

12 Lead ECG

Interpretation- Part 2b

Hypertrophy & Bundle Branch Blocks



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No disclosures relevant to this presentation.

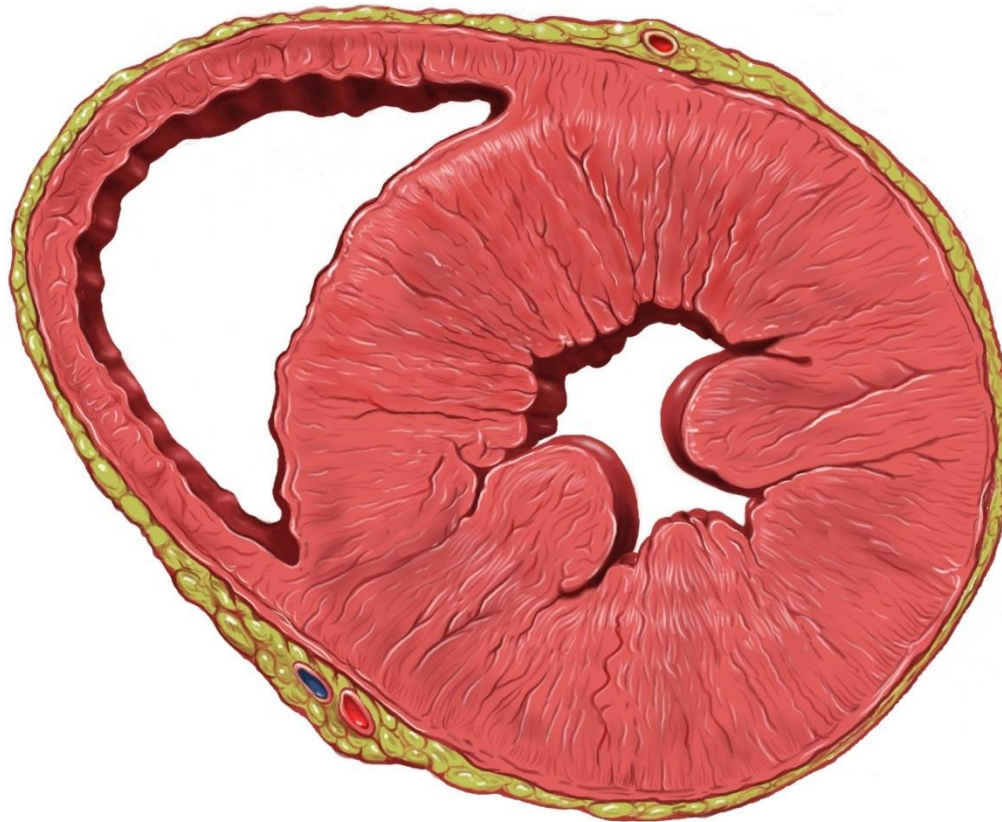
Systematic Interpretation of 12 Lead ECGs

Step 3:

- Assess for hypertrophy
 - Left ventricular hypertrophy (LVH)
- Assess for conduction delay
 - Bundle branch blocks

Not covered: atrial enlargement, RVH, or hemiblocks

Ventricular Changes with LVH

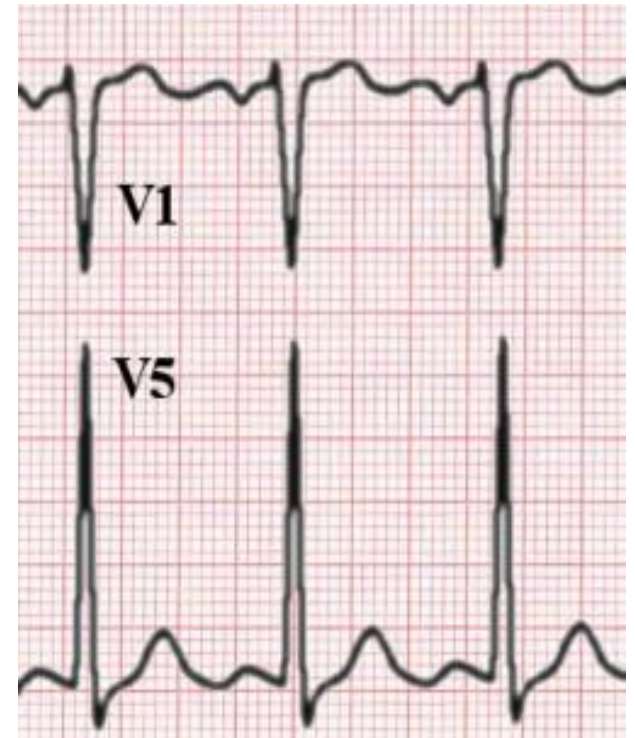


Courtesy of: Patrick J. Lynch, medical illustrator

Avail at: http://en.wikipedia.org/wiki/File:Heart_left_ventricular_hypertrophy_sa.jpg

Criteria for Determining Presence of LVH

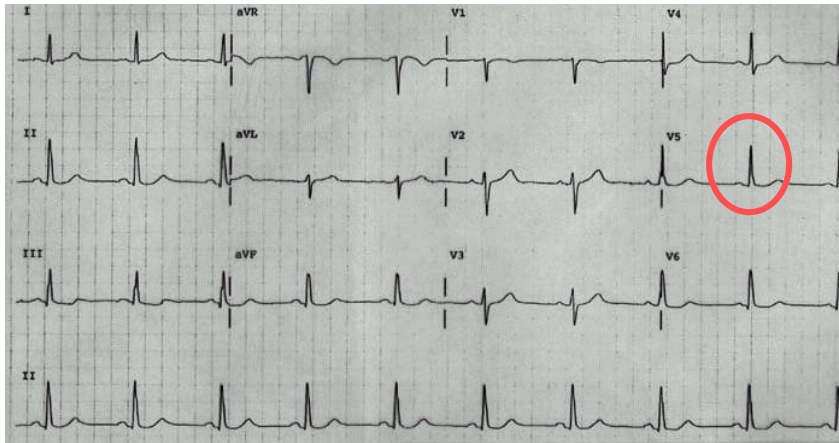
- Left axis deviation
- Many criteria; 2 most useful:
 - R wave in V5 or V6 *plus* the S wave in V1 or V2 exceeds 35 mm.
 - R wave in aVL exceeds 13 mm
 - The “eye ball” test



Avail: wikidoc.org/index.php/Left_ventricular_hypertrophy

Which one has LVH?

- Check for left axis deviation
- Measure to see if **either one** is present:
 - R wave in V5 or V6 **plus** the S wave in V1 or V2 exceeds 35 mm.
 - R wave in aVL exceeds 13 mm.

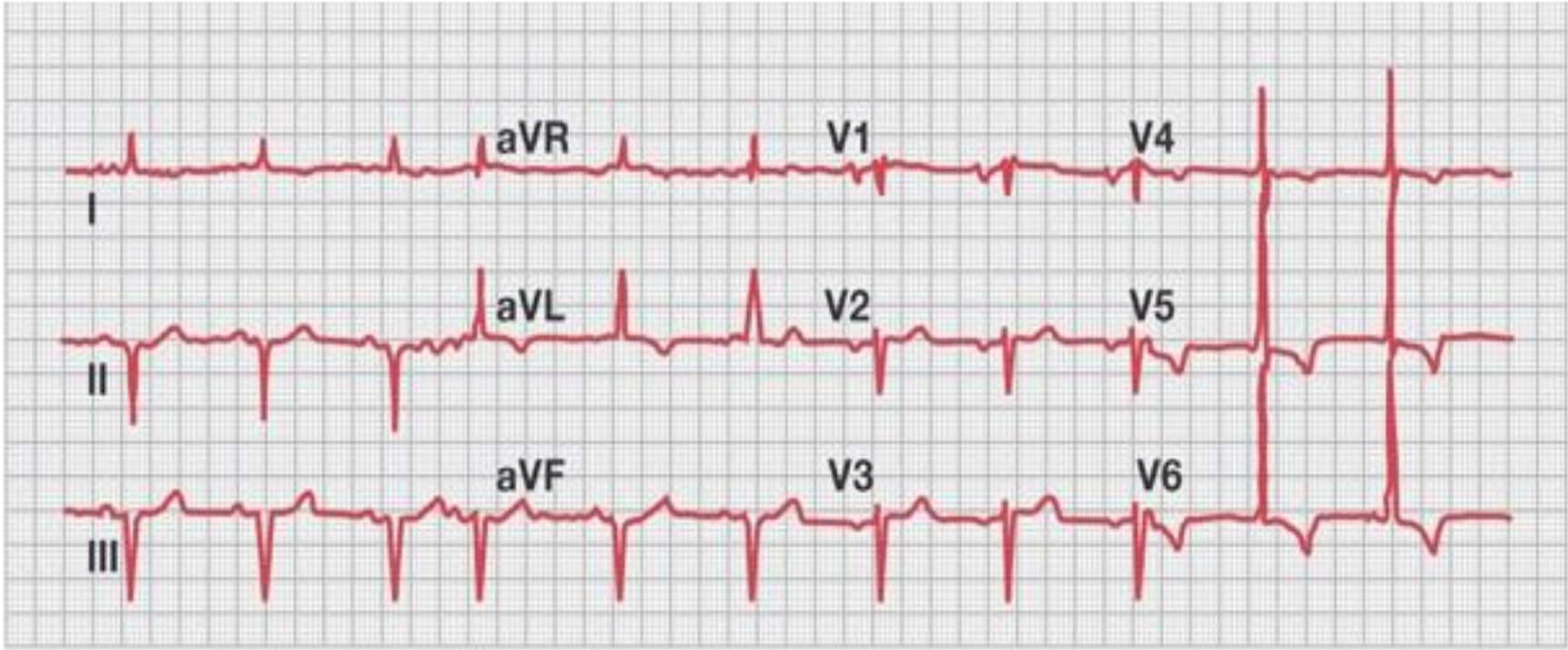


Example A

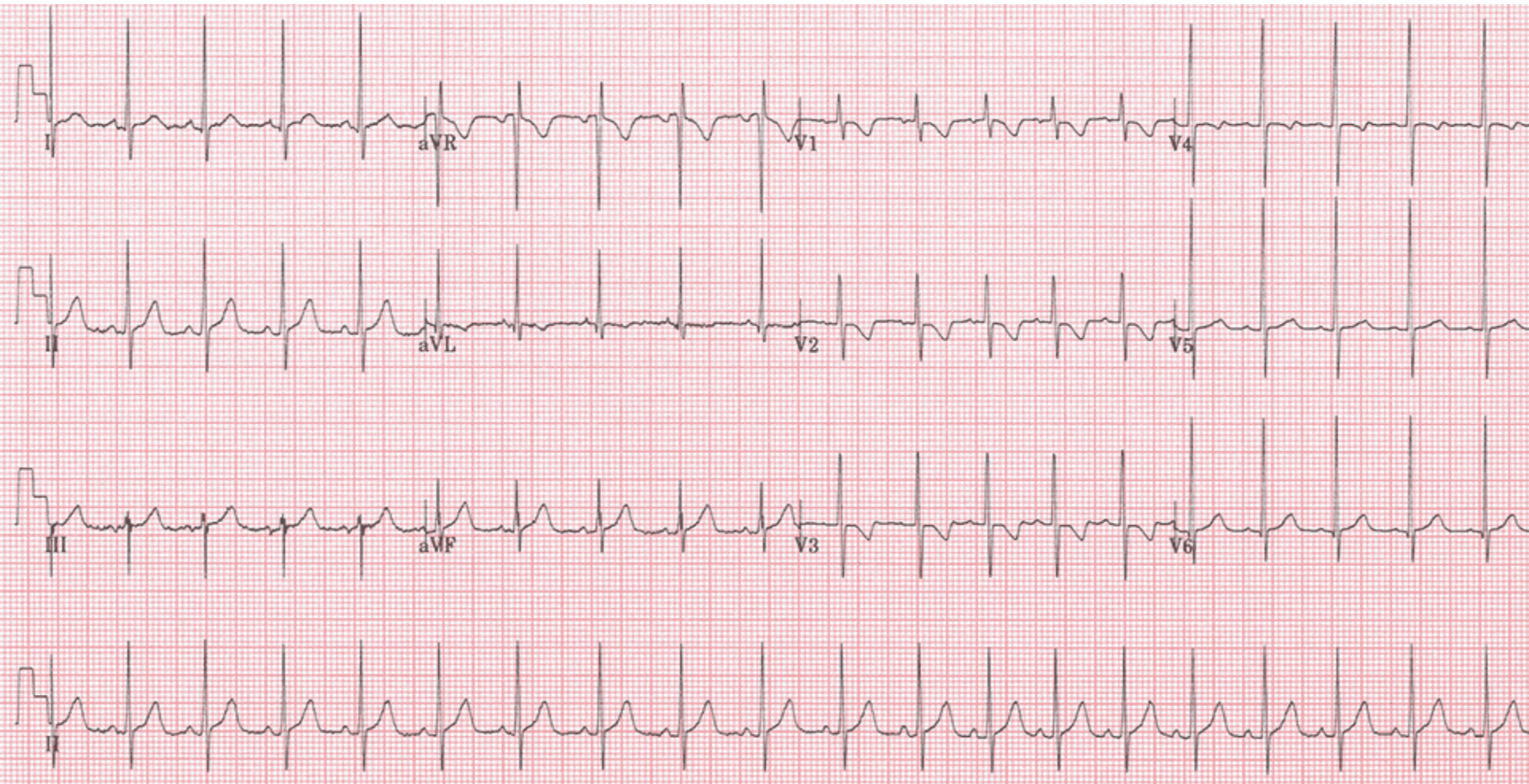


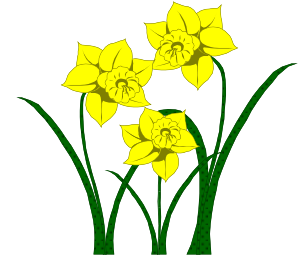
Example B

Case Study: Assess for LVH



Determine axis & check for LVH



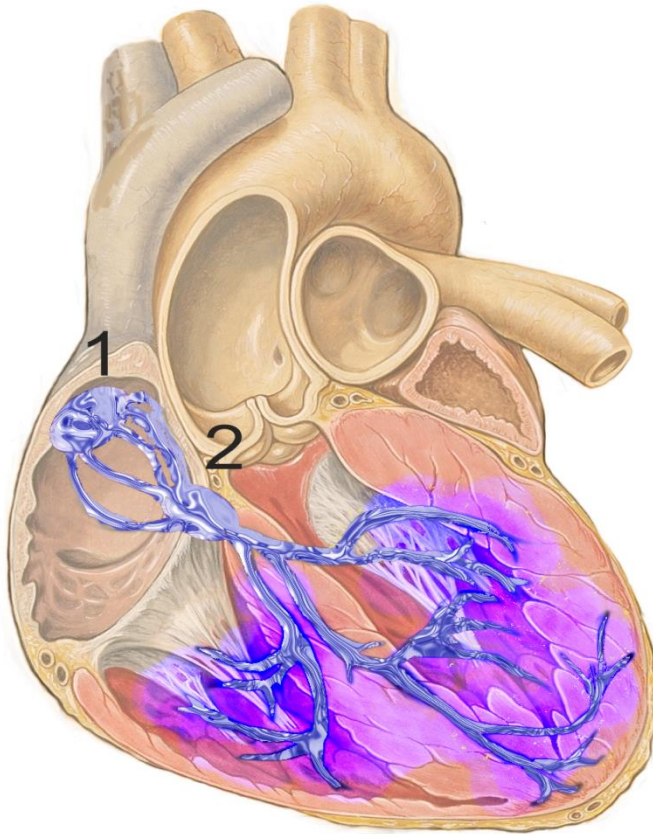


Bundle Branch Patterns

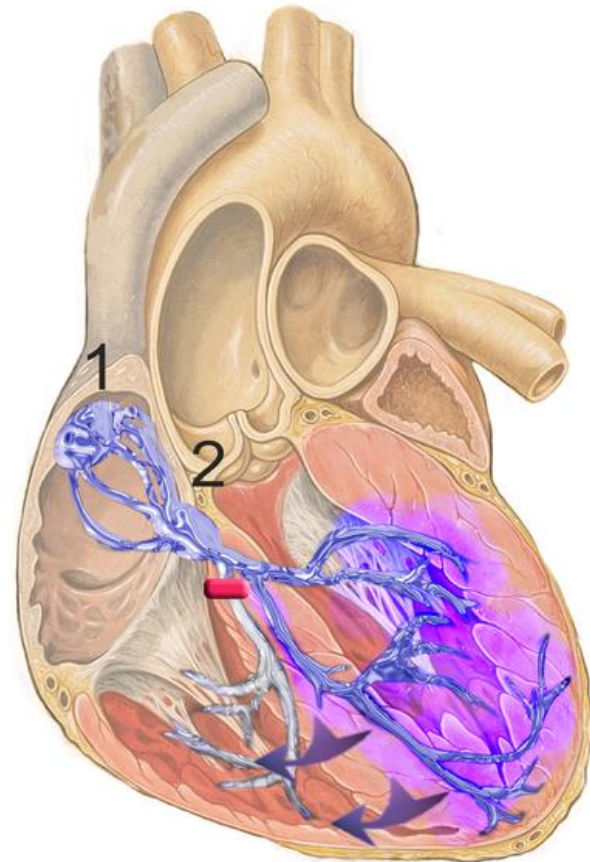
- Normal QRS complex width: .06 - .09 sec
- Intraventricular delay (incomplete BBB): .10 - .11 seconds.
- Bundle branch block: \geq .12 seconds.
- Examine width and configuration of the QRS complexes to determine BBB.

Heart Conduction

Normal conduction



Conduction Differences with a Right Bundle Branch Block

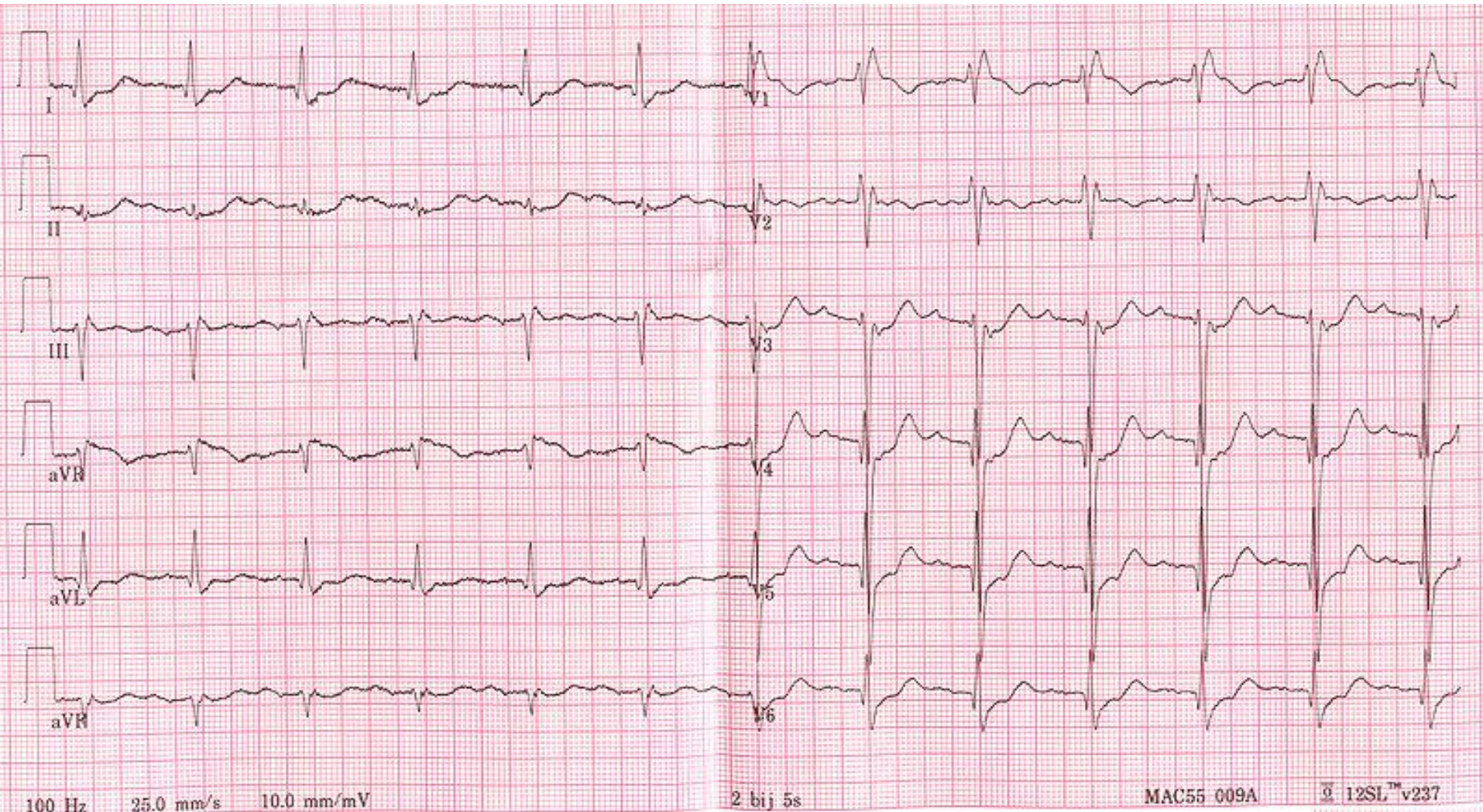


Courtesy of: Patrick J. Lynch, medical illustrator; C. Carl Jaffe, MD, cardiologist
Available at http://en.wikipedia.org/wiki/Right_bundle_branch_block

Right Bundle Branch Block

- Right ventricle depolarizes after the left ventricle due to RBBB.
- QRS complex \geq .12 seconds
- RSR' in V1 and V2 (*rabbit ears*) with ST segment depression and T wave inversion.
- Reciprocal changes in V5, V6, I, and aVL.

Example: Right BBB



Courtesy of: Steven Fruitsmaak

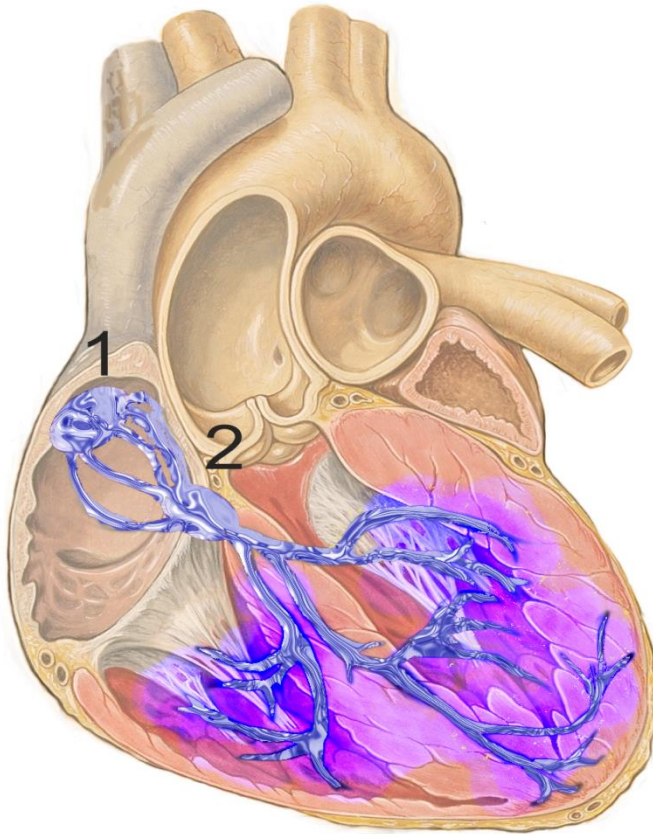
Avail at: http://en.wikipedia.org/wiki/File:RBBB_with_first_degree_AV_block.jpg

Left Bundle Branch Block

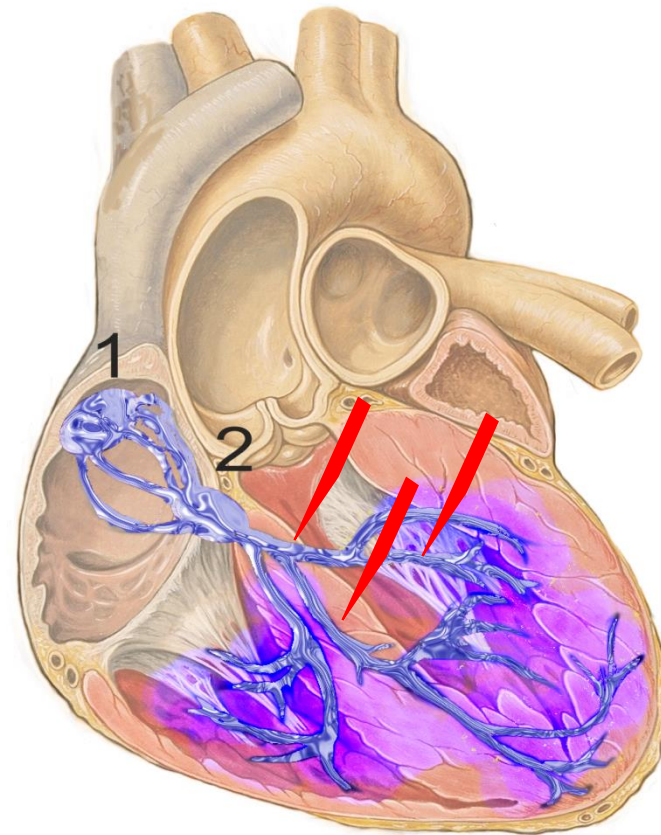
- QRS complex ≥ 0.12 seconds.
- Broad or notched R wave with prolonged upstroke in leads V5, V6, I, and aVL with ST segment depression and T wave inversion.
- Reciprocal changes in V1 and V2.
- Left axis deviation may be present.

Heart Conduction

Normal conduction

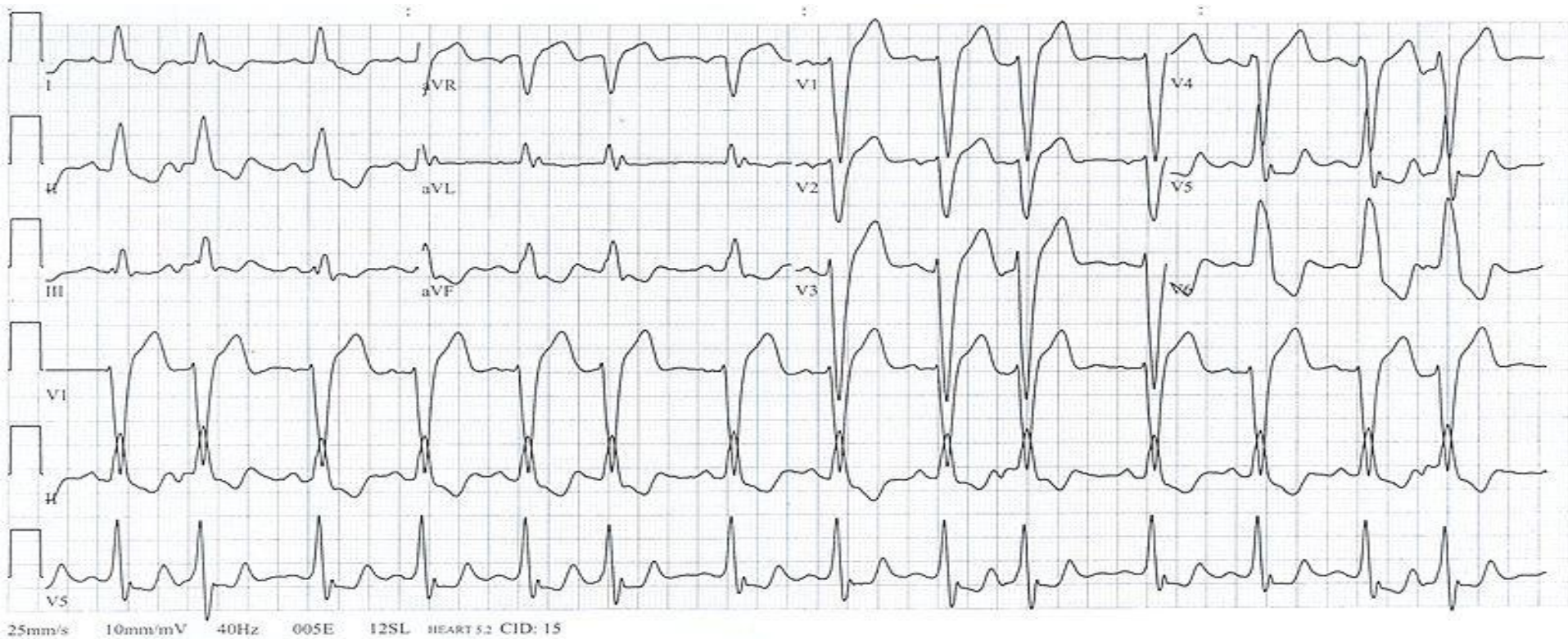


Many more opportunities for a LBBB can occur (3 examples)



Courtesy of: Patrick J. Lynch, medical illustrator; C. Carl Jaffe, MD, cardiologist
Available at http://en.wikipedia.org/wiki/File:Reizleitungssystem_12.png

Example: Left BBB



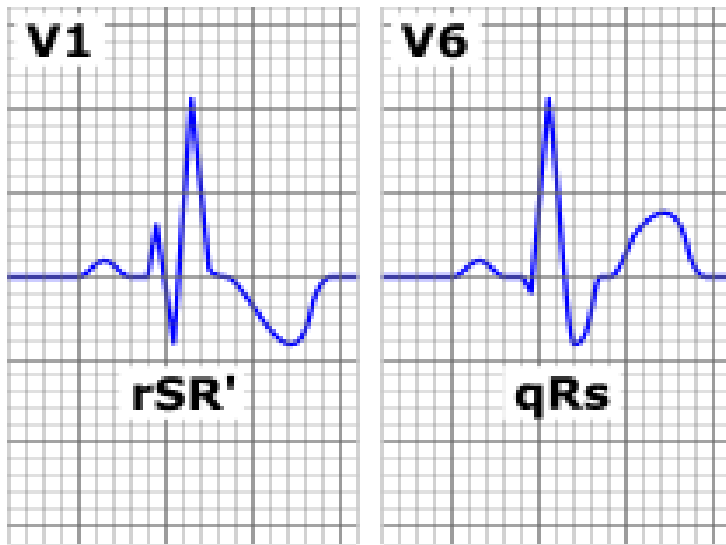
Courtesy of: Steven Fruitsmaak

Avail at: http://en.wikipedia.org/wiki/File:Left_bundle_branch_block_supraventricular_extrasystole.jpg

Right Versus Left BBB

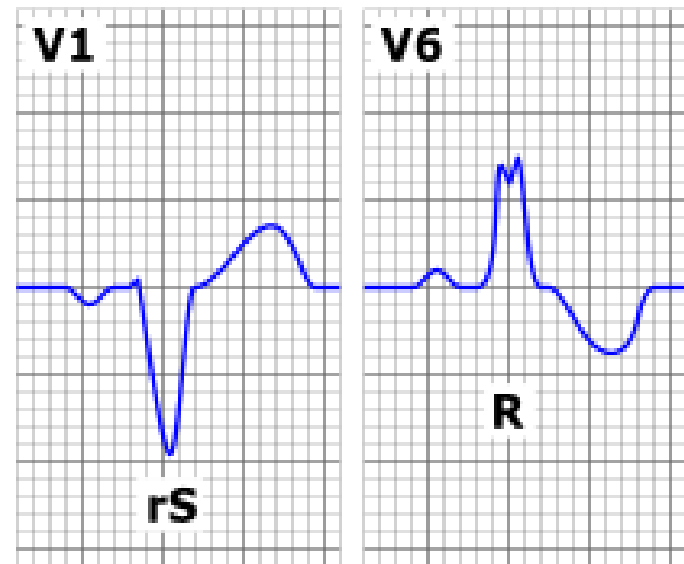
V_1 and V_6 provide clues

Right bundle branch block characteristics



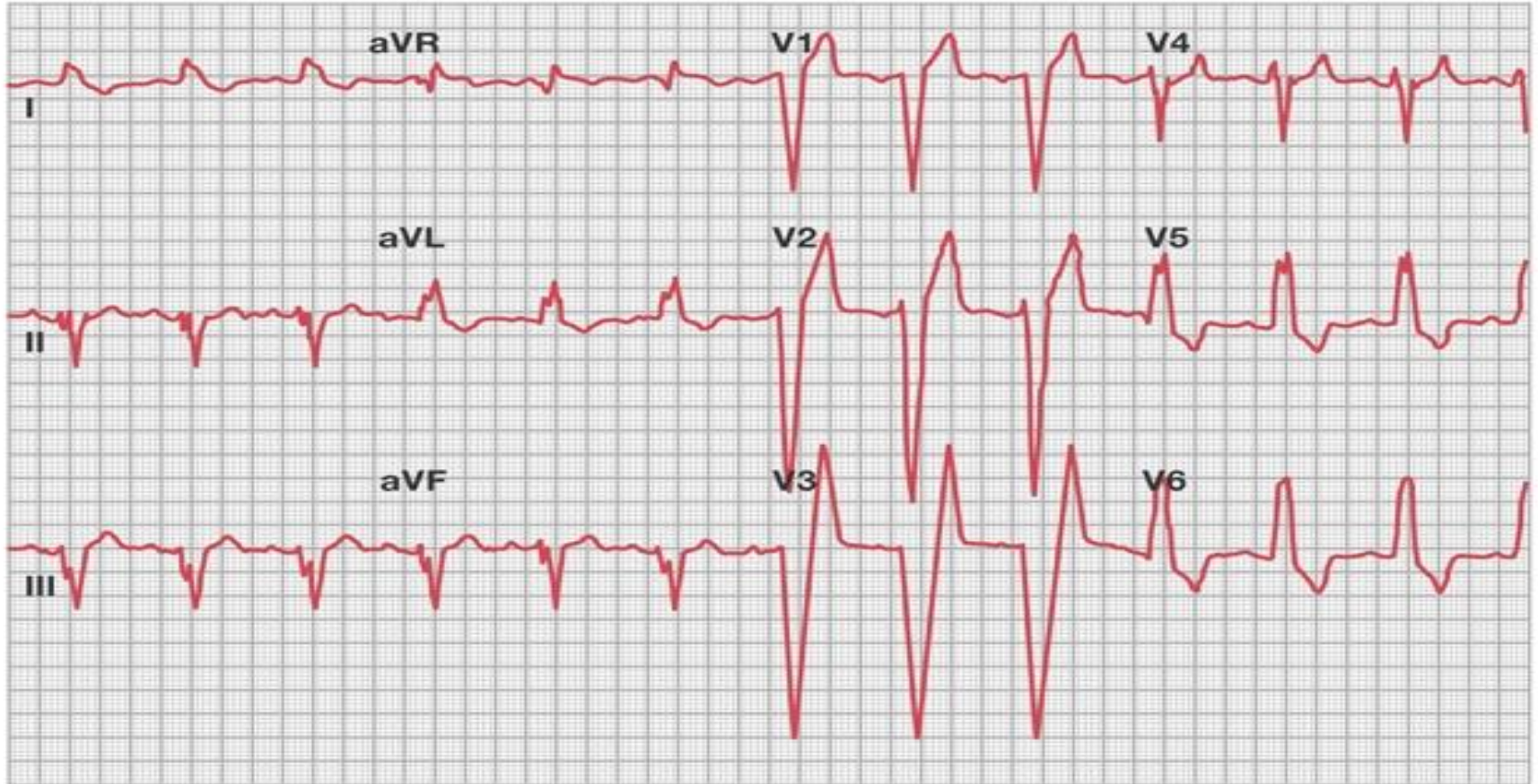
Courtesy of: A. Rad
Available at:
http://en.wikipedia.org/wiki/Right_bundle_branch_block

Left bundle branch block characteristics

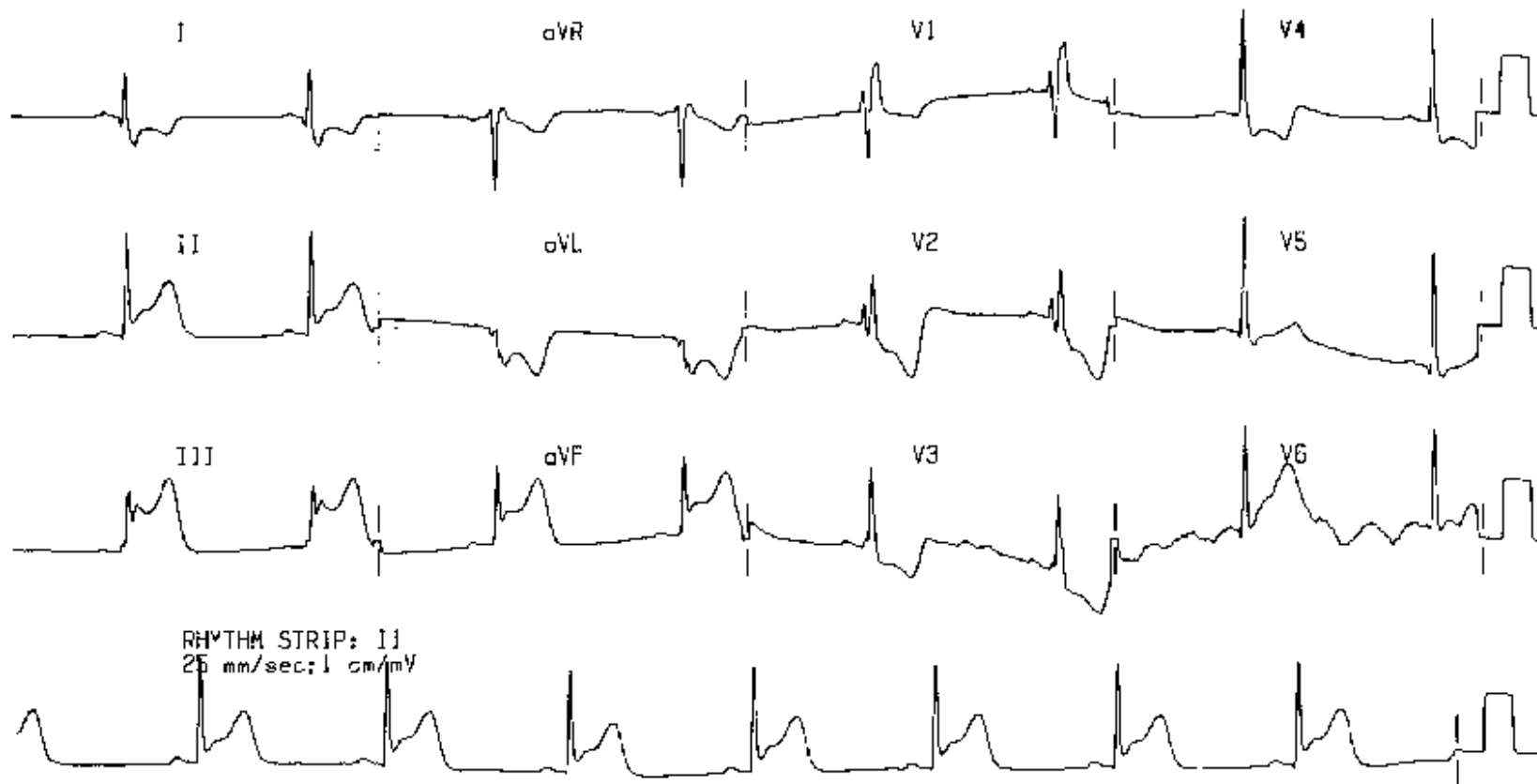


Available at:
http://en.wikipedia.org/wiki/File:Left_bundle_branch_block_ECG_characteristics.png

What Type of BBB is This?



What type of BBB is this?

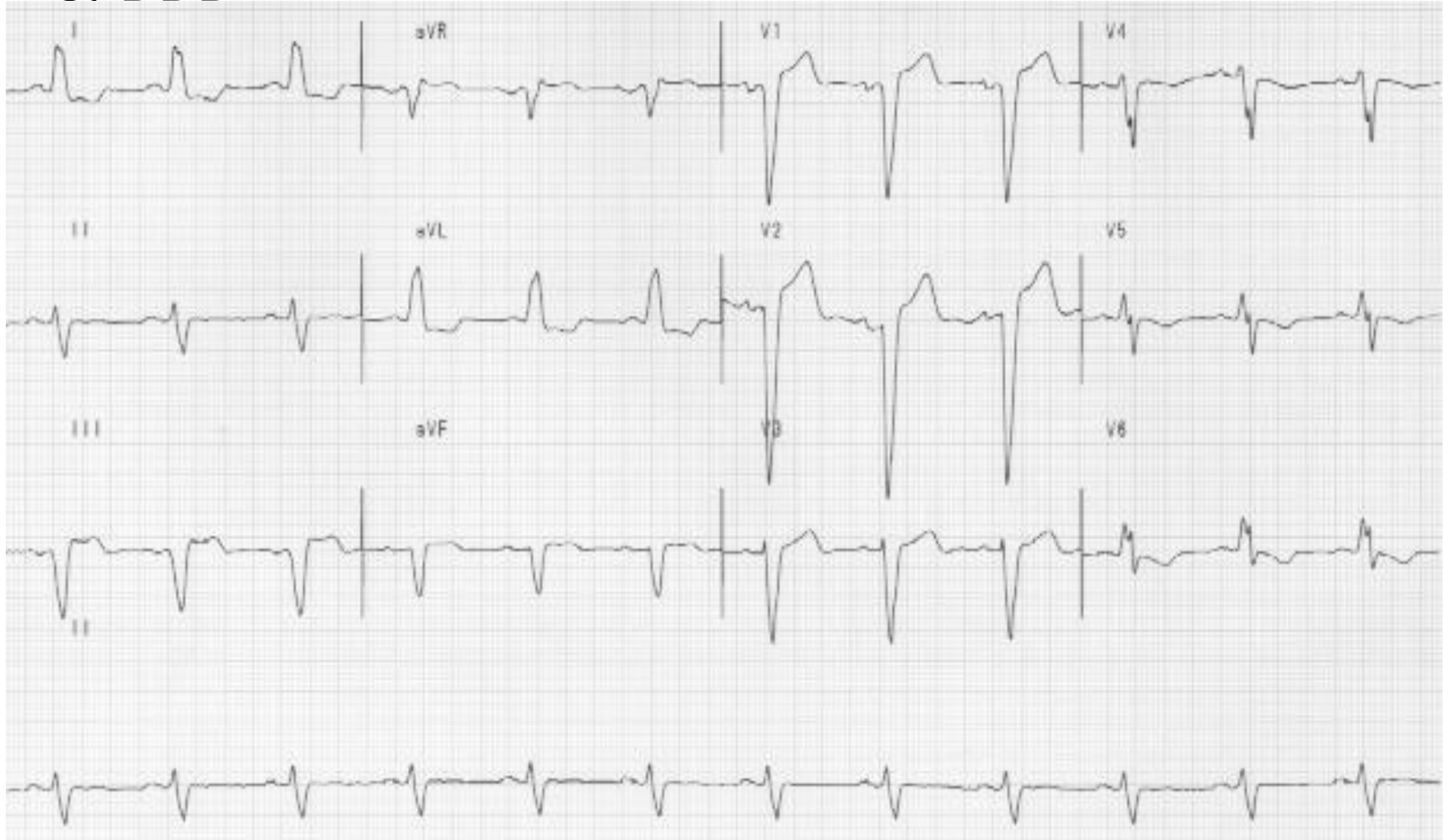


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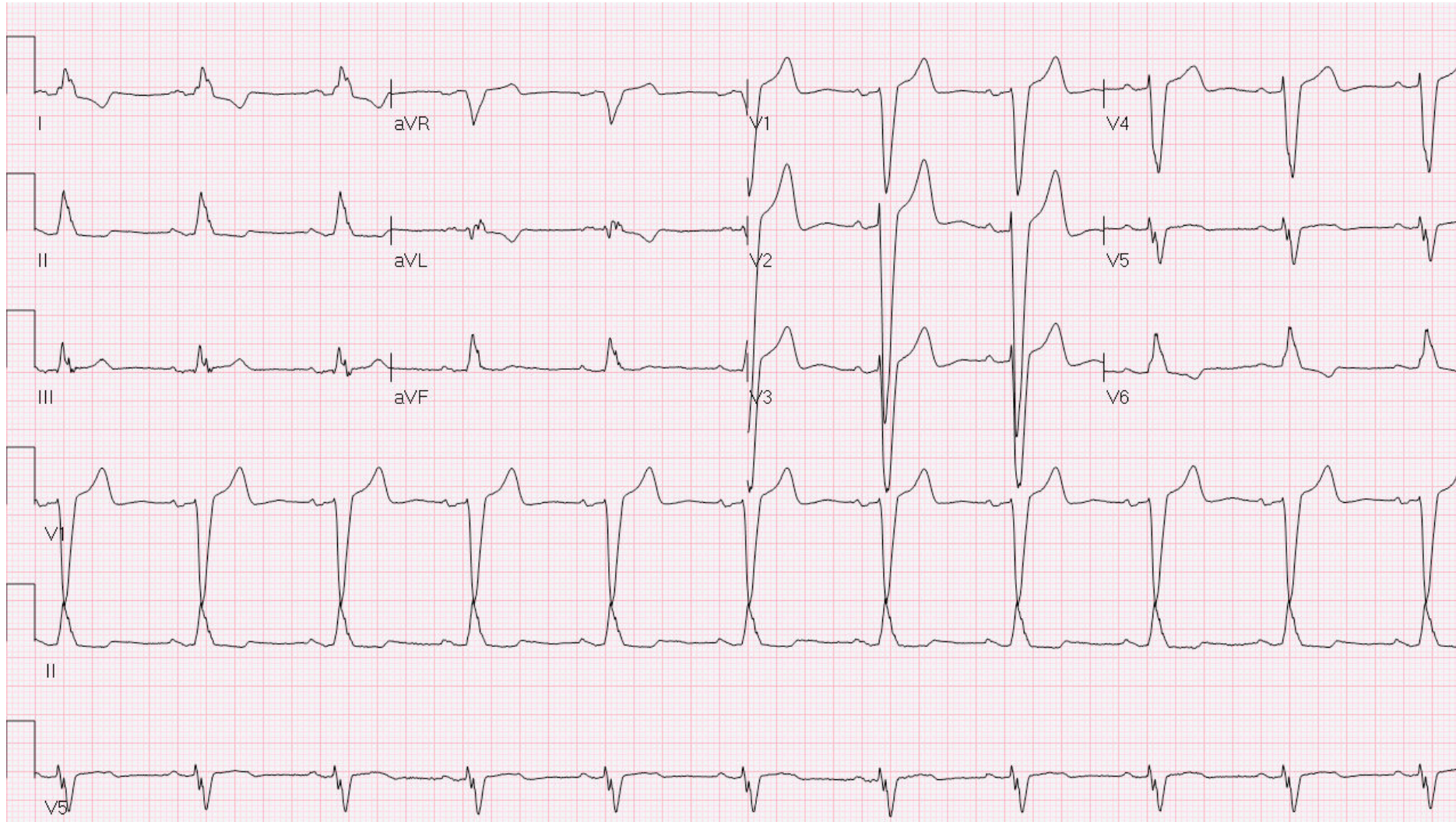
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<http://www.ecglibrary.com/infmi.html>

Case Study: Determine axis & Check for LVH & BBB



Determine Axis & Check for LVH & BBB



25mm/s
 10mm/mV
 100Hz
 Pgm 007B
 v206
 Med:
 19-NOV-1924 Ht: Wt:
 Sex: F Race: Cauc
 Loc: 12 Room:
 Option: 14
 Vent. rate 56 BPM
 PR interval 200 ms
 QRS duration 96 ms
 QT/QTc 428/406 ms
 P-R-T axes 59 -42 -22
 Cart: 12
 Tech:
 Order number:
 Secondary ID:

Determine the axis and check for LVH & presence of BBB.

