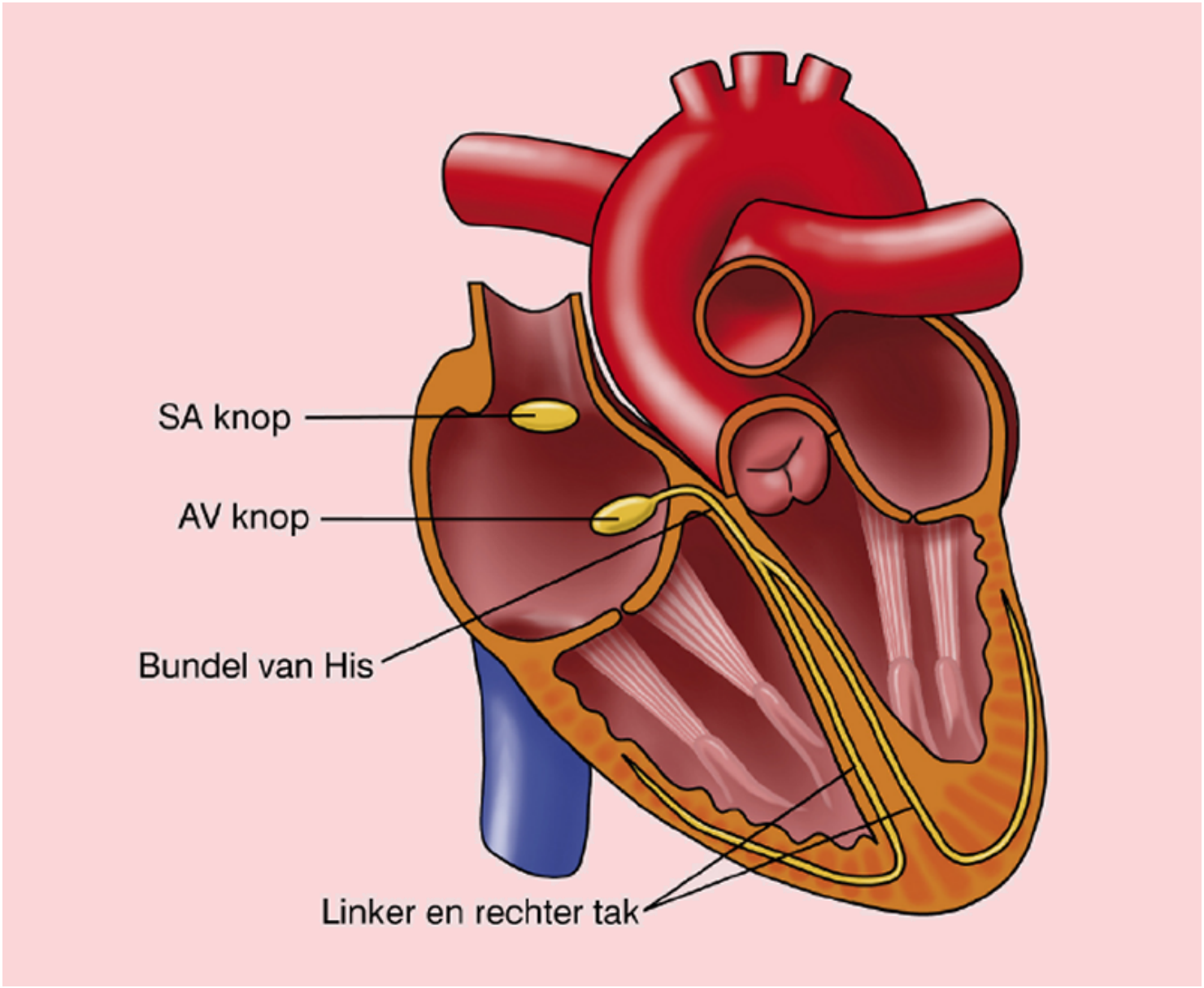

R
P
T
Q
S
P golf
QRS complex
T golf
Activatie van het atrium
Activatie van de ventrikels
Herstel golf
ECGpedia.org © R.C.B. Kreuger



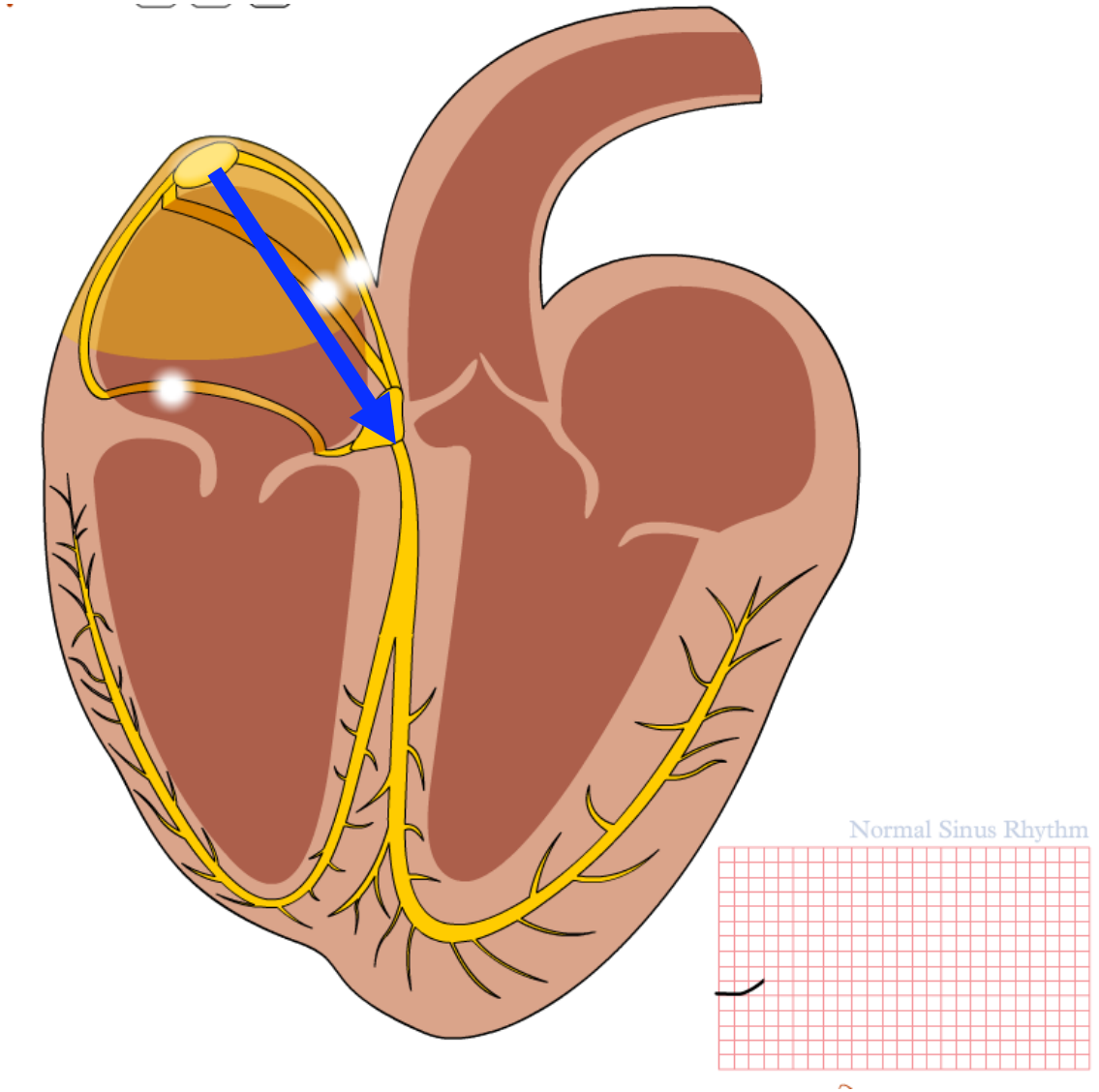
Het ECG registreert de optelsom van deze electrische stromen (B)

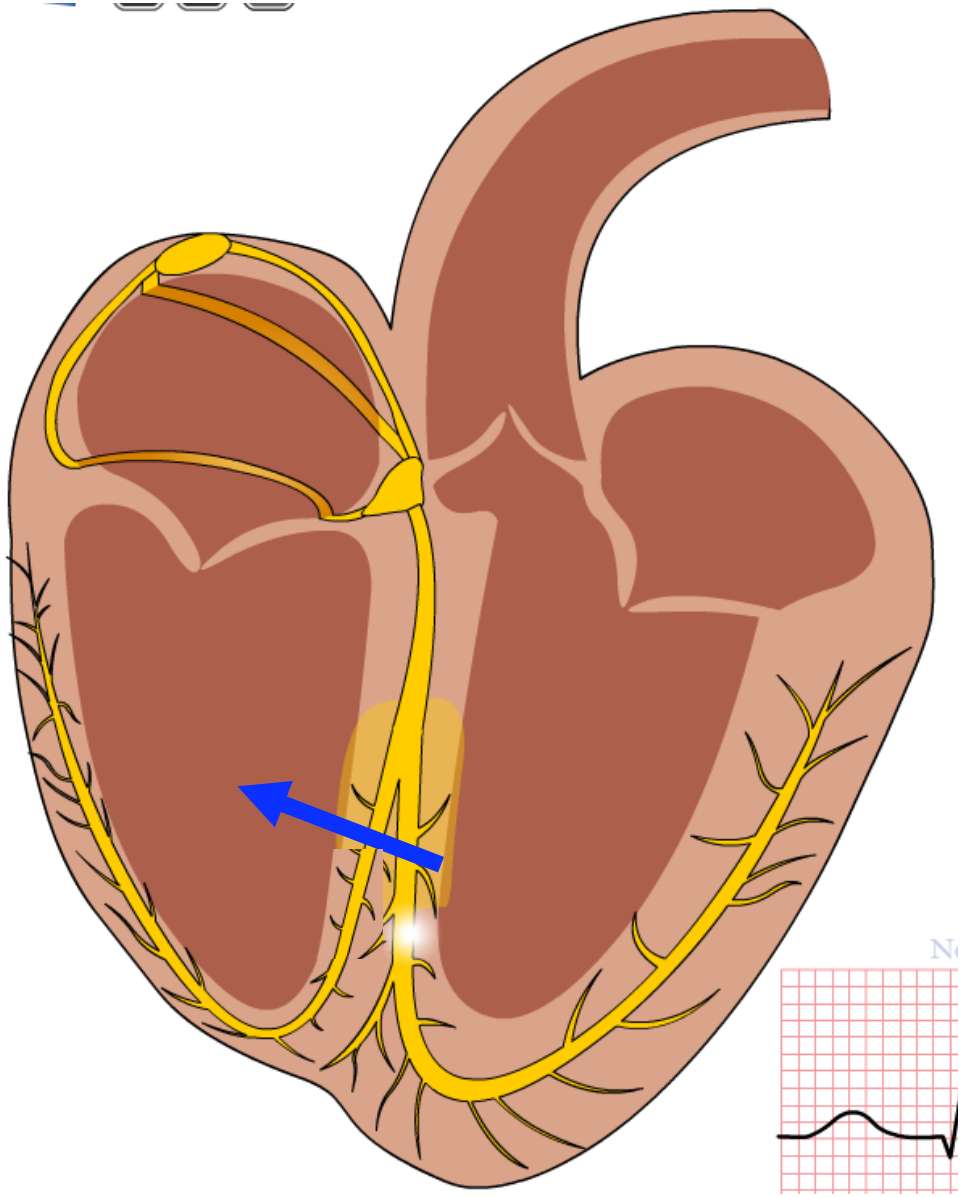
Het resultaat:

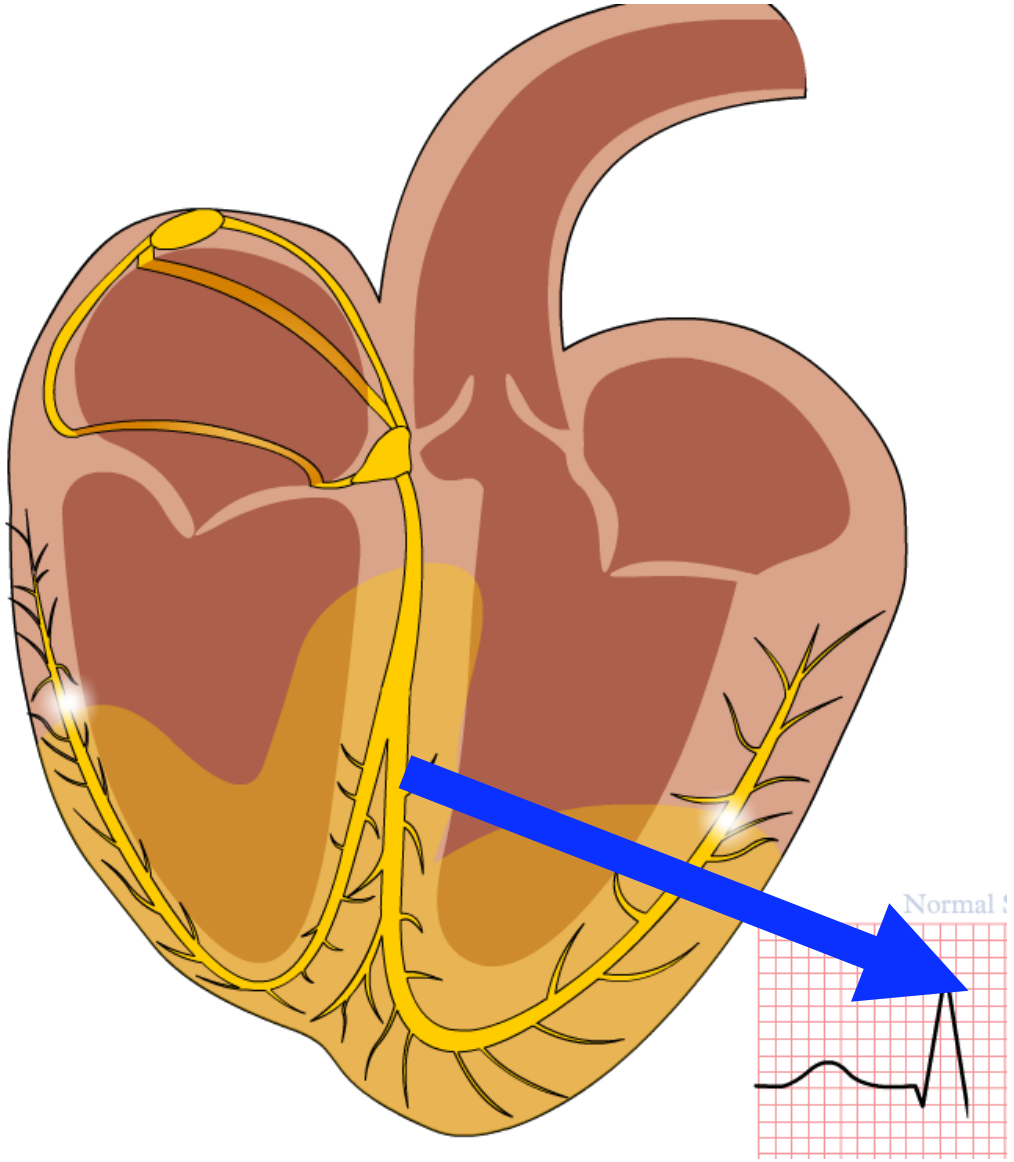


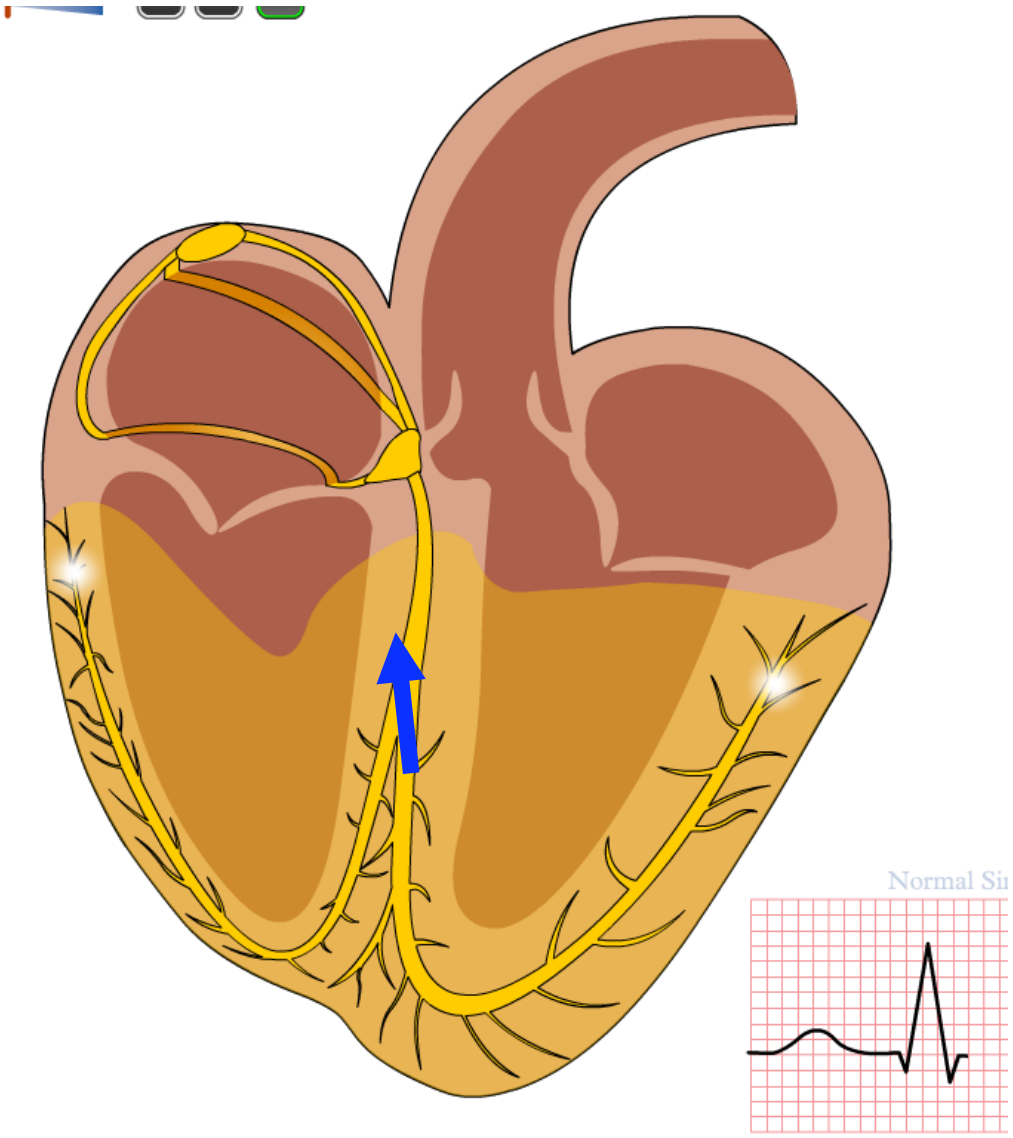

SA knop
AV knop
Bundel van His
Linker en rechter tak

- Animatie SR

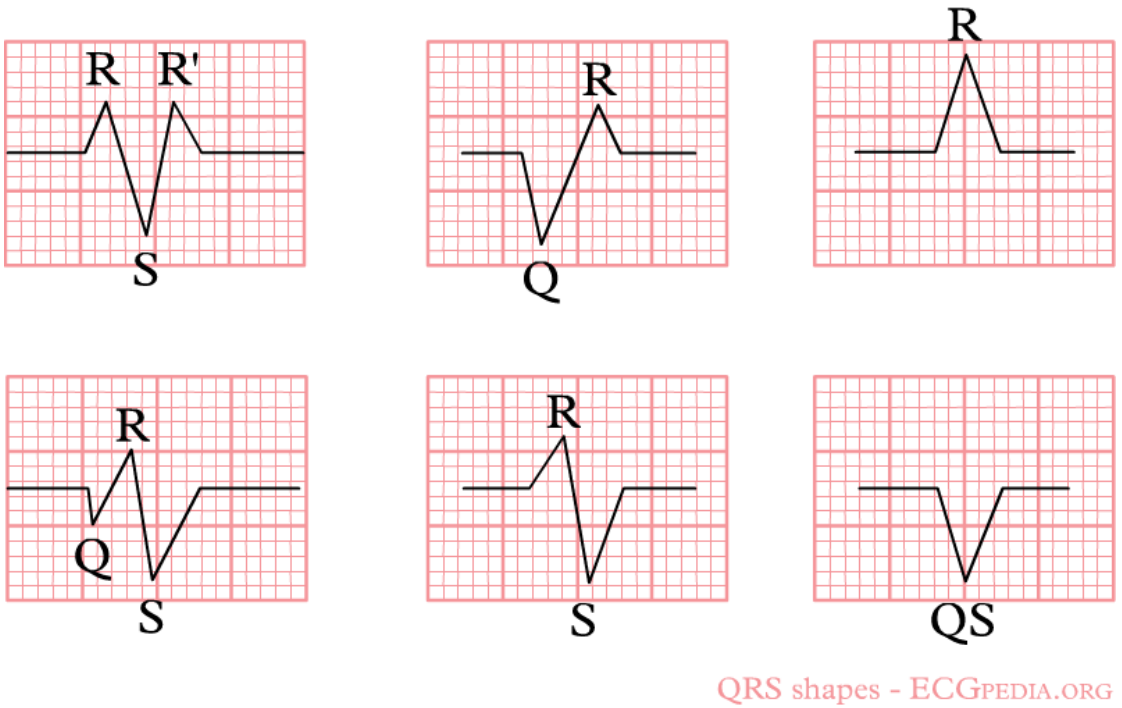

Normal Sinus Rhythm



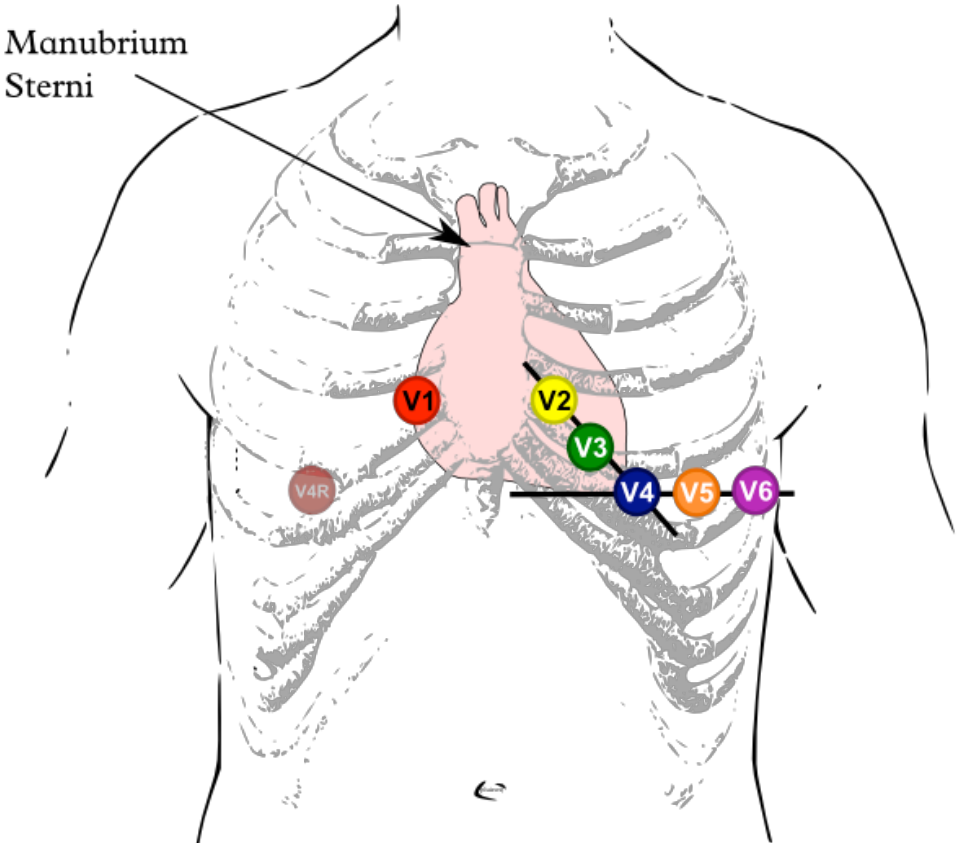

Normal

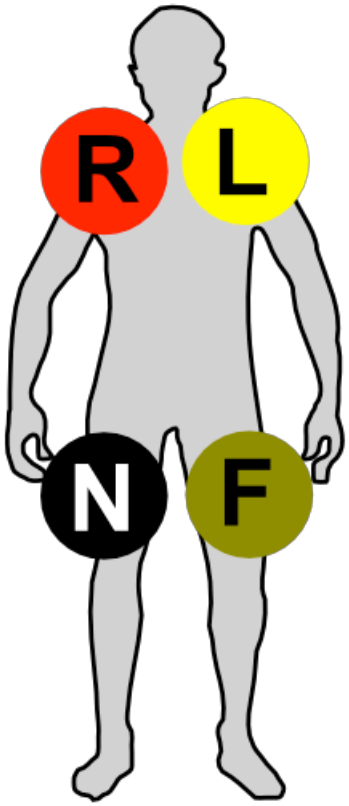

Normal Si

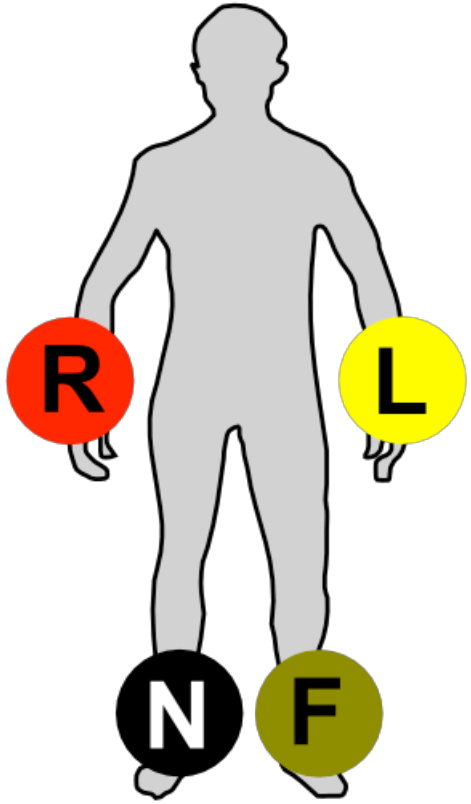
Nomenclatuur



QRS shapes - ECGpedia.org


Manubrium
Sterni
V1
V2
V3
V4
V5
V6
V4R


R
L
N
F


R
L
N
F

De extremiteitsafleidingen zijn:

I van rechter naar linker arm

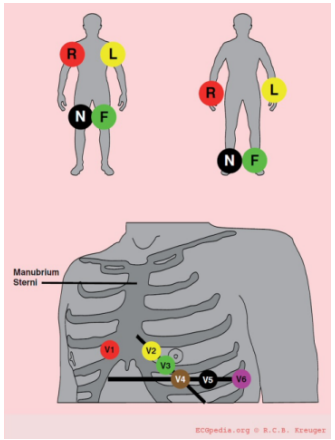
II van rechter arm naar linker been

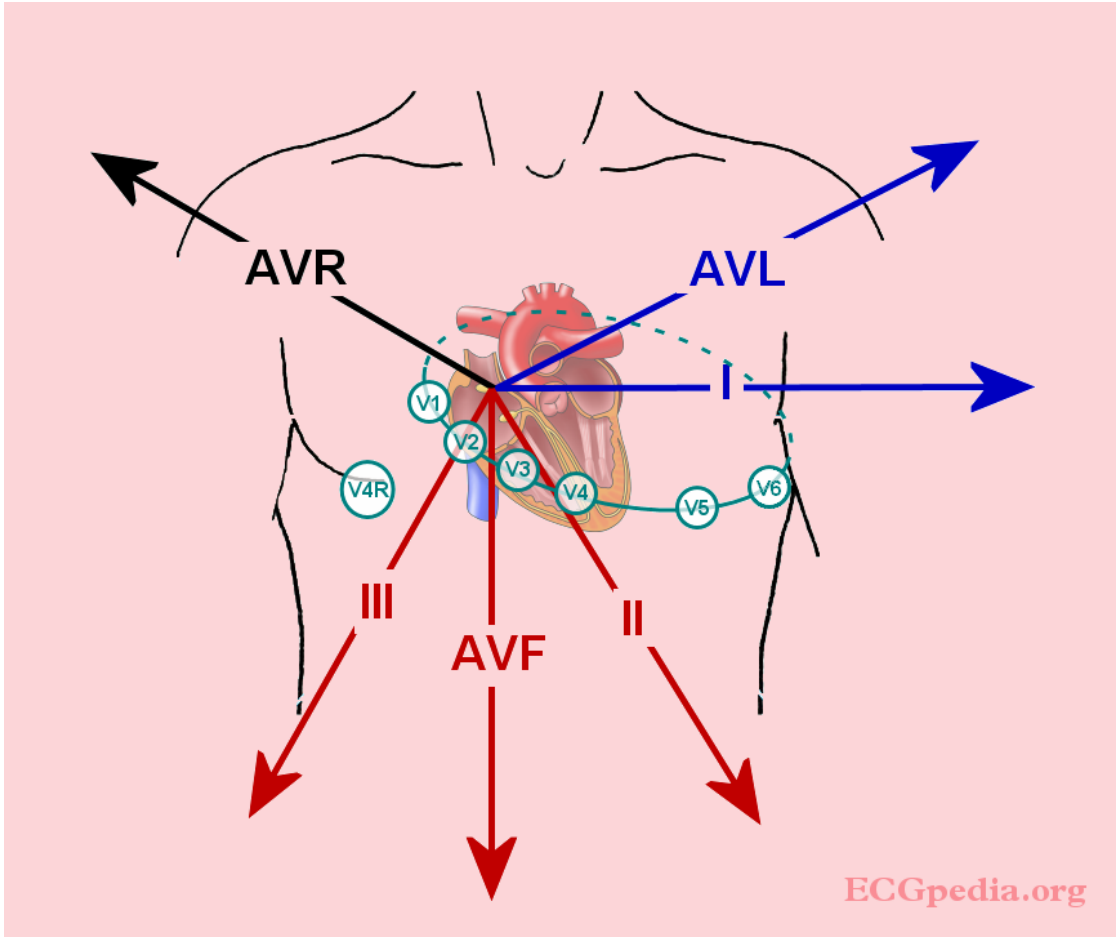
III van linker arm naar linker been

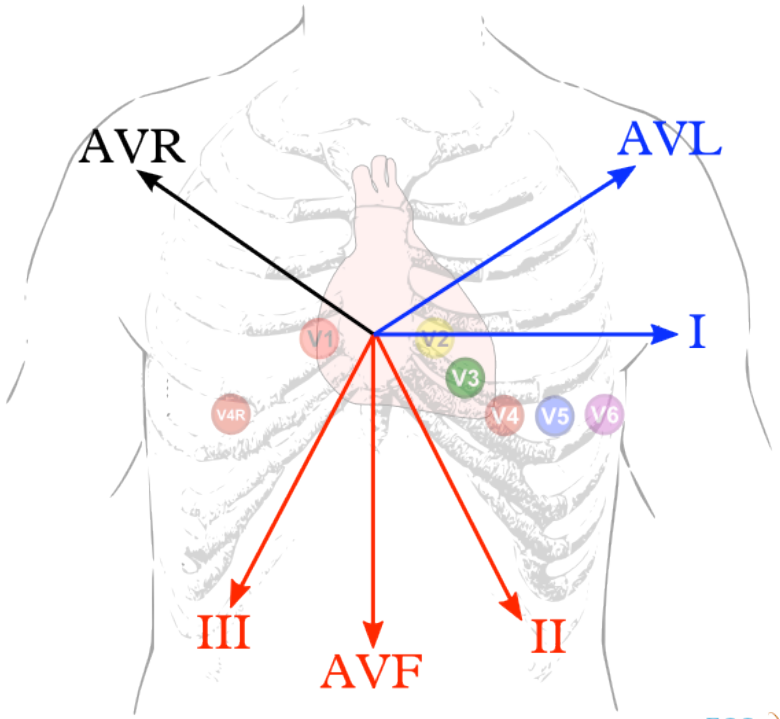
AVL wijst naar de Linker arm

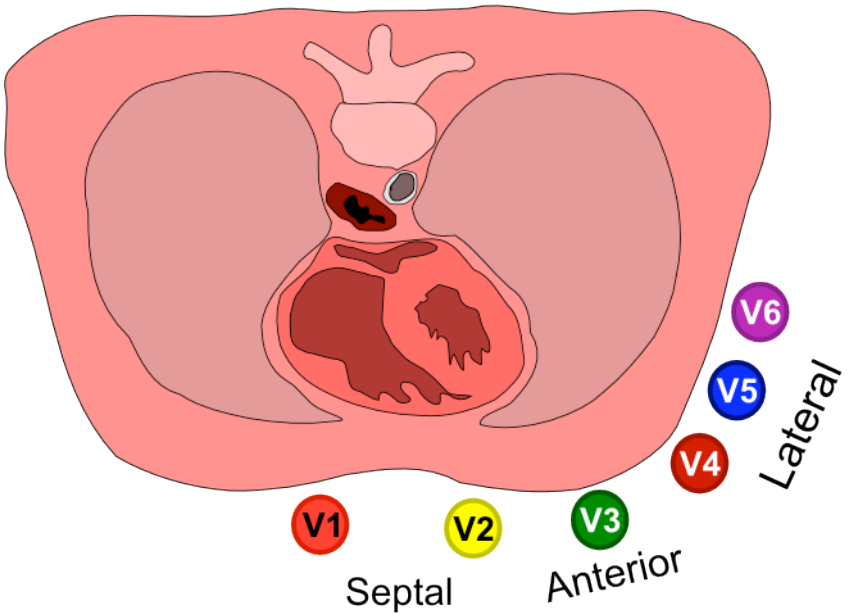
AVR naar de Rechter arm

AVF naar de voeten (Feet)



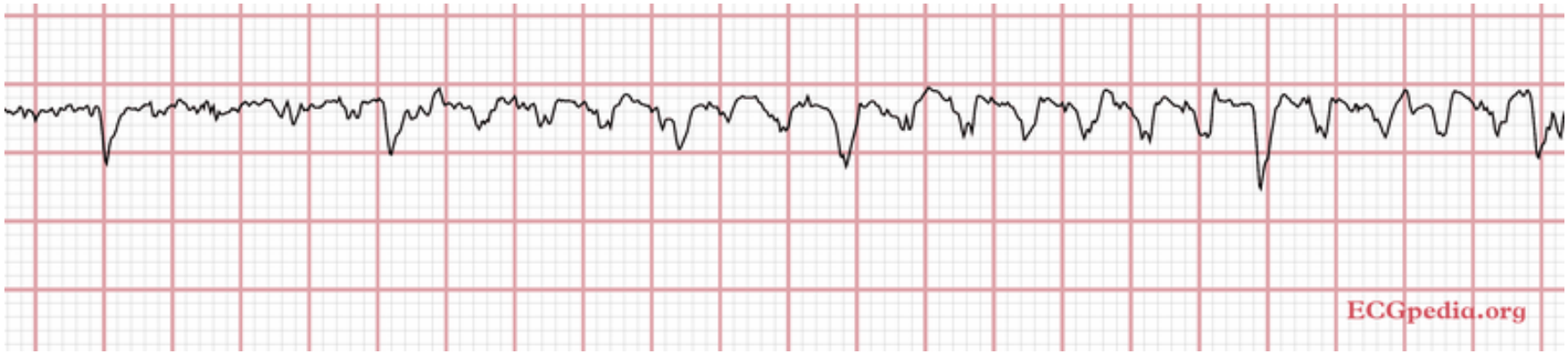






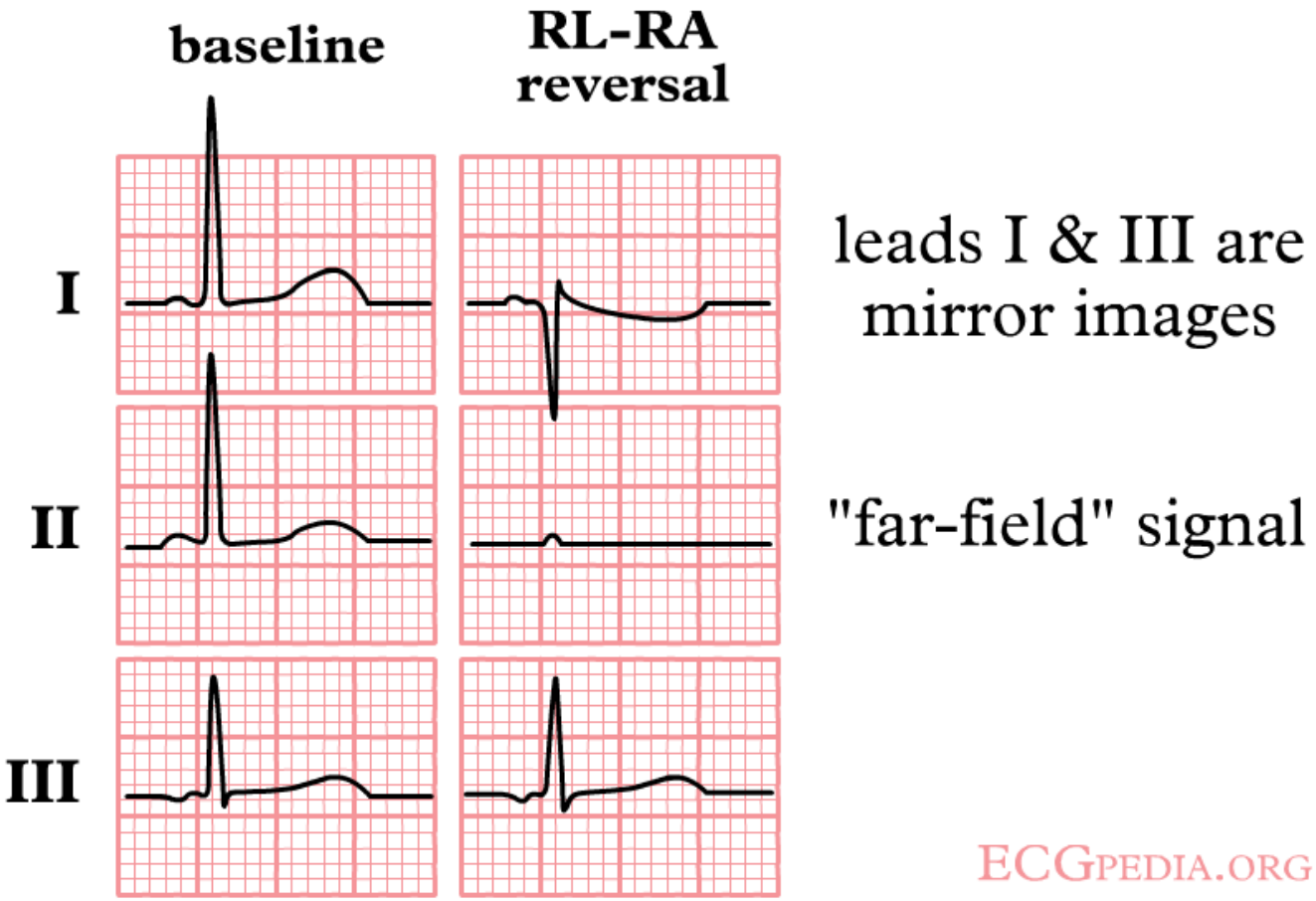
Technische problemen

Parkinson



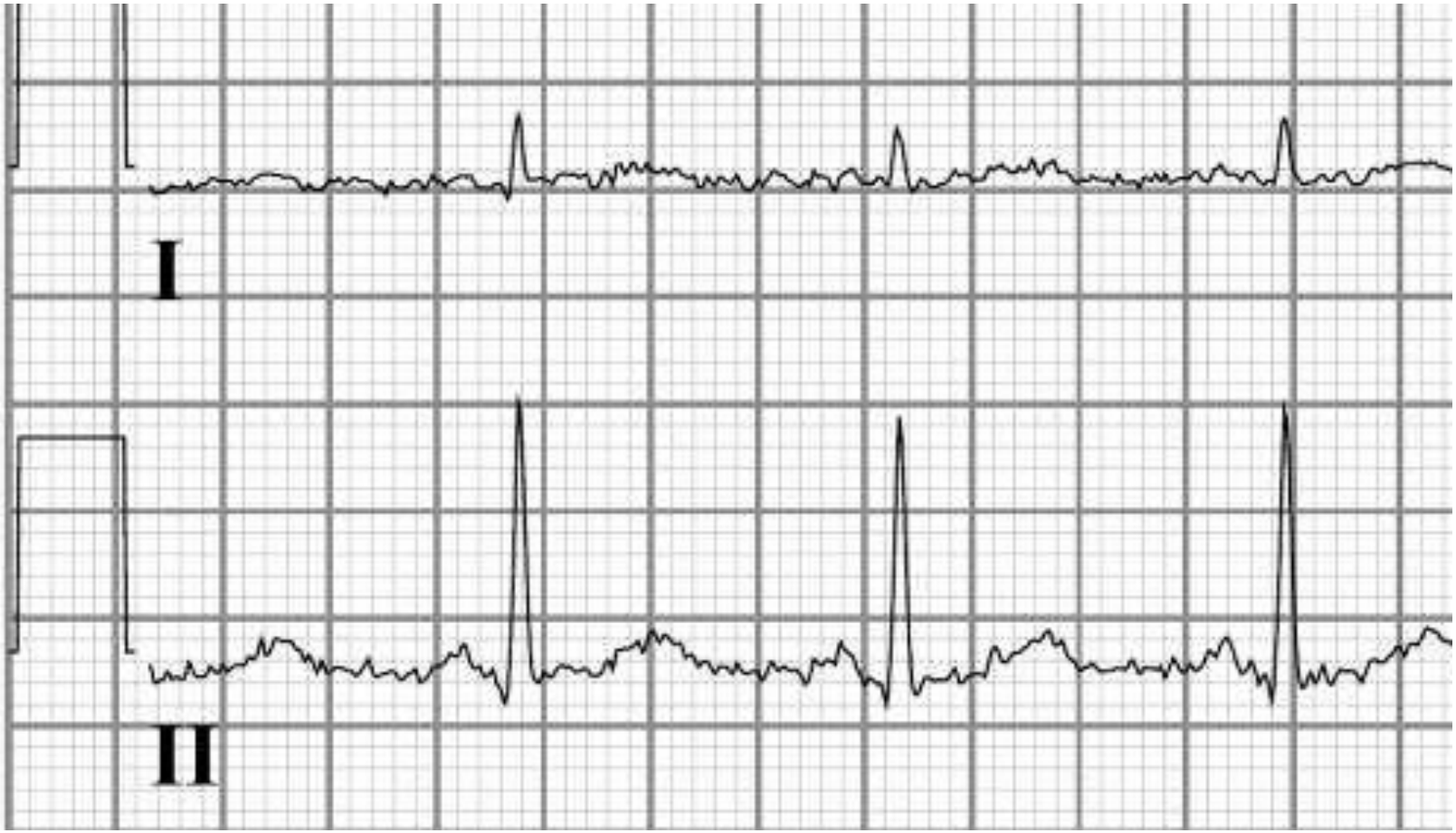
Technische problemen

Draadverwisselingen



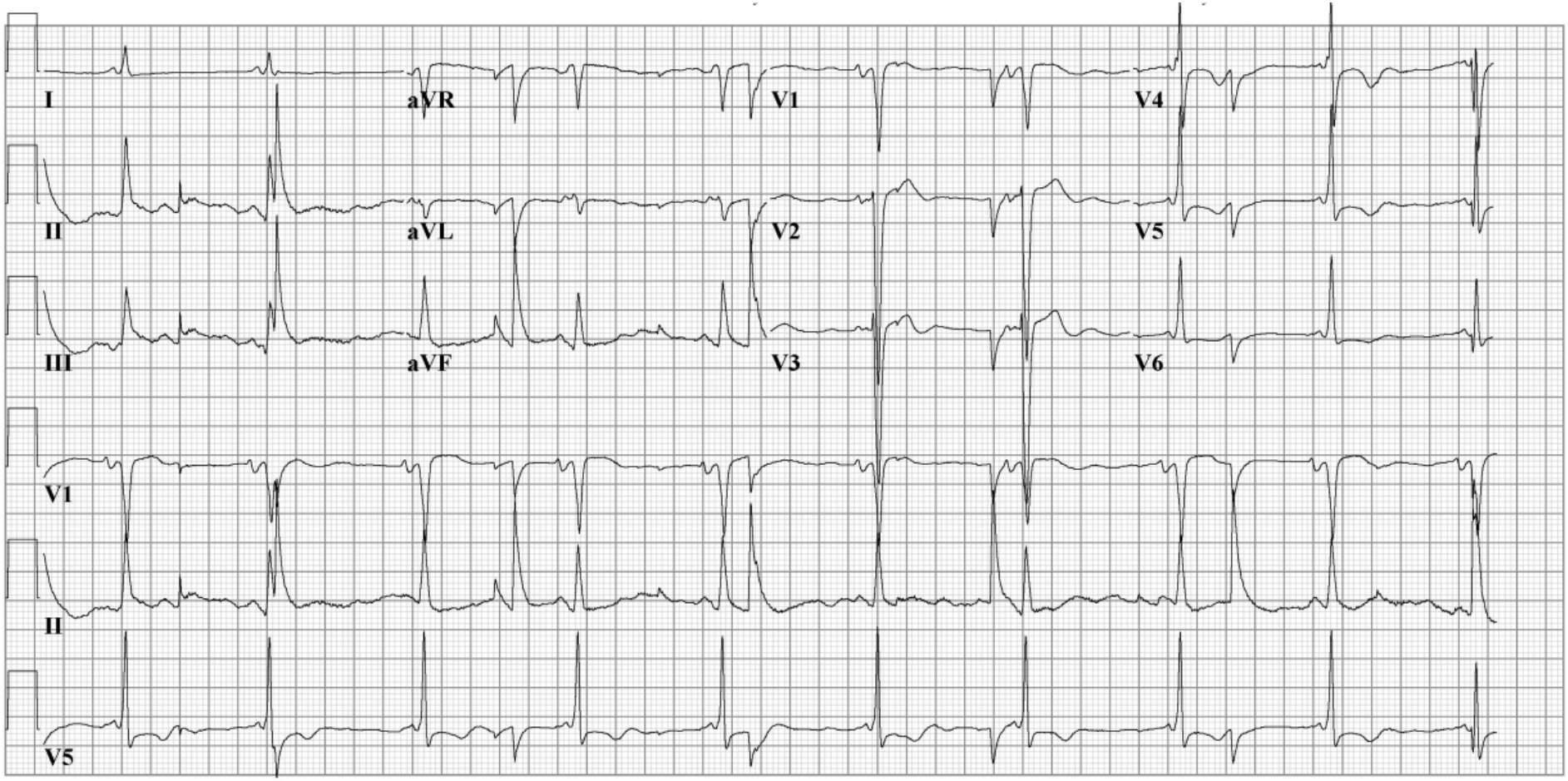
Technische problemen

Elektrische interferentie



Technische problemen

Elektrische interferentie



SYSTEMATISCHE BEOORDELING

Systematische beoordeling

- Kijk nooit eerst naar de pathologie!
- ALTIJD systematisch beoordelen!
- U mist belangrijke punten als u dat niet doet!

Systematische beoordeling

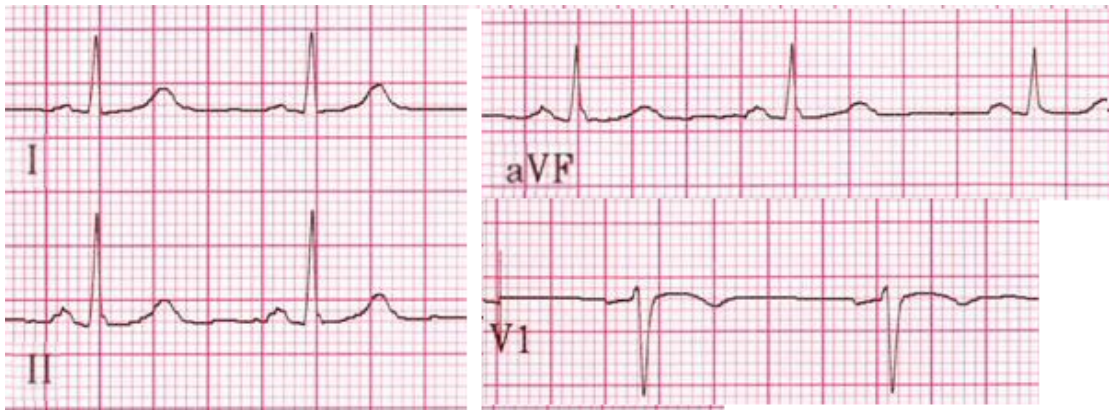
1. Ritme
2. Frequentie
3. Geleidingstijden
4. Hart-as
5. P top morfologie
6. QRS morfologie
7. ST morfologie

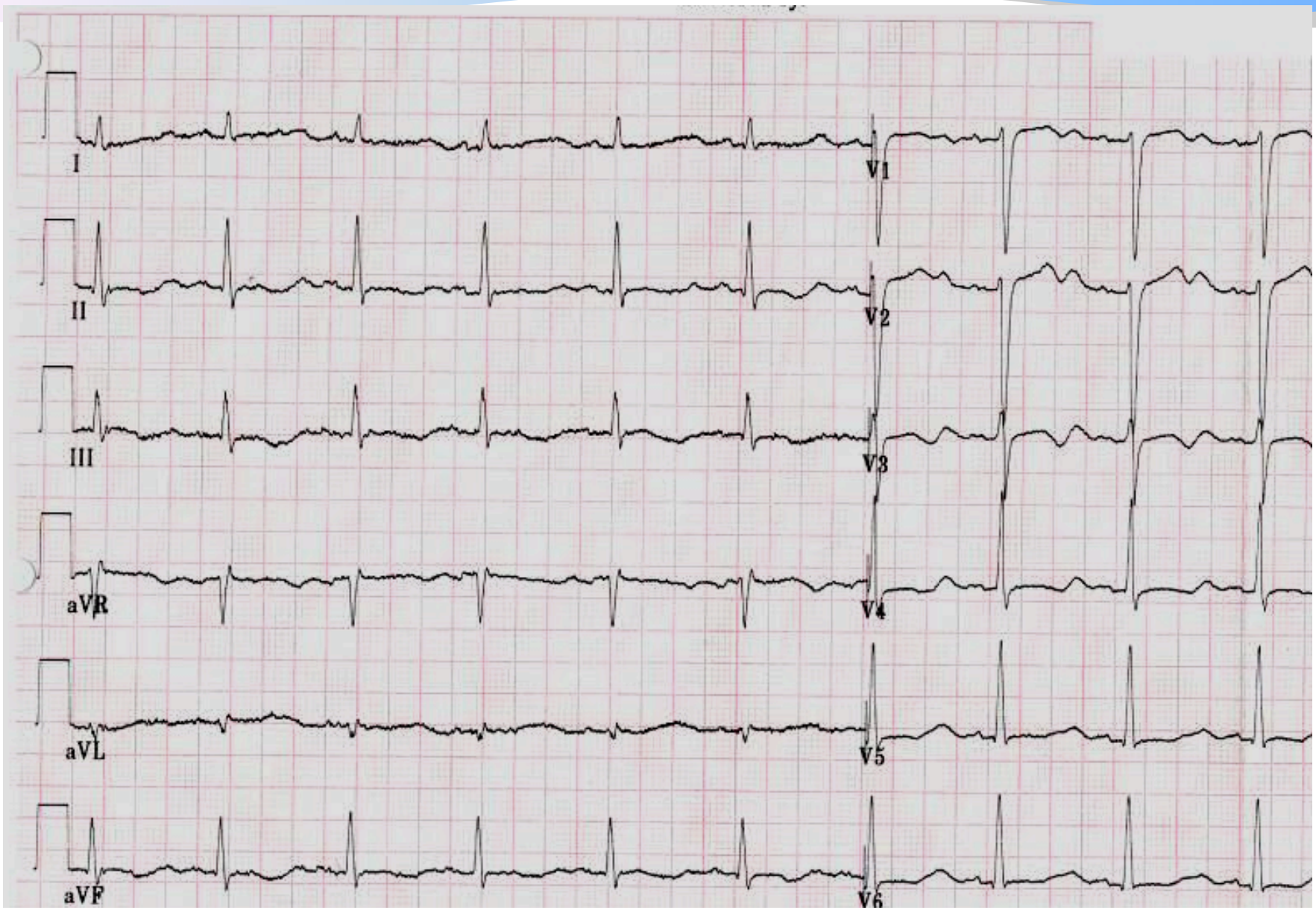
8. Vergelijking met oud ECG
9. Conclusie

1 Ritme

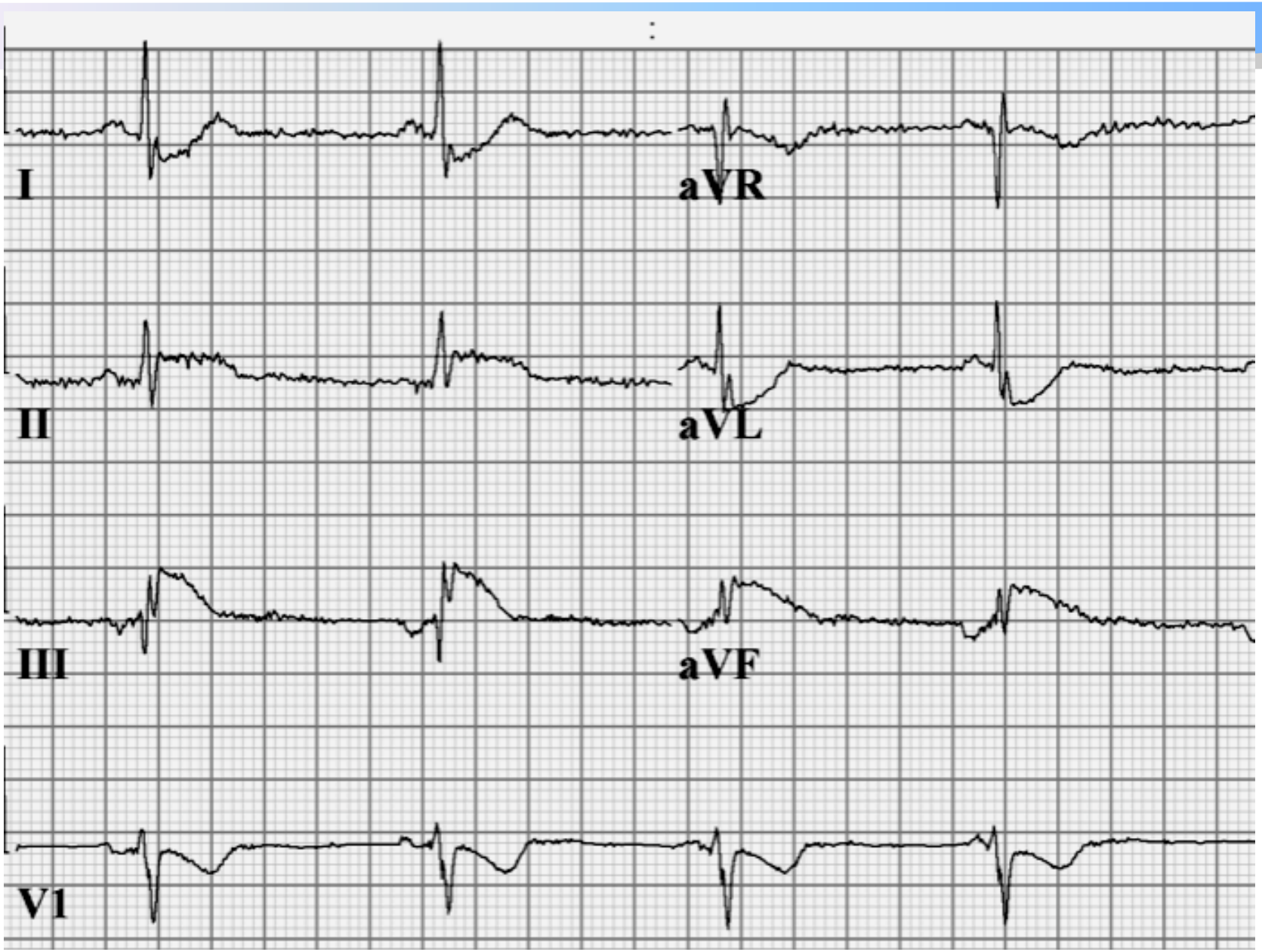
Eigenschappen van normaal sinusritme

- Op een P-top volgt meestal een QRS complex
- Het ritme is regelmatig, maar varieert licht met de ademhaling
- De frequentie ligt tussen de 60 en 100 / minuut.
- De p top is positief in II en AVF, en bifasisch in V1
- De PQ tijd is tussen de 0,12 en 0,2 seconden





Sinusritme?

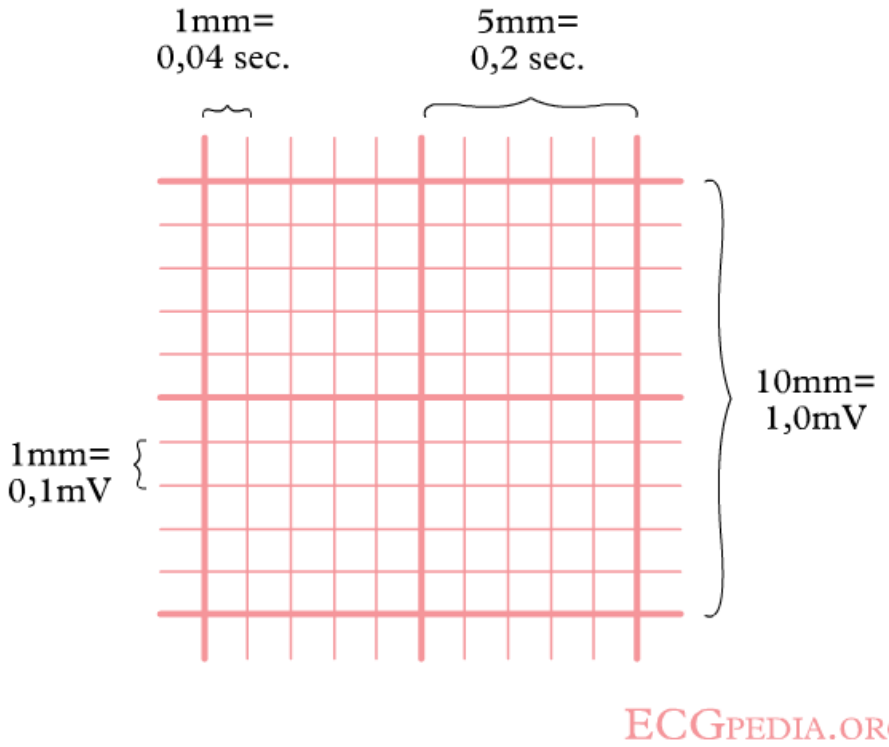


Sinusritme?

2 Frequentie

3 methoden:

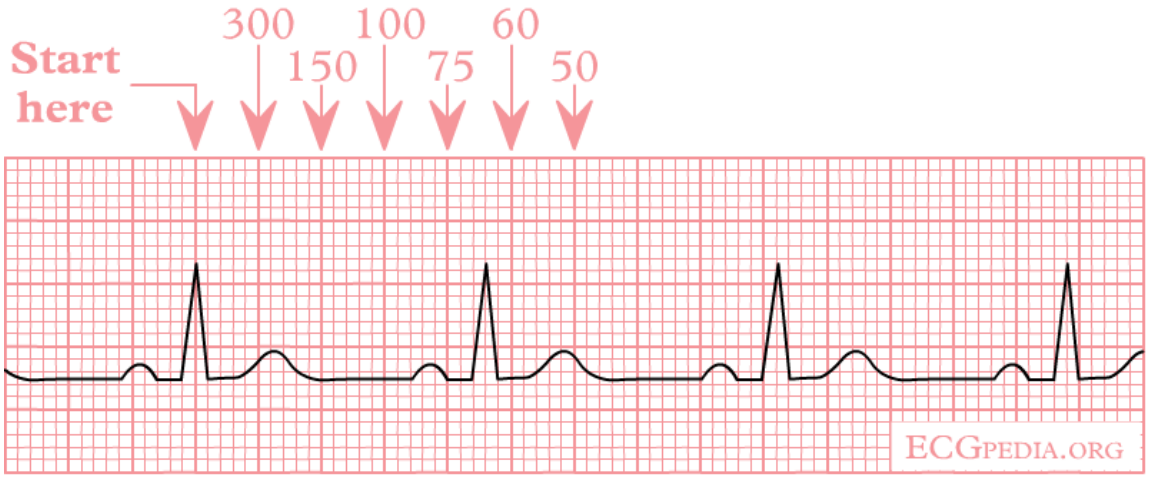
1. Aftelmethode
2. Berekenen: 1500 / aantal kleine hokjes tussen 2 hartslagen
3. Marker methode

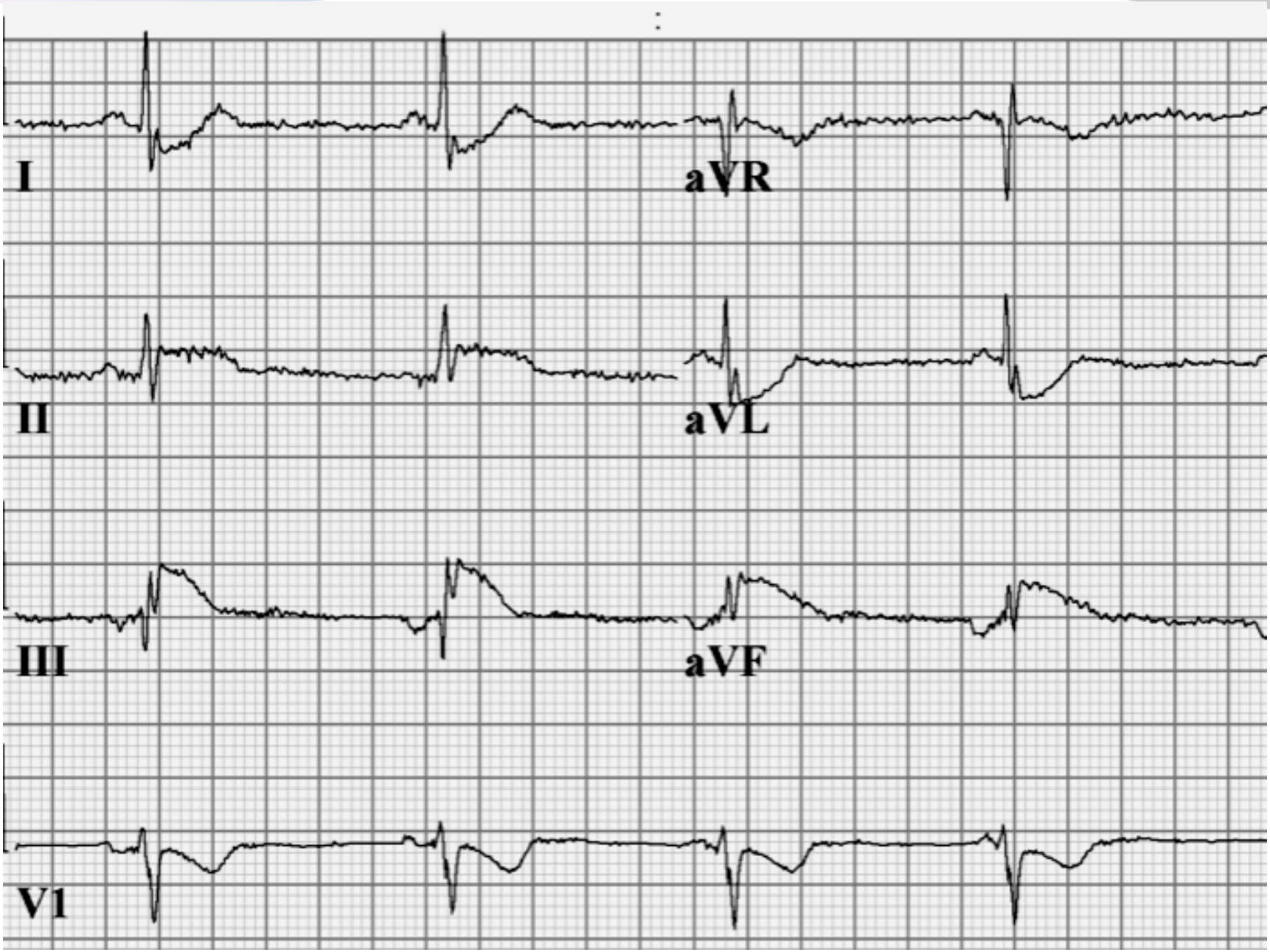


De hartfrequentie wordt beïnvloed door:

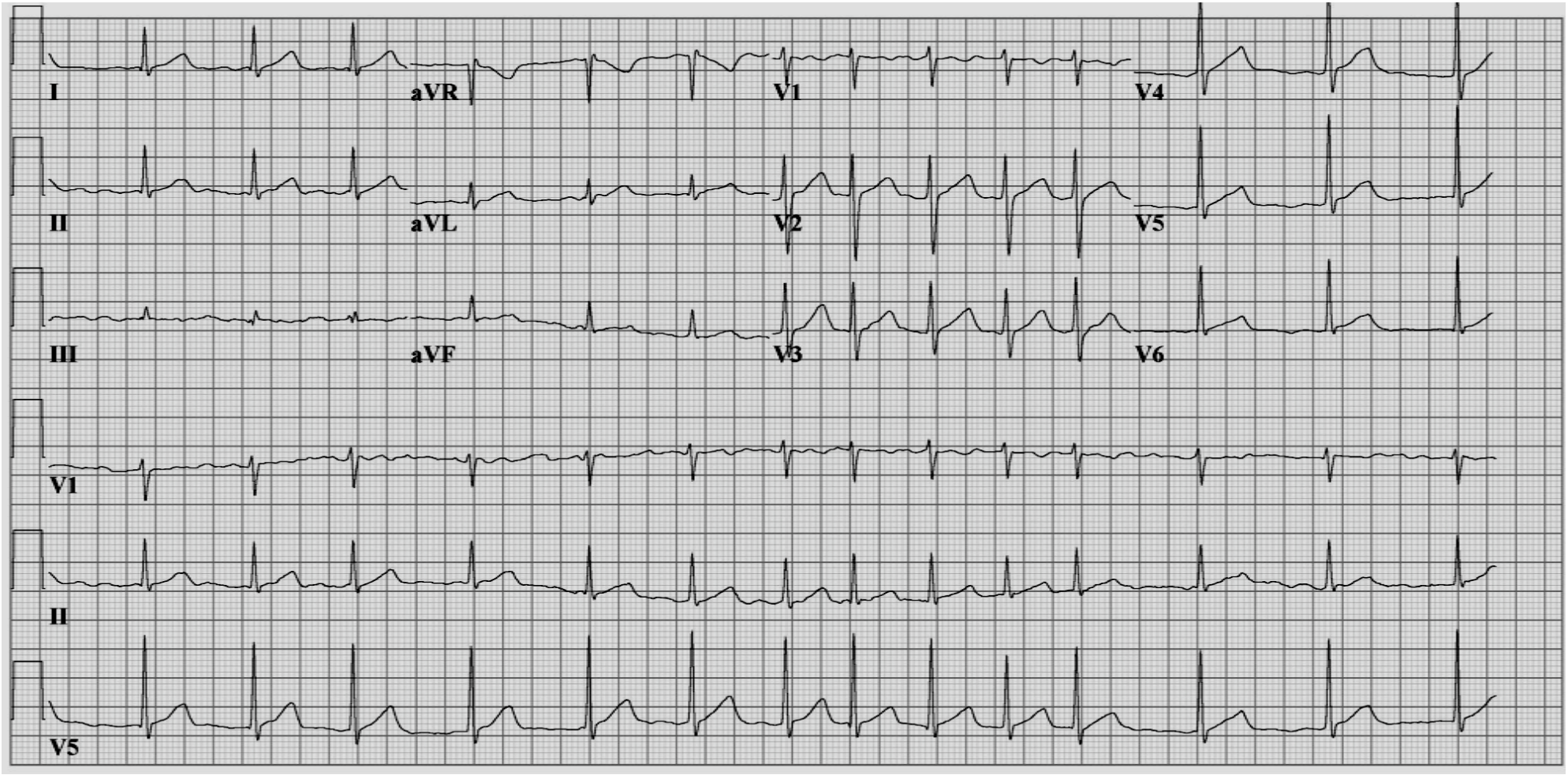
Het autonome zenuwstelsel

De vulling van het hart





Frequentie?



Frequentie?

3 Geleidingstijden

PQ tijd tussen 0.12 en 0.20 seconde

- te kort → WPW
- te lang → AV blok

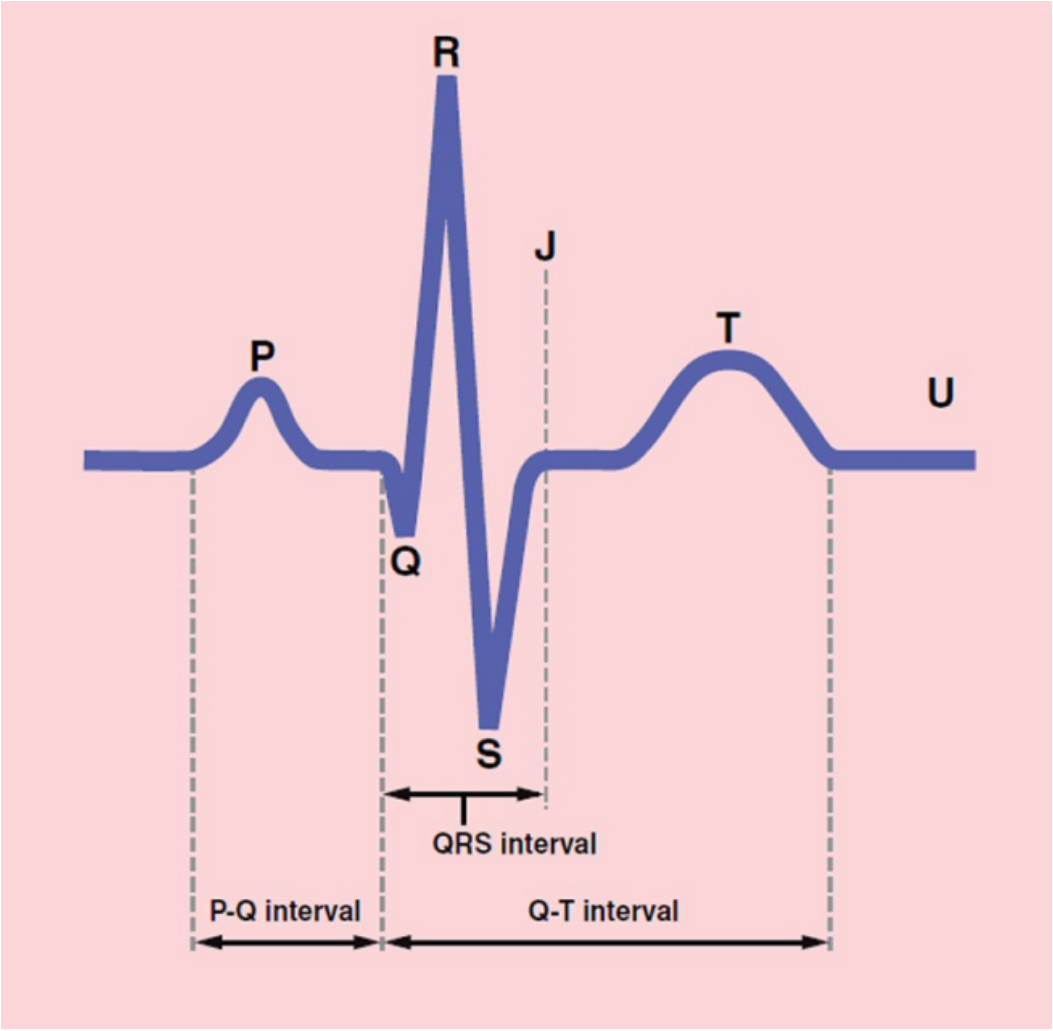
QRS duur <= 0.10-0.12 seconde

Te lang → LBTB / RBTB

QTc tijd = repolarisatie

Mannen < 450ms

Vrouwen < 460ms



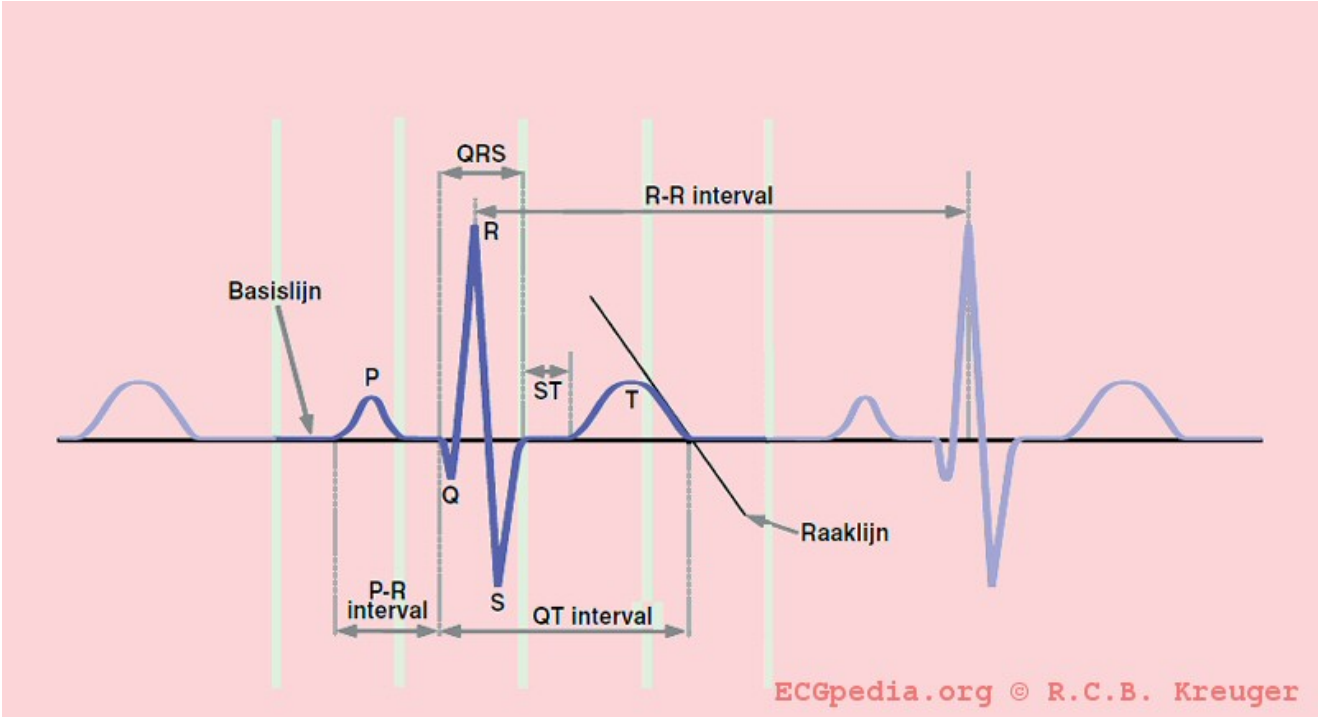
Check de QT tijd die de computer uitrekent!

Verlengde QTc tijd geeft verhoogd risico op plotse dood. Met name > 480 ms.

Dan geen QTc verlengende medicatie:

- Sotalol
- Amiodarone
- Erythromycine
- Clarithromycine
- Haldol

Zie www.torsades.org



$$QTc = \frac{QT}{\sqrt{RR\,interval\,(sec)}}$$

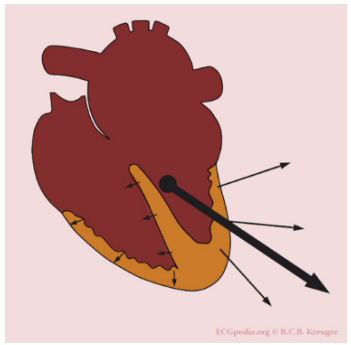
4 Hartas

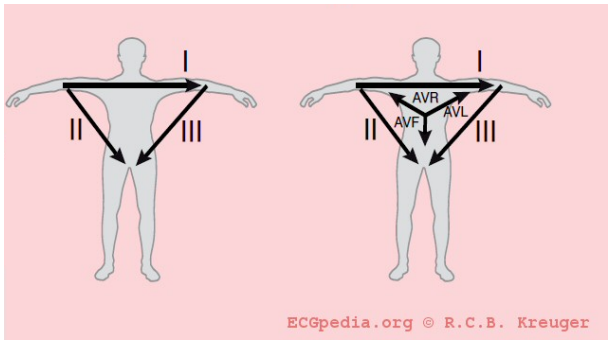
Geeft de gemiddelde electrische activiteit aan

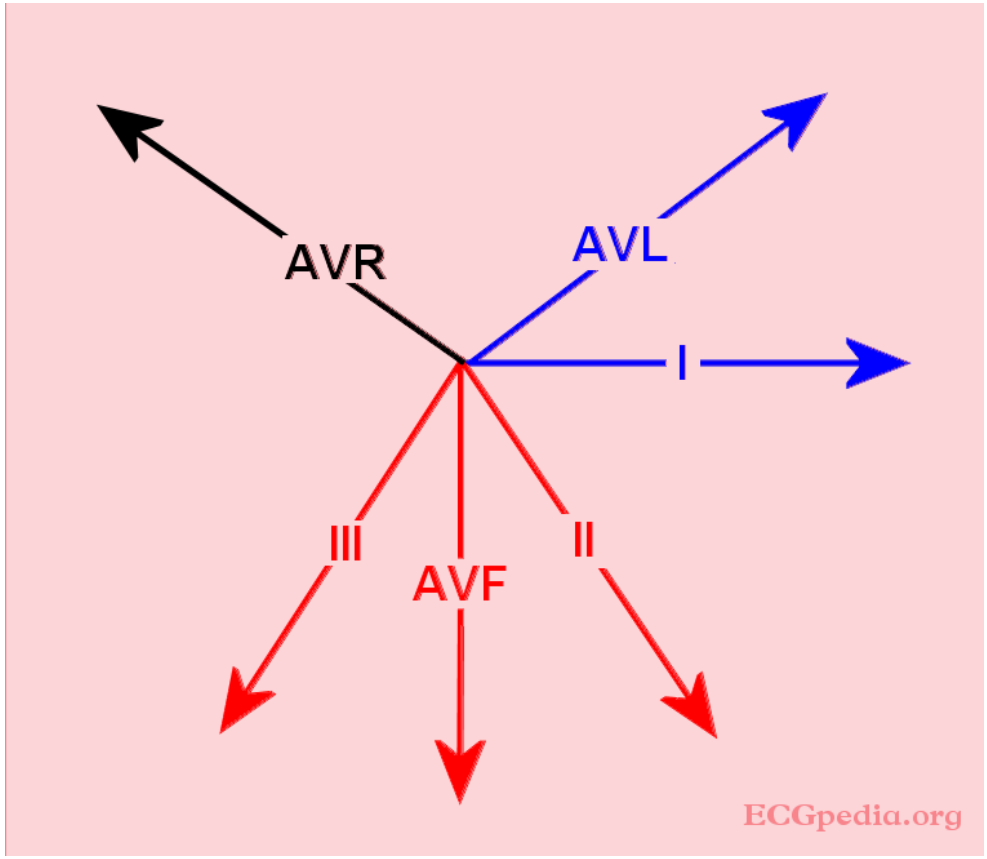
Normaal is tussen -30 en +90 graden.

Positief in I en AVF? → hartas = normaal

Kijk op het ECG! De computer heeft het meestal goed.



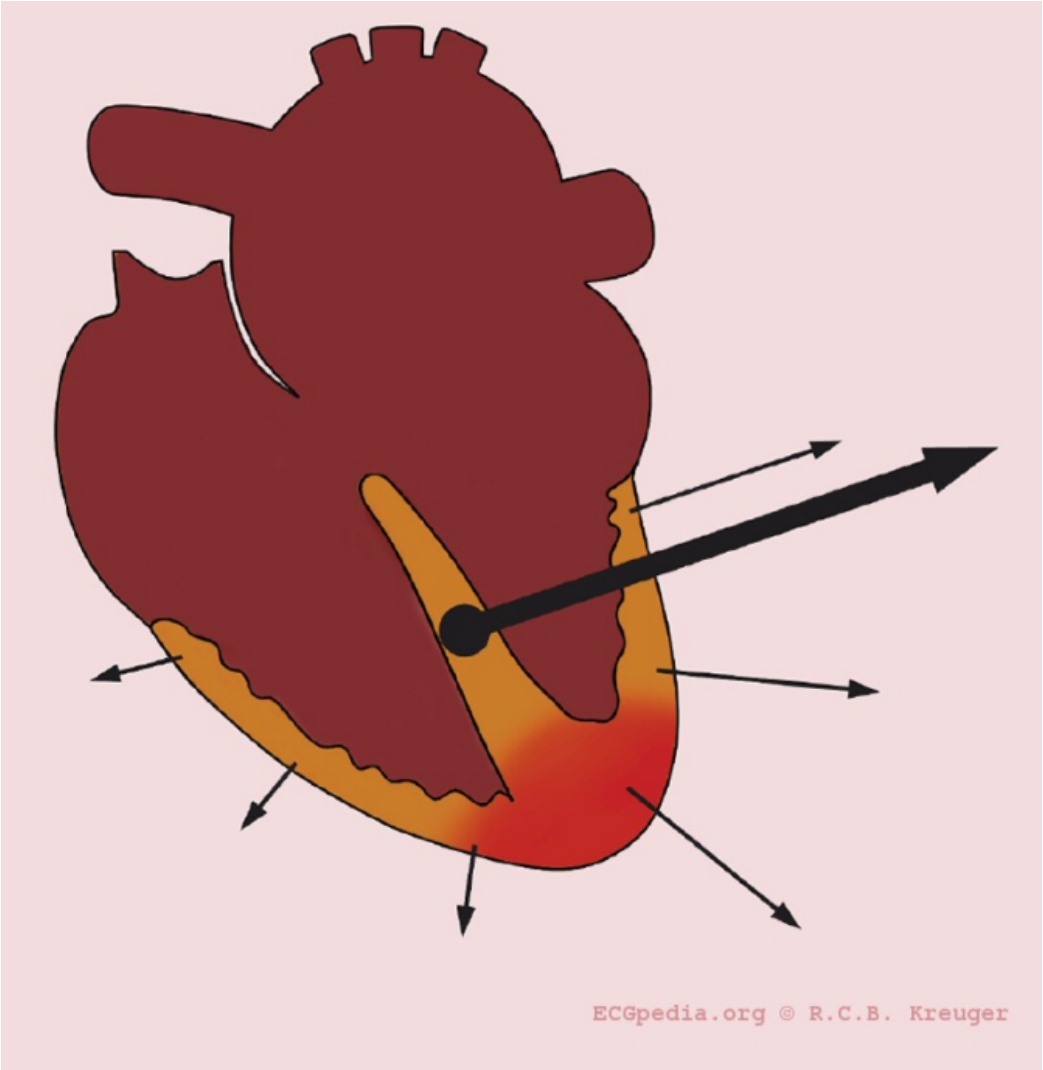




- Hartas simulator

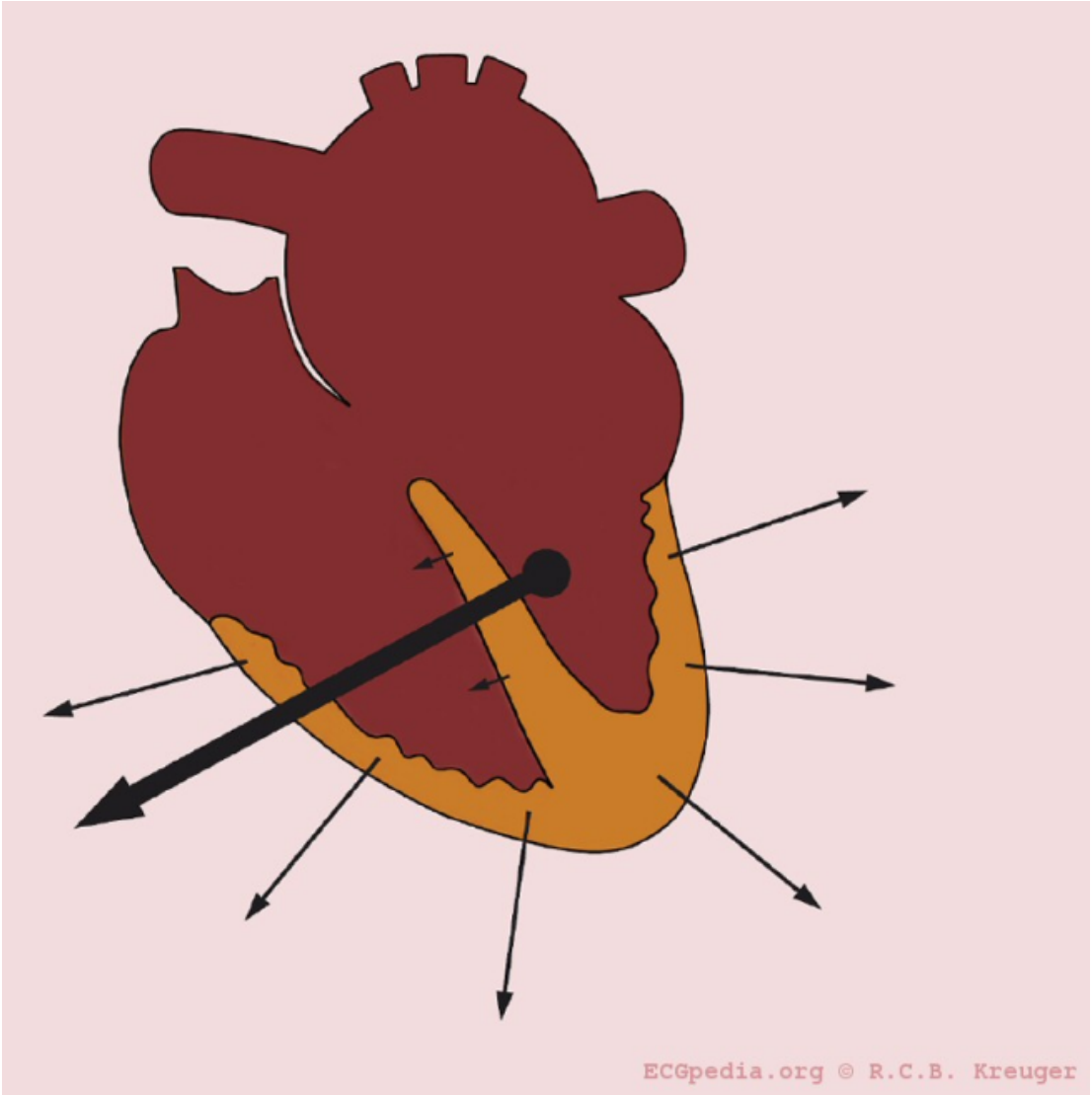
Linker hartas

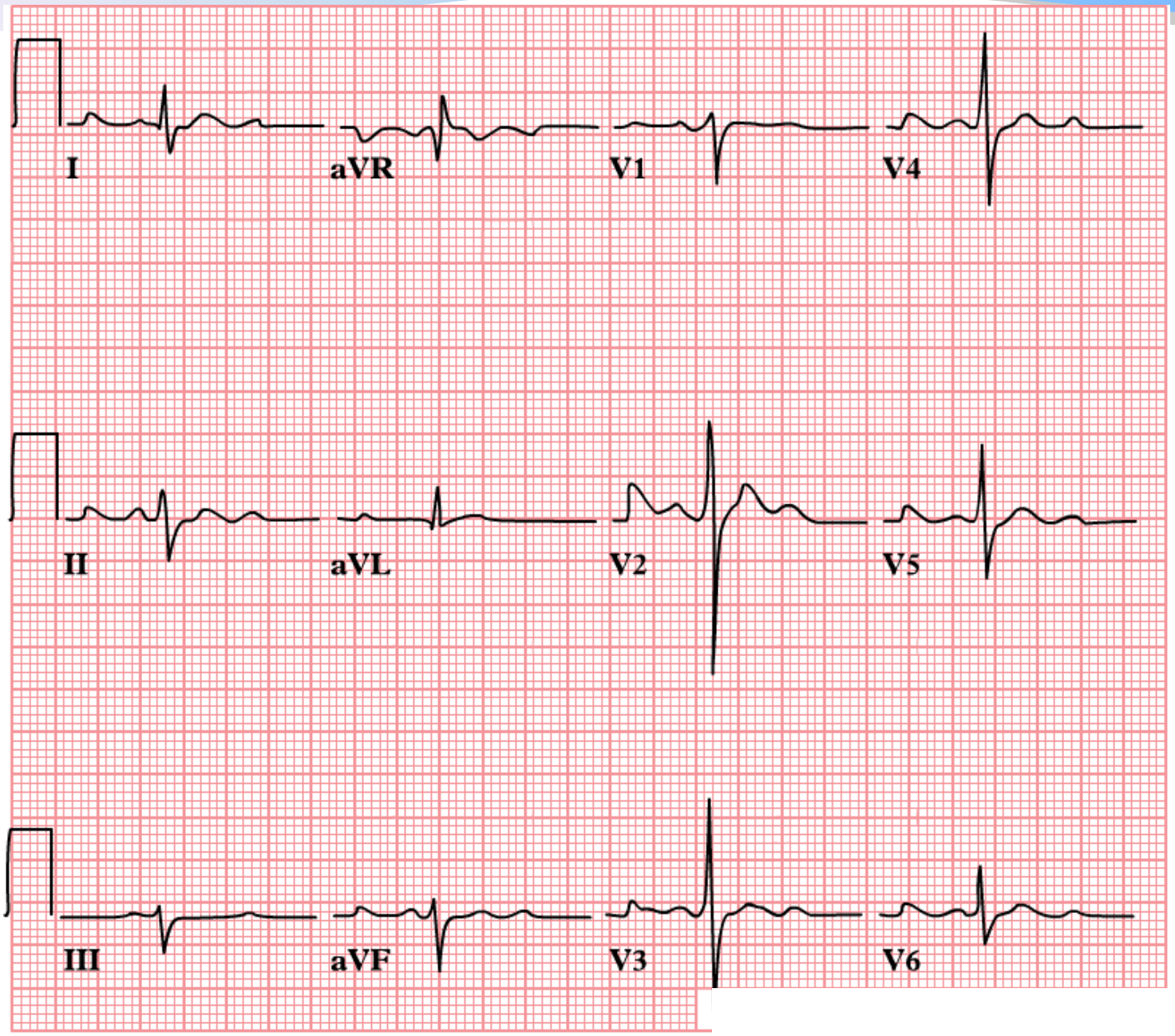
- Linker anterior hemiblok
- Onderwandinfarct
- Linker ventrikelhypertrofie
- Pacemakerritme



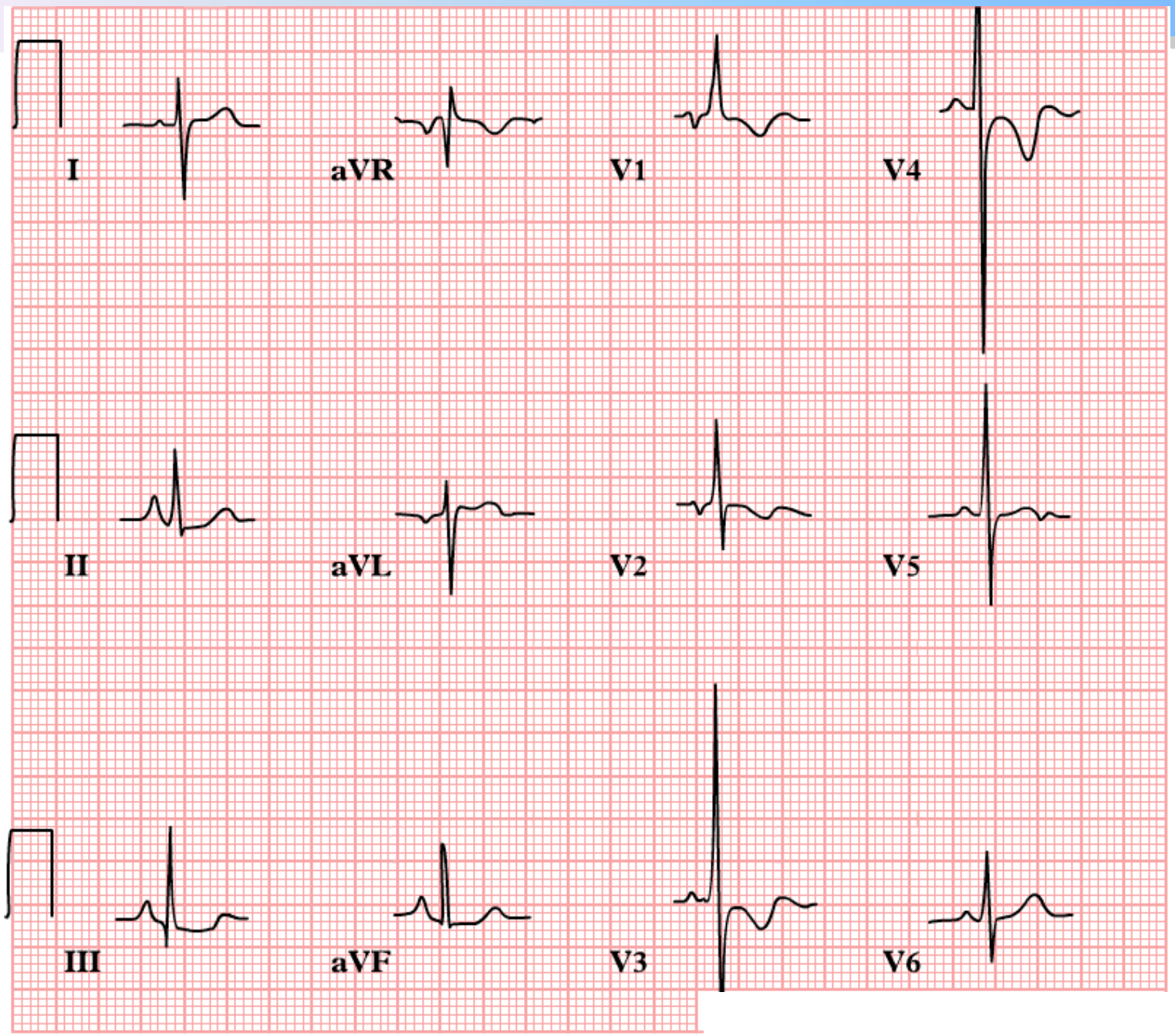
Rechter hartas

- Rechter ventrikelhypertrofie
- Rechter ventrikelbelasting (longembolie / COPD)
- Atriumseptumdefect, ventrikelseptumdefect
- Cave draad verwisseling!

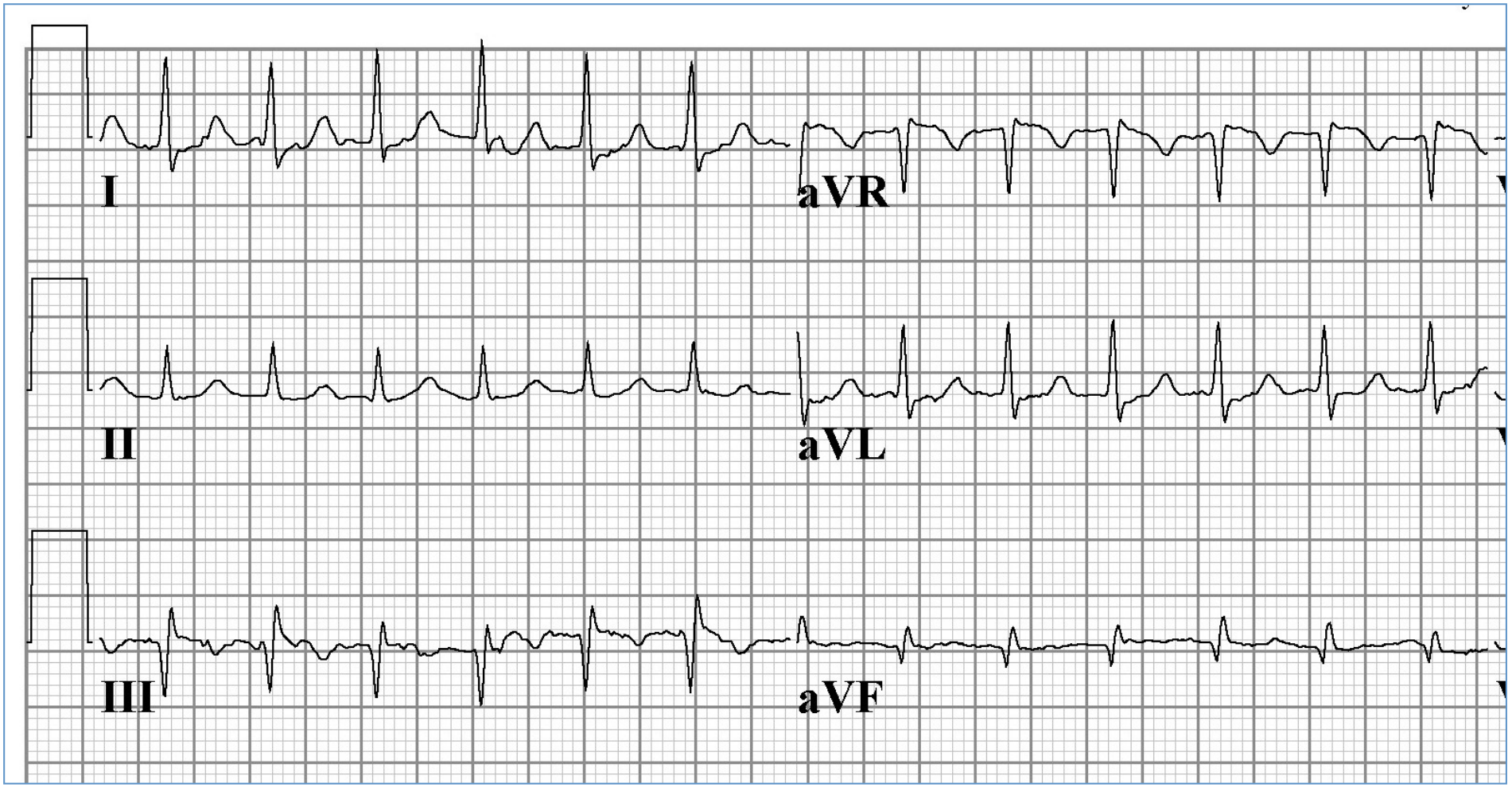




Hartas?



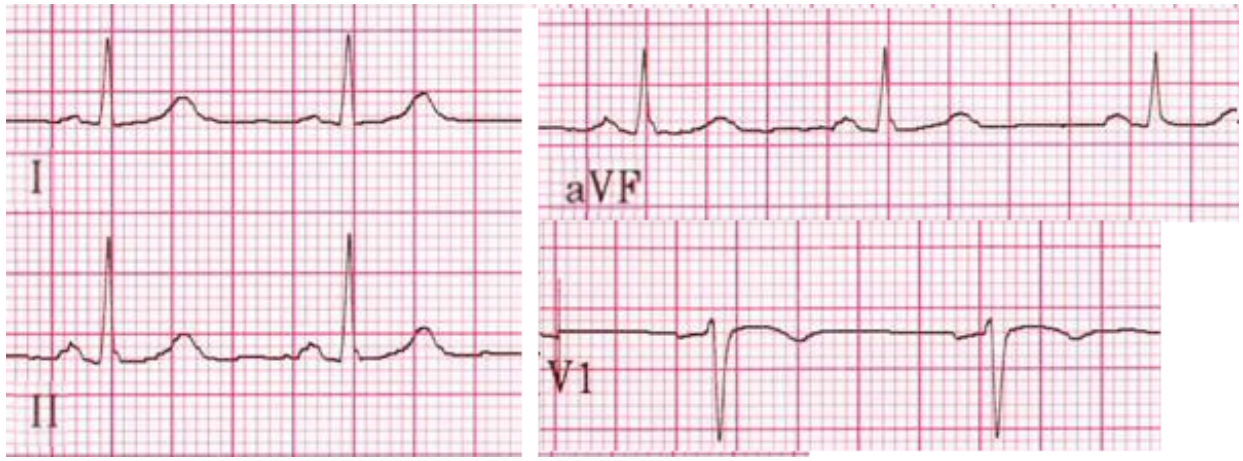
Hartas?



Hartas?

5 P top morfologie

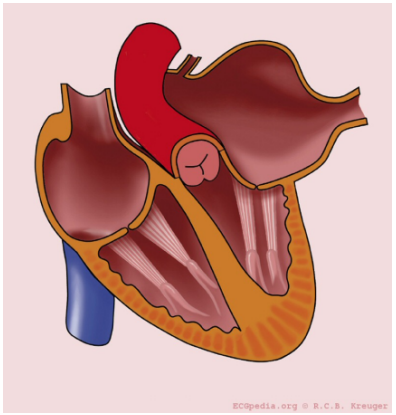
- De maximale hoogte van de p top is 2,5 mm in II en / of III
- De p top is positief in II en AVF, en bifasisch in V1
- De breedte van de p top is normaal korter dan 0.12 seconde

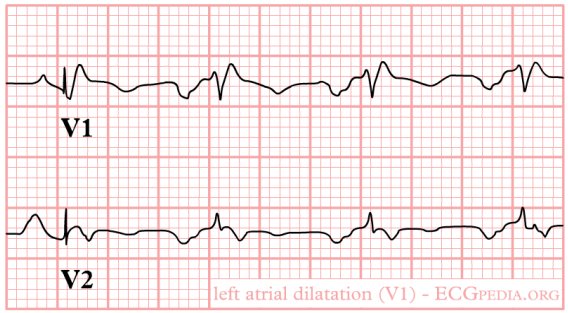


Linkeratriumdilatatie

Terminaal deel in V1 > 1mm2

en/of P >0,12 sec in I en/of II

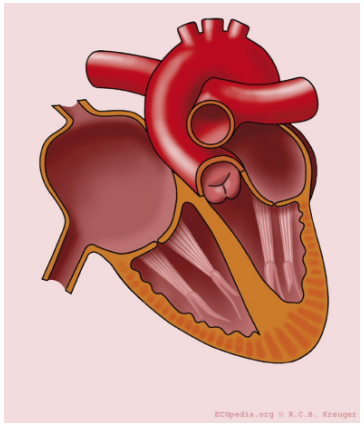


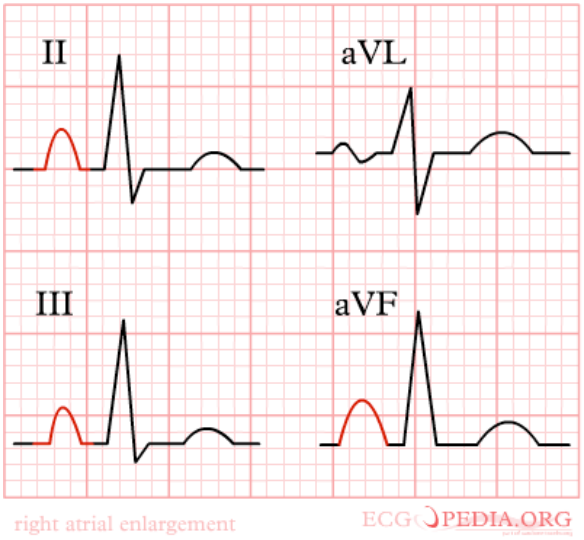


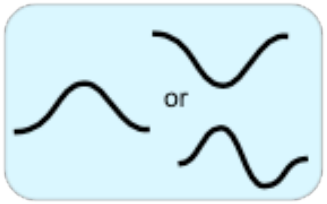
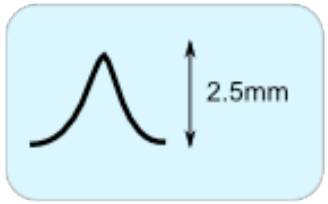
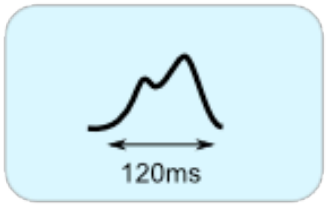
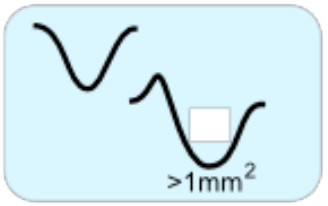
Rechteratriumdilatatie

P >2,5 mm in II en/of III en/of aVF

en/of P >1,5 mm in V1





Condition	P Wave Morphology	
	Lead II	Lead V1
Normal Sinus Rhythm		
Right atrial enlargement (= **P P**ulmonale)		
Left Atrial Enlargement (=**P M**itrale)		

6 QRS morfologie

- pathologische Q golven?
- LVH / RVH?
- microvoltages?
- geleidingsproblemen?
- R top progressie normaal?

6 QRS morfologie

- **pathologische Q golven?**
- LVH / RVH?
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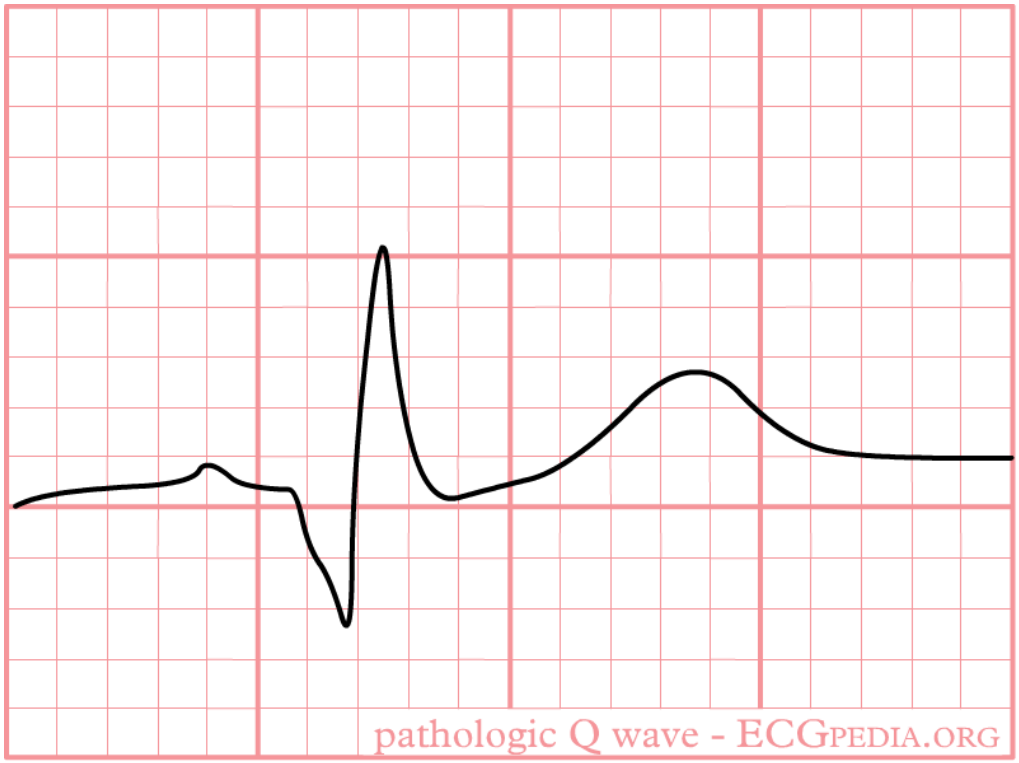
- R top progressie normaal?



Pathologische Q golf:

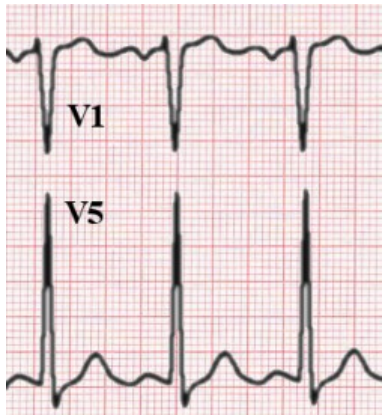
- > 30ms breed
- In 2 opvolgende afleidingen en > 1mm diep

Is een teken van oud infarct

Niet indien alleen in III of AVR

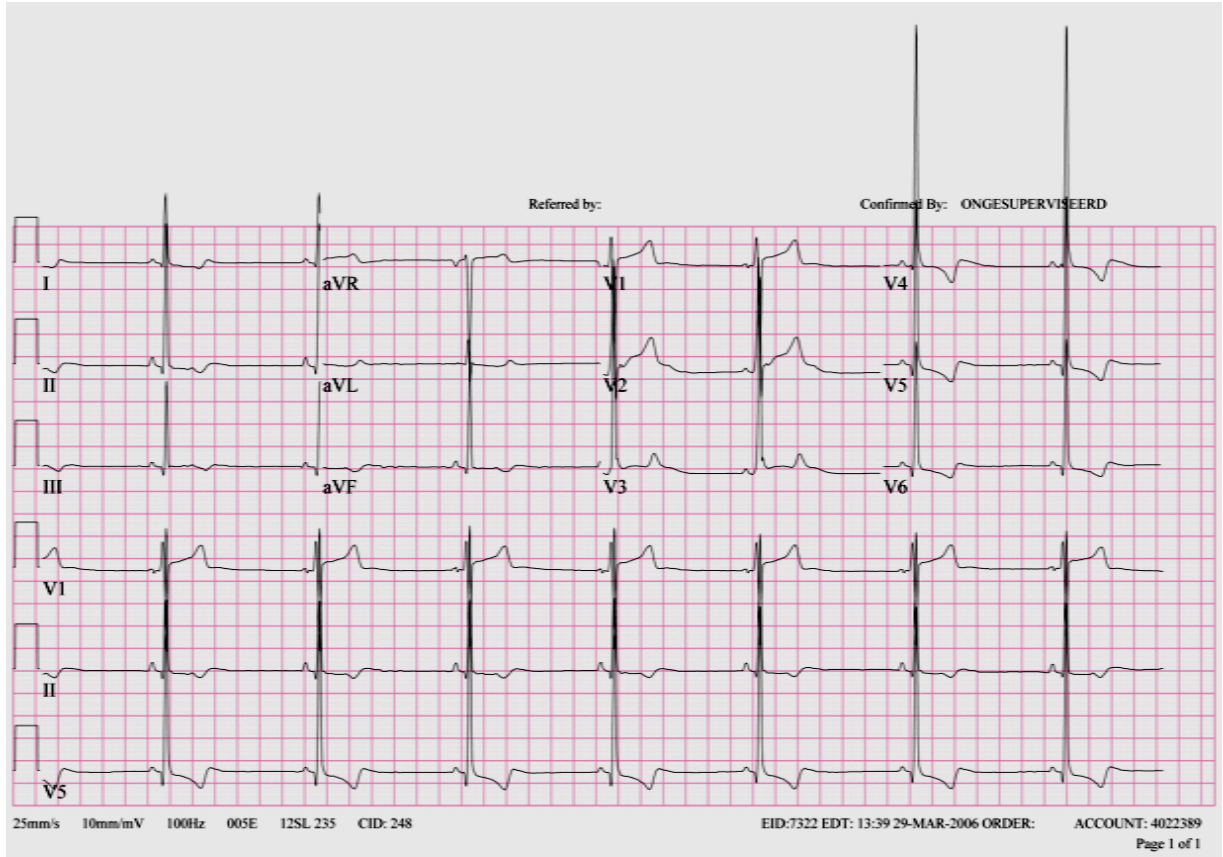
6 QRS morfologie

- pathologische Q golven?
- **LVH / RVH?**
- microvoltages?
- geleidingsproblemen?
- R top progressie normaal?



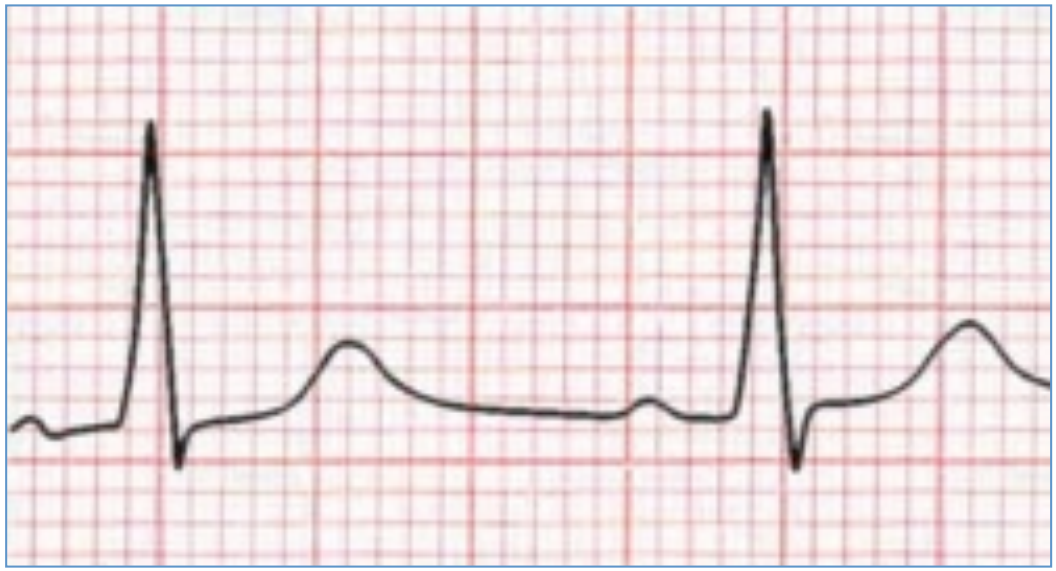
LVH:

- R in V5 of V6 + S in V1 > 35mm (Sokolow-Lyon criteria)
- Vaak strain patroon V5-V6



6 QRS morfologie

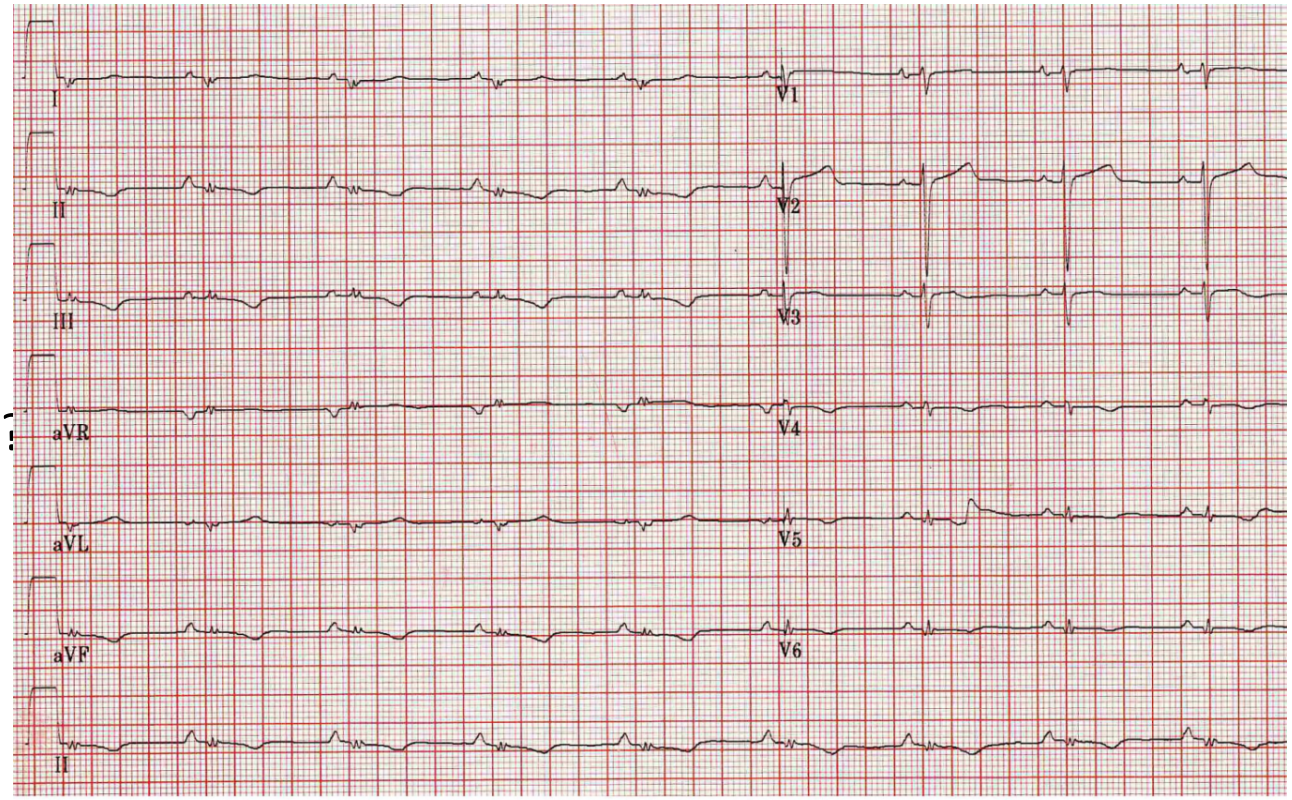
- pathologische Q golven?
- **LVH / RVH?**
- microvoltages?
- geleidingsproblemen?
- R top progressie normaal?



RVH:
R>S in V1

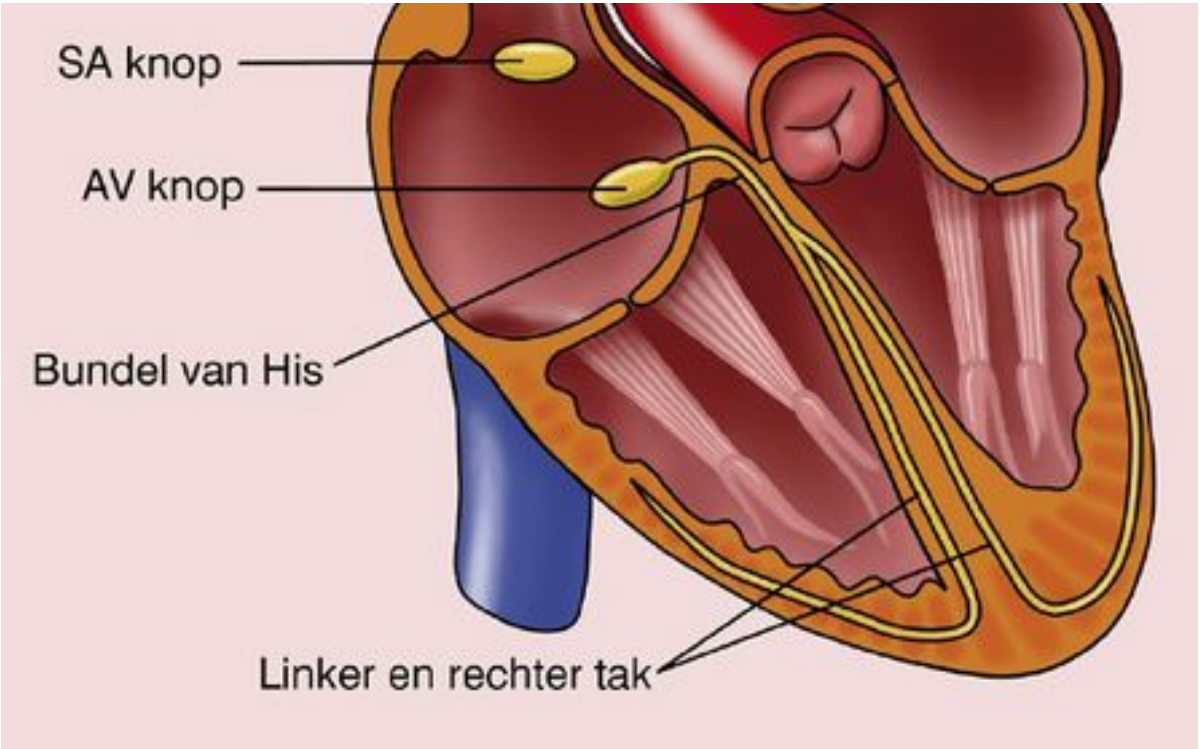
6 QRS morfologie

- pathologische Q golven?
- LVH / RVH?
- **microvoltages?**
- geleidingsproblemen?
- R top progressie normaal?



6 QRS morfologie

- pathologische Q golven?
- LVH / RVH?
- microvoltages?
- **geleidingsproblemen?**
  - **QRS > 0.12 seconde**
- R top progressie normaal?

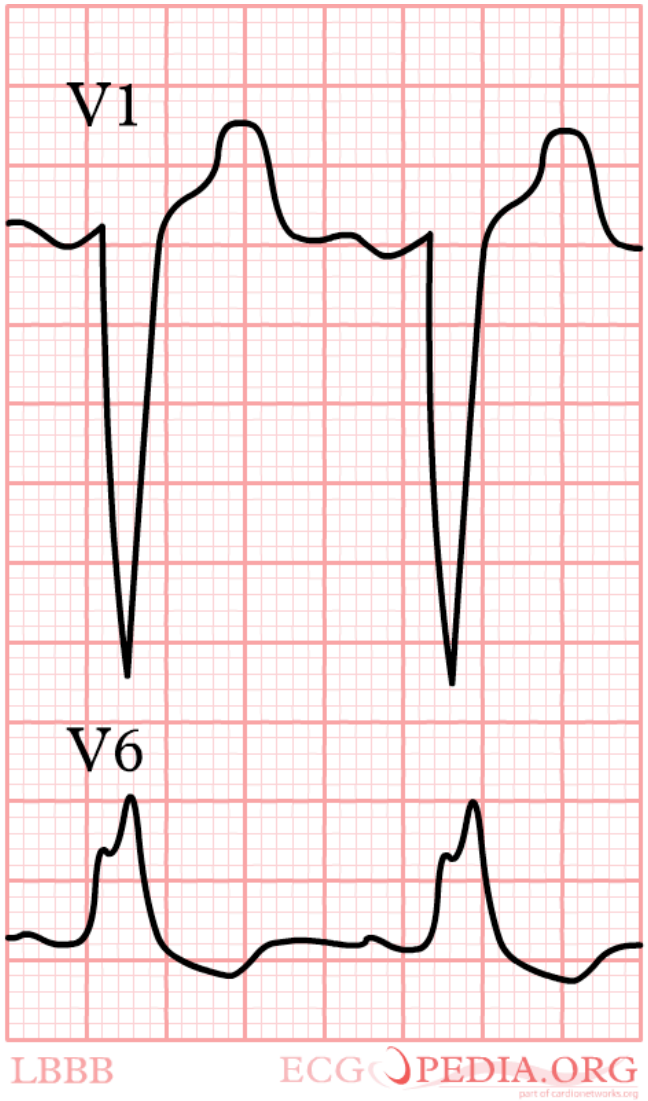


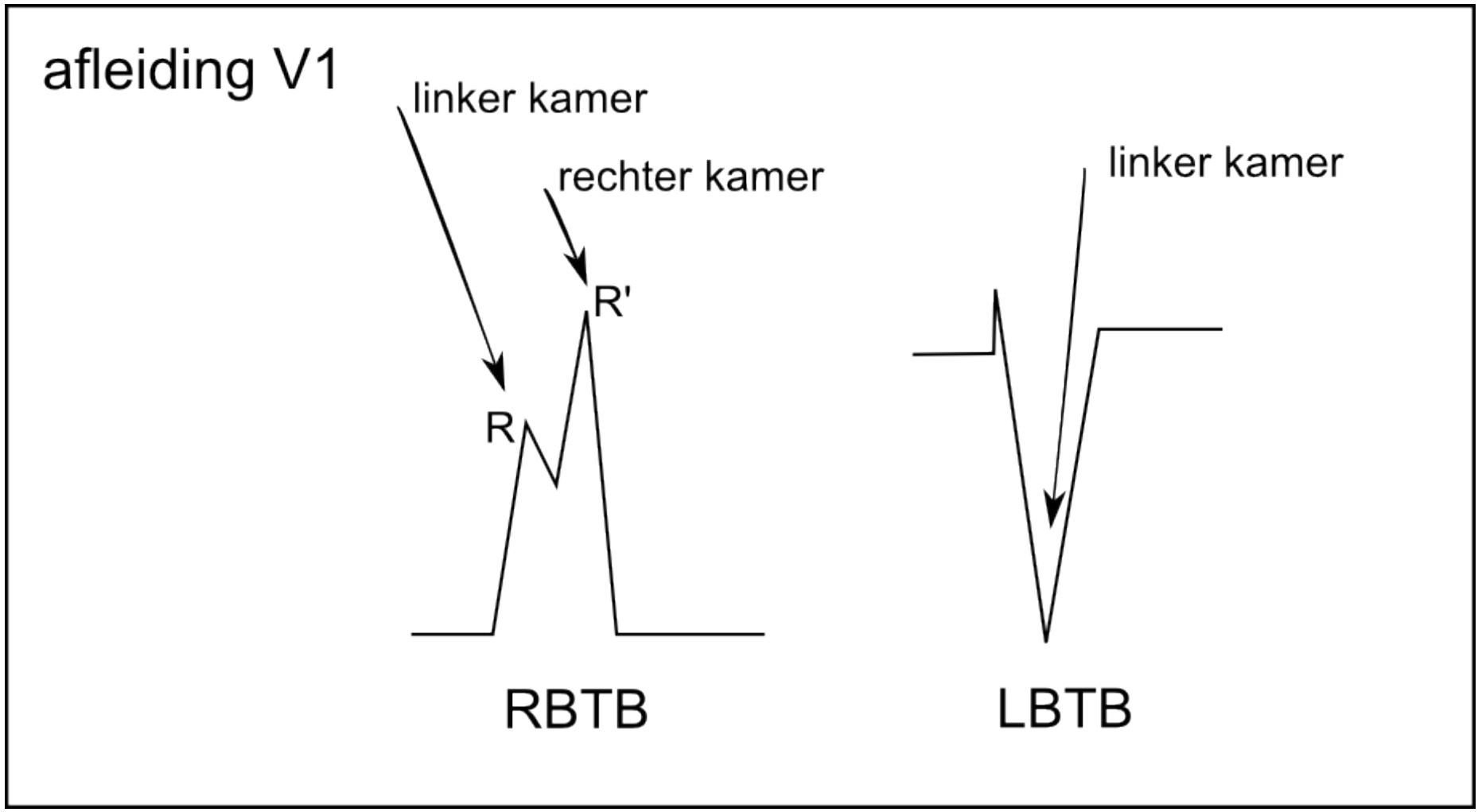
LBTB

QRS > 0.12 seconde

(r)S in V1

Brede R en geen q in I, V6



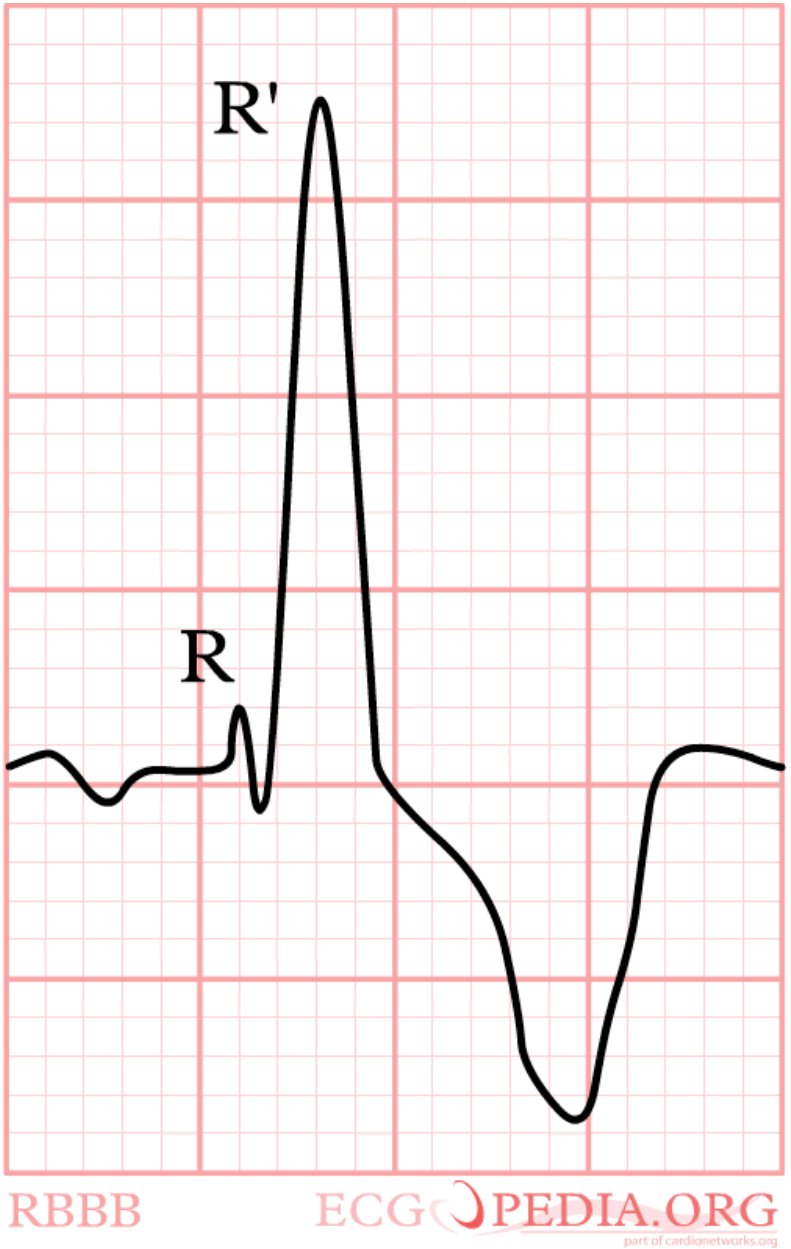

afleiding V1
linker kamer
rechter kamer
R'
R
RBTB
linker kamer
LBTB

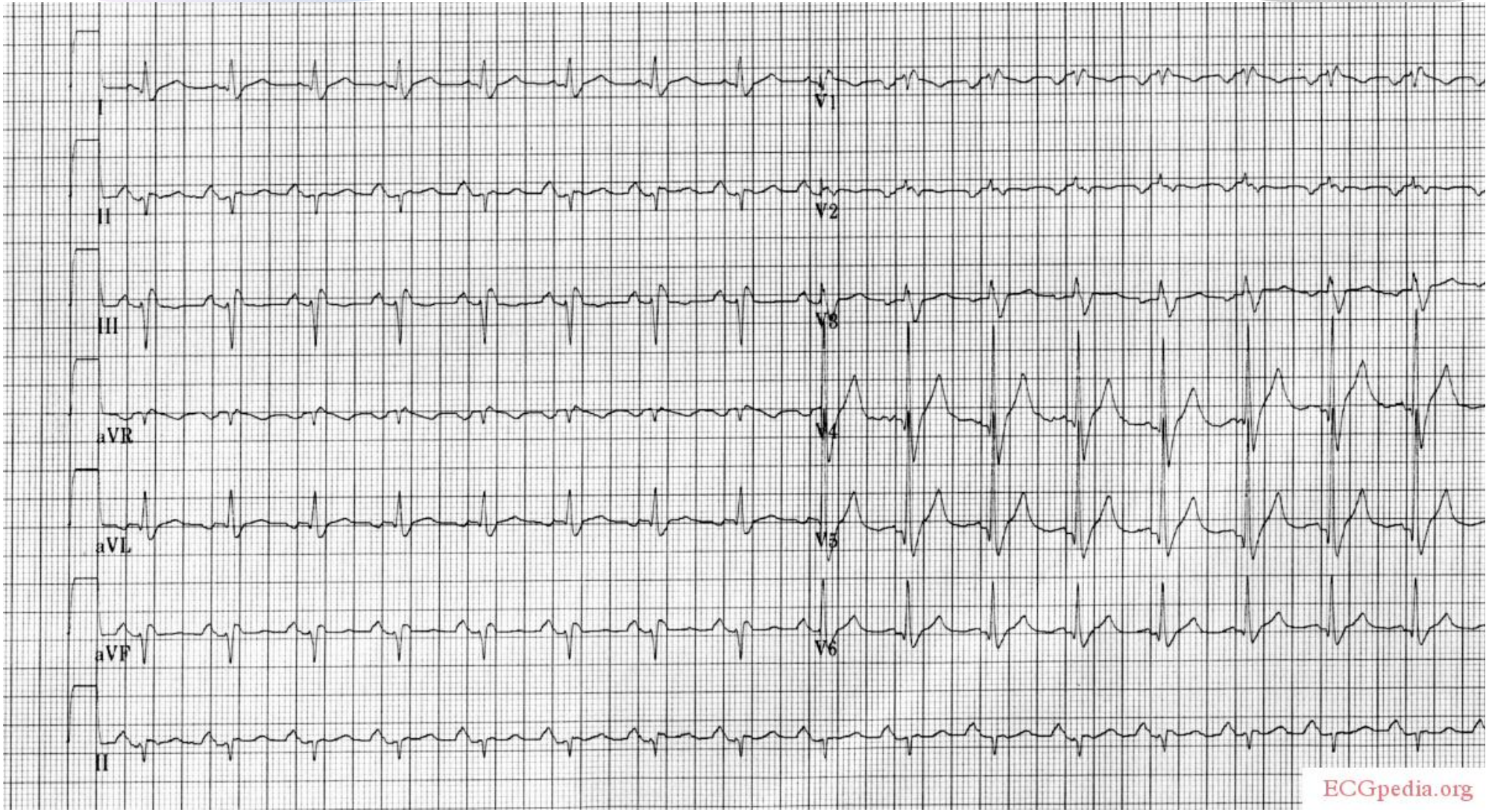
RBTB

QRS > 0.12 seconde

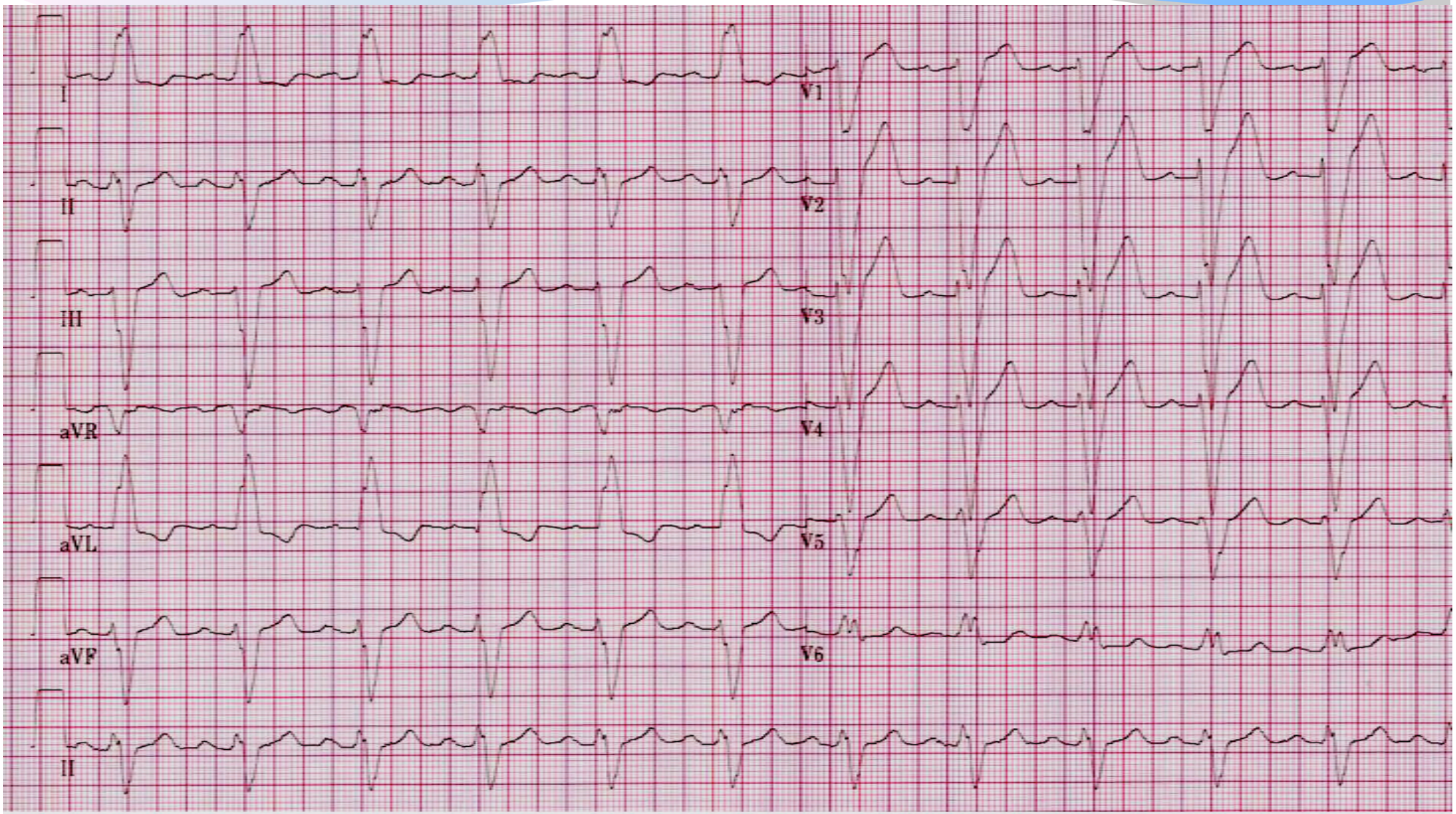
rsR’ in V1

R’ > R





RBTB of LBTB?


I
II
III
aVR
aVL
aVF
II
V1
V2
V3
V4
V5
V6
Courtesy of R.W. Koster, MD, PhD
AMC, The Netherlands
ECGPEDIA.ORG

RBTB of LBTB?

6 QRS morfologie

- pathologische Q golven?
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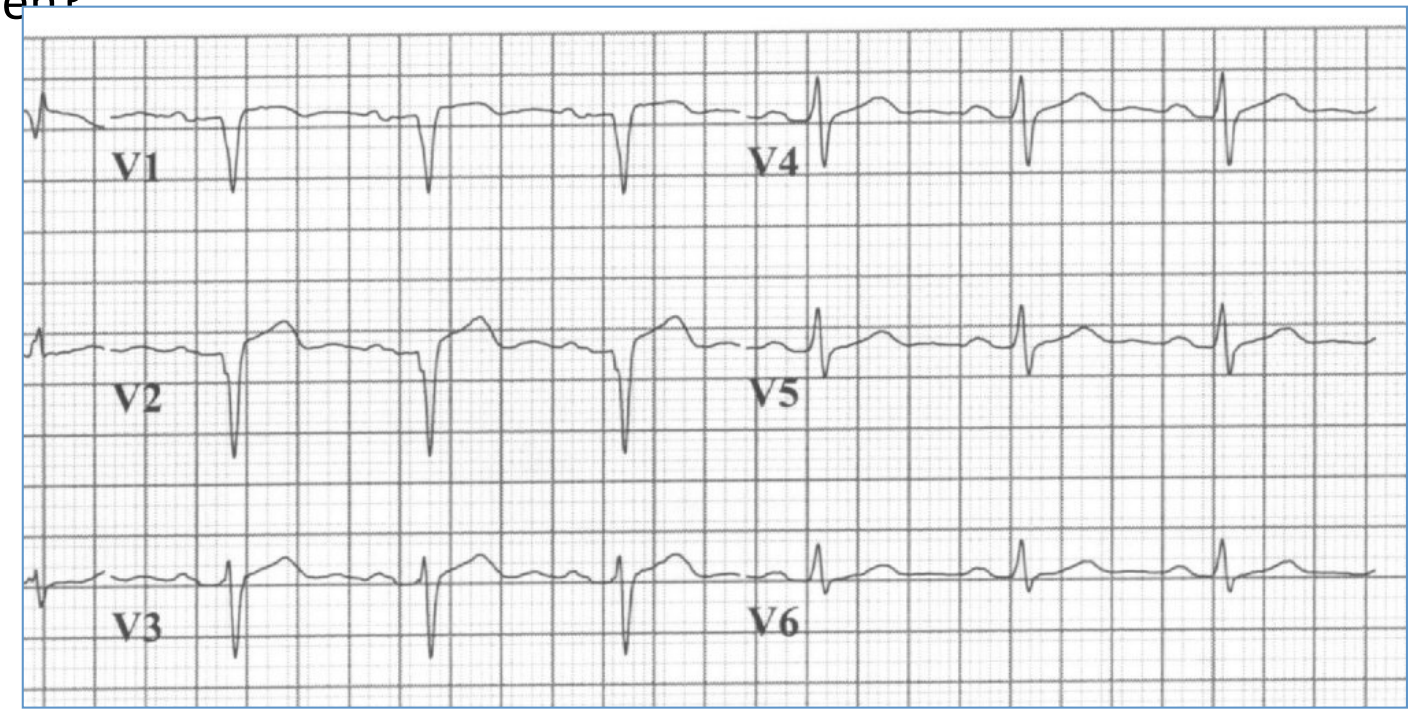
- microvoltages?
- geleidingsproblemen?
- **R top progressie normaal?**



7 ST morfologie

ST elevatie

Ischemie

Pericarditis

Aneurysma cordis

Normale variant

ST depressie

Reciproke bij ischemie

LVH

Digitalis

Hypokaliemie

Neurologisch

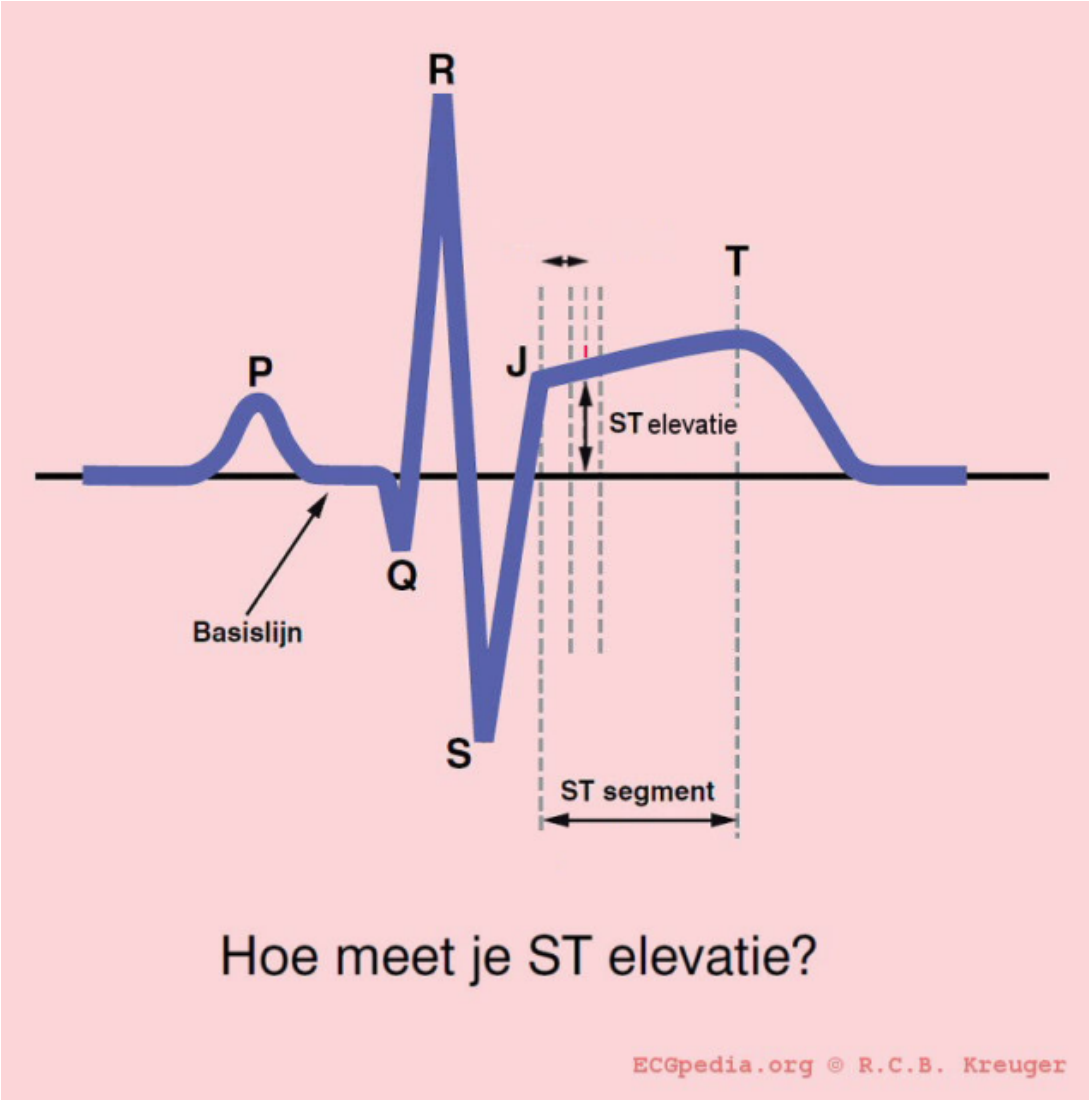
T top verandering

Ischemie

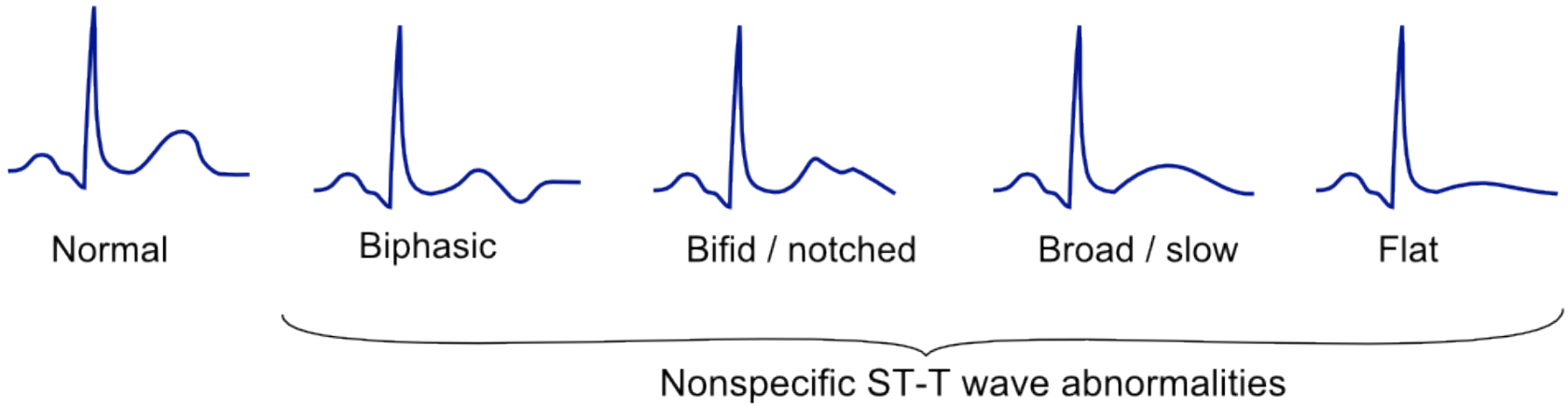
Pericarditis

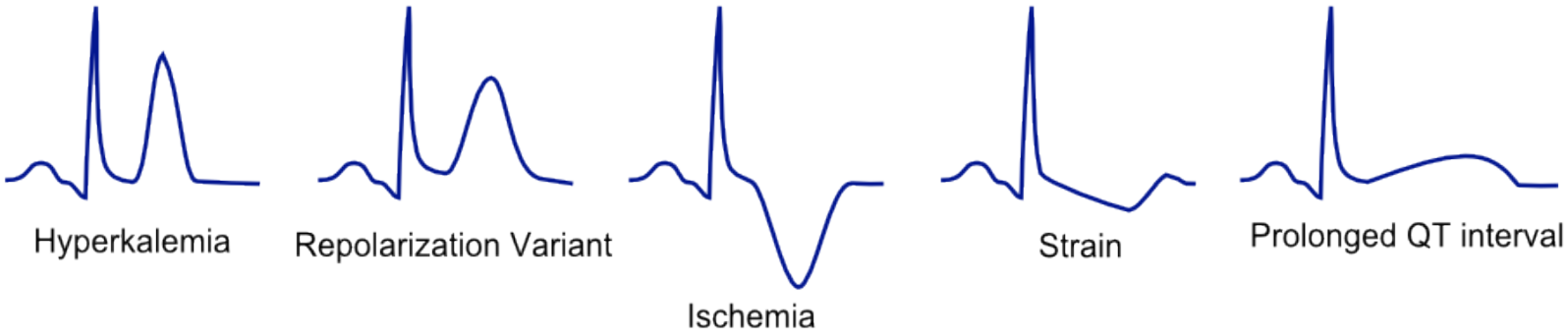
Myocarditis

LVH / RVH



T wave morphology





7+1 Vergelijken met oud ECG

- Nieuwe LBTB?
- Asdraai?
- Nieuwe pathologische Q?
- Afname R top hoogte?

7+2 Conclusie

Voorbeelden:

- "Sinustachycardie met ST elevatie over de voorwand, passend bij een acuut voorwandinfarct"
- "Supraventriculaire tachycardie van 200/min op basis van een AV nodale re-entry"
- "Oud onderwandinfarct met nu een acuut lateraal myocard-infarct met QRS verbreding ten opzichte van het ECG van 14 augustus vorig jaar"
- "Normaal ECG"

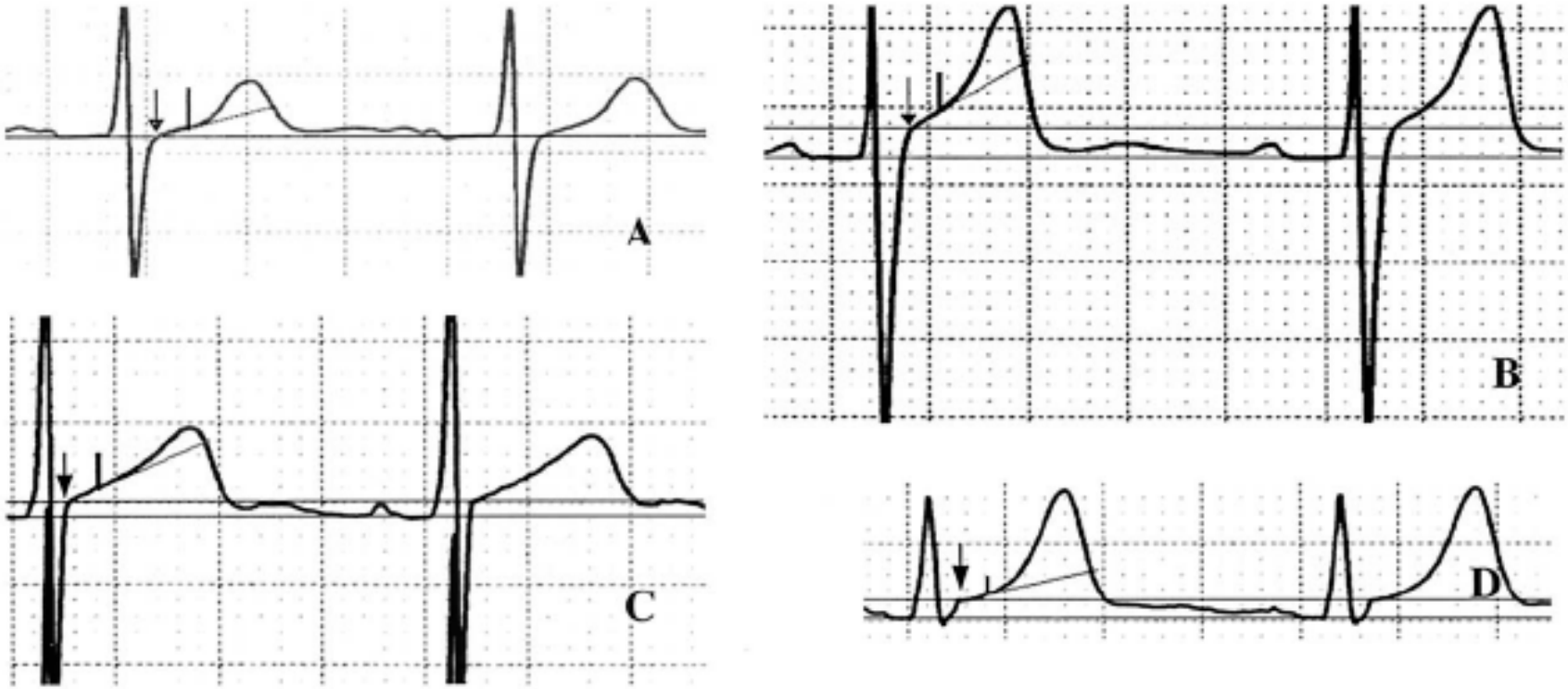
Ischemie

Uitingen ischemie op het ECG

- ST elevatie
- ST depressie
- T top inversie
- QRS verbreding
- Asdraai
- R top afname
- Q vorming
- QTc verlenging

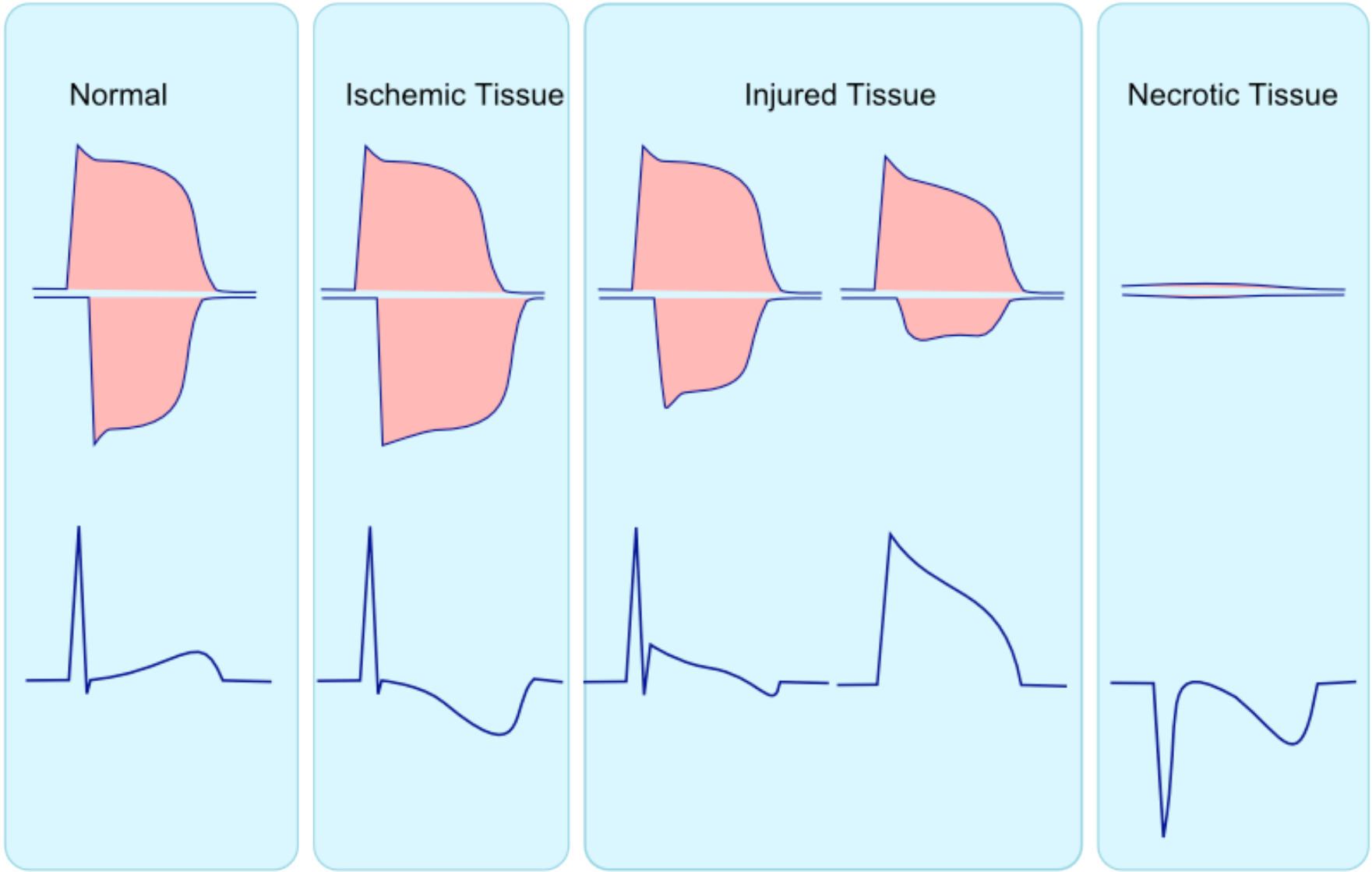
Normaal ST segment

≤ 1 mm ST shift onder/ boven iso-elektrische lijn
(2mm in V2-V3 bij jonge mannen)



Prevalence of Male and Female Patterns of Early Ventricular Repolarization in the Normal ECG of Males and Females From Childhood to Old Age

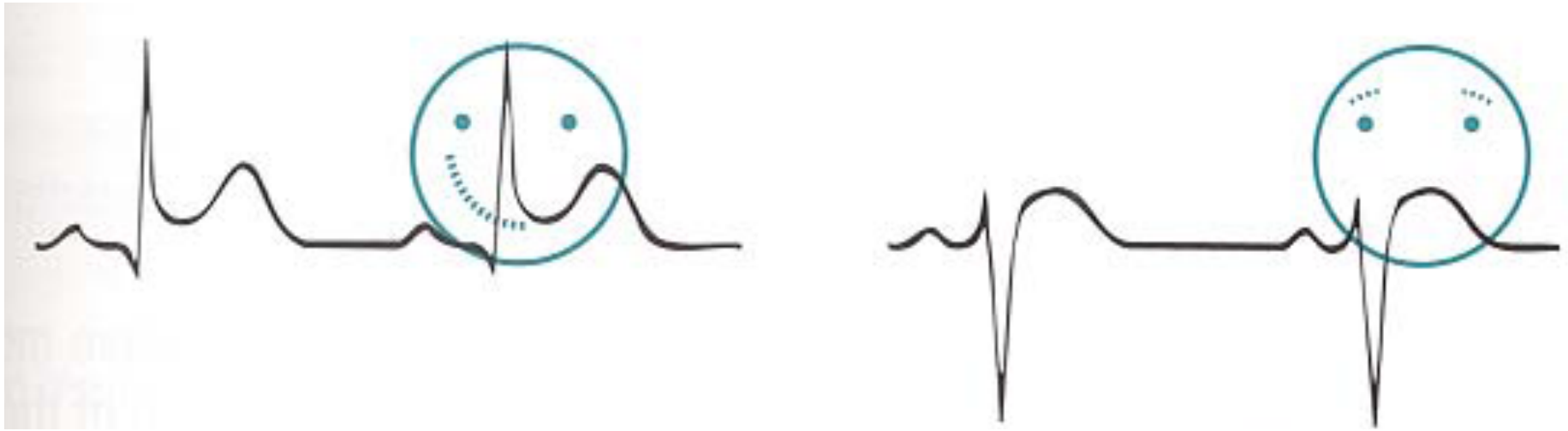
J ACC 2002;40:1870–6



Verschillende vormen van ST elevatie bij ischemie

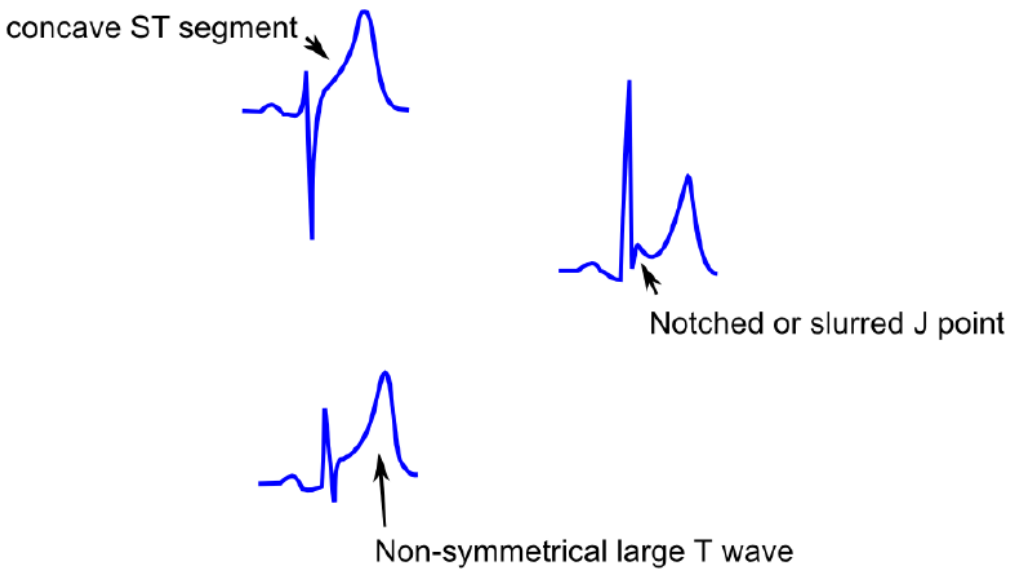
Vorm ST segment

concaaf of convex?

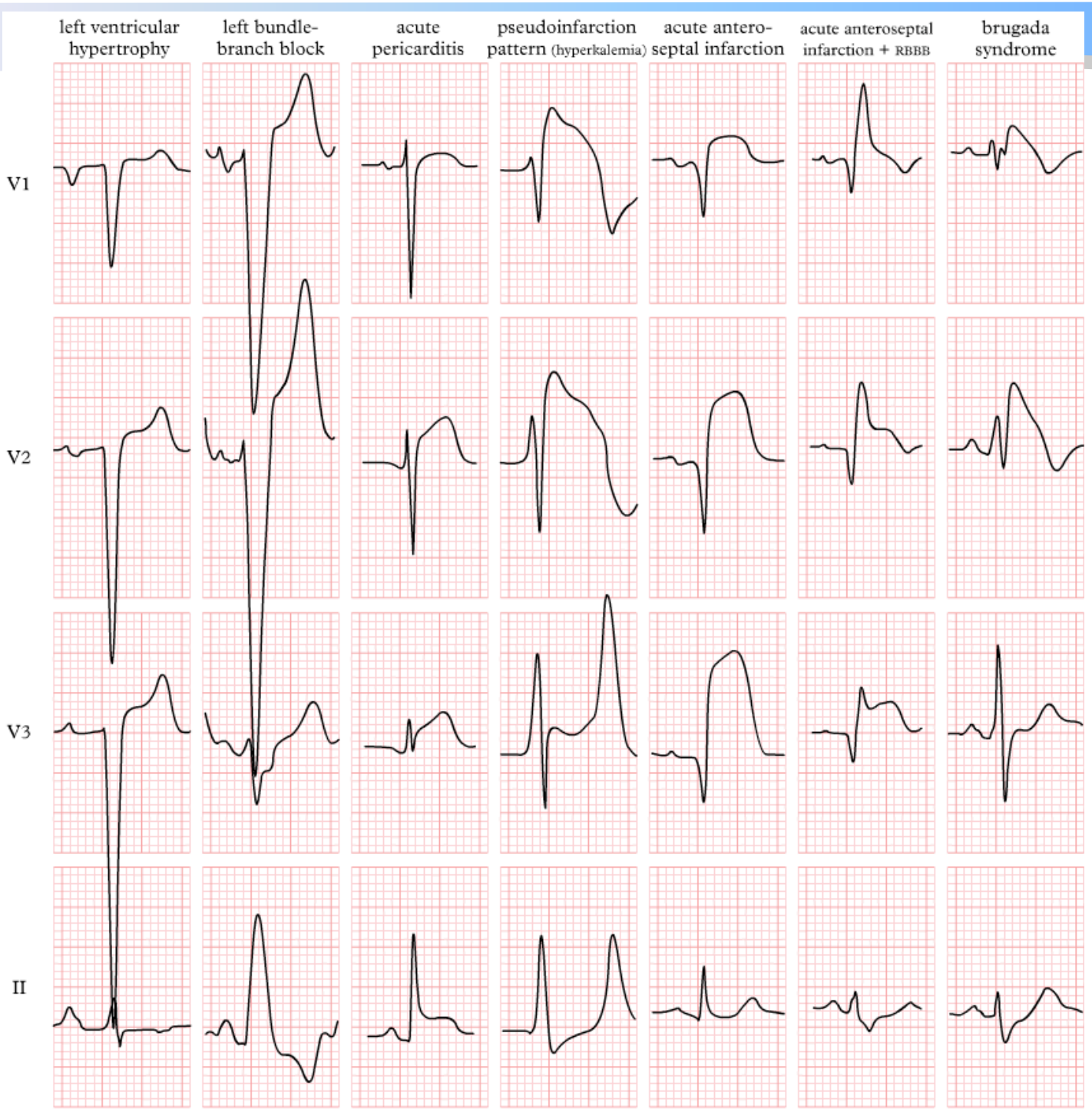


Vroege repolarisatie

- Zeer frequente bevinding
- “Smiley”configuratie
- Overigens gezonde asymptomatische jonge volwassene
- Vaak in voorwands afl.
- Notching J punt
- Geen Q
- Geen reciproke ST depressie

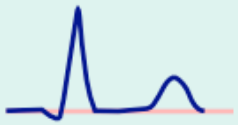
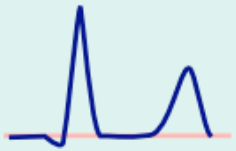
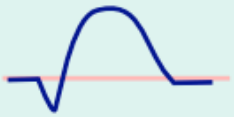
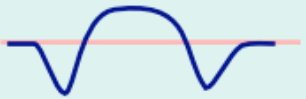
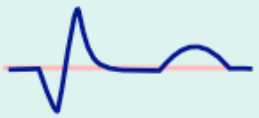



V1
V2
V3
V4
V5
V6
normal ST-segment elevation
early-repolarization pattern
normal variant
normal ST-segment elevation and normal variants
ECGPEDIA.ORG



ST-segment elevation in various conditions

Natuurlijk beloop ECG bij AMI

Normal		
Peaked T wave		minutes
Progression of ST segment elevation		minutes - hours
Loss of R wave, Q wave formation		hours - days
T wave inversion		days
T wave normalisation persisting Q wave		days - weeks - months

Infarct lokalisatie

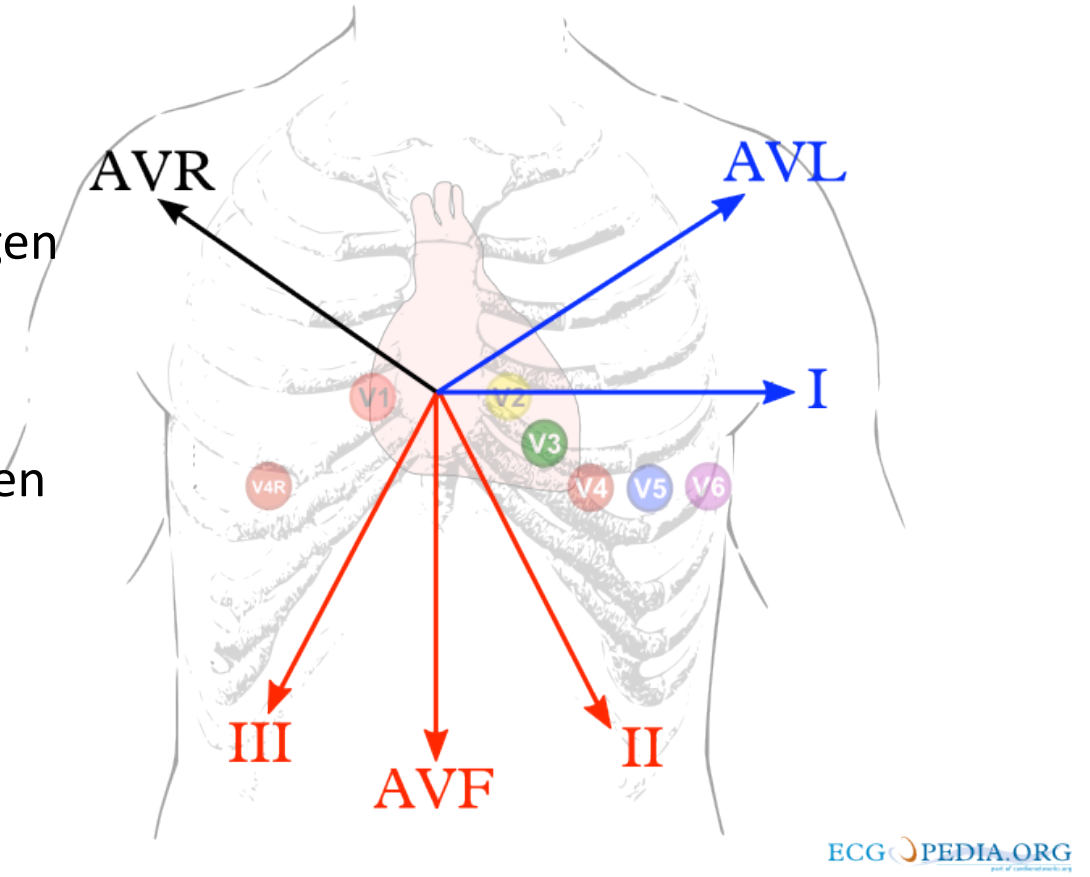
Significante ST elevatie

Extremiteiten:

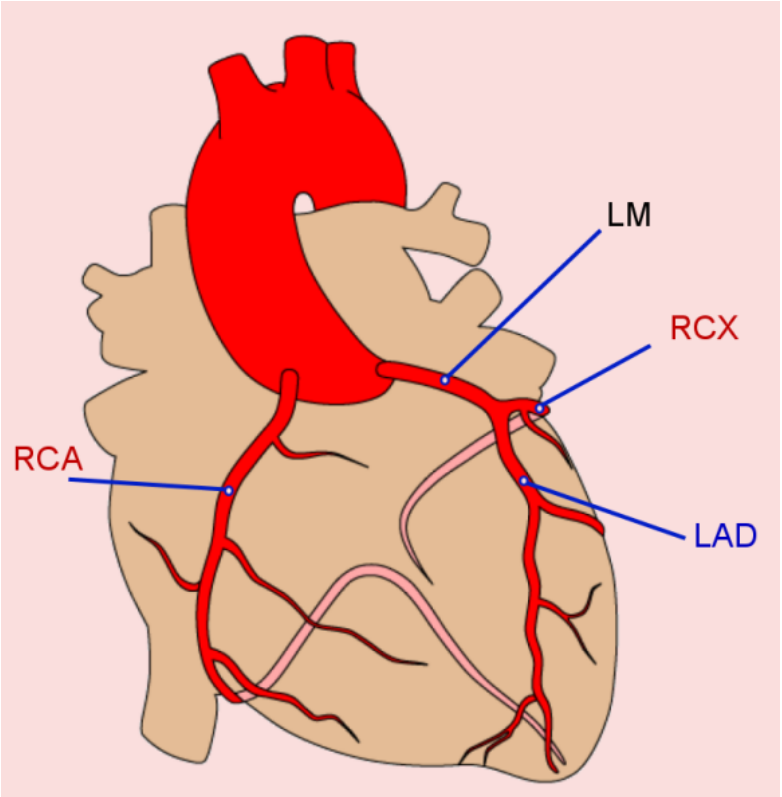
> 1 mm in 2 belendende afleidingen

Voorwand:

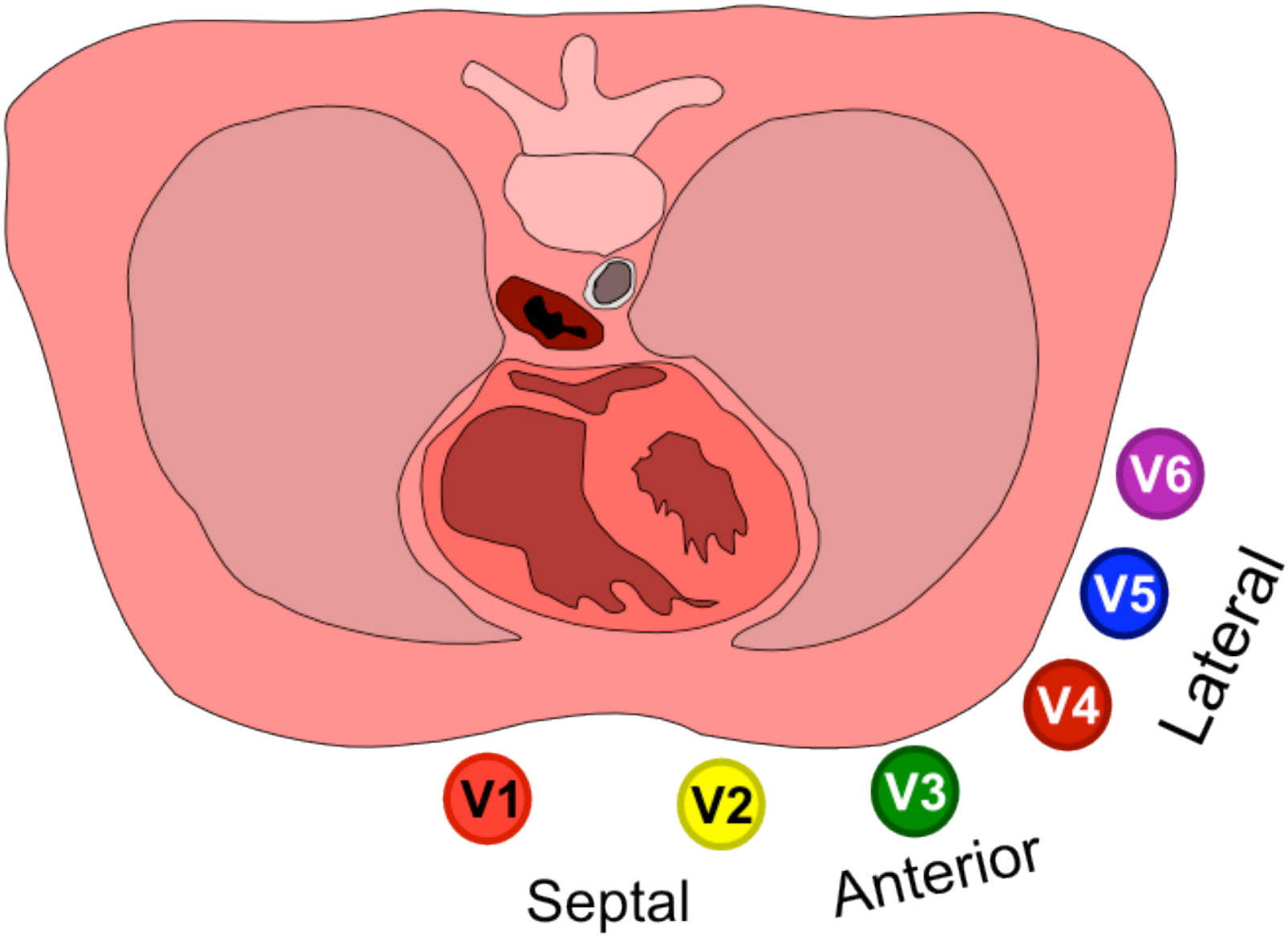
> 2 mm in 2 belendende afleidingen



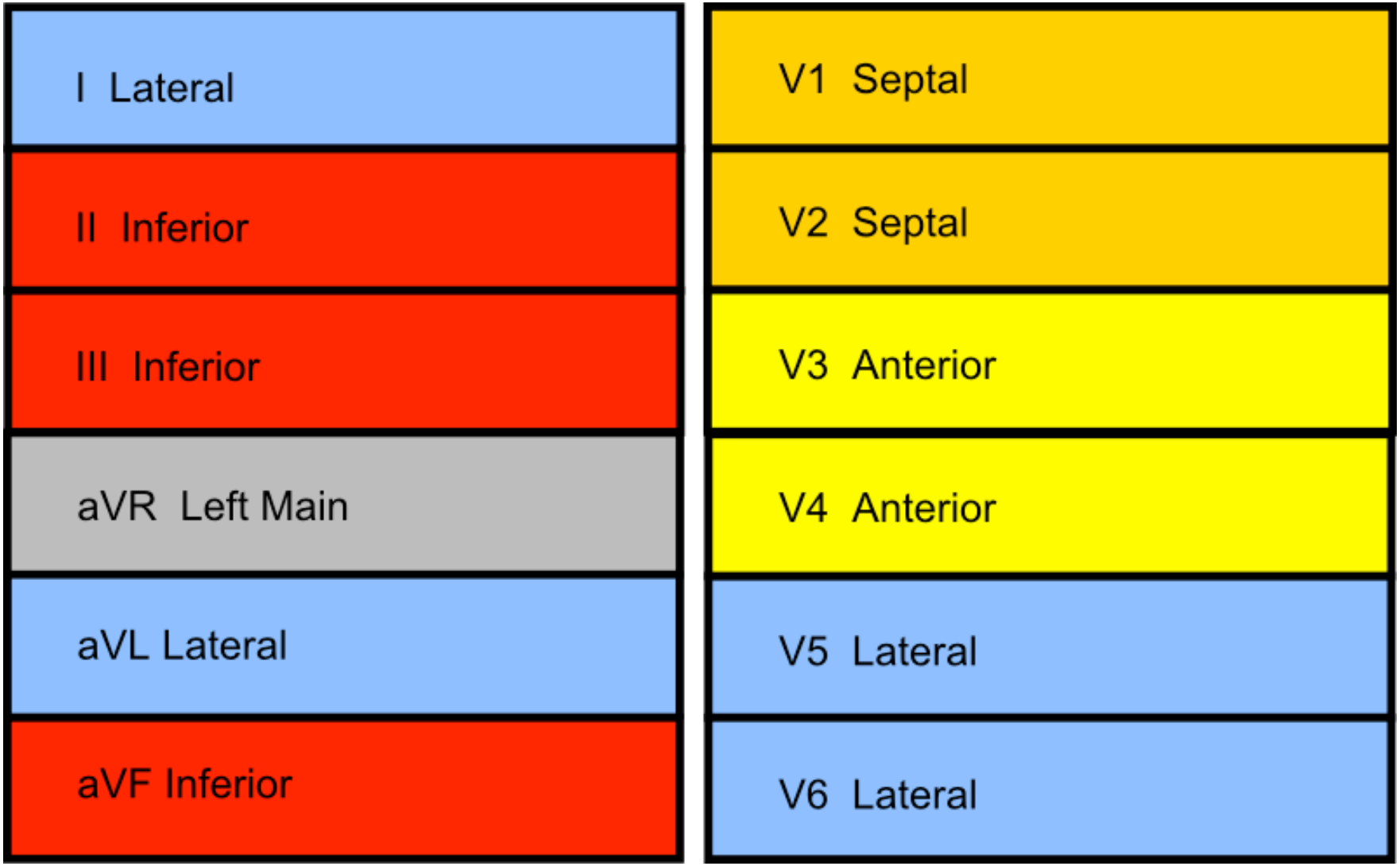
De ST elevatie wijst het infarctgebied aan



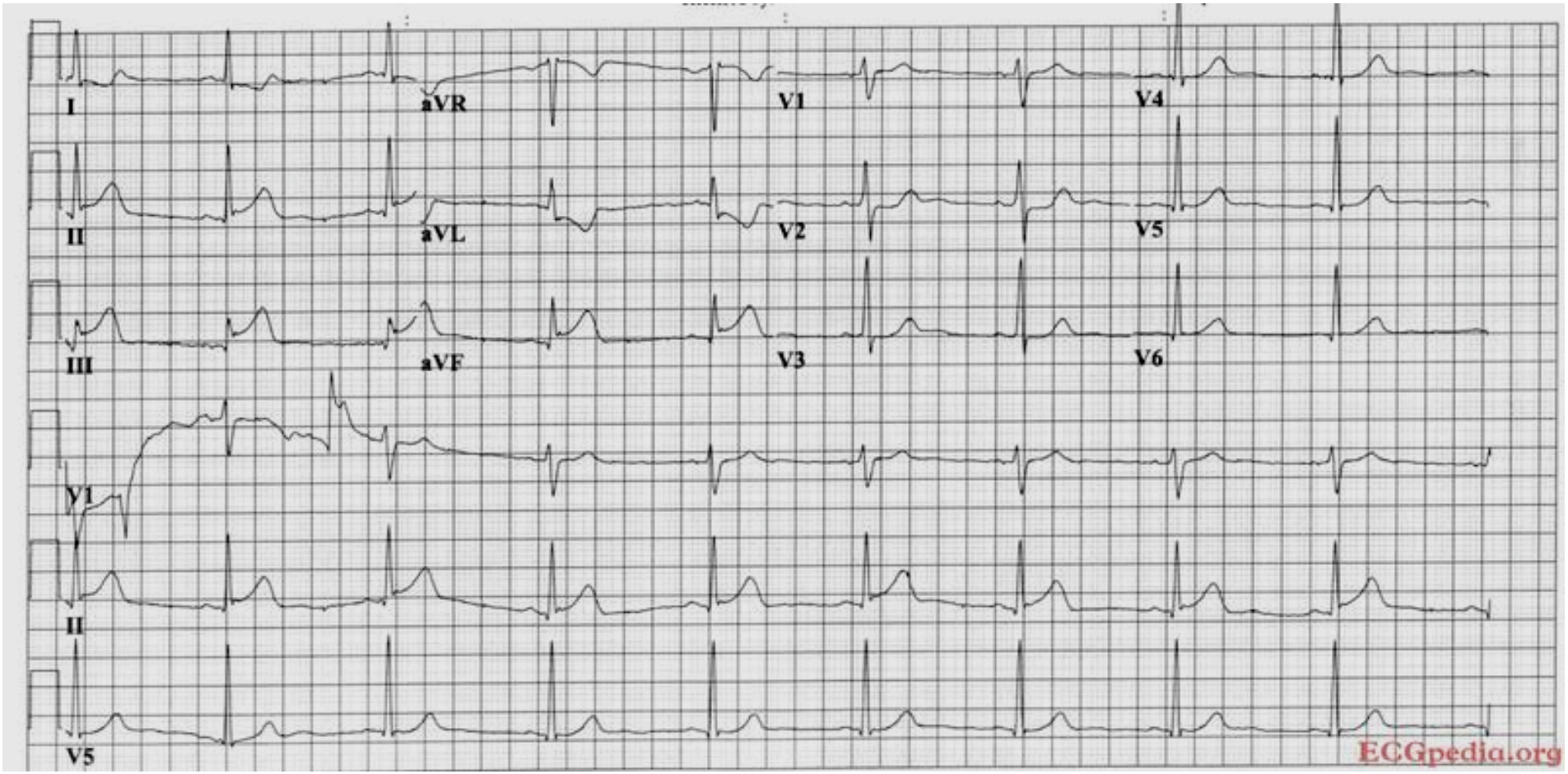
- **Voorwand**: V1-V4. Stroomgebied: LAD. *vaak tachycard.*
- **Onderwand**: II, III, AVF. Stroomgebied: 80% RCA (bradycard, elevatie III>II; depressie I en / of AVL), anders RCX (in 20%).
- **Rechter ventrikelfinfarct:** ST↑ in V4R. *vullen indien hypotensief*
- **Posterior**: hoge R en ST-depressie in V1-V3
- **Lateraal:** elevatie in I, AVL, V6. Stroomgebied: LAD (D-tak)
- **Hoofdstamocclusie:** diffuse ST depressie met ST elevatie in AVR. Z*eer hoog risico*


V6
V5
V4
Lateral
V1
V2
V3
Septal
Anterior

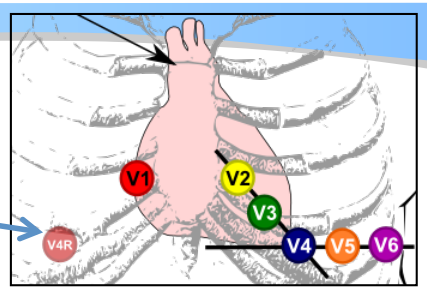
Zie ook ECG kaartje



Onderwand infarct



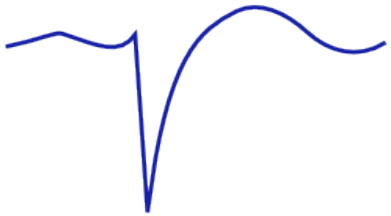
V4 rechts



A ST elevation ≥ 1 mm positive T wave

Proximal occlusion RCA

B No ST elevation positive T wave

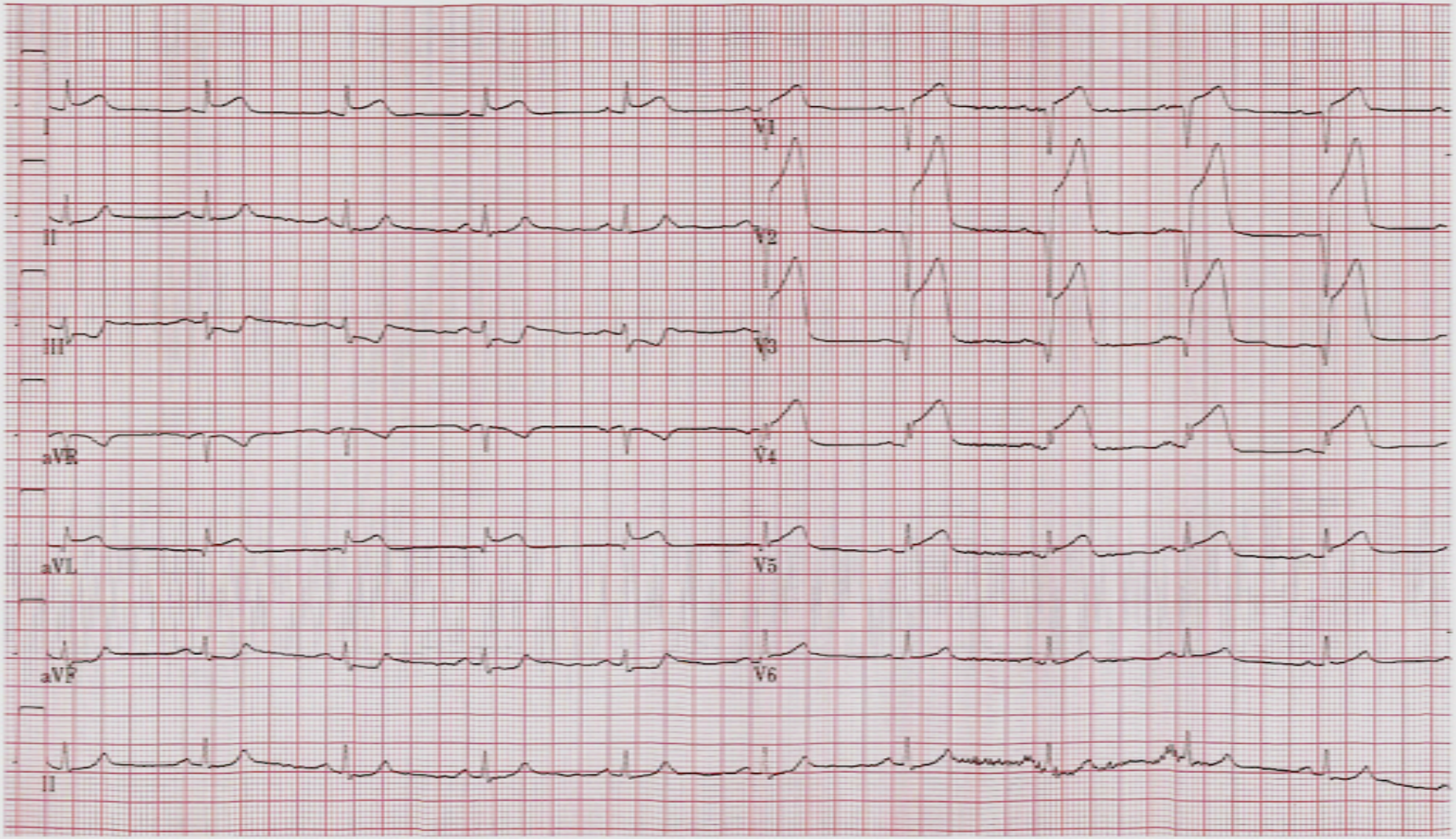


Distal occlusion RCA

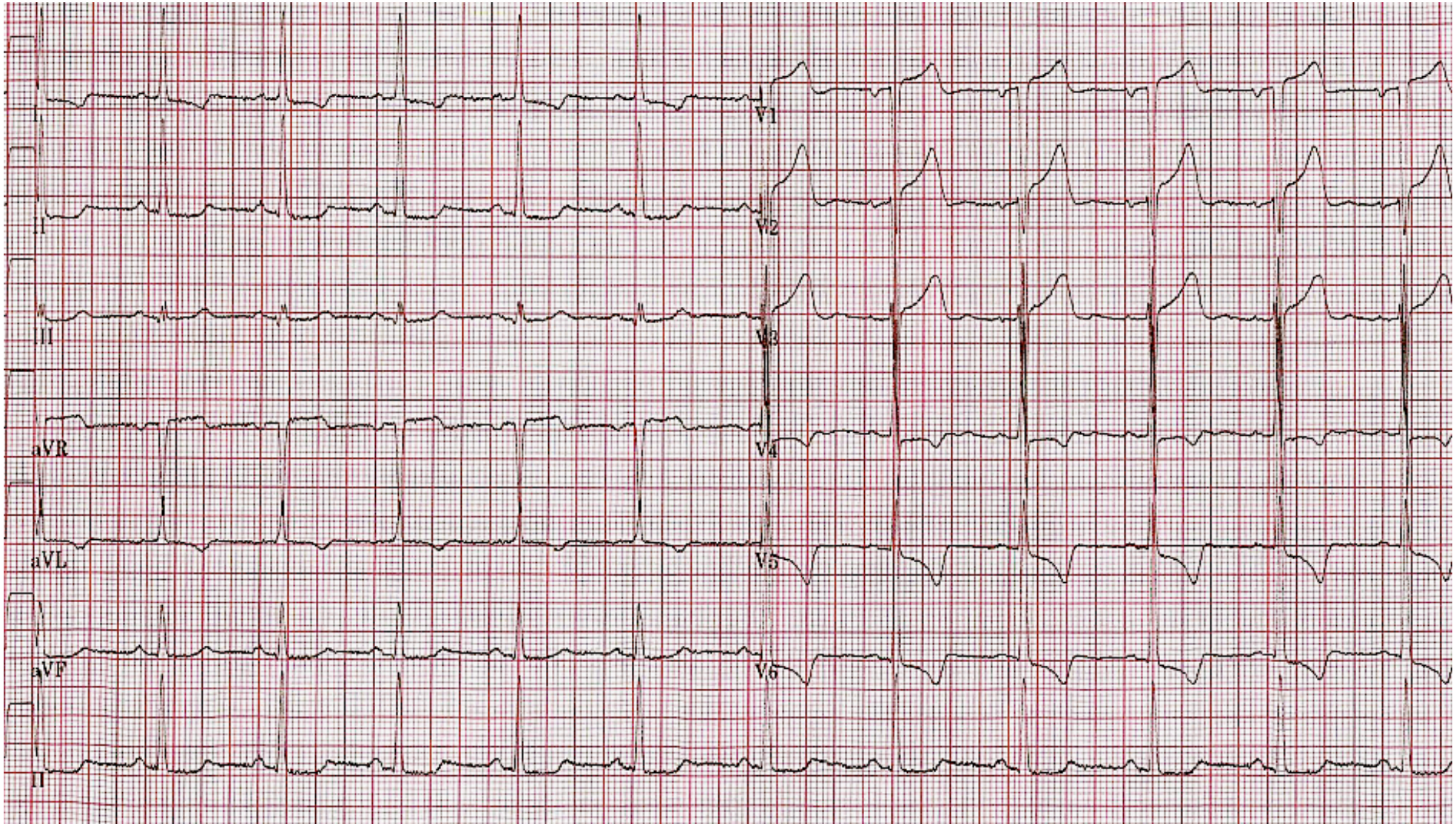
C Negative T wave

Occlusion RCX

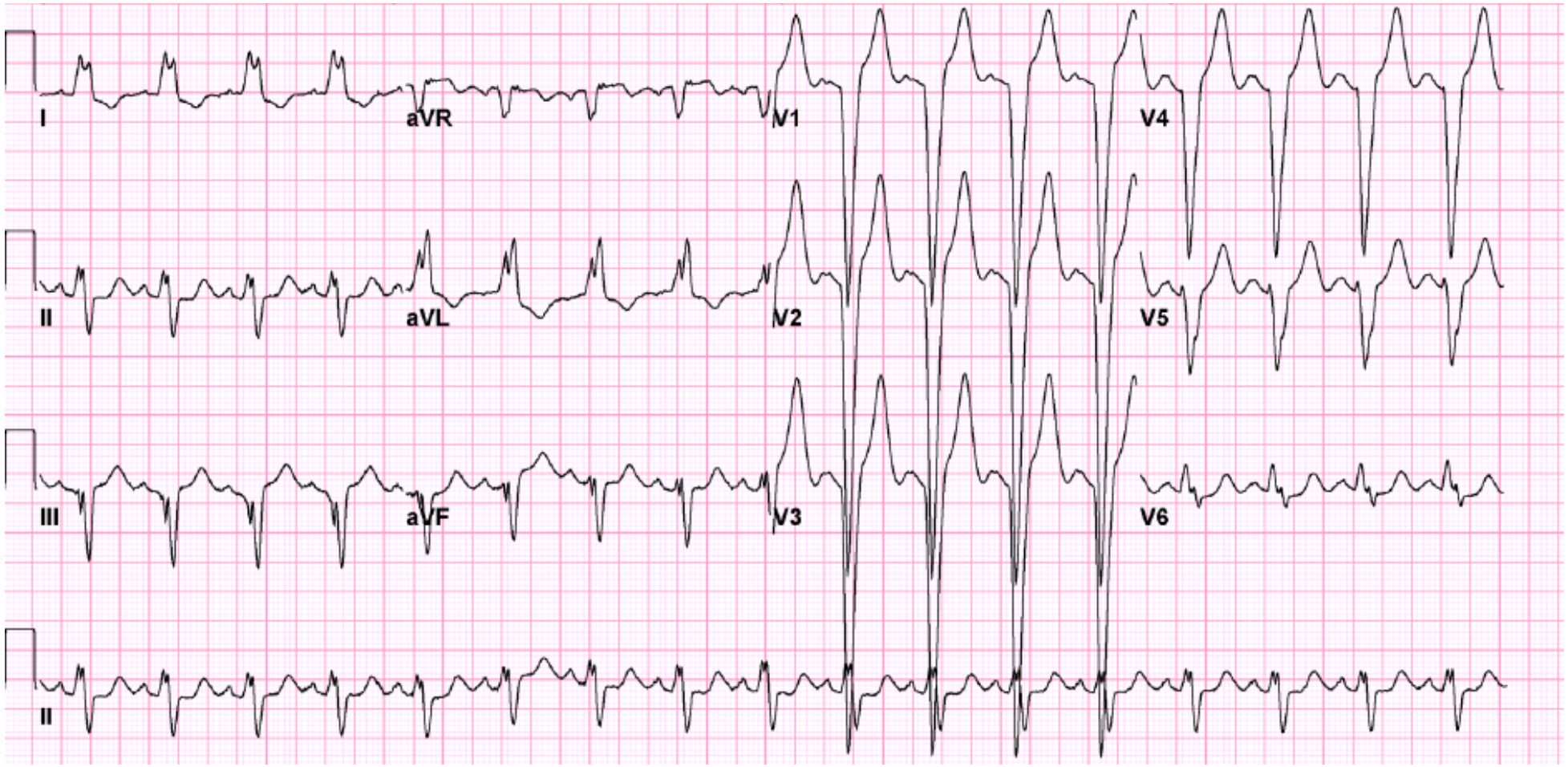
Anterolateraal infarct



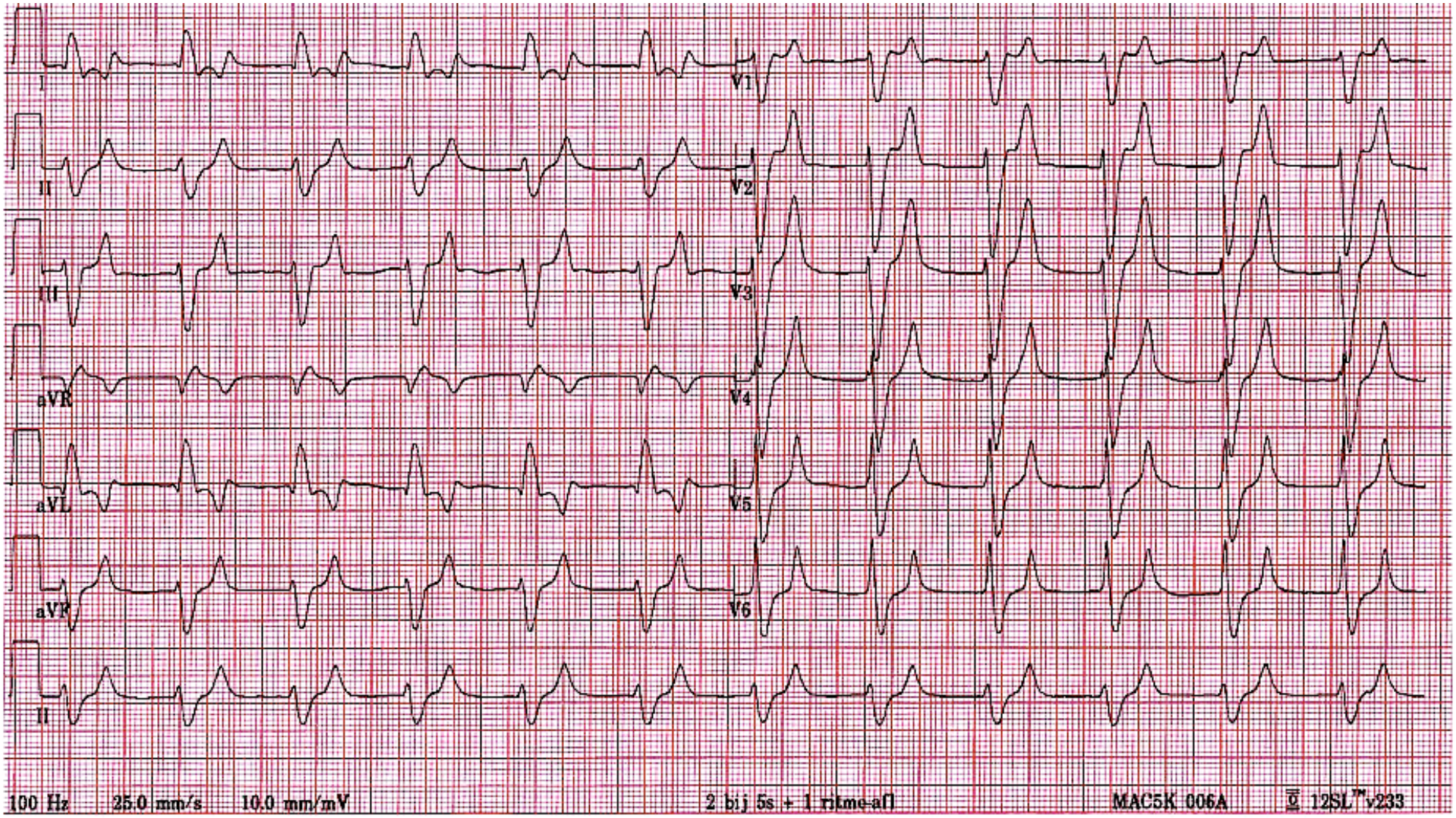
LVH



LBTB



Hyperkaliemie



Courtesy of W.G. de Voogt, MD, PhD, Amsterdam, The Netherlands

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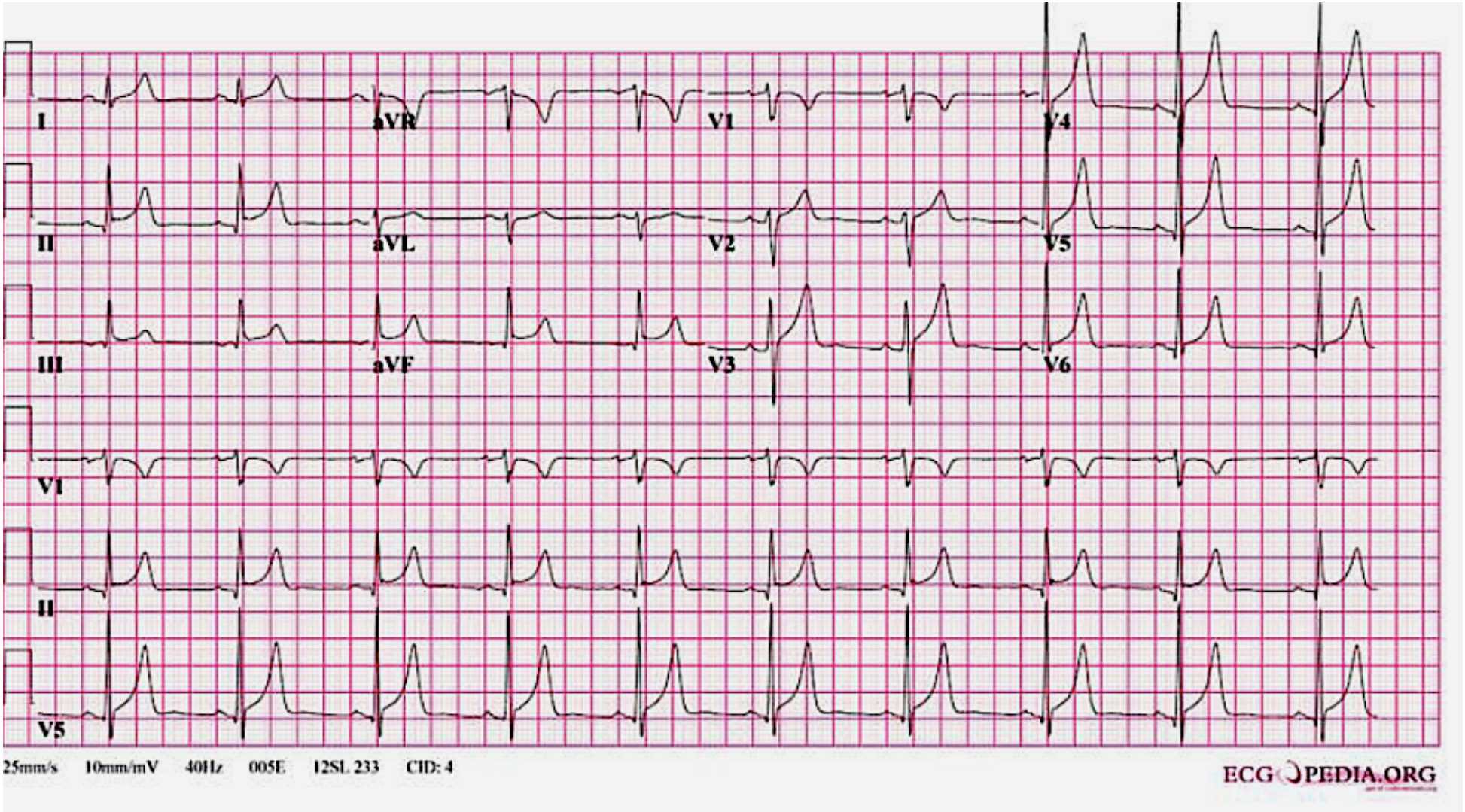
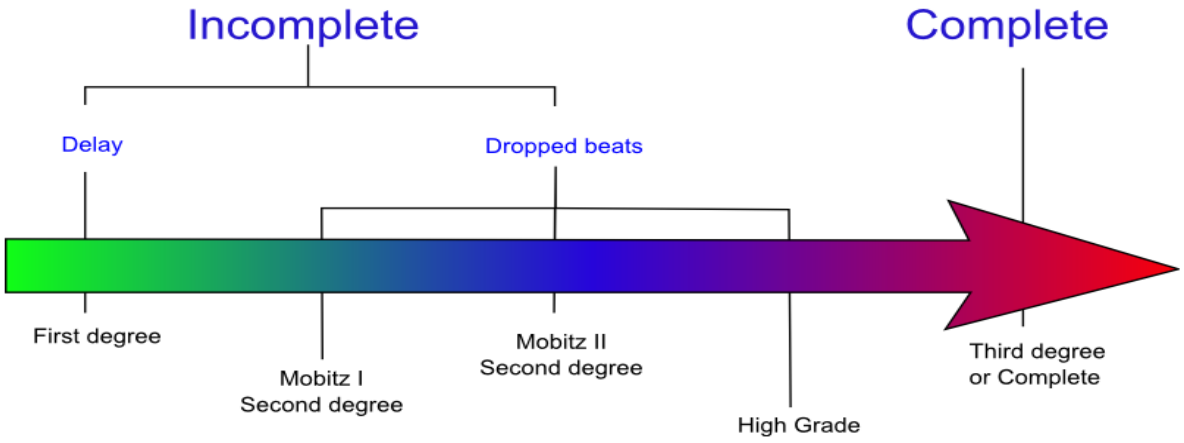
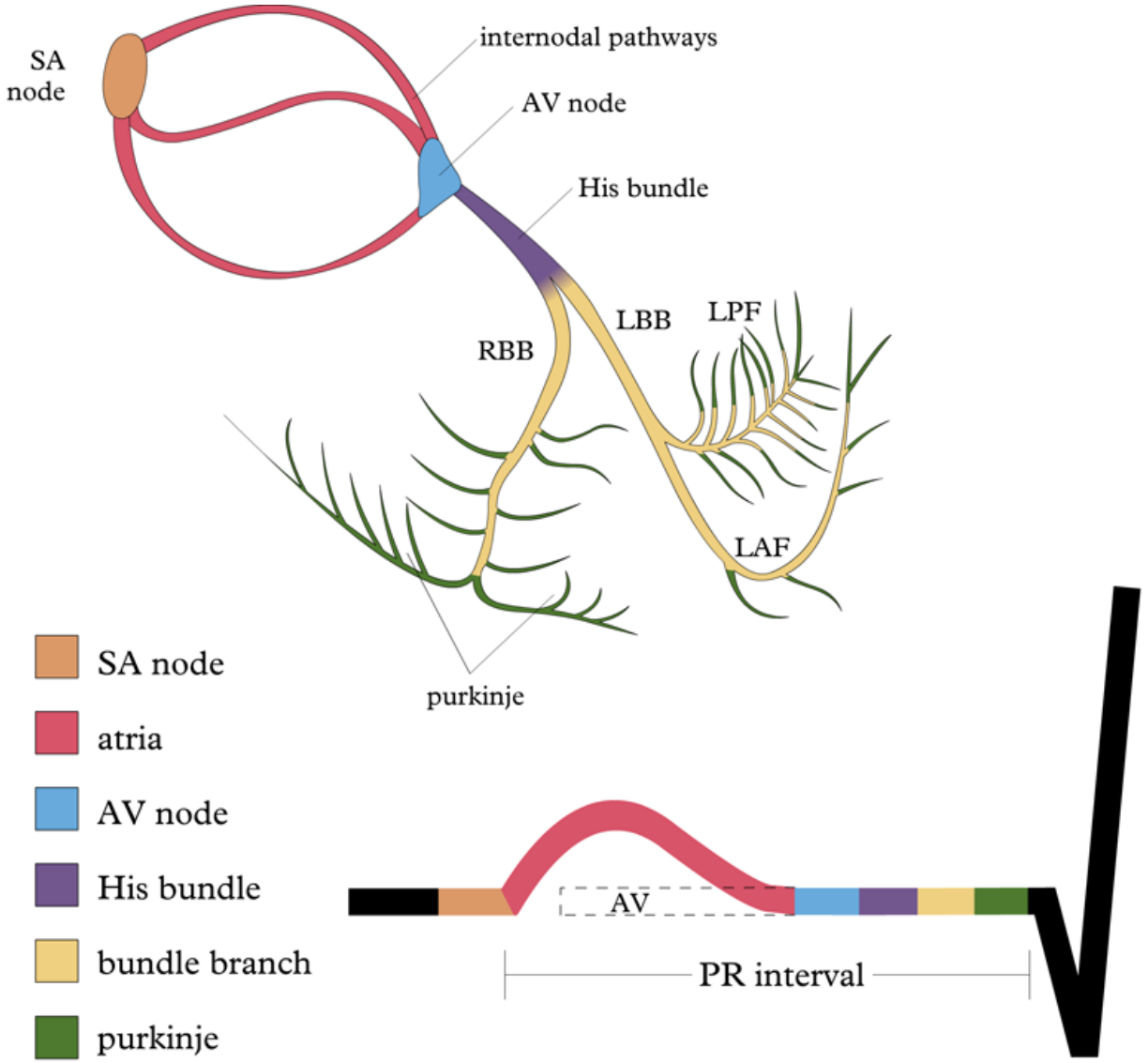
Pericarditis



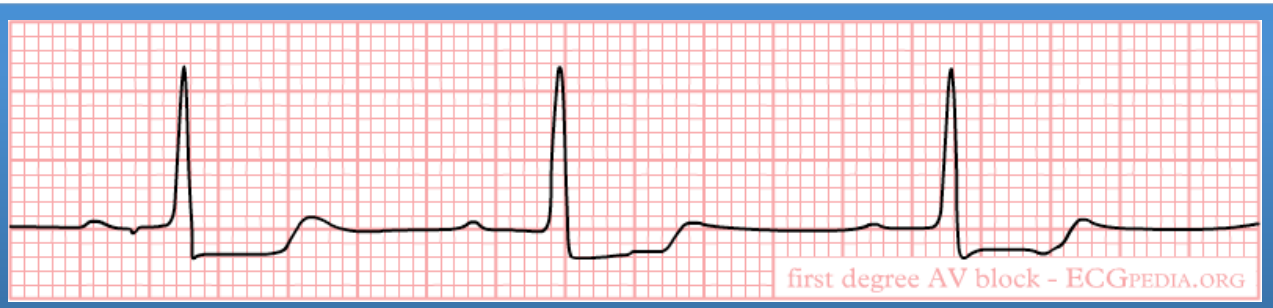
Geleidingsstoornissen

- 1e graads: verlengde PQ tijd > 200ms
- 2e graads
  - Type I (Wenkebach): PQ tijd neemt toe van complex tot complex tot er een complex uitvalt.
  - Type II (Mobitz): PQ tijd is normaal, maar niet alle p-toppen worden gevolgd (plotselinge uitval)
- Hooggradig AV blok
- 3e graads: totaal blok

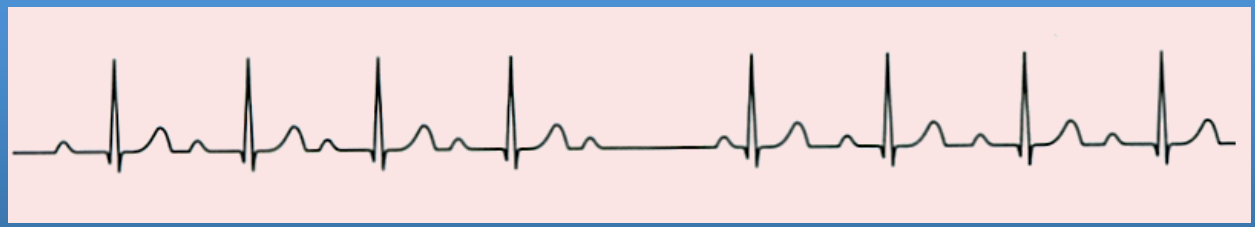




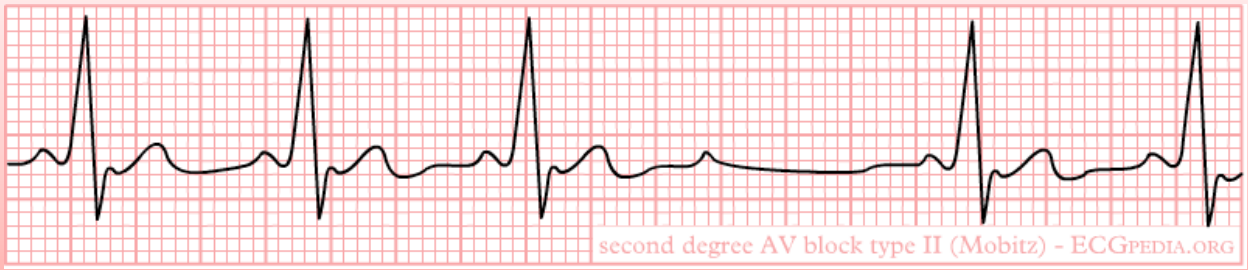
1e graads AV blok



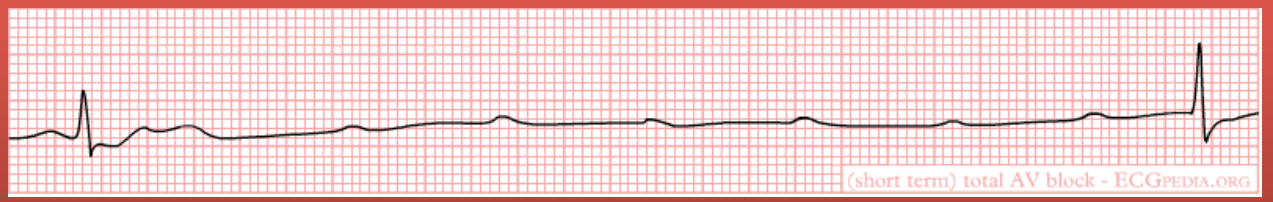
2e graads AV blok I
Wenkebach



2e graads AV blok II
Mobitz



3e graads AV blok
Totaal AV blok



RITMESTOORNISSEN

Indeling ritmestoornissen

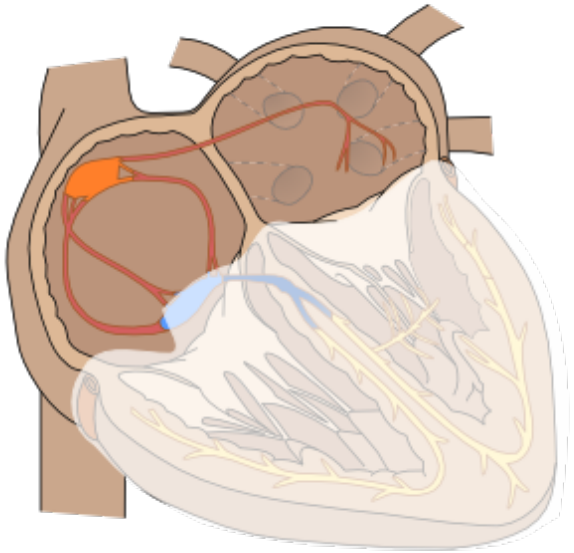
Naar oorsprong

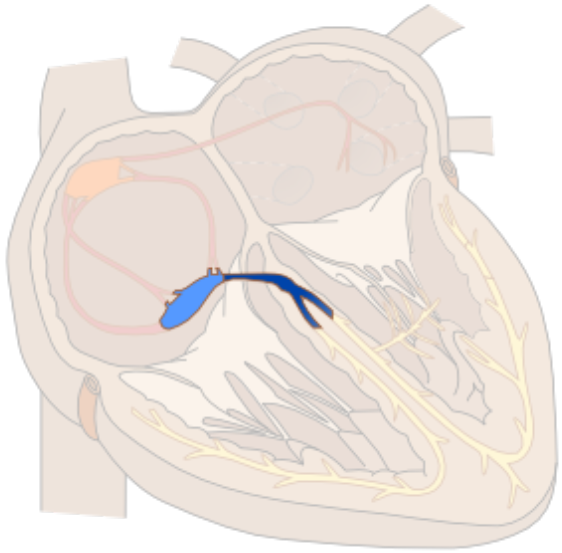
Supraventricular

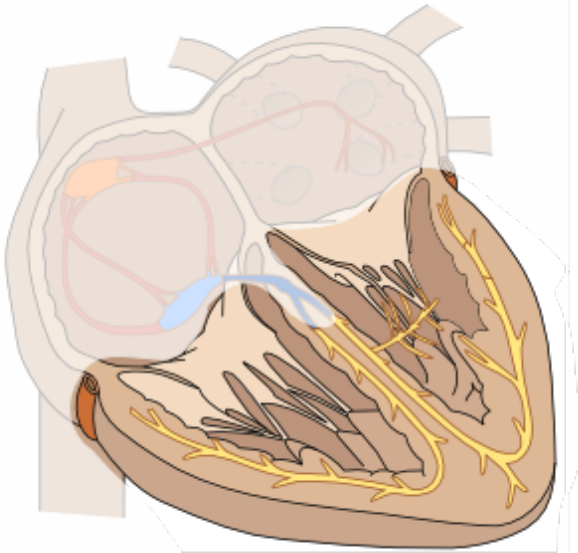
Atrial

Nodal

Ventricular







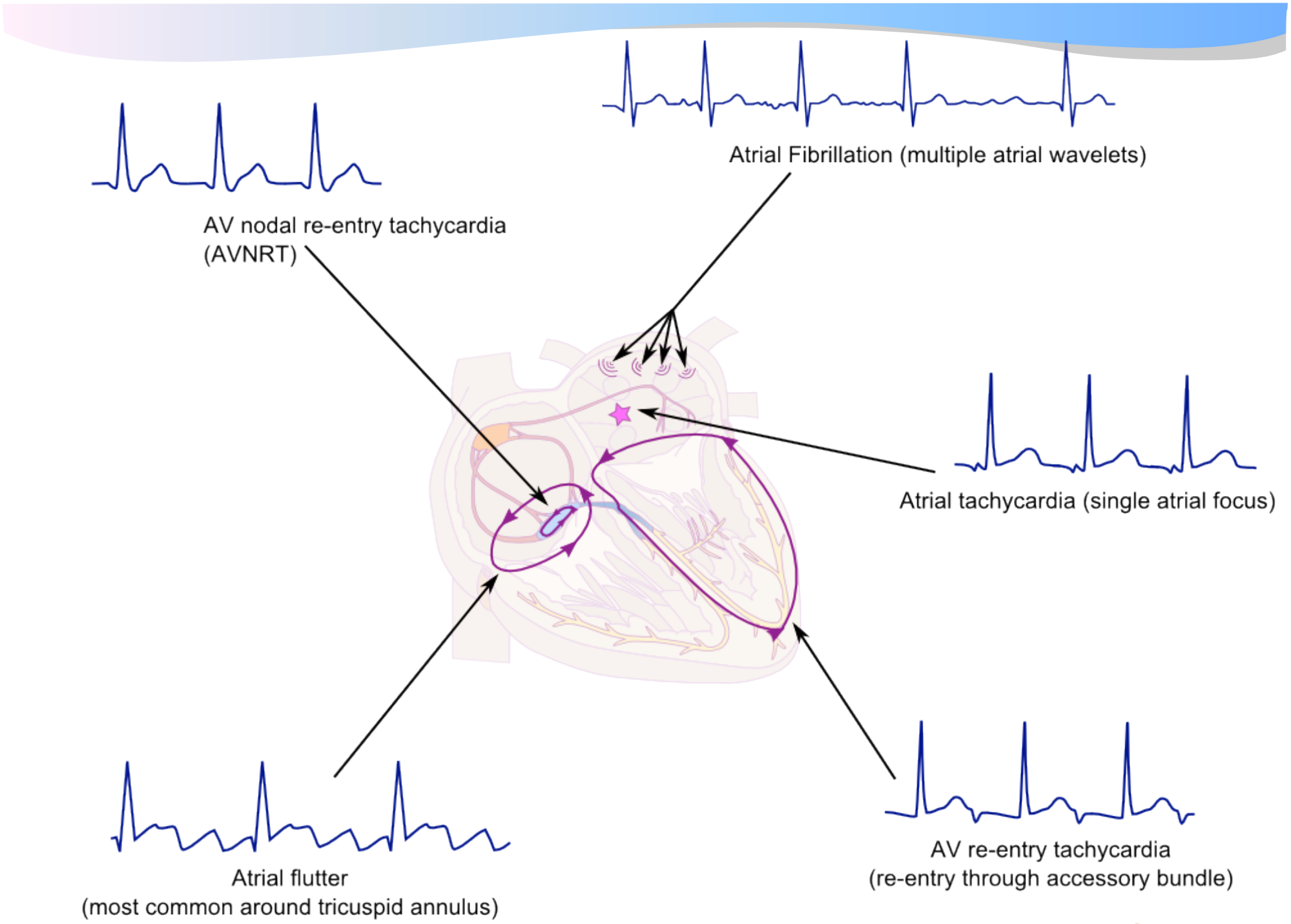
Ritmestoornissen

Nomenclatuur

- **extrasystole** : vroeg vallende slag
- **escapeslag**: slag volgend op pauze, meestal uit distaal weefsel
- **bradycardie** : < 60 bpm
- **tachycardie** : > 100 bpm
- **supraventriculaire ritmestoornis**: oorsprong van boven de bifurcatie in de bundel van His
- **re-entry** (anatomisch, Aflut/AVNRT/AVRT vs functioneel AF/VF)
- **ventriculaire ritmestoornis**: origine uit ventrikel (distaal van bifurcatie His)
- **breed** QRS complex (>0.12 sec)
- **smal** QRS complex (<0.12 sec)
- **AV dissociatie**: geen relatie tussen depolarisatie van atria en ventrikels

Indeling SVT

	Regulair	HR (bpm)	P-top	Therapie
Smal QRS(<0,12)				
Sinustachycardie	Ja	100-180	Voor ieder QRS complex	Geen of behandeling oorzaak (koorts, angst, anemie)
Atriale tachycardie	Ja	75-200	Voor ieder QRS complex maar afwijkende vorm	Sinus carotis massage, betablocker, amiodarone
Atriumfibrilleren	Nee	60-175	afwezig	Chemische/electrische cardioversie of rate control
Atriumflutter	Ja	75-150	Zaagtand m.n. in afleiding II	Chemische/electrische cardioversie of rate control
AVNRT	Ja	180-250	In of na QRS complex	Sinus carotis massage, adenosine
AVRT	Ja	150-250	RP<PR	Chemische/electrische cardioversie of rate control
Breed QRS(>0,12)				
SVT met block	Ja	75-200	afwezig	
AVRT	Ja	150-250	RP<PR	

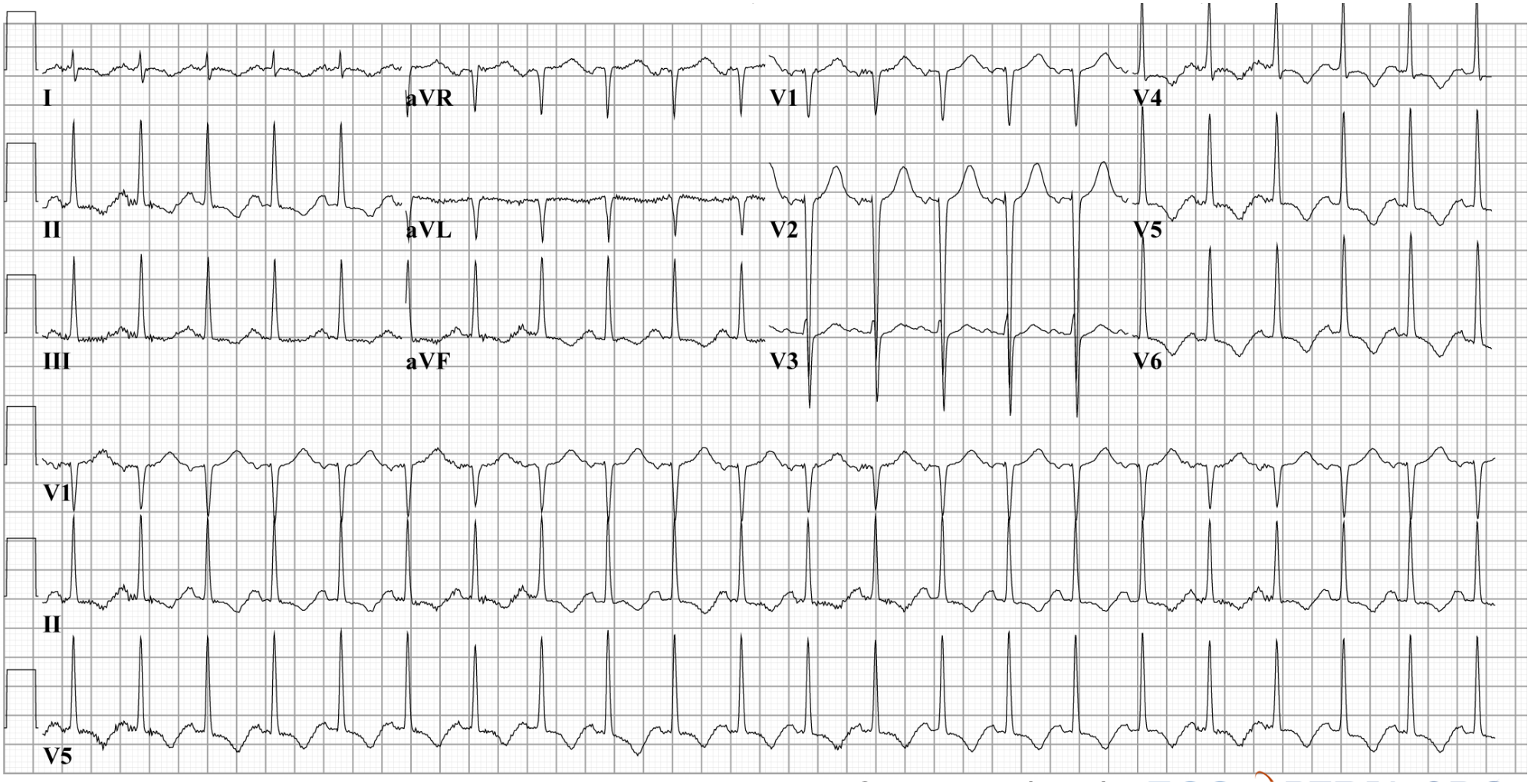

Atrial Fibrillation (multiple atrial wavelets)
AV nodal re-entry tachycardia
(AVNRT)
Atrial tachycardia (single atrial focus)
Atrial flutter
(most common around tricuspid annulus)
AV re-entry tachycardia
(re-entry through accessory bundle)

Supraventriculaire Ritmestoornissen

Sinusknoop

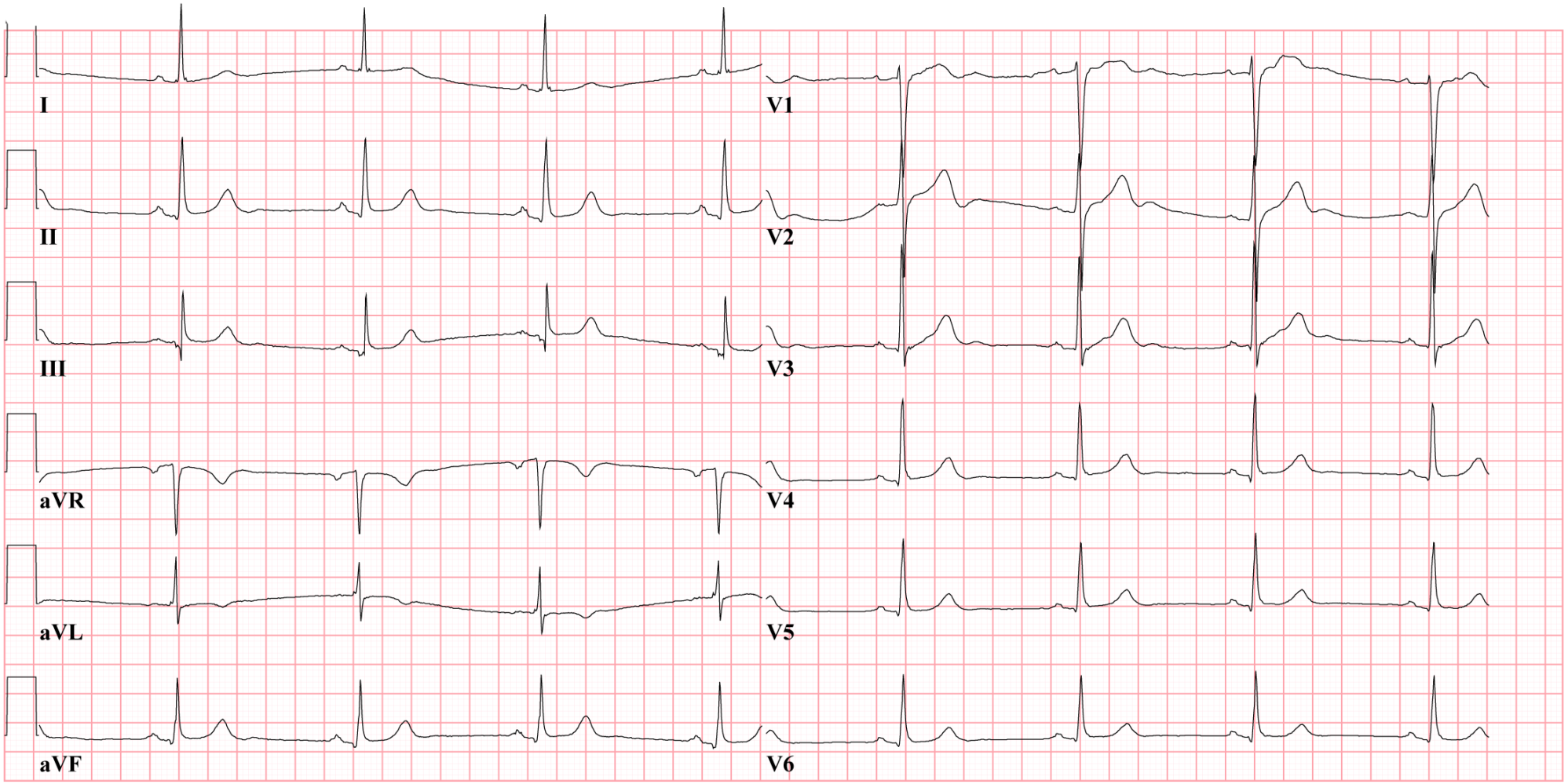
- Sinusritme: regelmatig,elk QRS-complex wordt
  voorafgegaan door een P-top (+ in I,II,AVF)
  - » *normaal* :60-100/min
  - » *sinusbradycardie* :< 60/min
  - » *sinustachycardie* :>100/min
- Sinusaritmie: normale P-toppen, normaal PR-interval
  irregulair PP-interval met variatie > 0.16 sec.
- Sinusarrest

Sinustachycardie



Courtesy of I.A.C. van der Bilt

Sinusbradycardie



25mm/s 10mm/mV 150Hz 7.0.2 12SL 235 CID: 251

Courtesy of I.A.C. van der Bilt ECGPEDIA.ORG part of cardionetworks.org

Geen SR →Wat nu?

- Frequentie?
- Breed of smal?
- Extra slagen?
- Hartas?

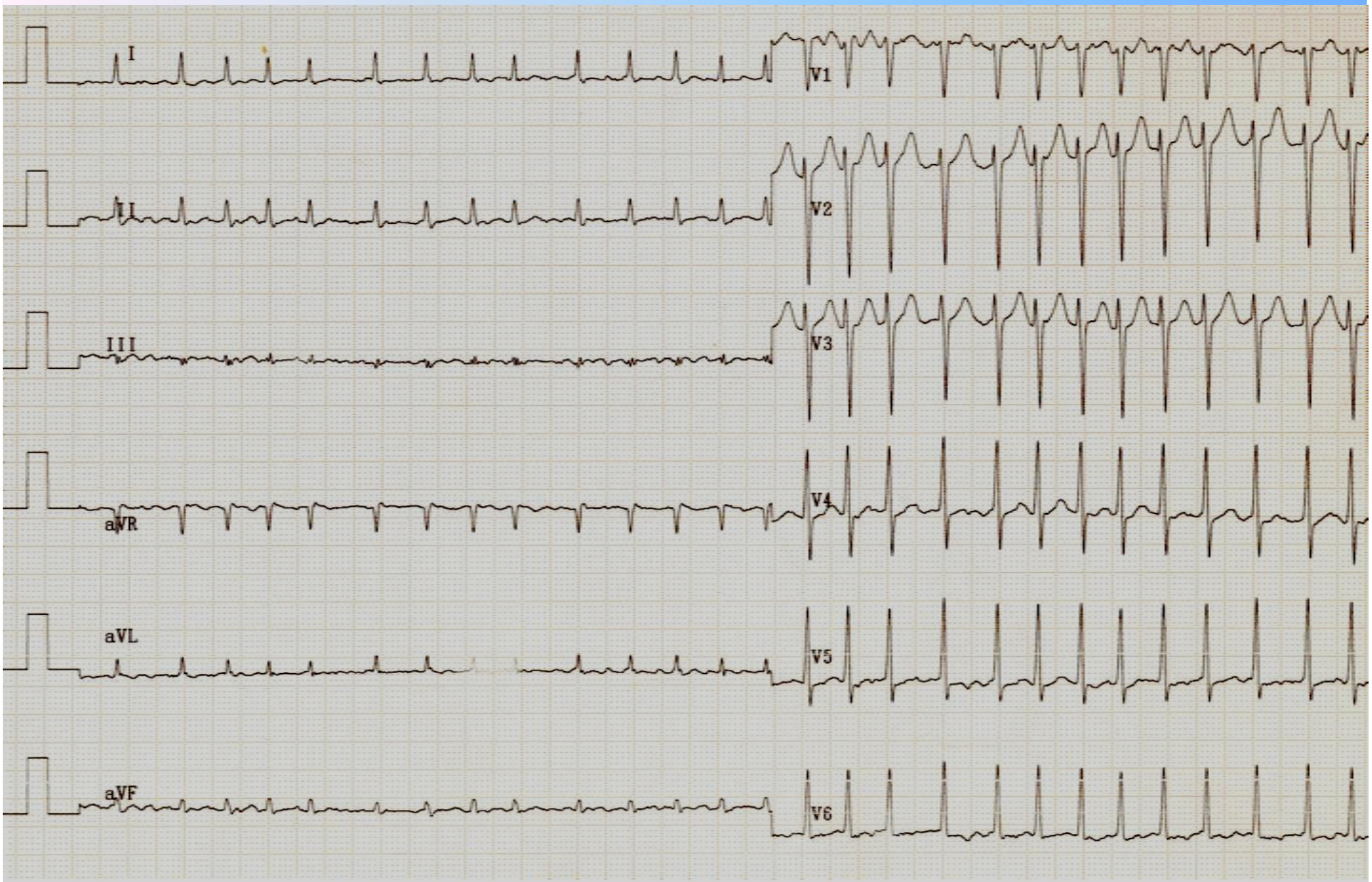
- Cherchez le “P”

Smal complex tachycardie

- Sinustachycardie
- Sinusbradycardie
- **Boezemfibrilleren**
- Boezemflutter
- AVNRT
- (anders …)

Volstrekt irregulair? → vrijwel altijd atriumfibrilleren (AF)

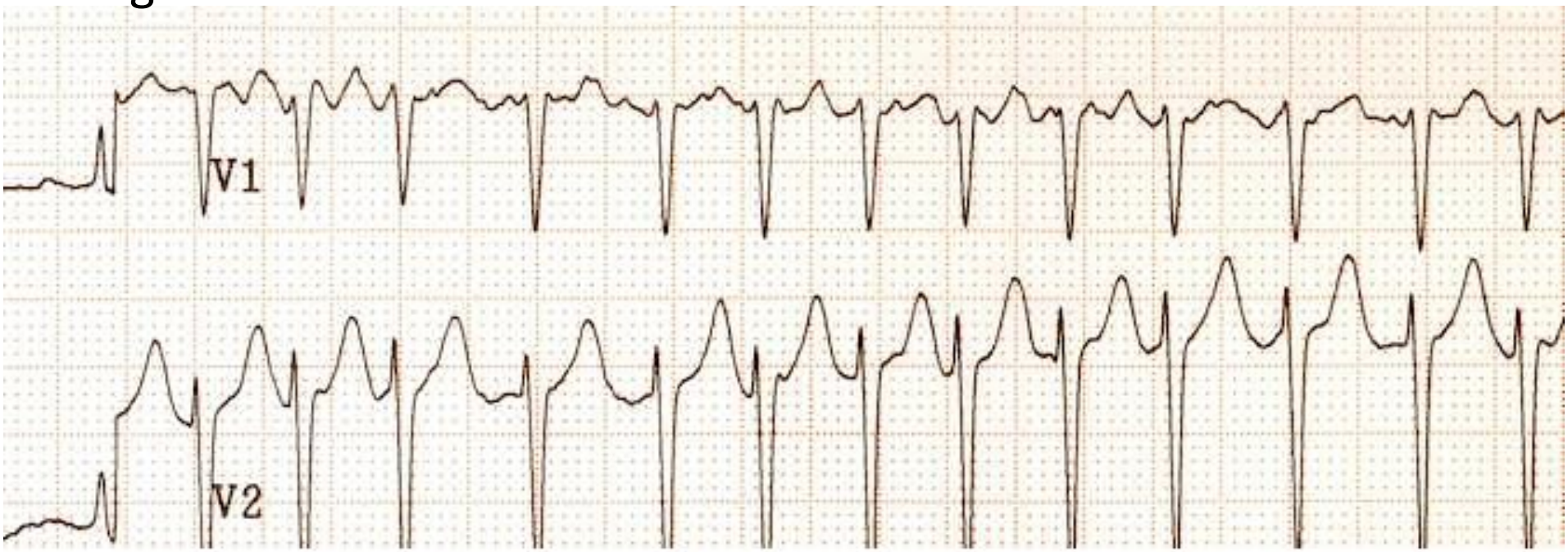
- **Permanent**: chronisch
- **Persisterend**: recidief ondanks chemische/electrische cardioversie
- **Paroxysmaal**: spontaan recidiverend



Courtesy of R.W. Koster, MD, PhD
AMC, The Netherlands

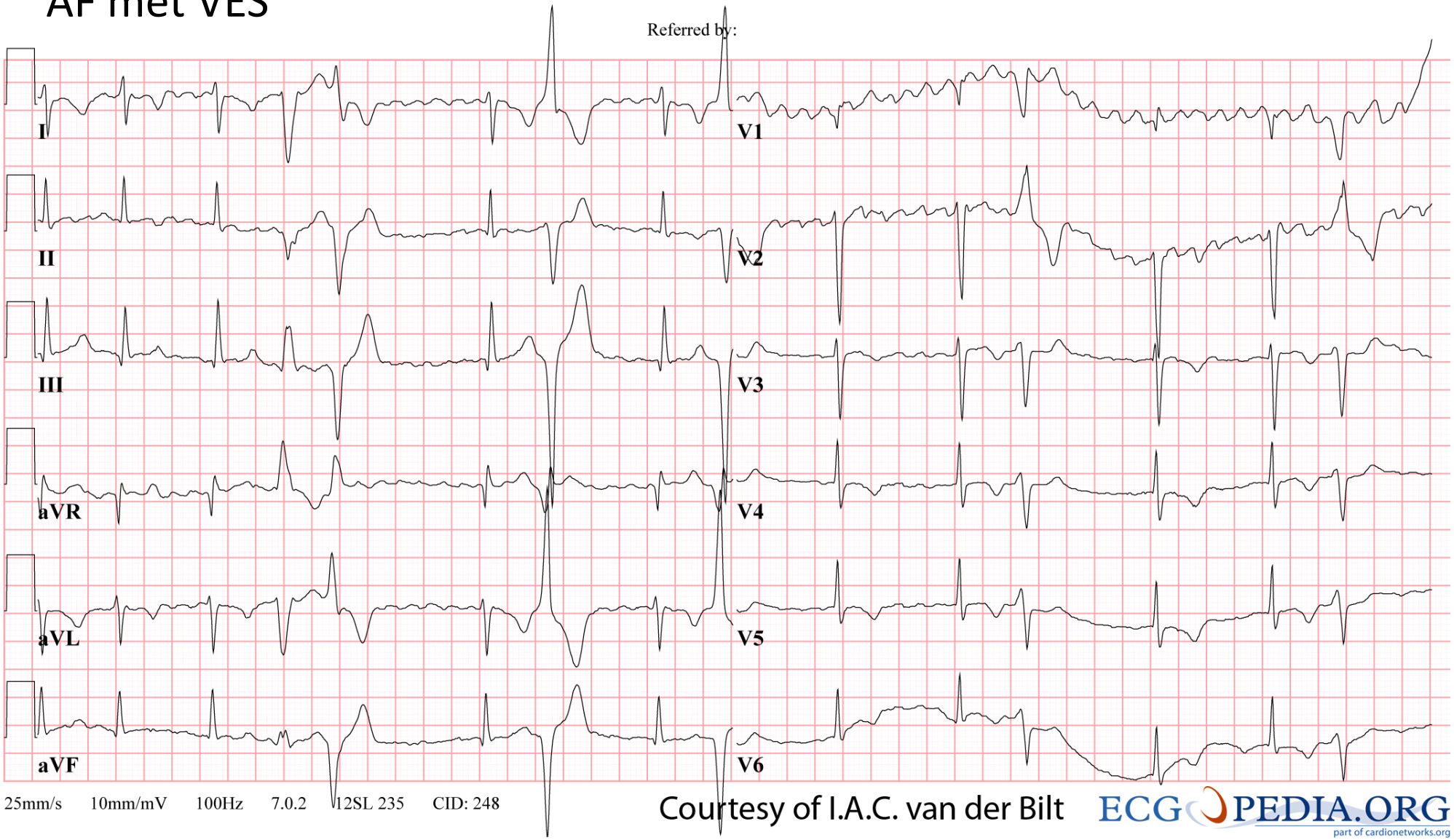
ECG PEDIA.ORG

Irregulair



Courtesy of R.W. Koster, MD, PhD ECG PEDIA.ORG
AMC, The Netherlands

AF met VES



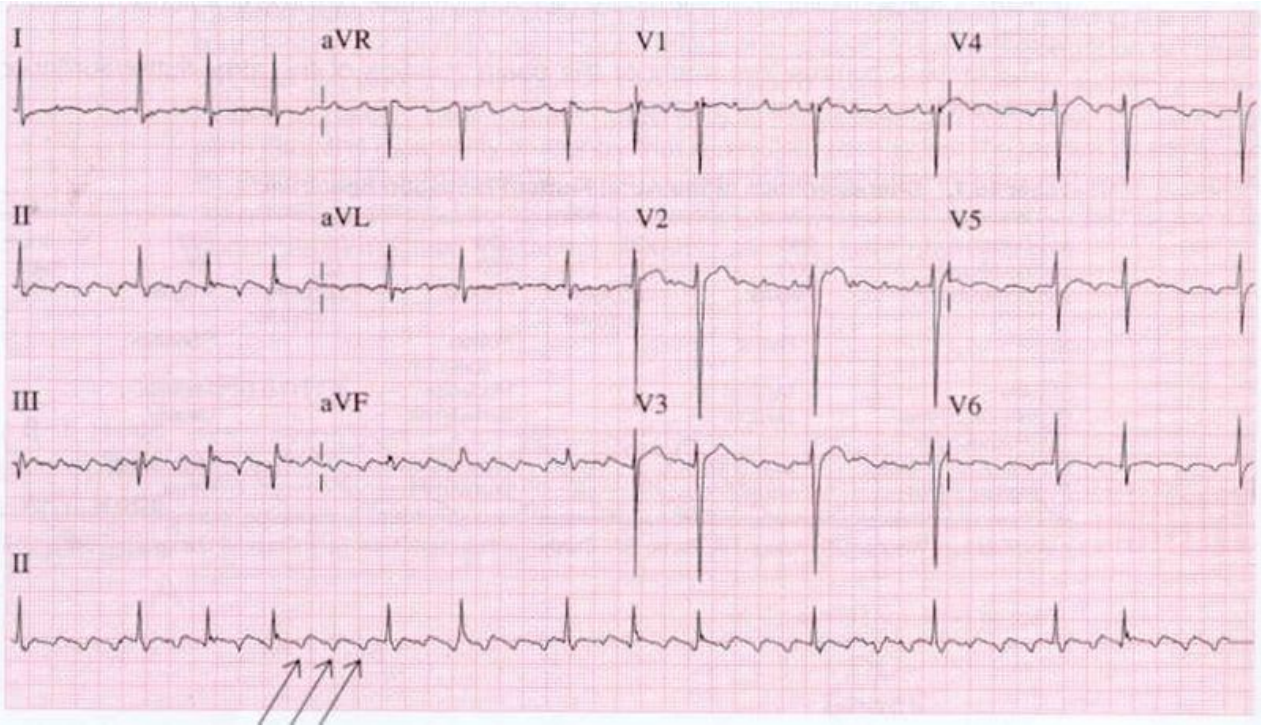
Courtesy of I.A.C. van der Bilt

ECG PEDIA.ORG
part of cardionetworks.org

Smal complex tachycardie

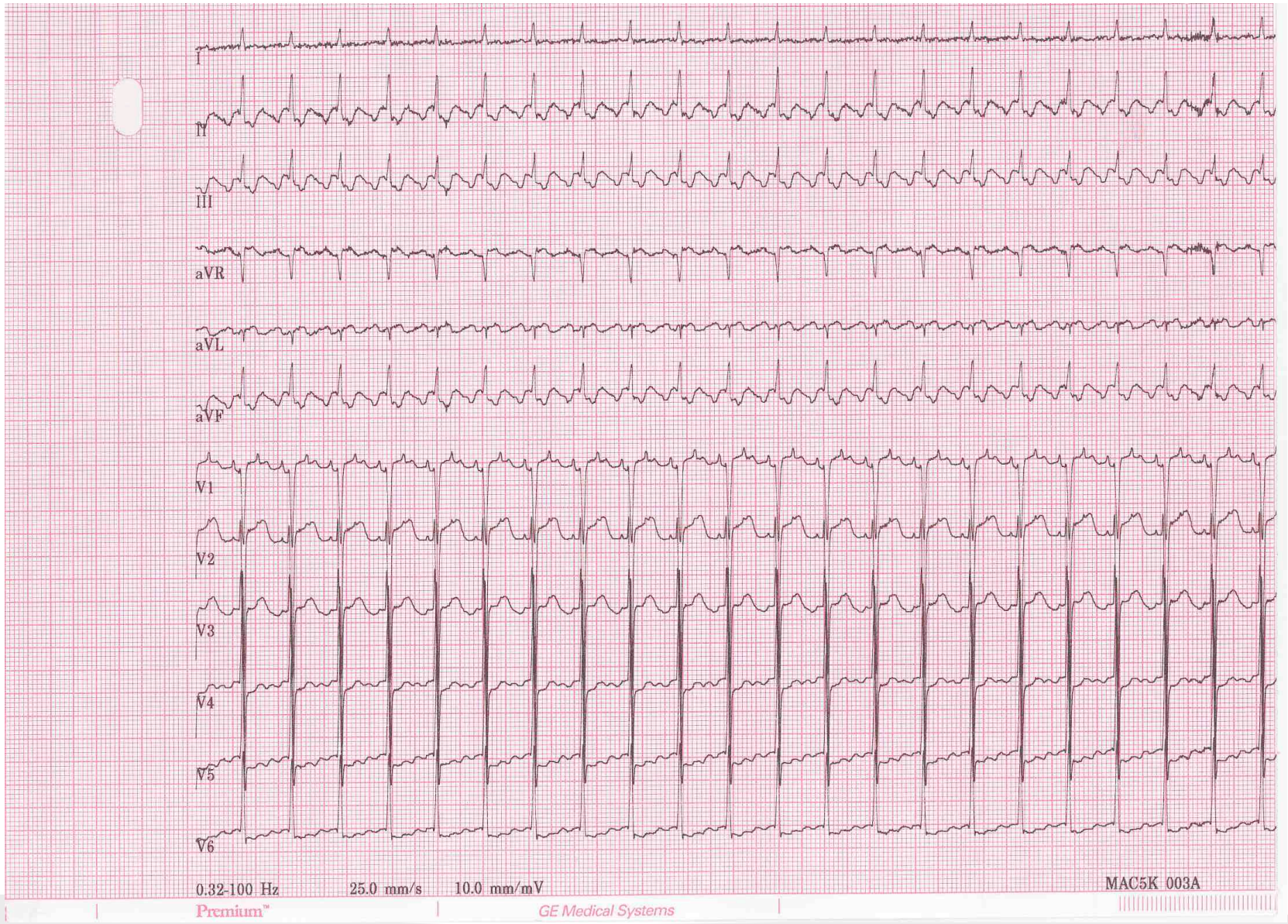
- Sinustachycardie
- Sinusbradycardie
- Boezemfibrilleren
- **Boezemflutter**
- AVNRT
- (anders …)

"Iedere tachycardie van 150/min is een boezemflutter tot het tegendeel bewezen is"



Zaagtand!

Boezemflutter



Smal complex tachycardie

- Sinustachycardie
- Sinusbradycardie
- Boezemfibrilleren
- Boezemflutter
- **AVNRT**
- (anders …)

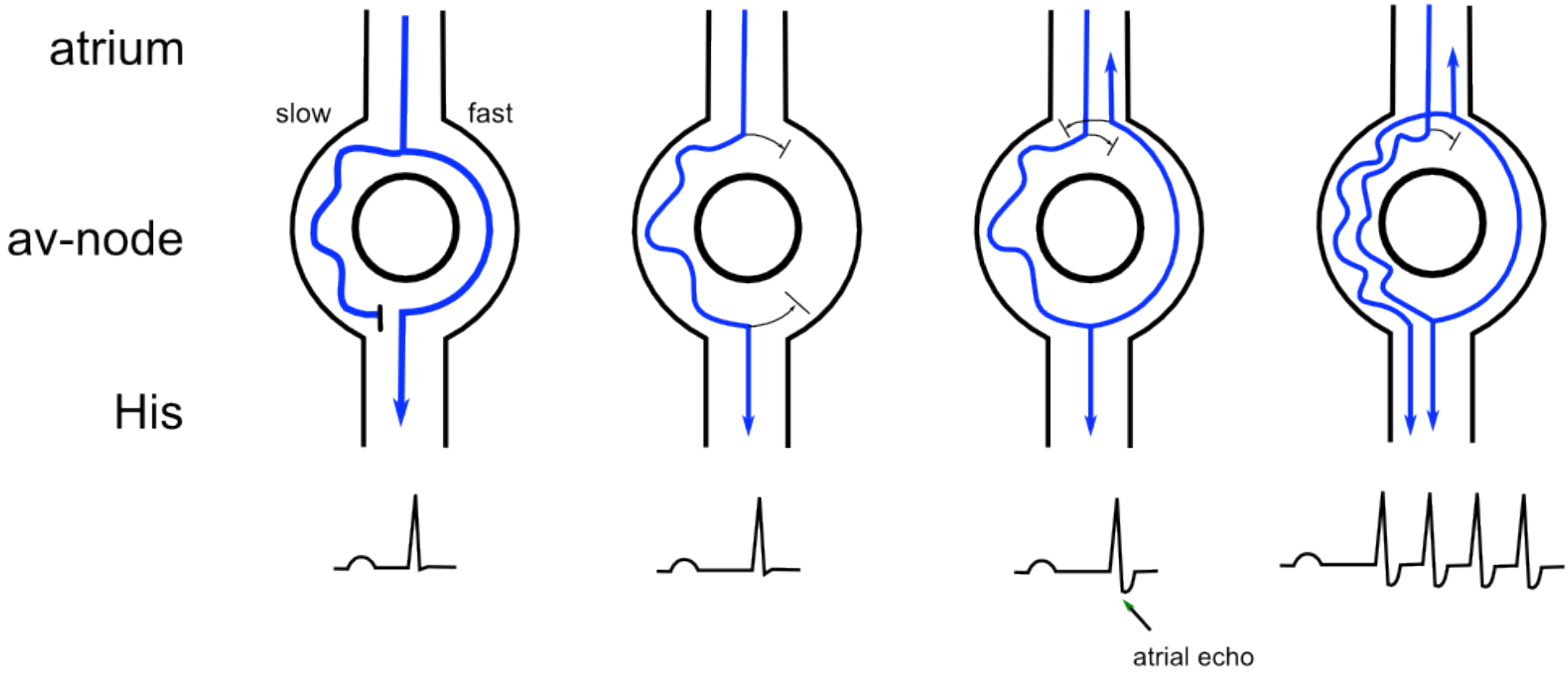
AV Nodale re-entry tachycardie.

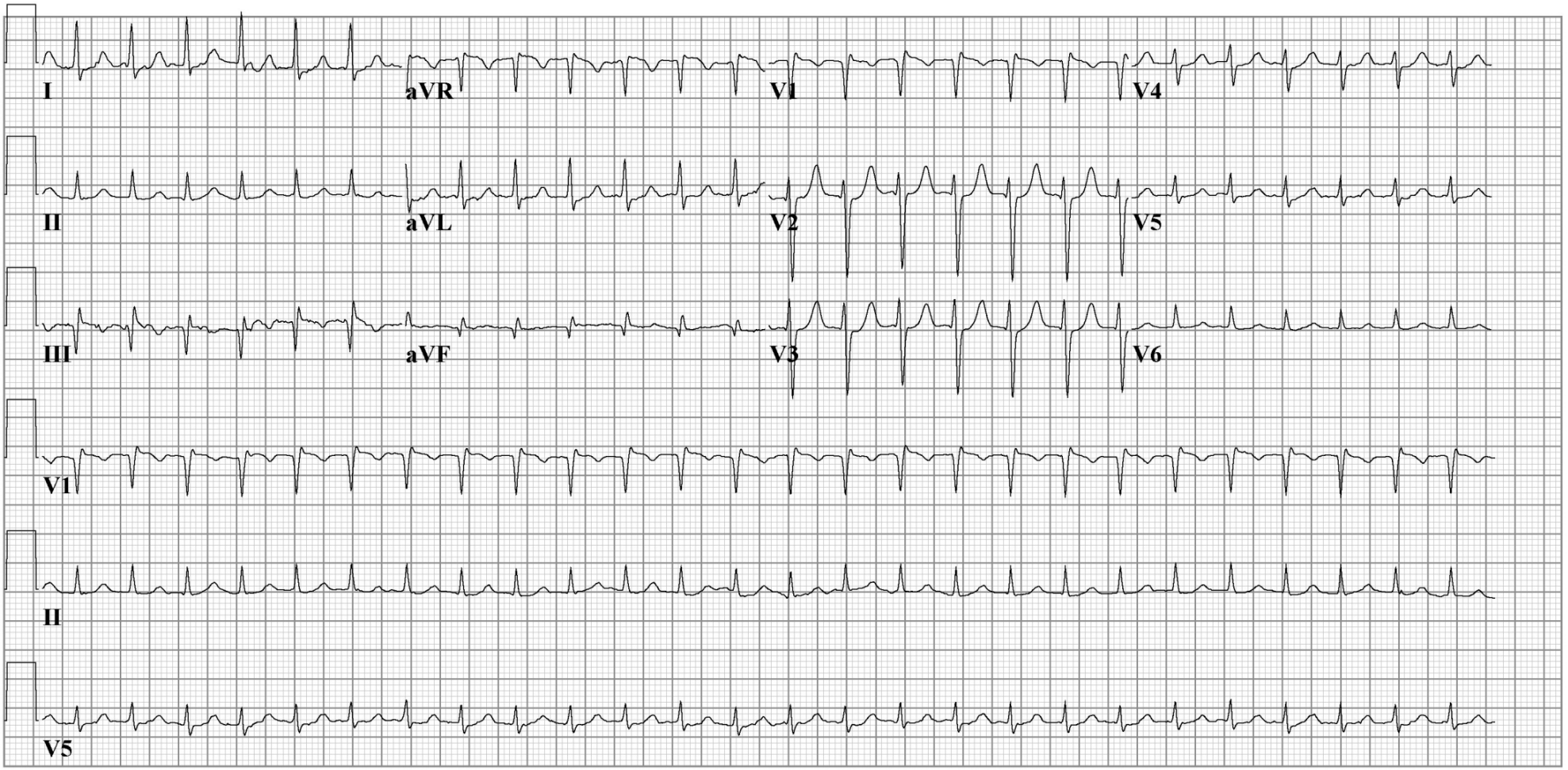
- Frequentie: 180-250 / min
- R-R’ in V1
- Typisch jonge patiënt
- Recidiverend

Manoeuvres:

- Hurken
- Sinus carotis massage
- Adenosine

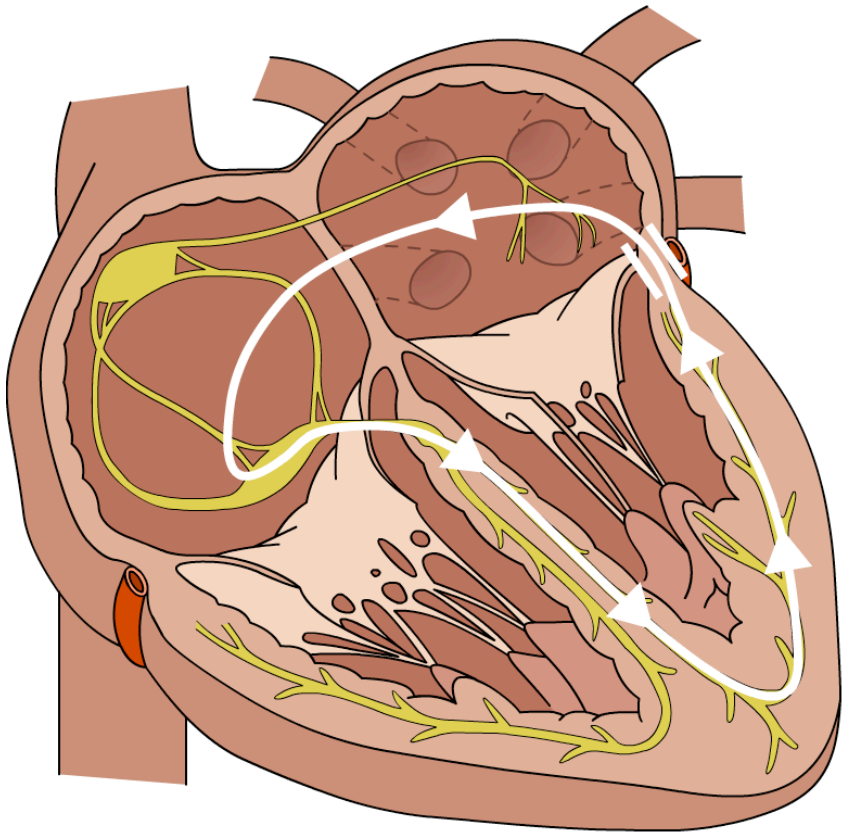
Re-entry



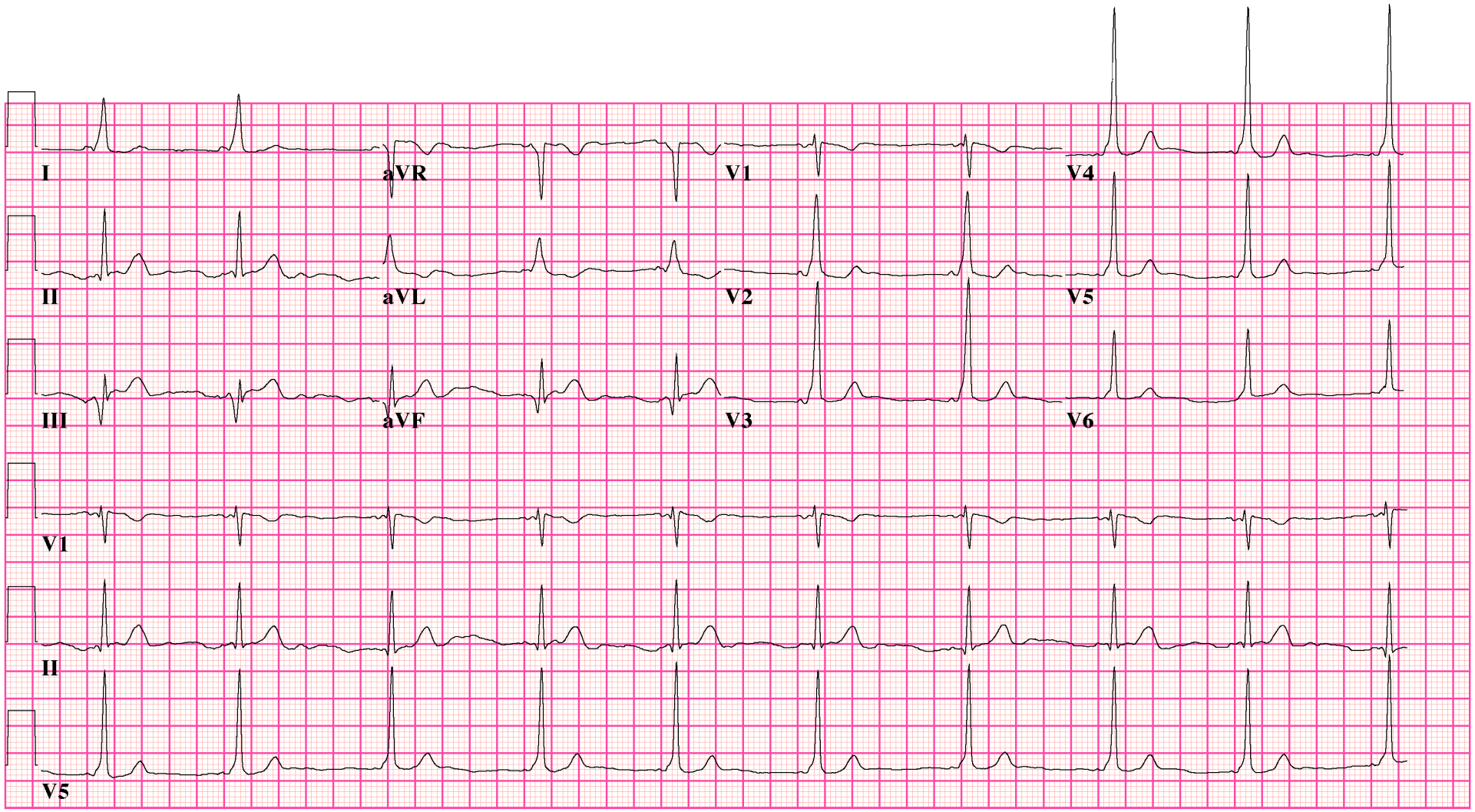

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
V5

Adenosine

AVRT: re-entry via een accessoire verbinding orthodroom



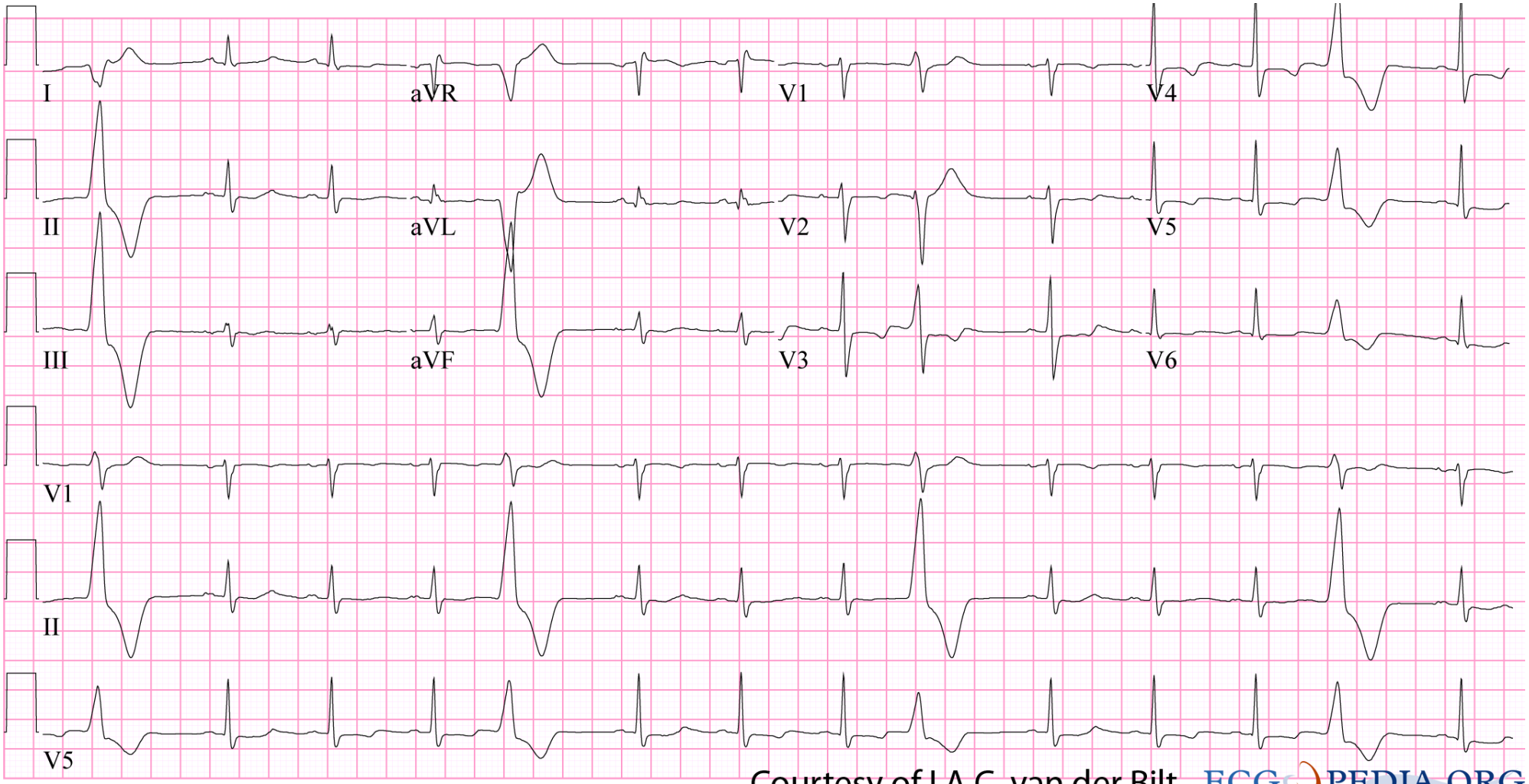
Pre-exitatie



Ventriculaire ritmestoornissen

	Regulair	HR(bpm)	P-top	Therapie
Altijd Breed QRS(>0,12)!				
Ventriculaire tachycardie	Ja(meestal)	110-250	AV dissociatie	Cardioversie, overpacing, medicatie
Ventrikel flutter	Ja	150-300	-	Defibrillatie
Ventrikel Fibrilleren	Nee	400-600	-	Defibrillatie
AIVR	Ja(meestal)	50-110	AV dissociatie	Geen
Torsades de pointes	Nee	150-300	AV dissociatie	Oorzaak behandelen

PVC


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
V5
25mm/s 10mm/mV 100Hz 005E 12SL 235 CID: 248
Courtesy of I.A.C. van der Bilt
ECG PEDIA.ORG
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Breed complex tachycardie

-**Ventrikeltachycardie**

-SVT met aberrante geleiding

-Ventrikelfibrilleren

-Ventrikelflutter

-AVRT/WPW

-(anders…)

Breed complex tachycardie = niet goed!

VT

Klinische kenmerken

Brugada criteria

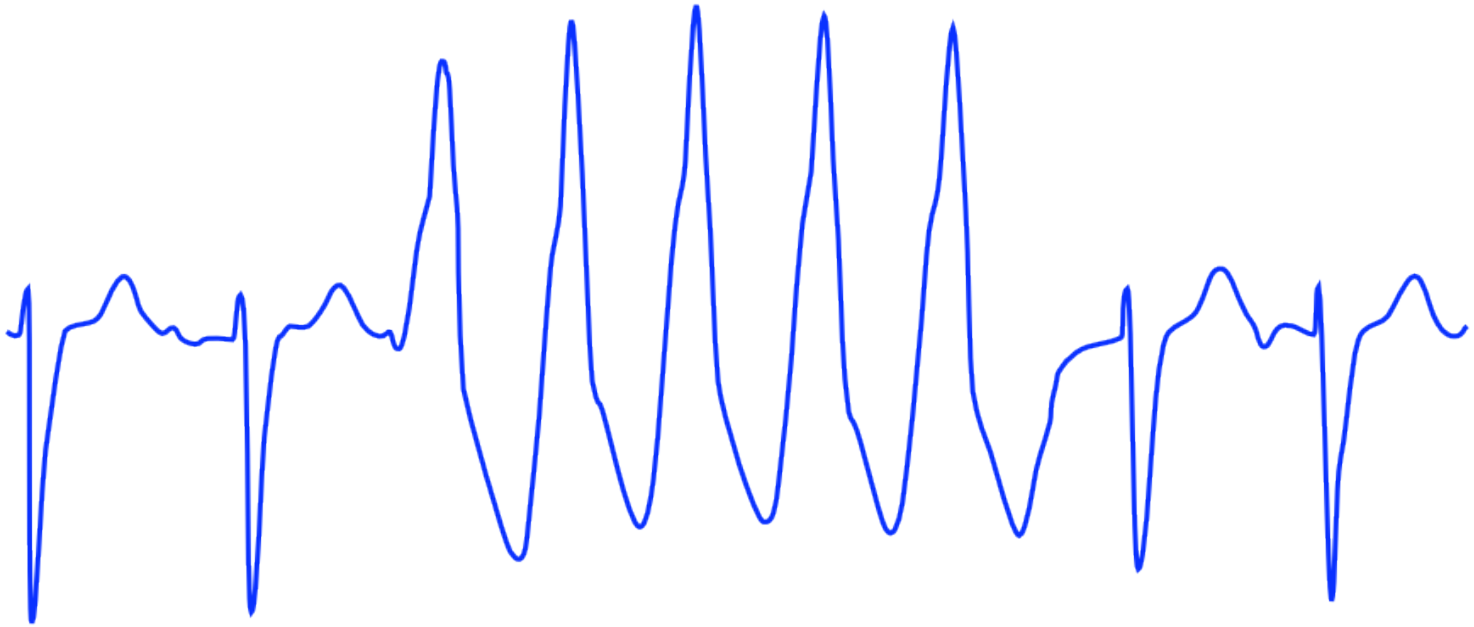
Andere criteria

Klinische kenmerken

- Patiënt ouder dan 65 jaar
- Myocardinfarct in VG
- “Horizontal entrance”
  - A priori kans op VT hoog!

Definities

- **Non-sustained VT**: 3 of meer slagen, max 30 seconde
- **Sustained VT**: > 30 seconde (of minder indien gecardioverteerd)
- **Monomorfe VT**: alle ventriculaire slagen hebben dezelfde configuratie
- **Polymorfe VT**: de ventriculaire slagen veranderen van configuratie.



VT

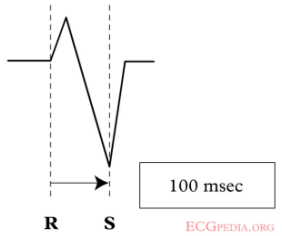
Klinische kenmerken

Brugada criteria

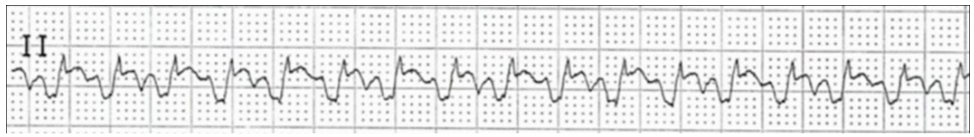
Andere criteria

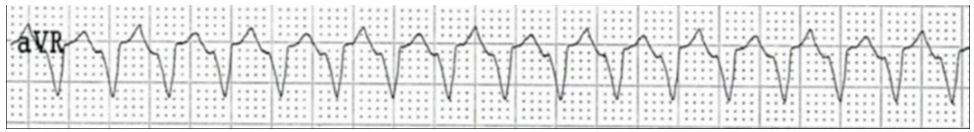
- Fusieslagen? (SP 100)

- RS afwezig over de voorwand? (SN 21, SP 100)
- RS duur in een precordiale afl > 100ms (SN 66, SP 98)

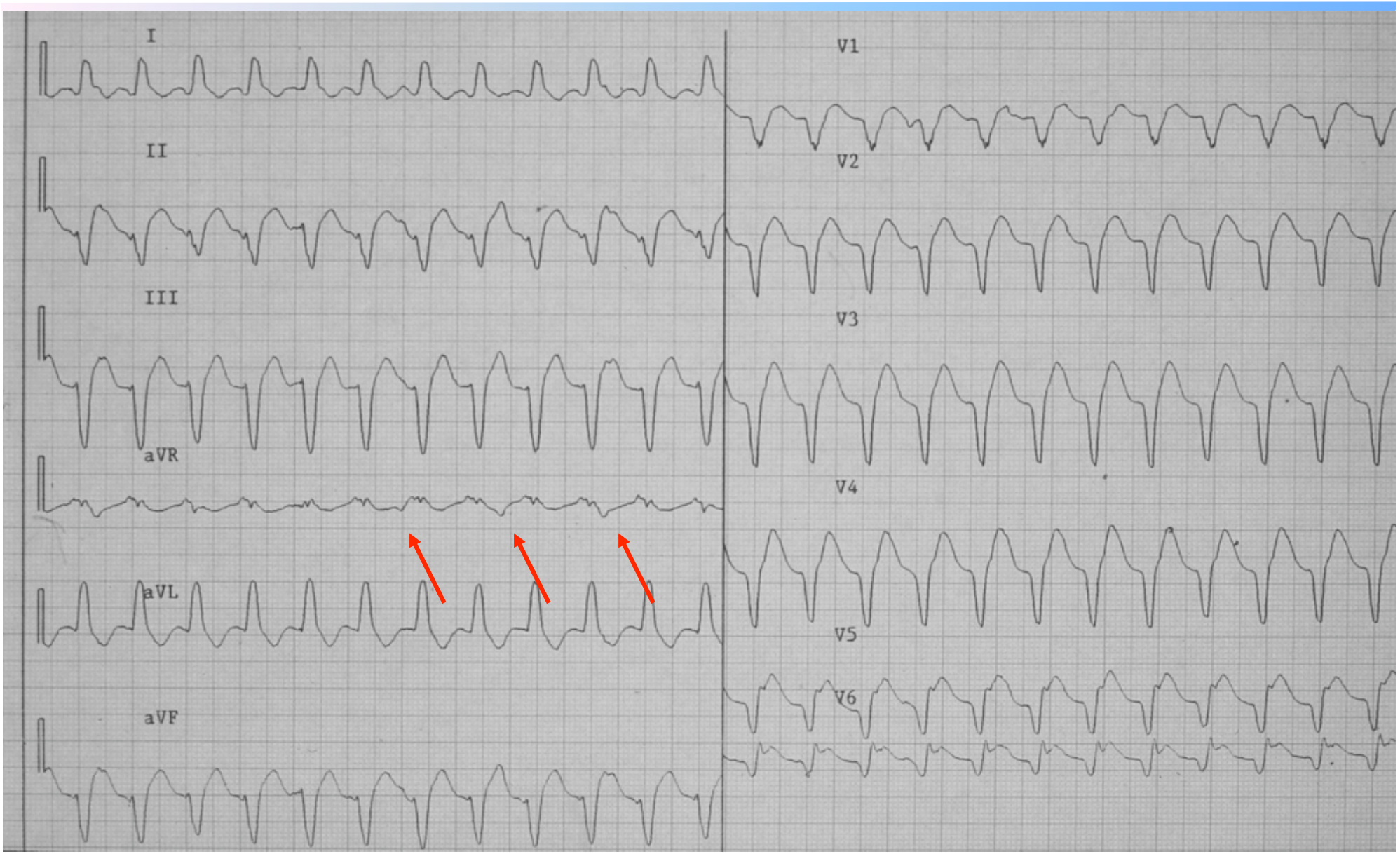


- AV dissociatie (SN 82, SP 98)





- Morfologische criteria



Ventrikeltachycardie

Breed complex tachycardie

-Ventrikeltachycardie

-**SVT met aberrante geleiding**

-Ventrikelfibrilleren

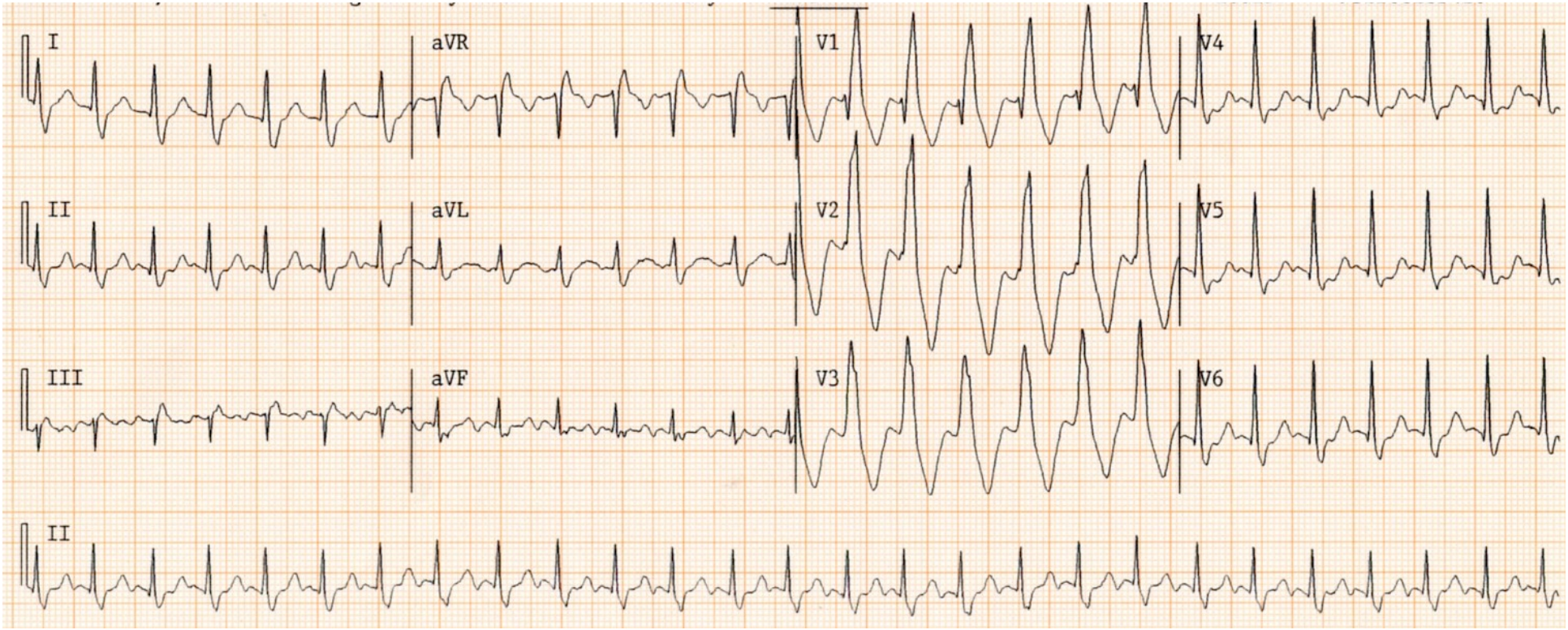
-Ventrikelflutter

-AVRT/WPW

-(anders…)

Typisch jongere patiënt

- SVT:
  - AVNRT
  - Boezemfibrilleren
  - Boezemflutter
  - AVNRT
- + aberrantie:
  - LBTB
  - RBTB


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II


II

Breed complex tachycardie

-Ventrikeltachycardie

-SVT met aberrante geleiding

-**Ventrikelfibrilleren**

-Ventrikelflutter

-AVRT

-(anders…)

Ventrikelfibrilleren

Breed complex tachycardie

-Ventrikeltachycardie

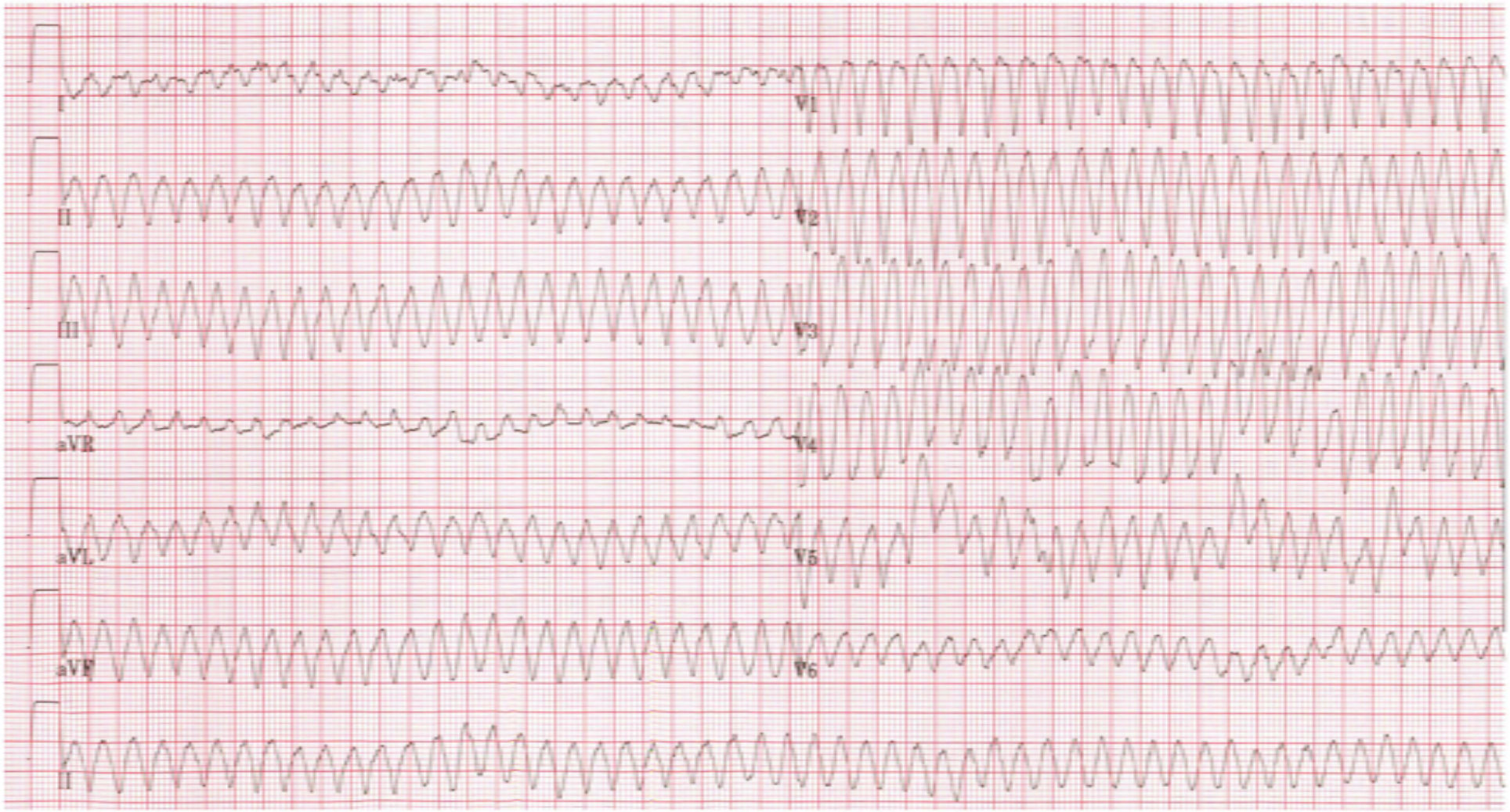
-SVT met aberrante geleiding

-Ventrikelfibrilleren

-**Ventrikelflutter**

-AVRT/WPW

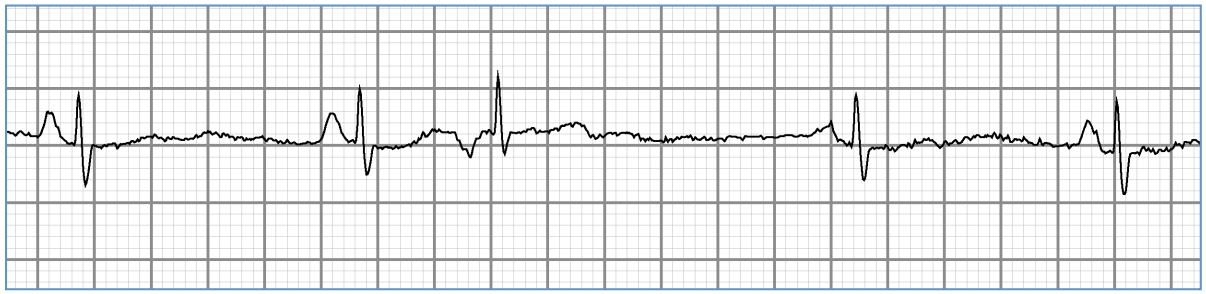
-(anders…)



Extrasystolen

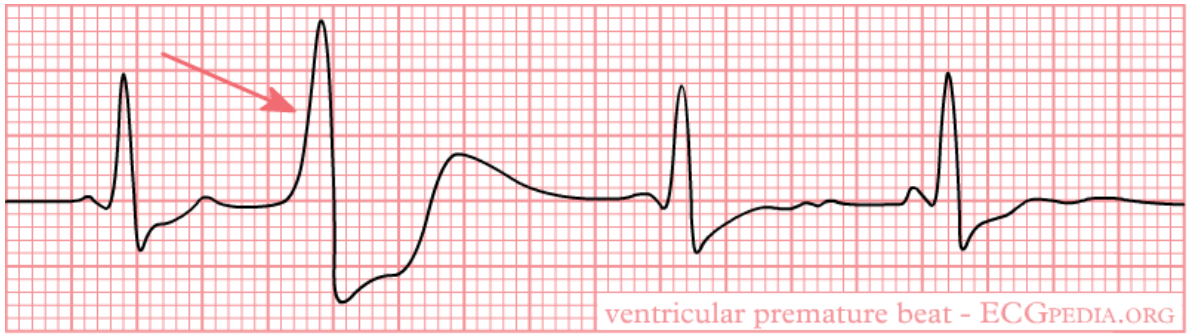
-Boezemextrasystole

(Non-compensatoire pauze)

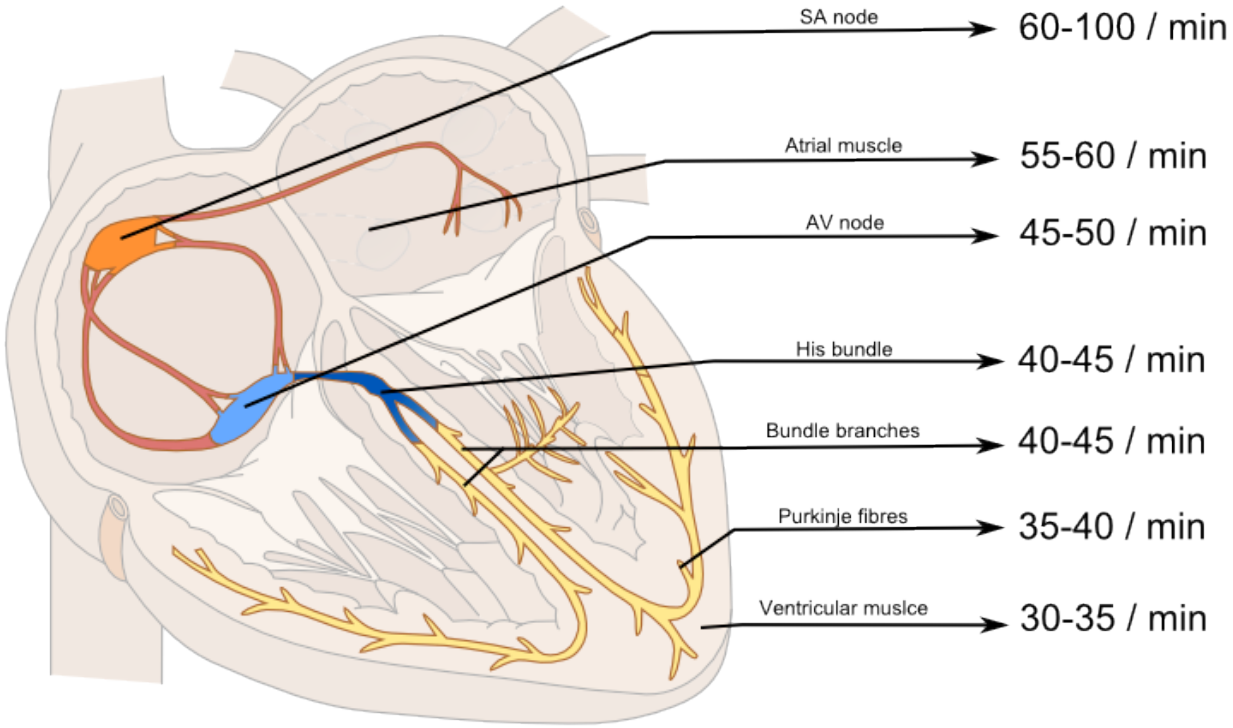


-Ventrikelextrasystole

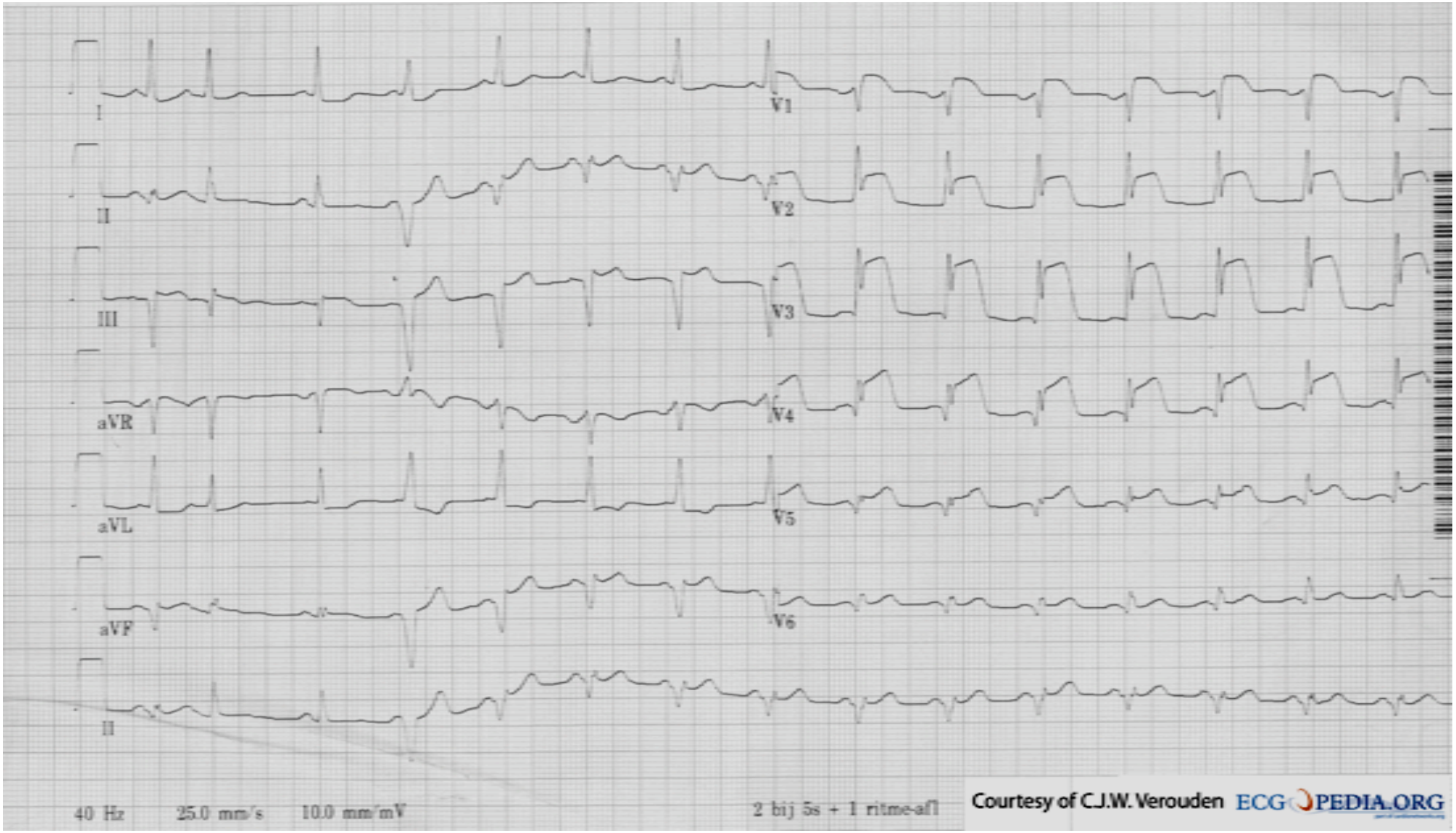
(Compensatoire pauze)

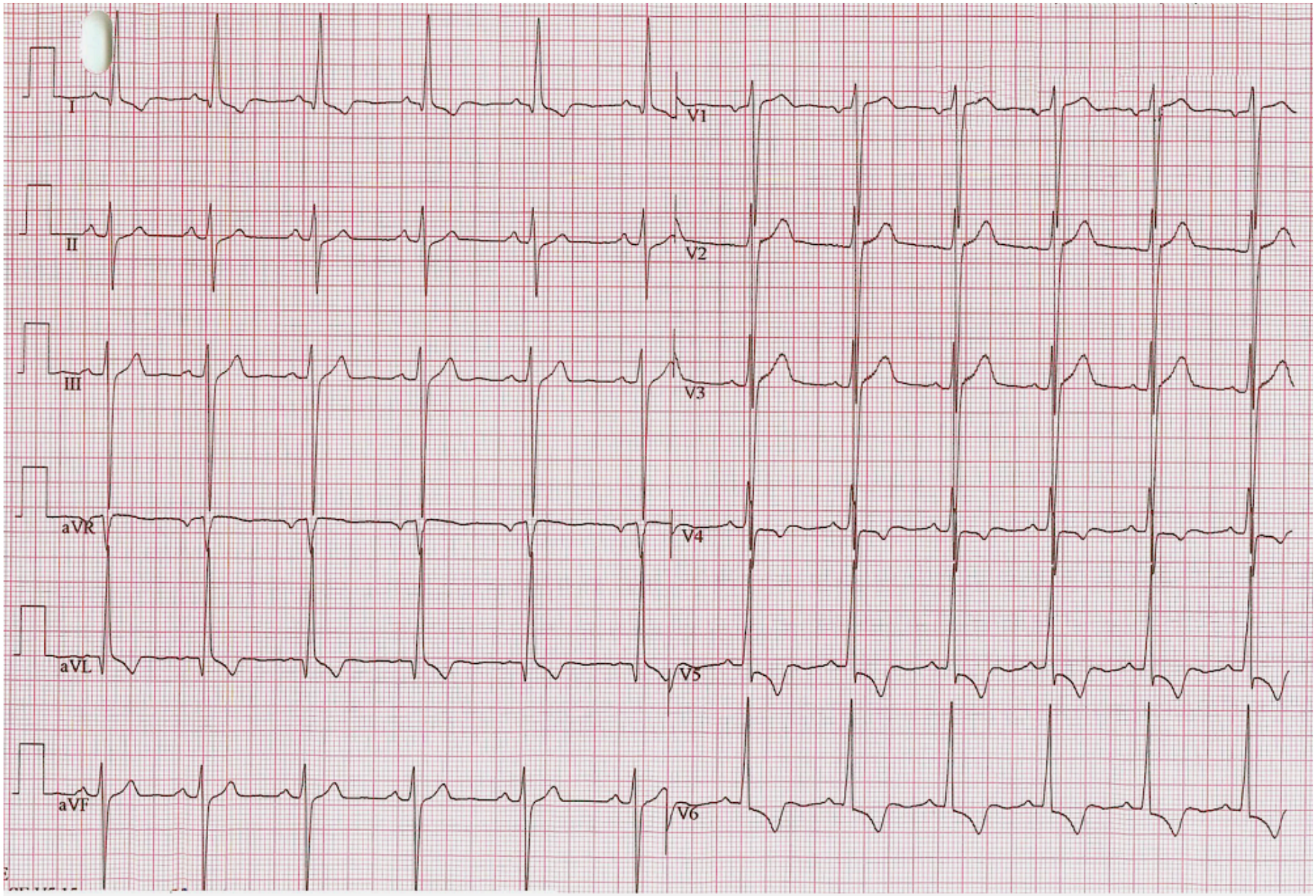


Escaperitme



QUIZ


I
II
III
aVR
aVL
aVF
II
V1
V2
V3
V4
V5
V6
40 Hz
25.0 mm/s
10.0 mm/mV
2 bij 5s + 1 ritme-afl
Courtesy of C.J.W. Verouden
ECG PEDIA.ORG


I
II
III
aVR
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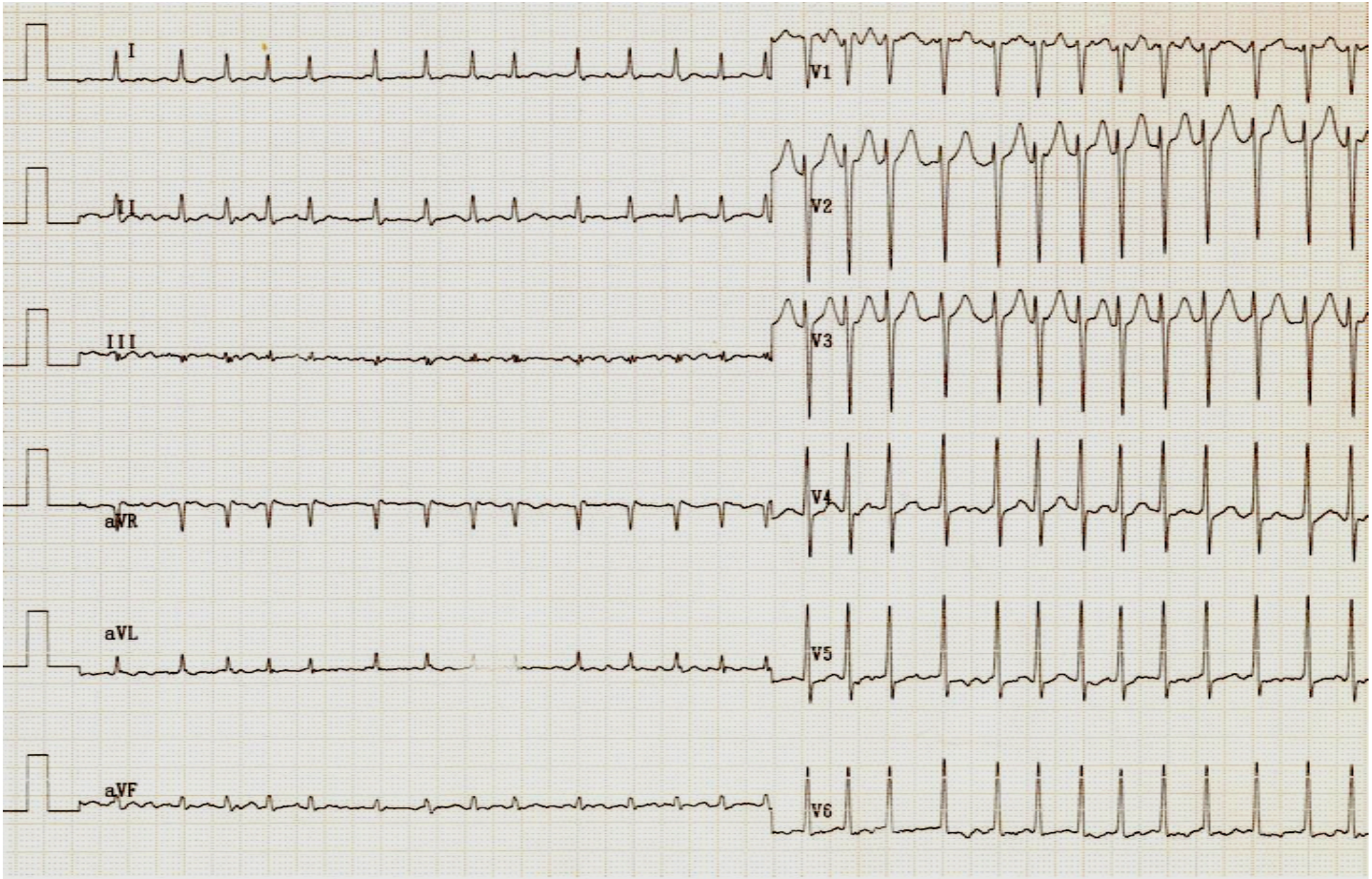
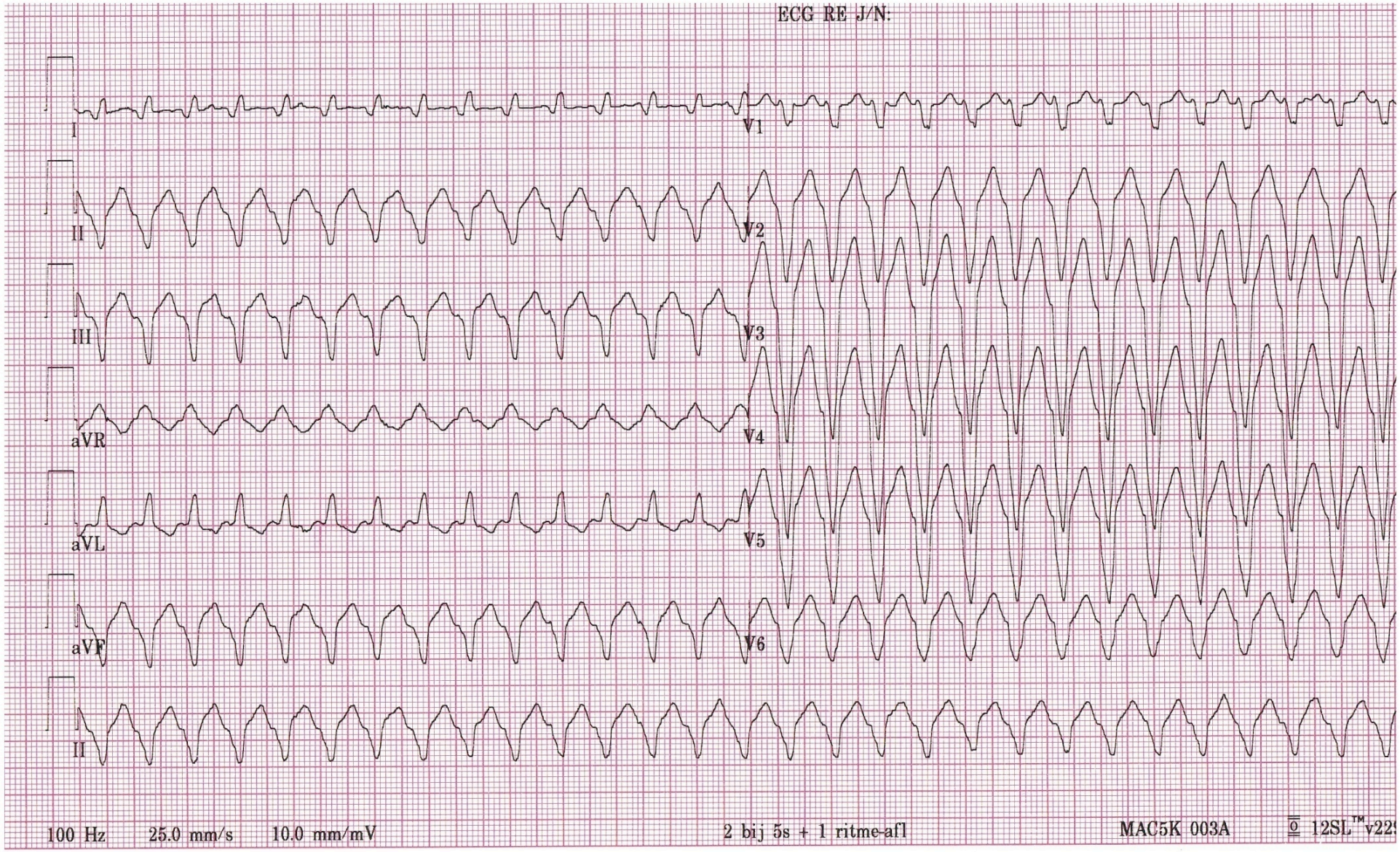
aVF
V1
V2
V3
V4
V5
V6
ECGPEDIA.ORG

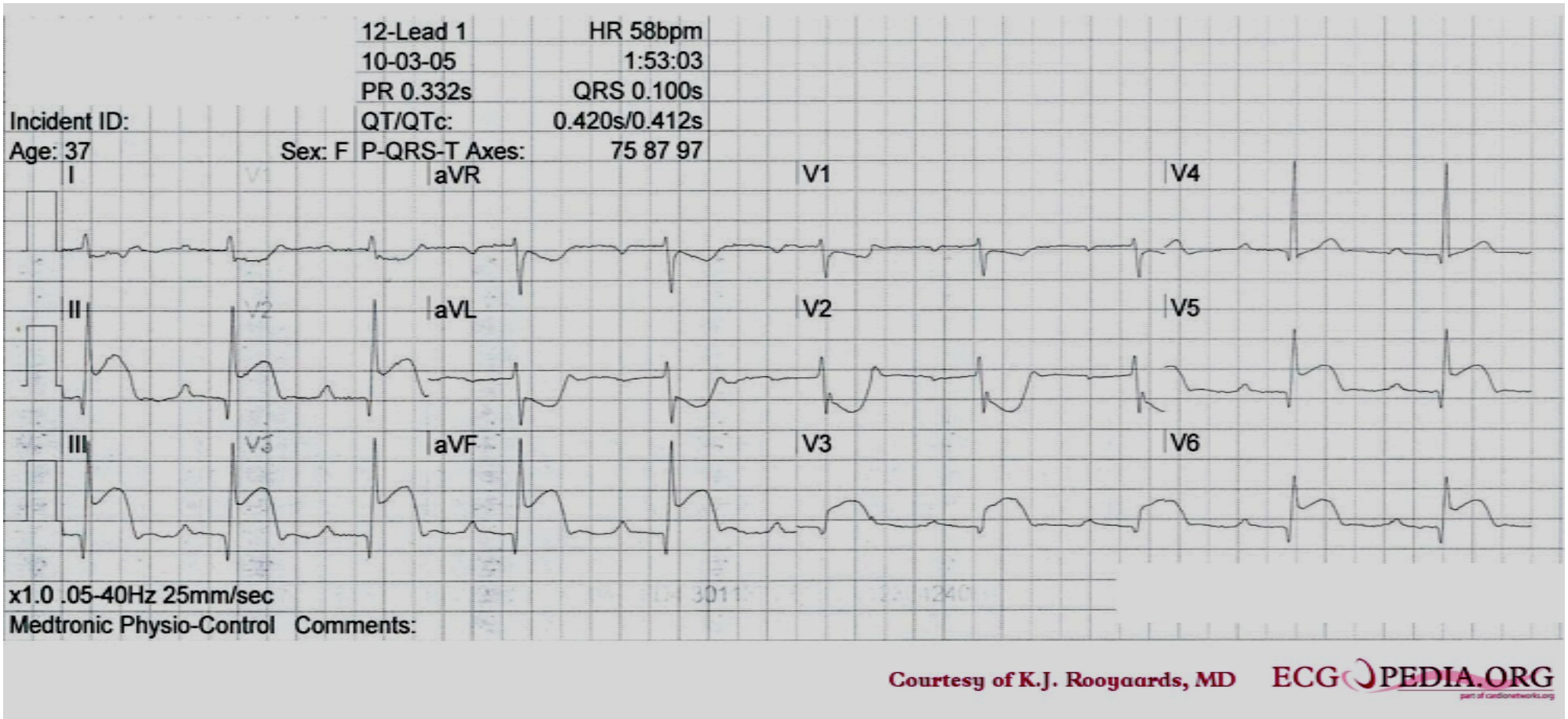


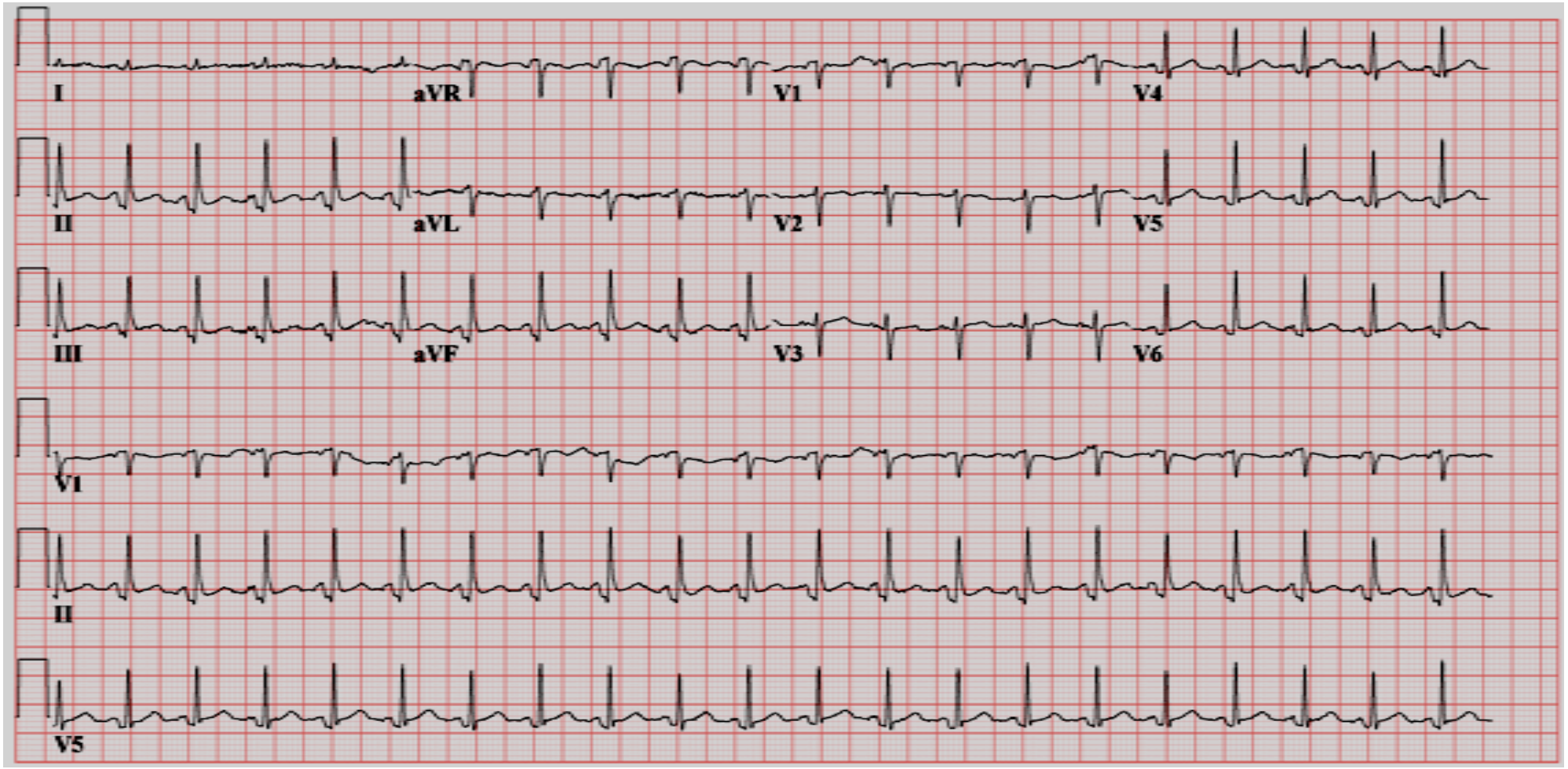
Courtesy of R.W. Koster, MD, PhD
AMC, The Netherlands

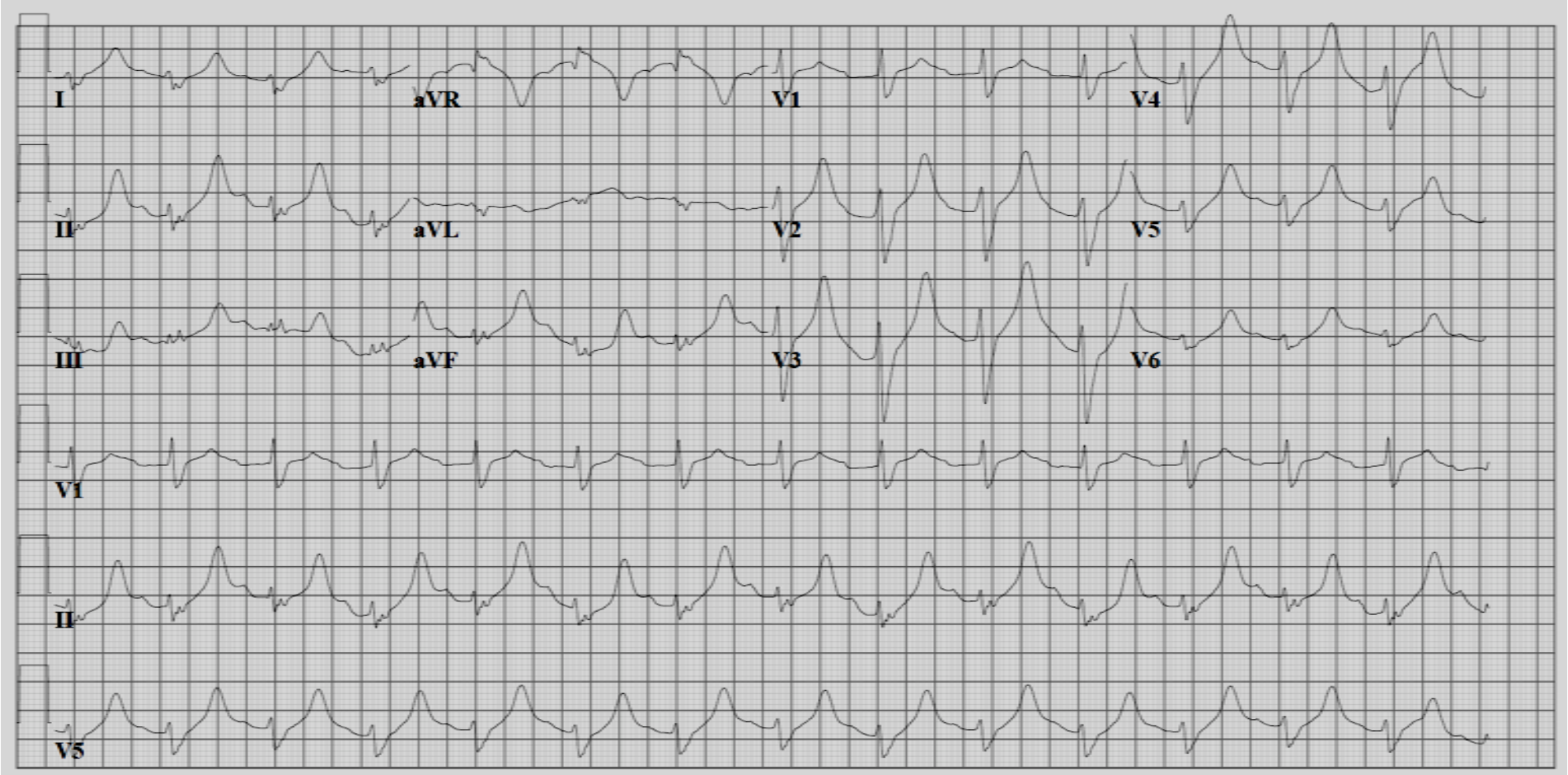
ECG PEDIA.ORG

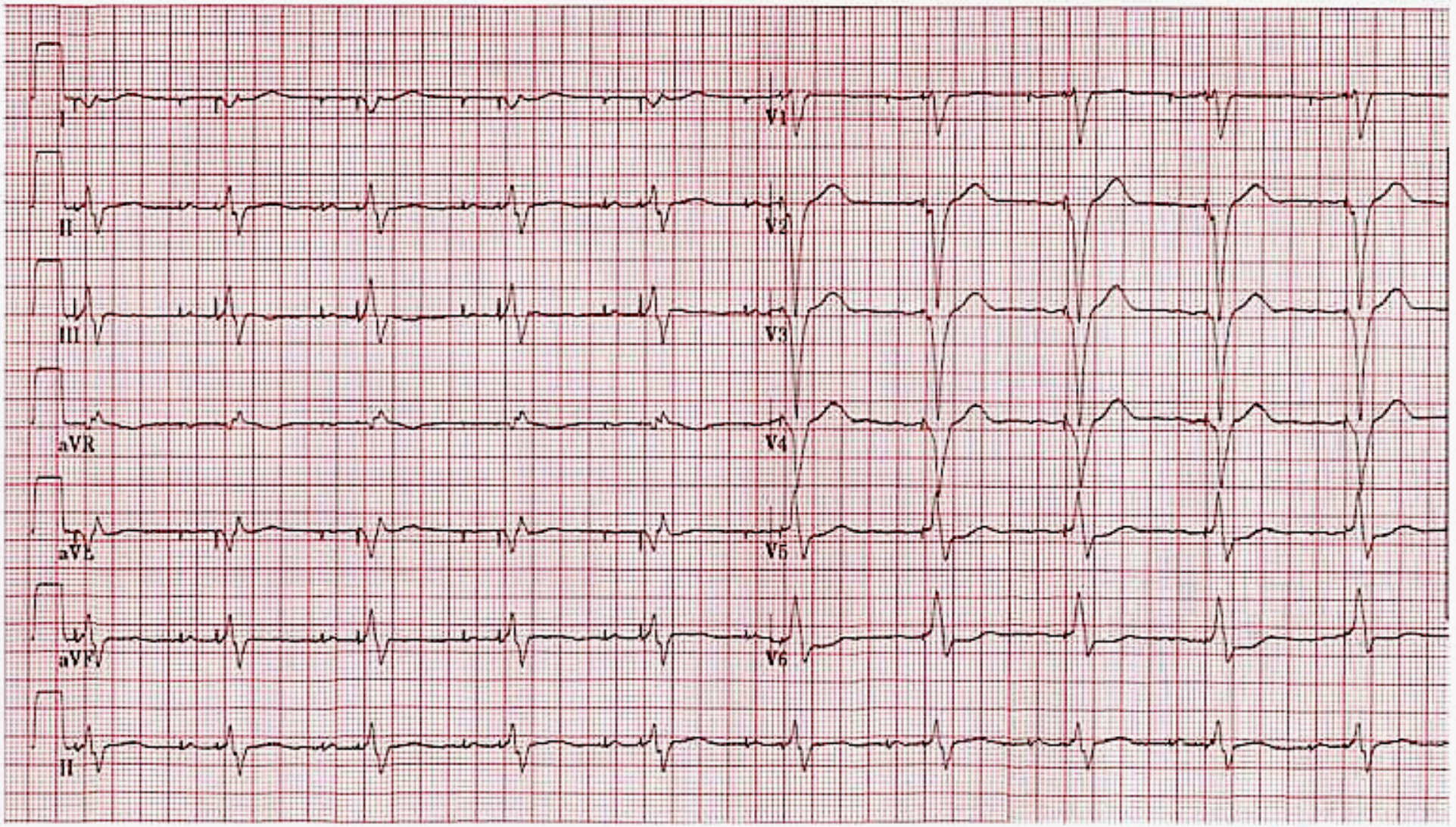


Courtesy of W.G. de Voogt, MD, PhD, Amsterdam, The Netherlands


12-Lead 1
HR 58bpm
10-03-05
1:53:03
PR 0.332s
QRS 0.100s
Incident ID:
QT/QTc:
0.420s/0.412s
Age: 37
Sex: F
P-QRS-T Axes:
75 87 97
I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
x1.0 .05-40Hz 25mm/sec
Medtronic Physio-Control
Comments:
Courtesy of K.J. Rooyaards, MD
ECG PEDIA.ORG


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
V5


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
V5


I
II
III
aVR
aVL
aVF
II
V1
V2
V3
V4
V5
V6
ECGPEDIA.ORG