



ISCHEMIE EN INFARCT



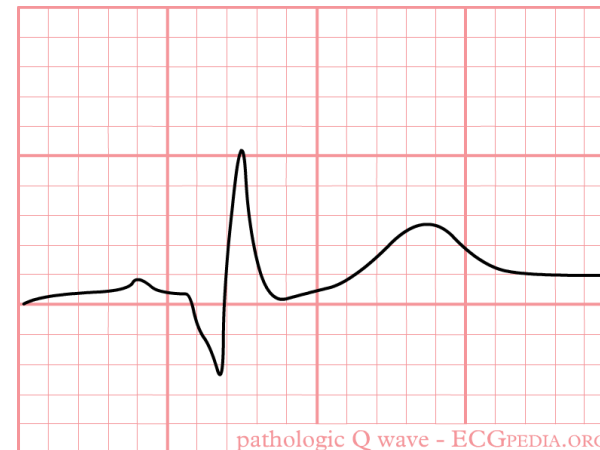
Diagnose infarct

Diagnostische criteria voor myocardinfarct:

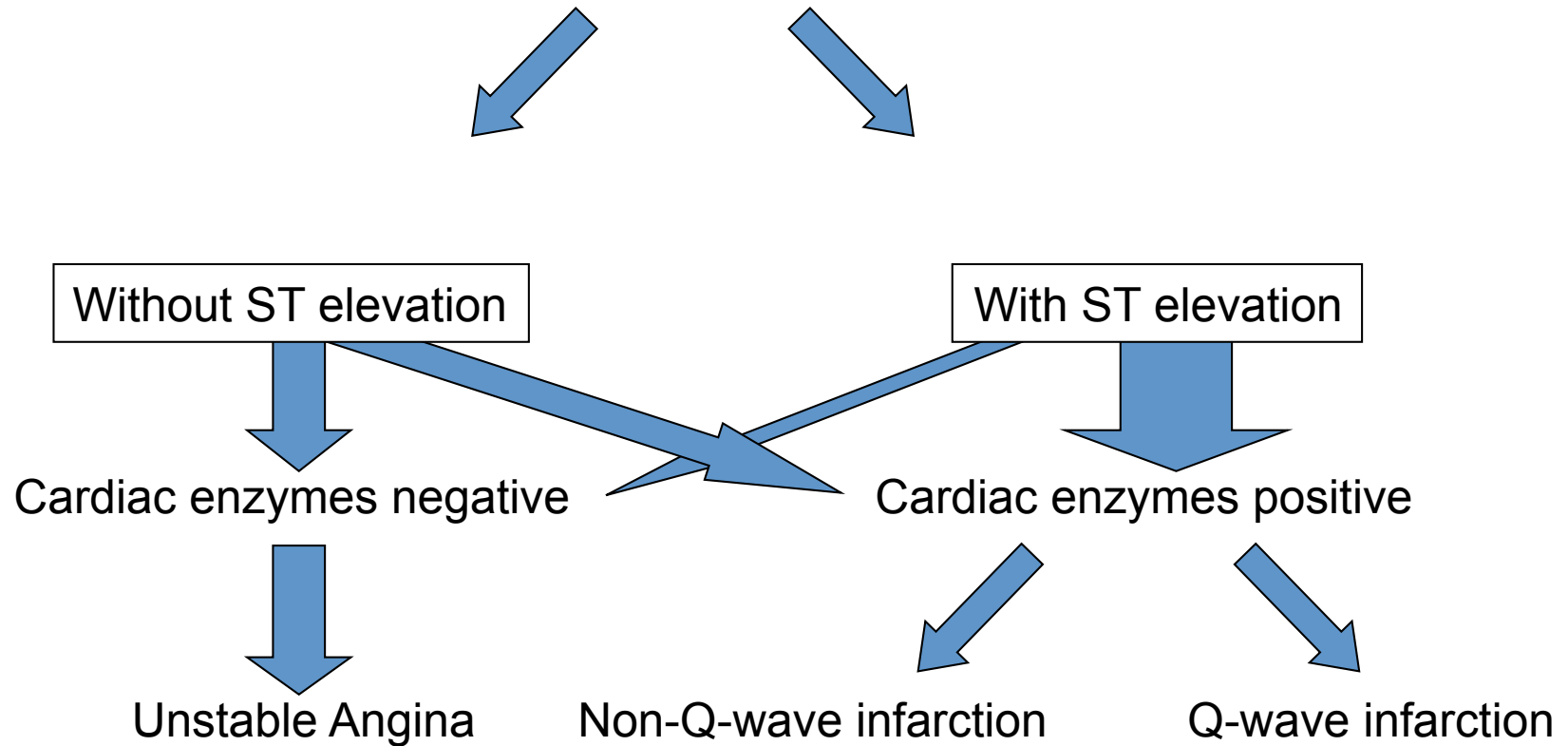
- Hartenzymen verhoogd &
- Eén van de volgende:
 - Typische klachten van drukkende snoerende pijn op de borst, eventueel met uistraling naar de kaak en/of arm en vegetatieve verschijnselen.
 - ST elevatie of depressie
 - Nieuwe pathologische Q
 - (na coronaire interventie)

Dus: ECG is ondergeschikt aan enzymen!

Maar wel essentieel in de acute fase!



Acute Coronary Syndrome (ACS)

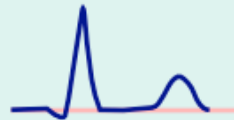


ECG uitingen van ischemie

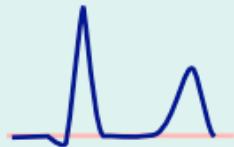
- ST elevatie
- ST depressie
- T top inversie
- QRS verbreding
- Asdraai
- R top afname
- Q vorming
- QTc verlenging

Natuurlijk beloop ECG bij AMI

Normal



Peaked T wave



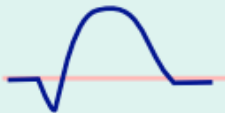
minutes

Progression of ST segment elevation



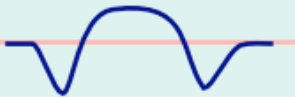
minutes - hours

Loss of R wave,
Q wave formation



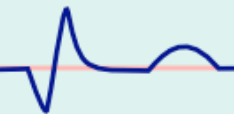
hours - days

T wave inversion



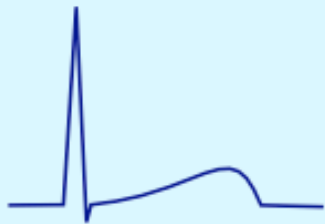
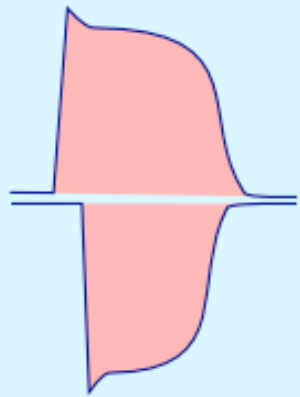
days

T wave normalisation
persisting Q wave

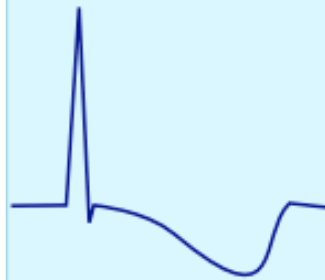
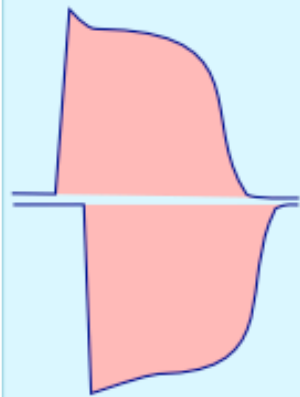


days - weeks - months

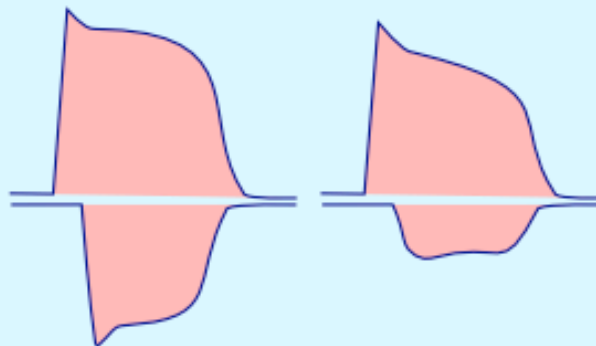
Normal



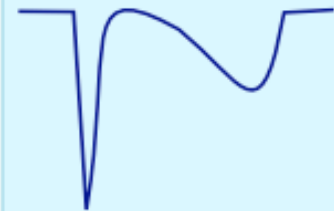
Ischemic Tissue

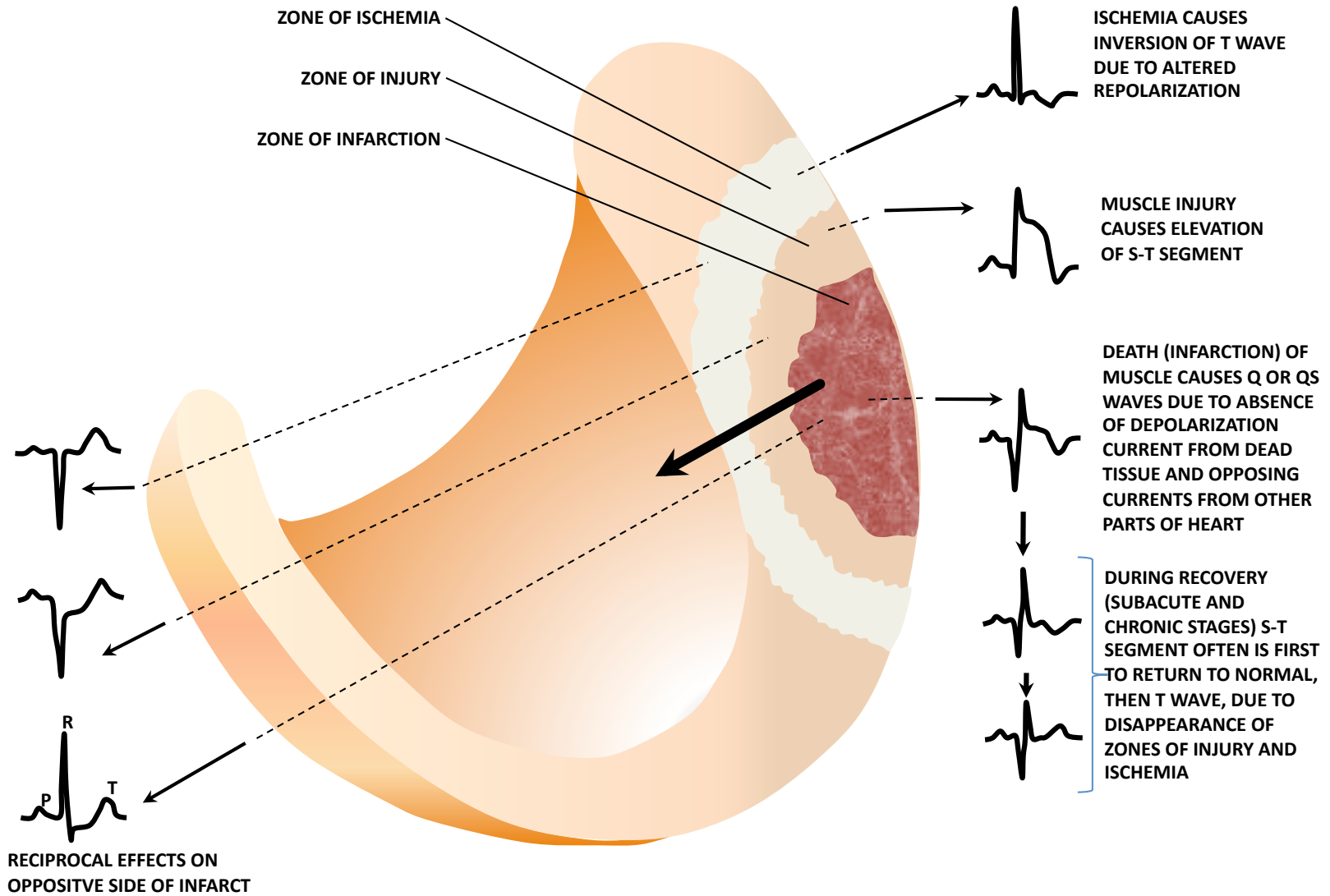


Injured Tissue



Necrotic Tissue

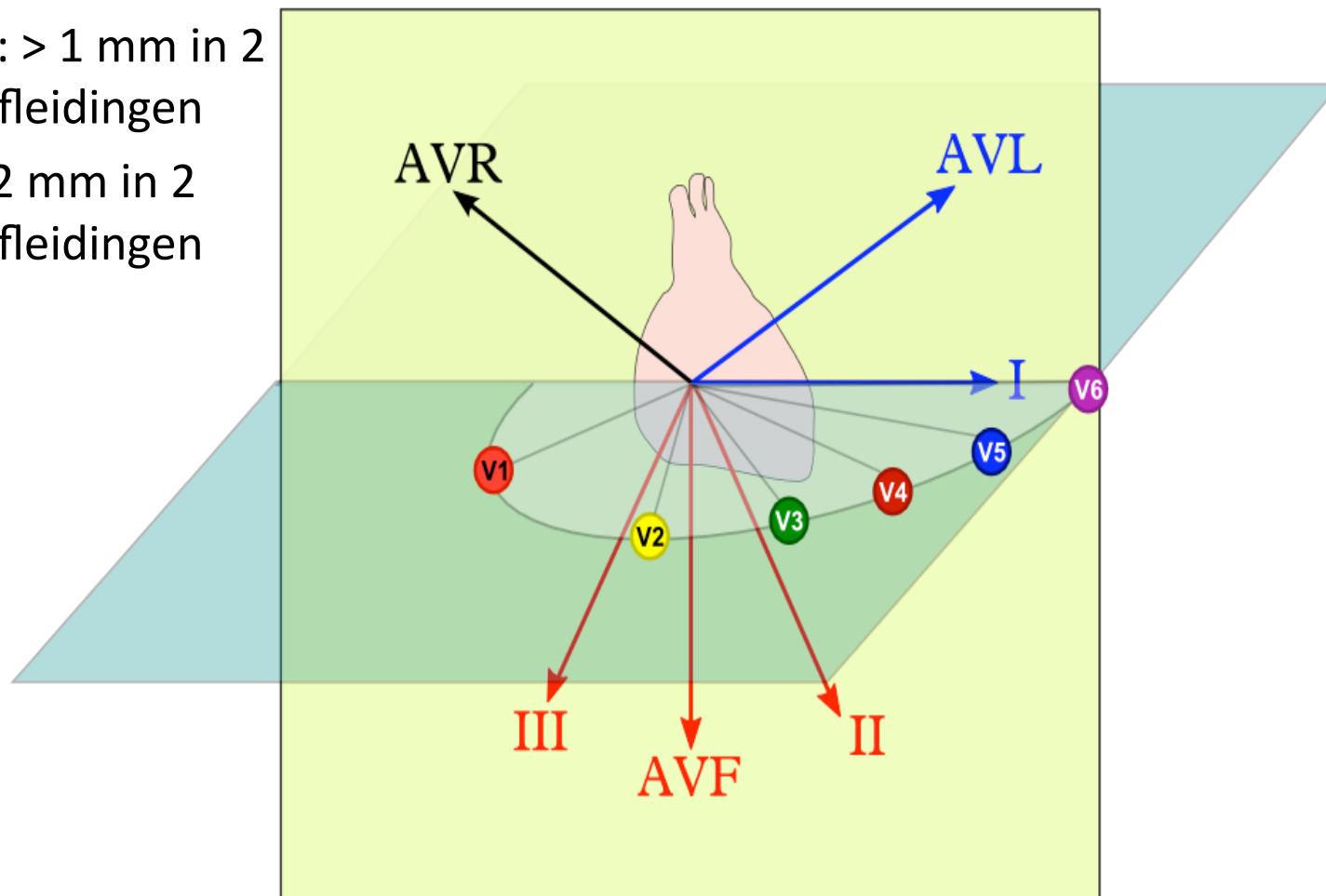


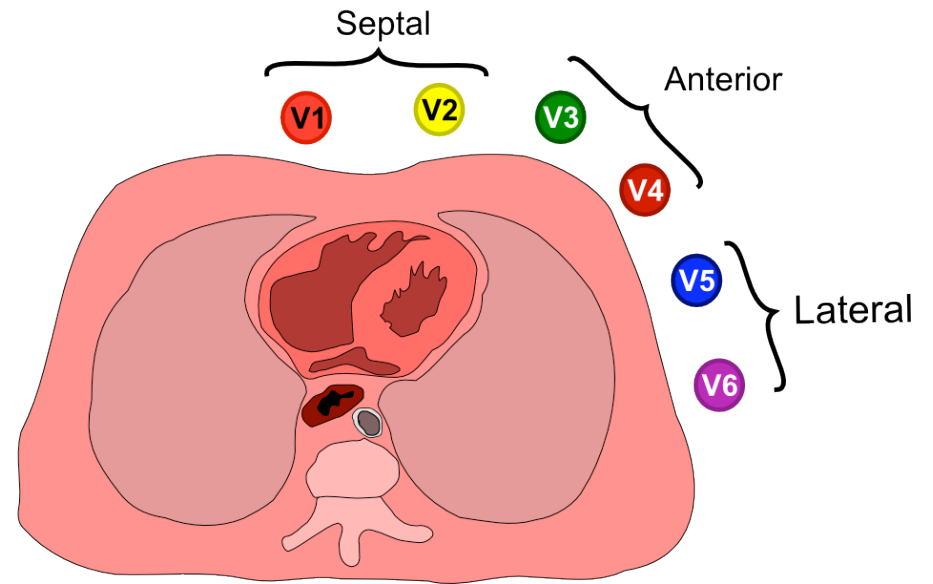
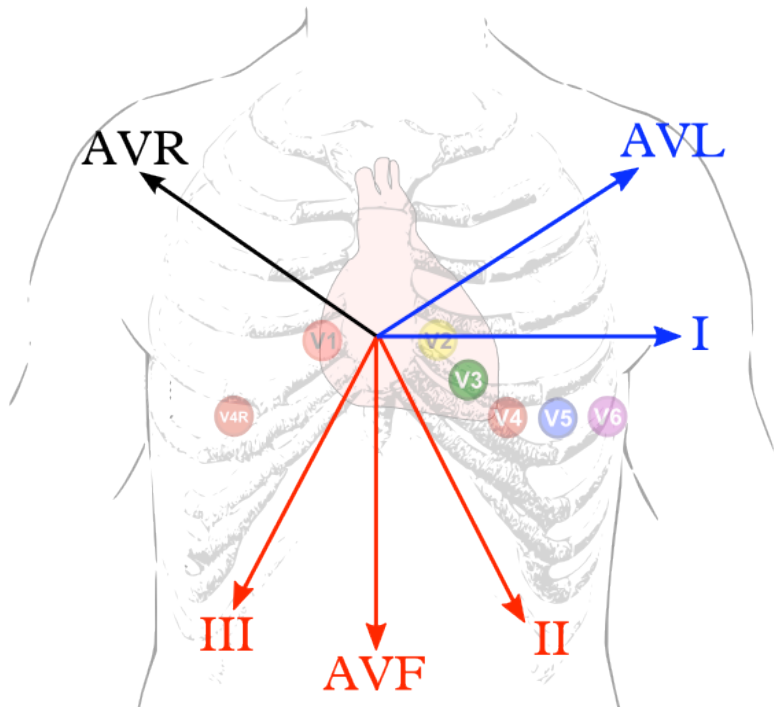


Significante ST elevatie

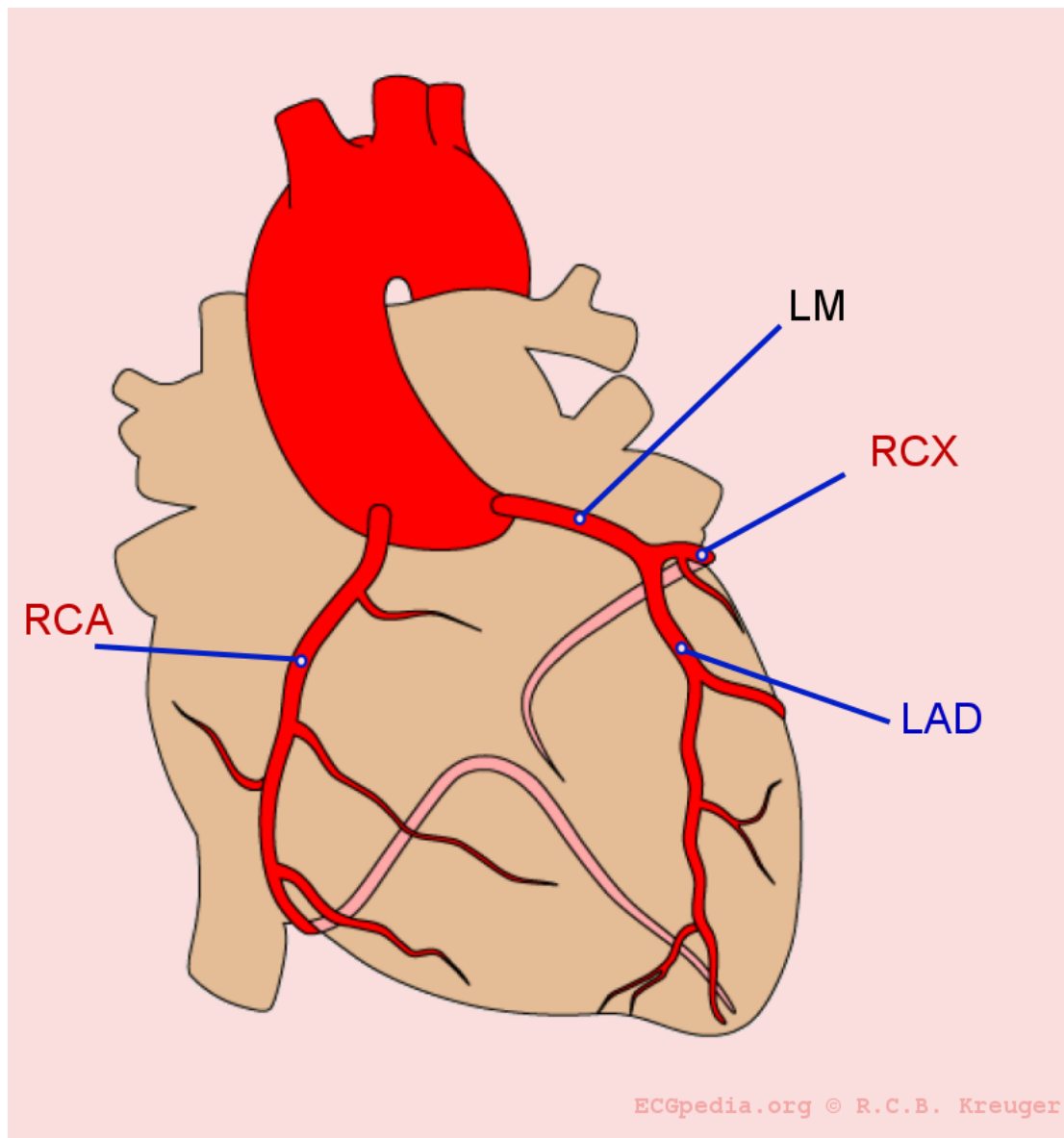
Extremiteten: > 1 mm in 2 belendende afleidingen

Voorwand: > 2 mm in 2 belendende afleidingen

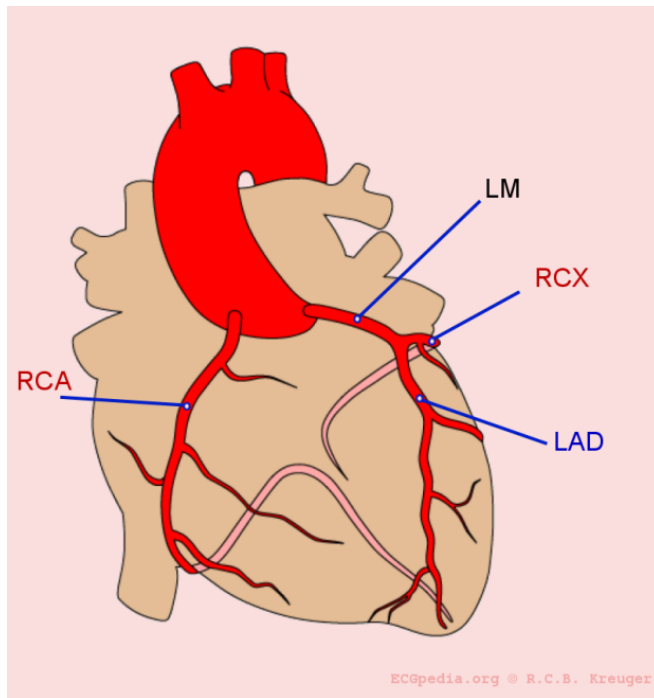




Kransslagvaten



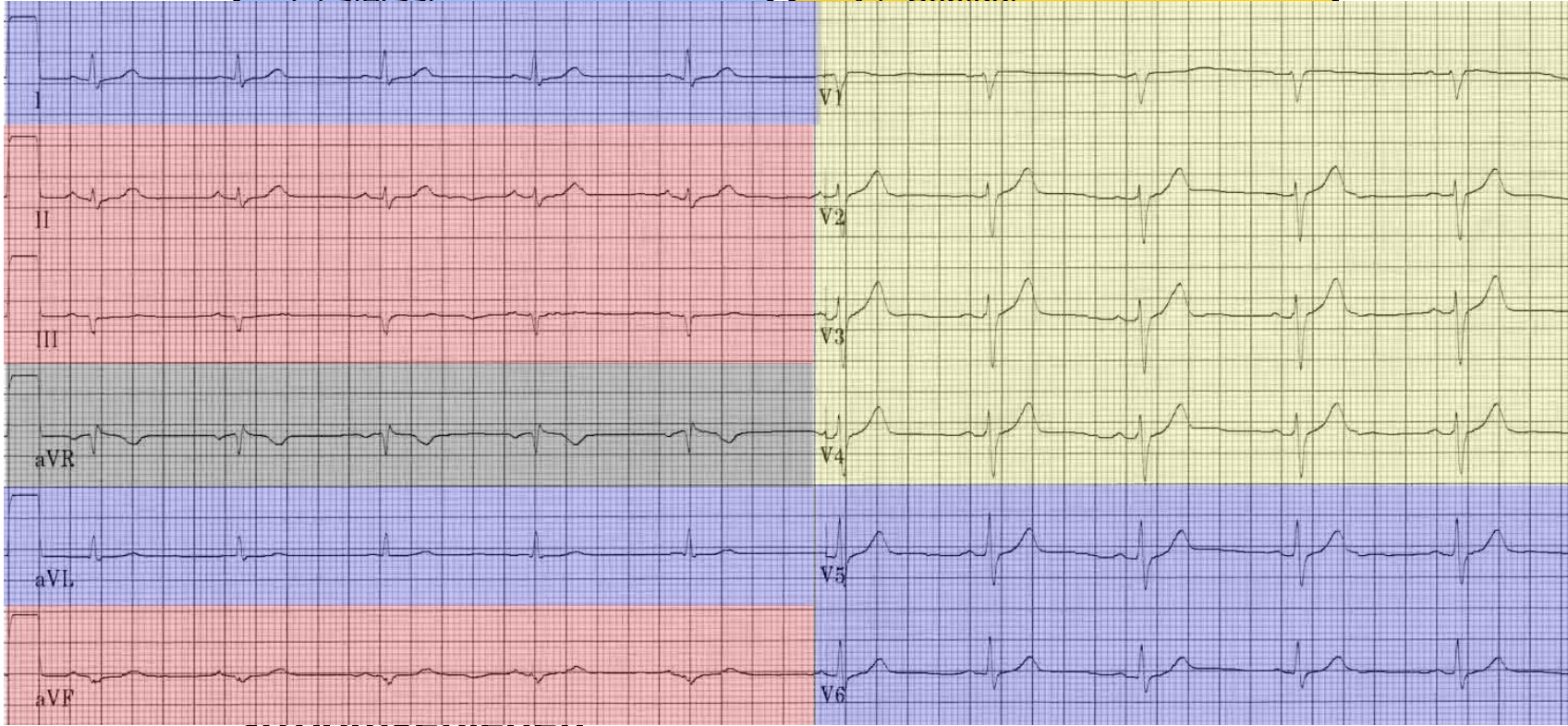
De ST elevatie wijst het infarctgebied aan



- **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 (namelijk resp Q en ST elevatie in tegenoverliggende posterior wand)
- **Lateraal:** elevatie in I, AVL, V6. Stroomgebied: LAD (D-tak)
- **Hoofdstamocclusie:** diffuse ST depressie met ST elevatie in AVR. *Zeer hoog risico*

I Lateraal

V1 Sentaal



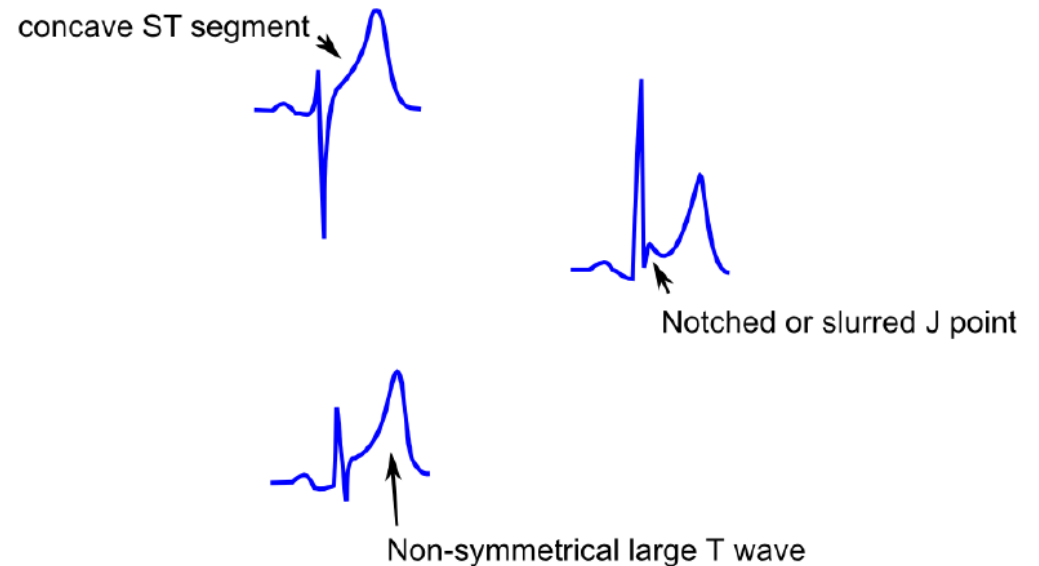
stroomgebieden

Waarom is dit belangrijk?

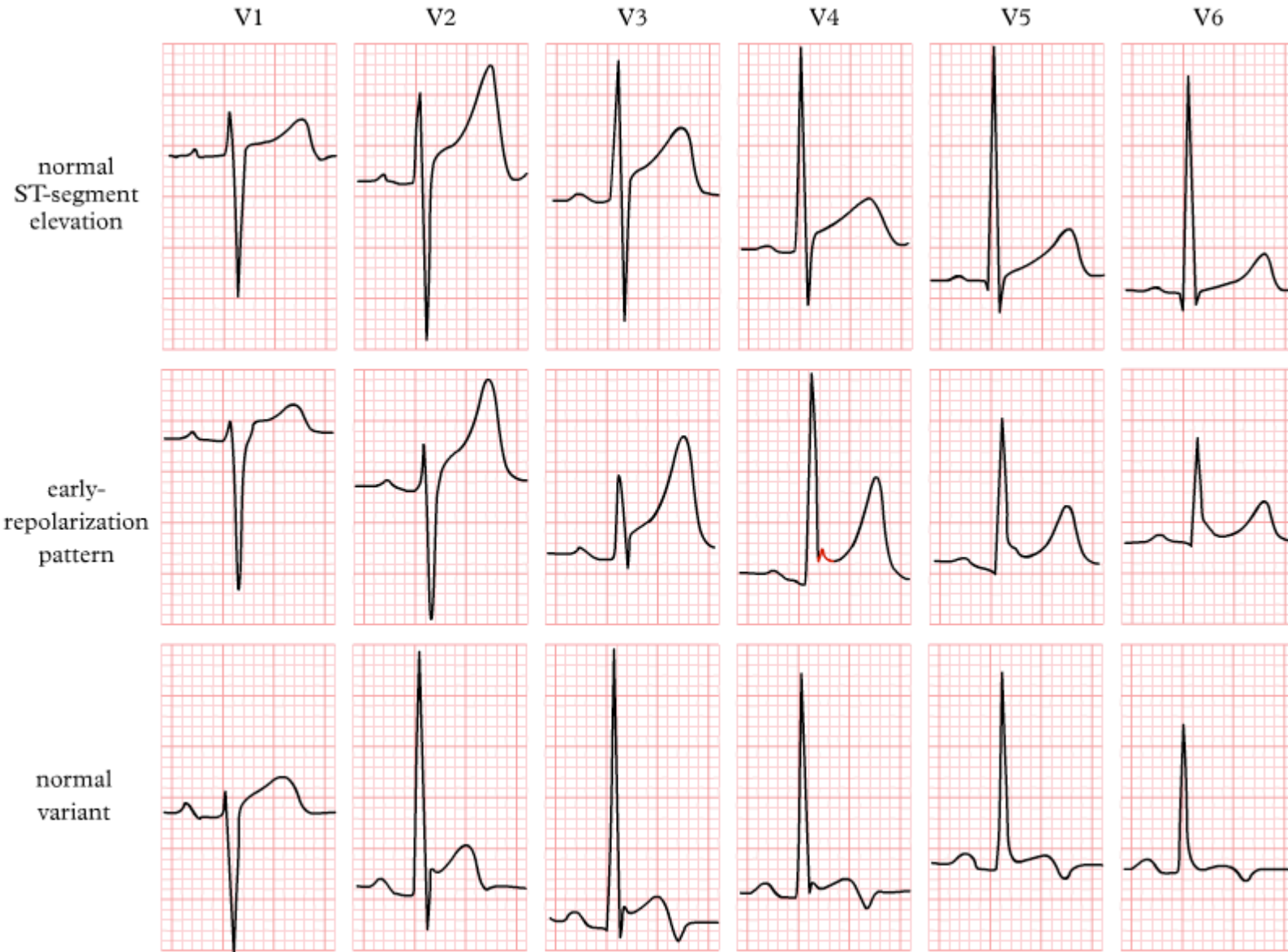
- Identificeren van patienten voor die voor spoed PTCA in aanmerking komen
- Vaststellen risico op complicaties
 - Ritmestoornissen
 - Geleidingsstoornissen
 - Pompfalen

Vroege Repolarisatie

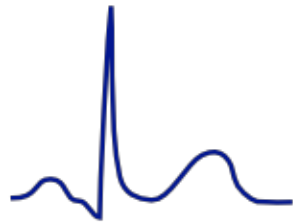
- Zeer frequente bevinding
- “Smiley”configuratie
- Overigens gezonde asymptotische jonge volwassene
- Vaak in voorwards afl.
- Notching J punt
- Geen Q
- Geen reciproke ST depressie



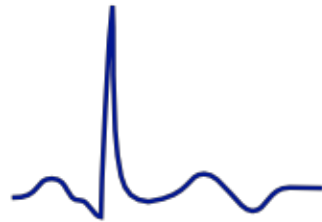
Normale Varianten



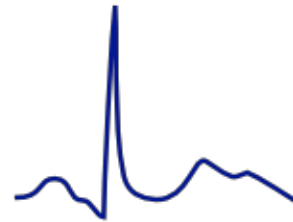
ST Varianten



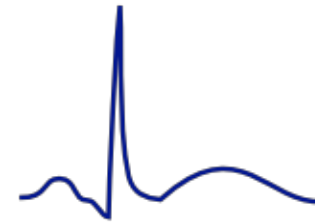
Normal



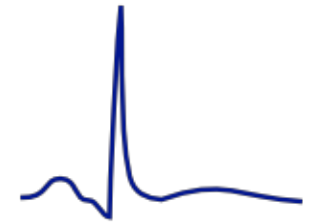
Biphasic



Bifid / notched



Broad / slow

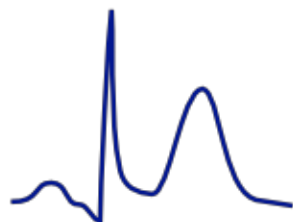


Flat

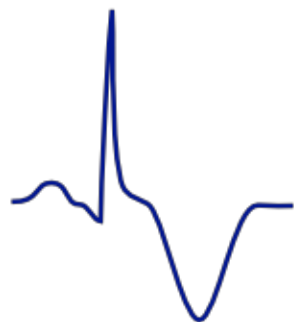
Nonspecific ST-T wave abnormalities



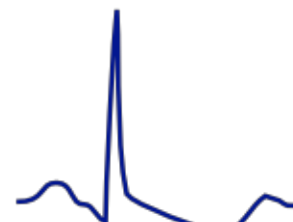
Hyperkalemia



Repolarization Variant



Ischemia



Strain

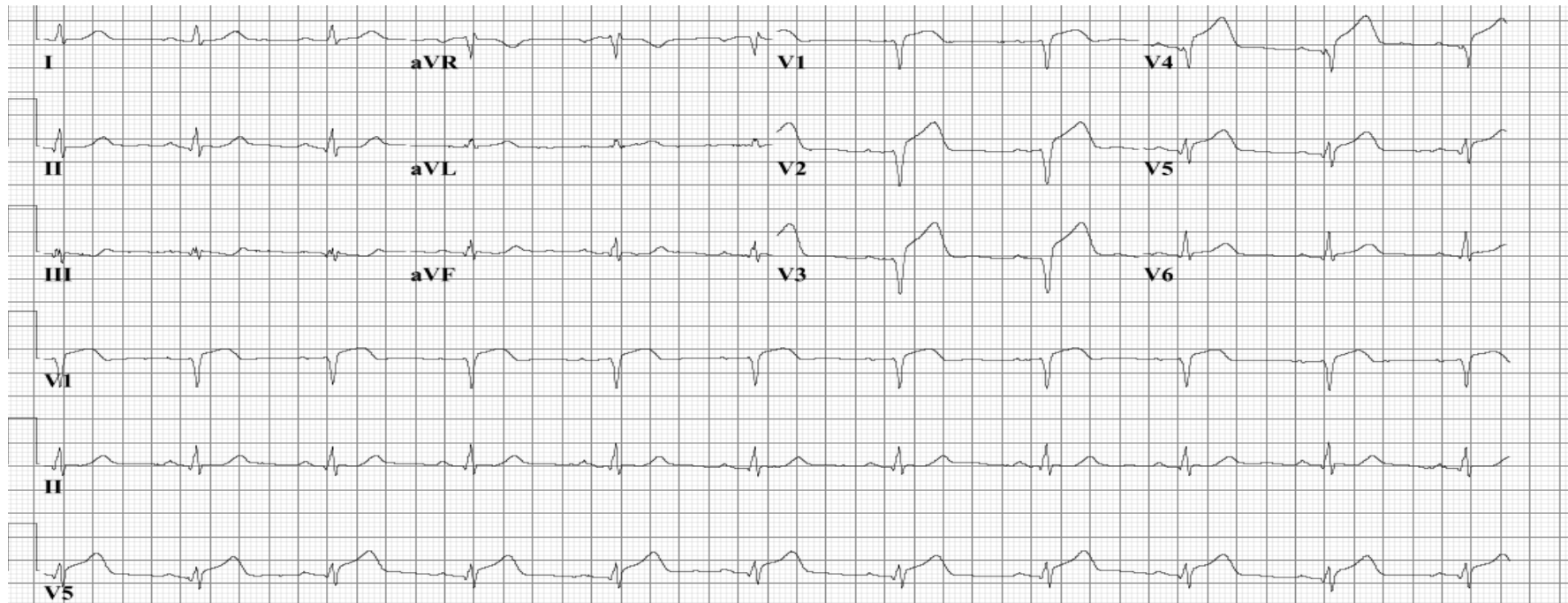


Prolonged QT interval

♀ 46 jr.

A: Bij presentatie 1 uur AP

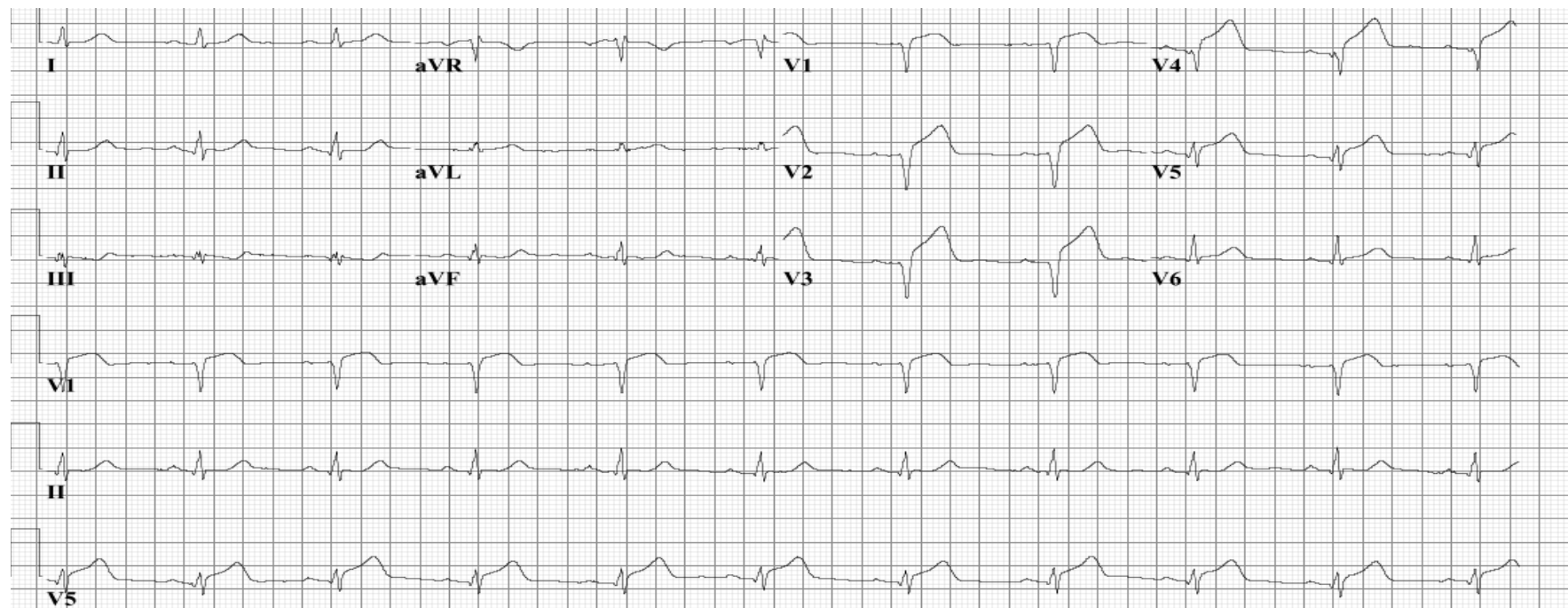
VG: Hypertensie, familie, hyperlipidemie, roken +++.



♀ 46 jr.

A: Bij presentatie 1 uur AP

VG: Hypertensie, familie, hyperlipidemie, roken +++.



ST-elevatie in (aVL) V1-V6,

Q's V1-3 →

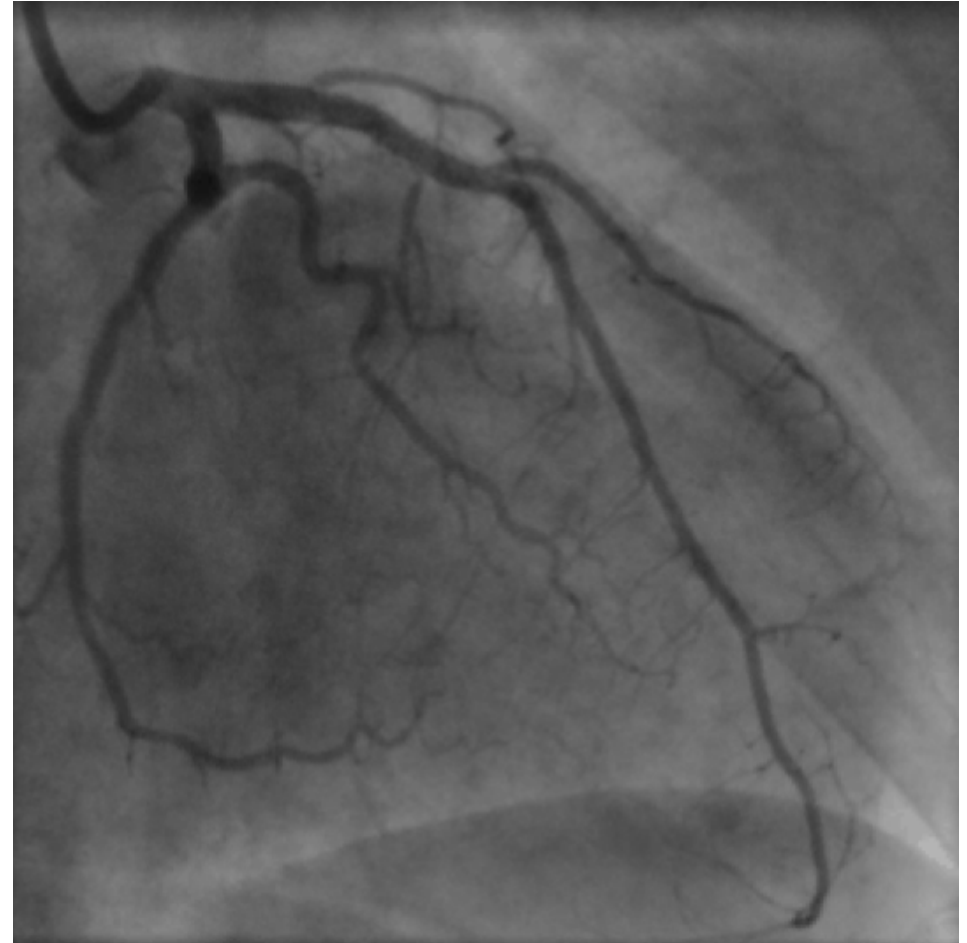
II, III, aVF: vlak/ ST↓

Acuut voorwand infarct

RCA LAO

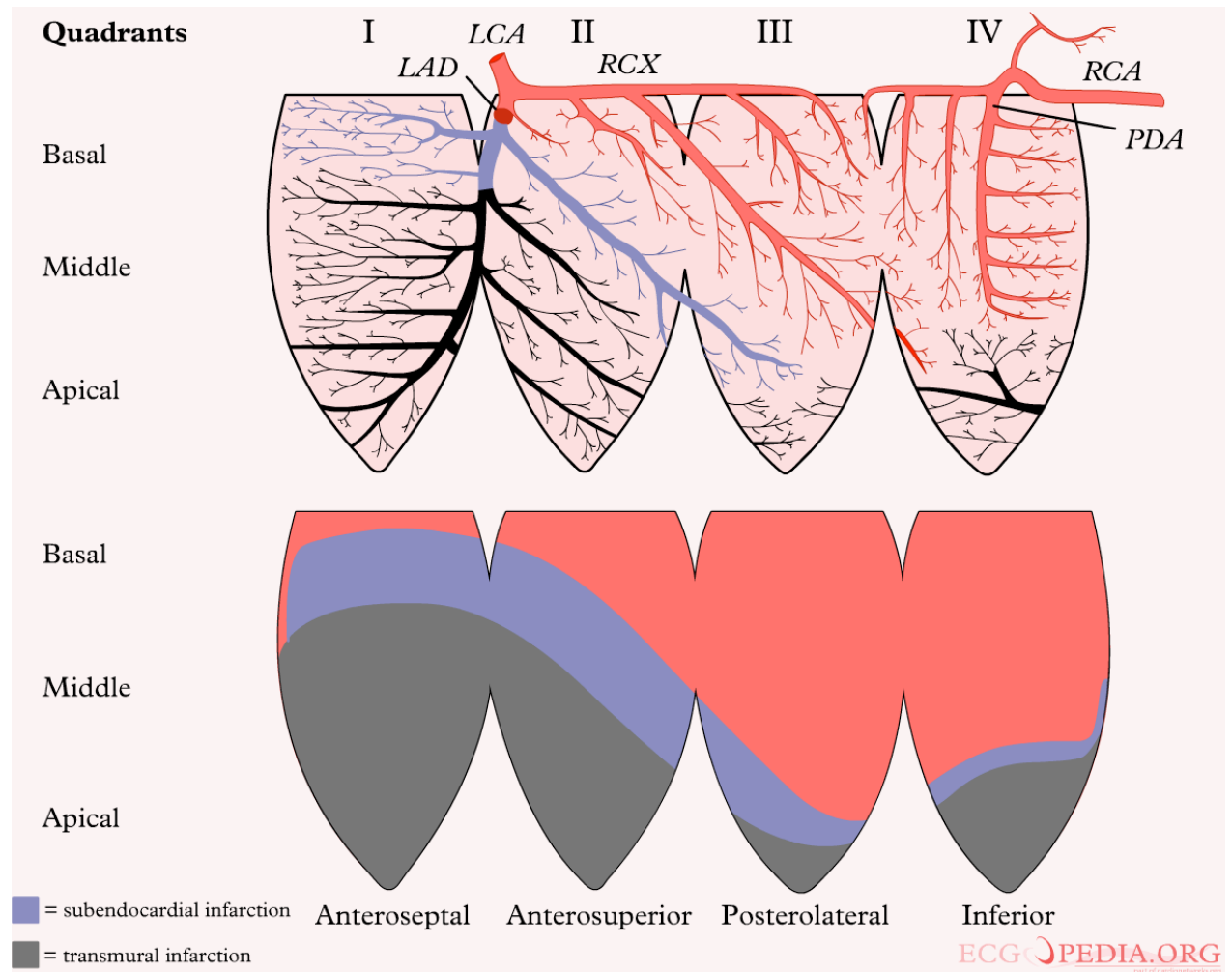
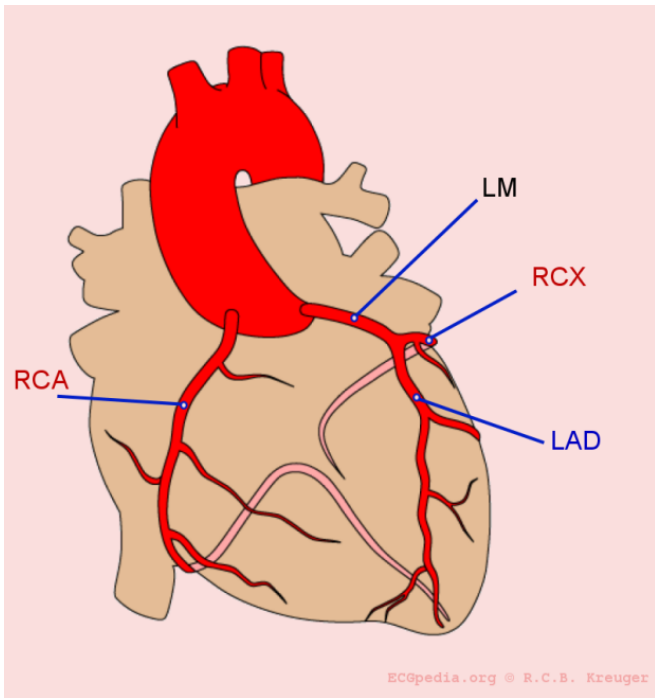


LCA pre en post PCI



Proximale LAD occlusie, voor eerste septale tak, na diagonale tak

Bloedvoorziening onderwand



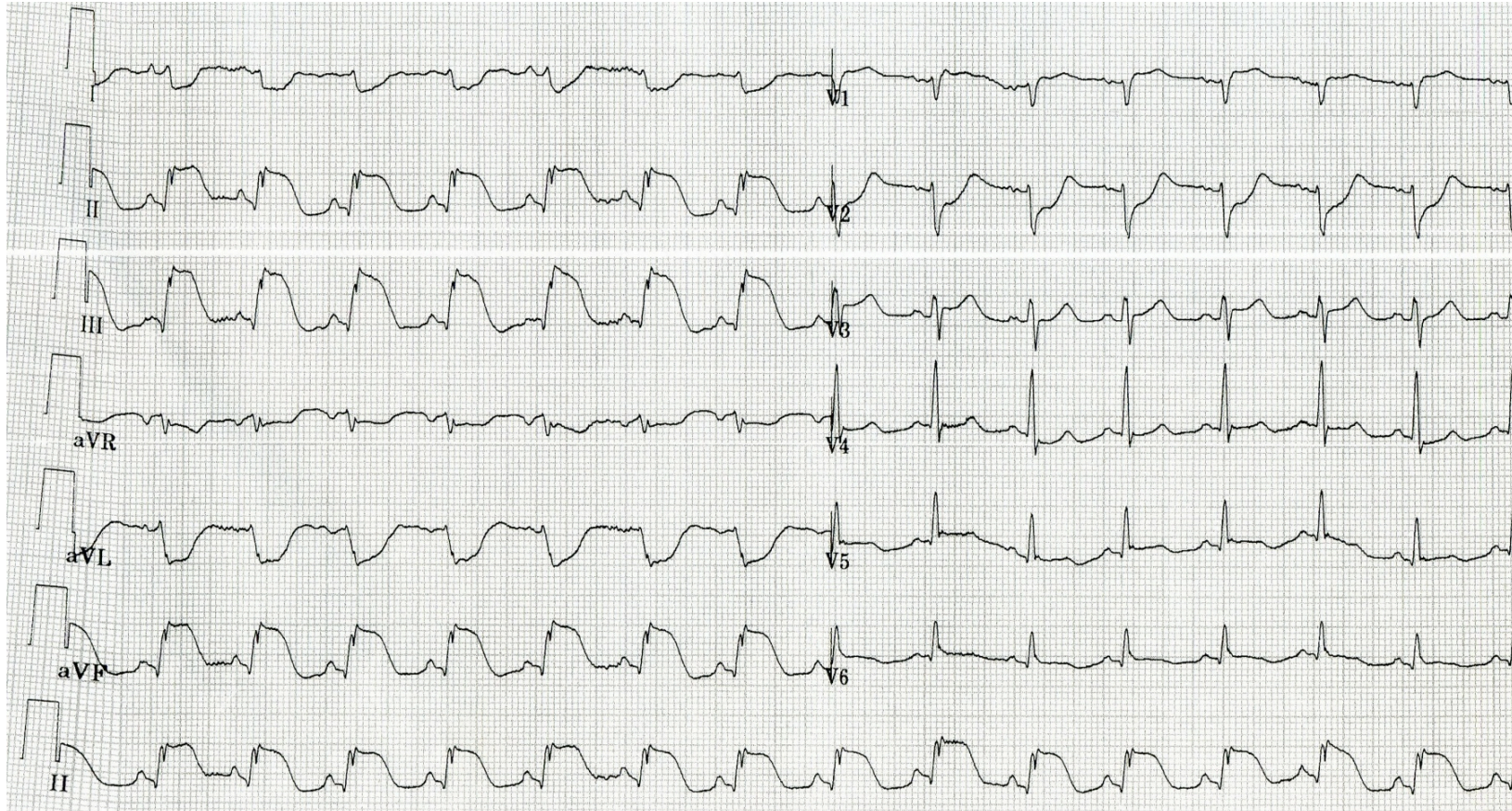
RCA of RCx?

- RCA occlusie
 - ST elevatie III>II
 - ST depressie in I mogelijk
 - V₄R isoelectrisch of geëleveerd
 - RV infarct mogelijk
- RCx occlusie:
 - ST elevatie II>III
 - ST elevatie I mogelijk
 - V₄R negatieve T
 - RV infarct in principe niet mogelijk

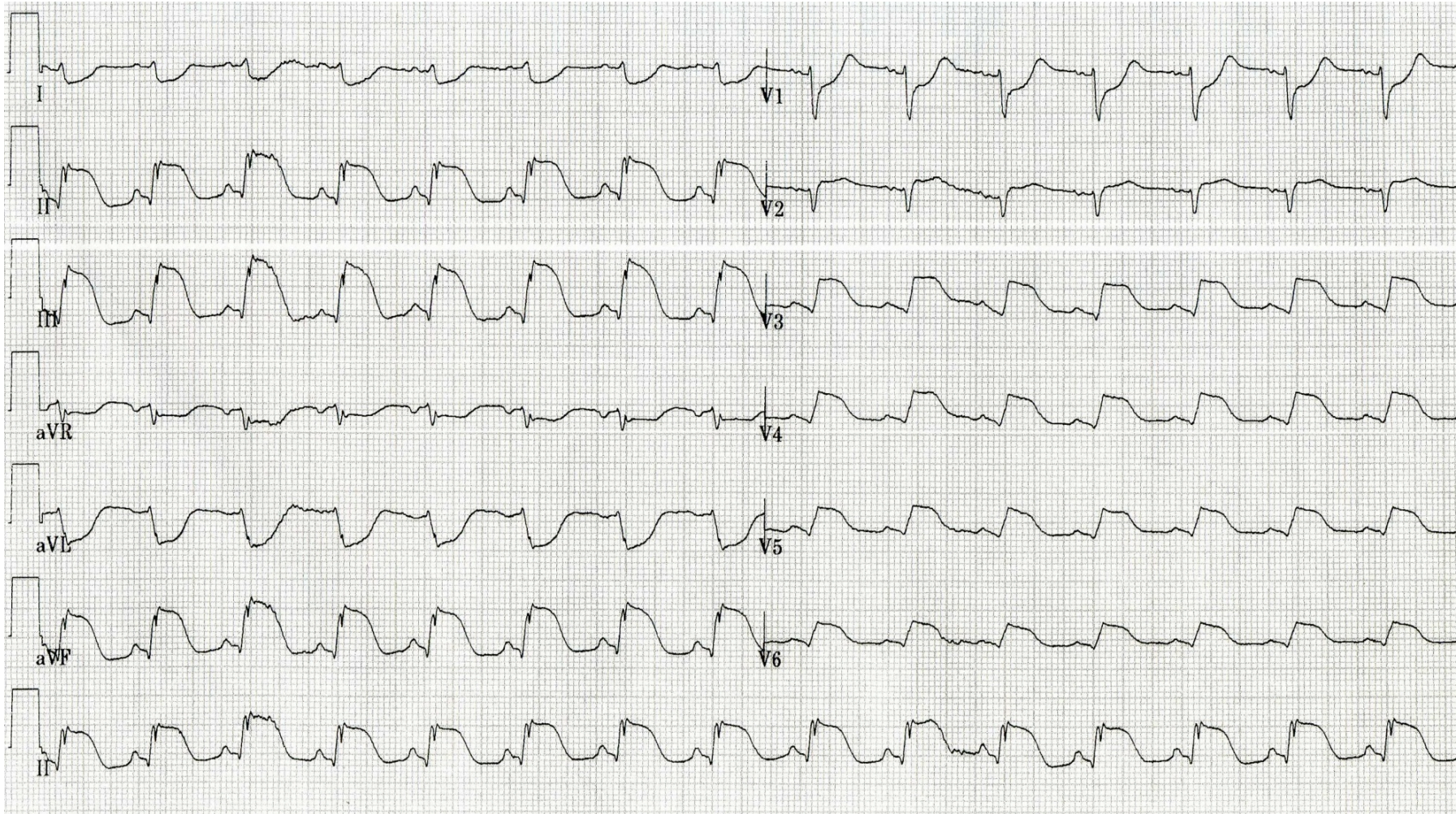
♂ 52 jr.

A: 75 min POB

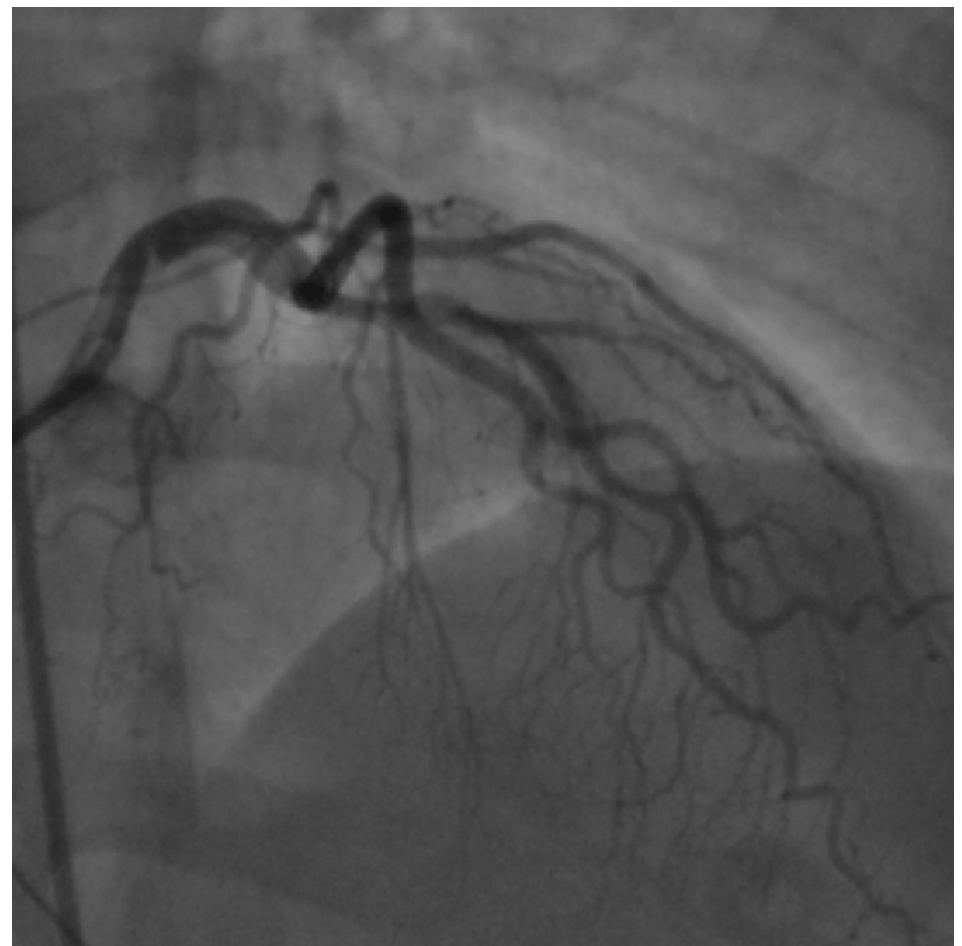
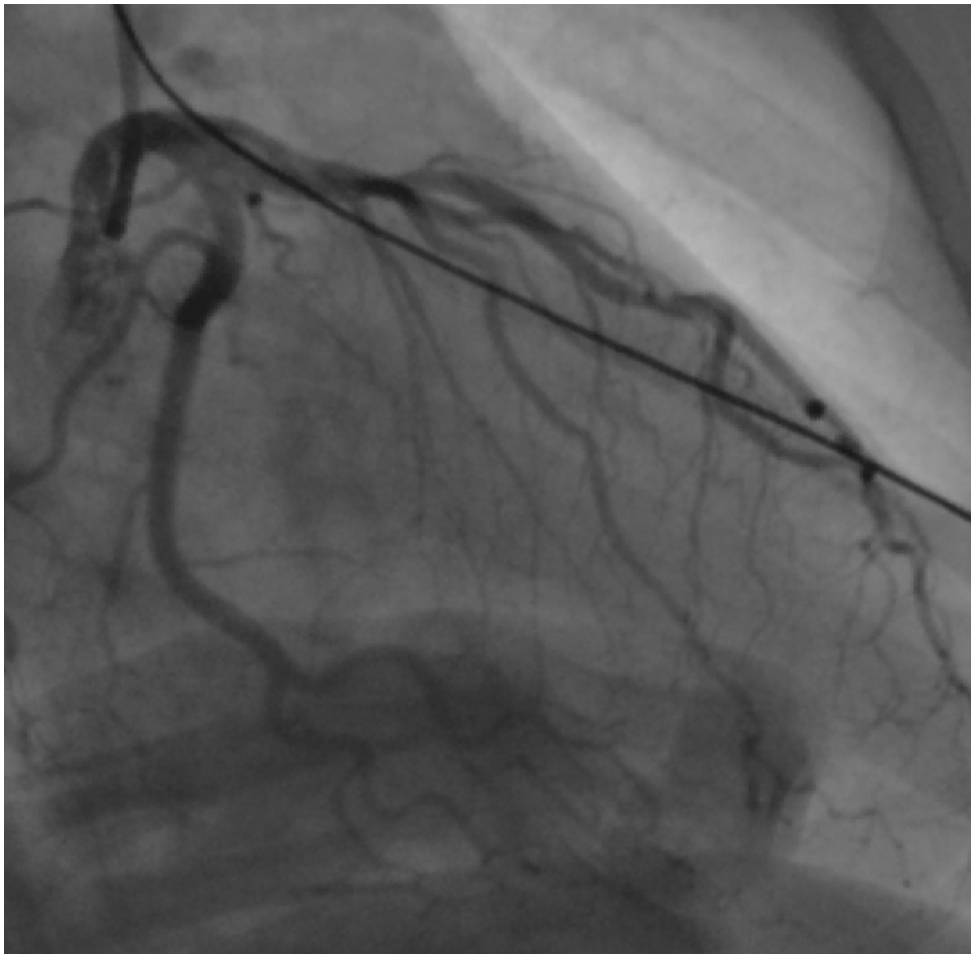
VG: HC/ HT/ fam



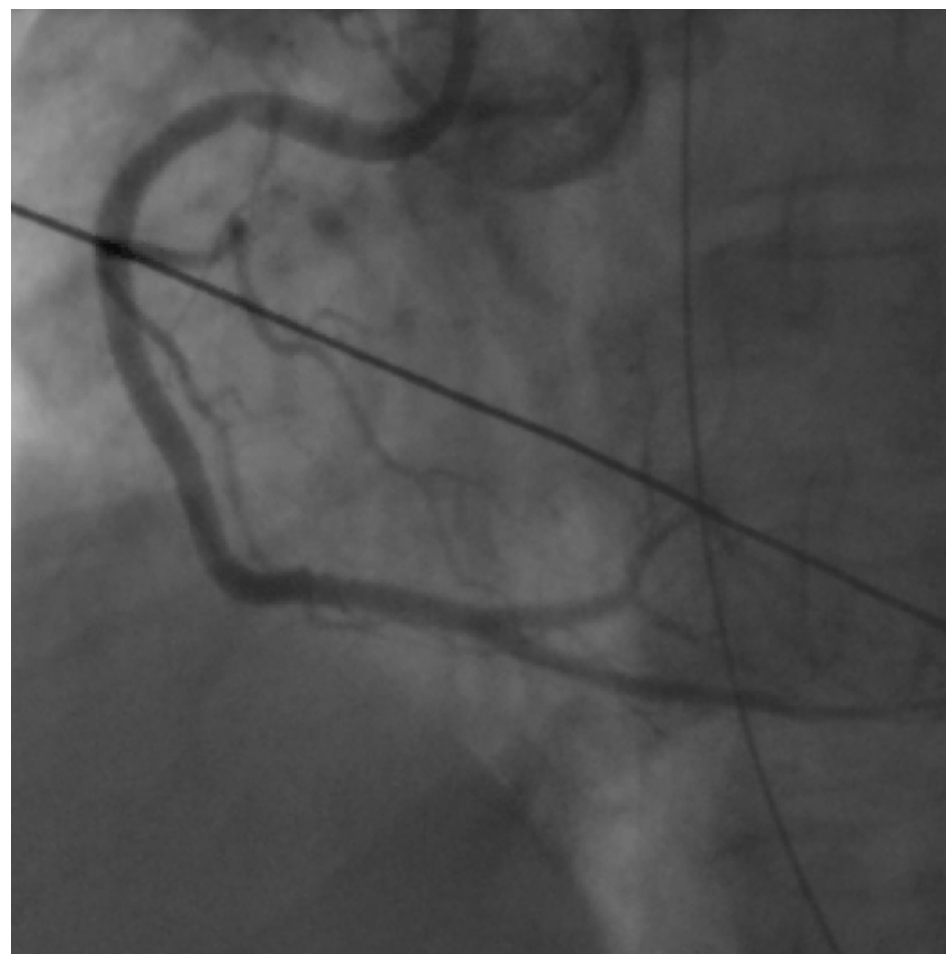
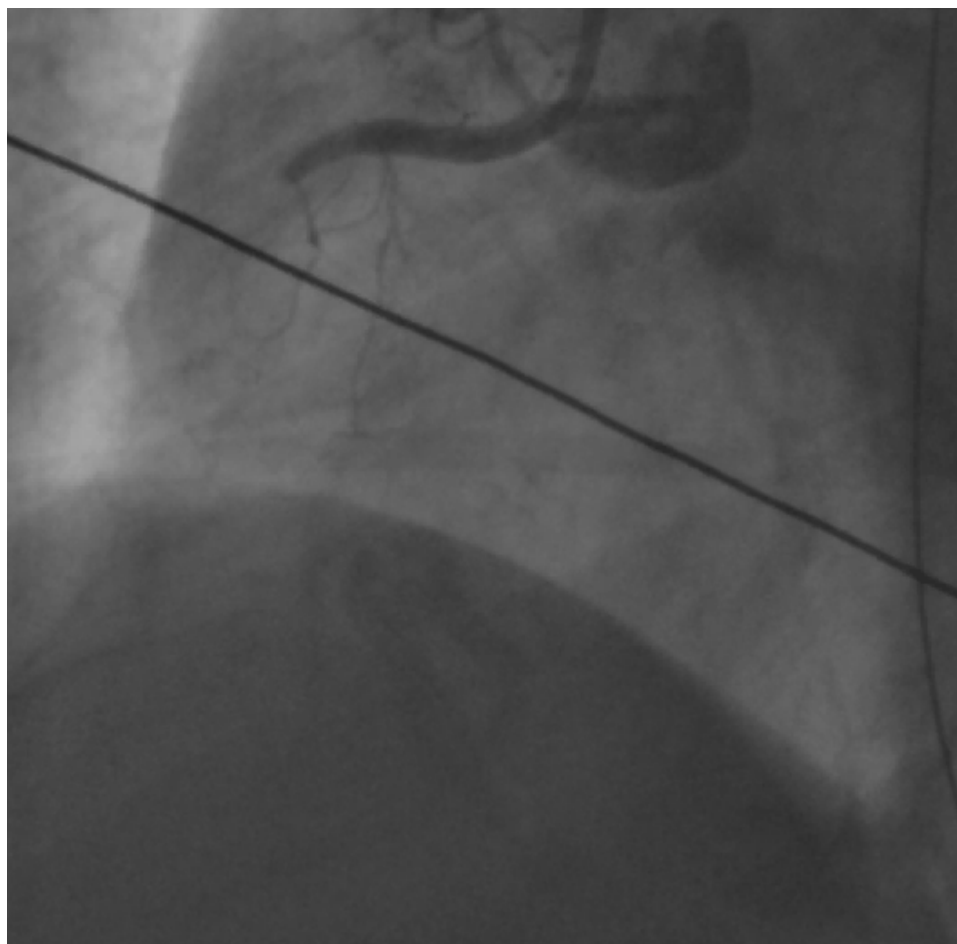
♂ 52 jr.



LCA RAO en craniaal



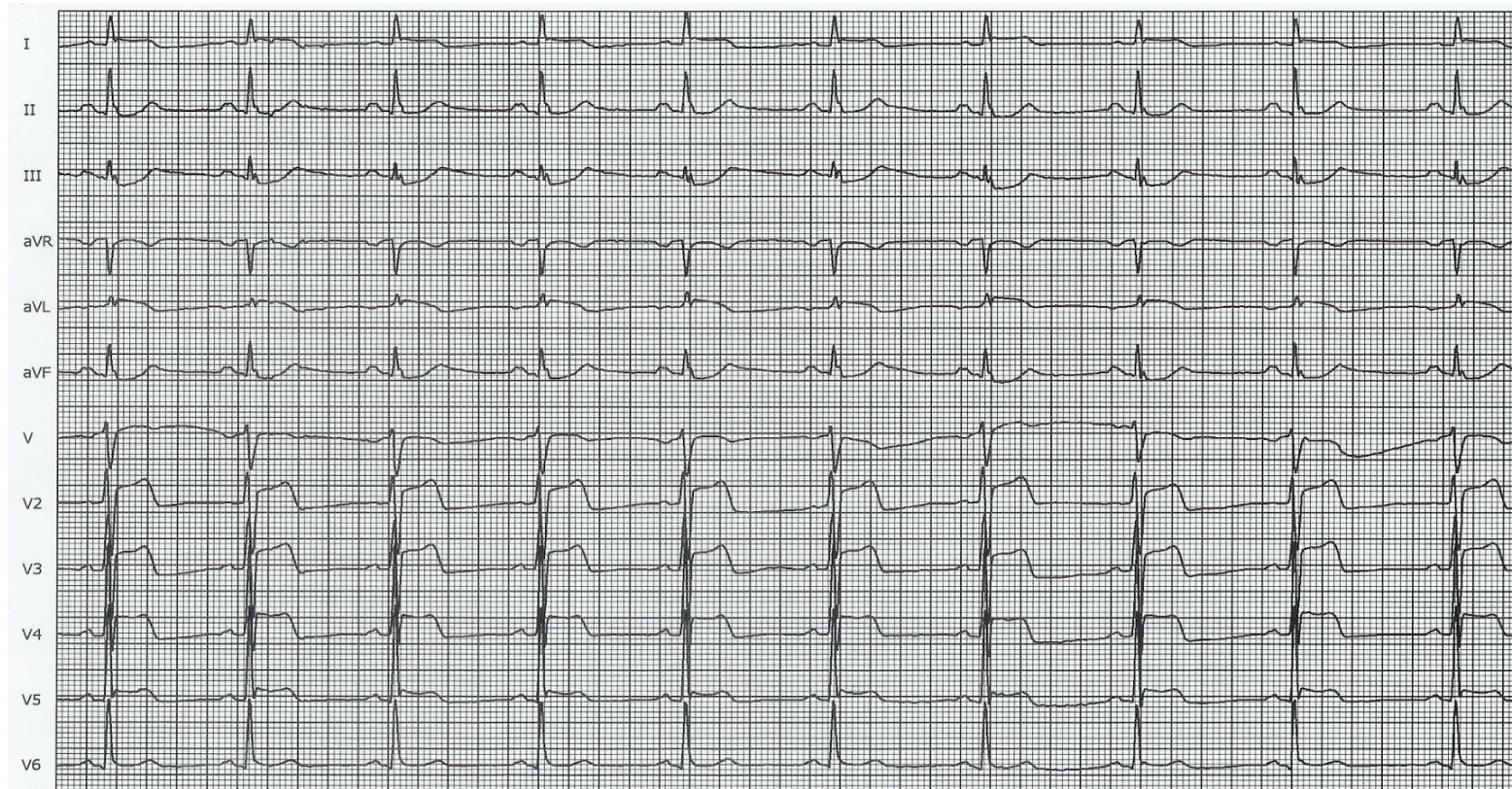
RCA pre en post PCI



♂ 69 jr.

A: Tijdens PCI LAD hevige AP

VG: Blanco

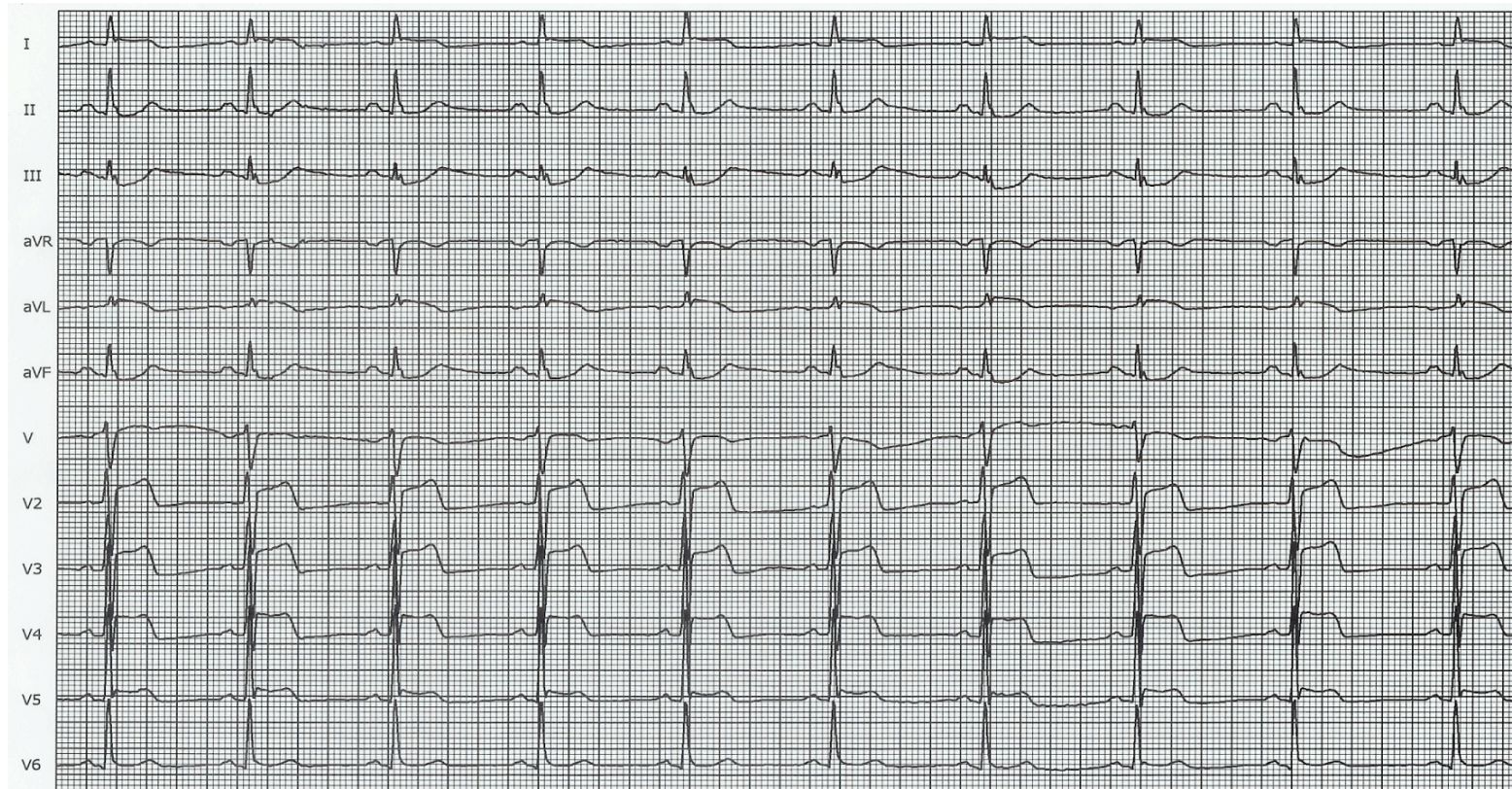


ST-elevatie in I, aVL, V2-V5 →

♂ 69 jr.

A: Tijdens PCI LAD hevige AP

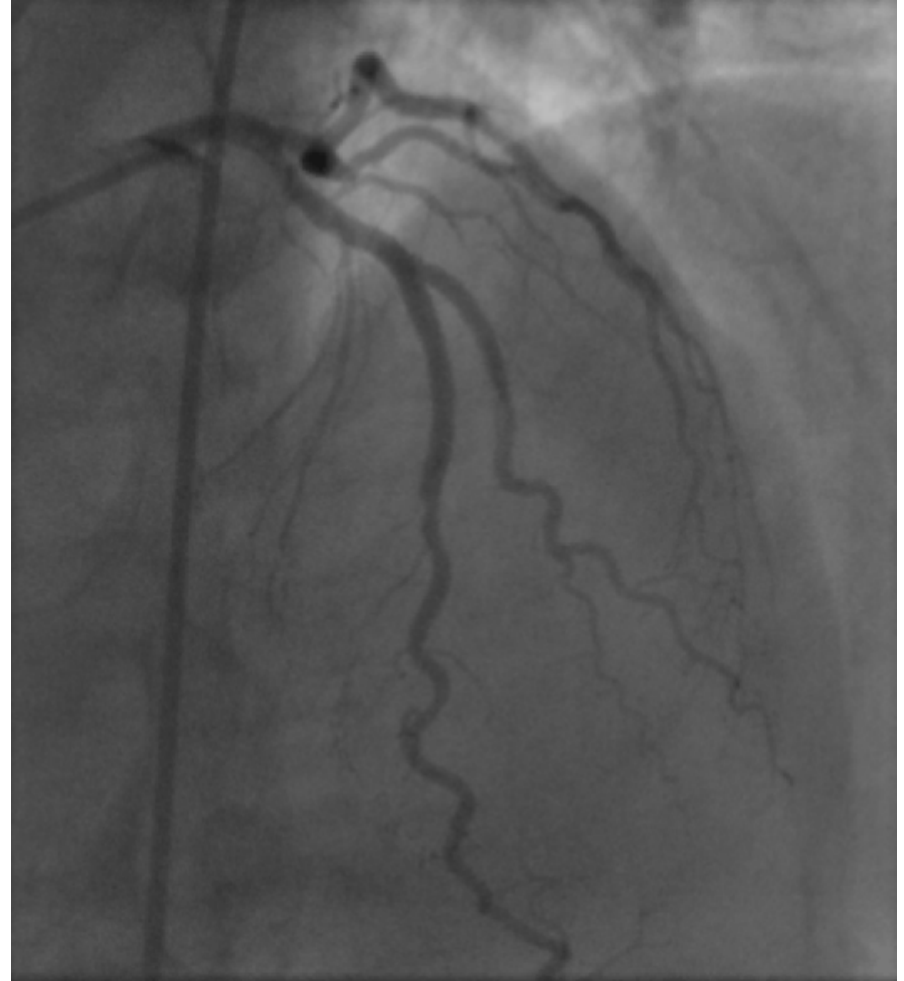
VG: Blanco



ST-elevatie in I, aVL, V2-V5 →

Grote diagonale tak

LCA



♂ 52 jr.

A: Sinds 90 min AP, vegetatieve verschijnselen

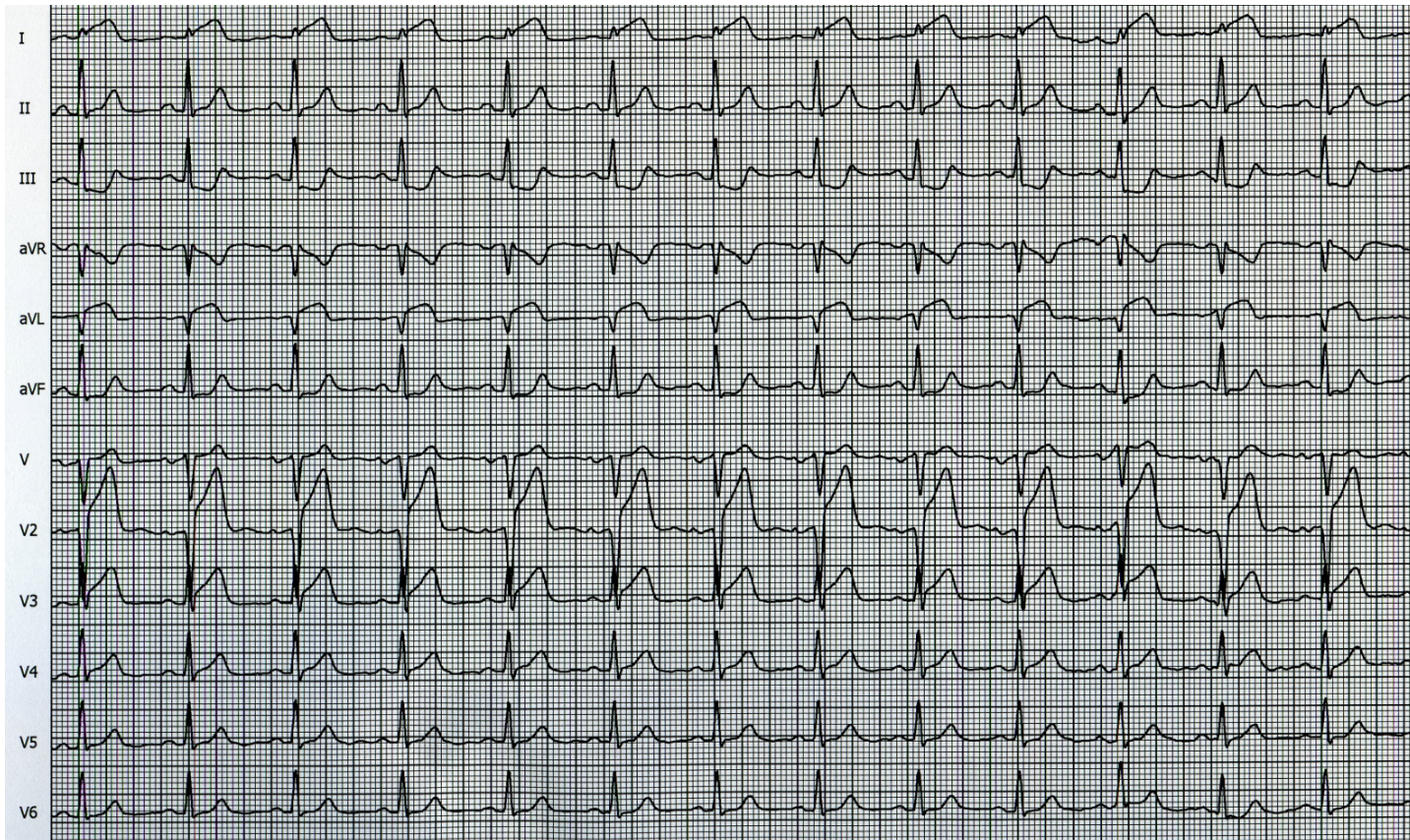
VG: HT, roken



♂ 52 jr.

A: Sinds 90 min AP, vegetatieve verschijnselen

VG: HT, roken

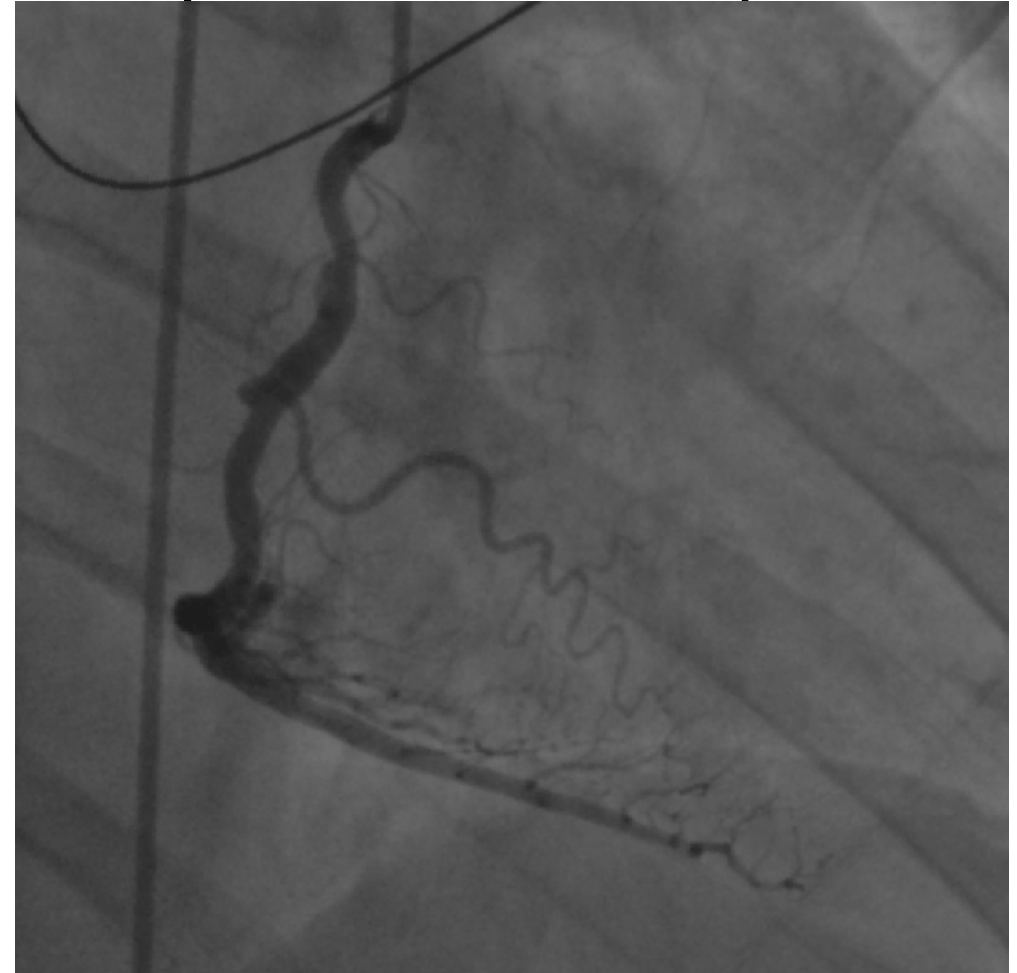
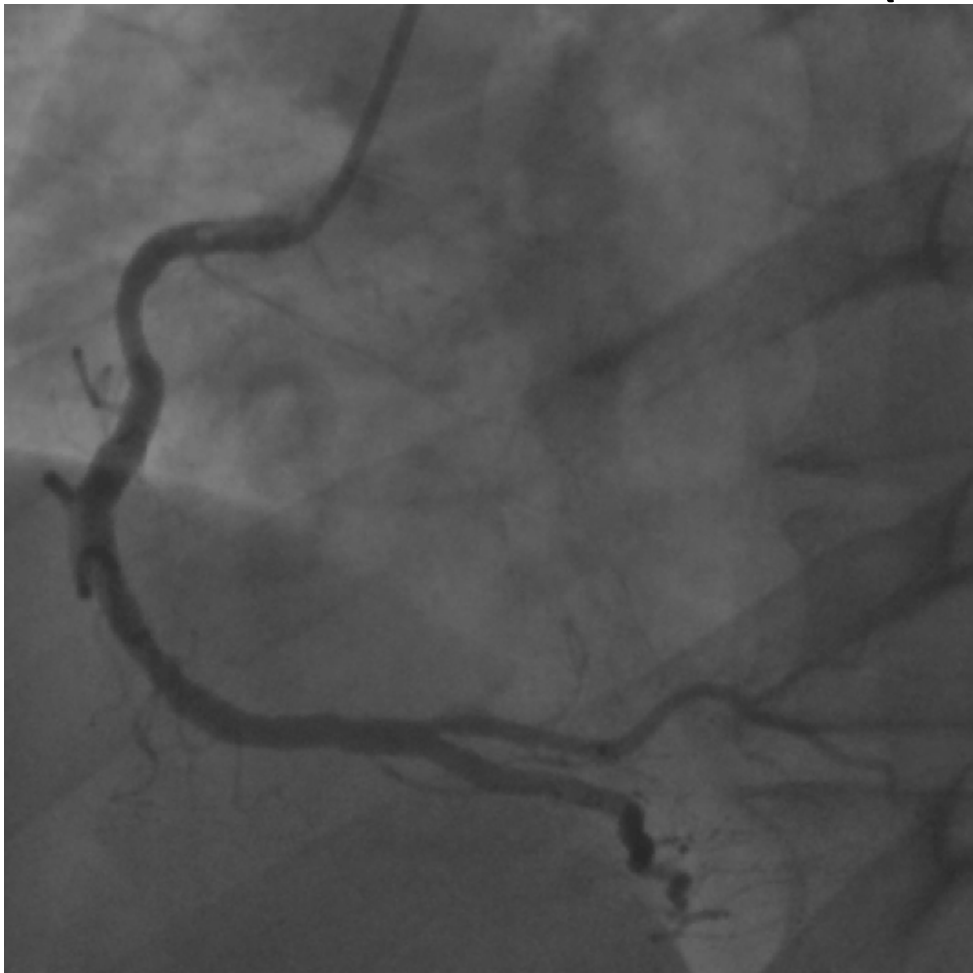


ST-elevatie in I, aVL, V2-V5

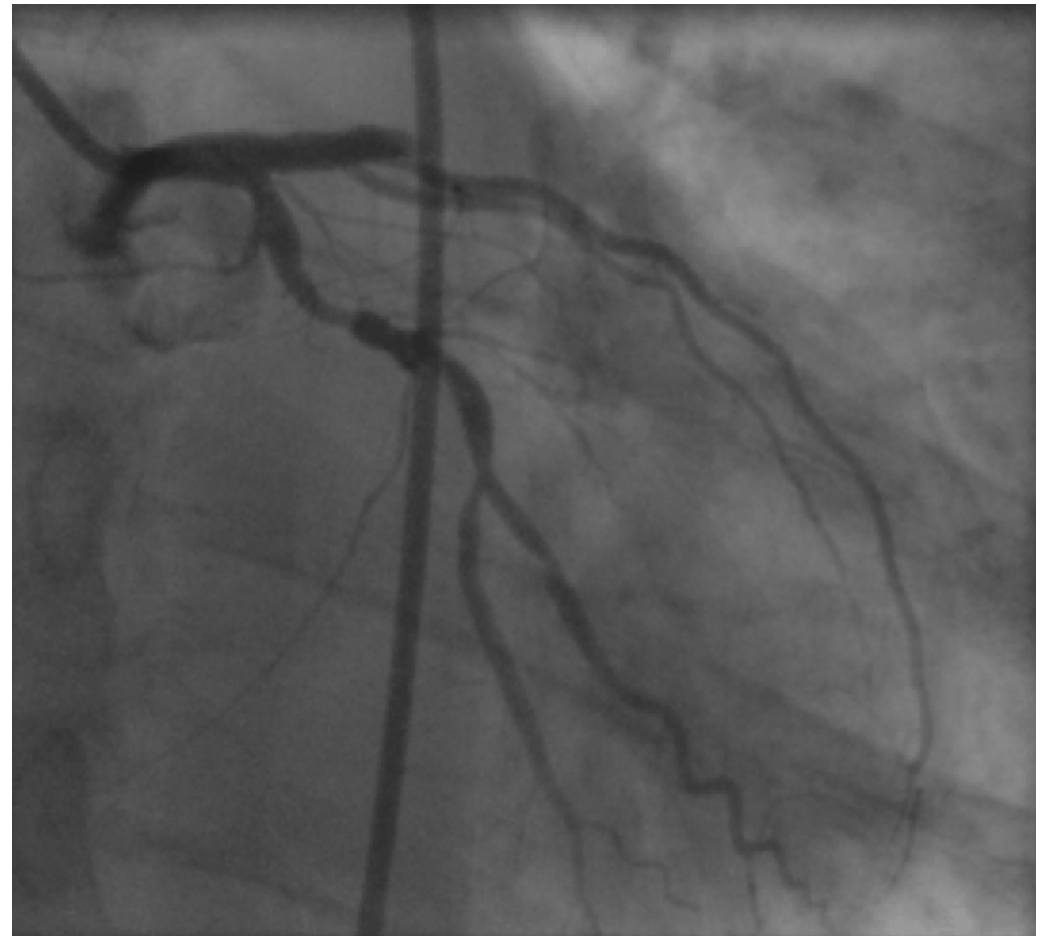
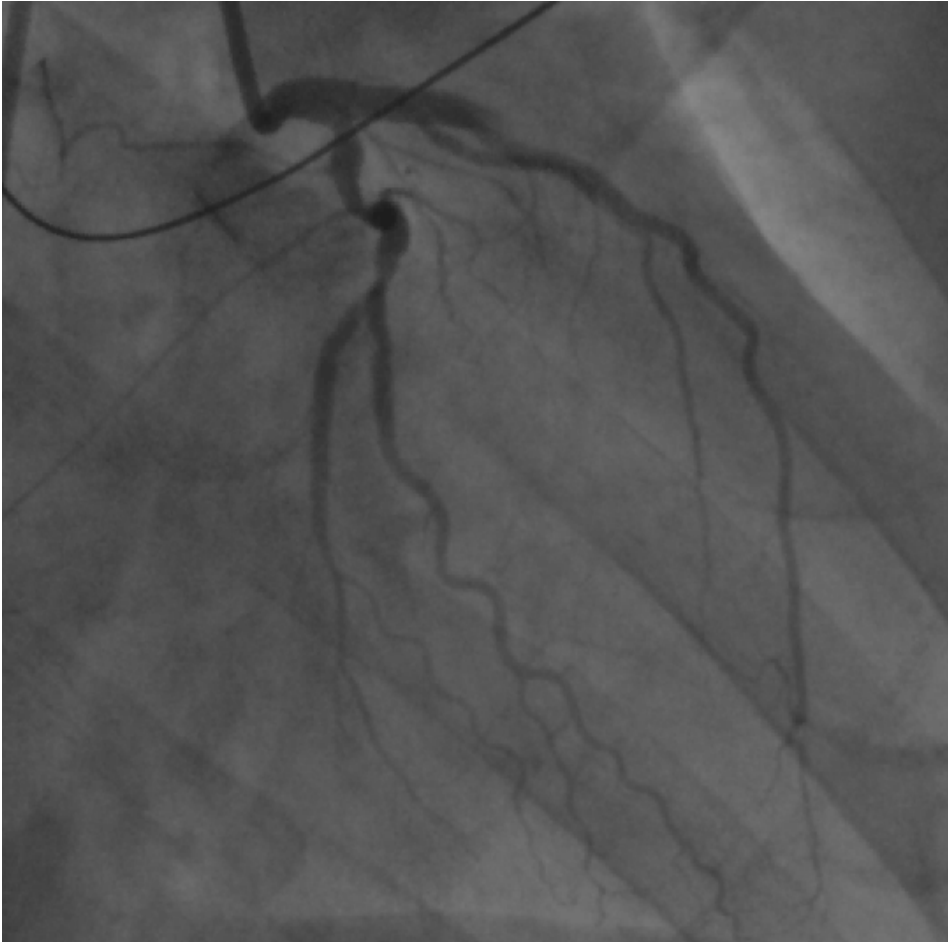
ST depressie III, aVF →

RCA

LAO en RAO (cave septe collateralalen)



LCA pre



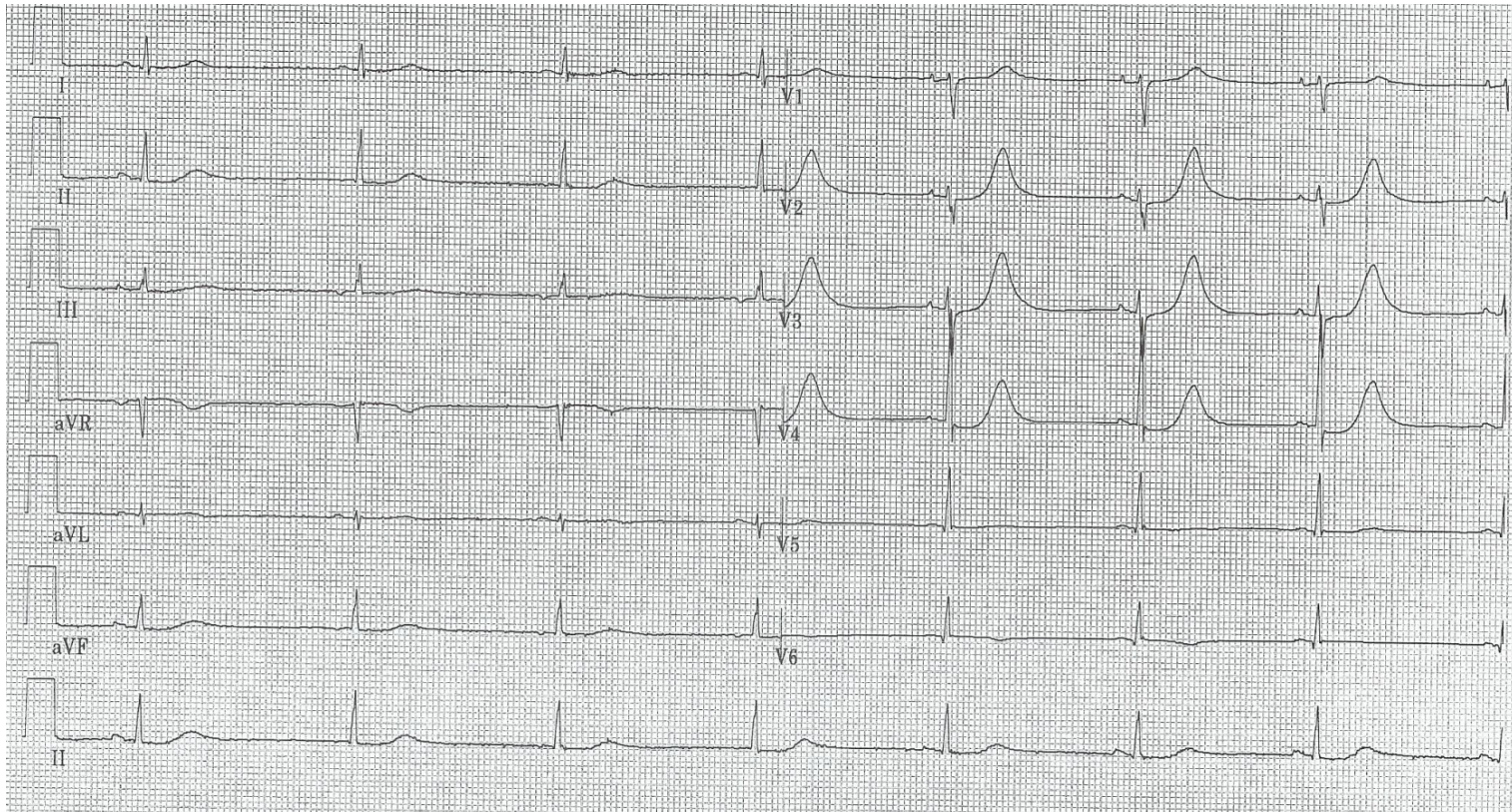
LCA post PCI



♀ 48 jr.

A: Bij presentatie 2 ½ uur AP

VG: roken

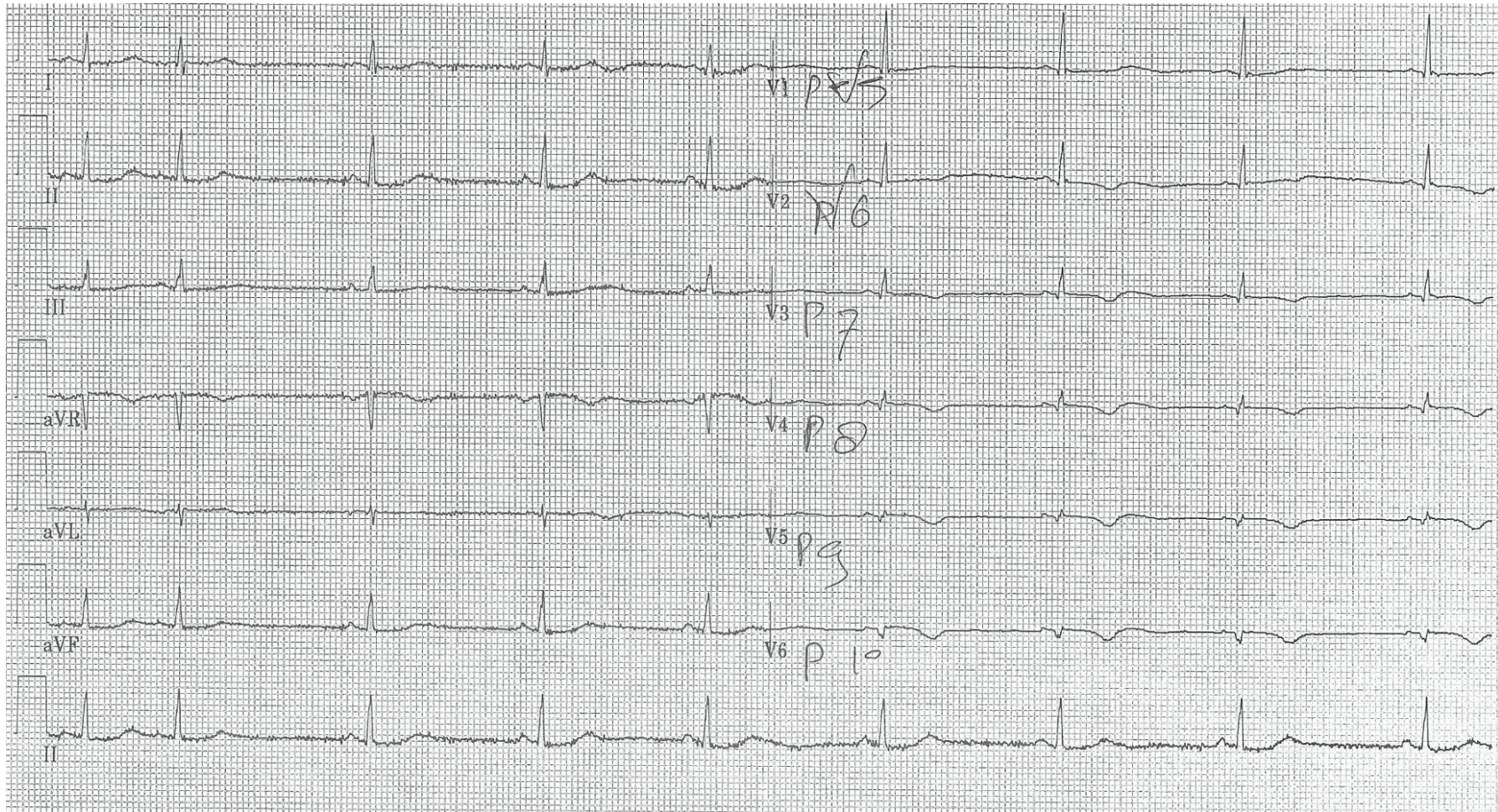


ST-depressie in I, II, III, aVF,
V2-4 →

ECG Uitgepoold naar posterior

♀ 48 jr.

A: Bij presentatie 2 ½ uur AP



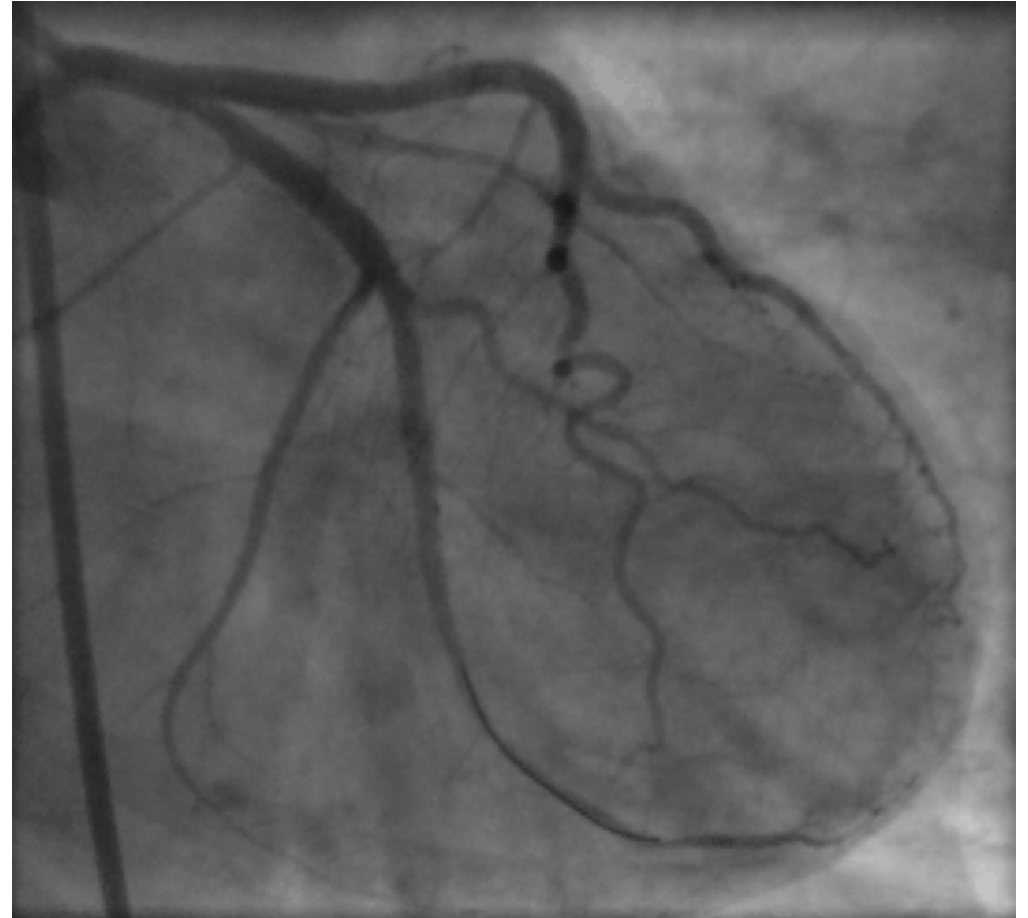
ST elevaties??

Negatieve T's

RCA (LAO) en LCA (LAO)



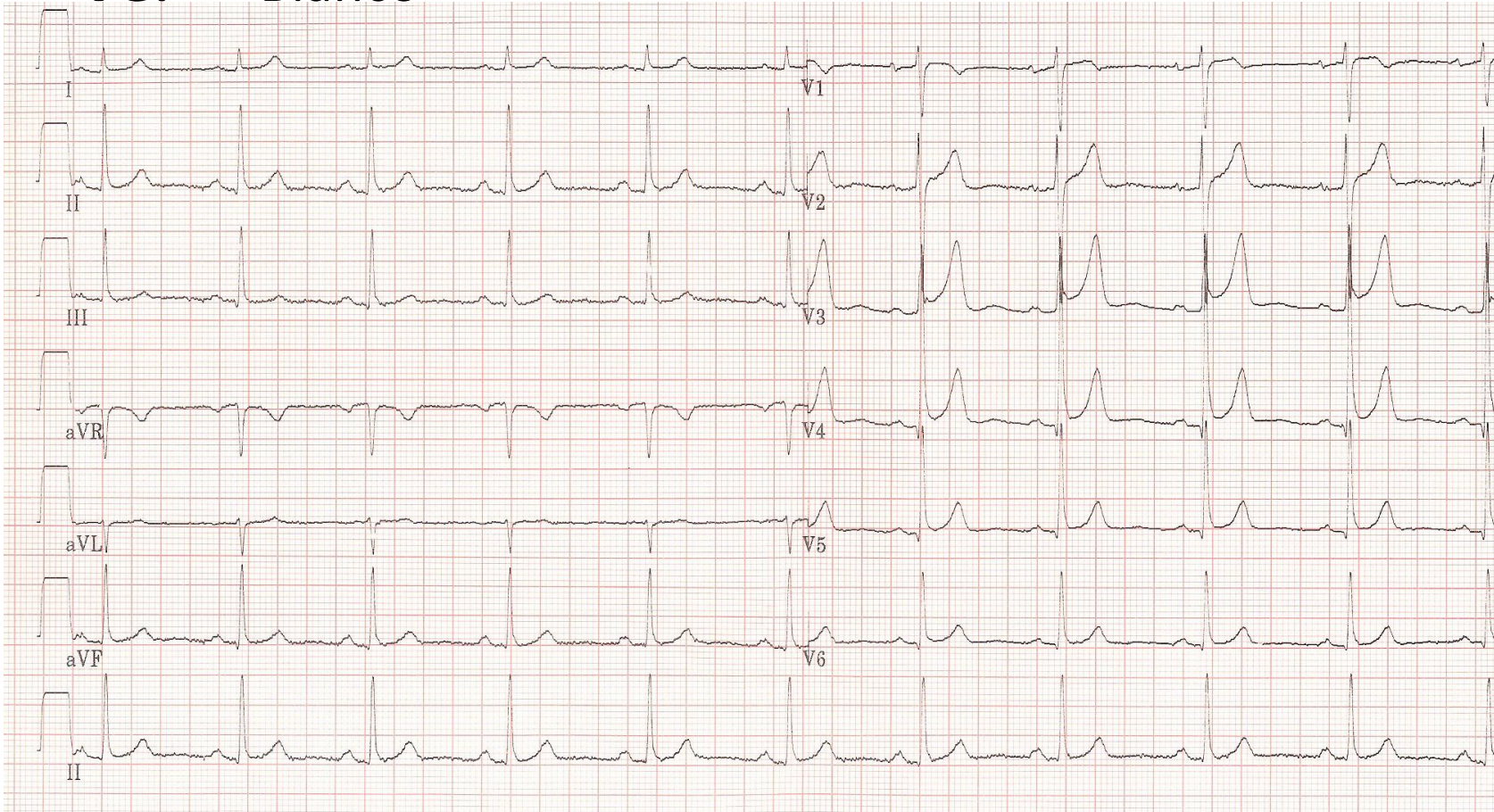
LCA, caudaal; pre en post PCI



♂ 62 jr.

A: 2 uur POB

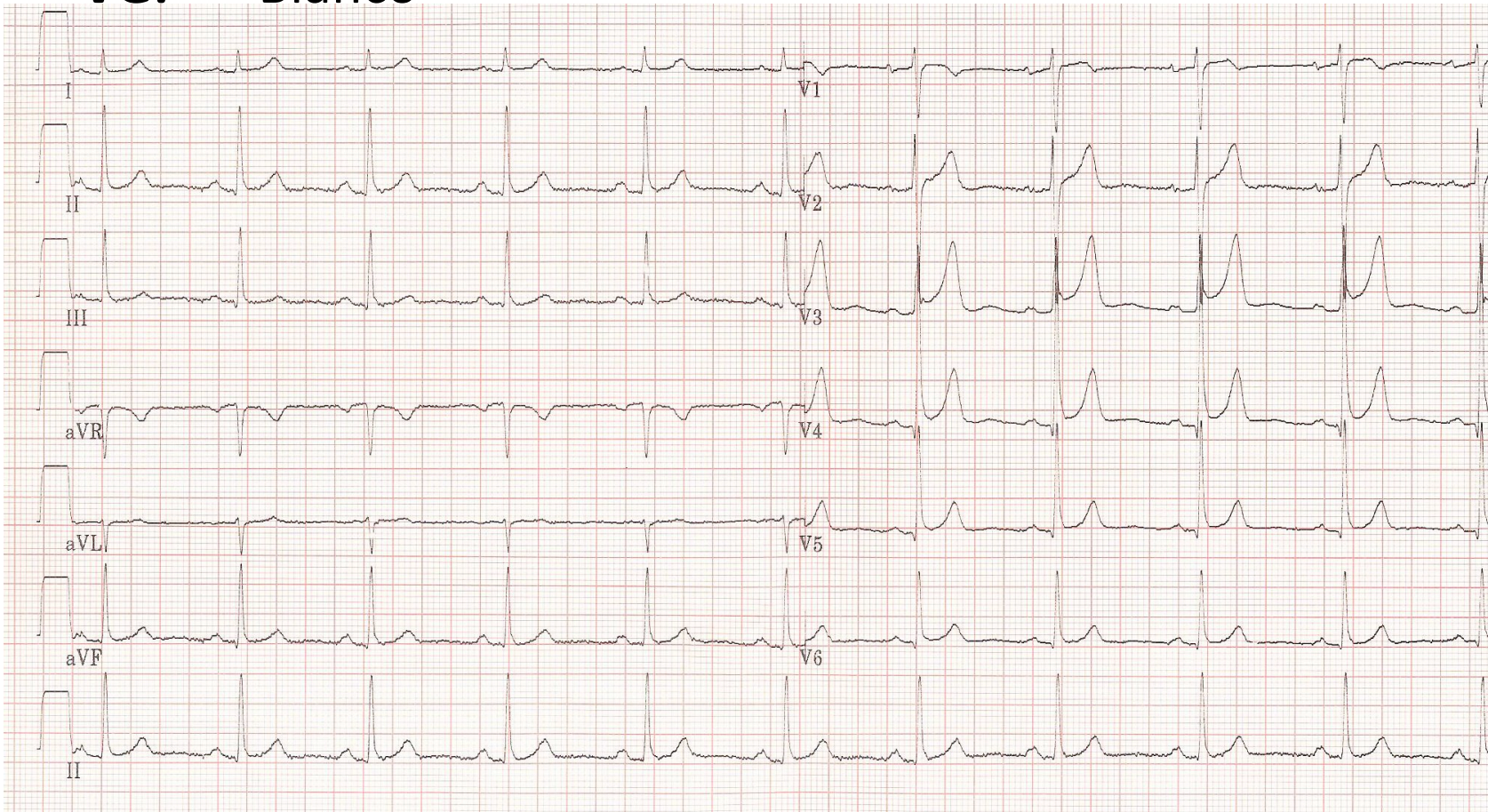
VG: Blanco



♂ 62 jr.

A: 2 uur POB

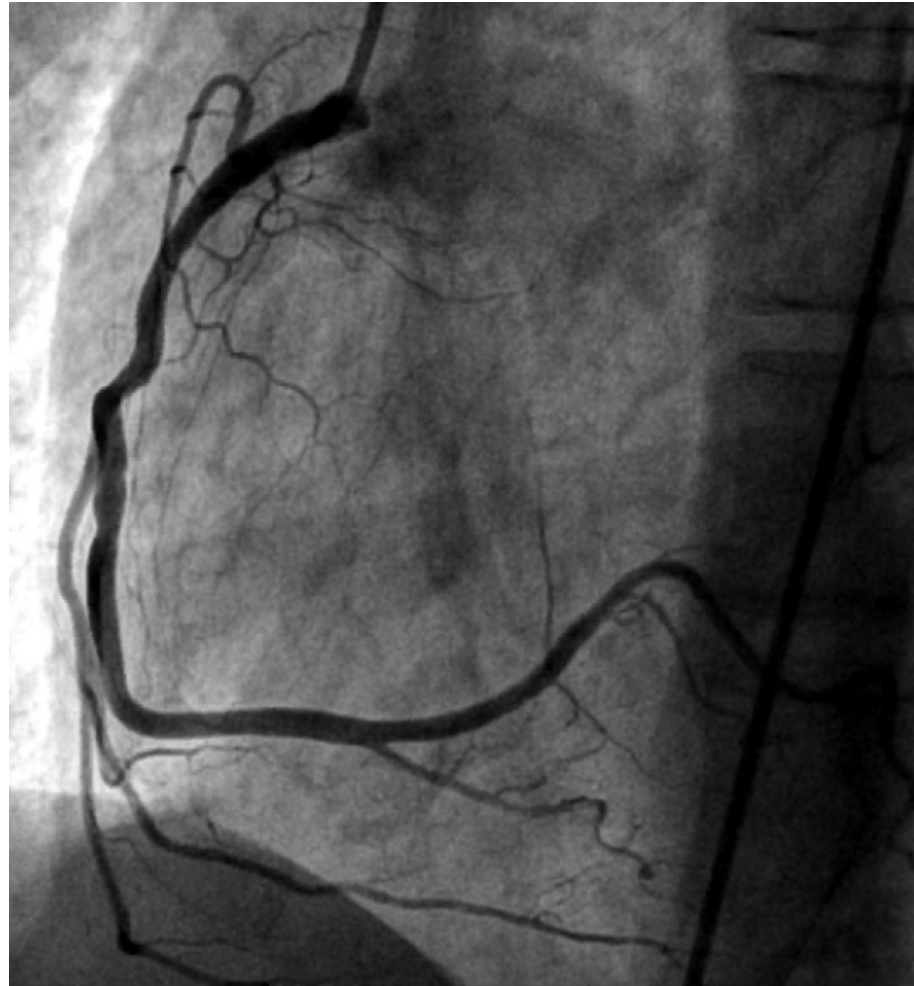
VG: Blanco



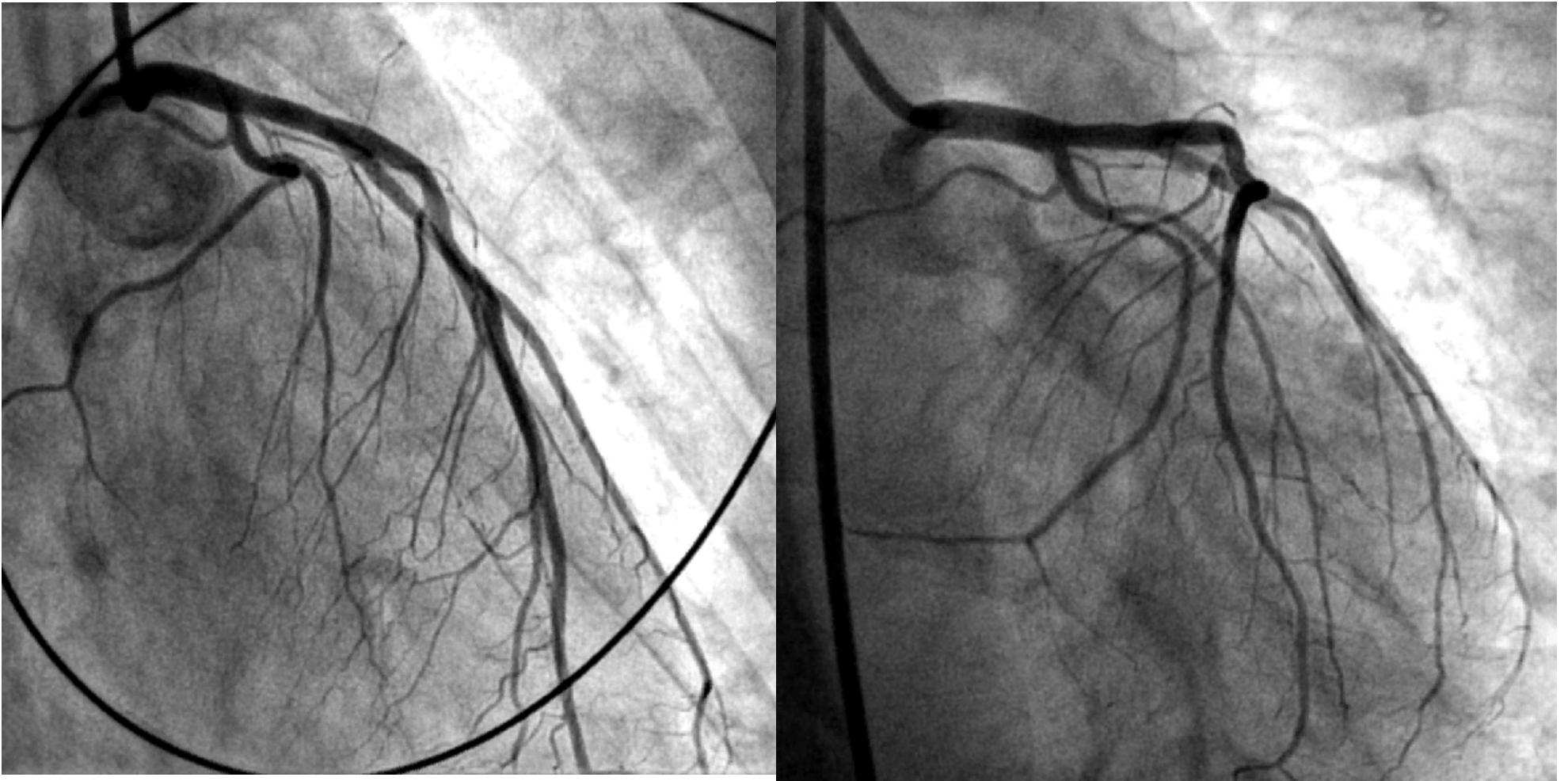
ST-elevatie in I, II, III, aVL, aVF V1-
V6, PR depressie in II →

Pericarditis

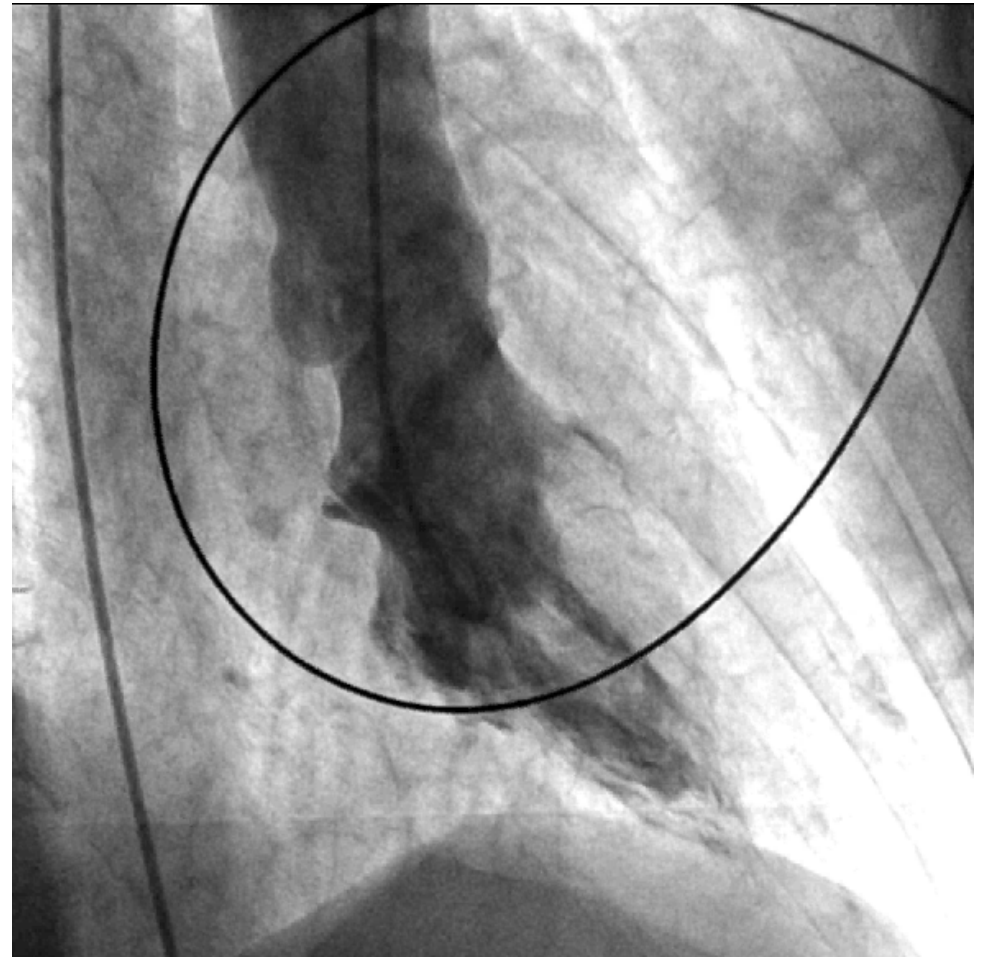
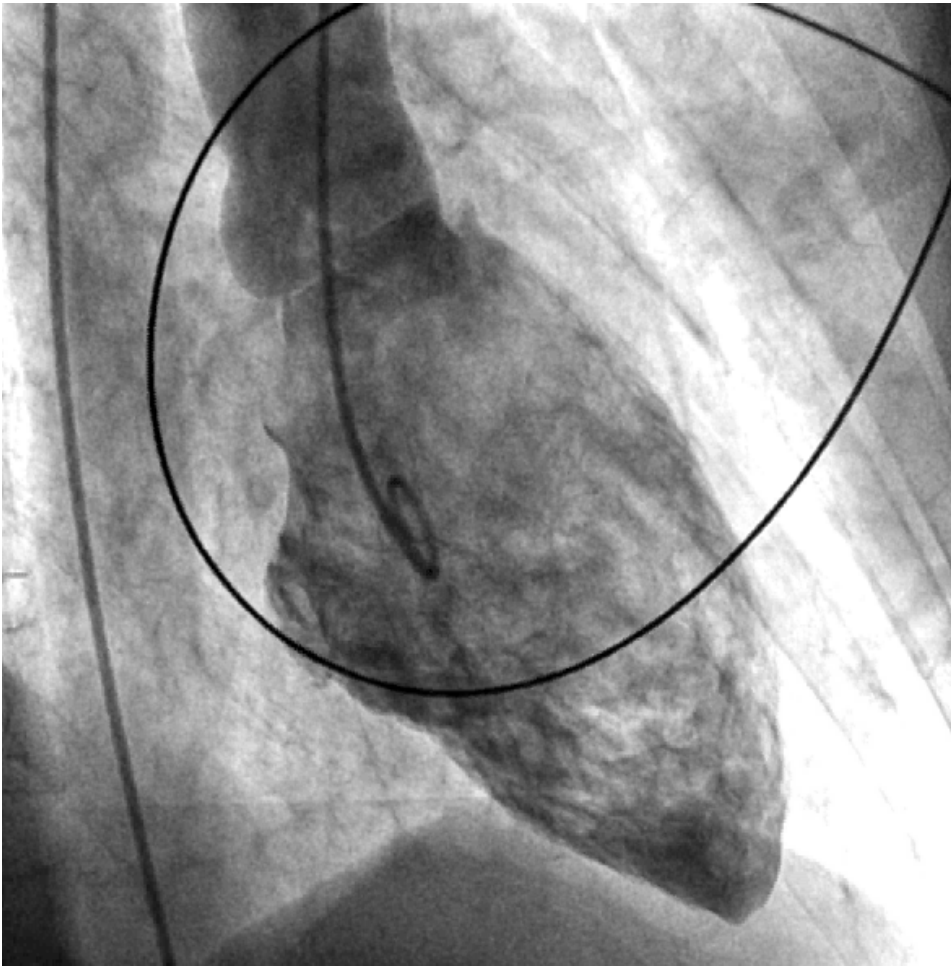
RCA



LCA RAO en craniaal

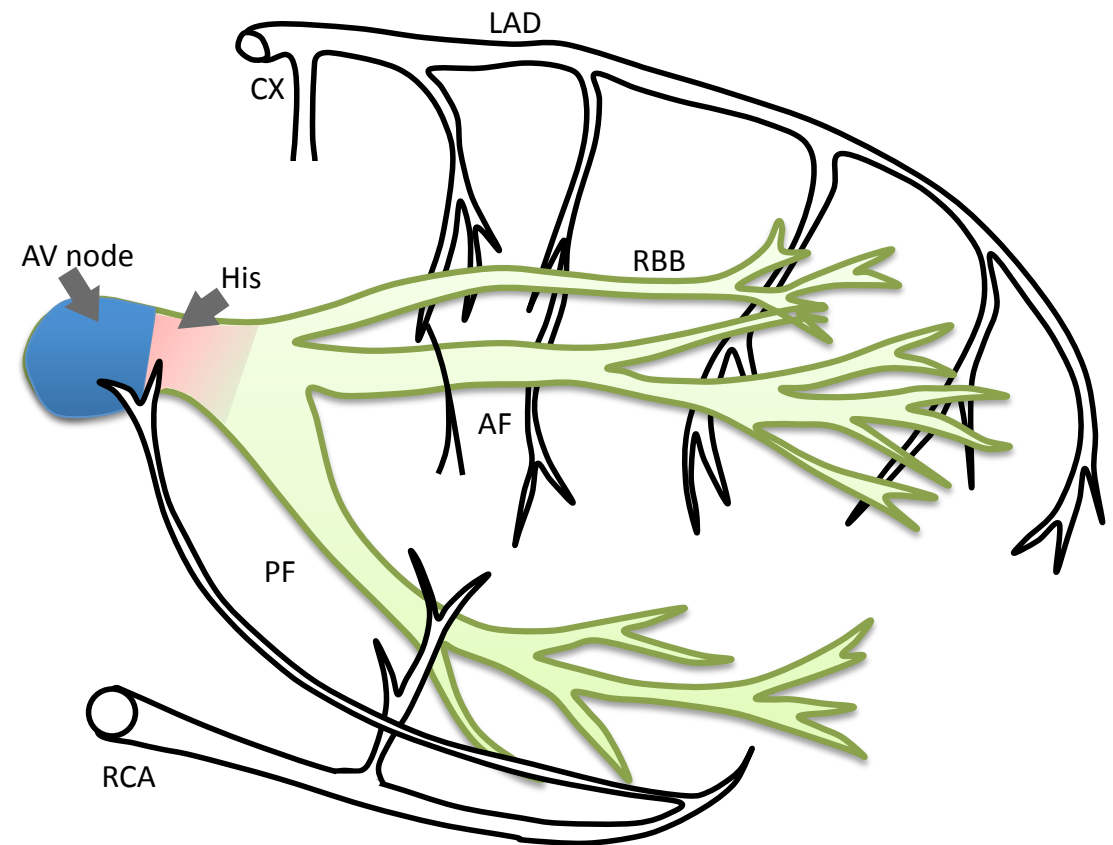


LV angio



Bloedvoorziening geleidingsysteem

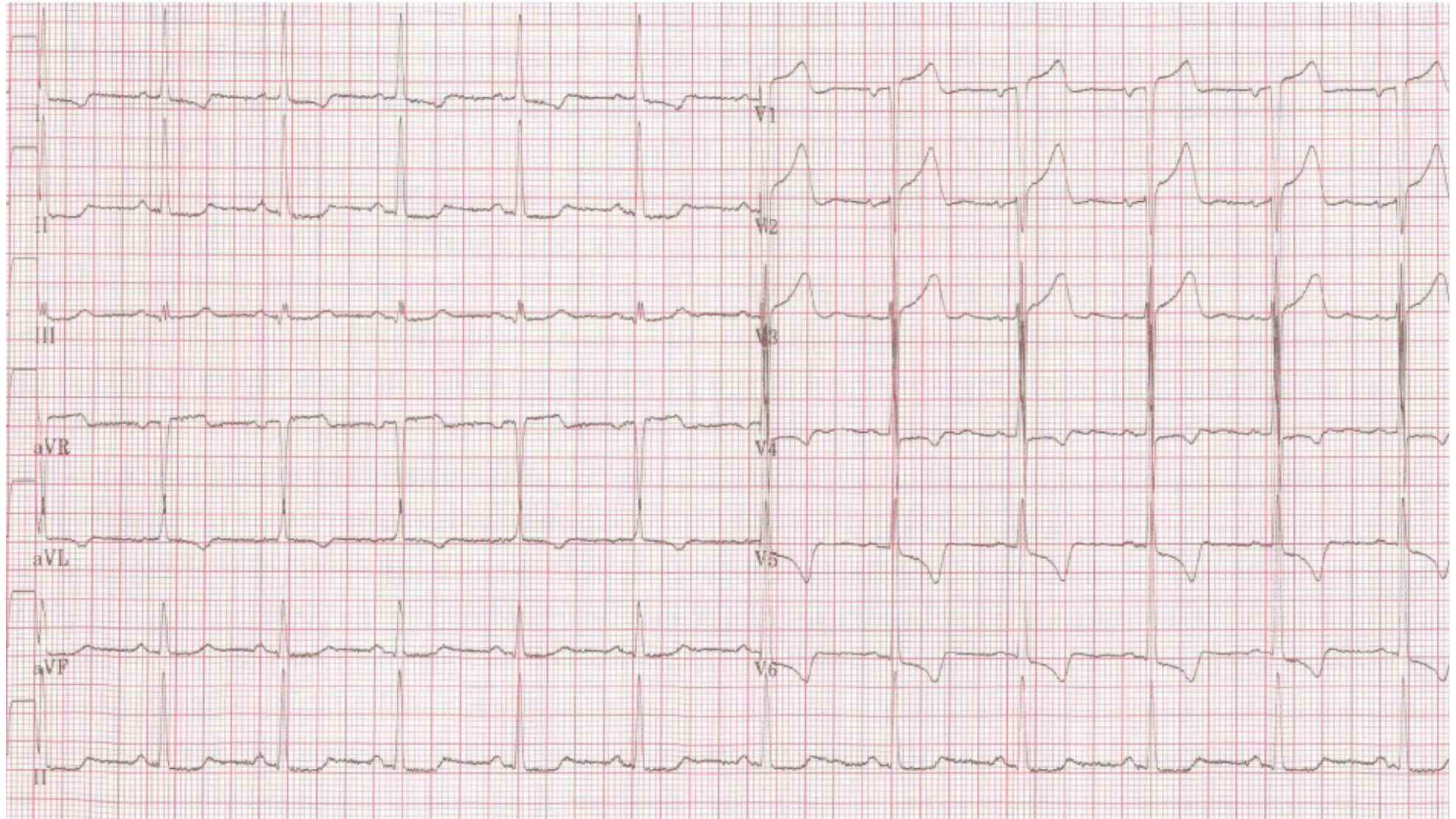
- SA knoop: RCA in 55%
- AV knoop: RCA in 90% (RCX)
- Bundel van His: RCA / LAD
- Rechter bundeltak: LAD (S1)
- Linkerbundeltak:
 - Anticus: LAD
 - Posticus: LAD/ RCA



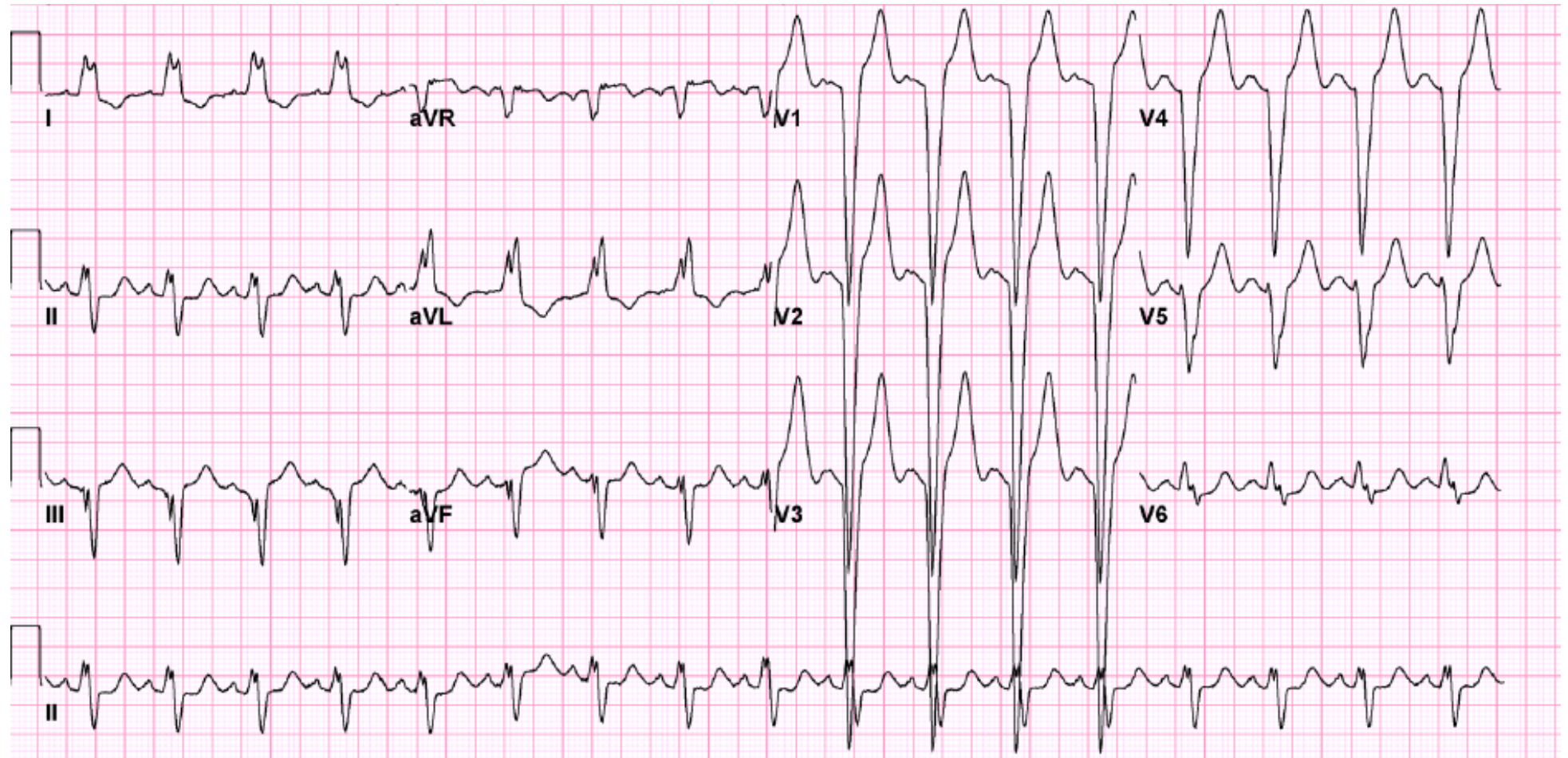
Geleidingsproblemen bij AMI

- Sinus bradycardie/ -arrest -/ totaal AV Blok(RCA):
 - Vagaal/ ischemisch/ neurologisch (Bezold- Jarisch reflex), humoraal (pH, adenosine) → atropine/ aminophylline
 - 10-20%, (meestal) smalcomplex escape ritme → HR: 40-60/ min, voorbijgaand, wel mortaliteit ↑ (2-3x)
- Totaal AV blok (LCA):
 - Ischemisch (septale necrose)
 - 5%, breedcomplex escape ritme → HR: <40/ min, voorbijgaand, wel mortaliteit ↑ (4x), pacemakerindicatie (primaire PCI)
 - Bij proximale LAD: RBTB, LAHB, 1^e grds AVB

LVH

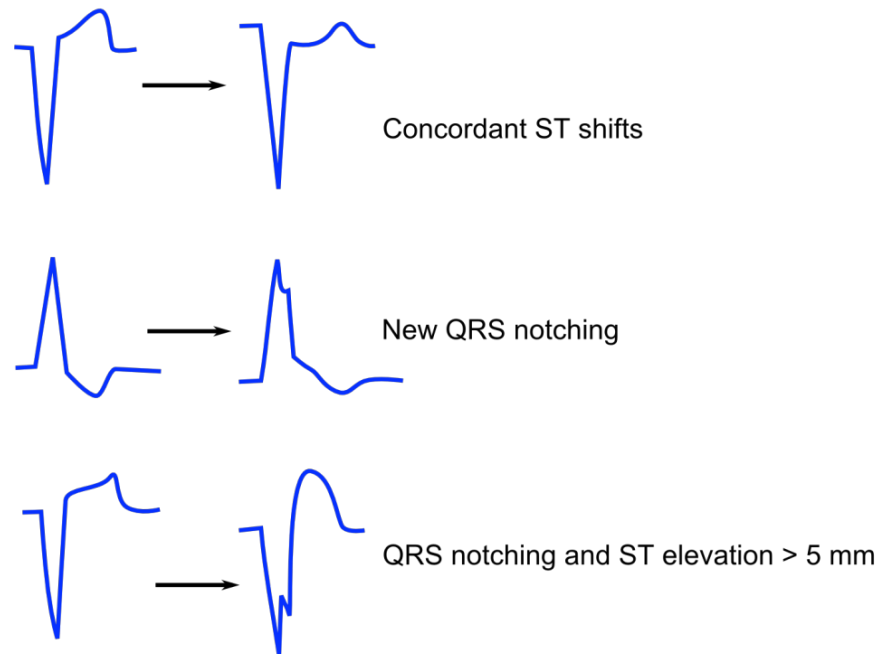


LBTB

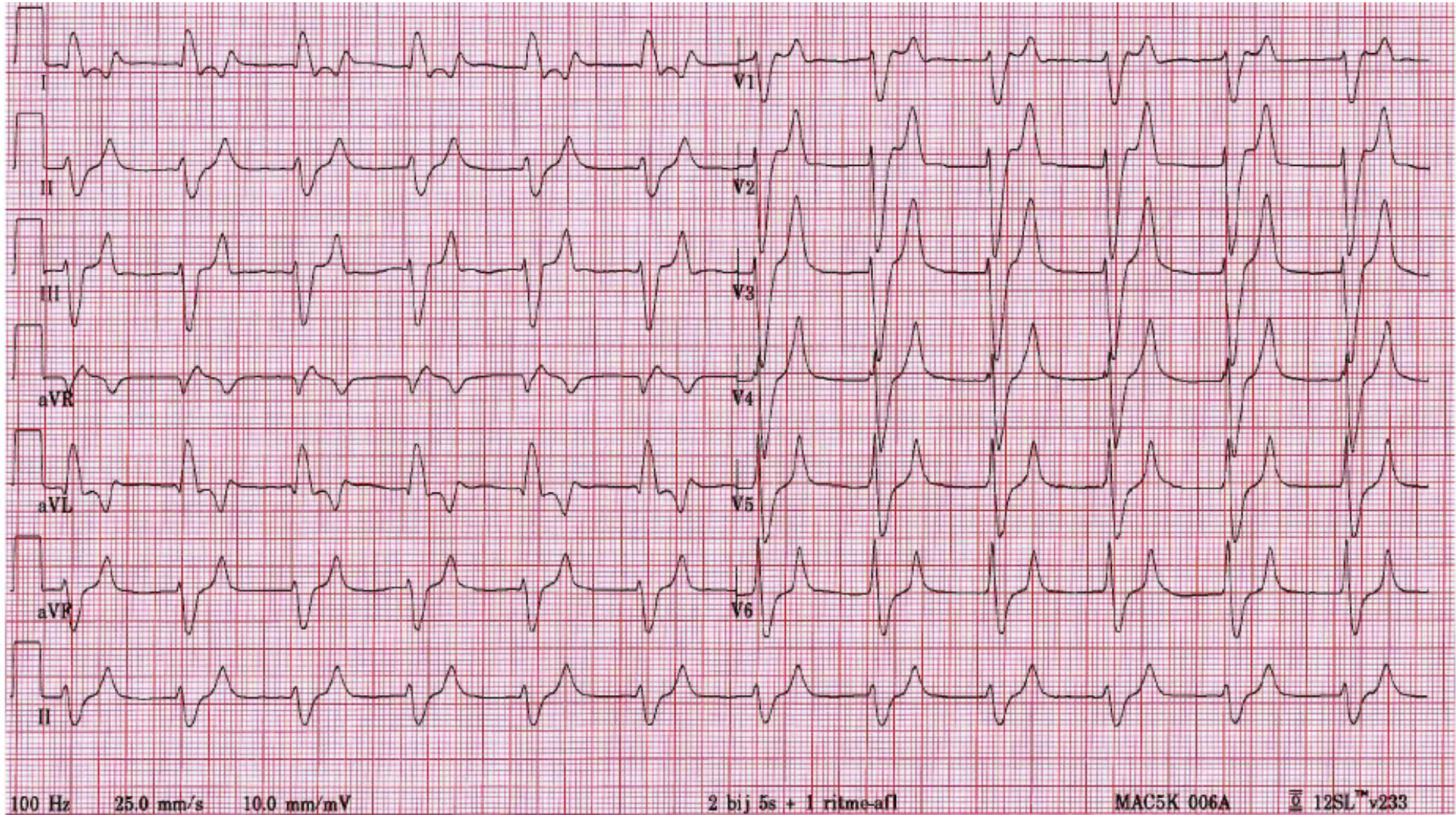


Infarct bij LBTB

- Concordantie ipv discordantie
- Toename discordantie in V1 (>5 mm)

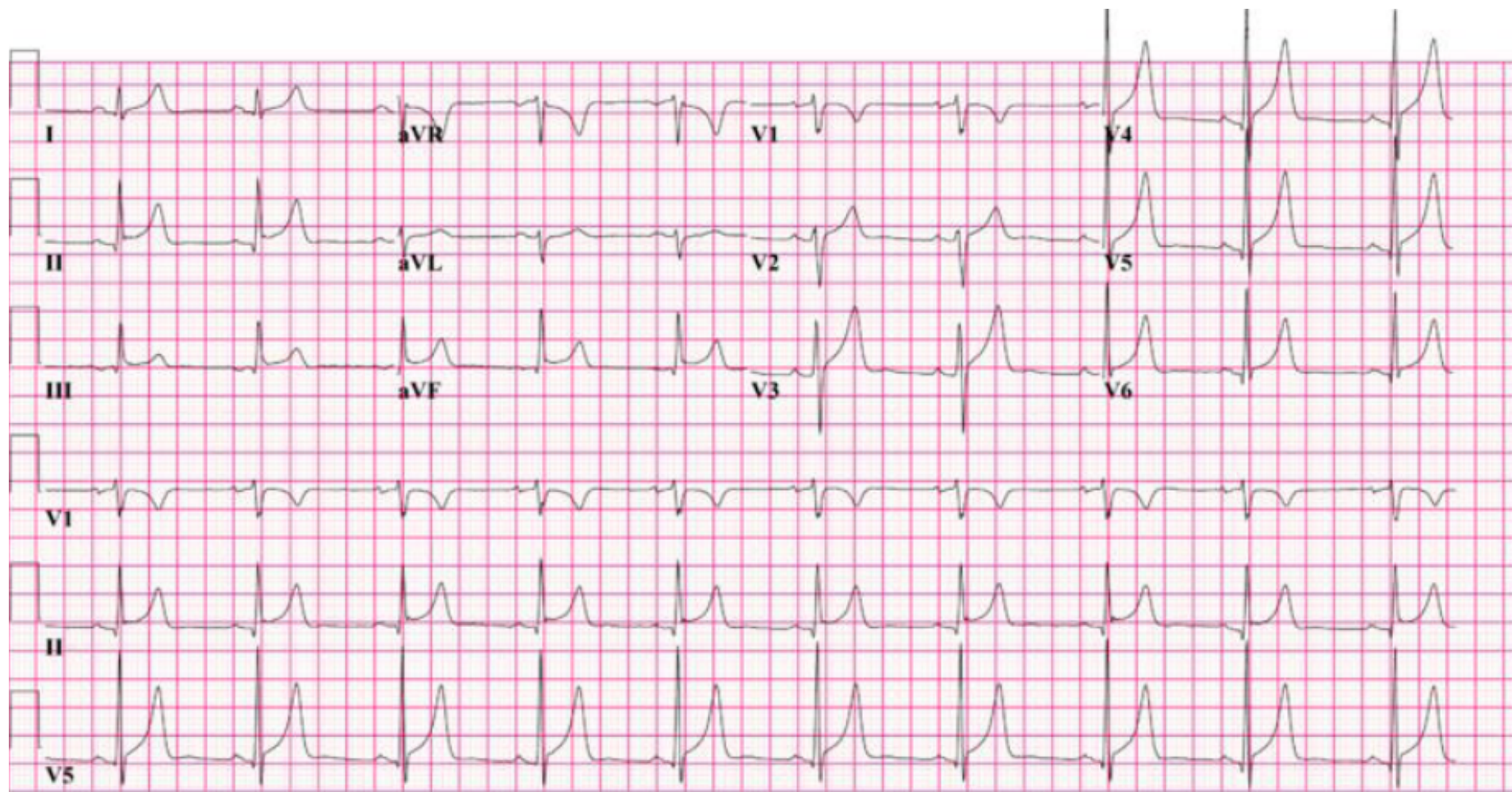


Hyperkaliemie



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

Pericarditis



25mm/s 10mm/mV 40Hz 005E 12SL 233 CID: 4

ECG PEDIA.ORG