Lesdoelstelling (1)

-De indicatie voor het maken van het ecg en de kwaliteitseisen benoemen

-De verpleegkundige aandachtspunten noemen bij het maken van een ecg

-CT en vectoren als begrip omschrijven

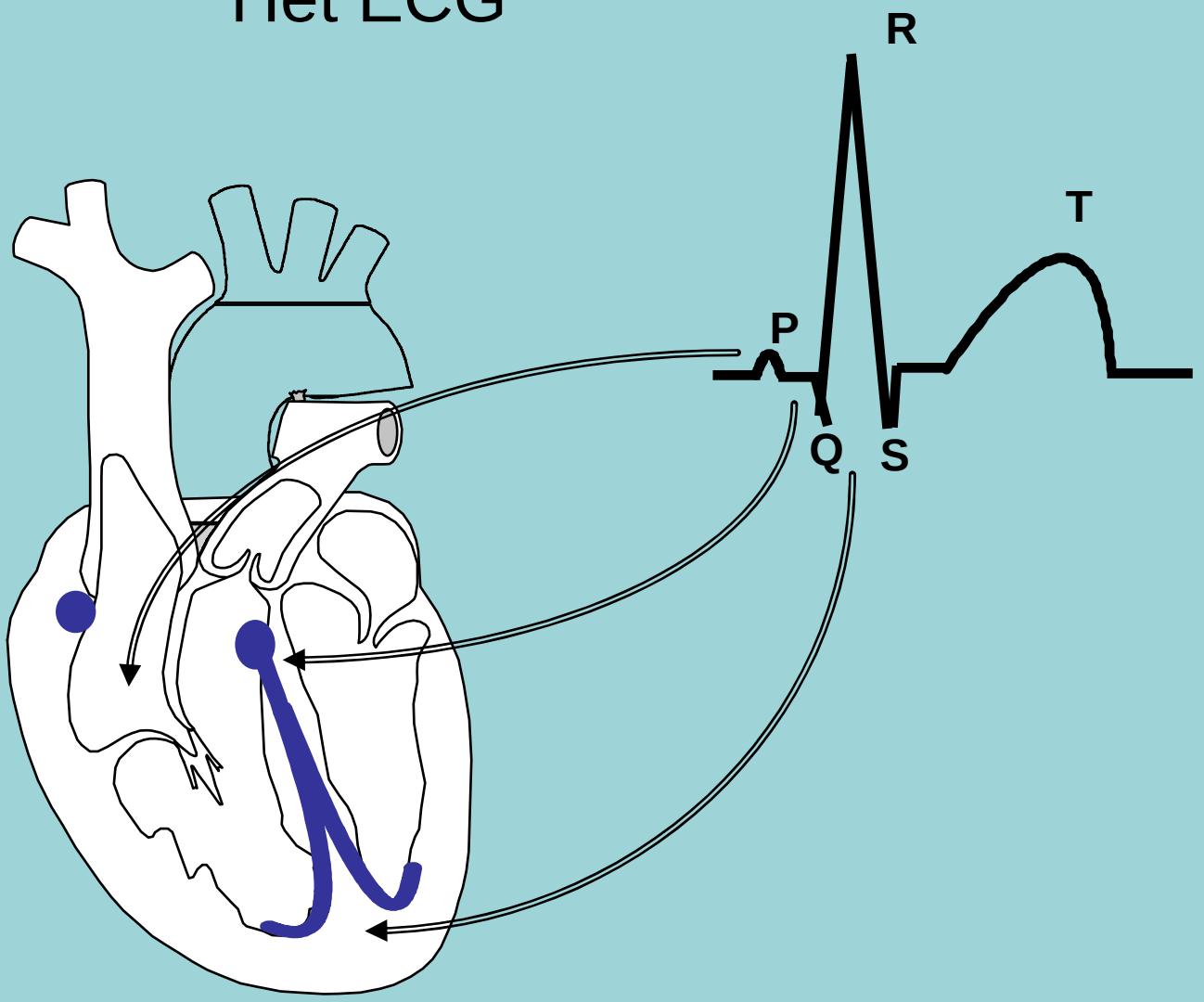
Lesdoelstelling (2)

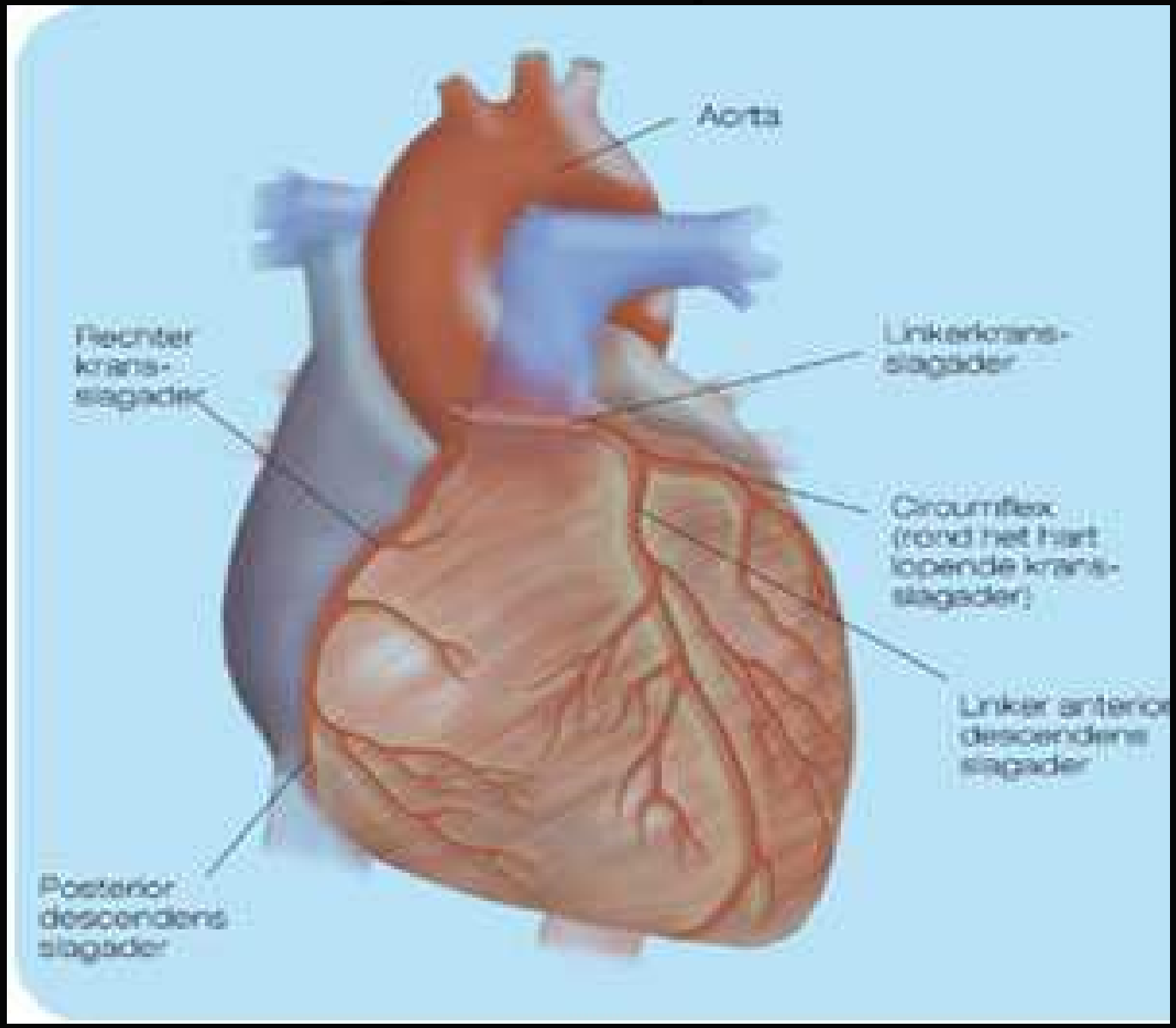
-De hartas bepalen

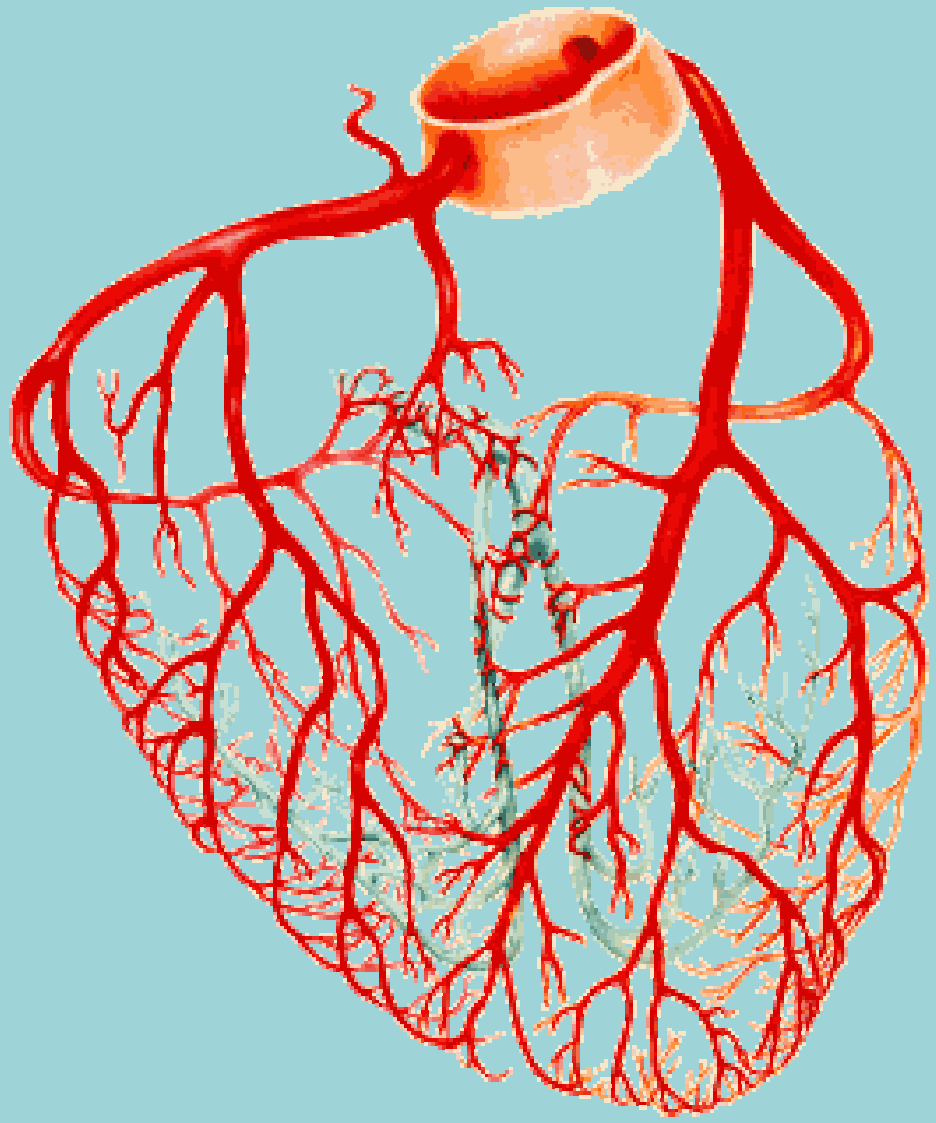
-Ischeamische kenmerken

-De standaardafleidingen
  -- Hun positie tov het hart
  -- En de vorm van het complex wat daarbij hoort benoemen

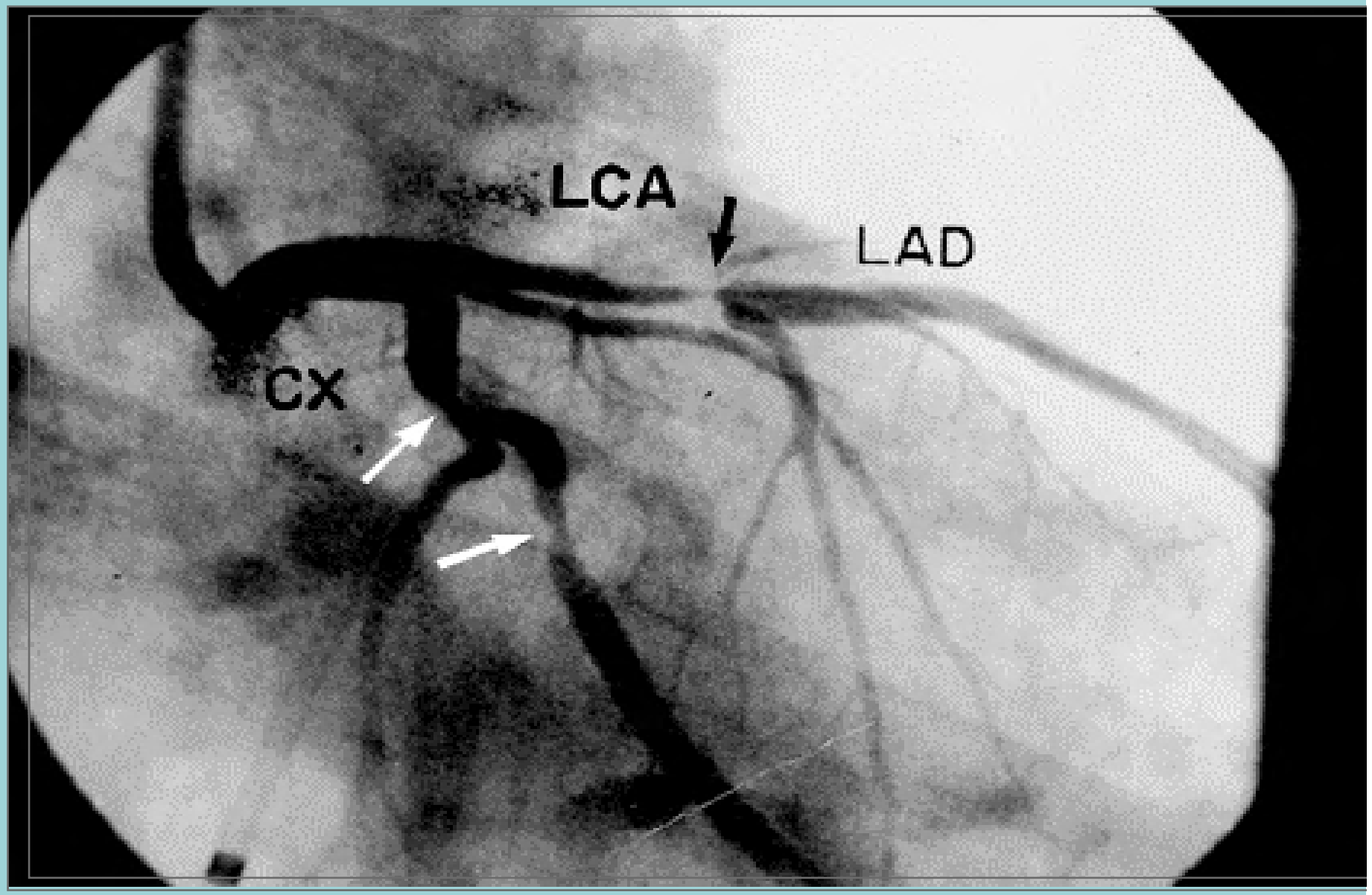
Het ECG




Aorta
Rechter kransslagader
Linkerkransslagader
Circumflex (rond het hart lopende kransslagader)
Linker anterior descenderens slagader
Posterior descenderens slagader



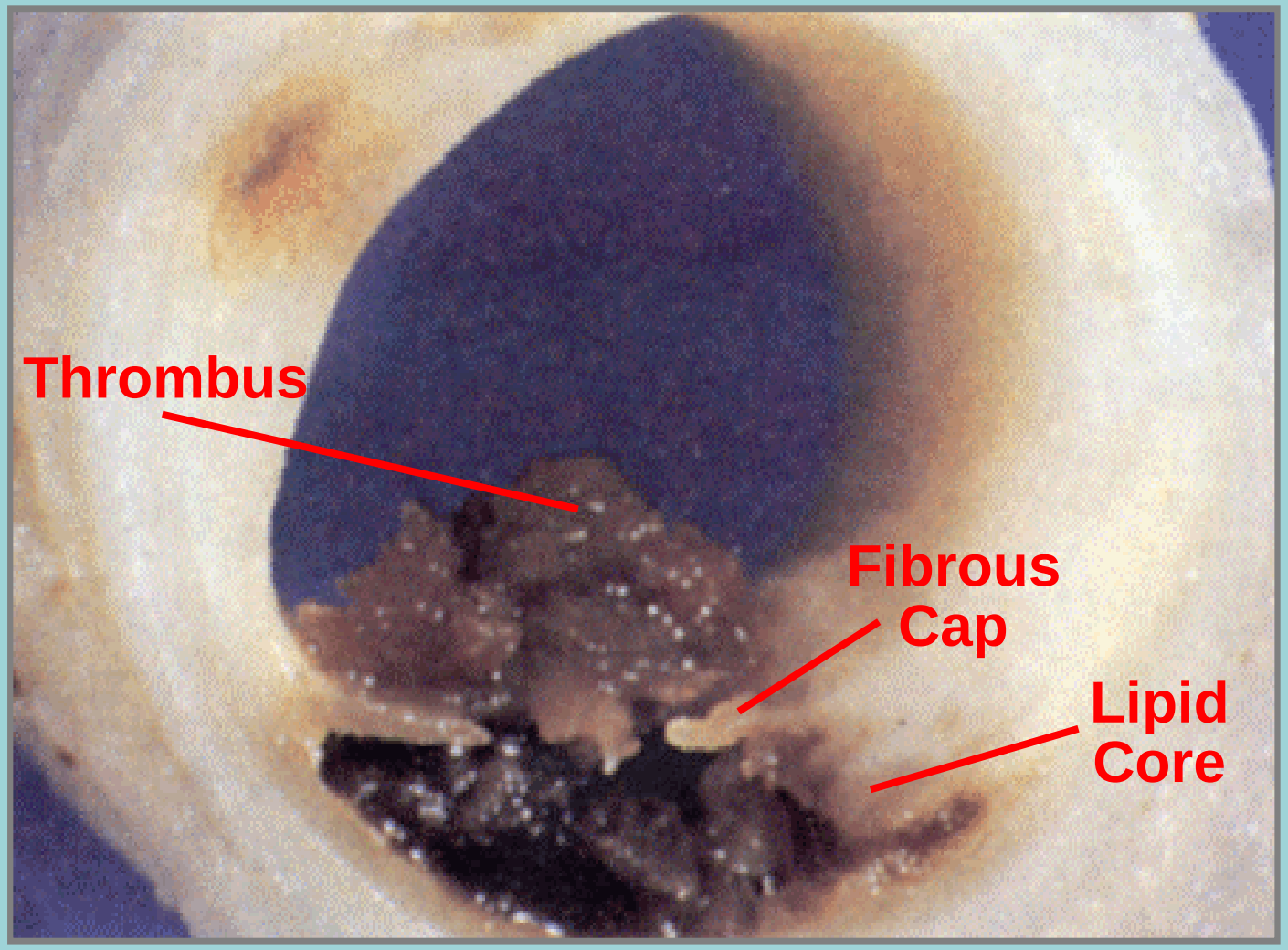
Coronaire atherotrombose

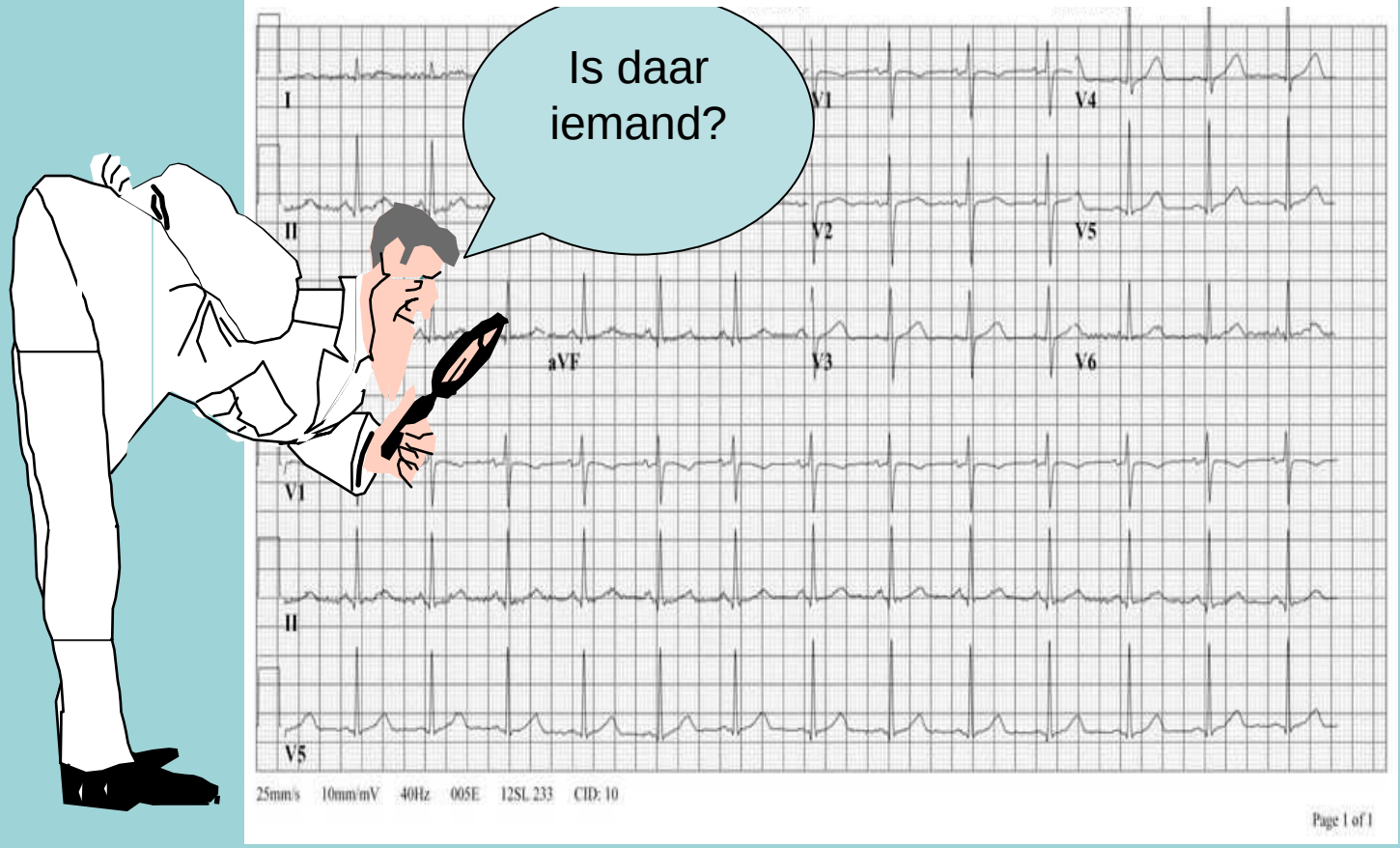


ECG

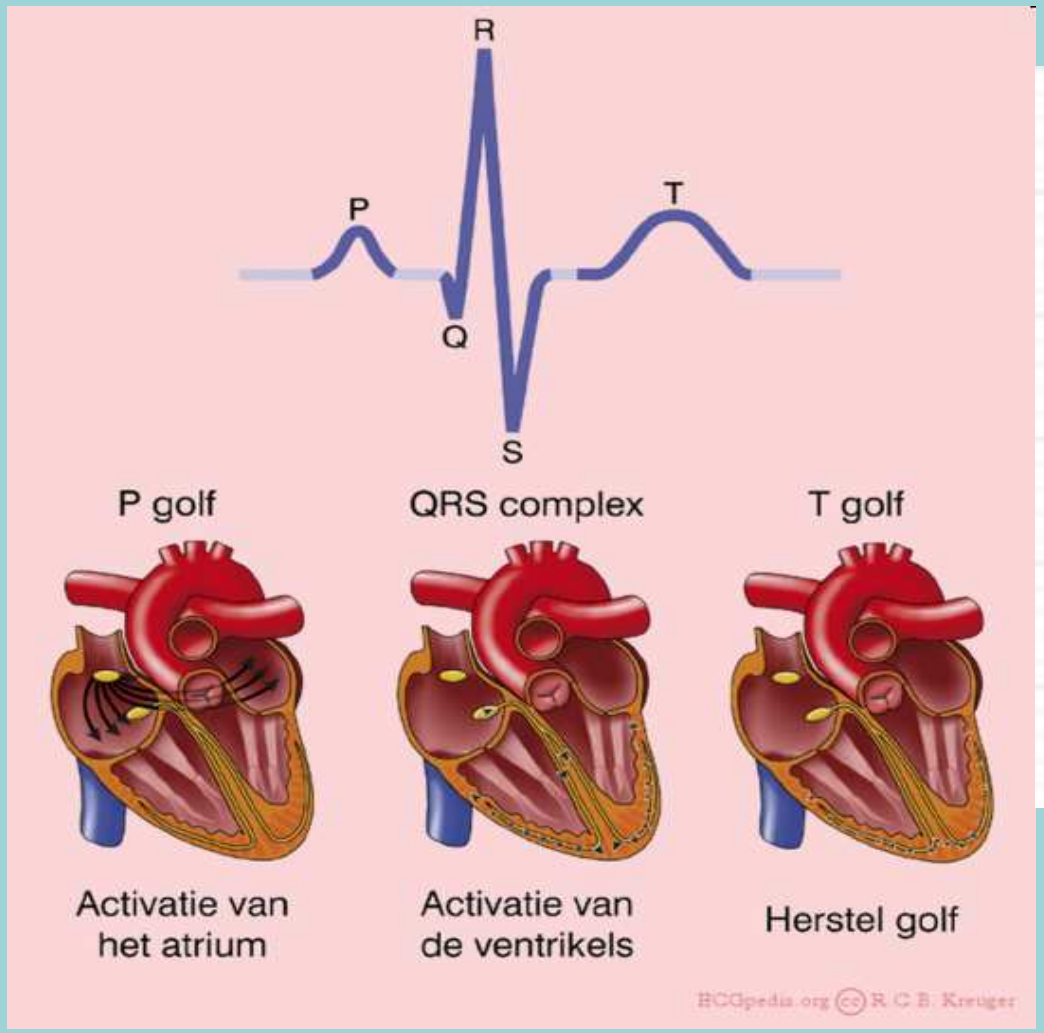
- http://www.youtube.com/watch?v=SNrTbeL2h84

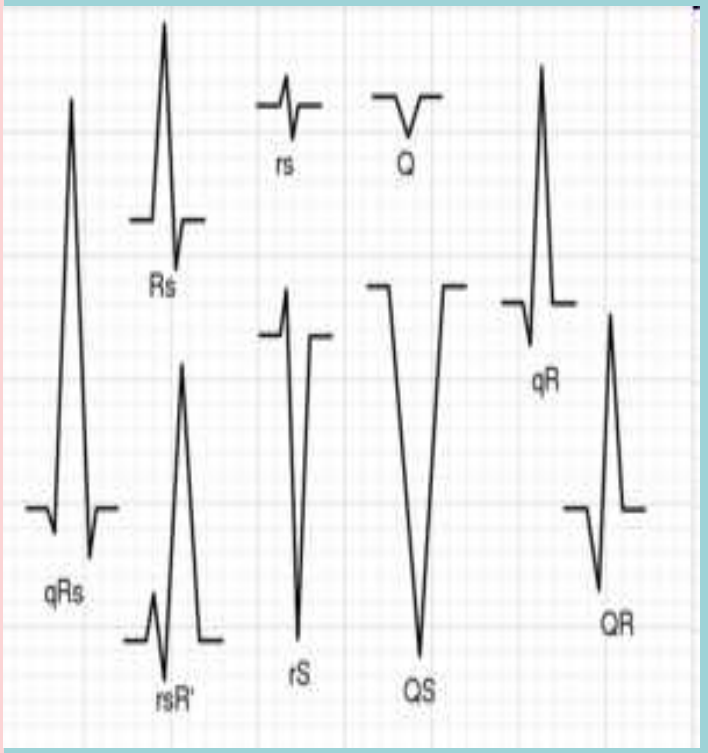
Plaque ruptuur




Is daar iemand?
I
II
V1
V2
V3
V4
V5
V6
aVF
V1
II
V5
25mm/s 10mm/mV 40Hz 005E 12SL 233 CID: 10
Page 1 of 1

Het QRS complex





Systematiek

- Technische staat
- Ritme op basis van de P top
- Frequentie
- Hartas
- Geleidingsintervallen
- Morfologie QRS complex
- Beoordeling ST segmenten
- Verpleegkundige interventies

Technische staat: kwaliteit

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:

I aVR V1 V4

II aVL V2 V5

III aVF V3 V6

V1

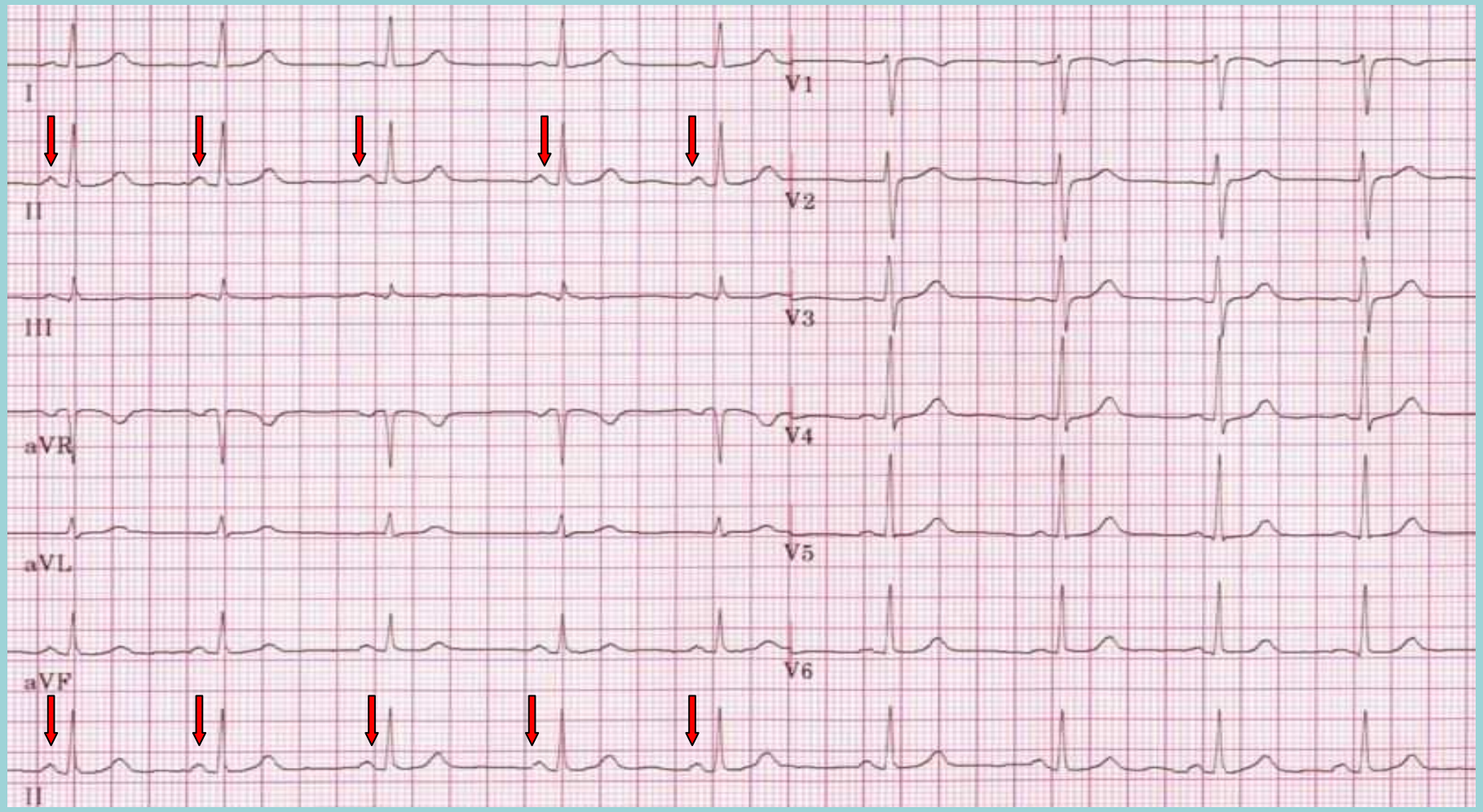
II

V5

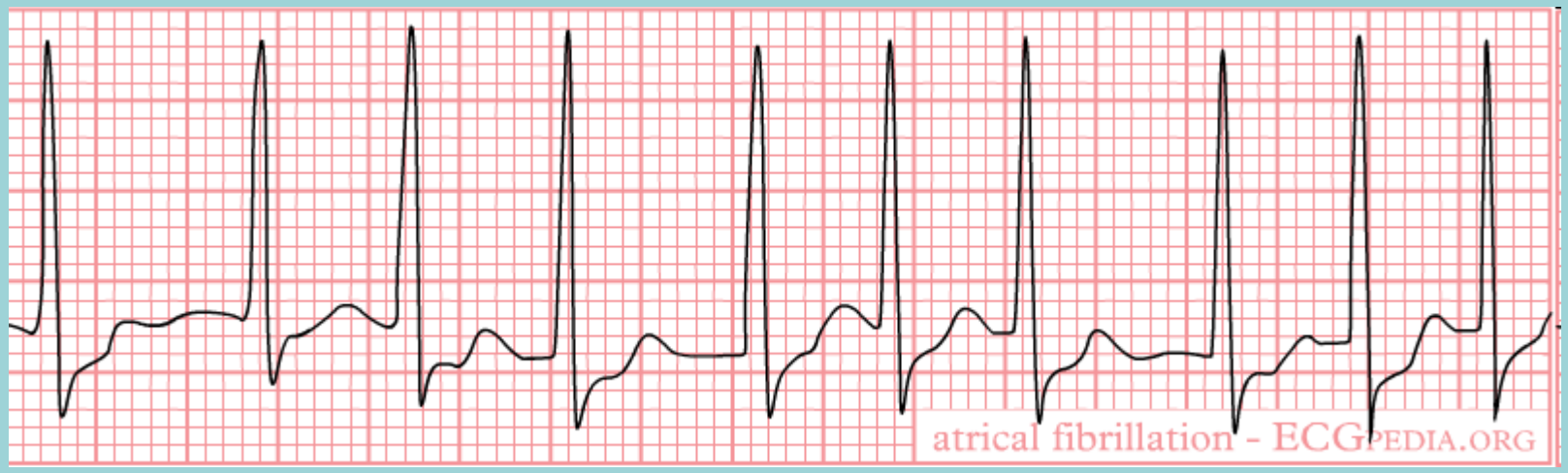
25mm/s 10mm/mV 40Hz 005E 12SL 233 CID: 10

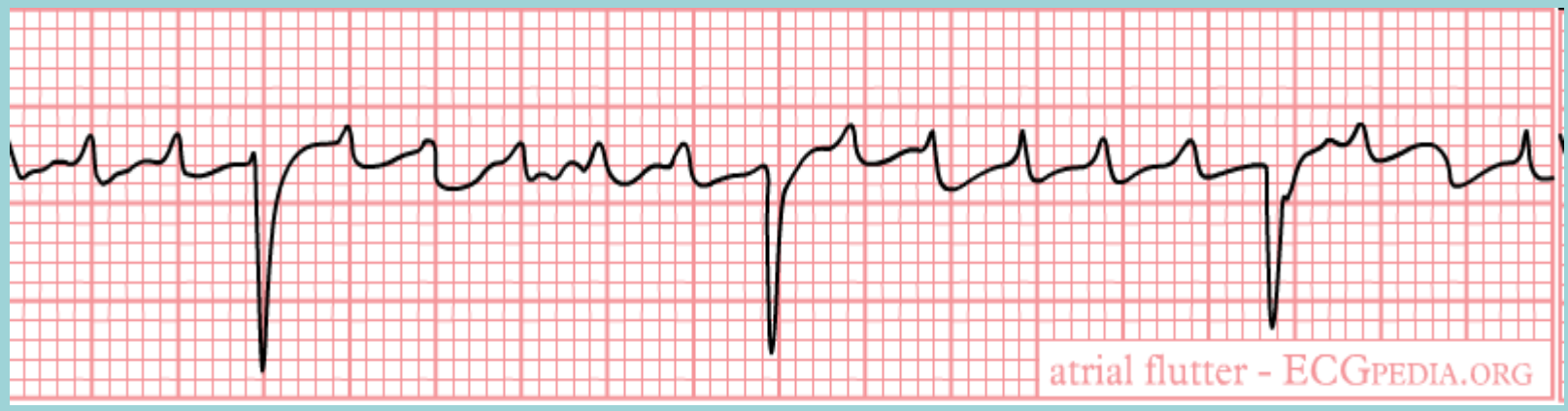
Page 1 of 1

Ritme op basis van de P top

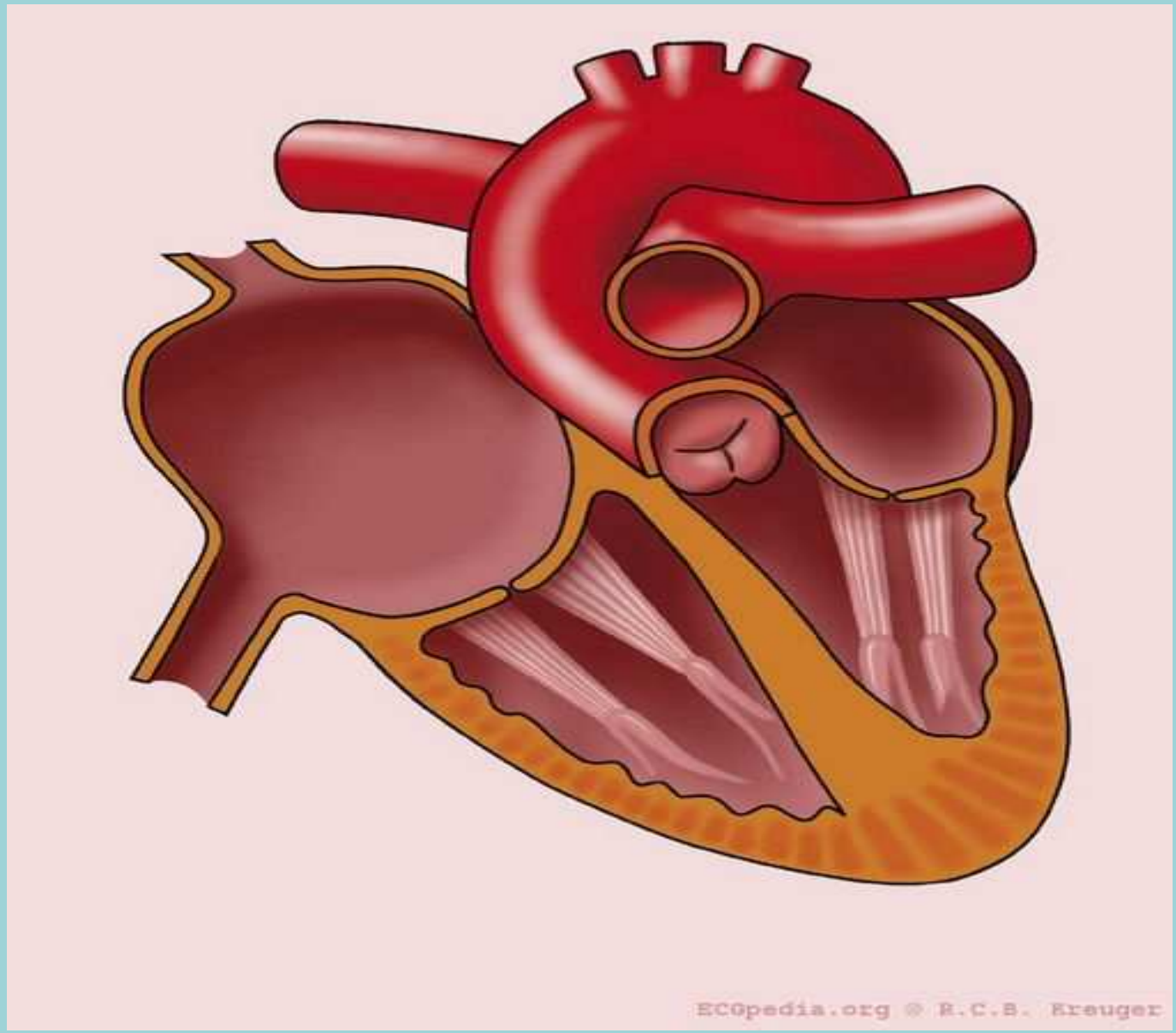


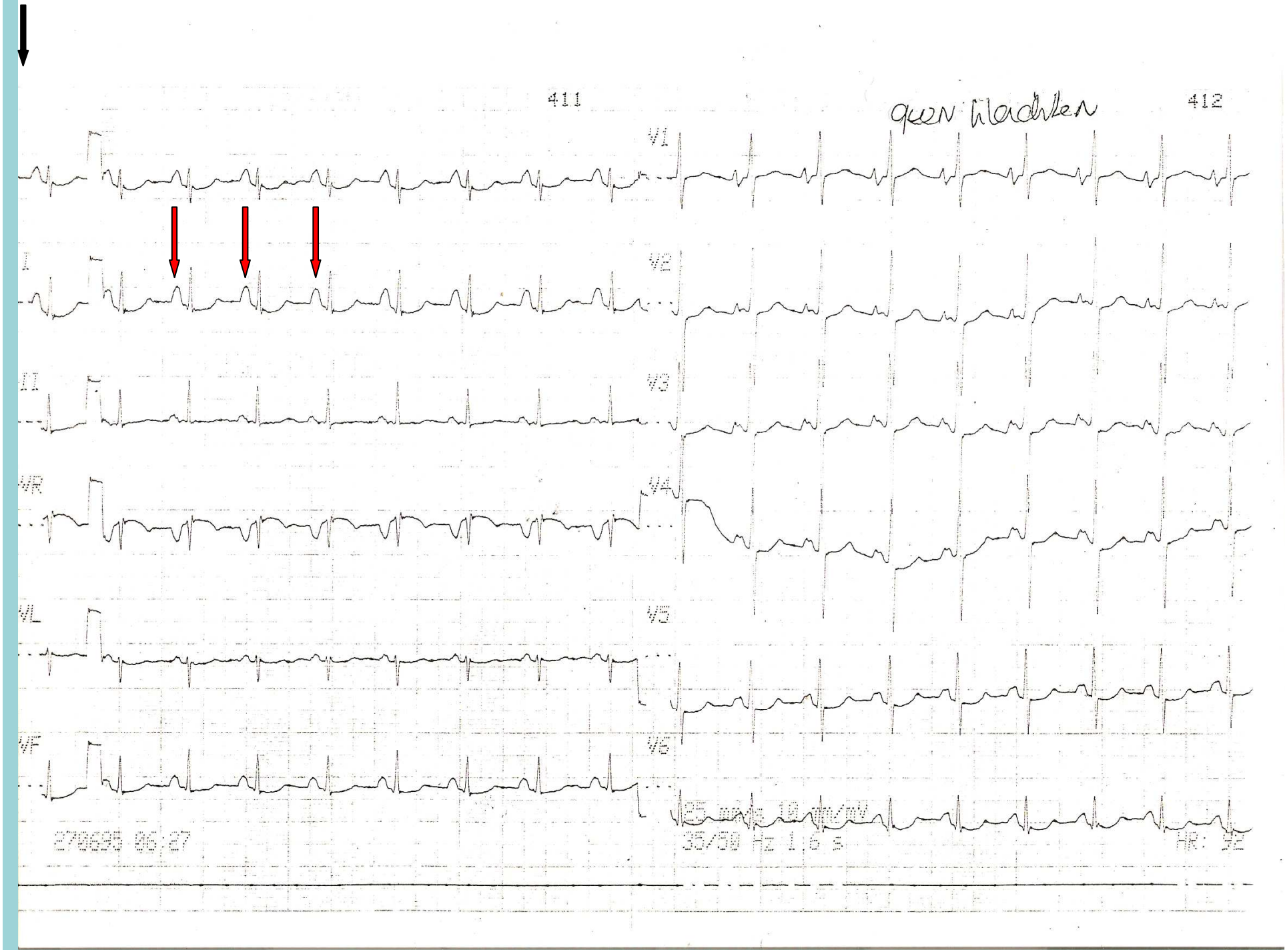
P toppen?


atrical fibrillation - ECGPEDIA.ORG

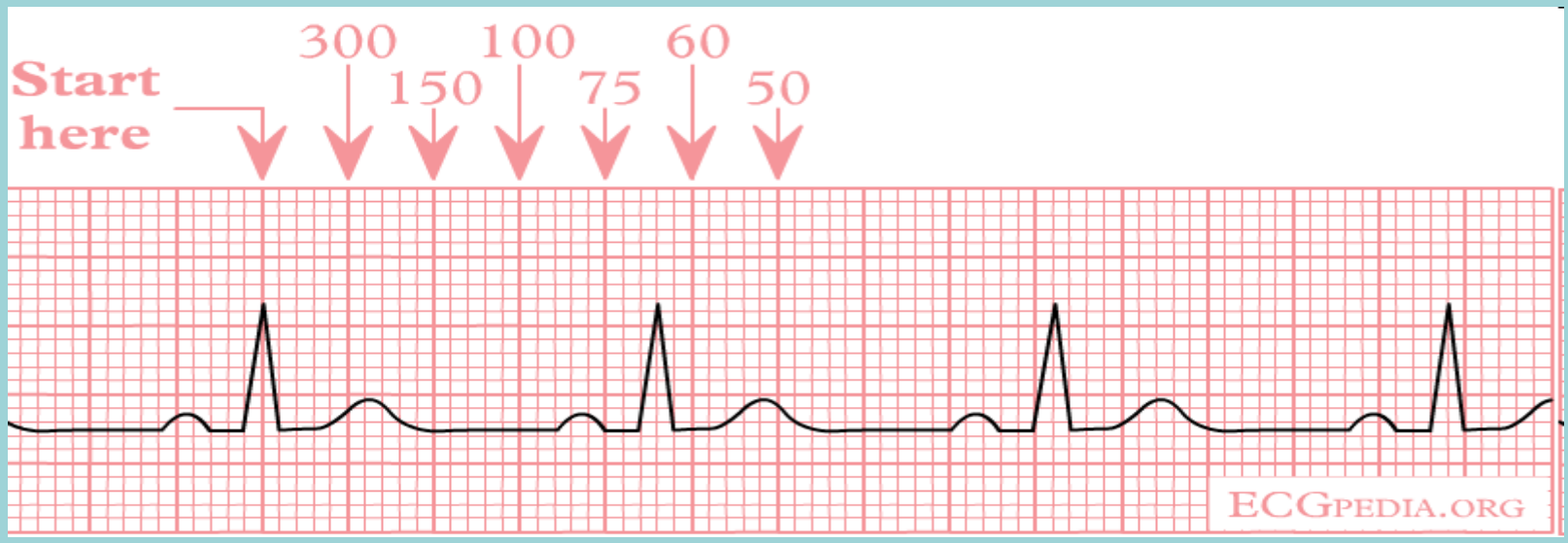

atrial flutter - ECGPEDIA.ORG

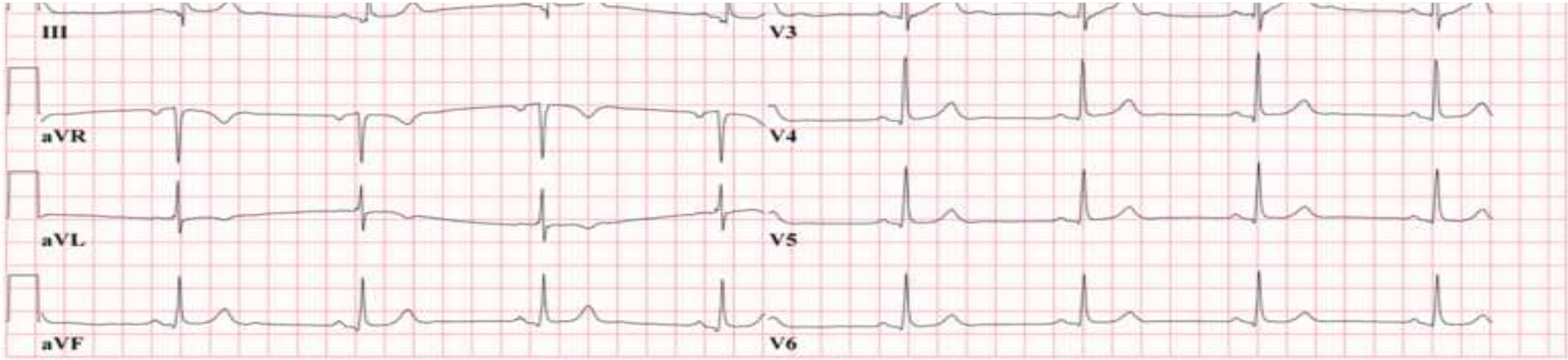
Dilatatie atrium




411
412
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
25 mm/s 10 mm/mV
35/50 Hz 1.6 s
HR: 92

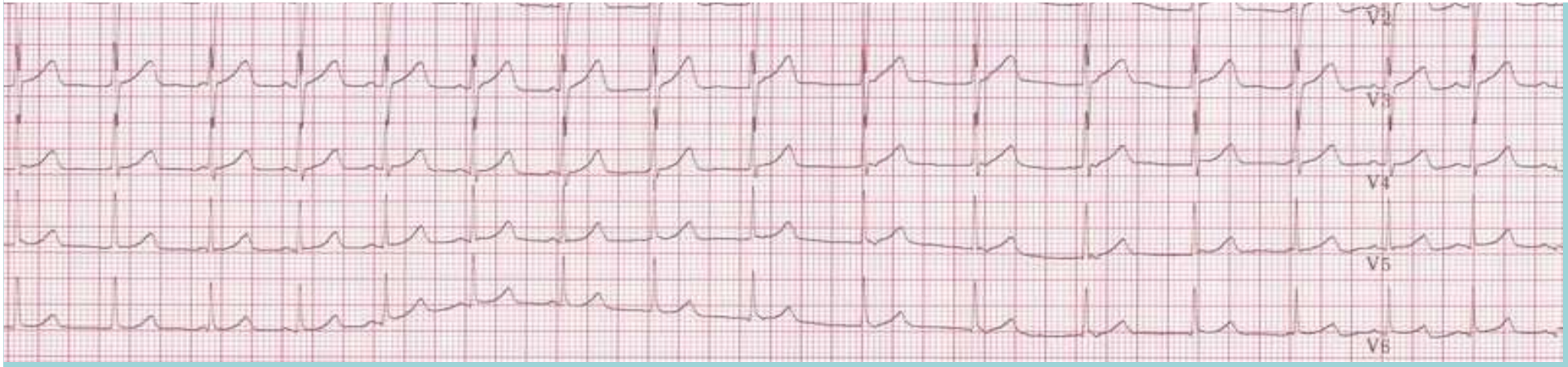
De frequentie

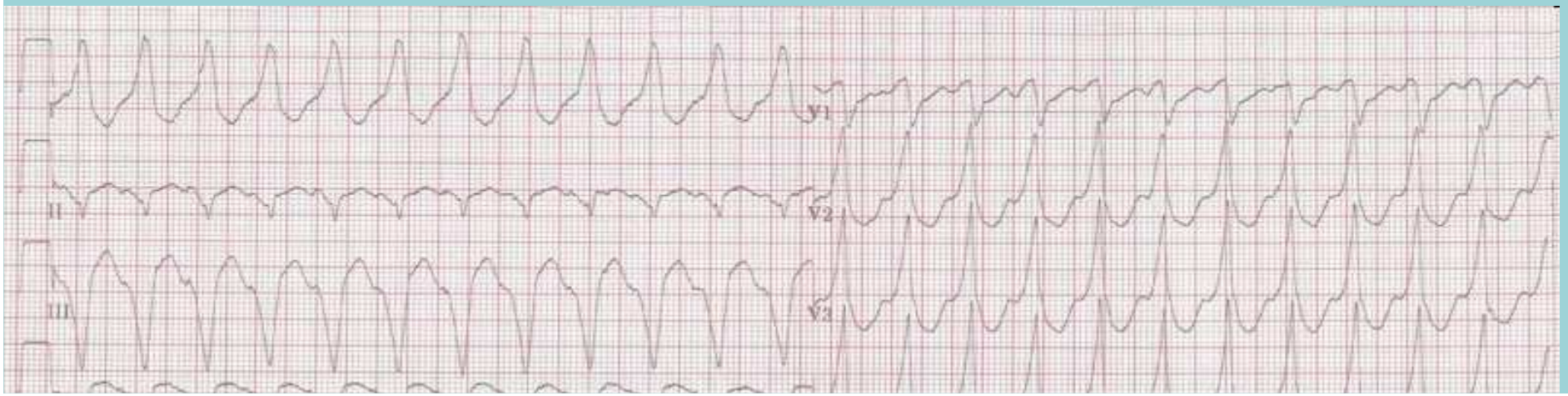




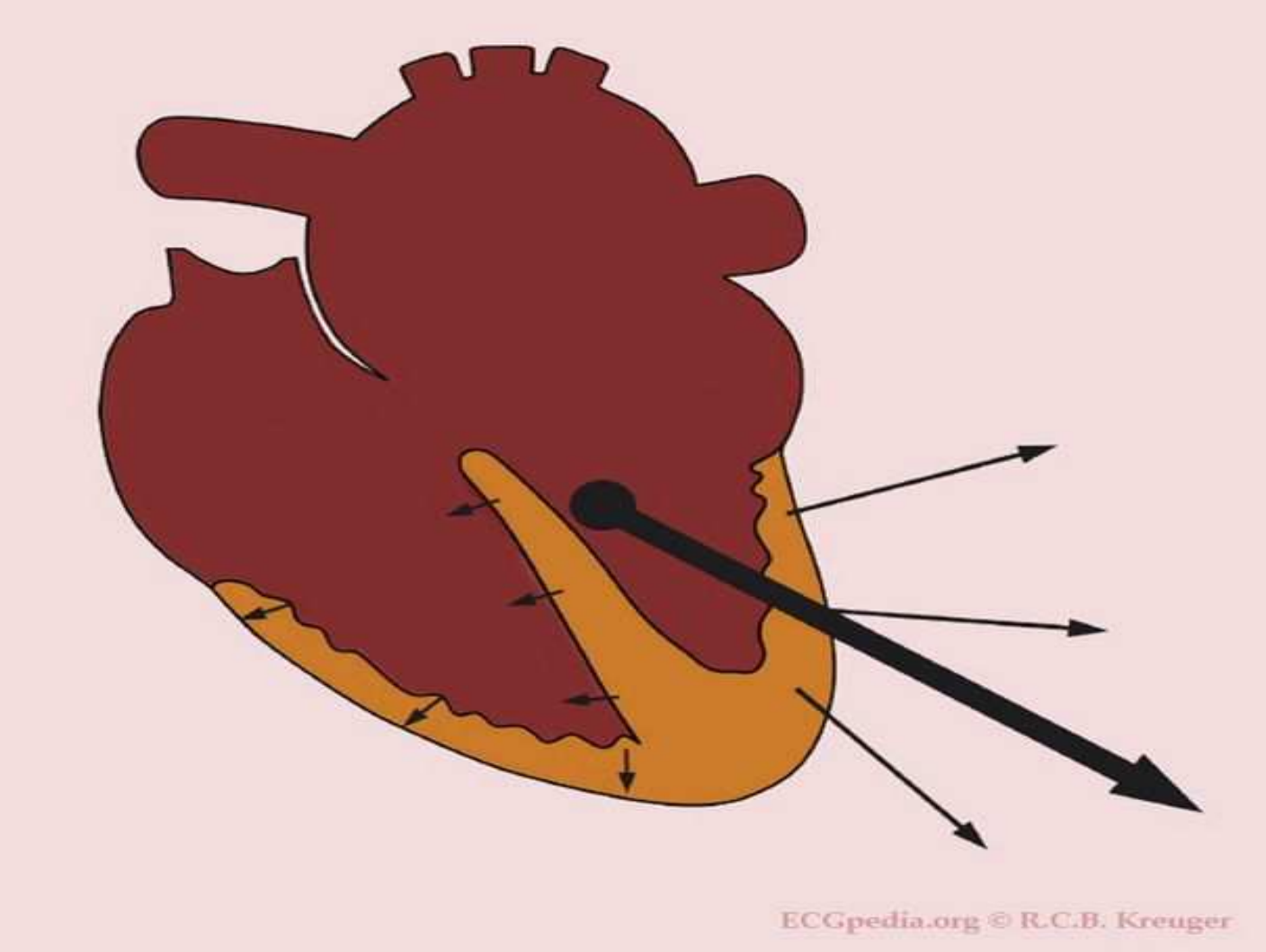
Courtesy of I.A.C. van der Bilt, M.D., AMC. The Netherlands

ECG PEDIA.ORG

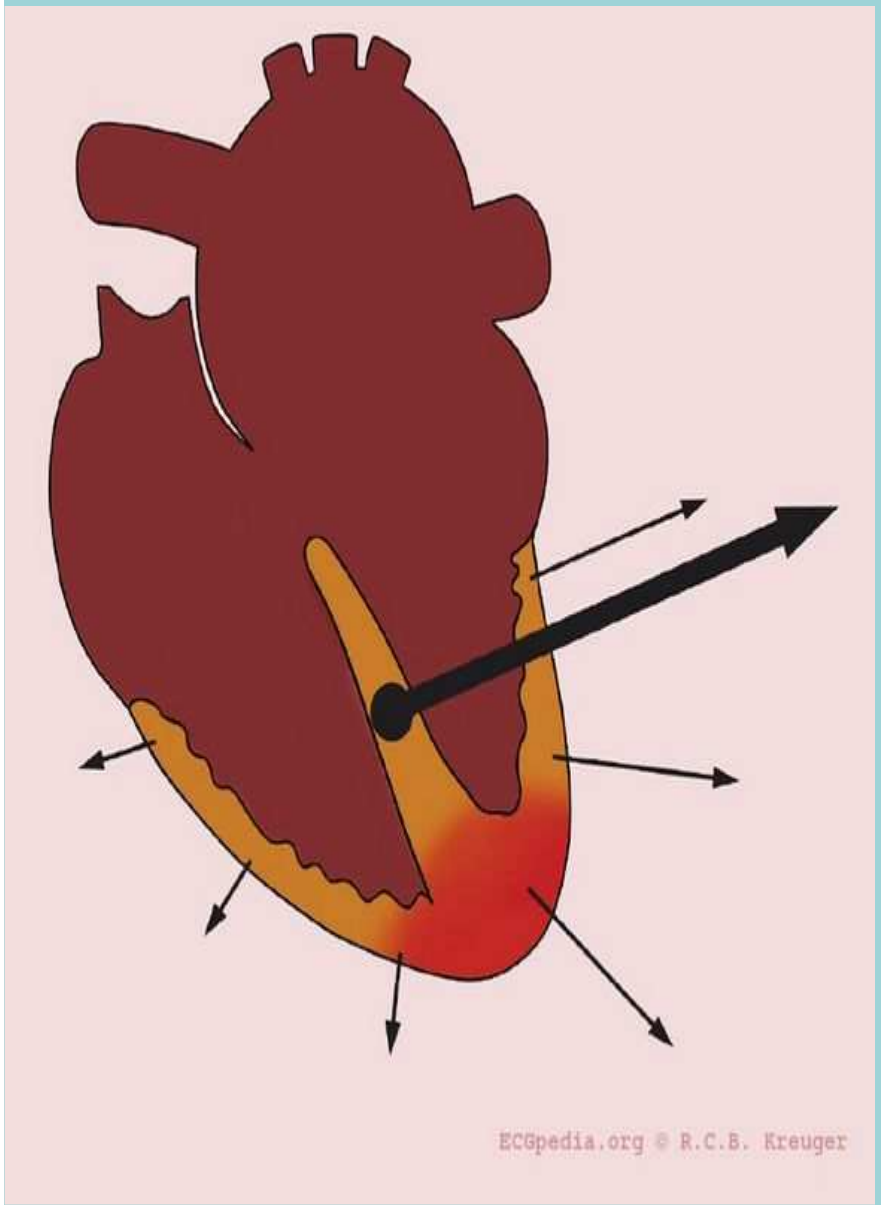




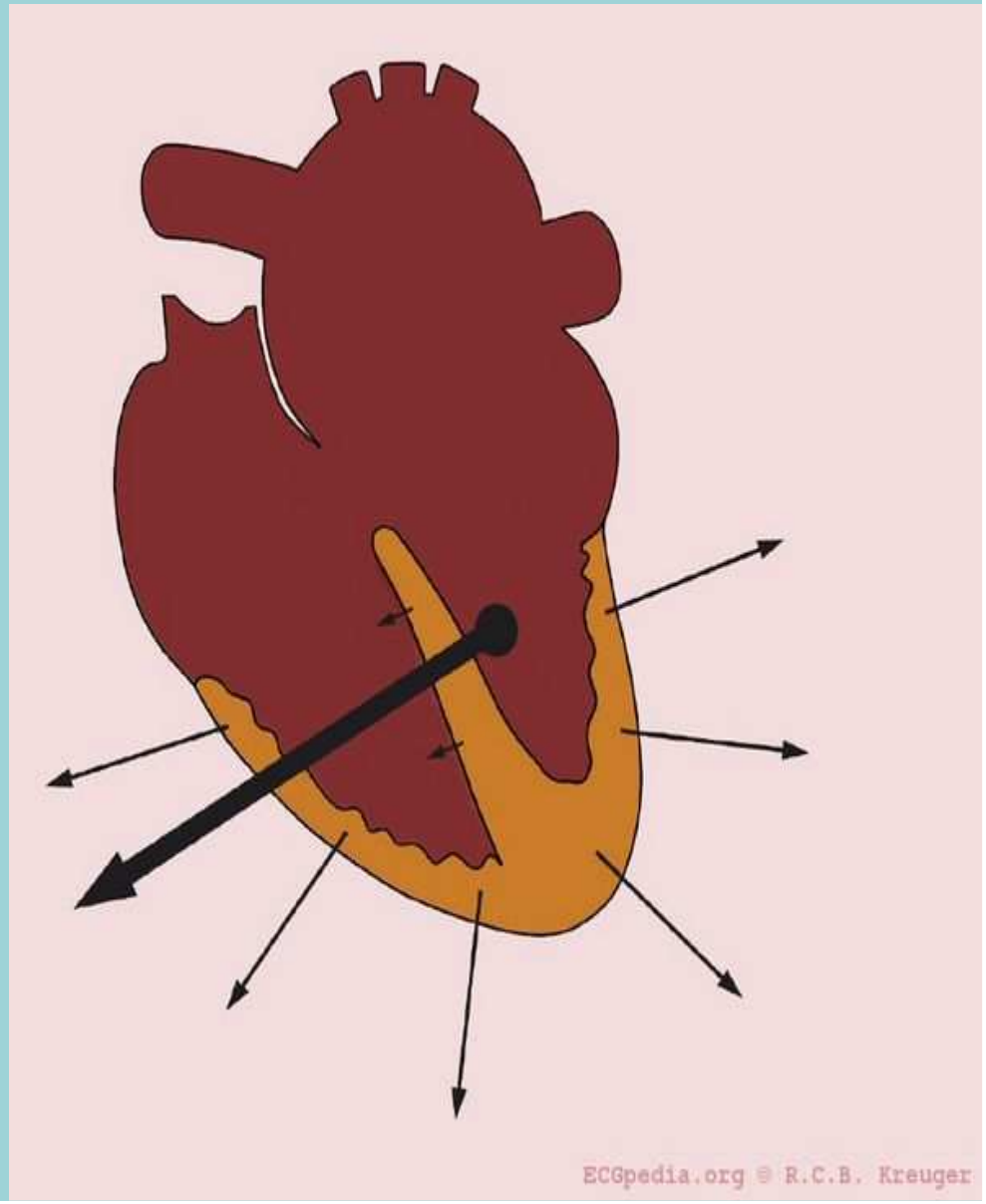
De hartas



Naar links



Naar rechts



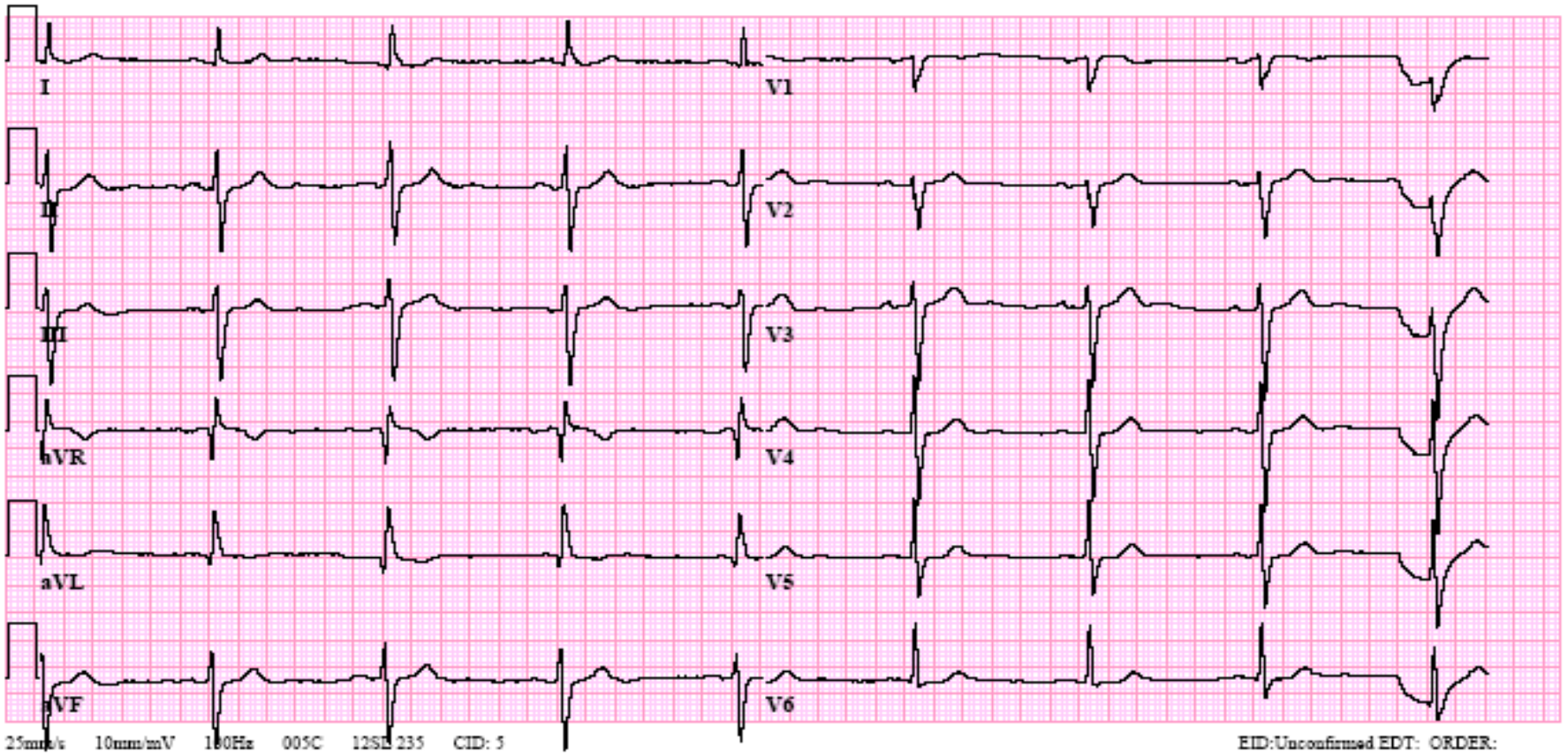
Linker-as draai

16-SEP-2005 15:41:18 A.A.K.

29-FEB-1952 (53 yr)
Male

Room:B1
Loc:30

Referred by: Unconfirmed



25mm/s 10mm/mV 100Hz 005C 12SL 235 CID: 5

EID:Unconfirmed EDT: ORDER:

Page 1 of 1

Rechter-as

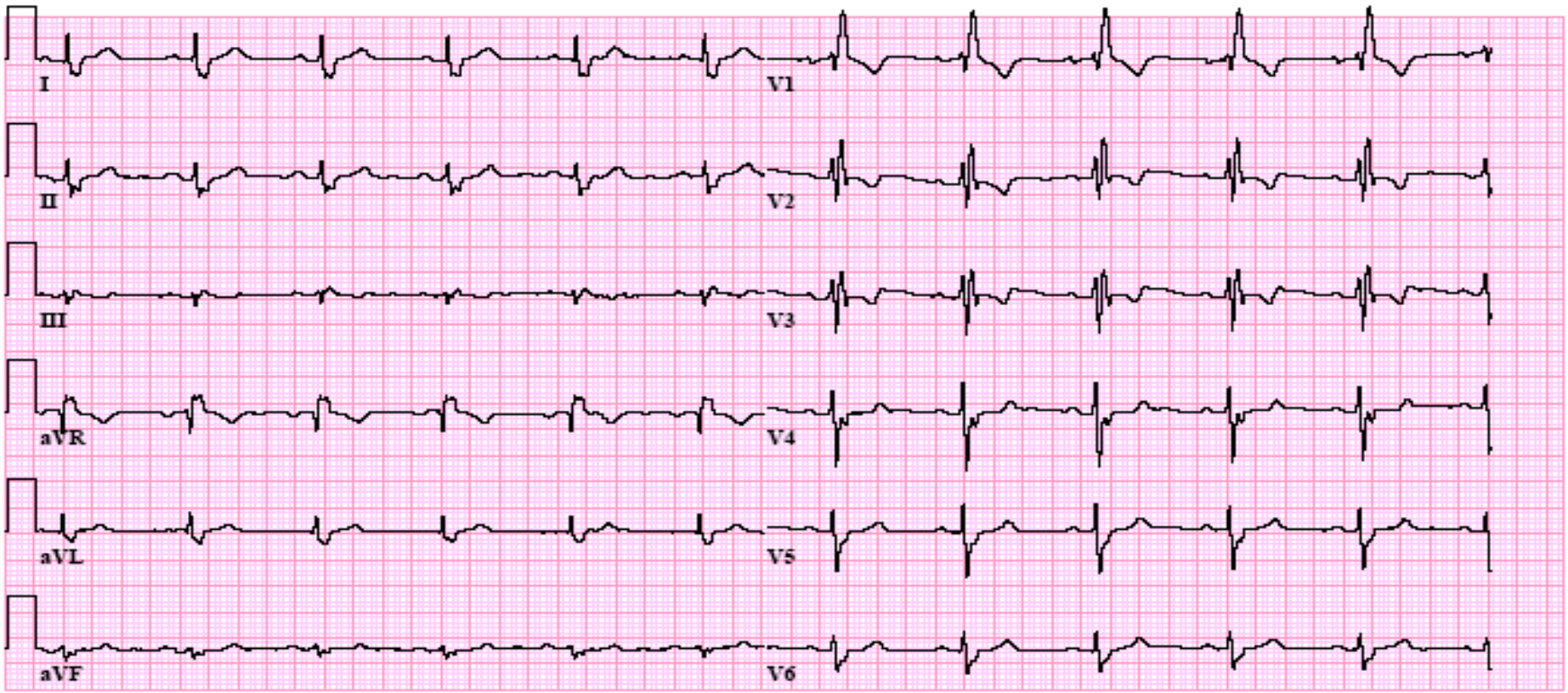
31-JUL-2006 10:01:09 A.A.K.

30-OCT-1950 (55 yr)
Male

Loc:9

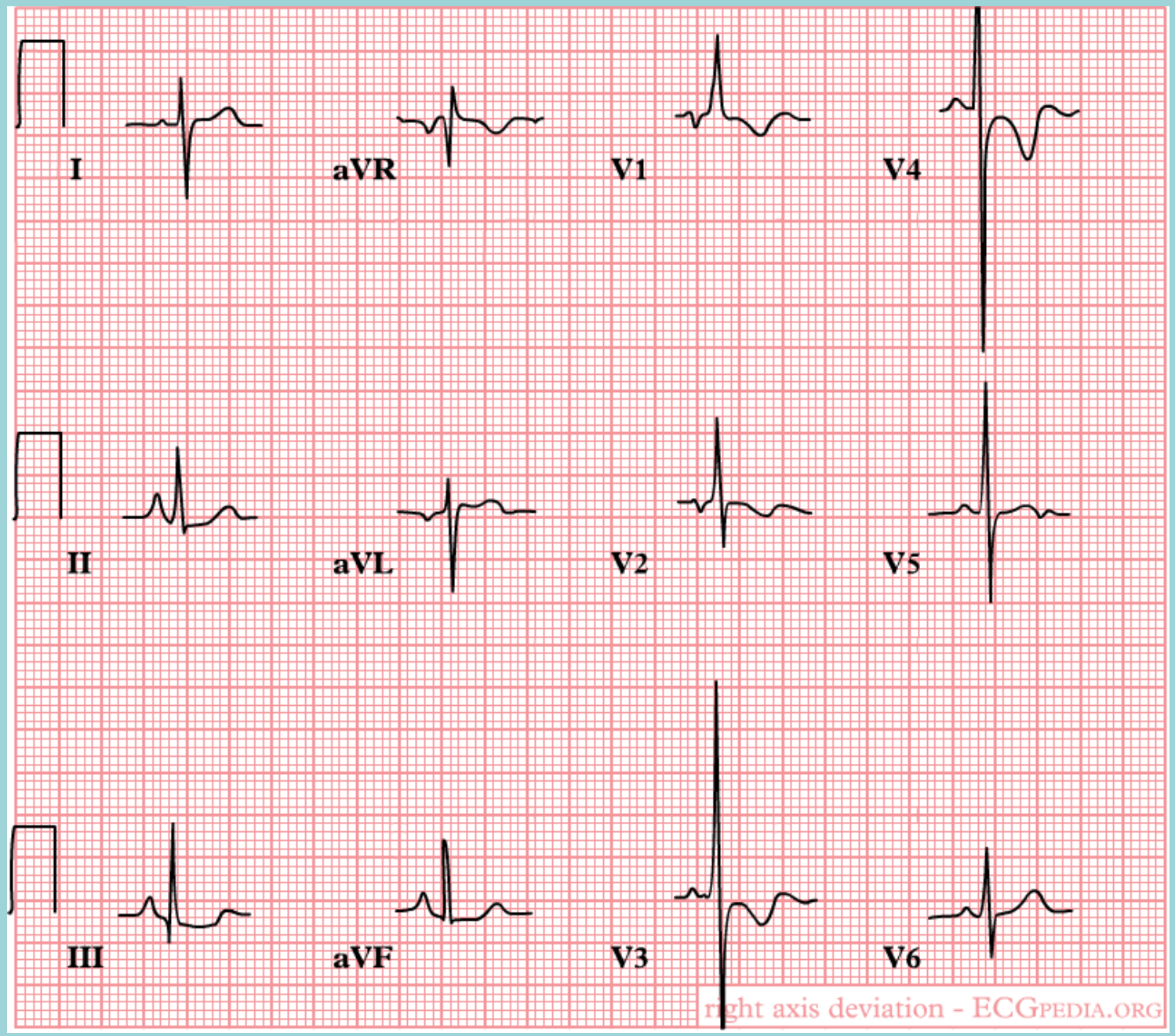
RBTB

Referred by: Confirmed By:

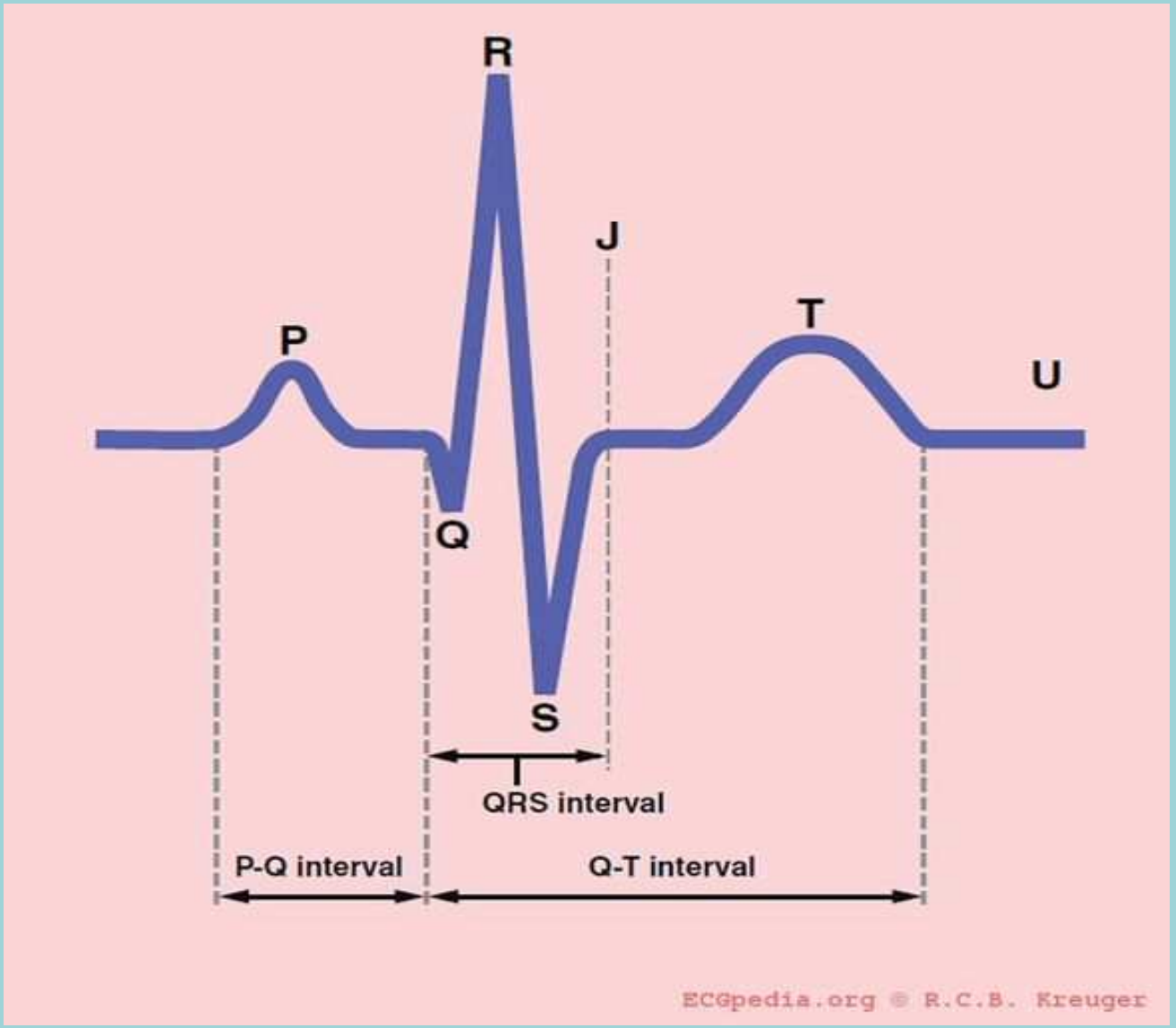


25mm/s 10mm/mV 100Hz 005C 12SL 235 CID: 5

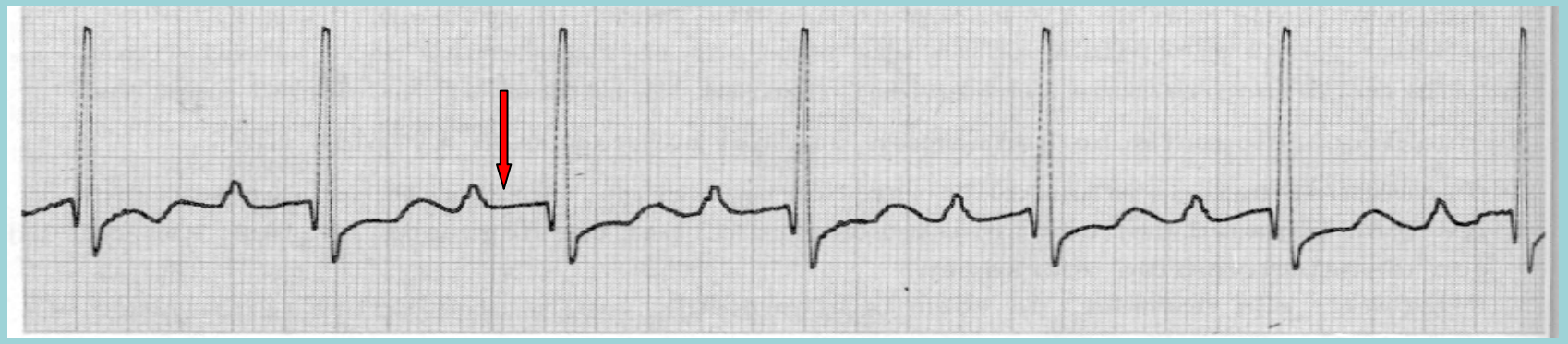
EID:148 EDT: 15:21 31-JUL-2006 ORDER:

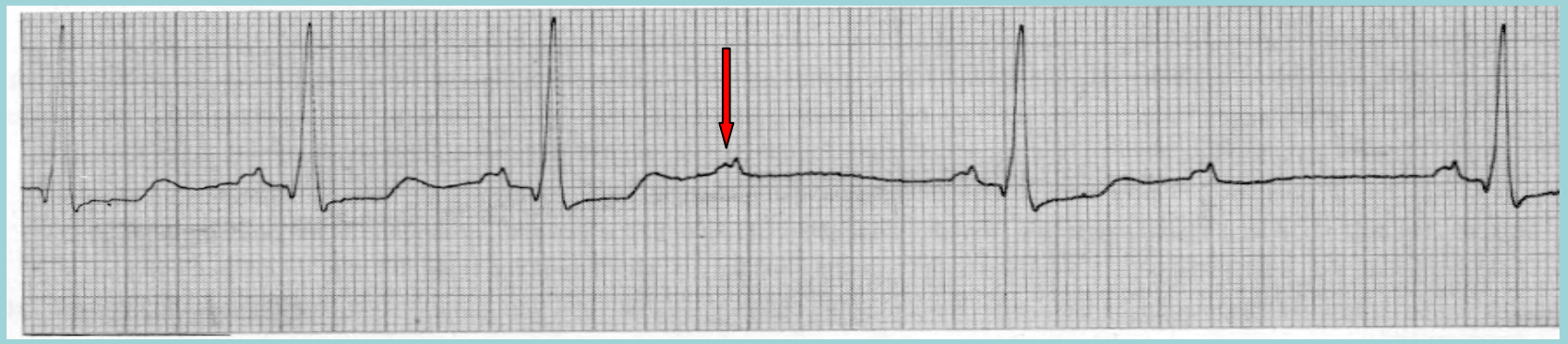

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
right axis deviation - ECGpedia.org

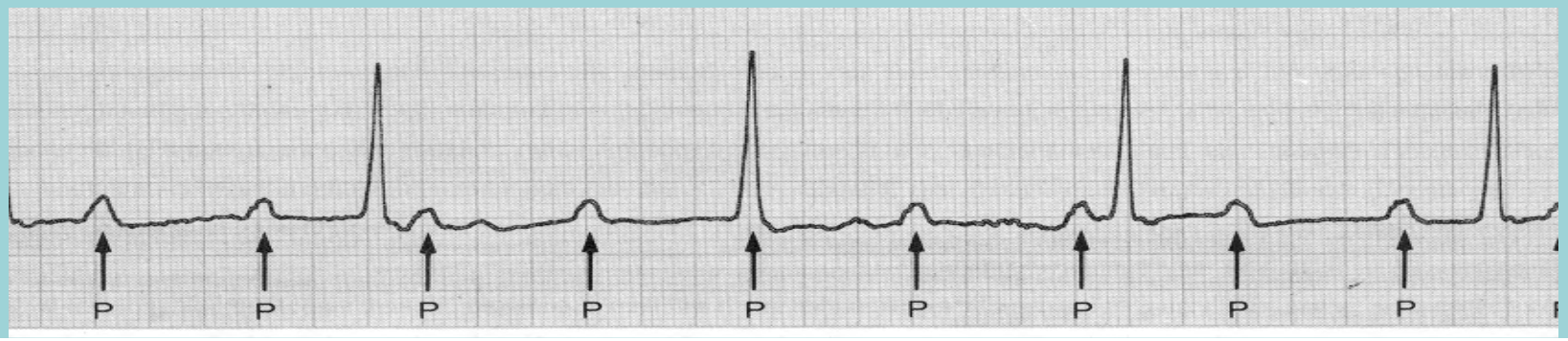
De geleidingstijden



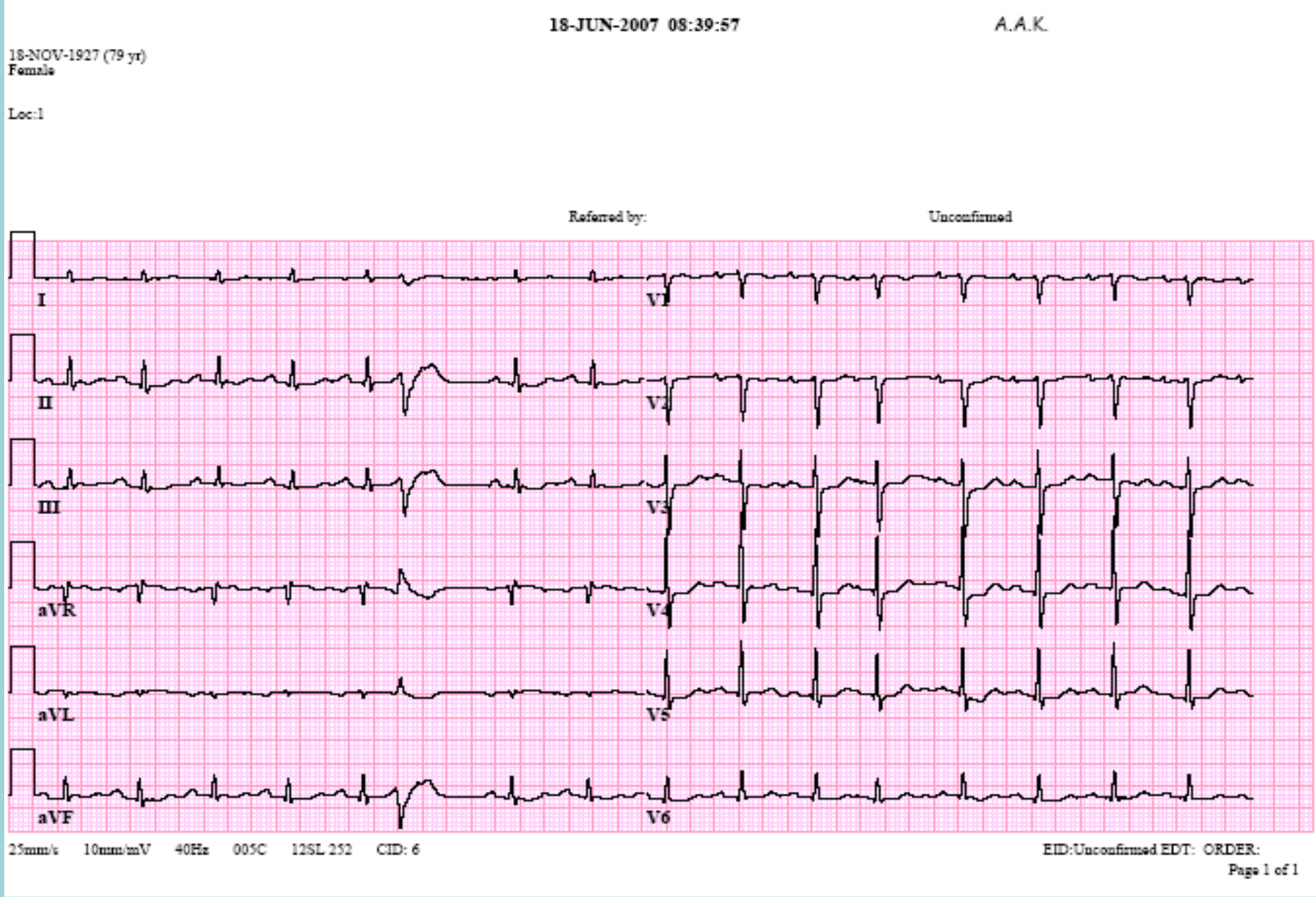
Het PQ interval



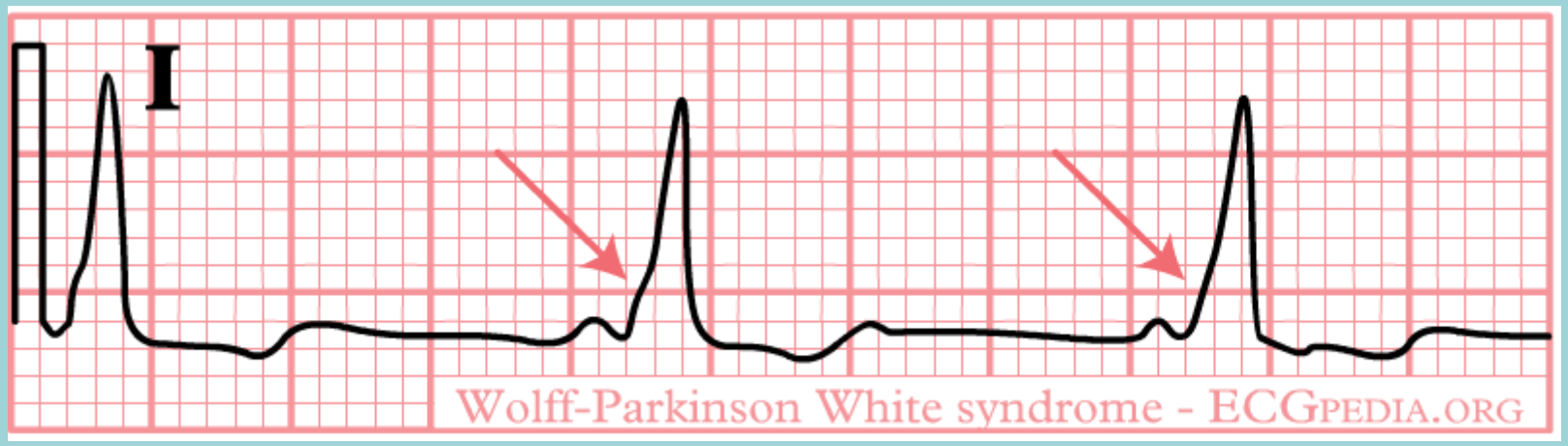


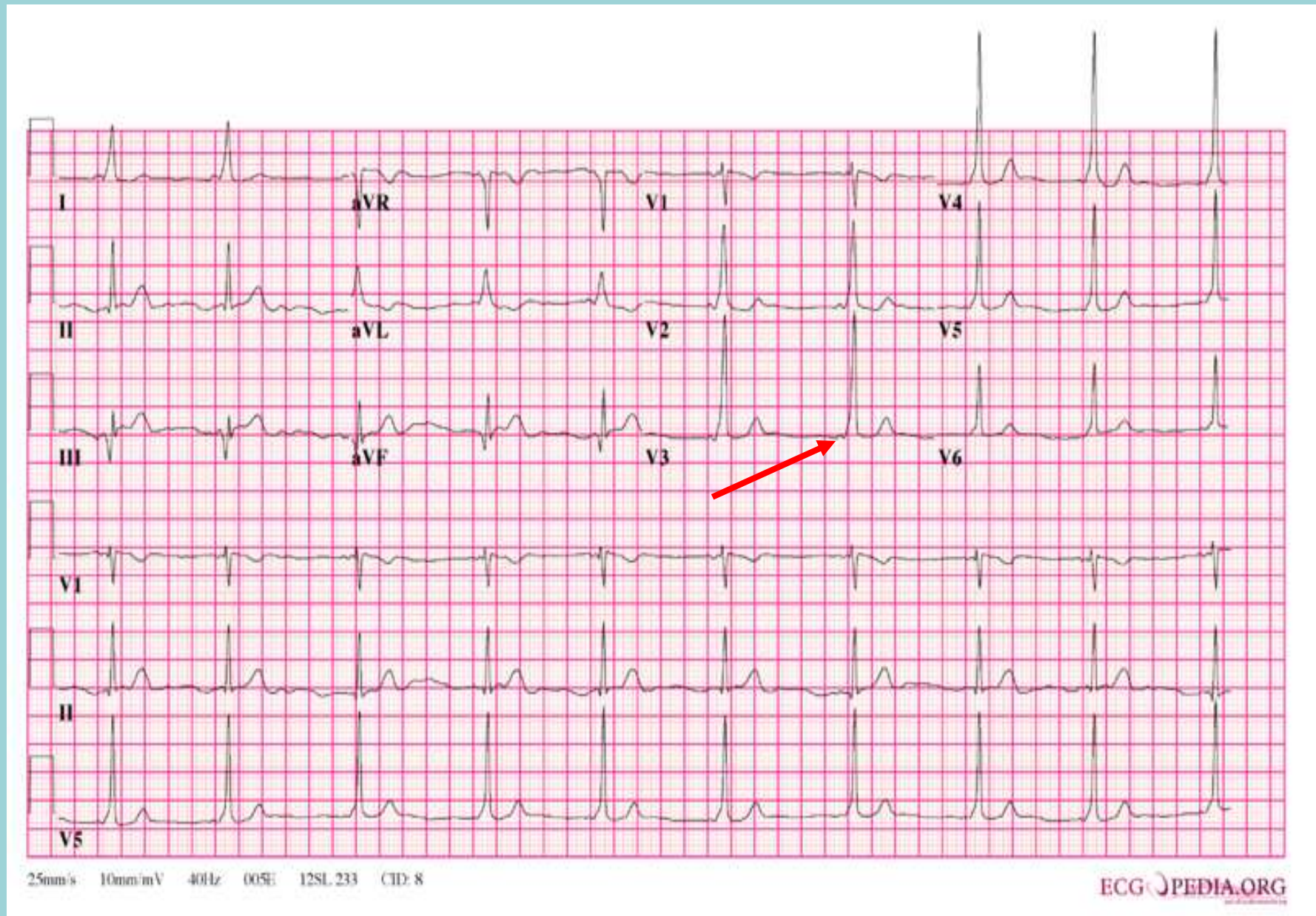


1e gr AV block

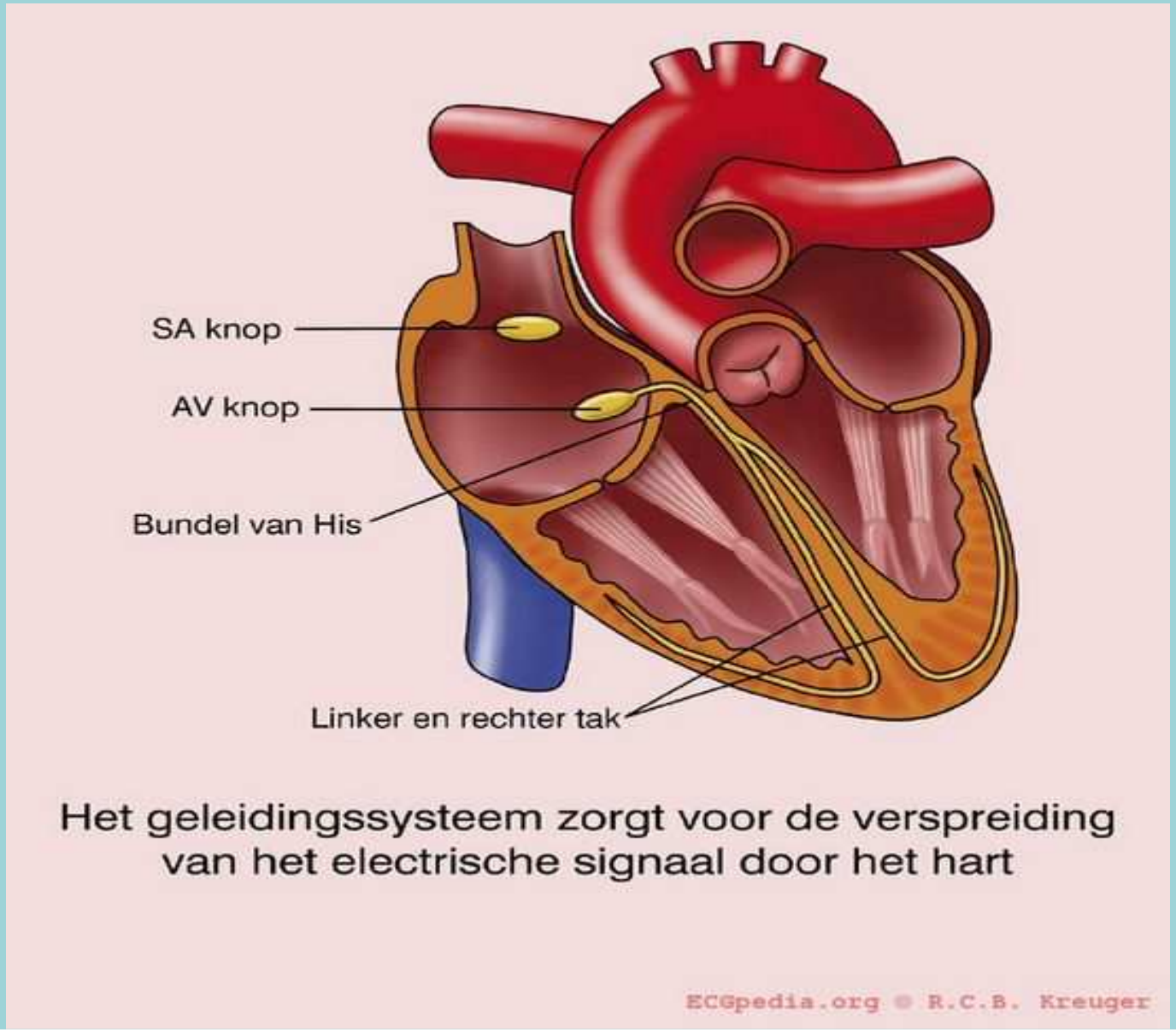


Te kort !!




I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
V5
25mm/s 10mm/mV 40Hz 005E 12SL 233 CID: 8
ECG PEDIA.ORG

Het QRS interval



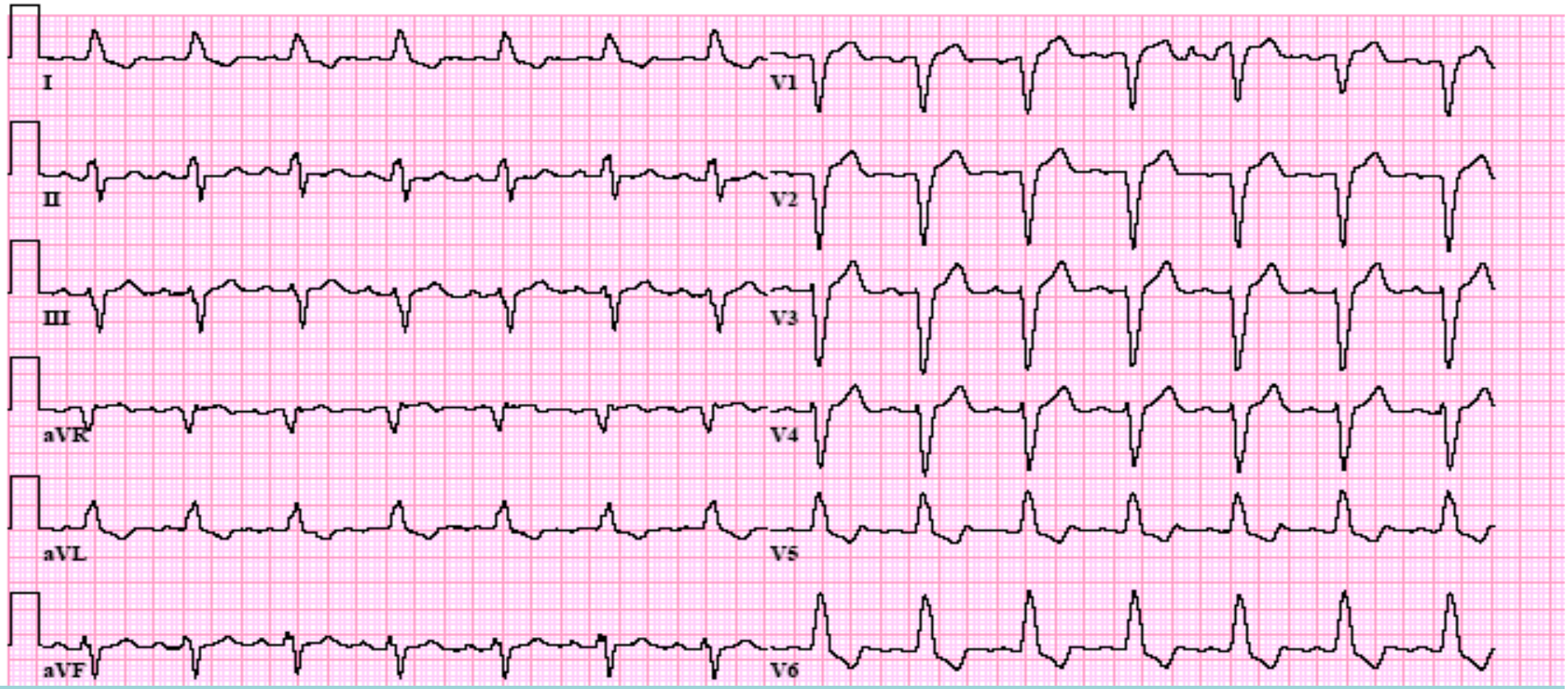
LBTB

04-JAN-2009 08:15:13 A.A.K.

13-DEC-1936 (72 yr)
Female

Loc:1

Referred by: Unconfirmed

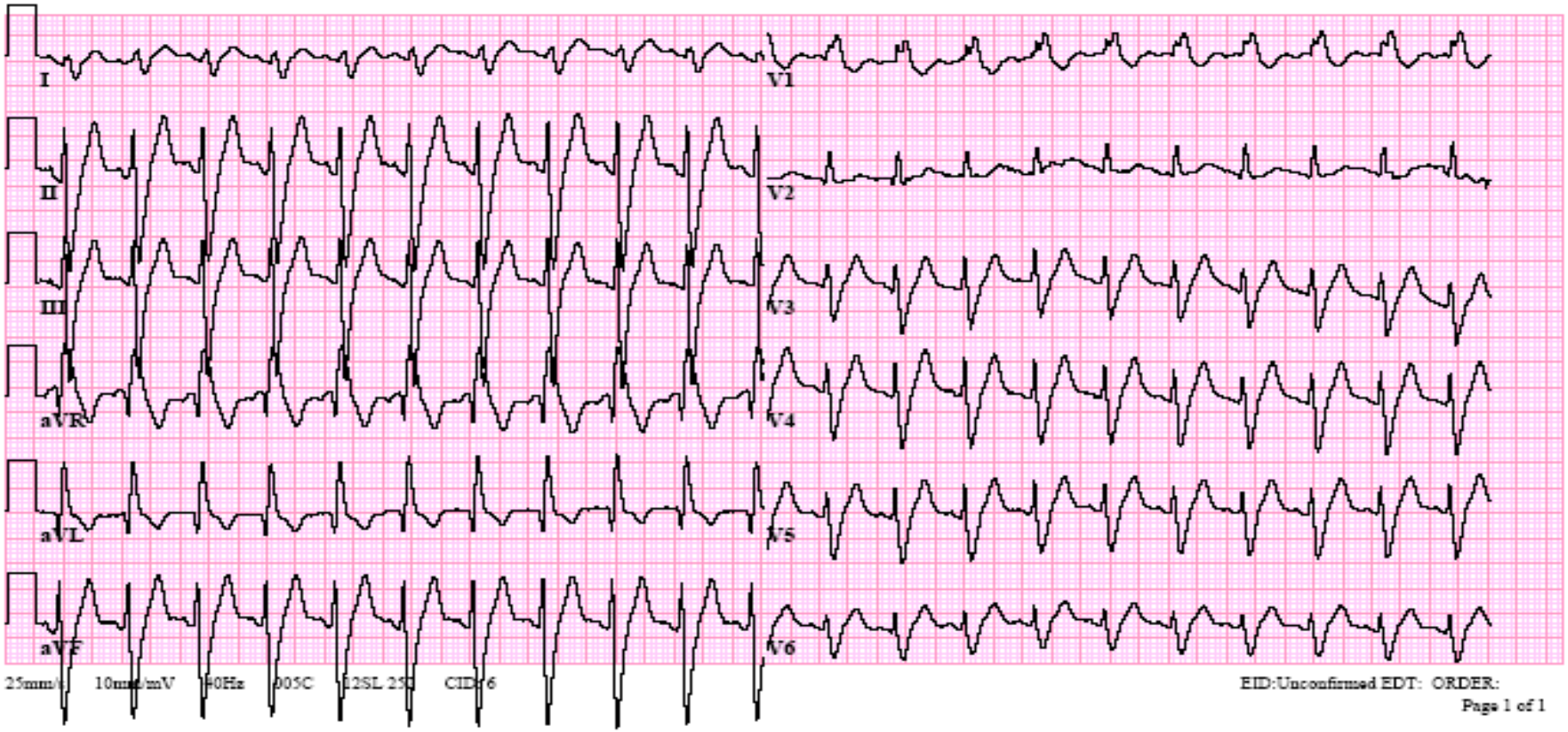


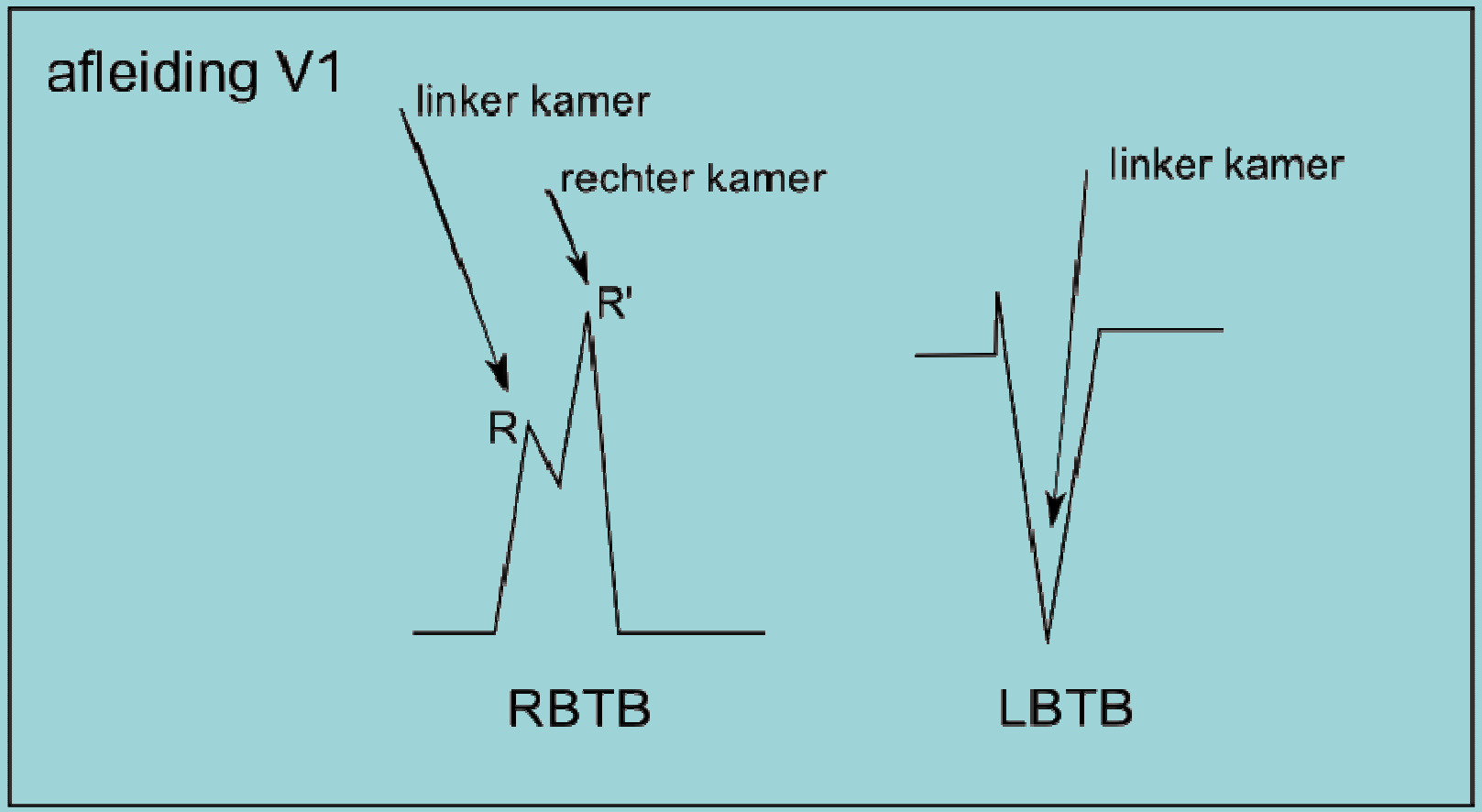
ST+ RBTB

18-JAN-2009 10:13:18 A.A.K.

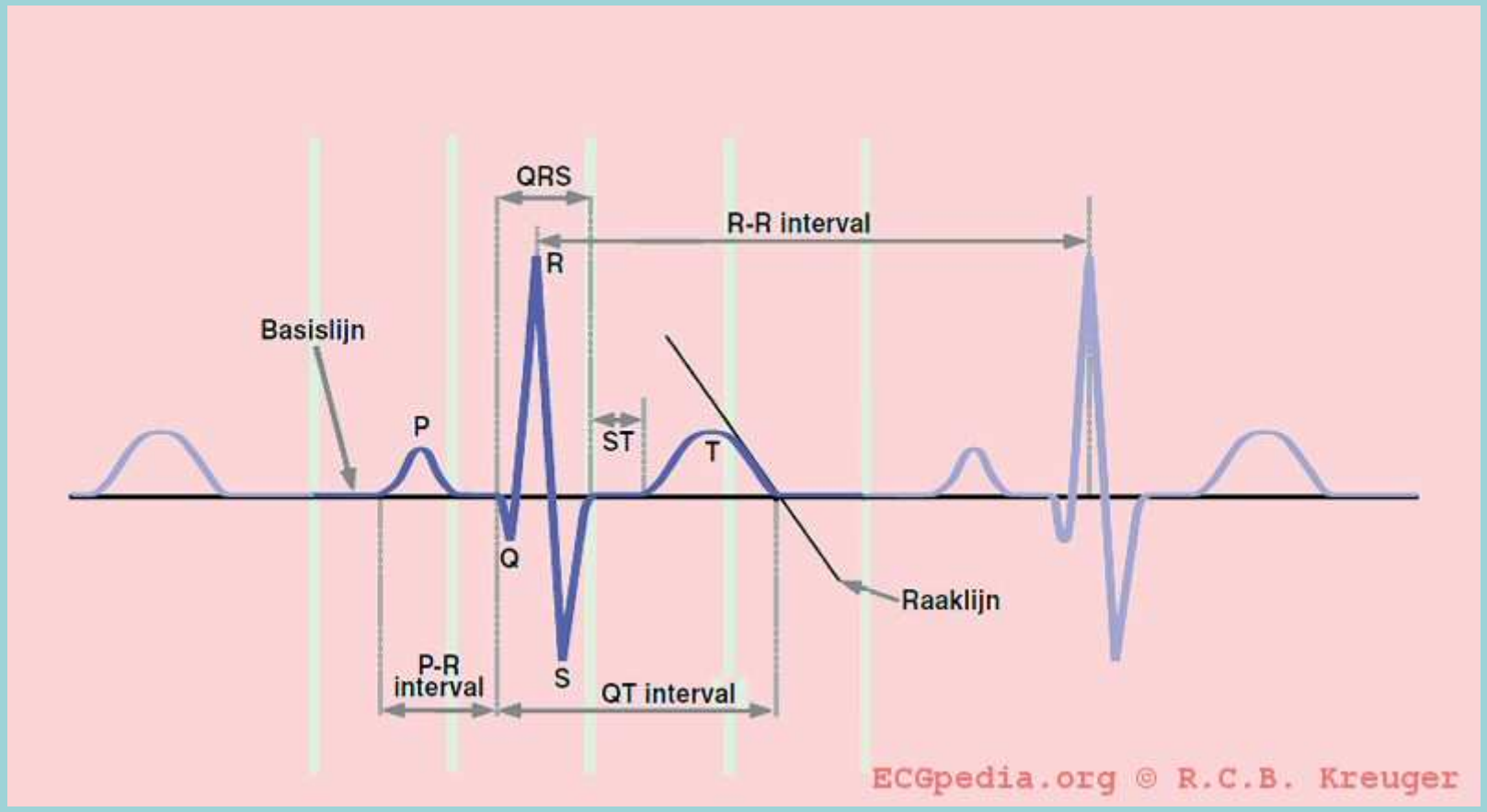
Loc:1

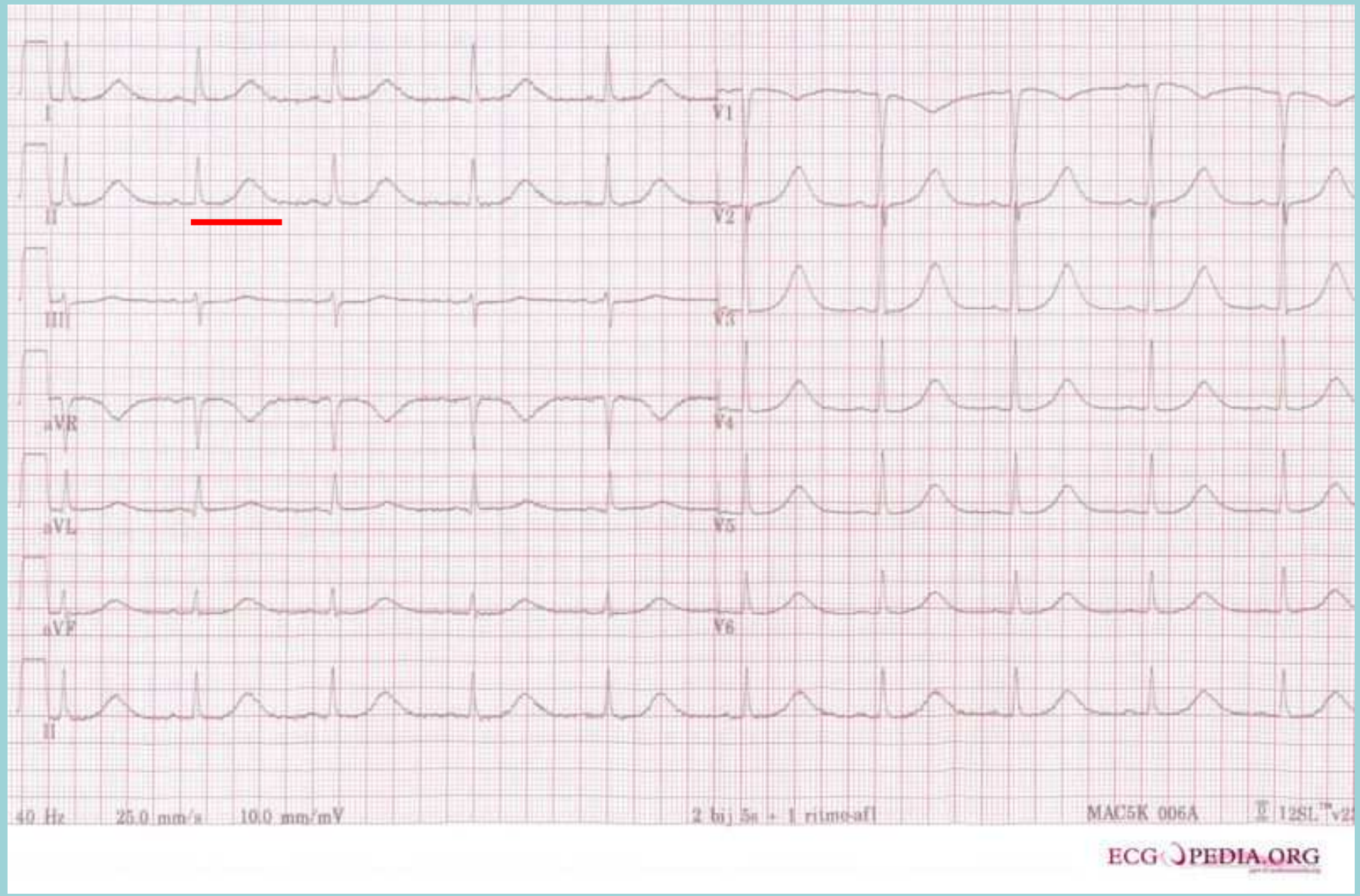
Referred by: Unconfirmed



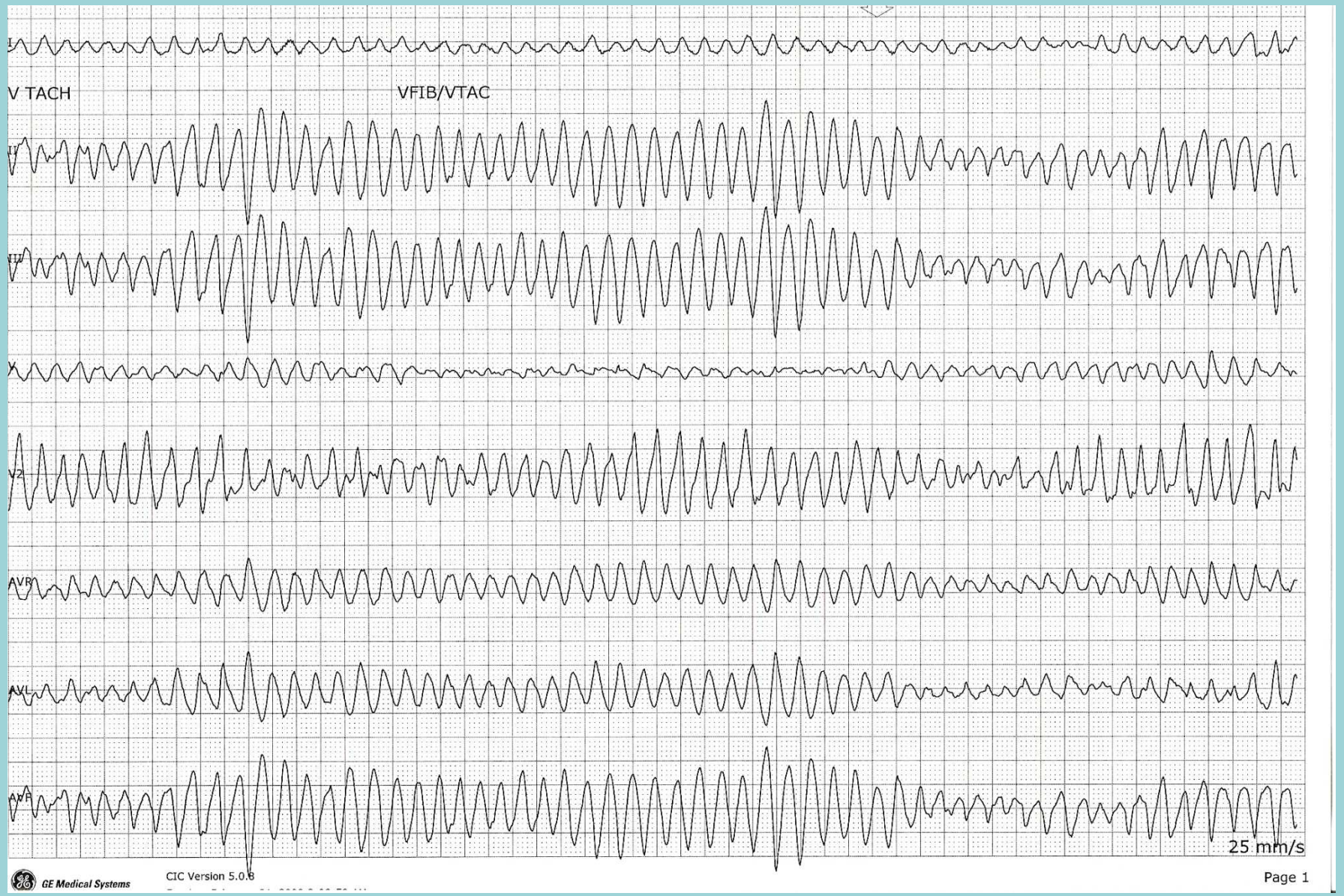

afleiding V1
linker kamer
rechter kamer
R'
R
RBTB
linker kamer
LBTB

Het QT interval




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
MAC5K 006A
ECG PEDIA.ORG

En dan plotseling…


V TACH
VFIB/VTAC
I
II
III
V
V2
AVR
AVL
AVF
25 mm/s
GE Medical Systems
CIC Version 5.0.8
Page 1

Storing!!!!

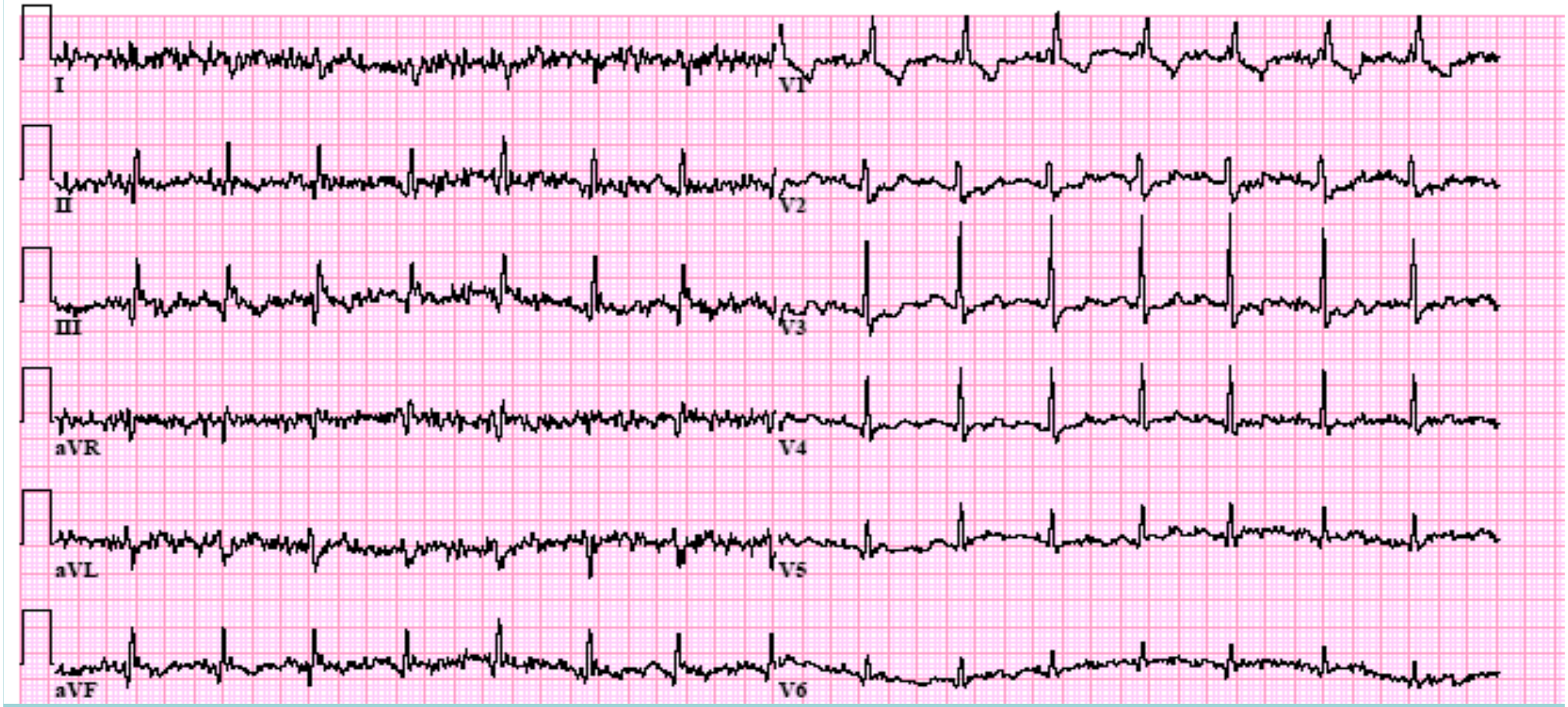
Name: **ID:9999999** **30-JAN-2009 20:27:00** **DIAKONESSENHUIS UTRECHT**

55 yr
Room:9
Loc:32

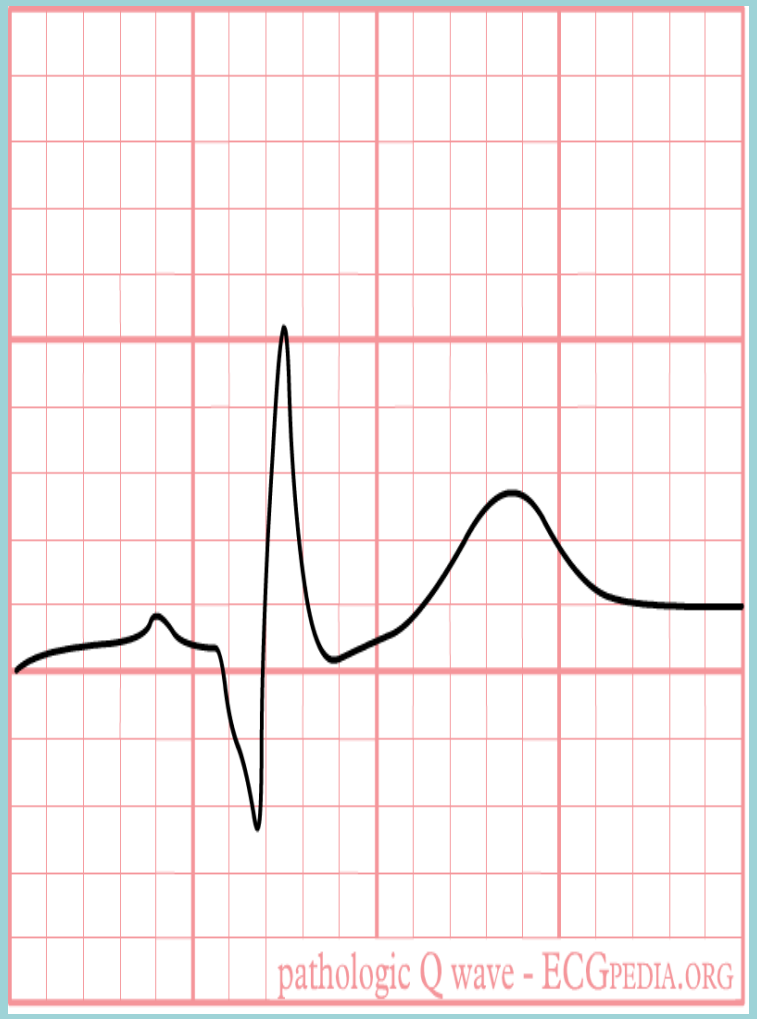
Vent. rate	95	BPM
PR interval	*	
QRS duration	108	ms
QT/QTc	338/425	ms
P-R-T axes	* 94	-17

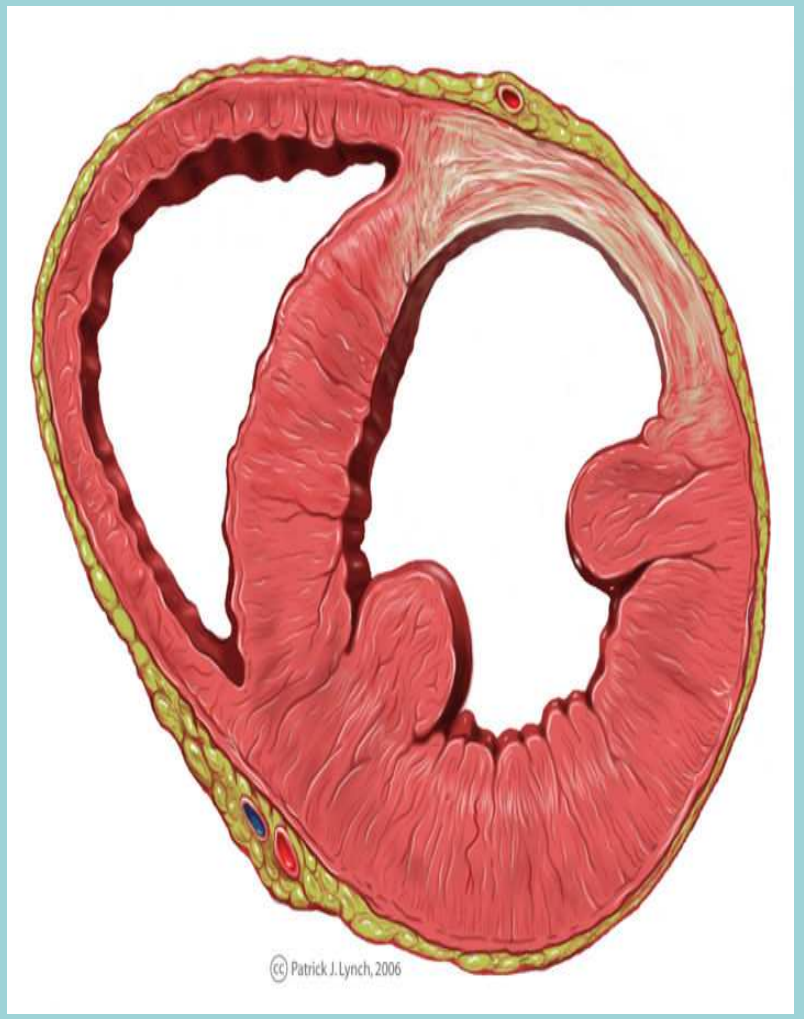
Niet te bepalen ritme
Inferior-posterior infarct , leeftijd onbepaald
Abnormaal ECG

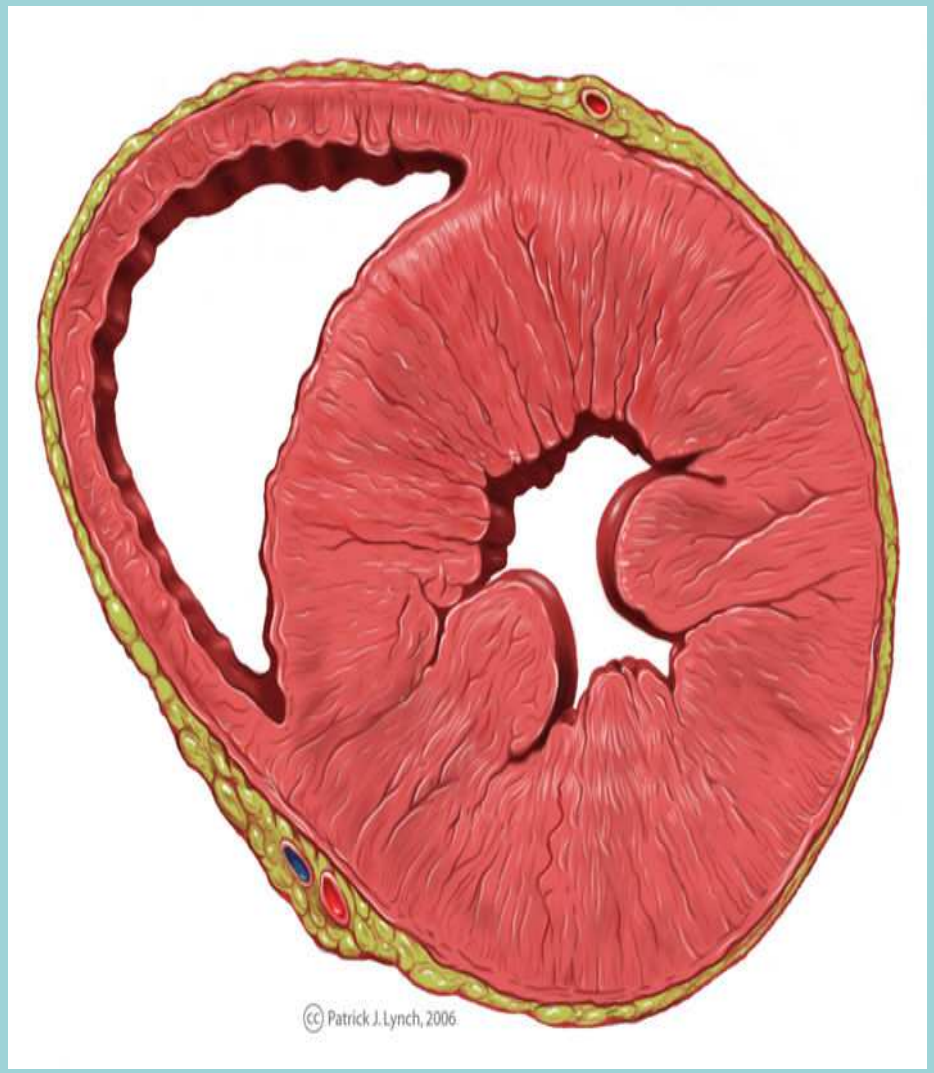
Referred by: Unconfirmed

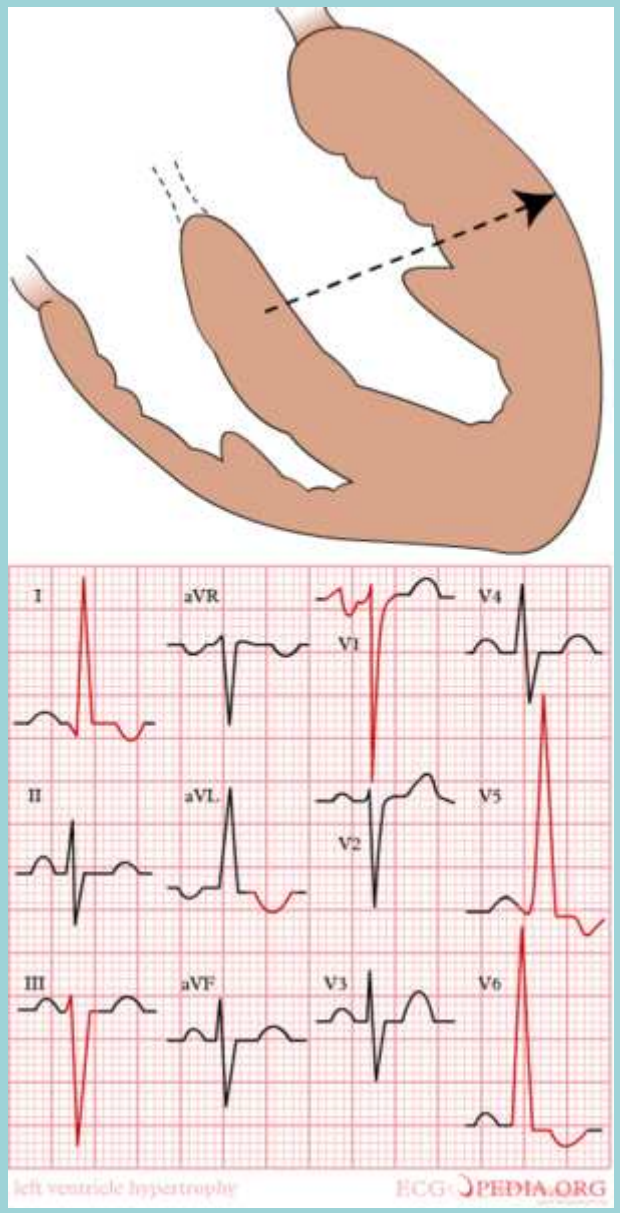


De QRS morfologie






Patrick J. Lynch, 2006

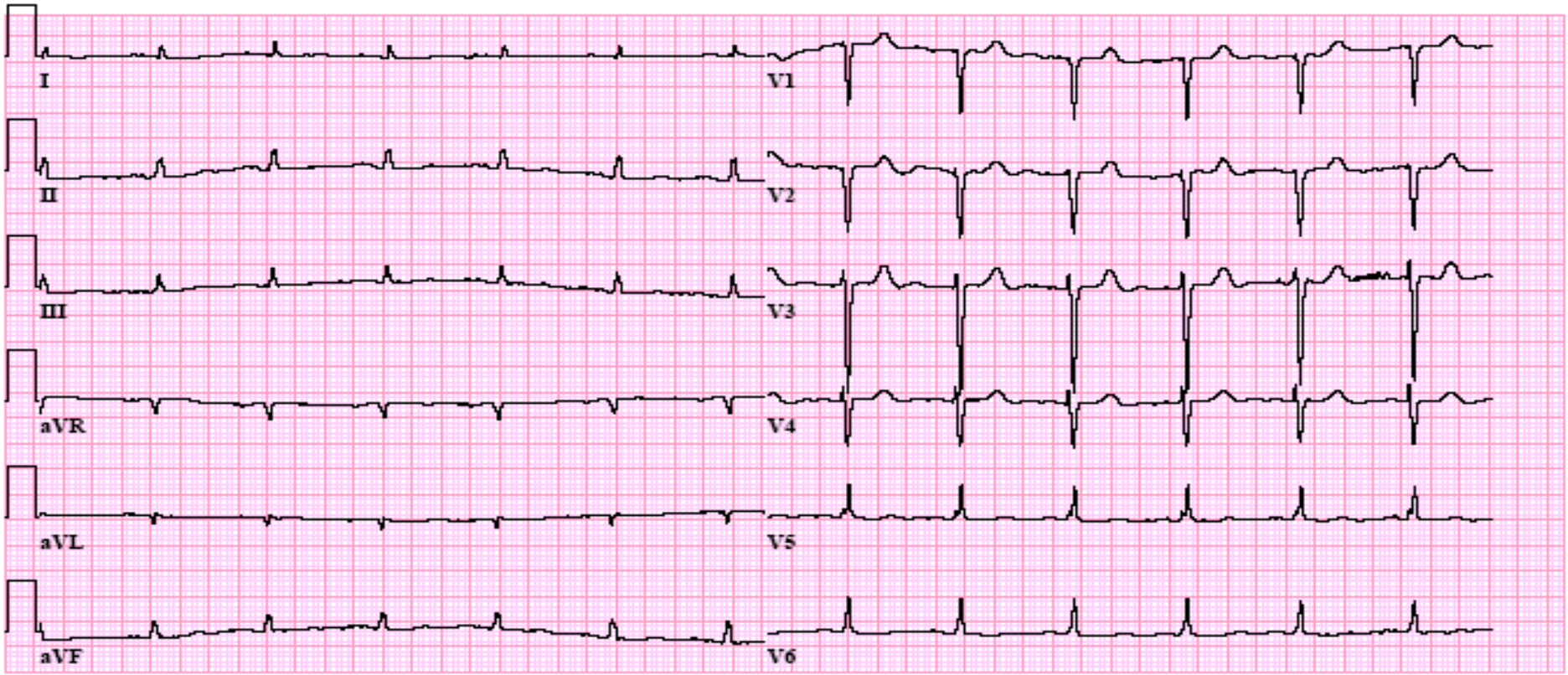

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
left ventricle hypertrophy
ECG PEDIA.ORG

Laag voltage

13-AUG-2008 14:31:57 A.A.K.

Loc:1

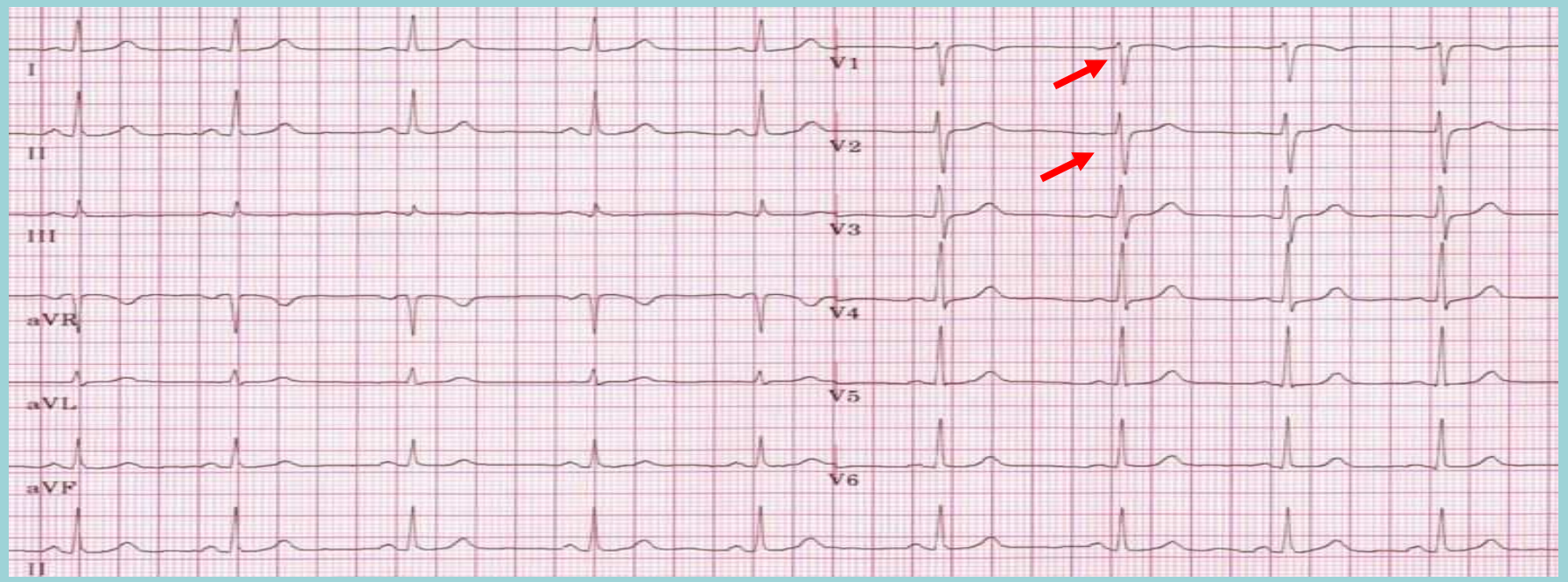
Referred by: Unconfirmed

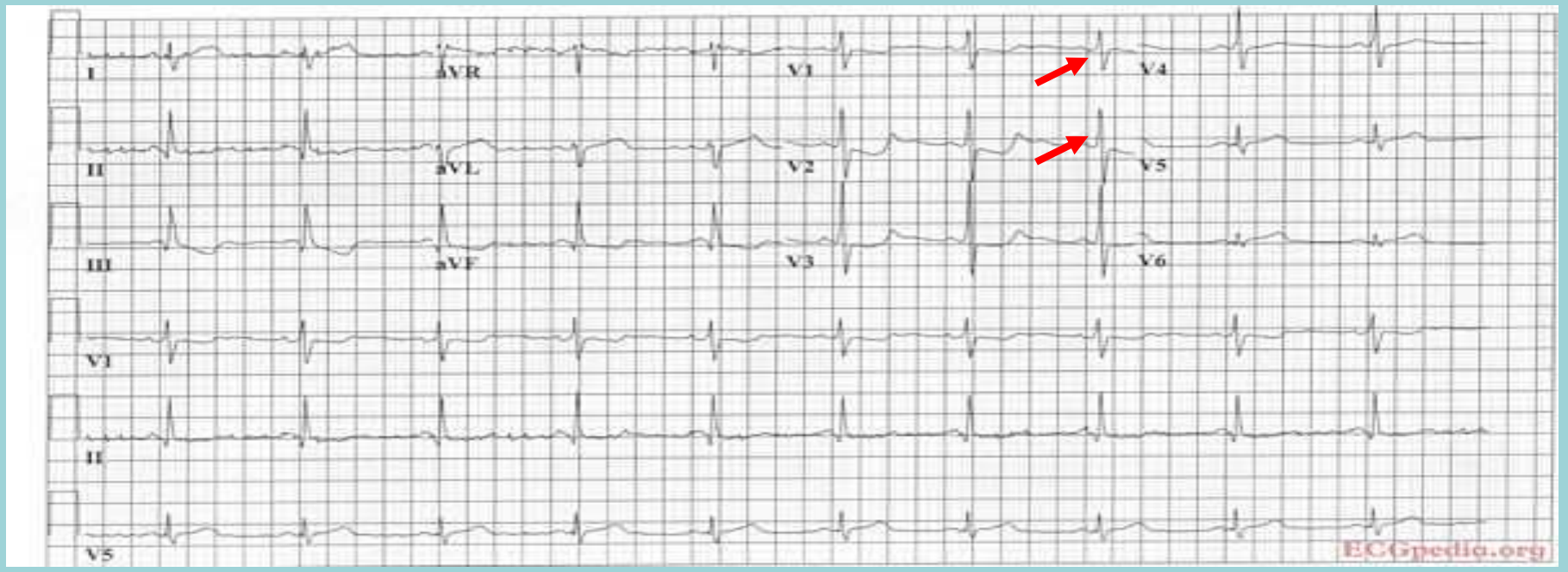


25mm/s 10mm/mV 40Hz 005C 12SL 252 CID: 6

EID:Unconfirmed EDT: ORDER:

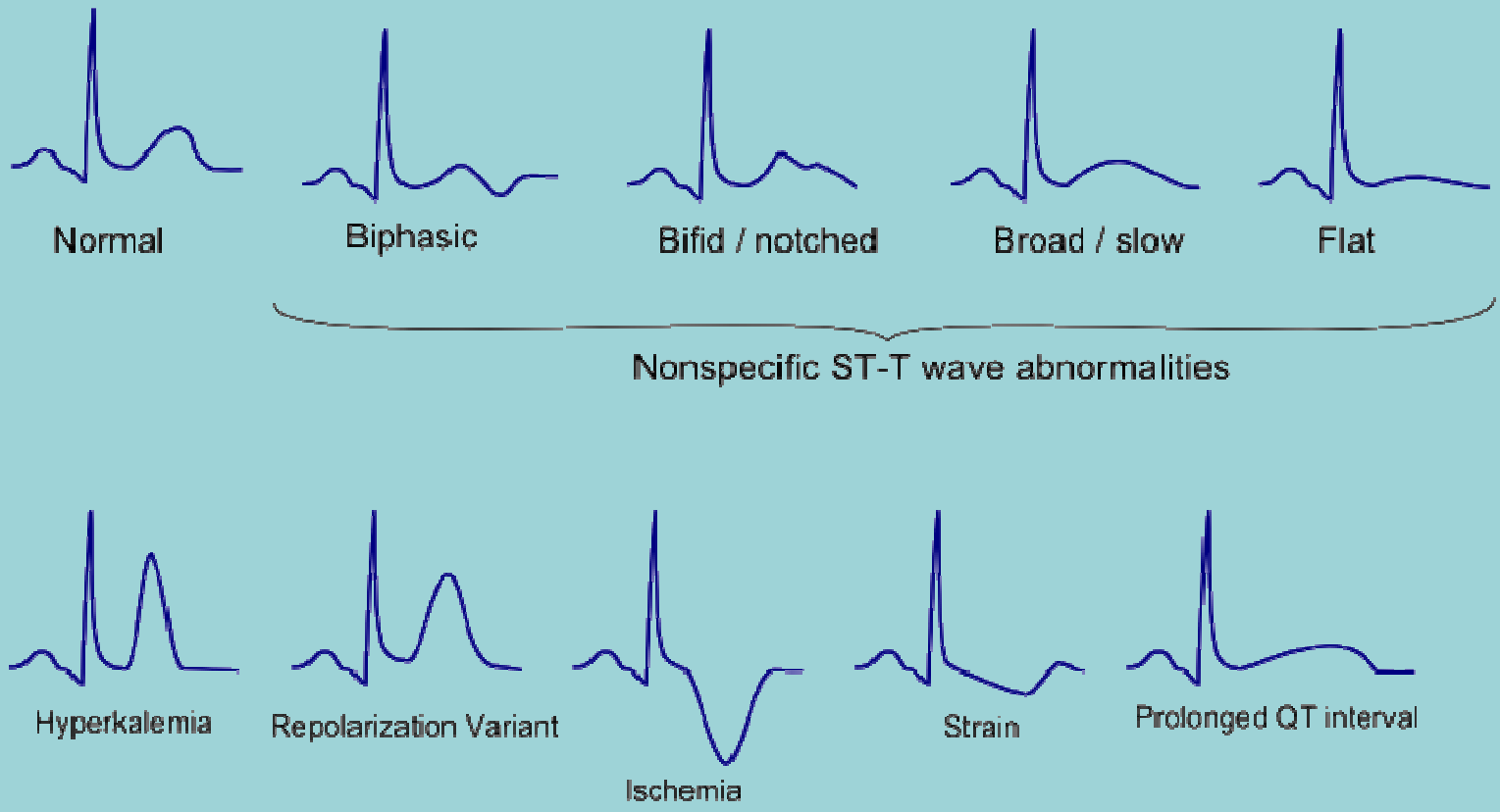
Page 1 of 1

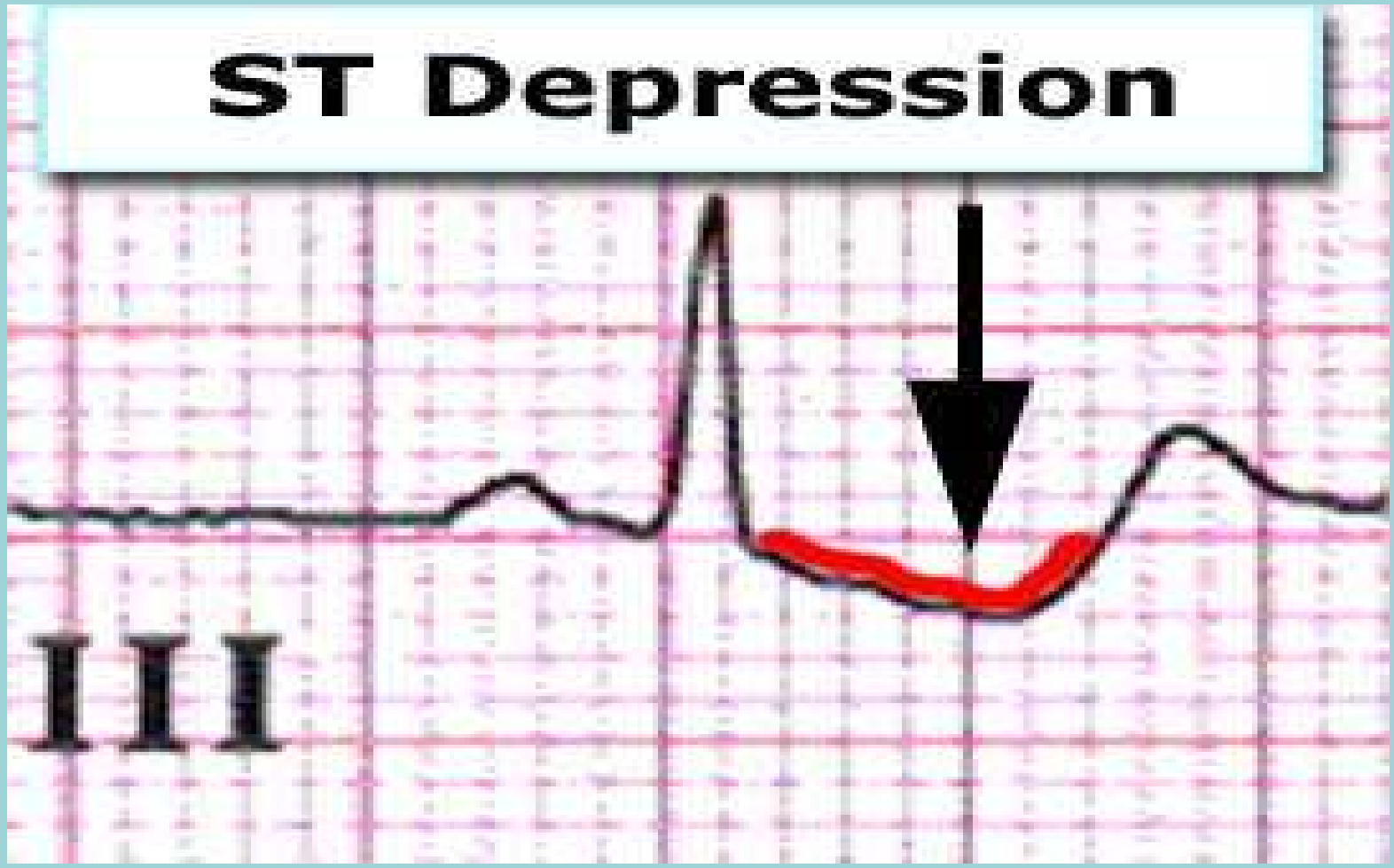

I
II
III
aVR
aVL
aVF
II
V1
V2
V3
V4
V5
V6

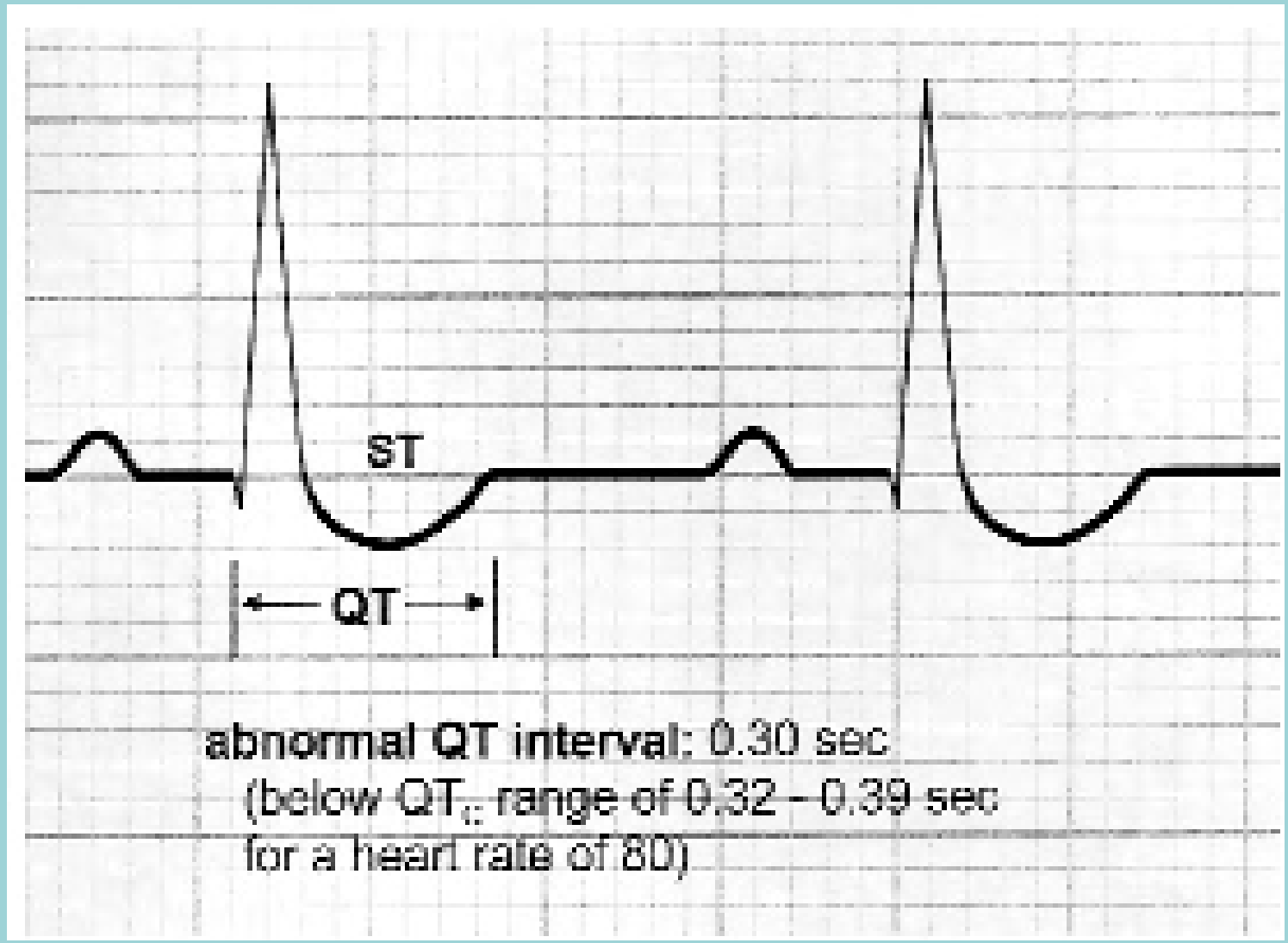

I
II
III
V1
V2
V3
aVR
aVL
aVF
V4
V5
V6
V1
II
V5
ECGpedia.org

Het ST segment

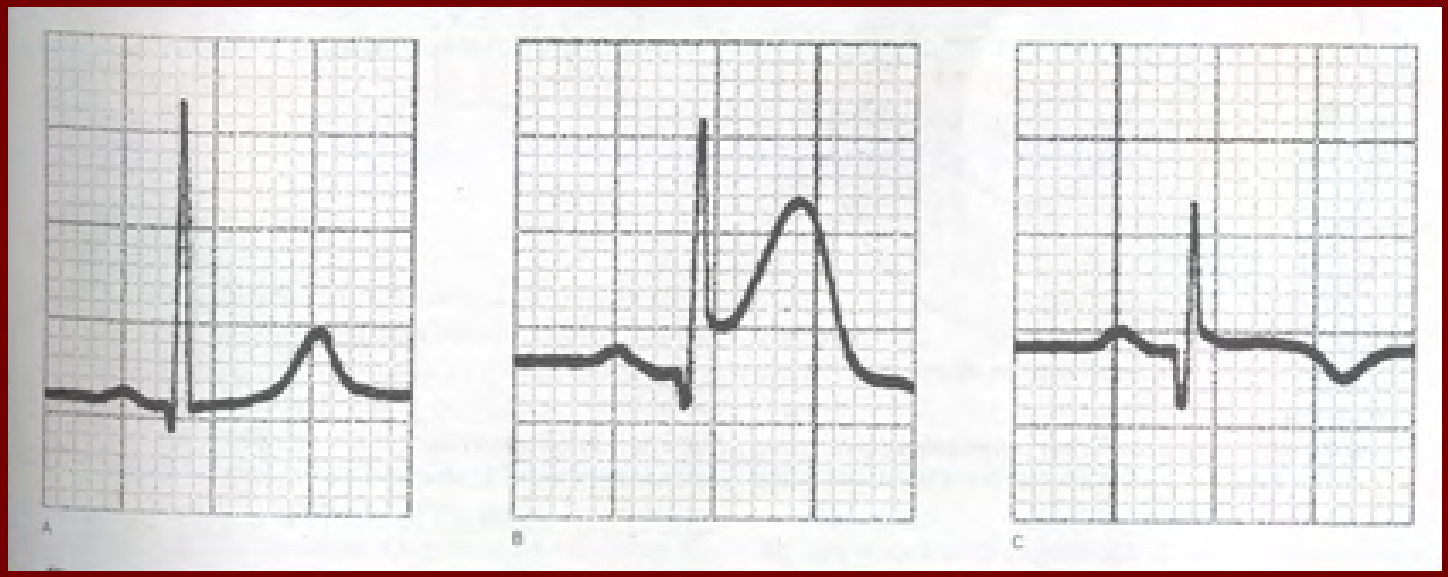
T wave morphology



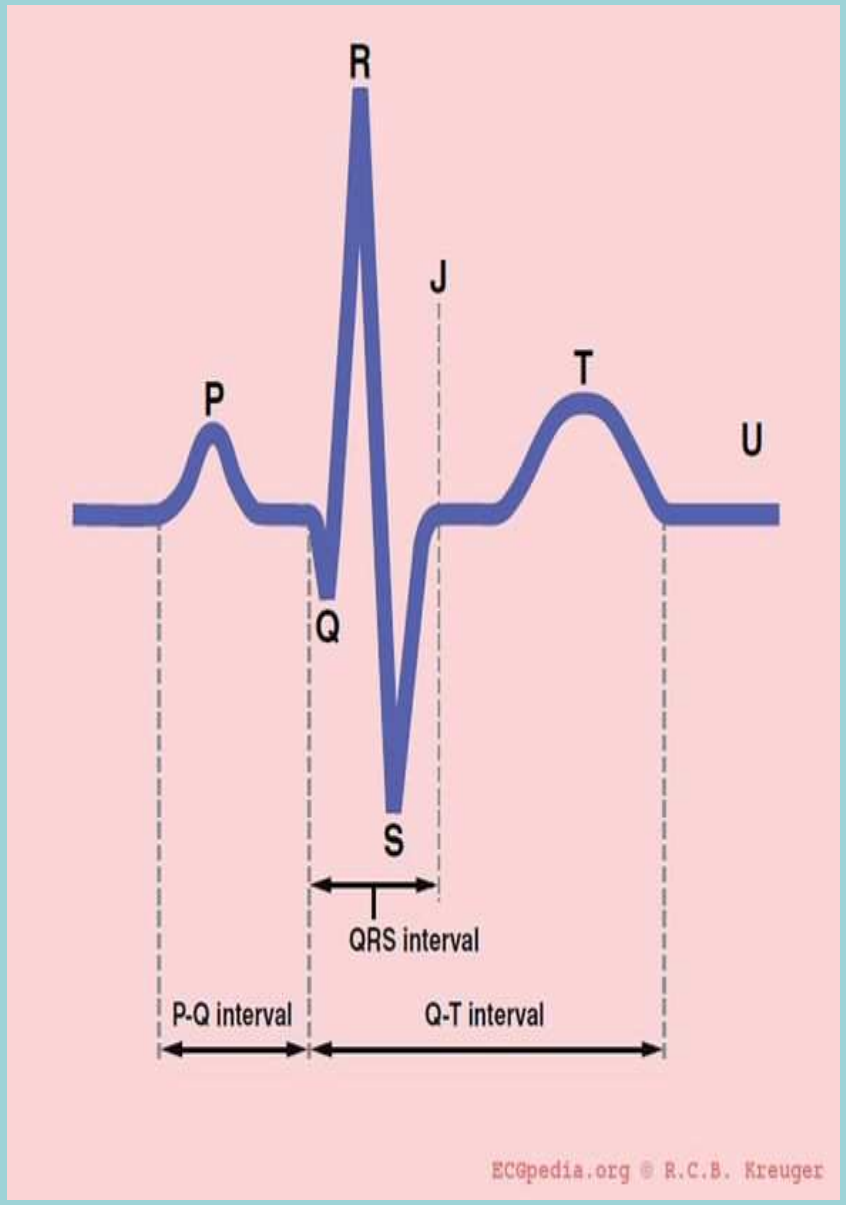

ST Depression
III

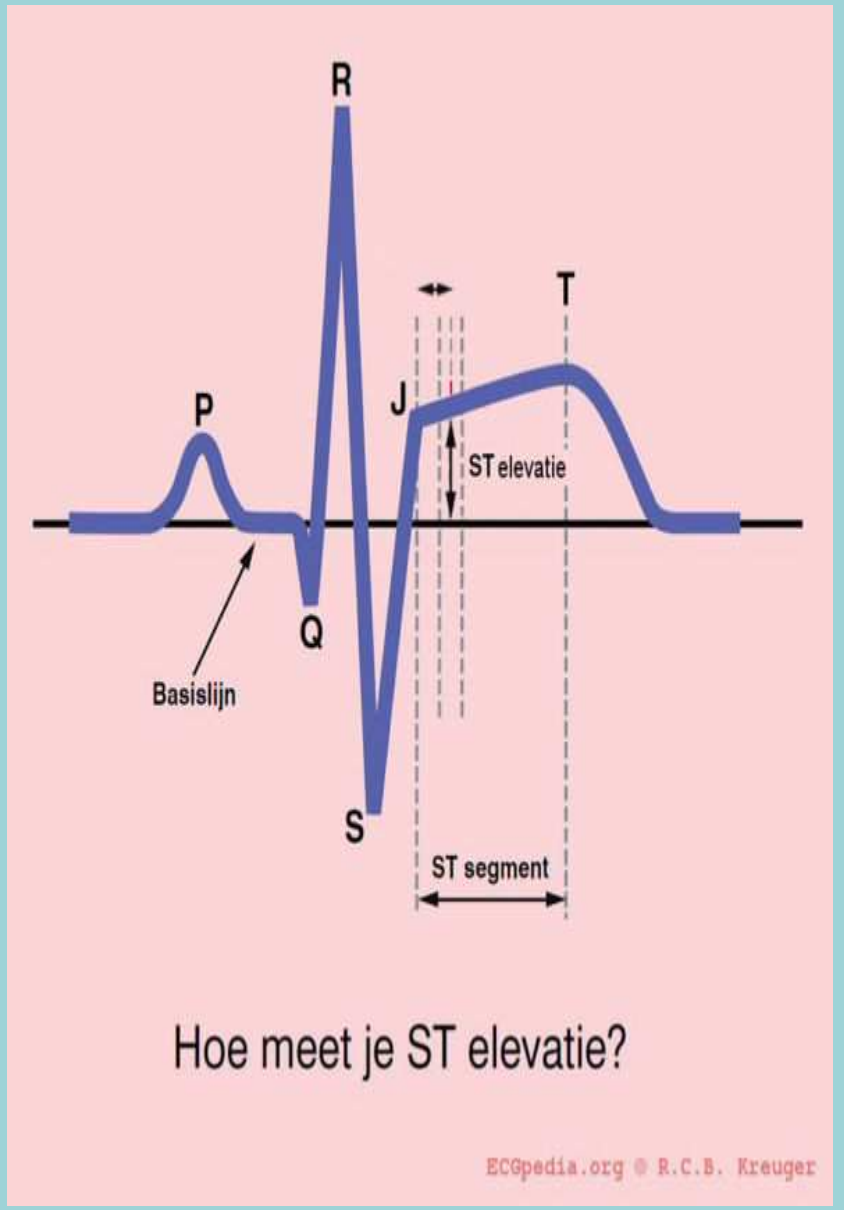

ST
QT
abnormal QT interval: 0.30 sec
(below QT_c range of 0.32 – 0.39 sec
for a heart rate of 80)

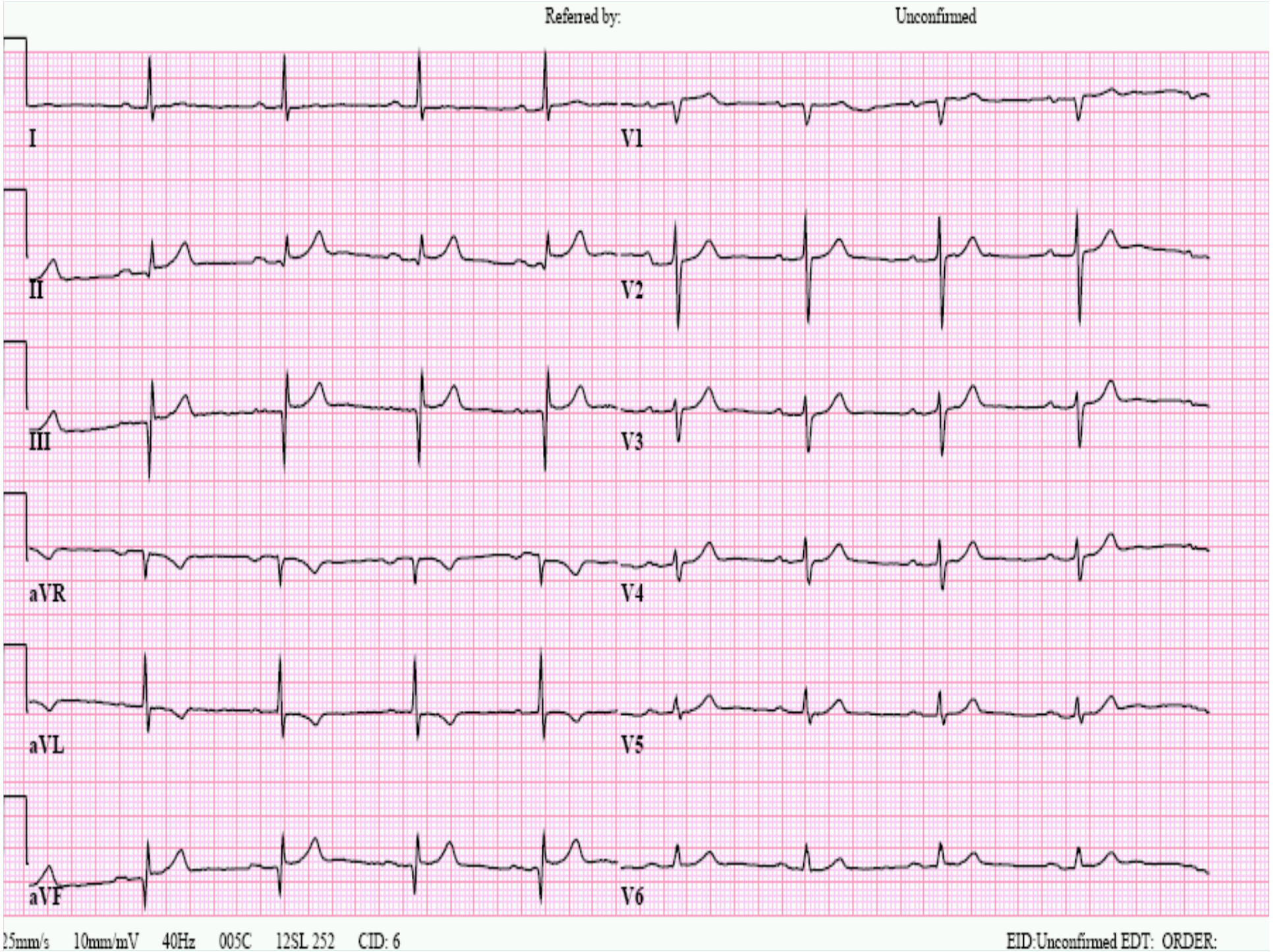
ACS: STEMI

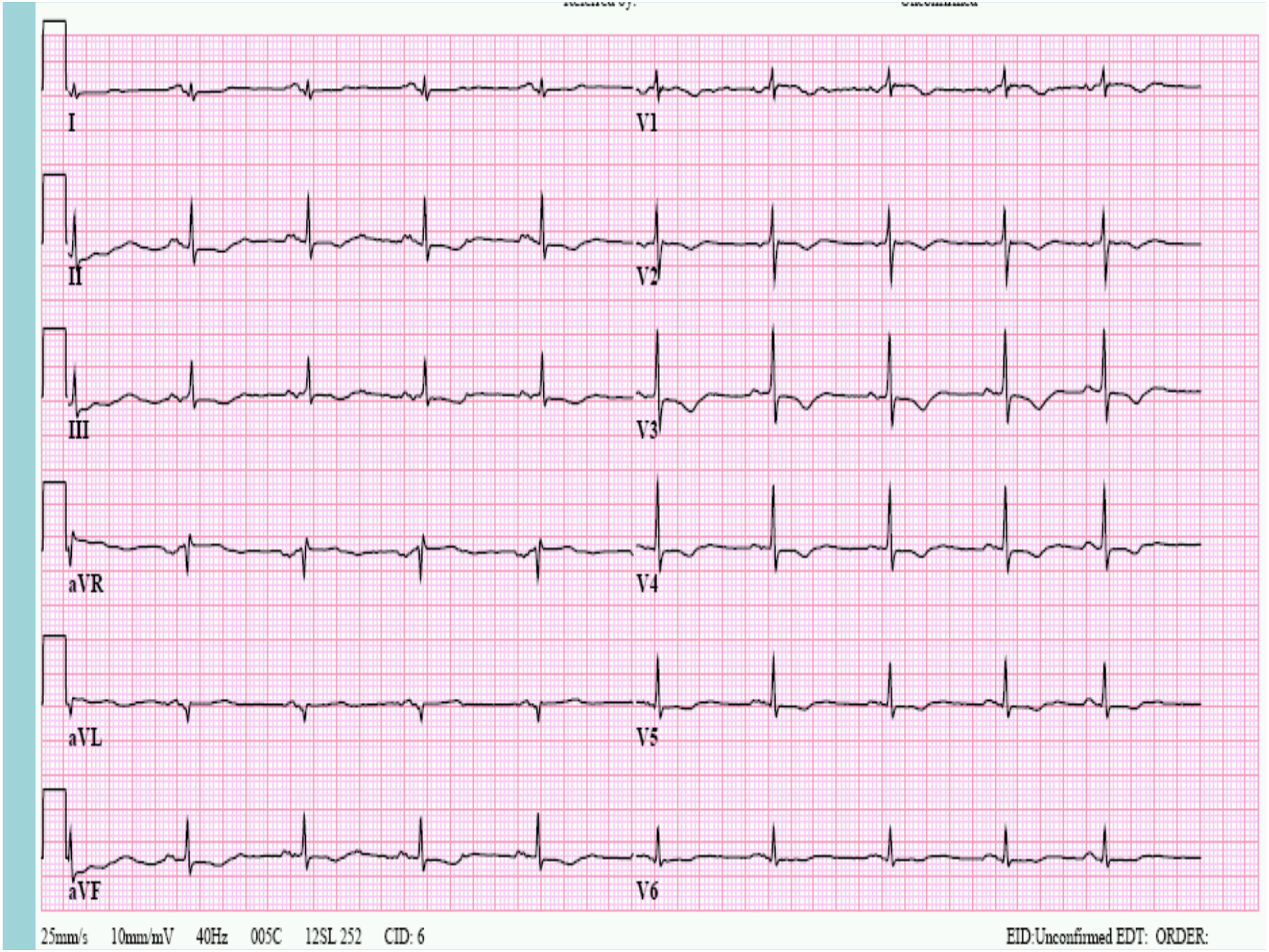


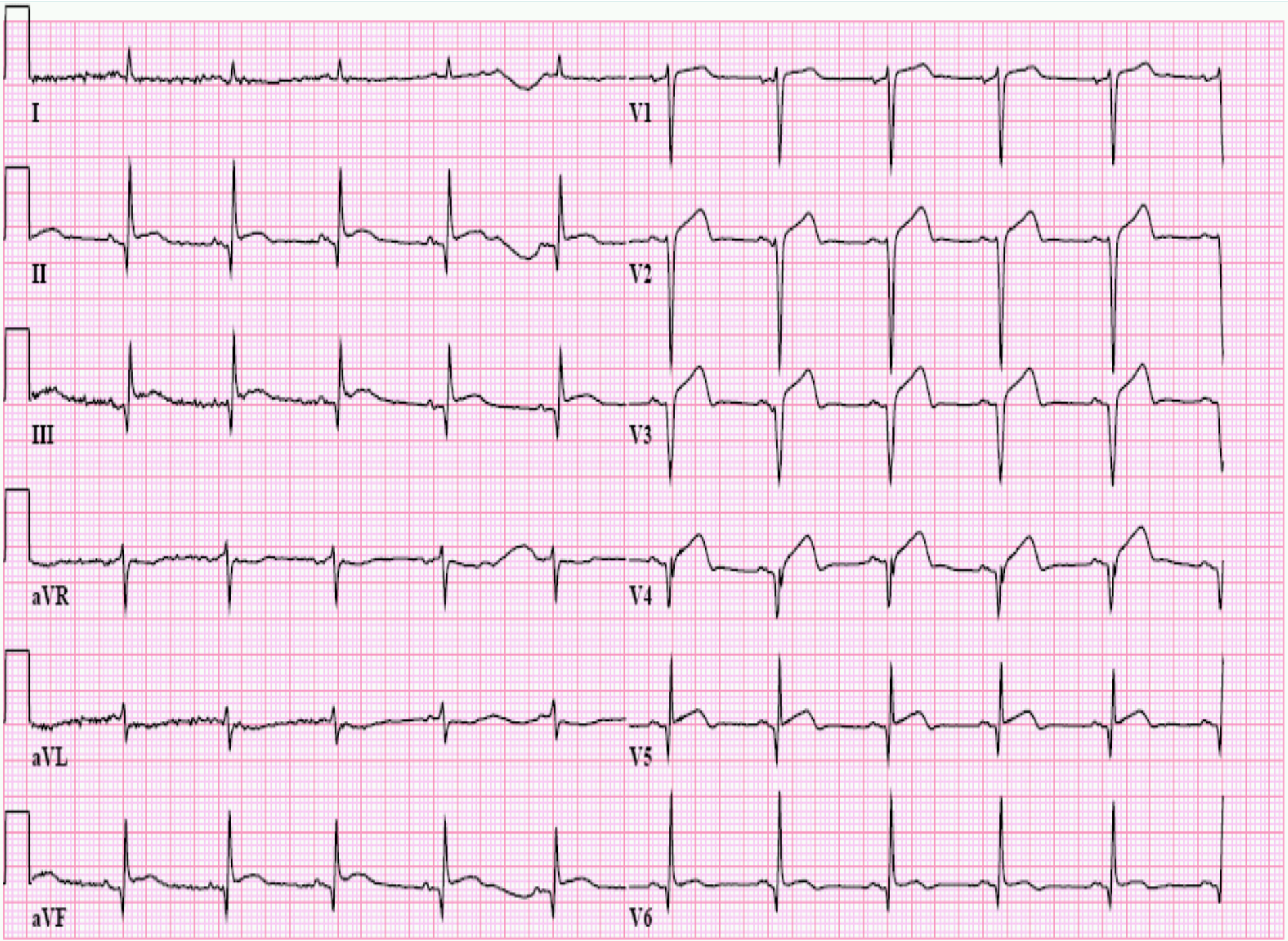
ECG: infarct verloop bij STEMI

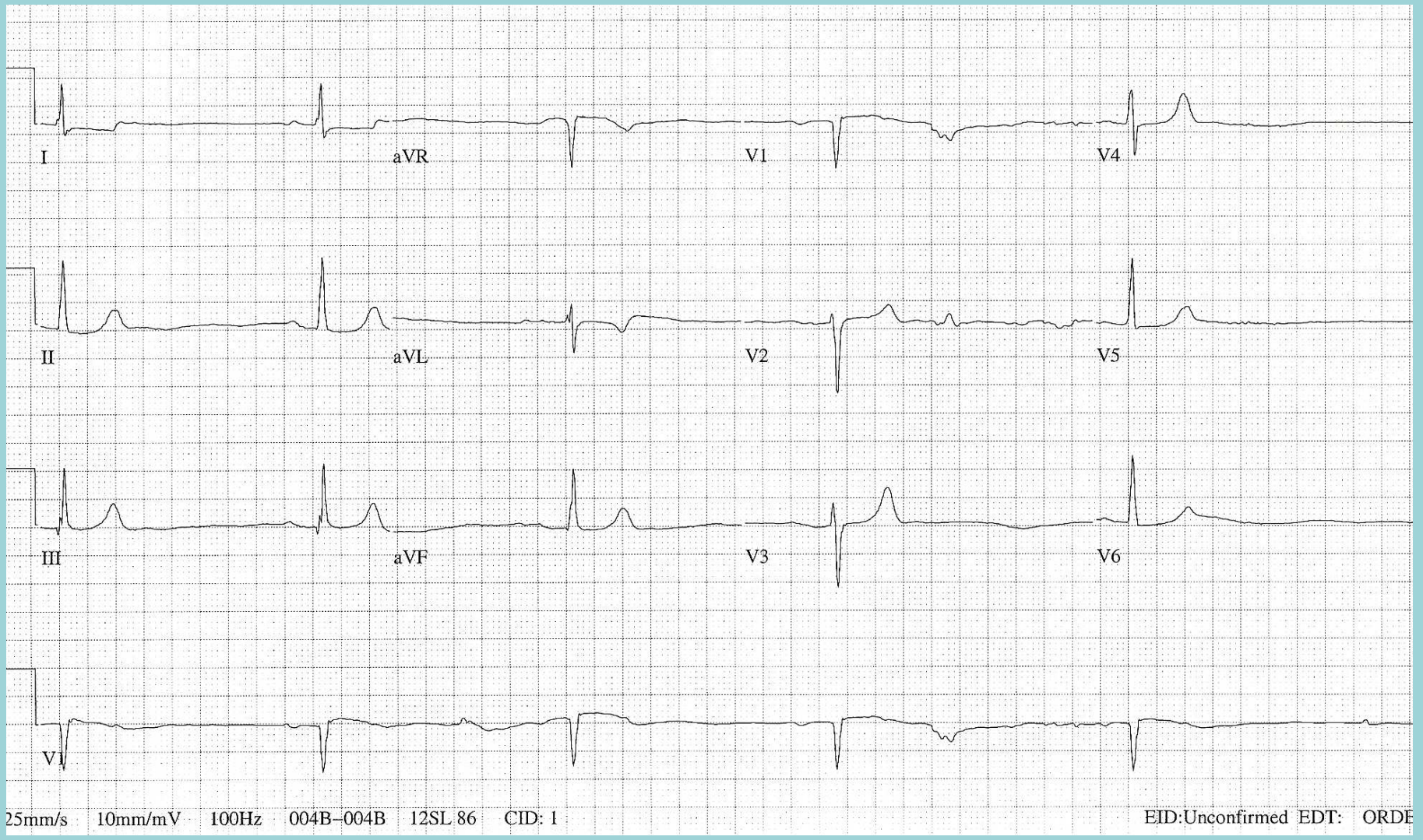

R
J
T
P
U
Q
S
QRS interval
P-Q interval
Q-T interval
ECGpedia.org © R.C.B. Kreuger


R
T
P
J
ST elevatie
Q
Basislijn
S
ST segment
Hoe meet je ST elevatie?
ECGpedia.org © R.C.B. Kreuger


Referred by:
Unconfirmed
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
25mm/s 10mm/mV 40Hz 005C 12SL 252 CID: 6
EID:Unconfirmed EDT: ORDER:


I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
25mm/s 10mm/mV 40Hz 005C 12SL 252 CID: 6
EID:Unconfirmed EDT: ORDER:

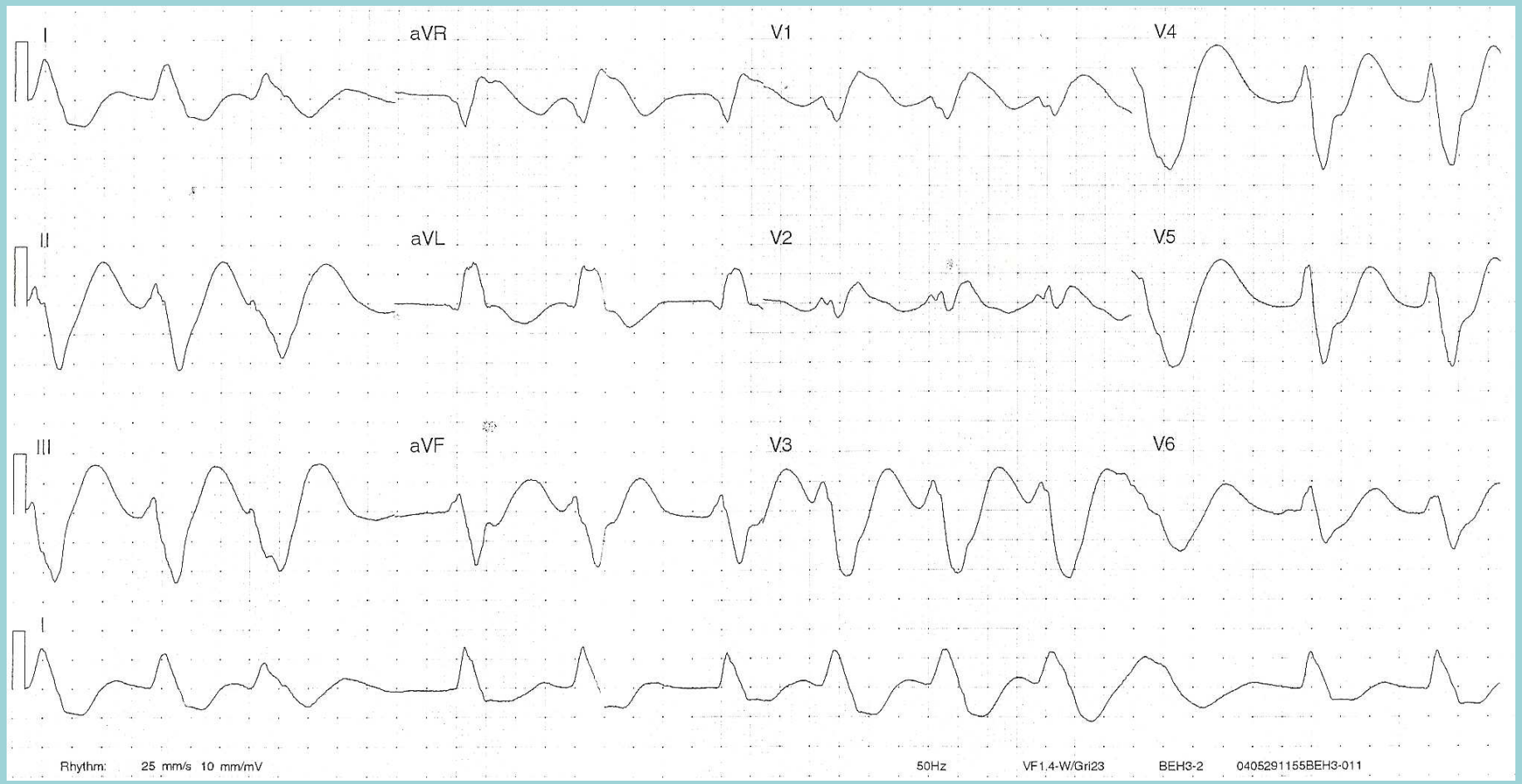

I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
25mm/s 10mm/mV 40Hz 005C 12SL 252 CID: 6
EID:Unconfirmed EDT: ORDER:


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
25mm/s 10mm/mV 100Hz 004B–004B 12SL 86 CID: 1
EID:Unconfirmed EDT: ORDE

Hypokaliemie

- Hoe lager K hoe hoger voltage QRS en hoe langer duur QRS (meestal niet meer dan 0,02 sec, zelfde morfologie)
- Hoe lager K hoe hoger en langer P-top

- Toename ectopische complexen (atriaal en ventriculair), leidend tot ernstige ventrikulaire ritmestoornissen (VT, TdP en VF)

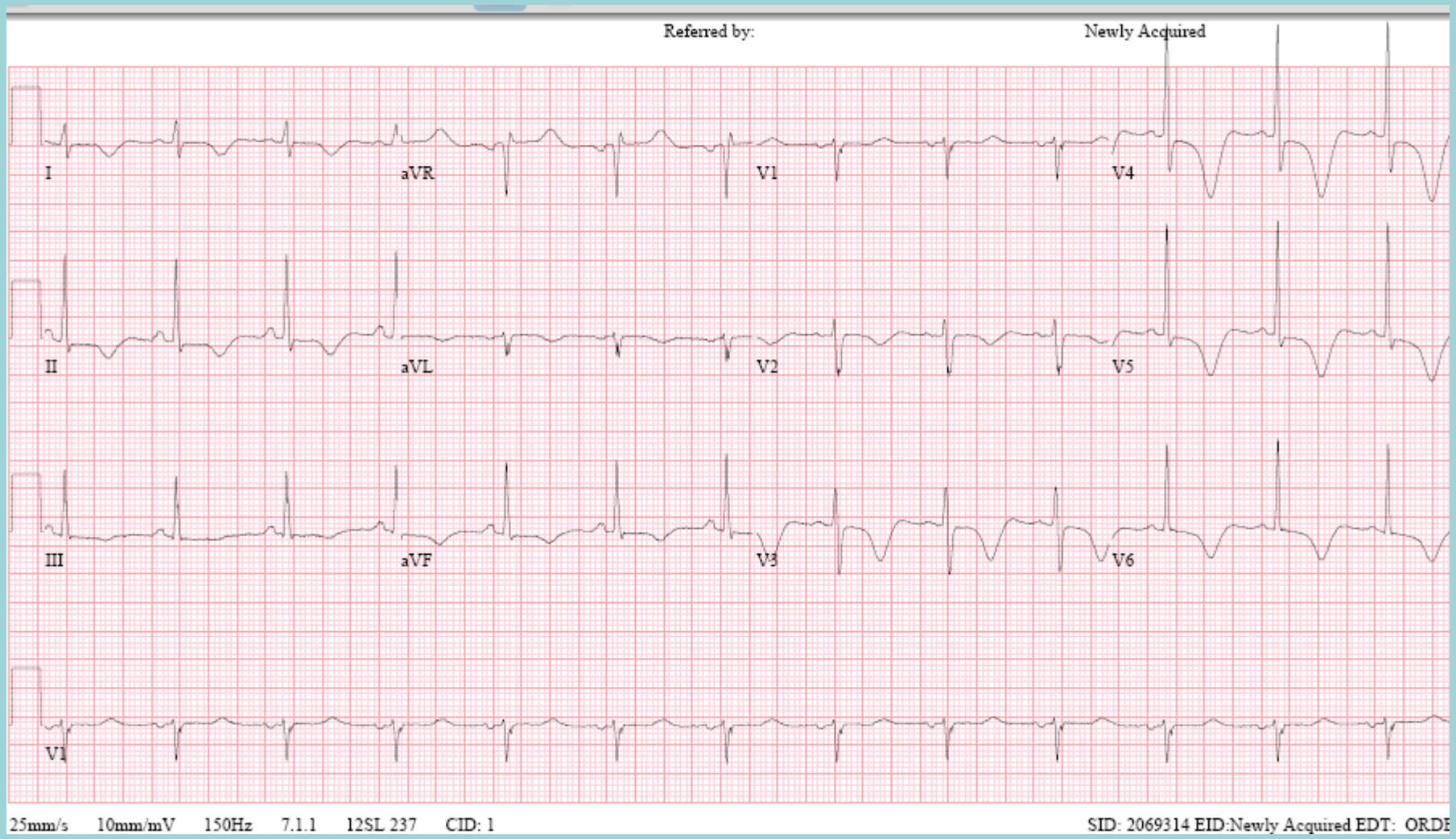

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
I
Rhythm: 25 mm/s 10 mm/mV
50Hz
VF1.4-W/Gri23
BEH3-2
0405291155BEH3-011

Hyperkaliemie

- Vanaf > 5,5 mM hoge, smalle spitse T-toppen, cave andere oorzaken. Slechts in 22% van pt met hyperkaliemie daadwerkelijke T-top afwijkingen
- Vanaf > 6,5 mM overige veranderingen
  - QRS verbreding, zowel initiele deel als terminale deel. Hoogte K = duur QRS.
  - ST segment deviatie als bij ischemie
  - Patroon als bij dying heart

Hyperkaliemie

- > 7mM afvlakking P-top en verlenging P-duur en (daardoor) PR-tijd.
- > 8mM onzichtbare P-top
- > 10mM irregulair ventrikulair ritme tgv competitive activiteit escape pacemakers in myocard.
- >12-14mM VF of asystolie, soms vooraf gegaan door een sinusoide patroon.


Referred by:
Newly Acquired
I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
25mm/s 10mm/mV 150Hz 7.1.1 12SL 237 CID: 1
SID: 2069314 EID:Newly Acquired EDT: ORDE

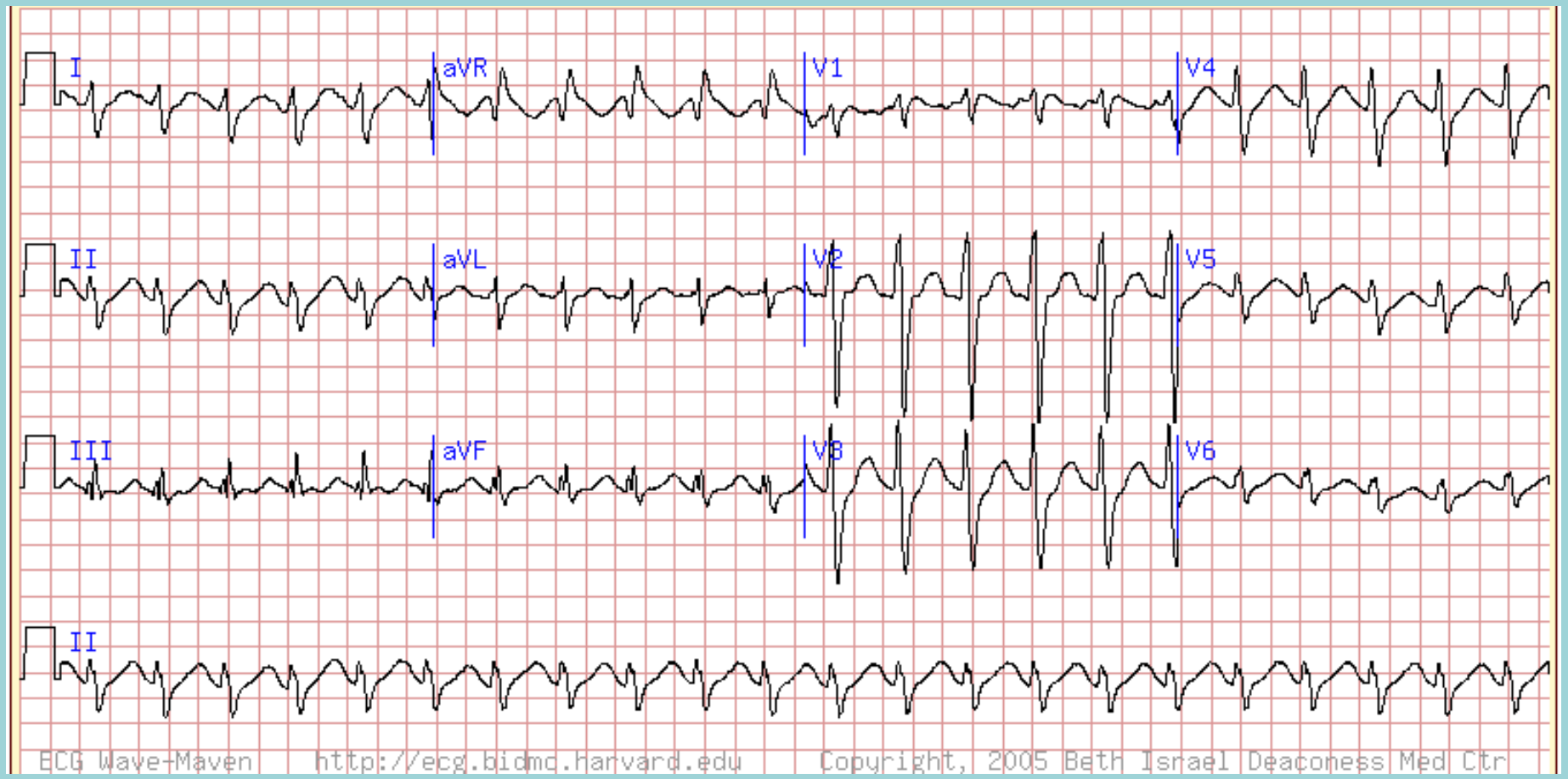
Digoxine intoxicatie

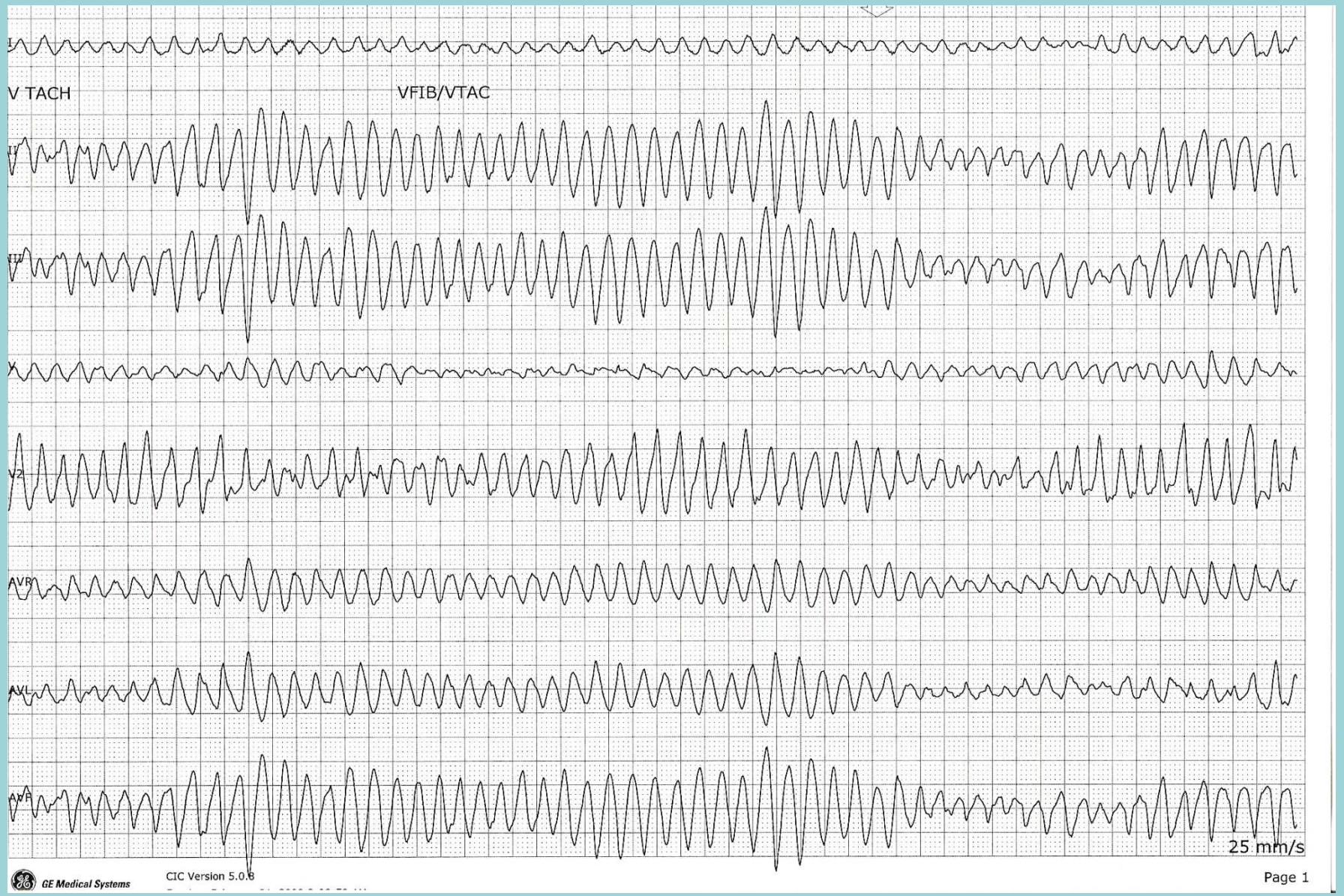
- Tgv verhoogde automaticiteit en vertraagde geleiding
  - Alle soorten ritme- en geleidingsstoornissen (behalve Aflutter en BTB) zelf verschillende binnen korte tijd bij dezelfde patient.
  - PVC’s, VT, VF; AV-blocks; versneld junctioneel ritme; atriale tachy (met block); AF; sinusbrady/-tachy/ sinusarrest/SA block

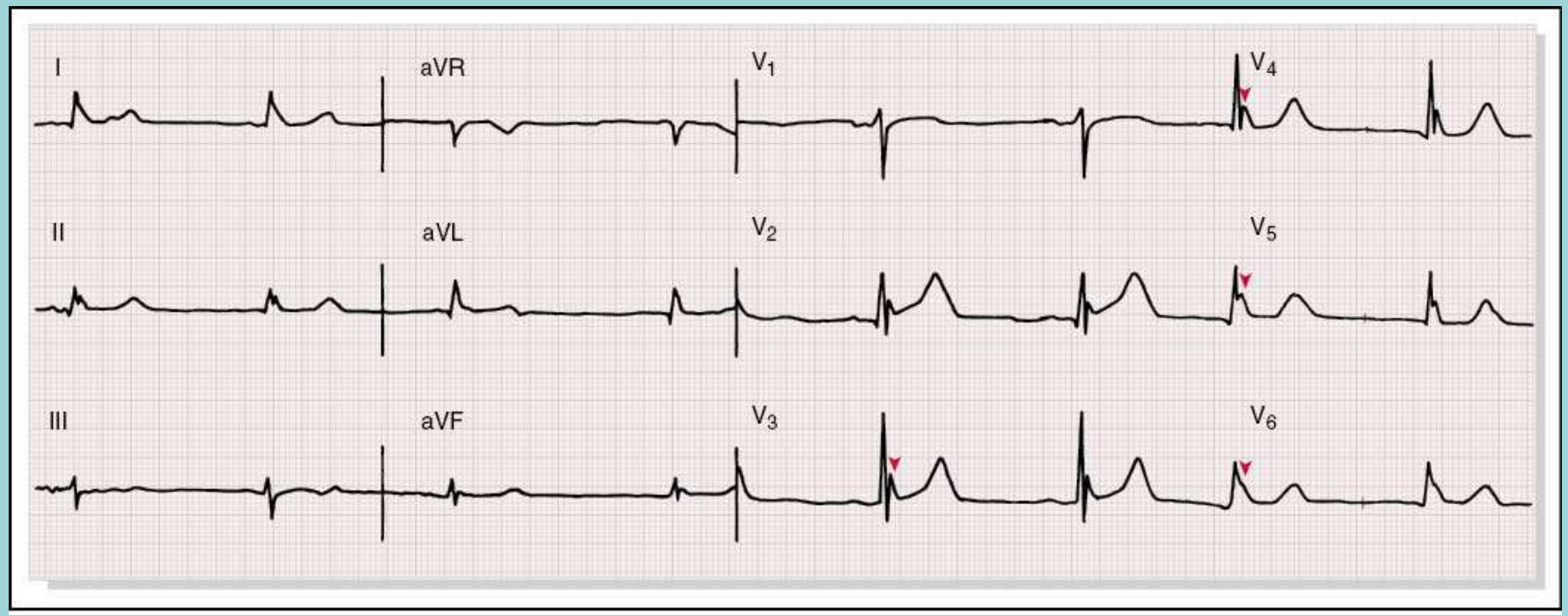
QT-verlenging

- Amiodaron, sotalol, flecainide, ibutilide,
- Citalopram, haldol, methadon, clozapine, lithium, nortriptyline, pregabaline (lyrica)
- Indapamide, alfuzosine
- Erytromycine, claritromycine, levofloxacine, ondansetron, domperidon, voriconazol

TCA overdosis.




V TACH
VFIB/VTAC
I
II
III
V
V2
AVR
AVL
AVF
25 mm/s
GE Medical Systems
CIC Version 5.0.8
Page 1


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

Hypothermie

- Ernstige hypothermie geeft zowel depolarisatie als repolarisatie afwijkingen. Tgv vertraagde geleiding K-kanalen ontstaat vertraging van alle ECG intervallen. (T < 34gr C)

Hypothermie

- Matige hypothermie alleen T-top afwijkingen.
  - Homogene Temp-daling hele hart geeft verlenging T-top bij normale polariteit.
  - Solitaire koeling achterwand (ijswater drinken) geeft T-top inversie II en III tgv veranderde vector T-top.

Hypothermie

- Osborne golven (J-golven) trage opwaartse deflectie tussen einde QRS en eerste deel ST-segment. Meest in II, III, aVF en V5-V6. Indicatie voor mate van hypothermie.
- Naar boven concave ST elevatie inferior en links precordiaal.
- Sinusbradycardie en AF.