Practical Physiology 2

A

Answer: First degree AV block

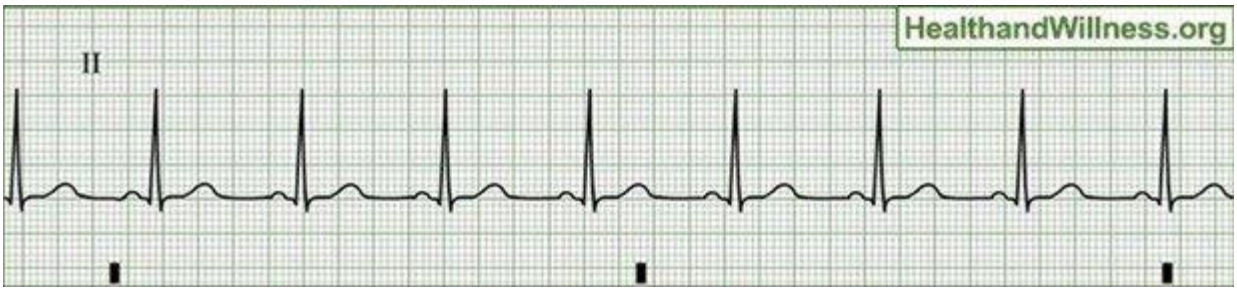
B

Answer: Second degree AV block / (Mobitz II)

C

Answer: Second degree AV block / (Mobitz I)

E



Answer: Normal sinus rhythm

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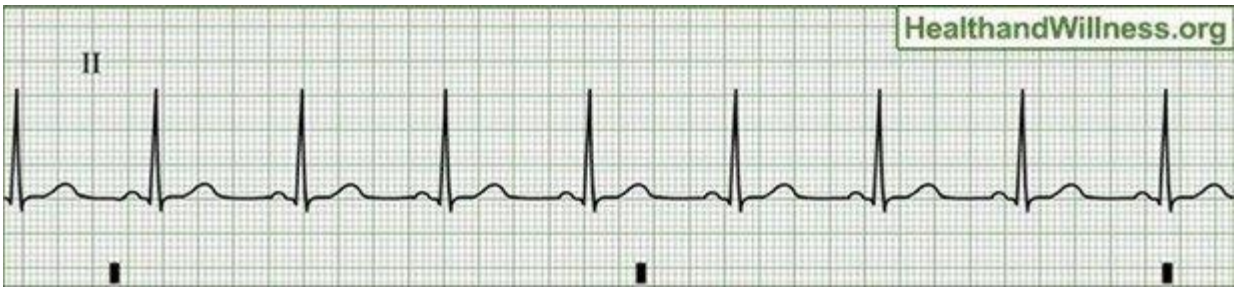


Answer: Normal sinus rhythm

قال تعالى :- "إن الأرض لله يورثها من يشاء من عباده والعاقبة للمتقين"

Practical Physiology 2

- Normal PR interval ⇒ 0.12 – 0.20 (P wave + PR segment).
  > 0.20 → long
  < 0.12 → short.

A

Answer: First degree AV block (Delay) long PR interval.

⇒ 6 x 0.04 = 0.24 long

B

Answer: Second degree AV block / (Mobitz II)

- Dropped QRS.
- sudden drop (the same PR segments)

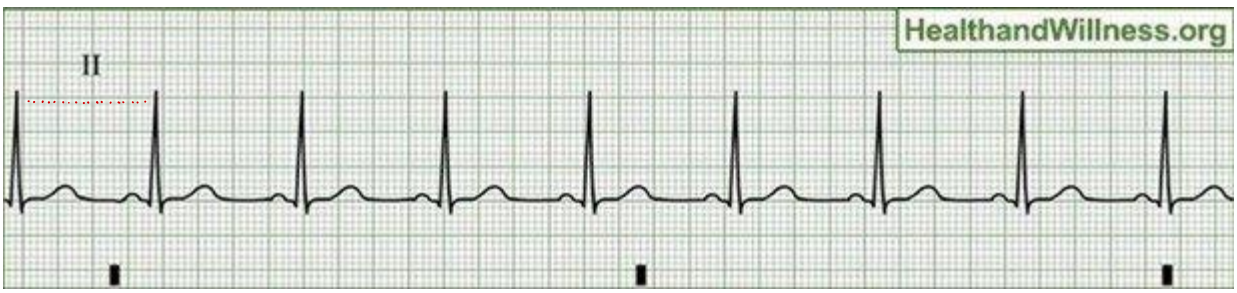
C

Answer: Second degree AV block / (Mobitz I)

- Dropped QRS.

*here you can note the increase in the PR segments before the drop occur

E



Answer: Normal sinus rhythm

- HR = 83 bpm.
- Regular rhythm
- every QRS complex preceeded by P wave.

- Normal atrial rhythm ⇒ P wave rate = 90 bpm.
- No relationship between the P waves and QRS Complex.
- QRS Complex rate = 36 bpm
- abnormally shaped QRS Complex.

Answer: Third degree AV block (complete heart block).

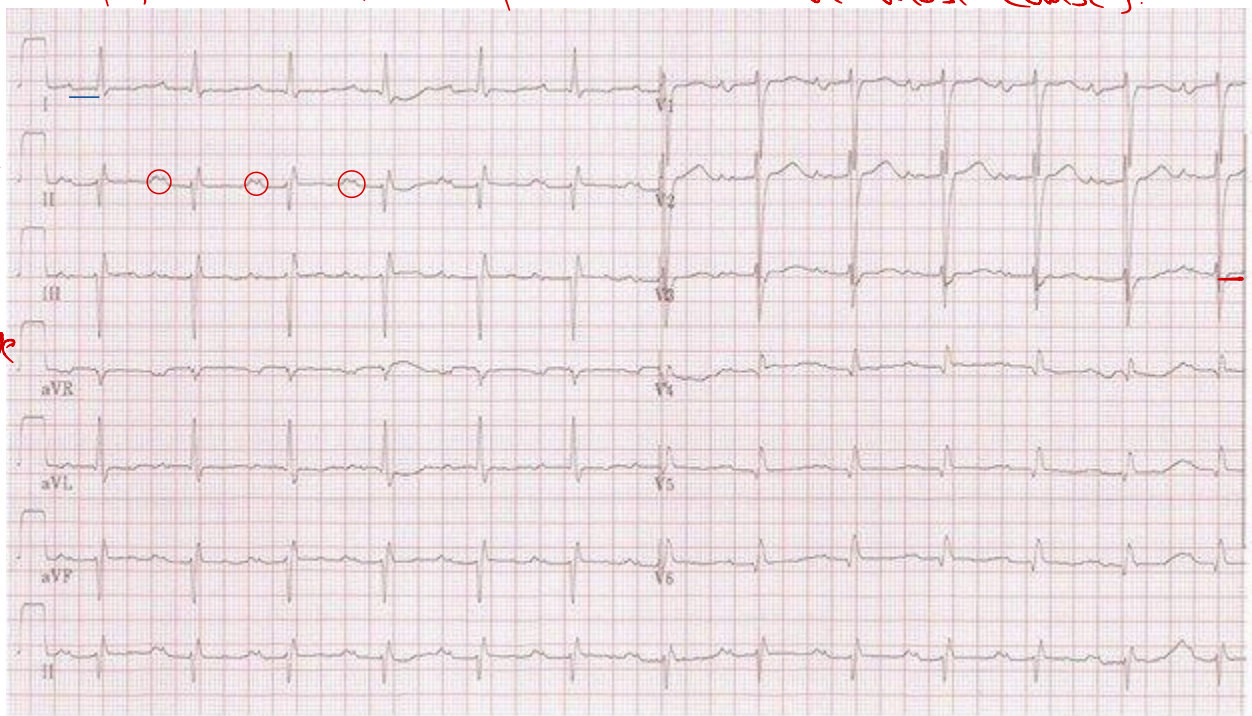
G

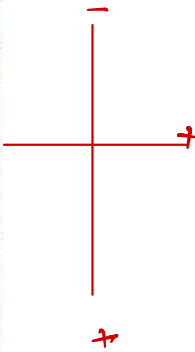
Answer: Second degree AV block / (Mobitz II)

sudden drop

H

- Abnormal P wave. (mitral stenosis is the most cause).
- seen in the left heart failure and hypertensive heart disease.





Answer: P mitral seen (LA enlargement) / Left axis deviation / First degree AV block

broad and bifid in lead II

prolonged P wave.

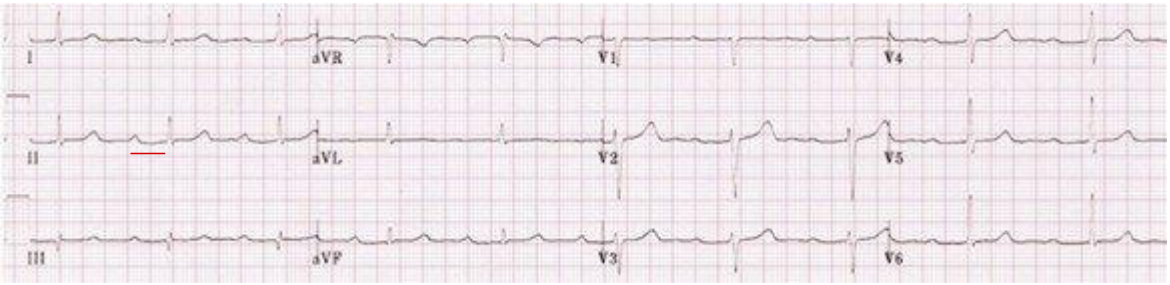
+ lead I
- AvF.

→ note the prolonged PR interval in lead I.

I

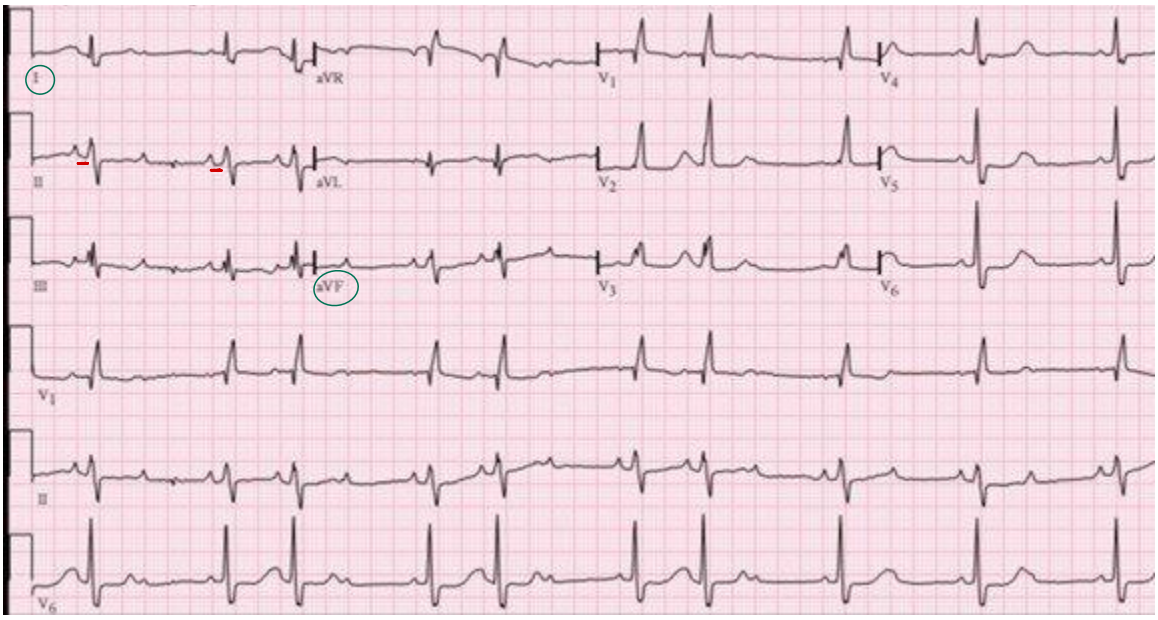
Answer: Second degree AV block / (Mobitz I)

J



Answer: First degree AV block (Note the prolonged PR).

K



Answer: Second degree AV block / (Mobitz II) / Left axis deviation

- maybe caused by LBBB.
- left ventricular hypertrophy.
- Inferior MI

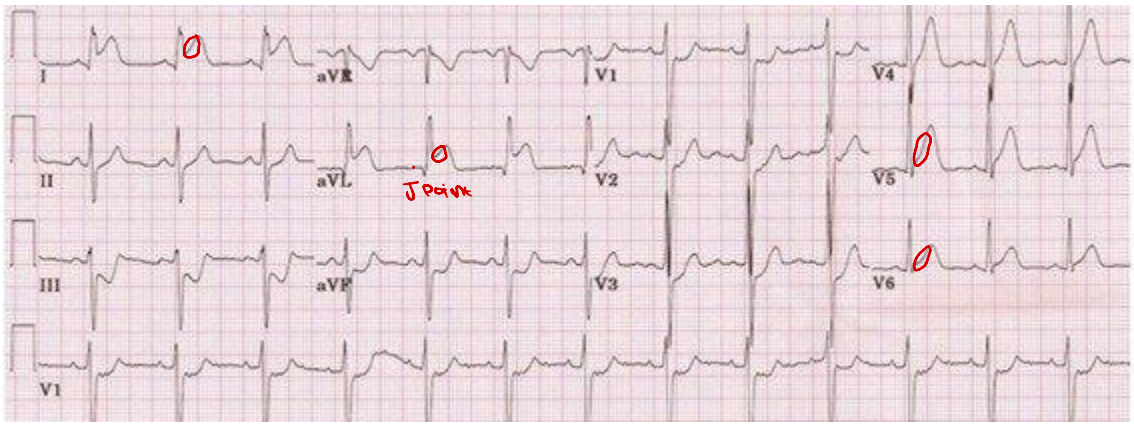
L

Answer: Second AV block / (Mobitz I)

M

Answer: Third degree AV block

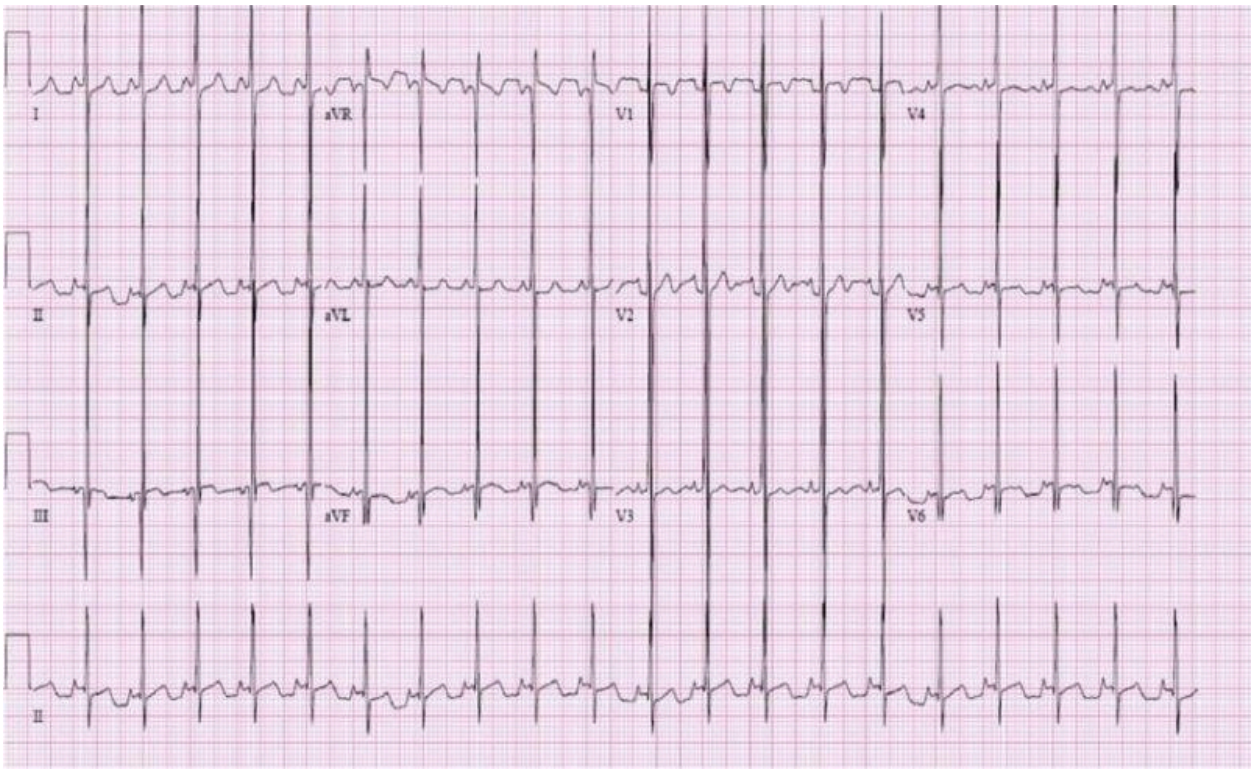
N



Answer: ST-segment elevation seen on leads I/aVL/V5/V6: Lateral-wall MI

- Anterior infarction = leads $V_1 - V_4$
- lateral infarction = lead I, aVL, V_5, V_6
- Inferior infarction = leads II, III, aVF
- Posterior infarction = lead $V_7 - V_9$

- Normal QRS Complex :- 1) Amplitude = 0.5 - 3 mV.
2) Duration = 0.06 - 0.12 (half of PR interval)
3) positively deflected in all leads except aVR and V_1 to V_3.



Answer: High voltage QRS it indicates ventricular hypertrophy

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P

Answer: Left bundle branches block (LBBB)

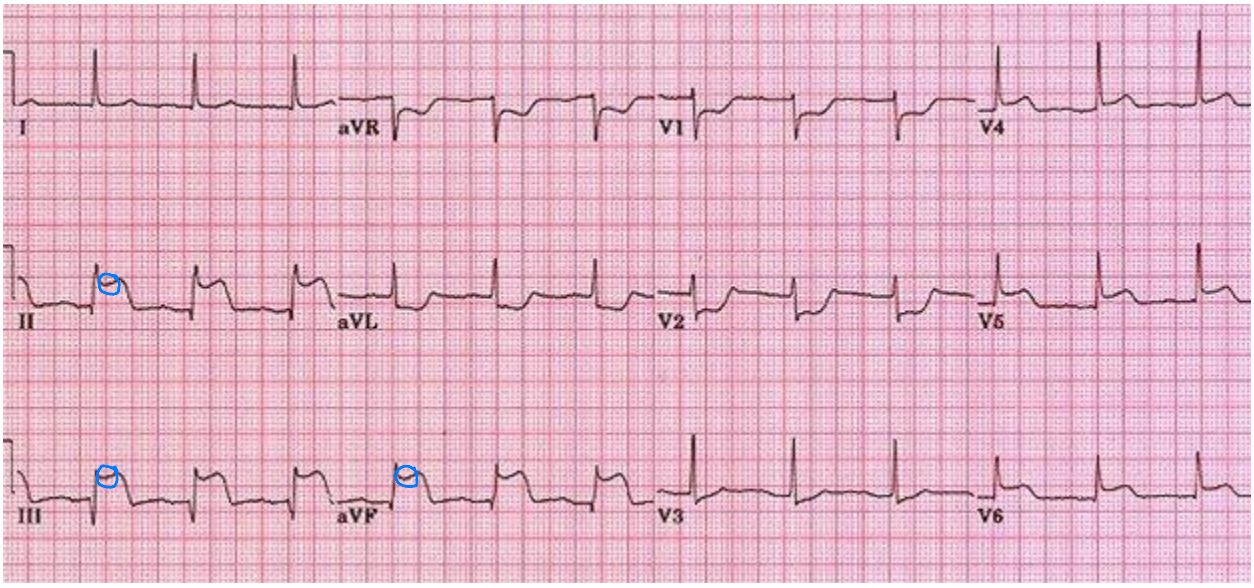
- wide QRS in the RBBB.

MARROW
V_1 V_6
WILLIAM

Q1

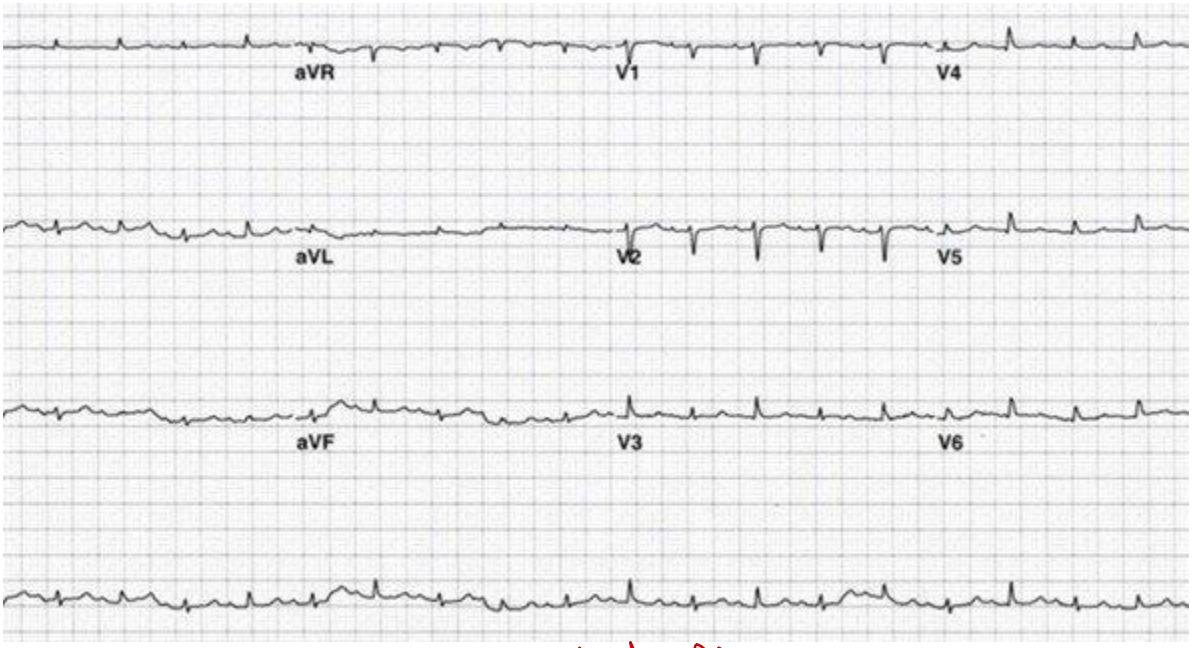
Answer: Right bundle branches block (RBBB)

R



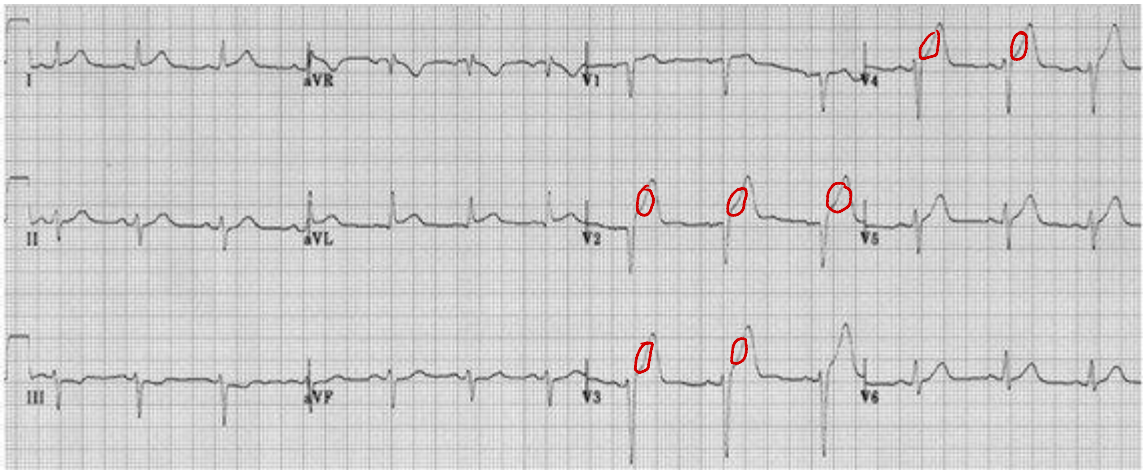
Answer: ST segment elevation seen on II/III/aVF: Inferior-wall MI

S



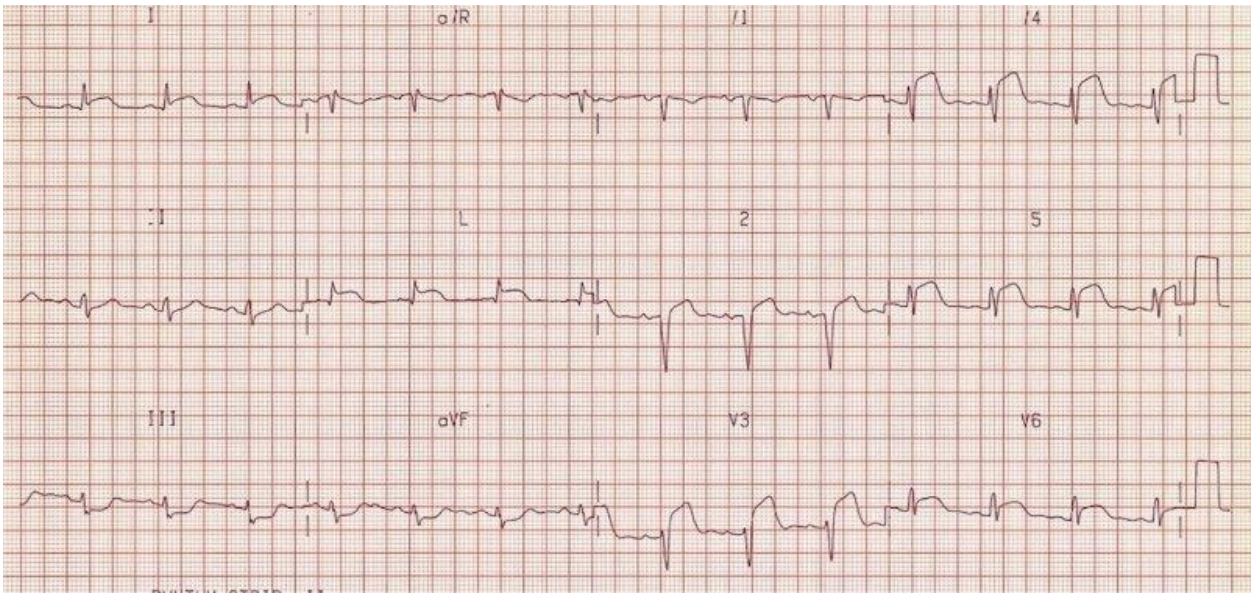
Answer: Low voltage QRS — in pericardial effusion
— pulmonary effusion — emphysema.

T



Answer: ST segment elevation seen on V2/V3/V4/V5: Anteroseptal MI

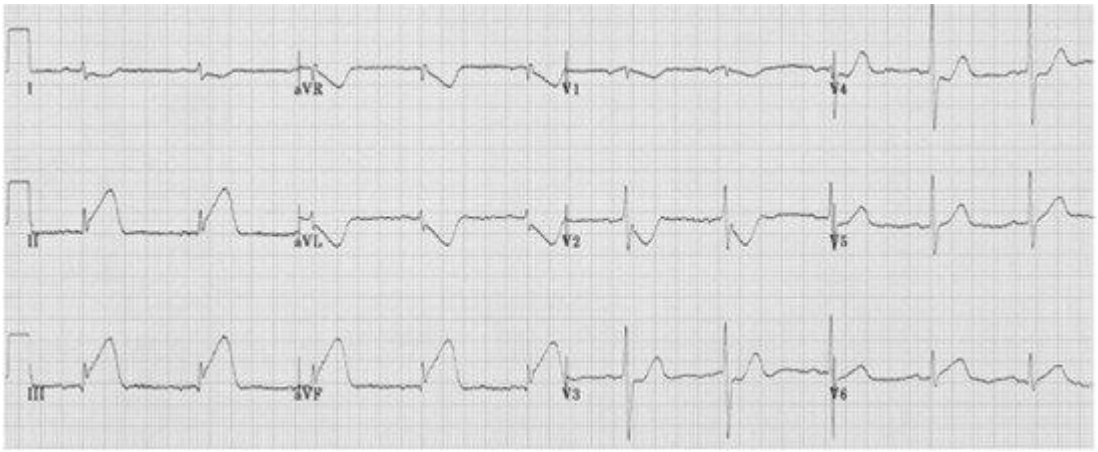
U



Answer: ST segment elevation seen on V2/V3/V4/V5/V6/I/aVL: Anterolateral MI

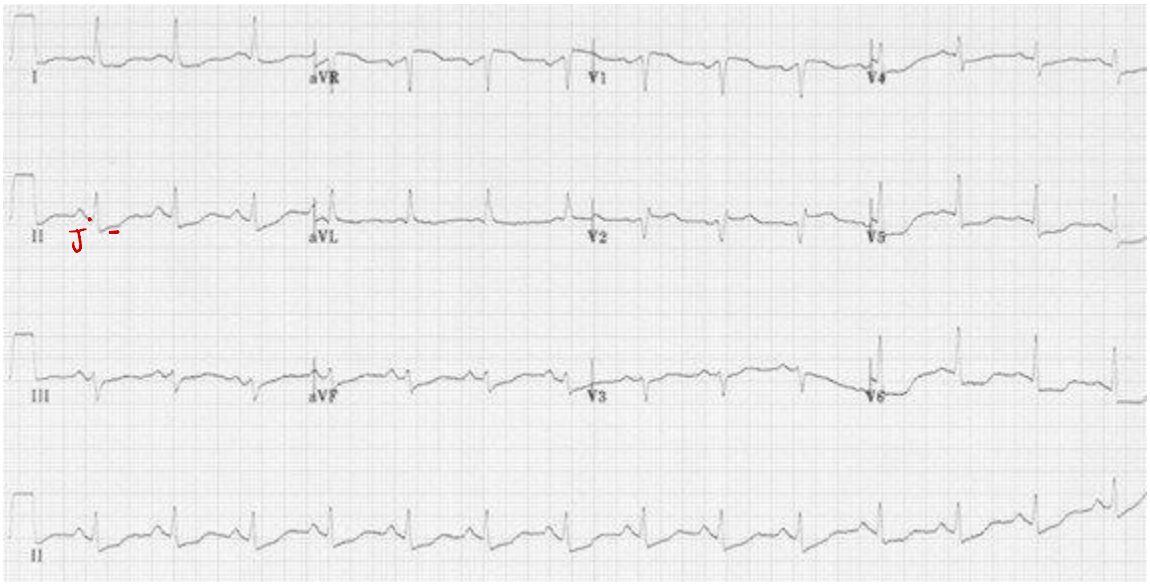
anterior lateral.

V



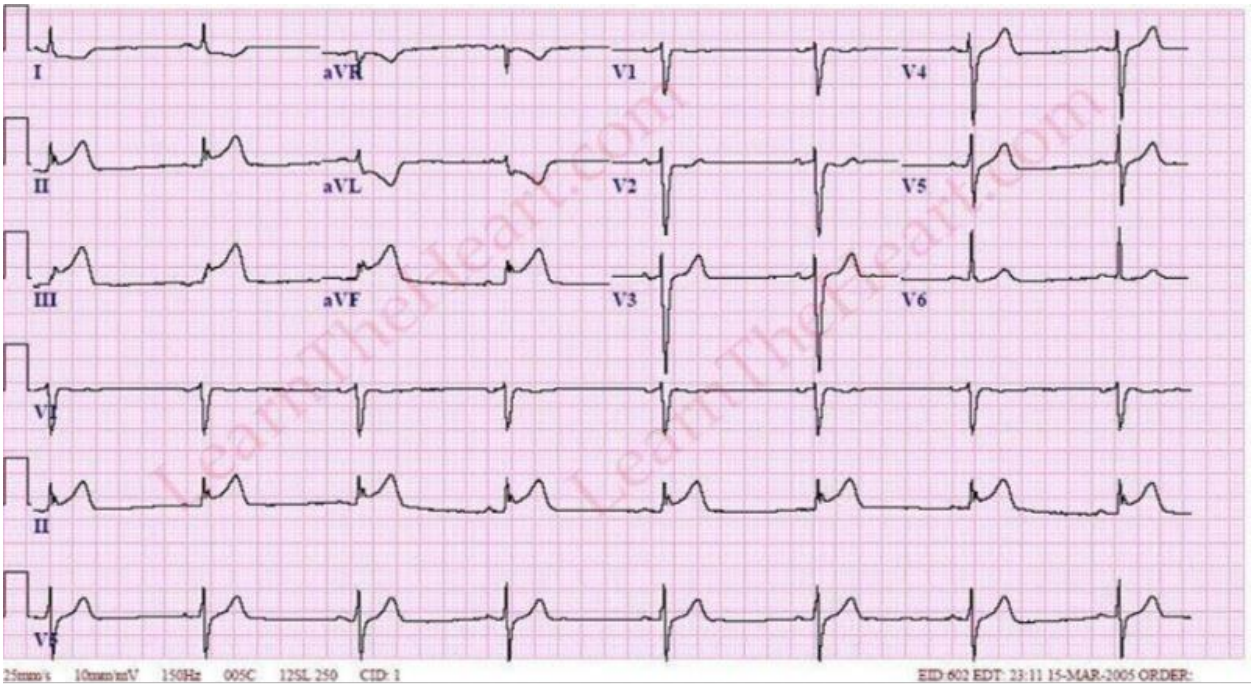
Answer: ST segment elevation seen on II/III/aVF: Inferior-wall MI

W



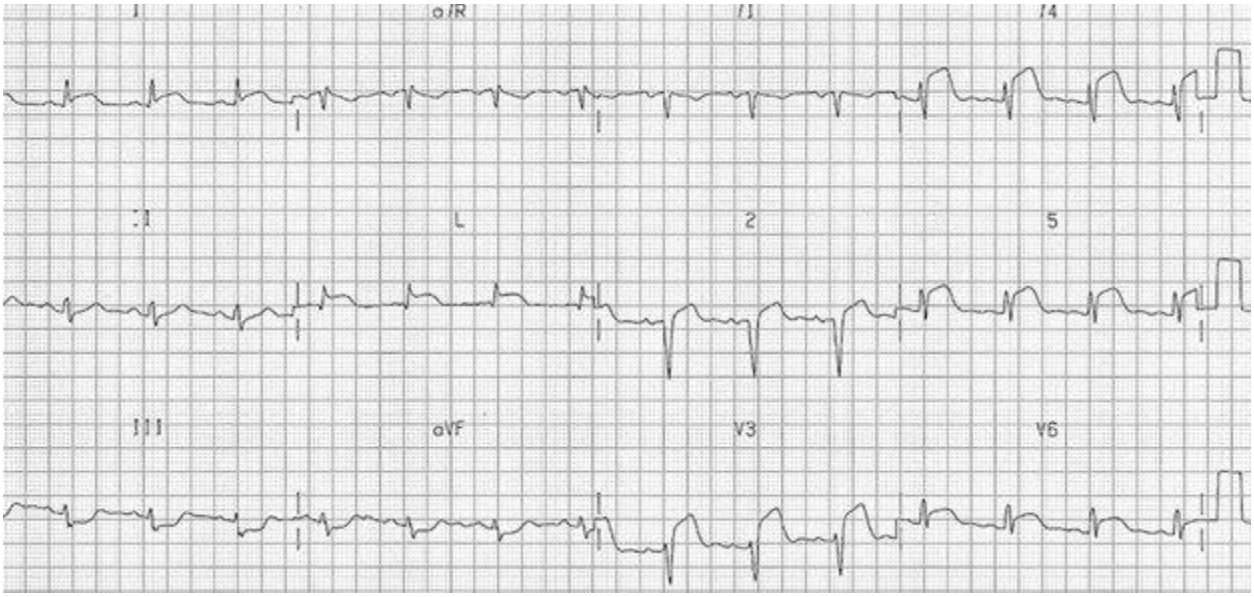
Answer: ST segment depression

X



Answer: ST segment elevation seen on II/III/aVF: Inferior

Y



Answer: ST segment elevation seen on V2/V3/V4/V5/V6/I/aVL: anterolateral

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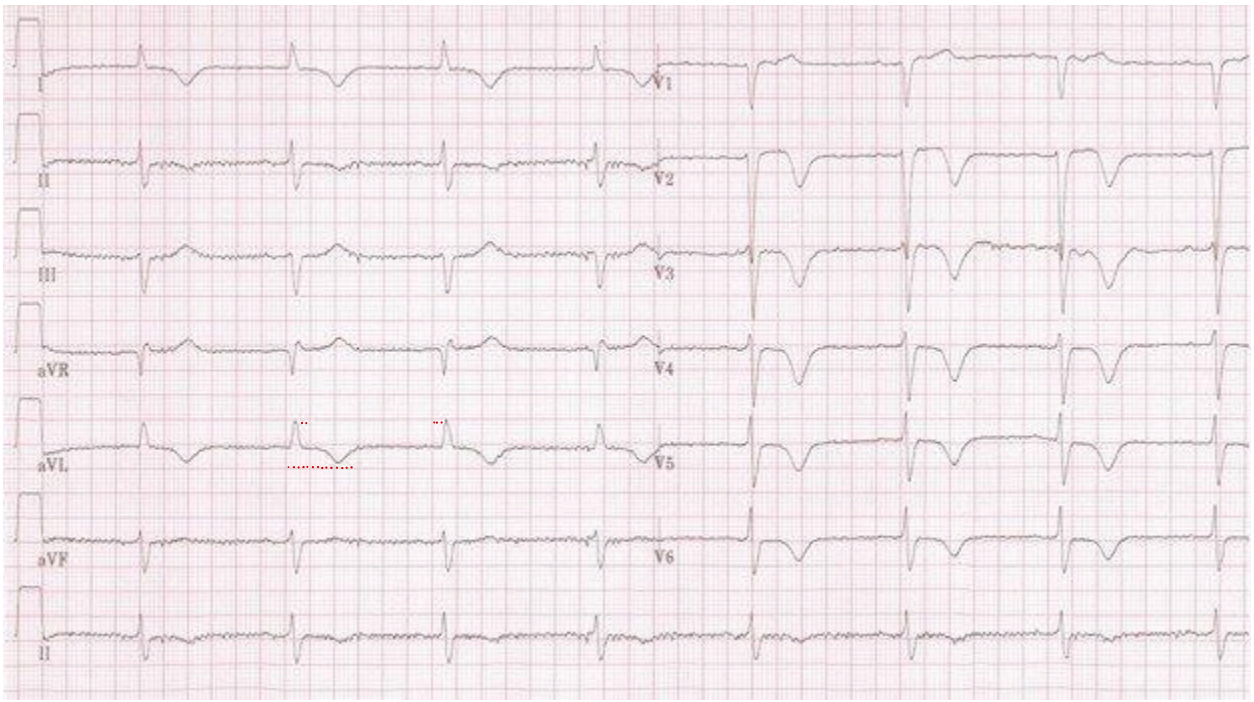
Z



Answer: T wave inversion post-acute MI associated with prolonged QTc interval (0.54 s)

$$\Rightarrow QTc = \frac{QT}{\sqrt{R-R}} \Rightarrow \frac{0.56}{1.1} = 0.51$$

Step 6: Evaluate the T Waves

When examining the **T waves**:

- **Are T waves present?**
- **Do all the T waves have a normal shape?**
- **Do all the T waves have a normal amplitude?**
- **Are all T waves consistent in amplitude?**
- **Do the T waves have the same deflection as the QRS complexes?** (i.e., if QRS is upright, T should also be upright, unless abnormal).

Step 7: Determine the Duration of the QT Interval

To measure the **QT interval**:

1. Count the number of **small squares** between the **beginning of the QRS complex** and the **end of the T wave**, where the T wave returns to the baseline.
2. Multiply the number of small squares by **0.04 seconds** to calculate the duration.
3. Ask yourself:
    - **Is the QT interval duration normal (0.36 to 0.44 seconds)?**

Correcting the QT Interval (QTc)

The **QT interval** is influenced by the **heart rate**. As the heart rate increases, the QT interval shortens, and as the heart rate decreases, the QT interval lengthens. To account for these changes and evaluate the QT interval consistently, it is corrected to a standard heart rate of **60 beats per minute**. This corrected QT interval is known as **QTc**.

Formula for Corrected QT (QTc):

The most commonly used formula for calculating **QTc**:

$$QTc = \frac{QT}{\sqrt{RR\ \text{interval}}}$$

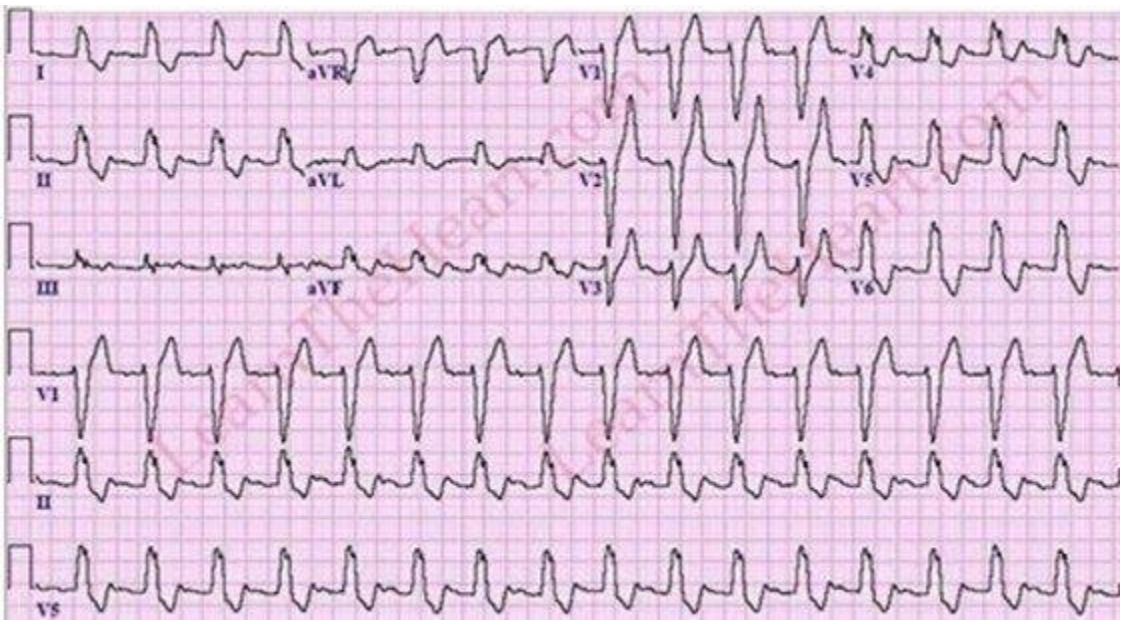
Where:

- **QT** = the measured QT interval in seconds
- **RR interval** = the time between two consecutive R waves, also in seconds

Sarah Basel, MD
University of Jordan, School of Medicine
Department of Physiology, 2024

- Correction for the QT interval is necessary, as it varies with heart rate.
- QTc = QT interval /√RR interval (seconds)

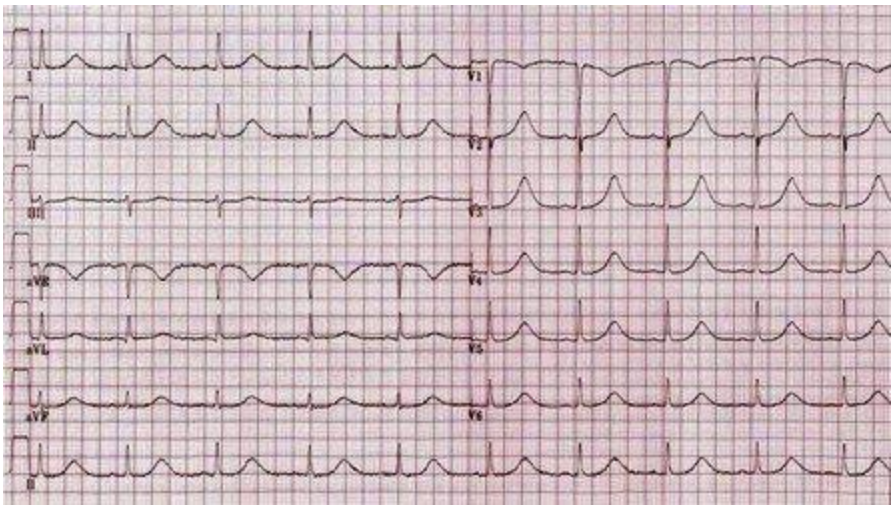
II



Answer: T wave inversion post-acute MI associated with prolonged QT interval/ LBBB

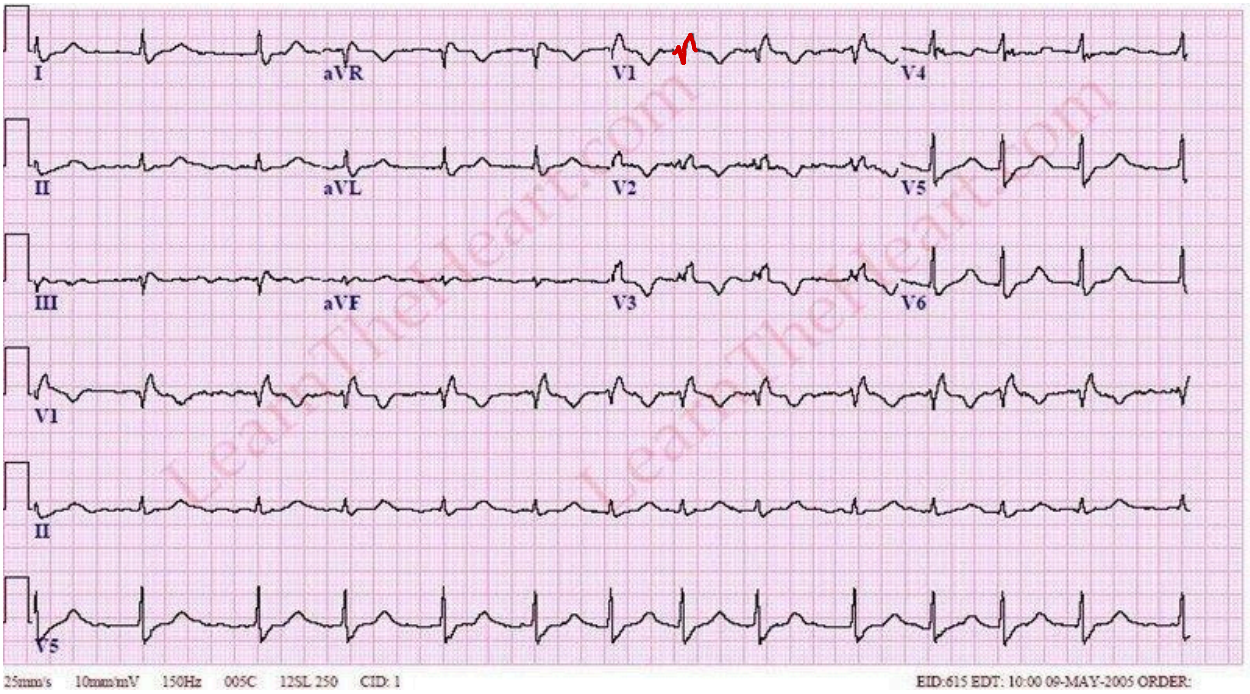
Wide QRS Complex.

III

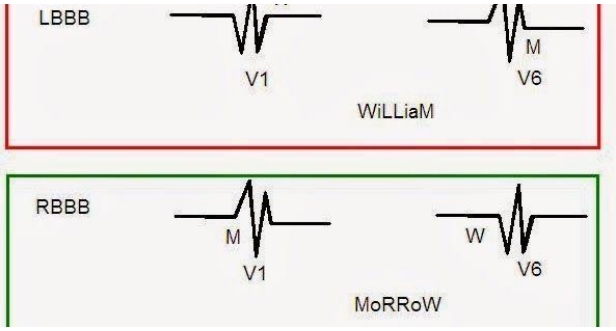


Answer: QTc = QT interval /√RR interval (seconds)= 0.67 s (prolonged)

Q2



Answer: Right bundle branches block (RBBB)



Modified by Lujain Ahmad.

Best wishes,
Fatima Ryalat, MD, PhD

Many thanks to:
Faisal Mohammad, MD, PhD.
Suzan Albdour, Msc.
Sara Basel, MD.
Sara Anas, MD.
Laila Nazzal, MD.
Mohammad Mansee, MD.
Omar Bani-ata, MD.

Mohammad Bushnaq, MD.