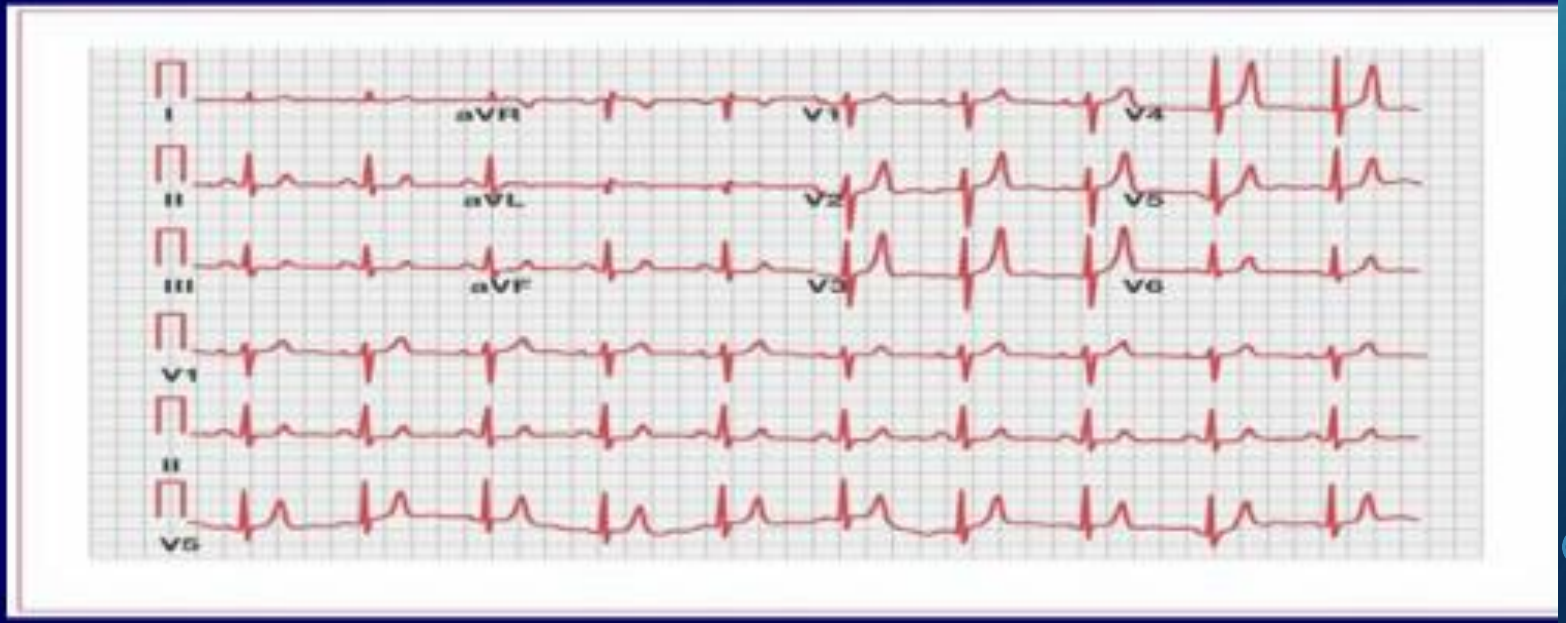
T WAVES

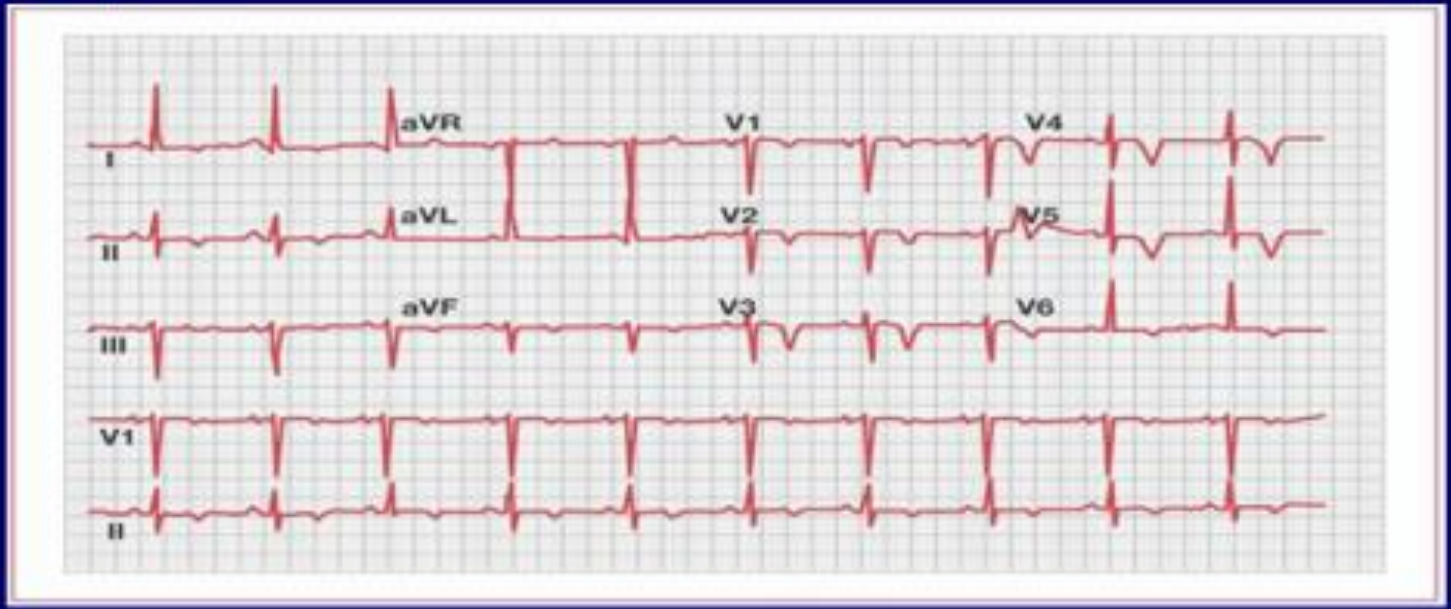
- Represents ventricular repolarization
- Dome shaped wave with asymmetrical limbs
- Normally upright ,except in leads aVR, aVL, V1 and V2.
- Tall peaked T wave :hyperkalemia ,acute subendocardial ischemia /infarction
- Low or inverted T wave : CAD /myocardial ischemia ,ventricular strain pattern ,constrictive pericarditis ,hypokalemia and CVA (Subarachnoid hemorrhage)

Tall, tented T waves



Hyperkalemia

T-wave inversion



Conditions: Myocardial ischemia ,ventricular strain pattern , constrictive pericarditis ,hypokalemia and CVA

U WAVE

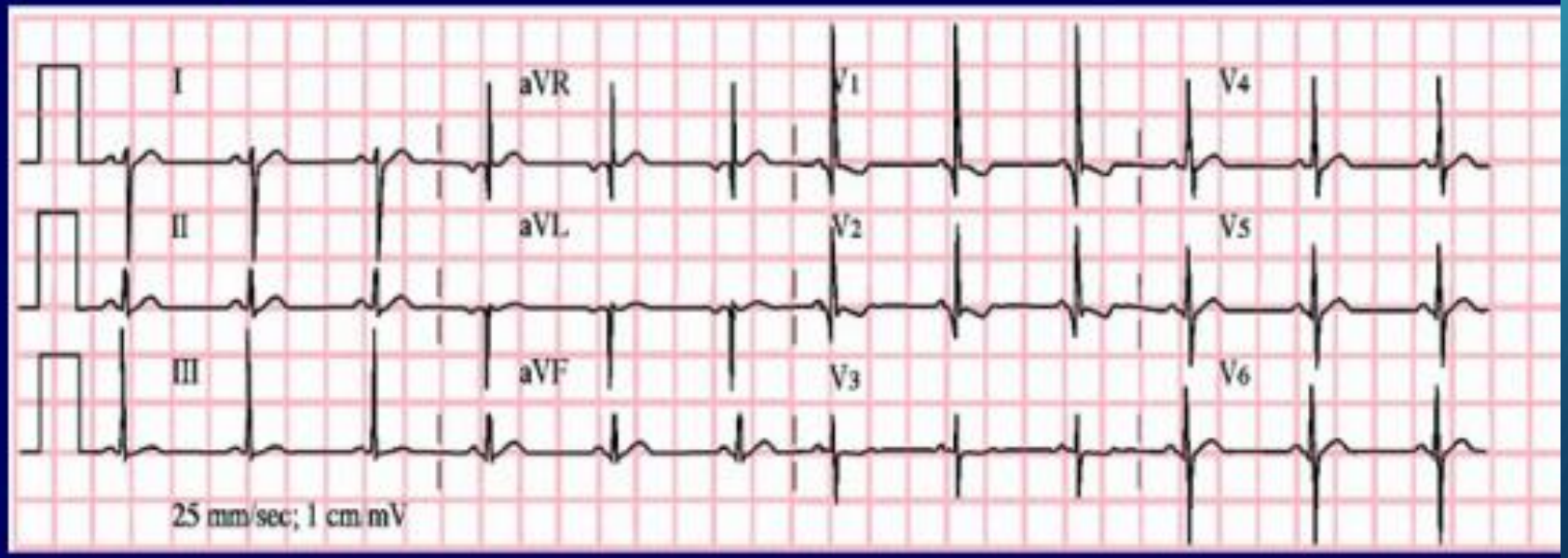
- Represents repolarization of the His-Purkinje's fibers.
- Positive deflection which comes after T wave and precedes the P wave of next cycle
- Amplitude : 5mm or less in standard leads I,II & III; 10mm or less in precordial leads V1-V6. Duration: not usually measured.
- Usually seen in hypokalemia

RIGHT VENTRICULAR HYPERTROPHY

1. A qR pattern in right ventricular surface leads
2. A positive T wave in leads V3R-V4R and V1-V3 between the ages 6days to 6year
3. A monophasic R wave in V3R, V4R or V1
4. An rsR' pattern in right precordial leads with 2nd R wave taller than the initial one
5. Age corrected increased voltage of the R wave in leads V3R-V4R or the S wave in leads V5-V6, or both
6. Marked RAD (>120degrees beyond the newborn period)
7. Complete reversal of the normal adult precordial RS pattern
8. Right atrial enlargement

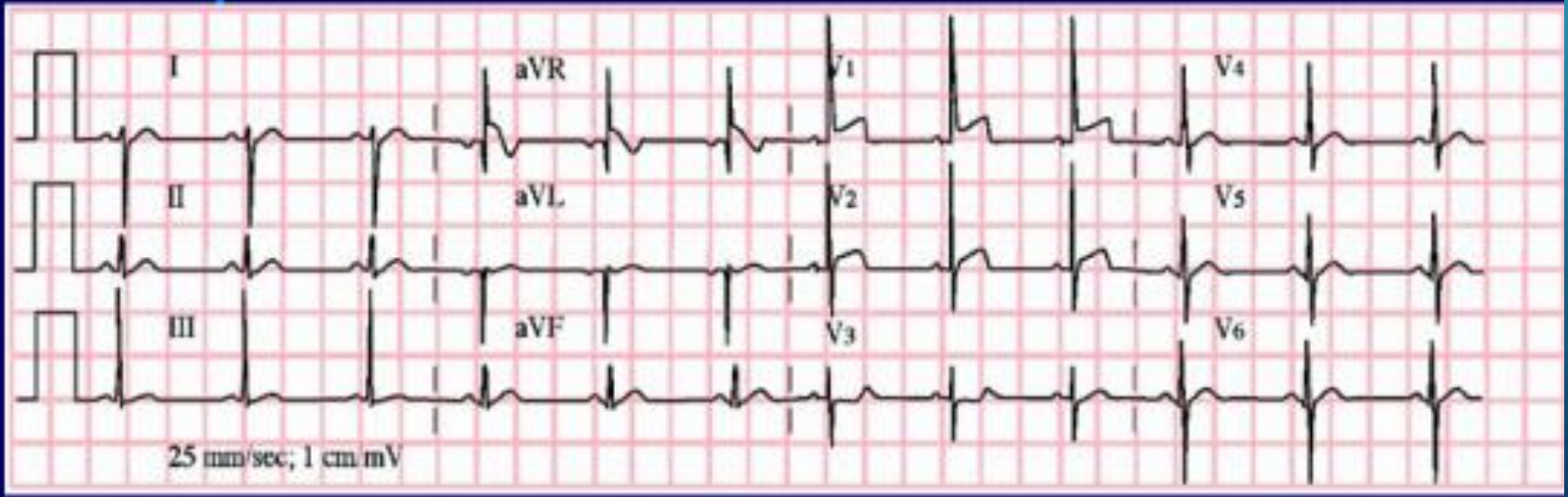
At least two of theses changes supports RVH

RVH- qR



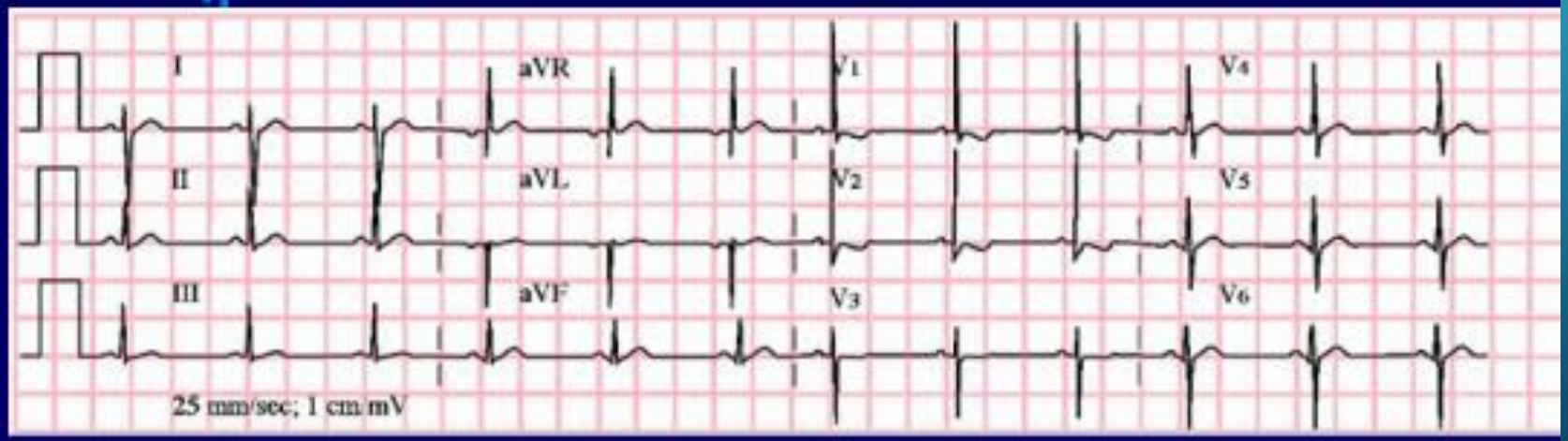
qR in V1 & V2

RVH- pure R



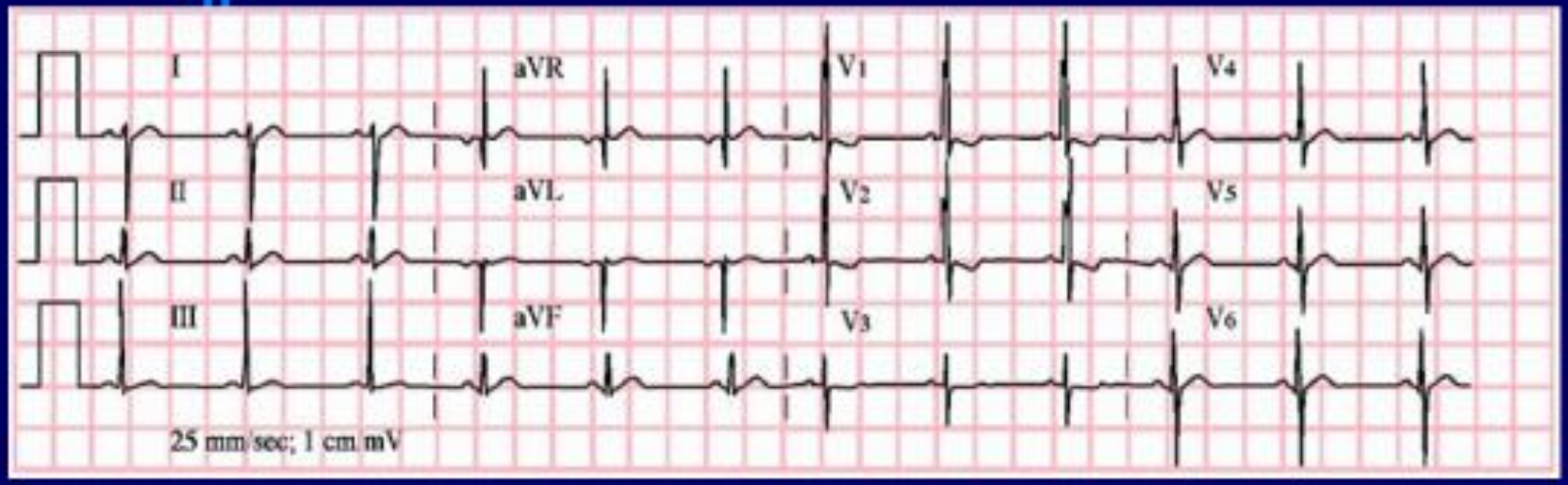
Pure R wave in V1 & V2 , with or without ST & T changes indicative of strain

RVH –tall R



R in V1 taller than 95% of normal PLUS S in V6 deeper than 95%.

RVH –rsR’

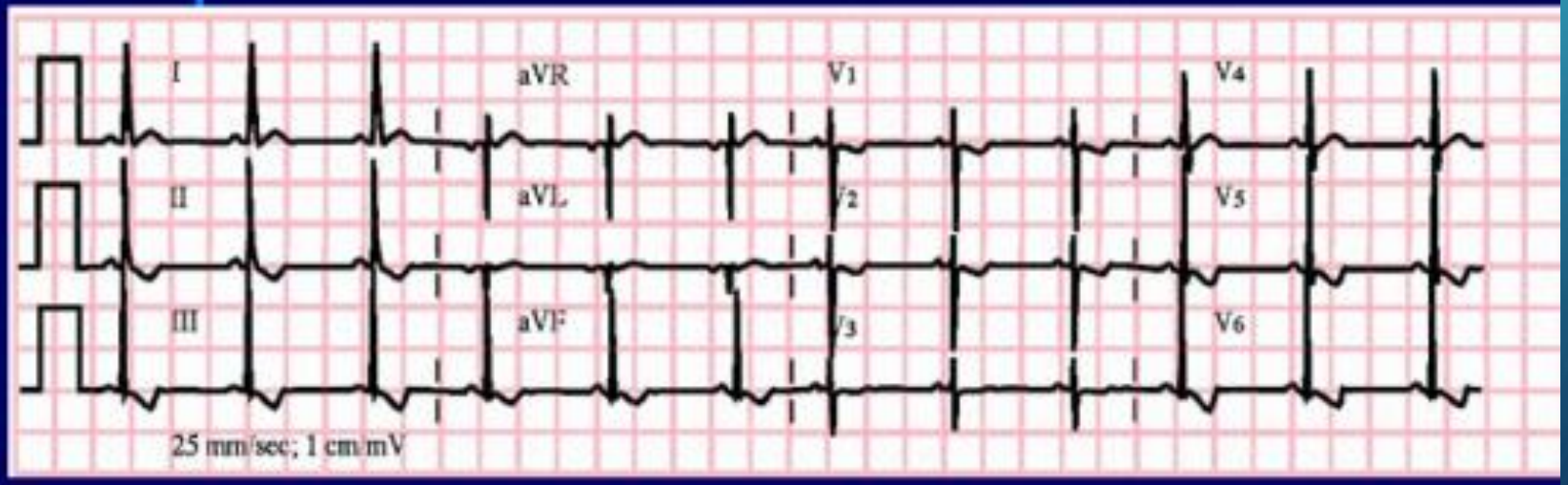


- rsR’ in V1 & V2 without widening of QRS complex as in bundle branch block. (The upper case R in rsR’ indicate that the R’ deflection is taller than the r wave.

LEFT VENTRICULAR HYPERTROPHY

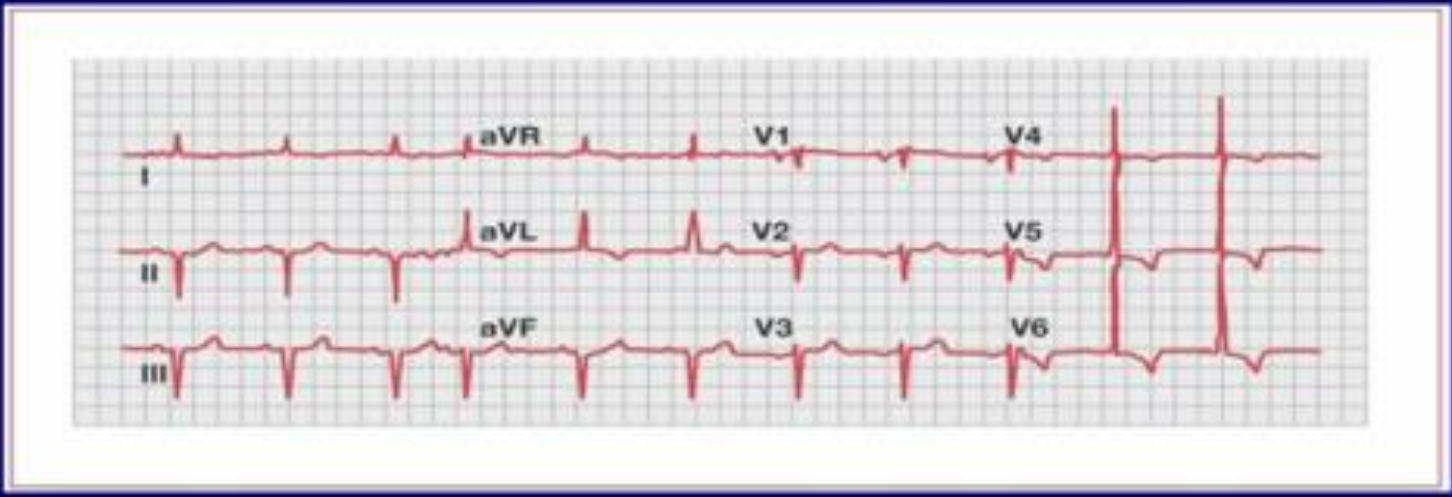
1. Depression of ST segments and inversion of the T waves in left precordial leads(V5-6, strain)
2. A deep q in left precordial leads
3. Increased voltage of S wave in V3R and V1 or the R wave in V5-6 or both

LVH



- R in V6 taller than 95% of normal and S in V1 deeper than 95%

Left ventricular hypertrophy

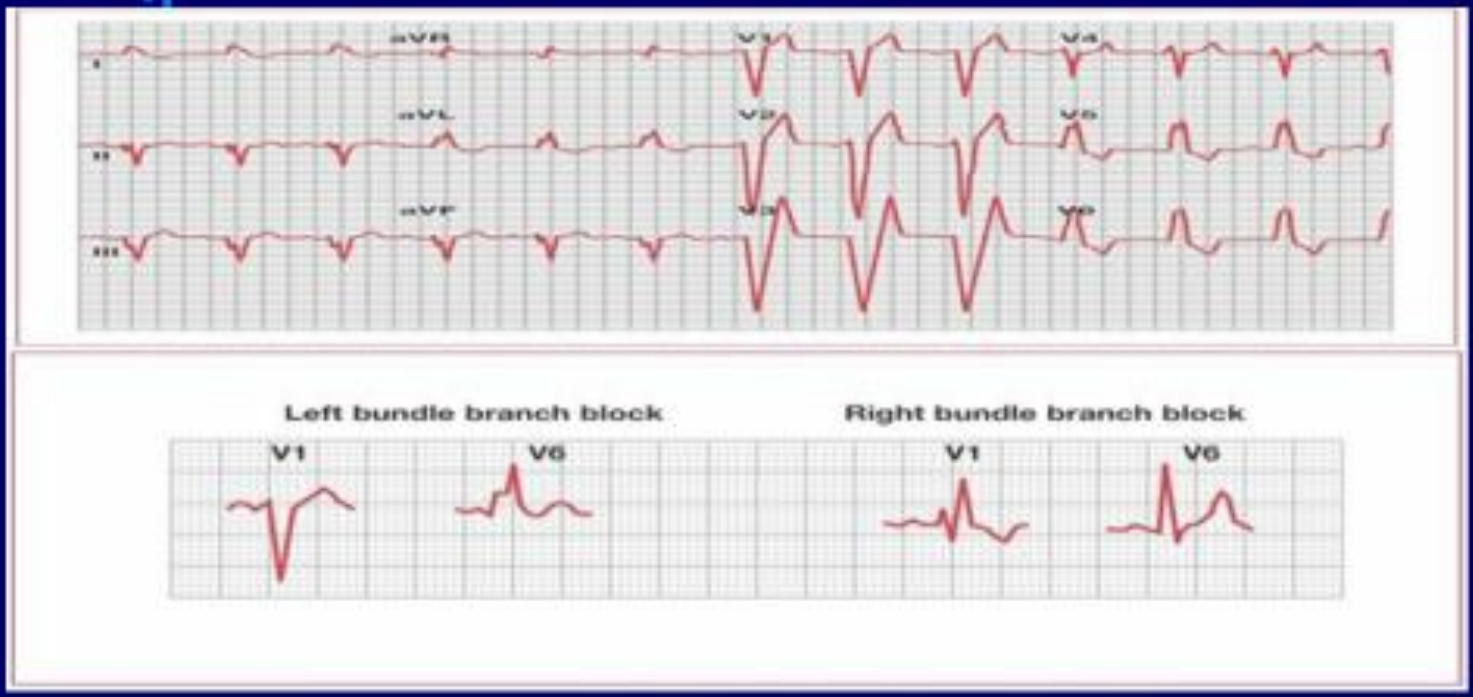


- Left ventricular hypertrophy.
- T-wave inversion in leads V4–V6. This is often labeled "strain".

Long PR interval

- PR Interval >0.2 sec constitutes first-degree heart block
- It rarely requires action, but in the presence of other abnormalities might be a sign of hyperkalemia, digoxin toxicity, or cardiomyopathy

Broad QRS complexes and strange-looking ECGs



- A wide QRS complex: bundle branch block.
- New LBBB can be diagnostic of myocardial infarction (MI).

Long QT interval

Congenital	Acquired
Jervell and Lange–Nielsen syndrome	Amiodarone, sotalol Phenothiazines Tricyclic antidepressants
Romano–Ward syndrome	Hypocalcemia Hypokalemia Hypomagnesemia

Pediatric dysrhythmias

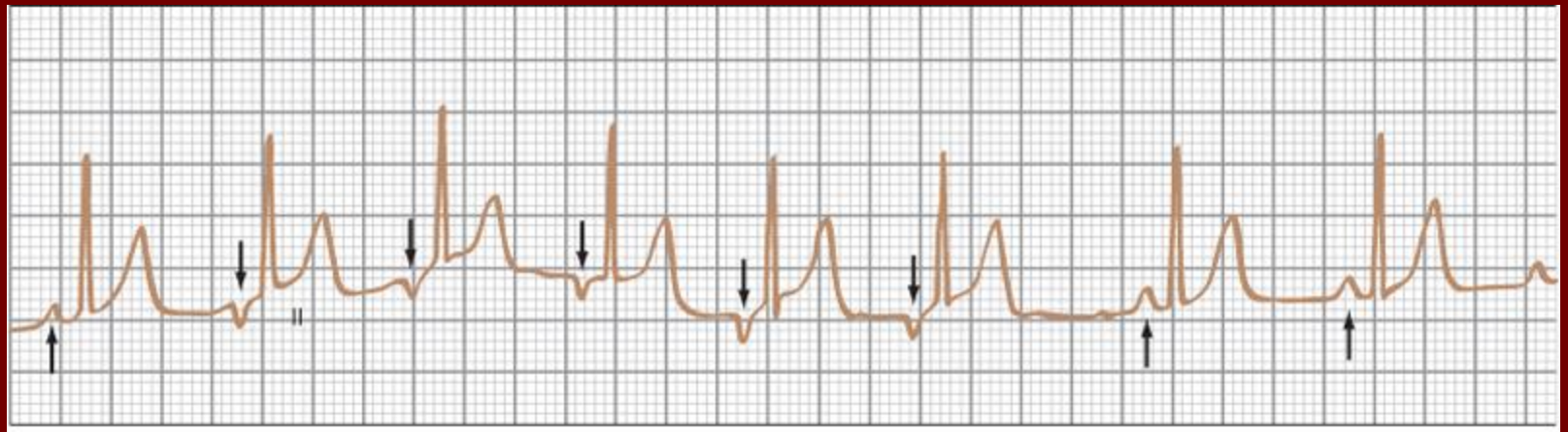
Treatment not required	Treatment is required
Sinus arrhythmia	Supraventricular tachycardia
Wandering atrial pacemaker	
Isolated premature atrial contractions	
Isolated premature ventricular contractions	Ventricular tachycardia
First degree AV block	Third degree AV block with symptoms

Reproduced from Zitelli's Atlas of Pediatric physical diagnosis, 2007, pg 140.

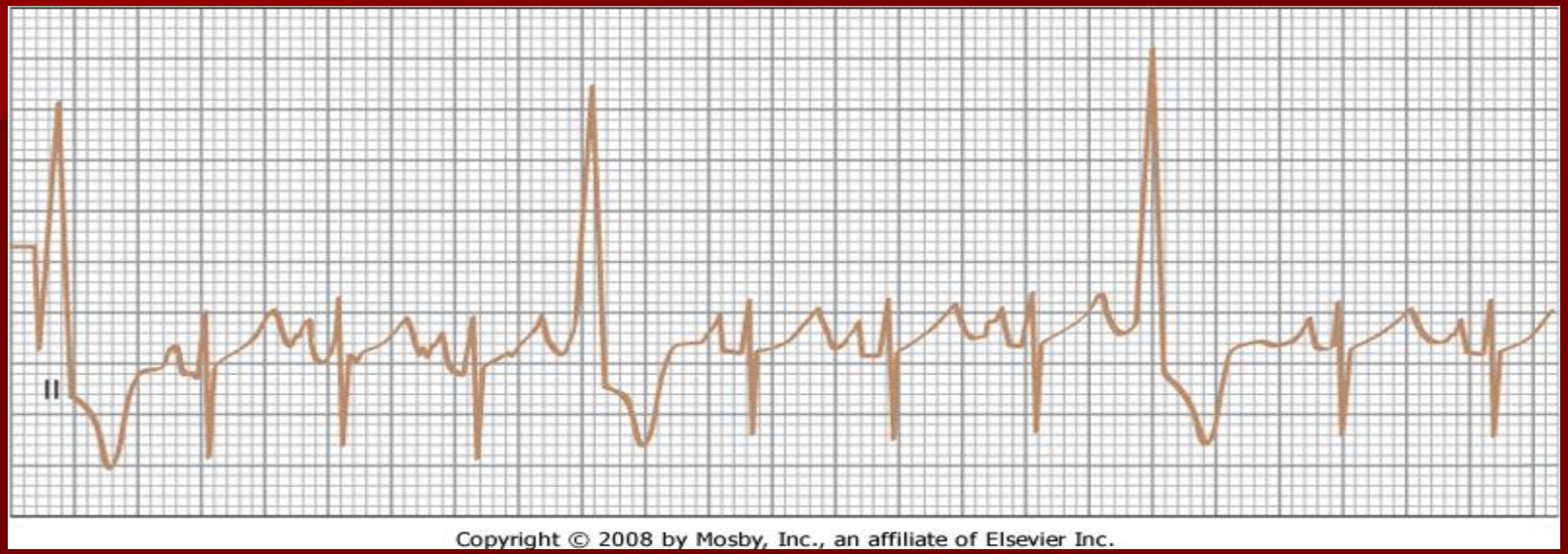
Sinus arrhythmia

Wandering atrial pacemaker

- Atrial pacemaker shifts from sinus node to another atrial site
- Normal variant, irregular rhythm



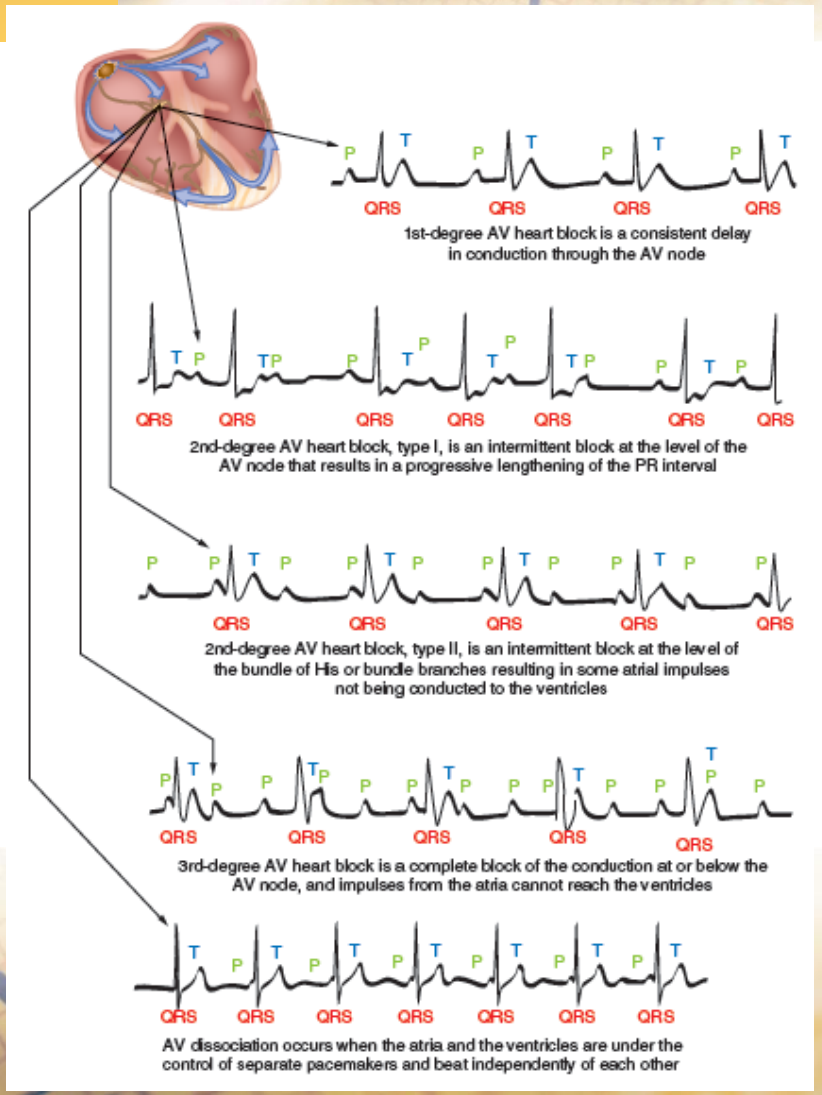
PVC's



- If unifocal, disappear with exercise, and associated with structurally and functionally normal heart, then considered benign, no therapy needed

AV Heart Blocks

- 1st-degree AV heart block
- 2nd-degree AV heart block, type I (Wenckebach)
- 2nd-degree AV heart block, type II
- 3rd-degree AV heart block
- AV dissociation



First Degree Block

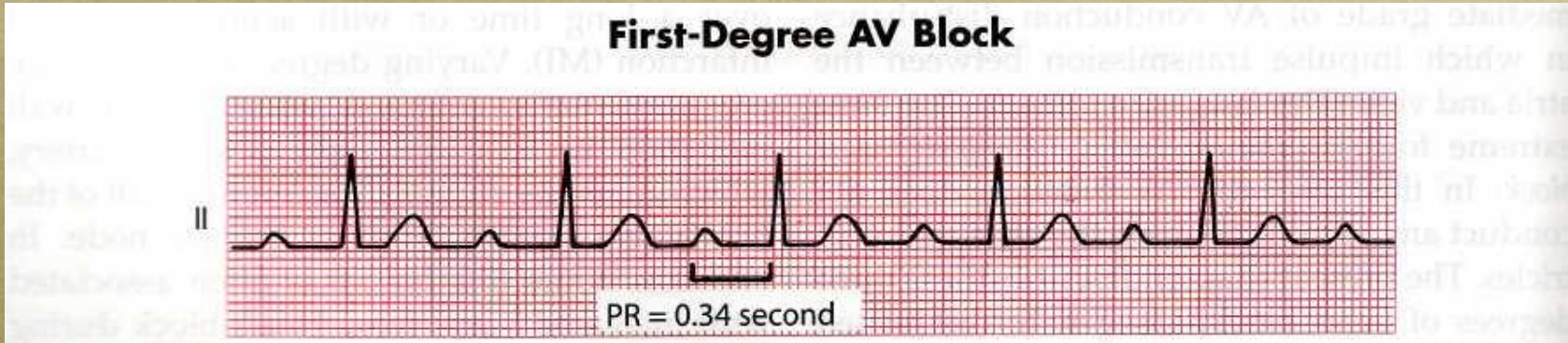
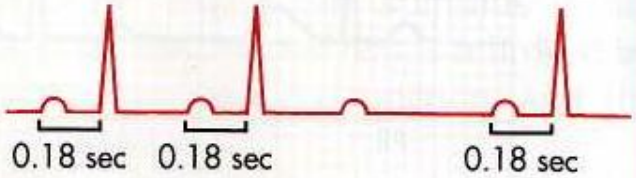


FIGURE 17-1 With first-degree AV block, the PR interval is uniformly prolonged beyond 0.2 second with each beat.

- *note the prolonged PR interval*

Second Degree AV Block

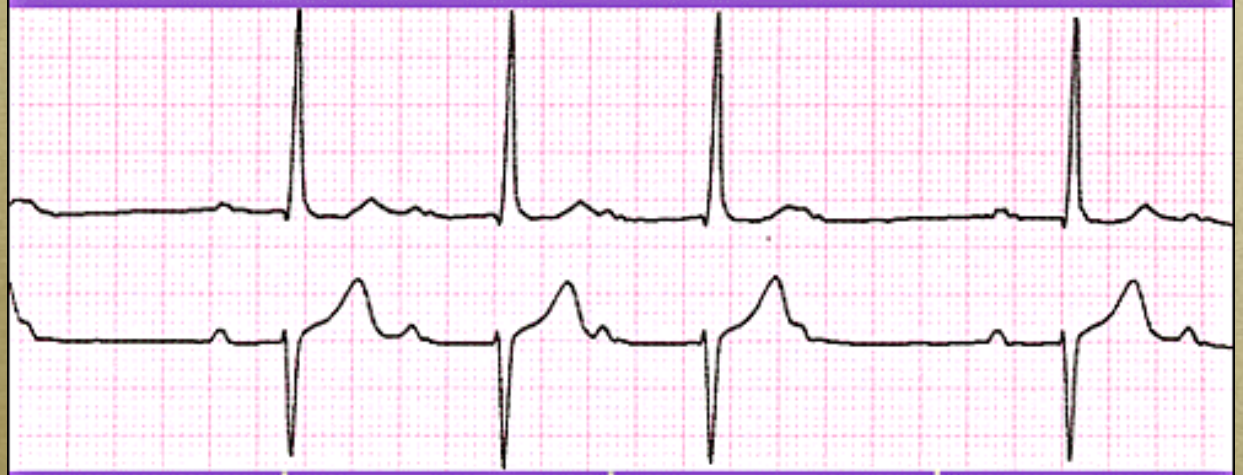
TABLE 17-2 **Mobitz Type I and Mobitz Type II AV Blocks**

Characteristic	Mobitz Type I	Mobitz Type II
		
Pattern of block	Cycles of gradually increasing PR intervals followed by nonconducted P waves	Abrupt nonconducted P waves without preceding changes in the PR intervals

- *Mobitz type I or Winckebach*
- *Mobitz type II*

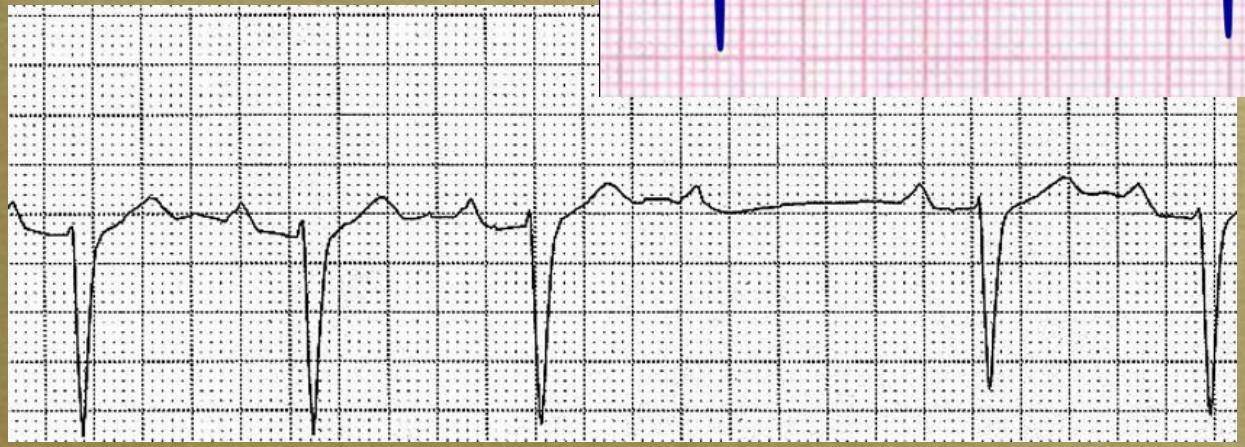
Second Degree AV Block Type I or Wenckebach

Second Degree AV Block • Mobitz 1 (Wenckebach)



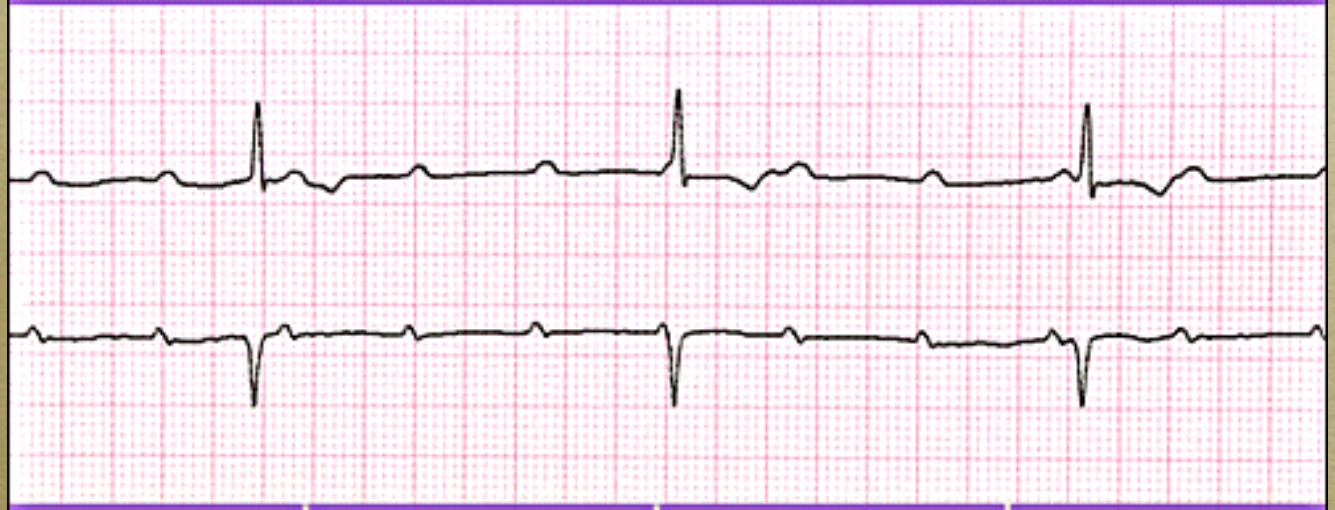
P Wave	PR Interval (in seconds)	QRS (in seconds)	Characteristics
Conduction intermittant	Increasingly Prolonged	<.12	QRS dropped in a repeating pattern

Second Degree AV Block
Type II



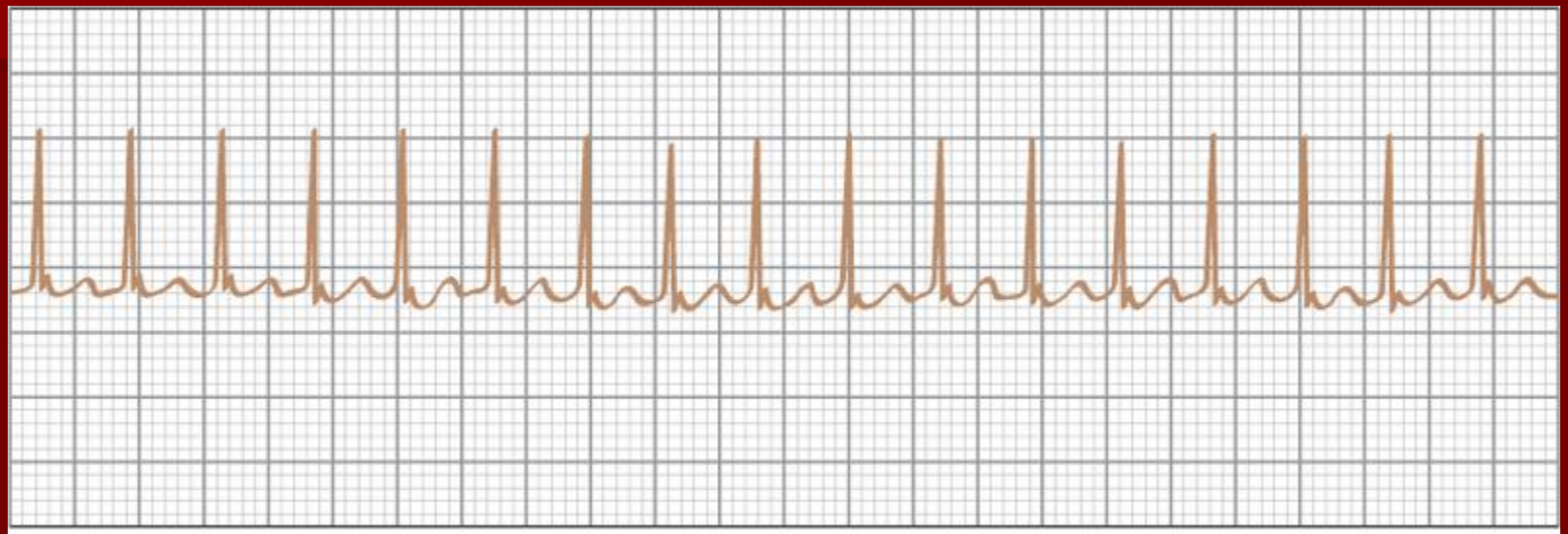
Third-Degree (Complete) AV Block

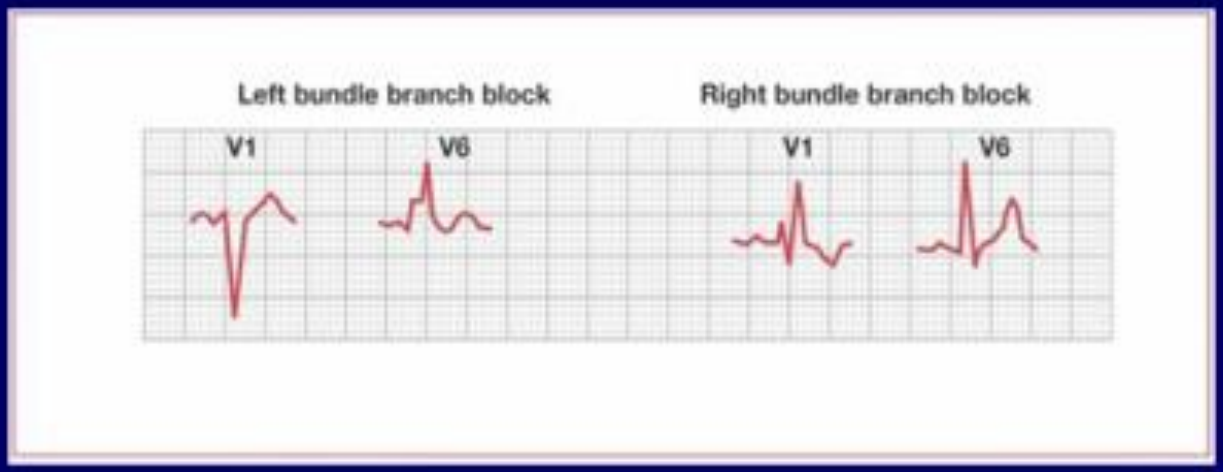
Third Degree (complete) AV Block



P Wave	PR Interval (in seconds)	QRS (in seconds)	Characteristics
Normal but not related to QRS	None	N/A	No relationship between P&RS

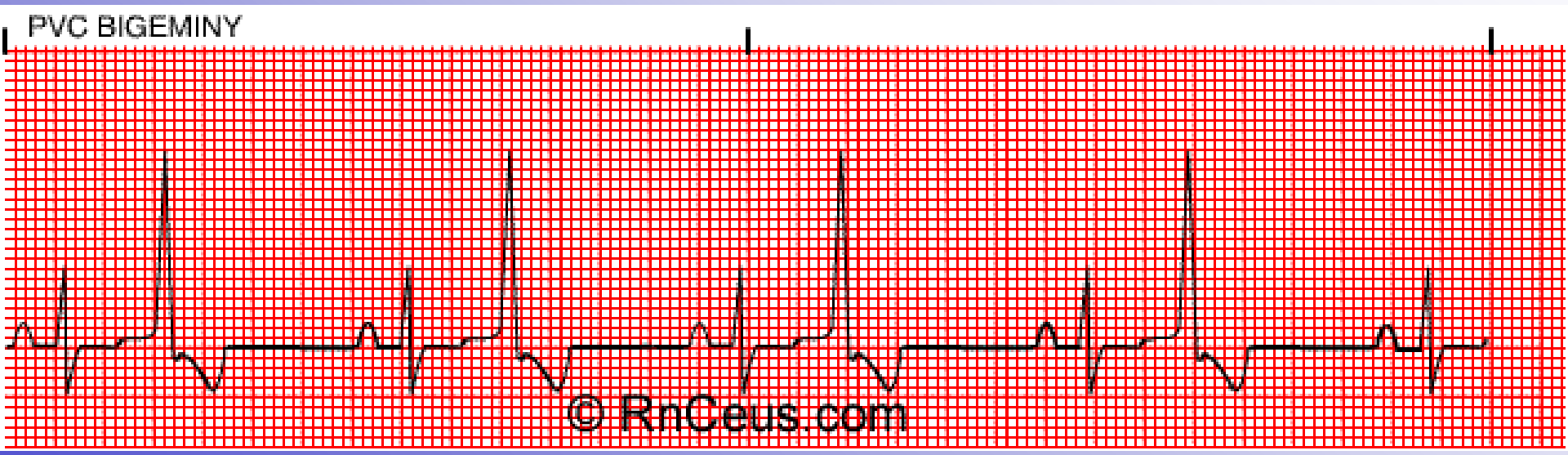
SVT

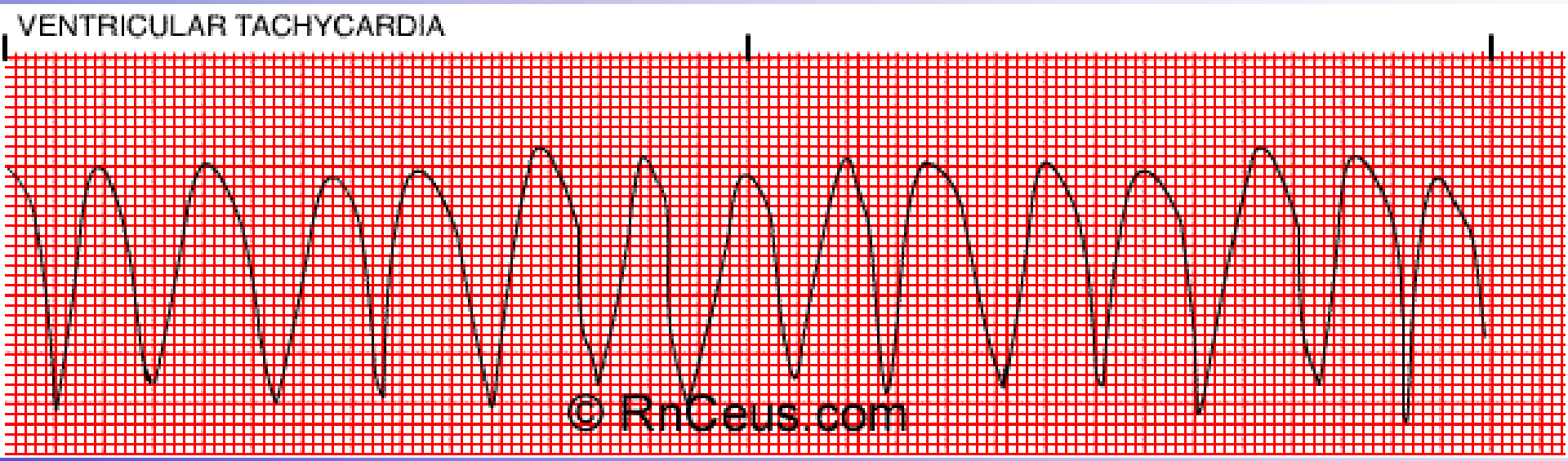




The shapes of V1 and V6 QRS complexes in left and right bundle branch block.

- left bundle branch block.


PVC BIGEMINY
© RnCeus.com


VENTRICULAR TACHYCARDIA
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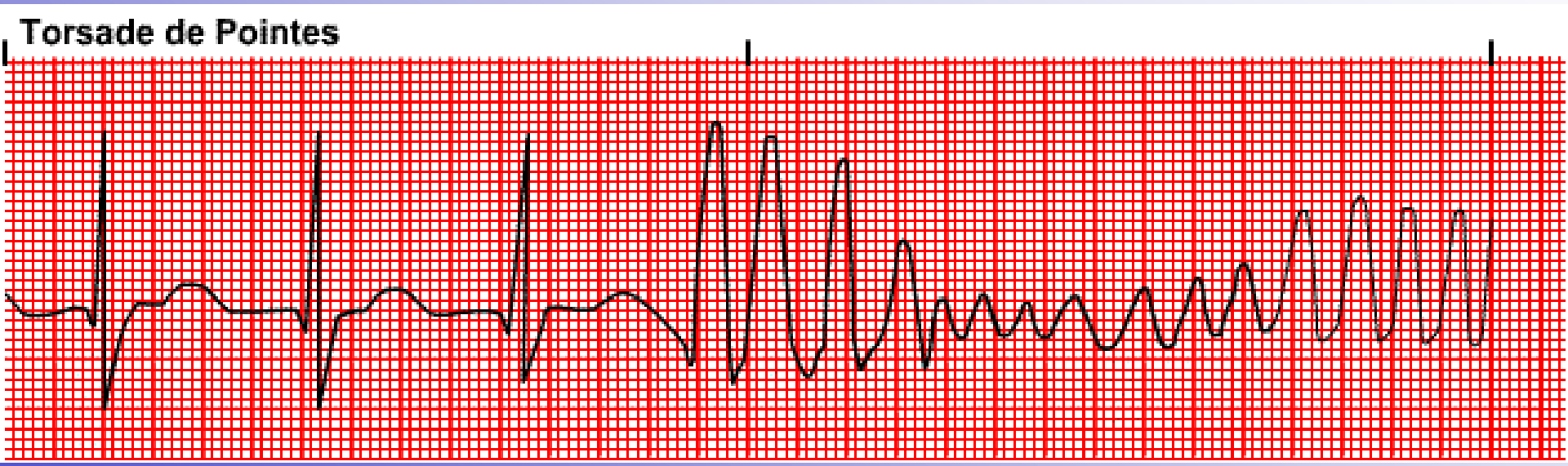
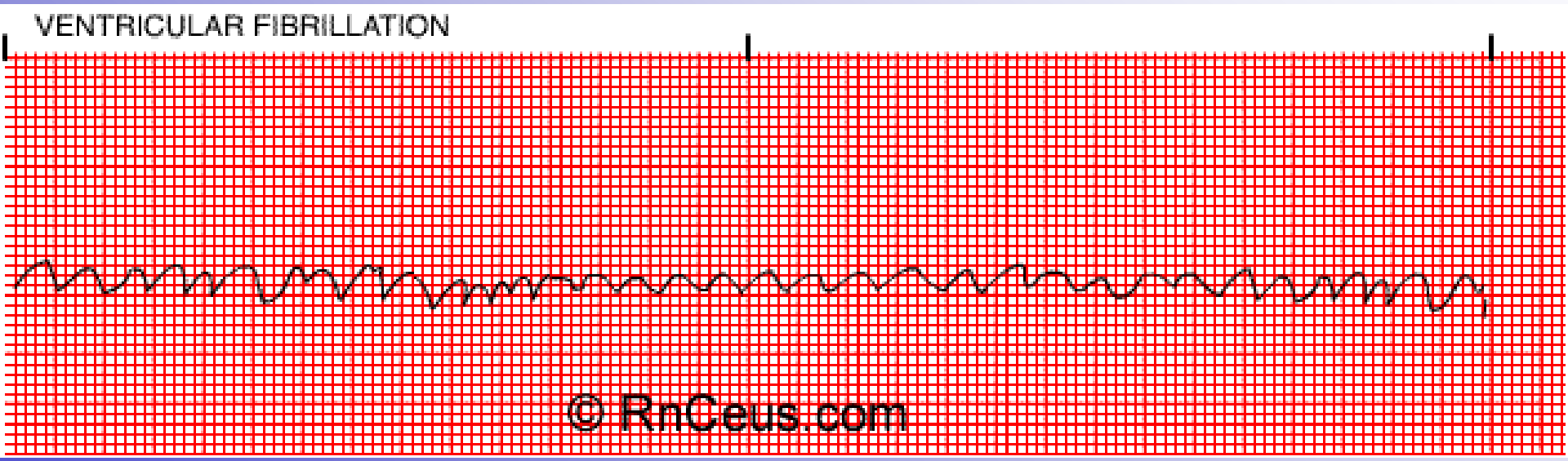

Torsade de Pointes


VENTRICULAR FIBRILLATION
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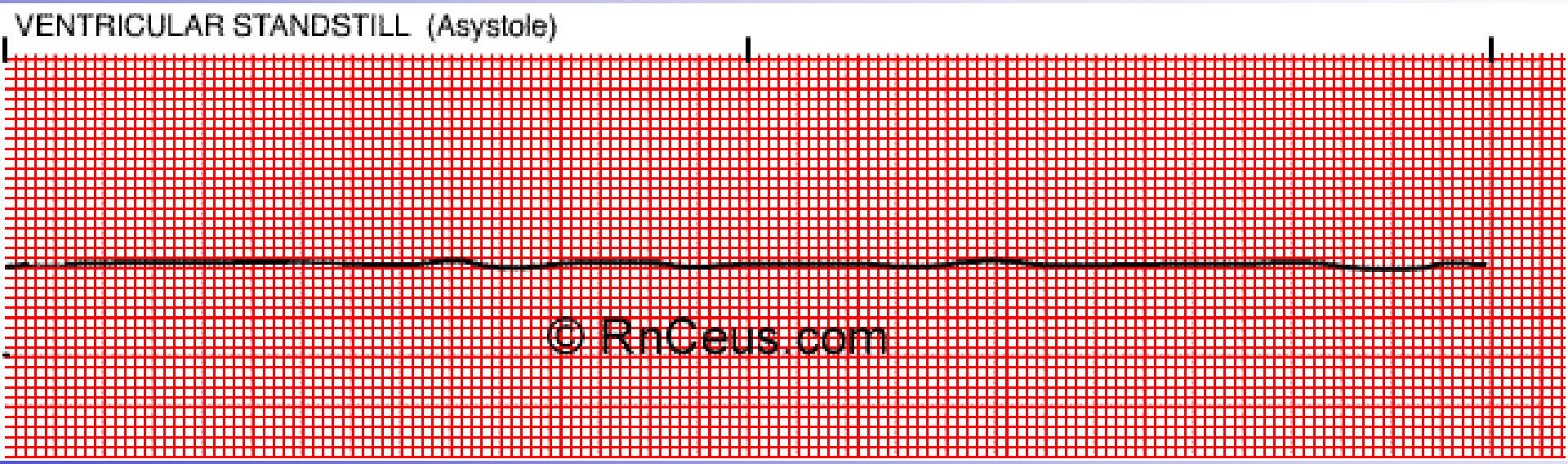
VENTRICULAR STANDSTILL (Asystole)
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Do not forget, nothing replaces good traditional clinical examination and detailed history

Thank for your attention