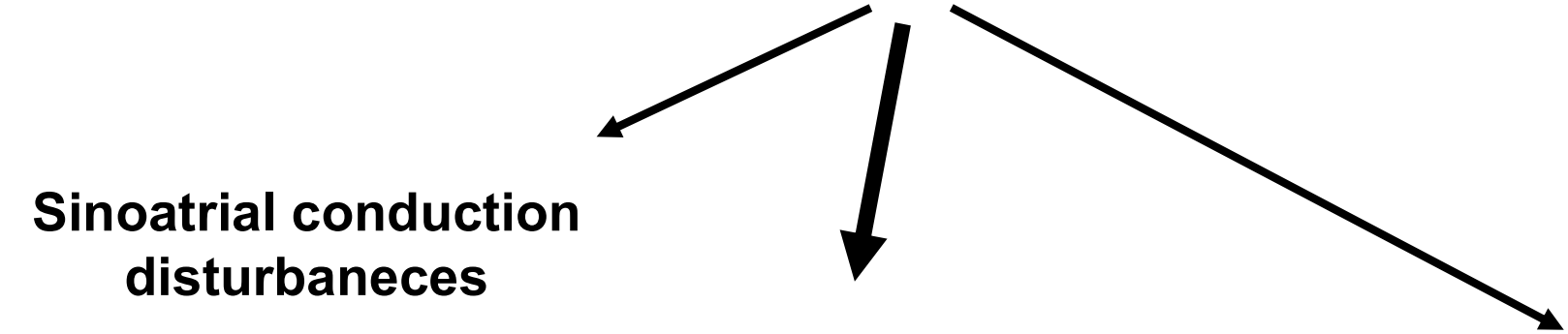
ECG Analysis Of Arrhythmias III.
(Conduction Abnormalities)

ECG Signs Of Volume And Pressure Overload

University Of Debrecen
Faculty Of Medicine
Division of Clinical Physiology

Conduction abnormalities



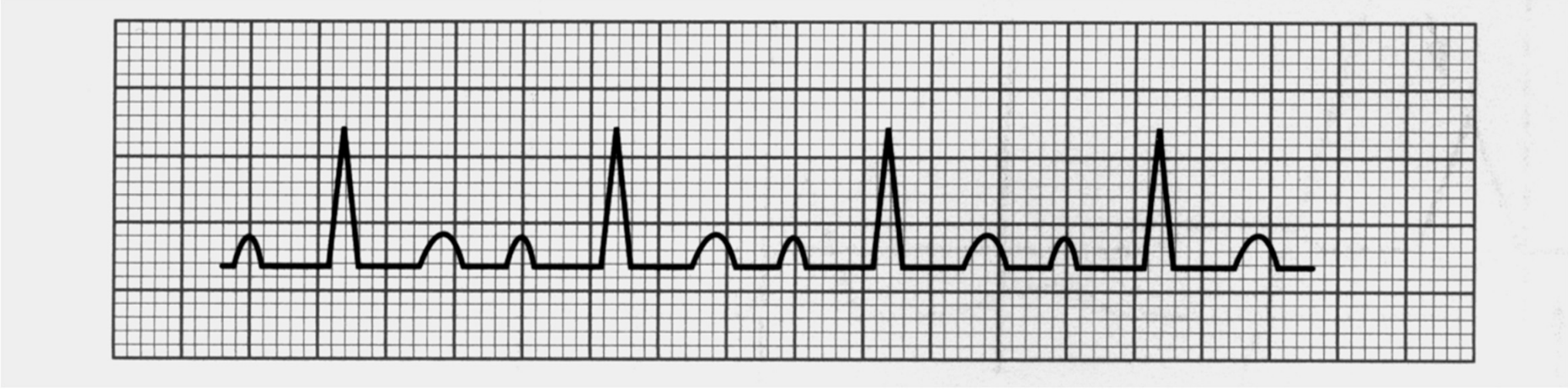
Sinoatrial conduction disturbaneces

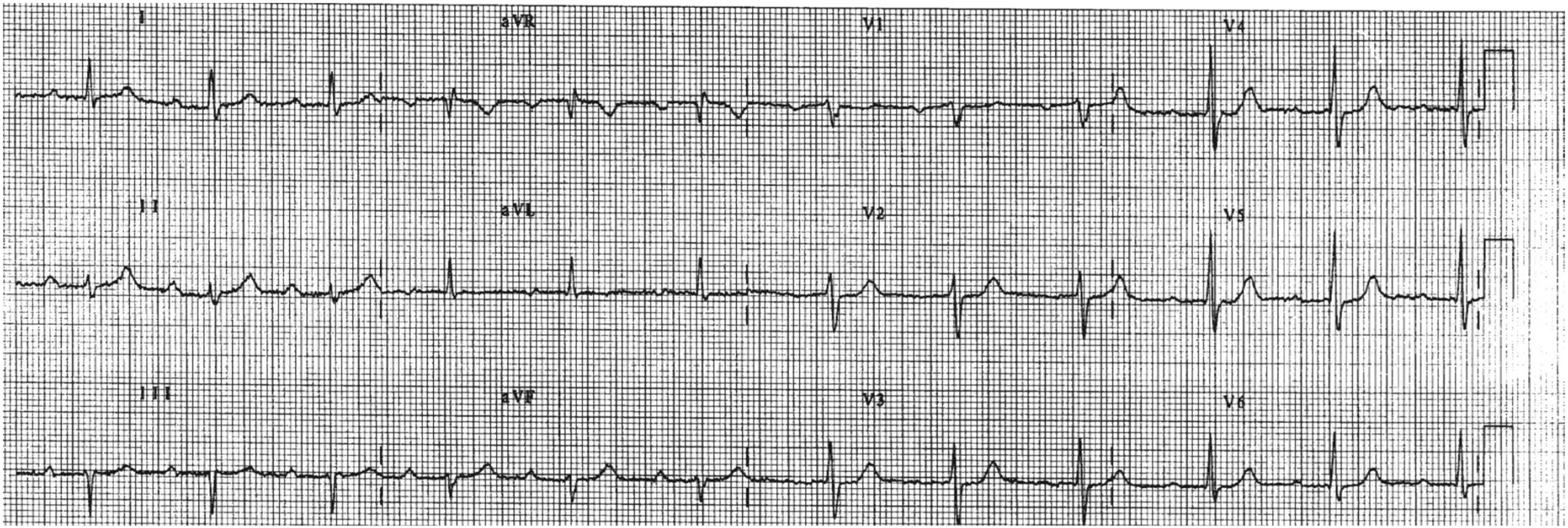
Atrio-ventricular conduction disturbances (AV-blocks)

Intraventricular conduction disturbances

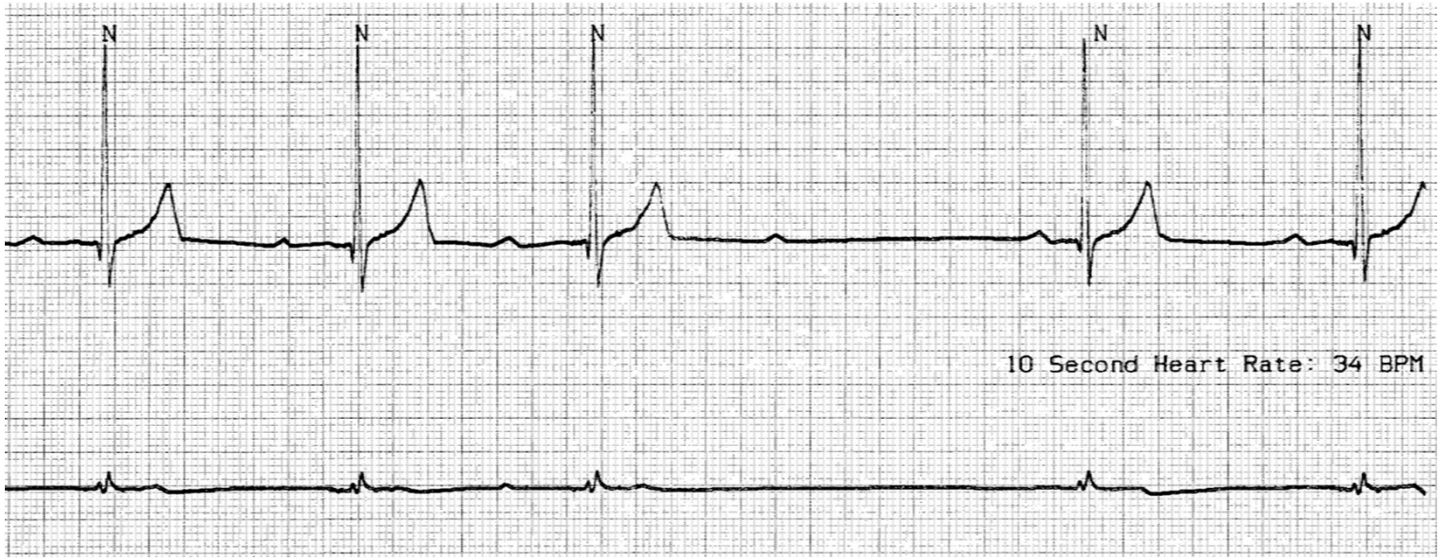
1. First degree AV block
2. Second degree AV block
   - a/ Mobitz I
   - b/ Mobitz II
   - 2:1 AV block
   - High degree AV block
3. Third degree AV block

First degree AV block





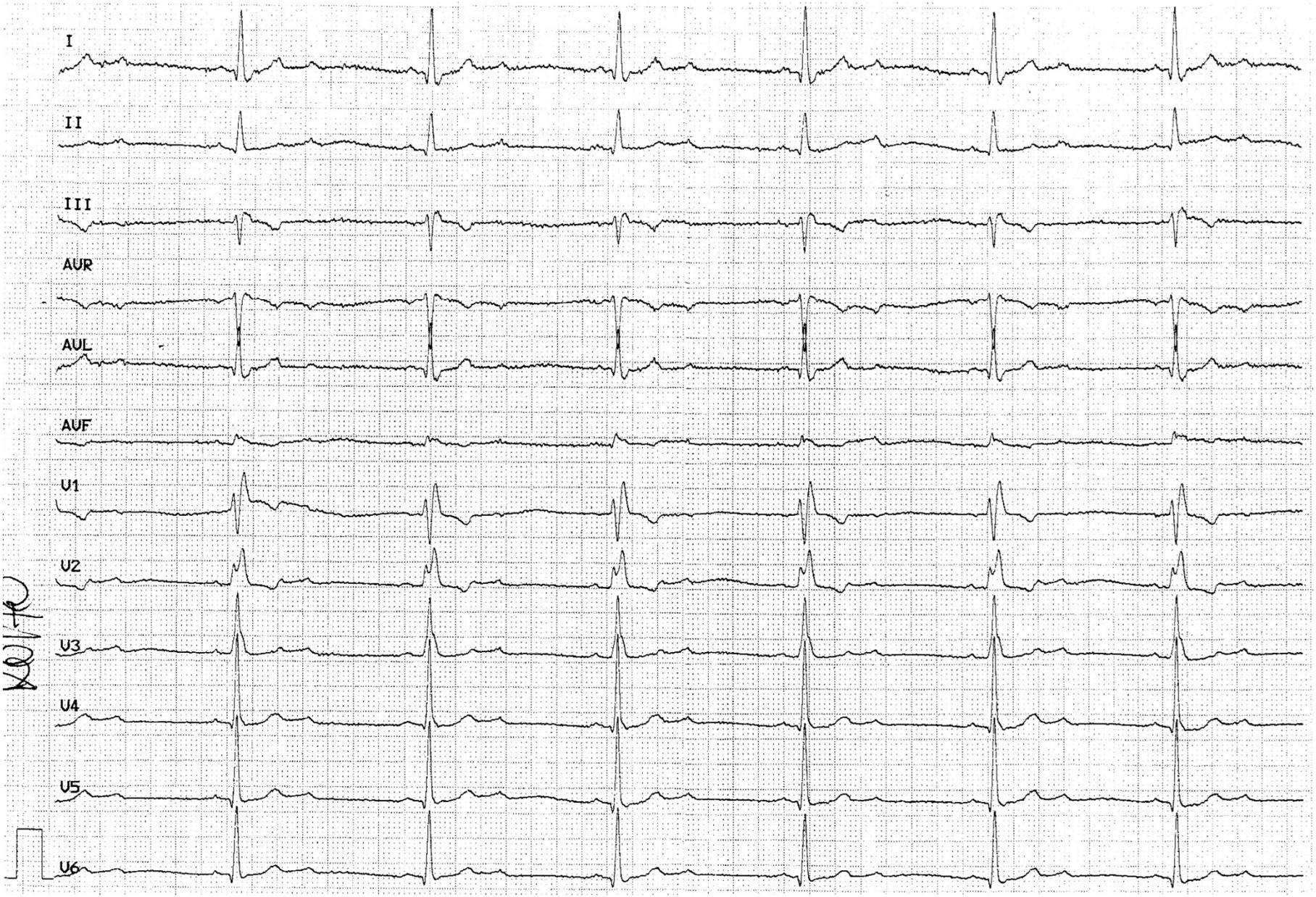
Second degree AV block – Mobitz I.



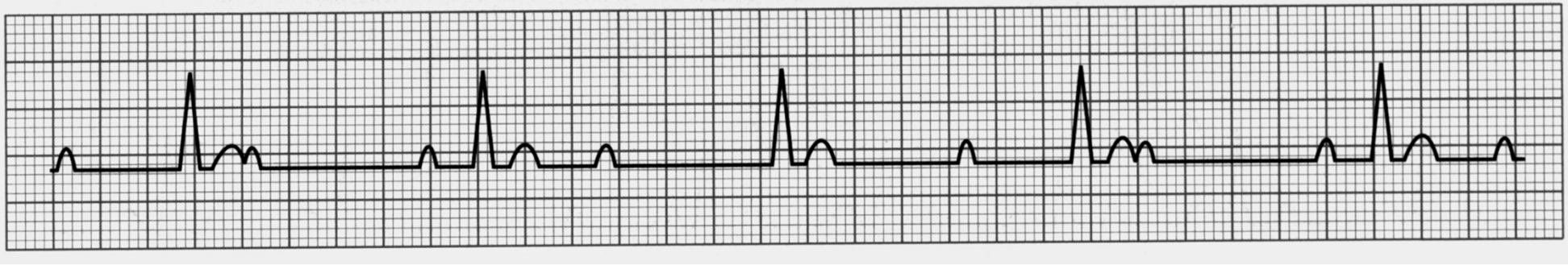
Second degree AV block – Mobitz II.

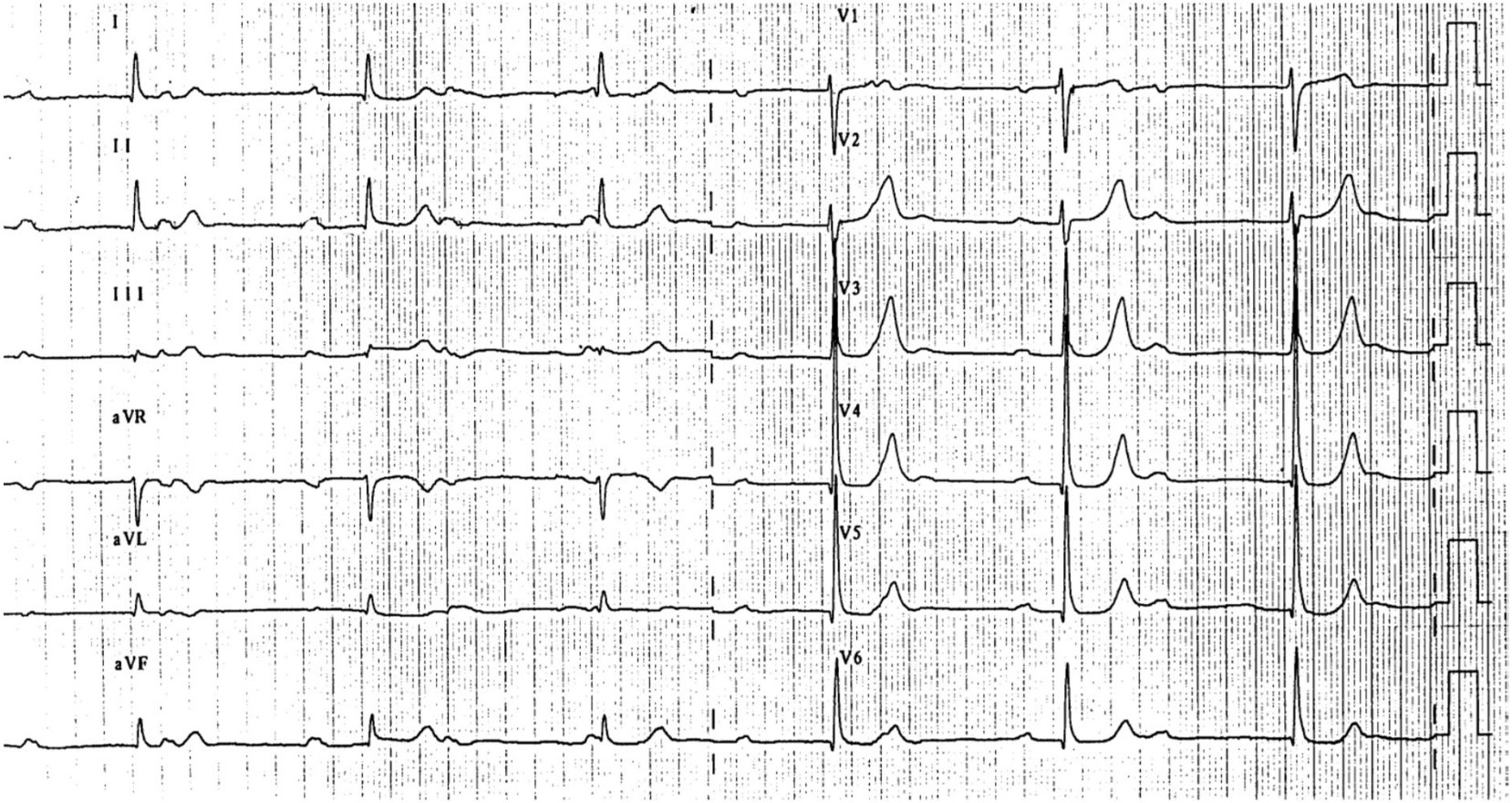
Mobitz II.

Second degree AV block – 2:1 AV block



Third degree AV block



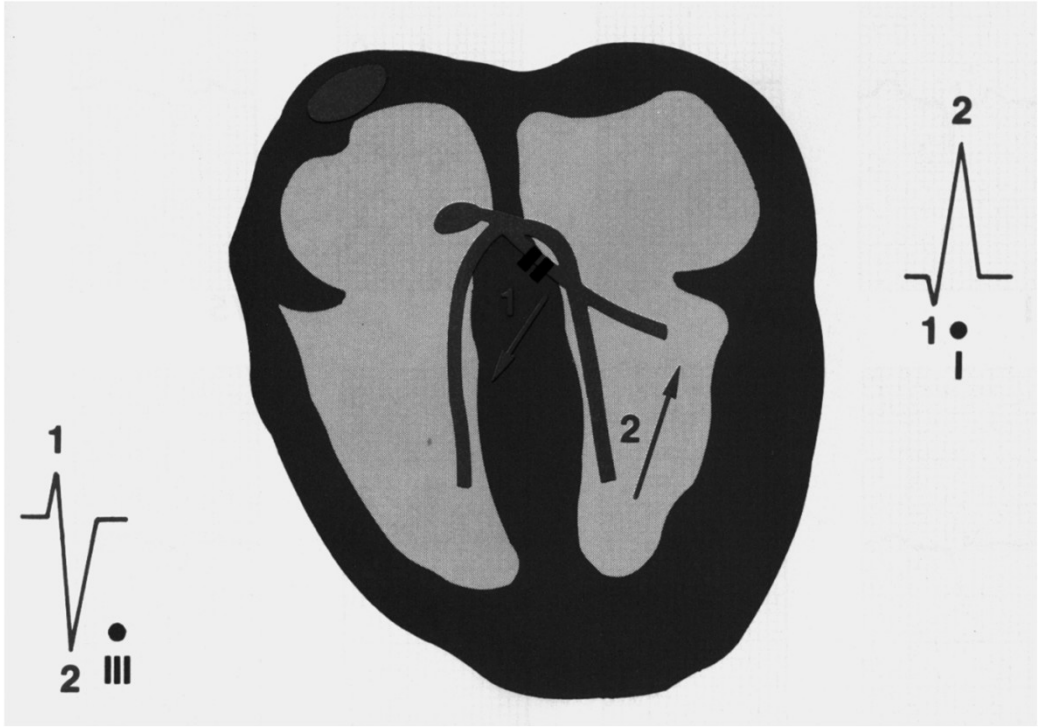


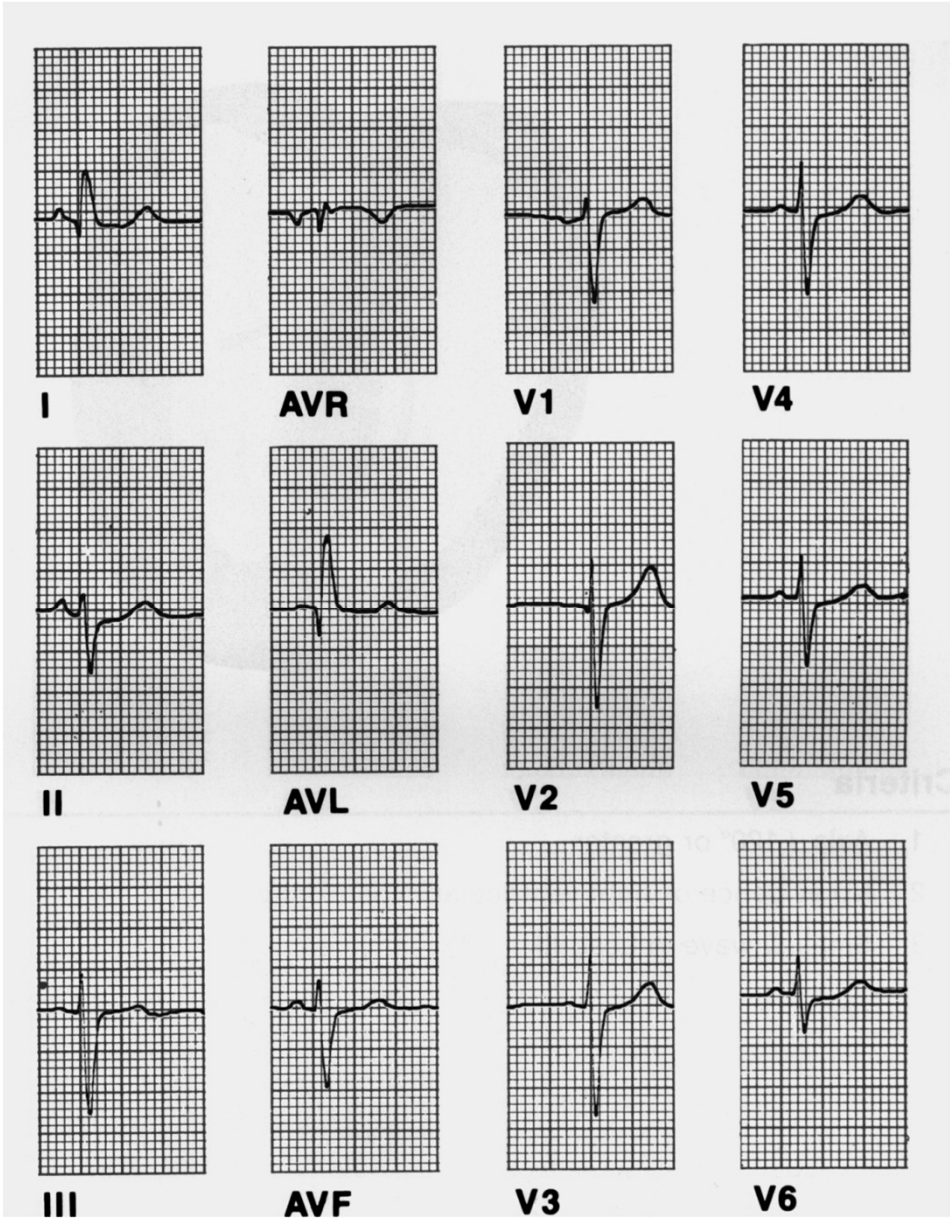
Intraventricular conduction disturbances

1. Left anterior hemiblock (LAH)
2. Left posterior hemiblock (LPH)
3. Left bundle branch block (LBBB)
4. Right bundle branch block (RBBB)
5. Bifascicular blocks
6. Trifascicular blocks

Left anterior hemiblock (LAH)

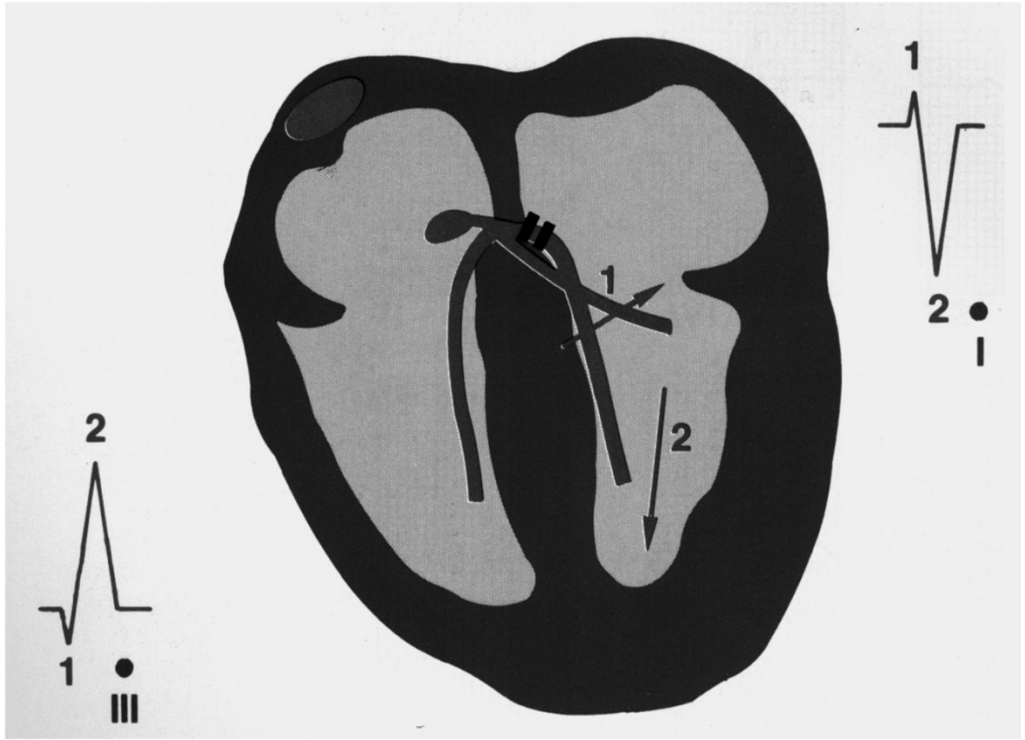
- left QRS axis (-30º - -90º)
- II-III-aVF: rS; I-aVL: q
- QRS < 120 msec
- no LVH, inf. MI, lung disease

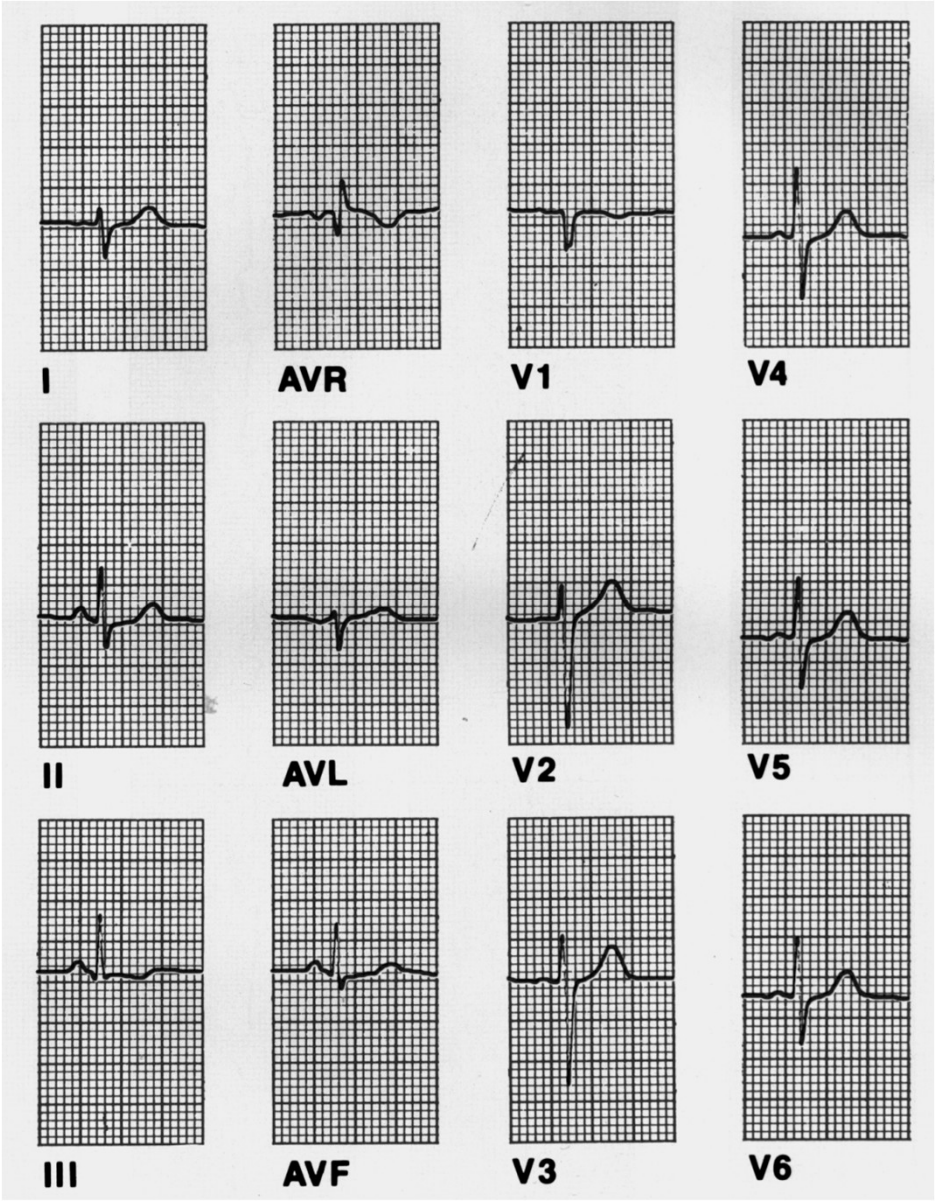




Left posterior hemiblock (LPH)

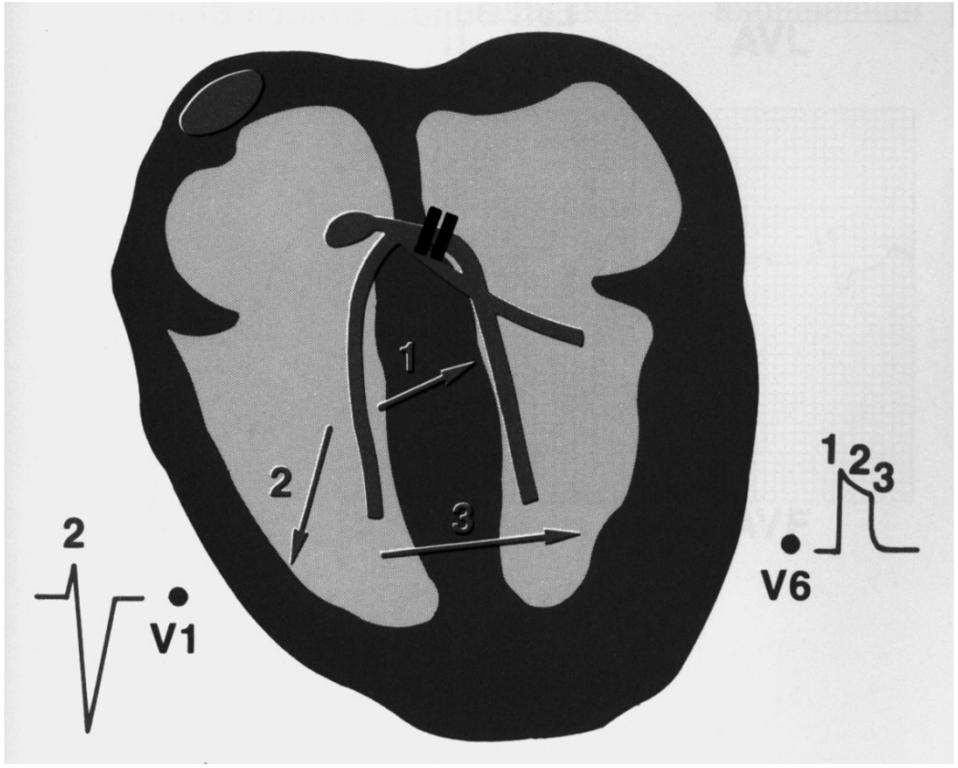
- right QRS axis (> +120º)
- II-III-aVF: qR; I-aVL: S
- QRS < 120 msec
- no RVH, lat. MI, lung disease

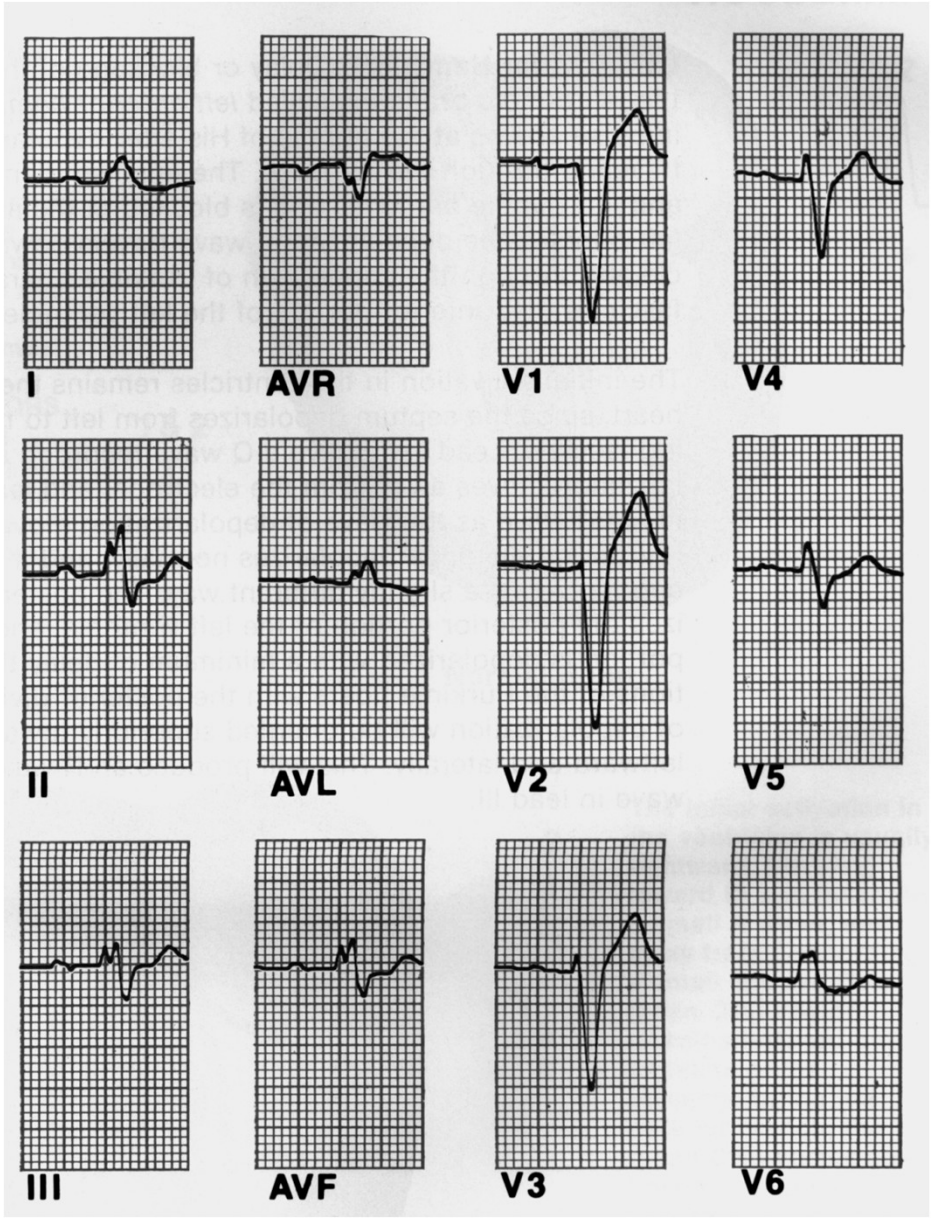




Left bundle branch block (LBBB)

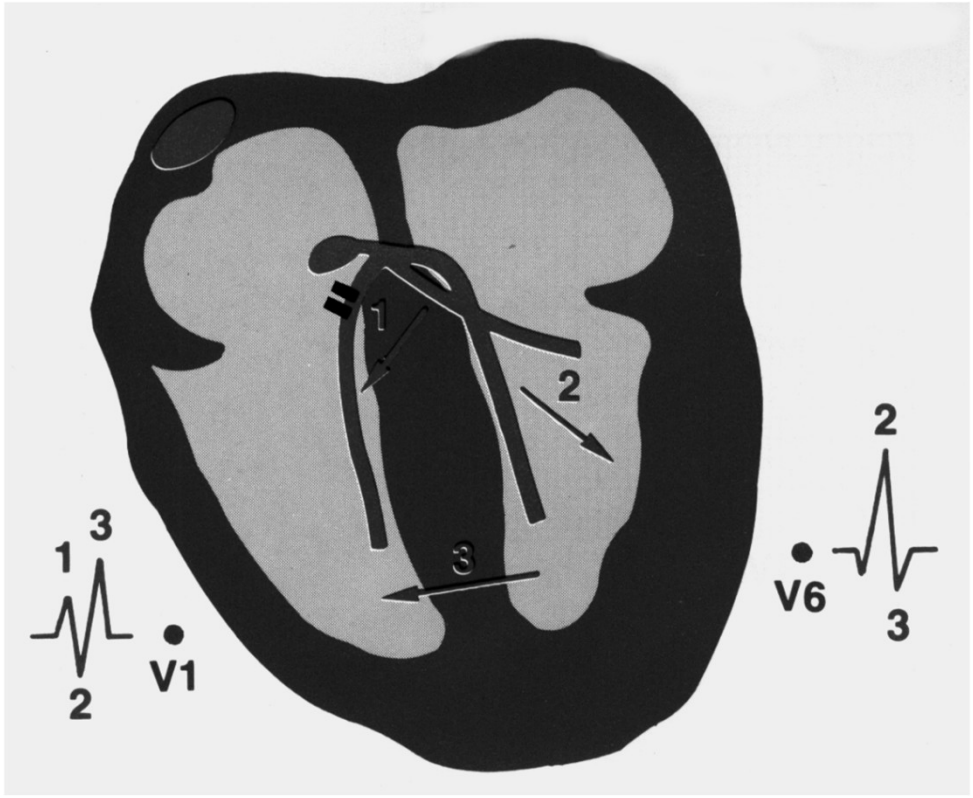
- QRS > 120 msec
- I-aVL-V5-V6: no q, wide R
- V1-V2: QS
- V6: elongated VAT

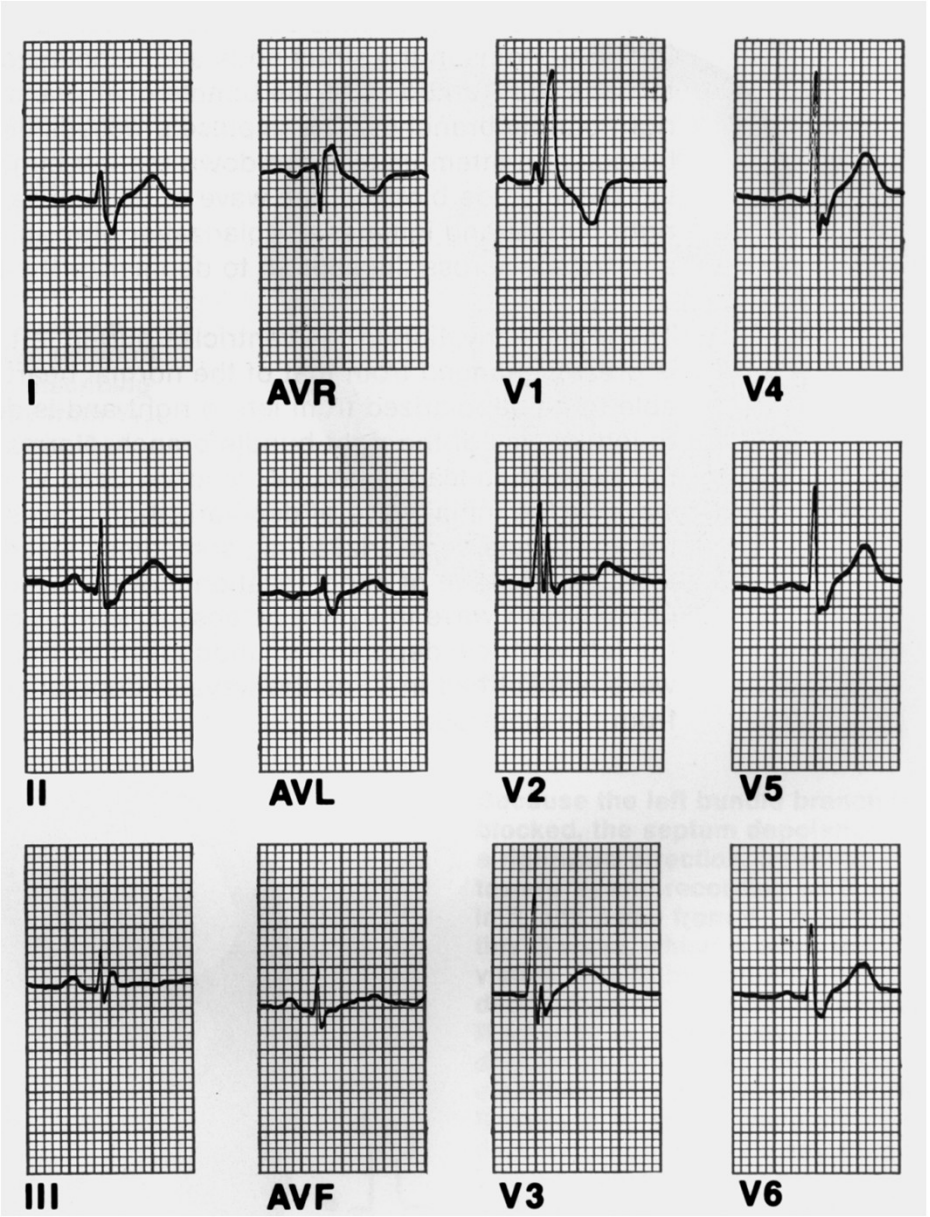




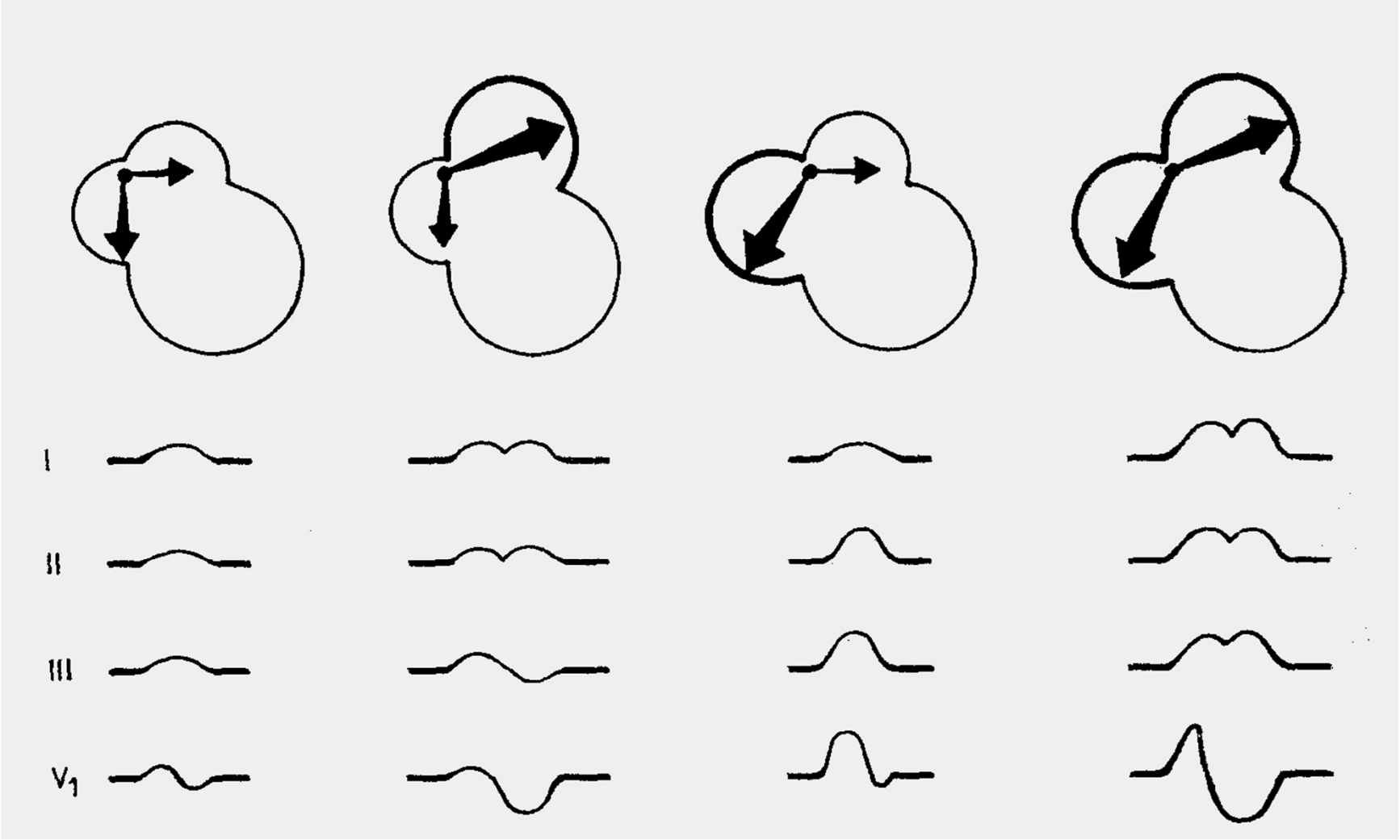
Right bundle branch block (RBBB)

- QRS > 120 msec
- I-aVL-V5-V6: wide S
- V1-V2: rSR', negative T
- V1-V2: elongated VAT





ECG signs of atrial abnormalities



Normal P | P sinistroatriale | P dextoatriale | P biatriale

Right atrial hypertrophy (P-pulmonale)

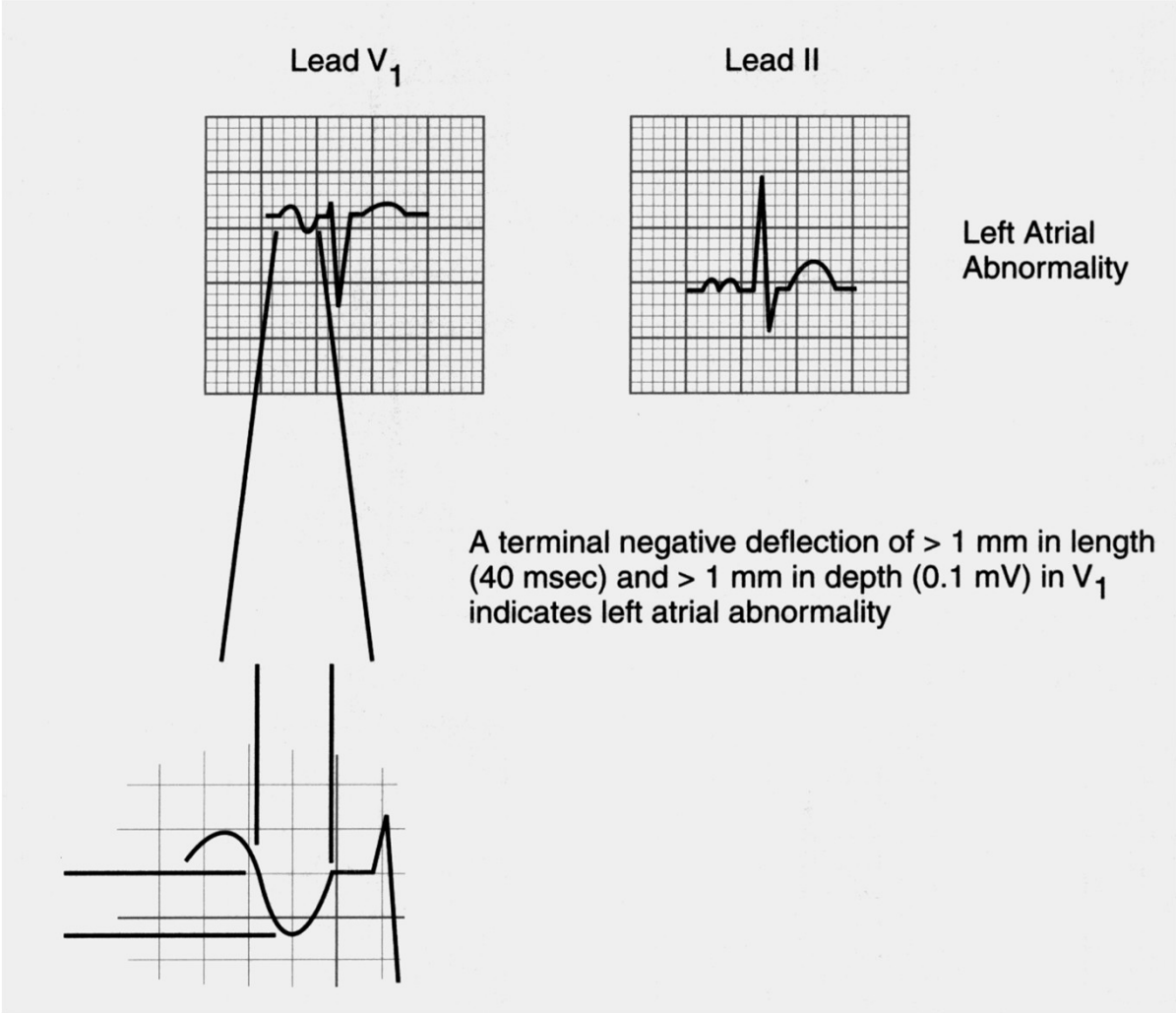
II-III-aVF:

P wave amplitude > 0.25 mV

Left atrial hypertrophy (P-mitrale)

V1:
P wave amplitude > -0.1 mV

I-II-aVL:
wide, double-humped P wave



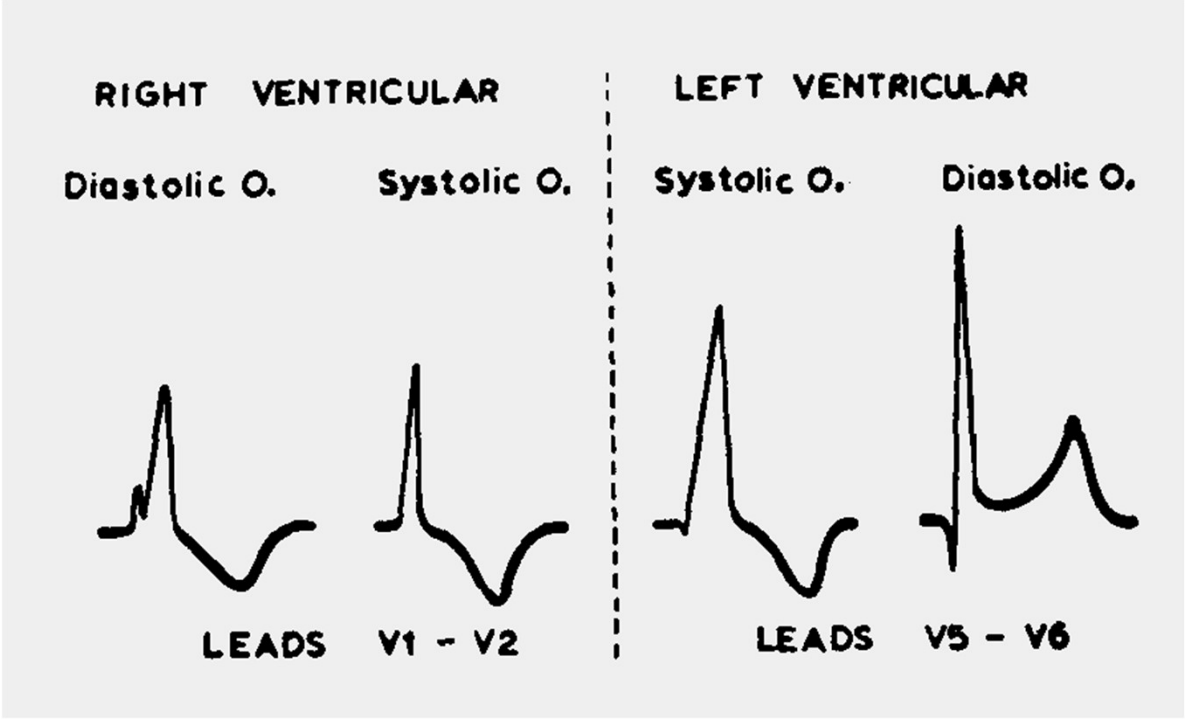
Right and left ventricular diastolic and systolic overload

Right ventricular diastolic ol.:
RBBB

Right ventricular systolic ol.:
signs of „strain”

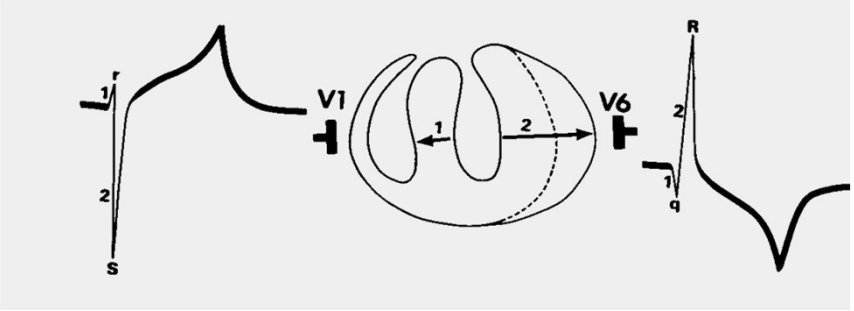
Left ventricular distolic ol.:
concave ST elevation

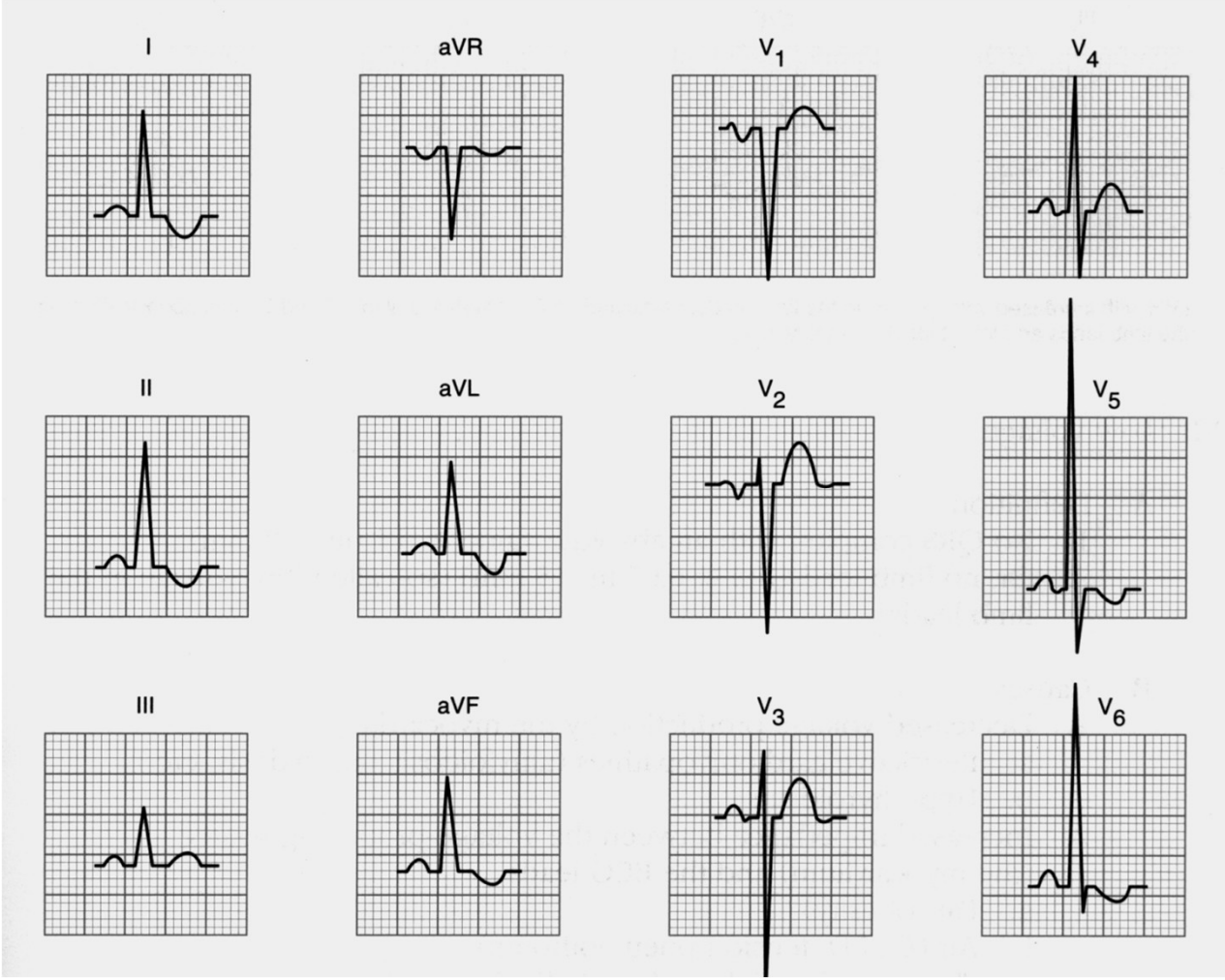
Left ventricular systolic ol.:
signs of „strain”



Left ventricular hypertrophy

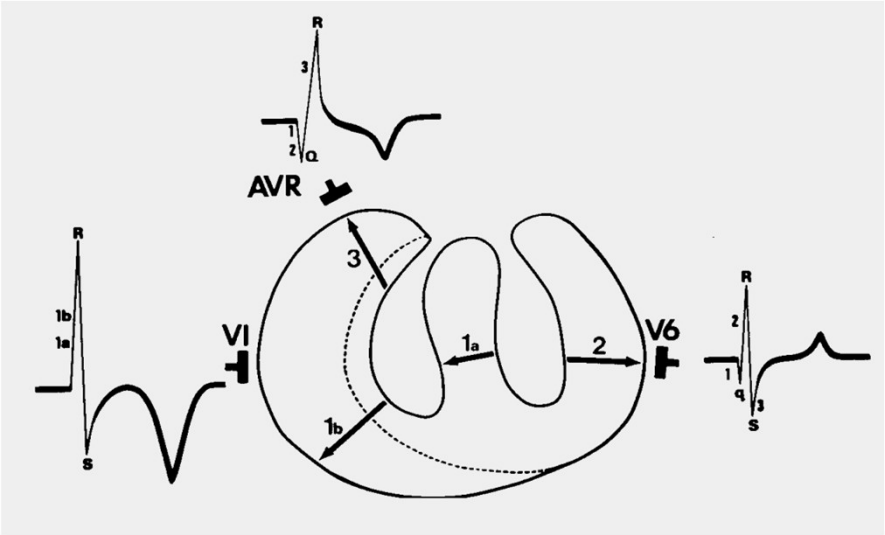
I-aVL-V5-V6: tall R
V1-V2: deep S
V1S + V5R > 35 mm
V5-V6: VAT > 0.045 sec
I-aVL-V5-V6: „strain”
Left axis

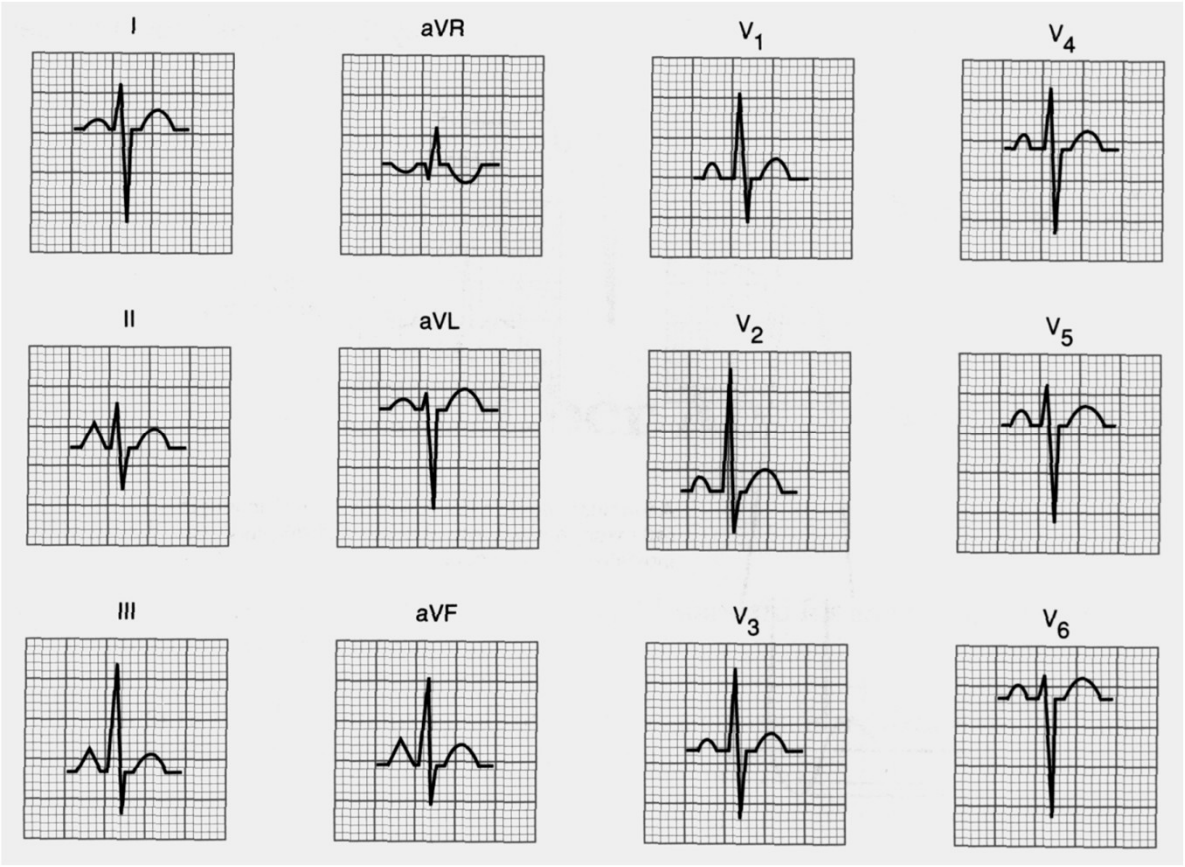




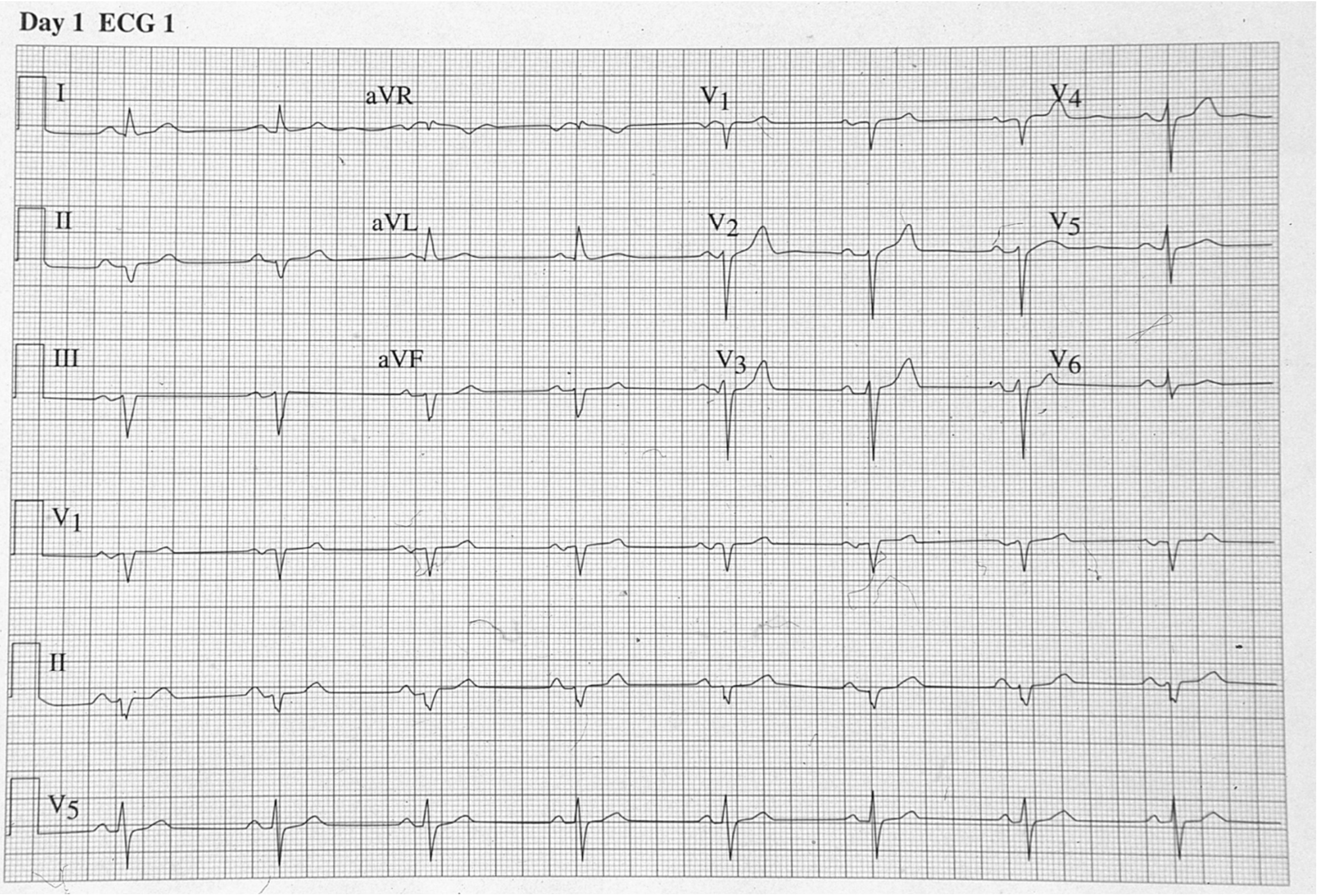
Right ventricular (right heart) hypertrophy

S1-R2-R3, right deviation
V1-V2: tall R wave (R ≥ S)
V1-V2-aVR: „strain”
RBBB
P- pulmonale
Low voltage

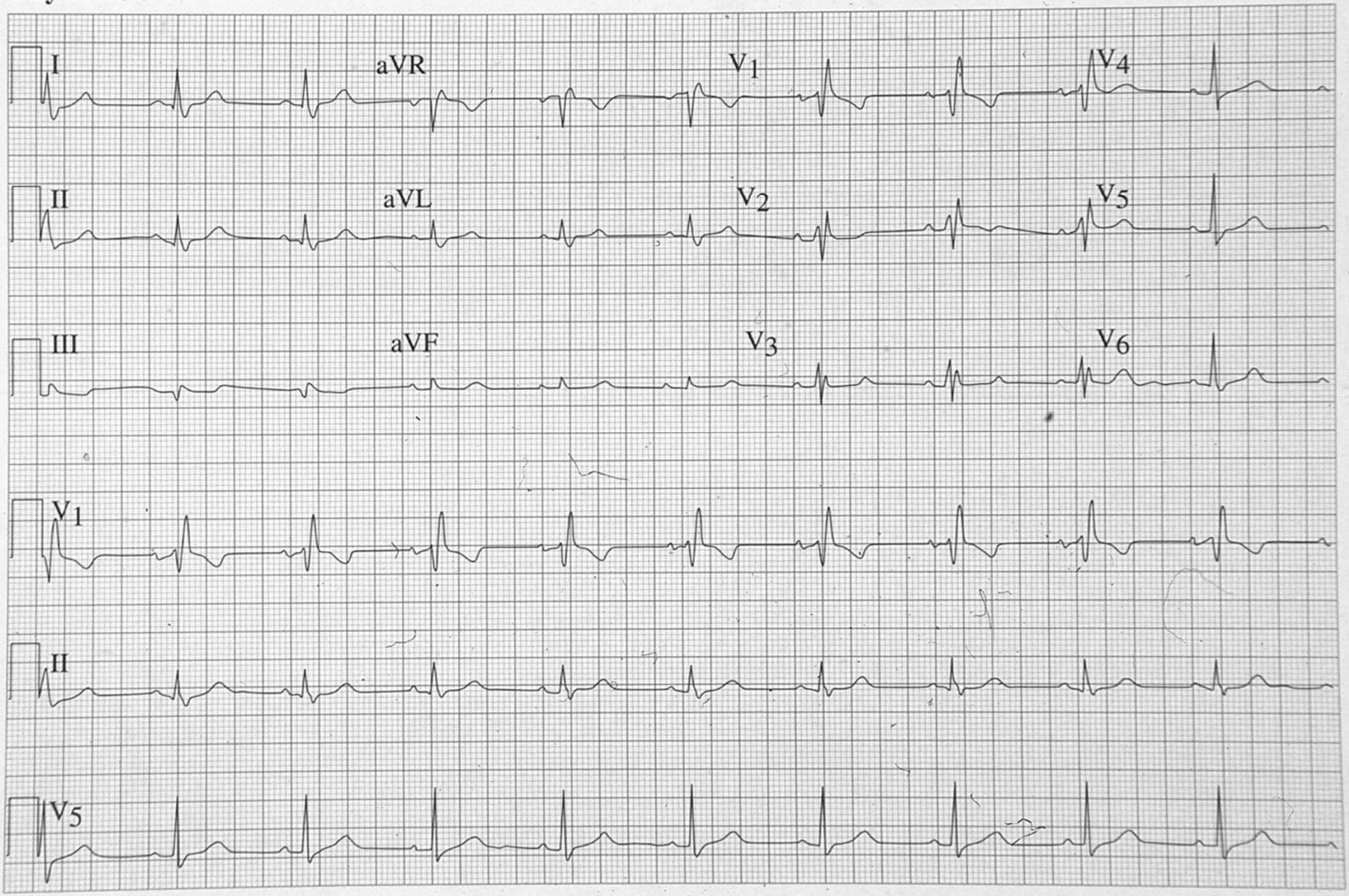




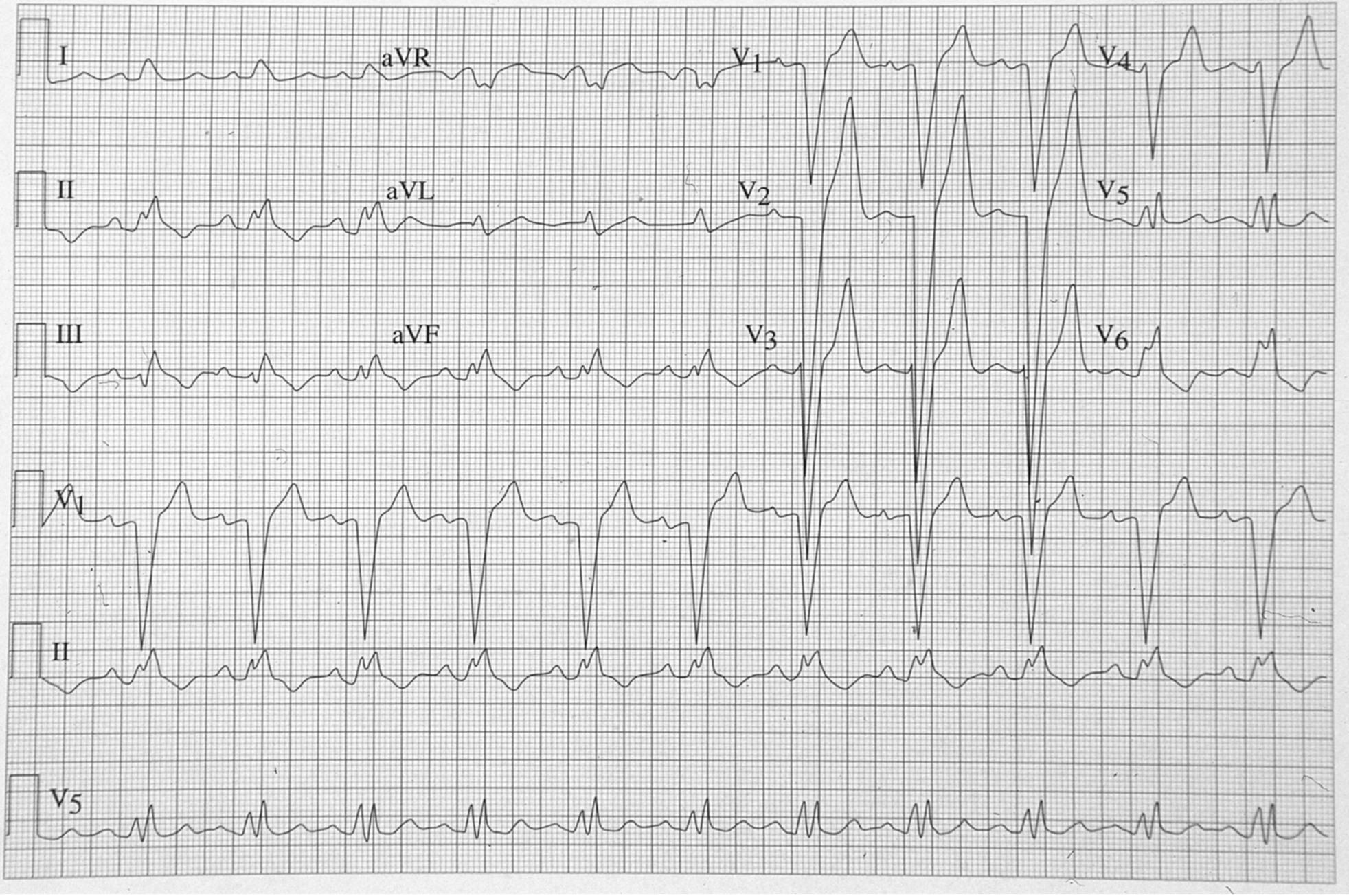
Day 1 ECG 1



Day 3 ECG 1



Day 3 ECG 7



Day 4 ECG 2