PHYSIOLOGY

بسم الله الرحمن الرحيم

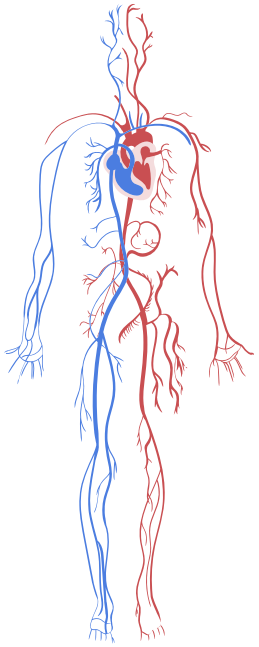
DOPAMINE SCIENTIFIC TEAM

PAST PAPERS

Lectures (1-9) & Practical

وَلَقَدْ خَلَقْنَا الْإِنسَانَ وَنَعْلَمُ مَا تُوَسْوِسُ بِهِ نَفْسُهُ ۖ وَنَحْنُ أَقْرَبُ إِلَيْهِ مِنْ حَبْلِ الْوَرِيدِ

اللهم إنّا نعوذ بك من شرور أنفسنا ومن سيئات أعمالنا



Written by: Masa Btoush
Dana Hijjeh

Reviewed by: Nour Aldulaimi

Vascular Hemodynamics

Q1: A vessel radius decreases by 50%, Q before was 600 find the new Q :

Answer : 37.5

Q new = Q old * r^4
r= (½)^4

Q2: The pressure drops significantly and is converted to a no pulsatile pressure, the structure mainly responsible for this is?

A) Aorta
B) Arterioles
C) Vena cava
D) Capillaries
E) Venules

Ans: B

Q3: Which of the following is a reconditioning organ which receives much more blood the necessary?

A) Heart
B) Brain
C) Skeletal muscle
D) Kidney

Ans: D

Q4: Which of the following is true regarding resistance ?

A) Amputation of a limb will not increase the overall resistance
B) When the Diameter of the artery is increased it will increase the conduction at a certain pressure
C) The total resistance is lower than the resistance in the arterioles alone

Ans: B

Q5: In case the diameter of arterioles decreased, what would happen to flow, conductance and resistance ?

A) Decrease , decrease , increase
B) Decrease , increase , decrease
C) Increase, decrease , increase
D) Increase , Increase , decrease

Ans: A

Q6 : All of the following regarding turbulence is correct except:

A) It is associated with the sounds of the closure of heart valves
B) Turbulence is associated with more resistance than Laminar blood flow
C) Turbulence is directly proportional to the cube root of the driving pressure
D) It is associated with very high velocity of the blood
E) It occurs normally in the Aorta and narrowed blood vessels

Ans: C

Q7: The major structure that contributes to peripheral resistance is:

A) Aorta
B) Arterioles
C) Vena cava
D) Capillaries
E) Venules

Ans: B

Q8: Resistance to laminar flow is :

Answer : Inversely proportional to the fourth power of radius .

Q9 : Parallel arrangement of vessels ensures that all organs receive blood of the same composition.

A) True
B) False

Ans: A

Q10: If P = 90 mm Hg at the beginning of vessel 1, and P = 10 mm Hg at the end of vessel 1, whereas P = 190 mm Hg at the beginning of vessel 2, and P = 110 mm Hg at the end of vessel 2. Which one has higher flow rate given the resistance is the same?

A) Both have the same flow rate
B) The information given is not enough
C) Vessel 2
D) Vessel 1

Ans: A

Q=delta P/R

Q11: One of the following statements is correct regarding laminar flow:

A) Turbulent flow is always pathological
B) It has a parabolic profile of velocity
C) All blood particles flow in the same speed within a vessel

Ans: B

Q12: The largest cross sectional area in the vascular system is at the level of:

A) Aorta
B) arterioles
C) veins
D) capillaries

Ans: D

Q13: The resistance offered by all capillaries is the highest in the vascular system.

A) True
B) False

Ans: B

Q14: How does anemia affect turbulent blood flow :

Answer : Anemia decreases blood viscosity which increases flow velocity and promotes turbulent blood flow

Q15: How does the sympathetic stimulation affect large veins :

Answer : Decrease capacitance so increase venous return

Q16: Regarding Reynold's number which of the following is correct?

A) Anemia causes an increase in Turbulence
B) Thrombosis decreases Reynold's number
C) Increase blood viscosity increases Reynold's number
D) When Reynold's number increases above 200 turbulence will not occur

Ans: A

Q17: Which of the following is correct about compliance?

A) Both arteries and veins have the same compliance
B) Arteries are more compliant the veins
C) Veins are more compliant the arteries due to their distensibility

Ans: C

Q18: A group of your colleagues are inventing an artificial blood vessel, they found out Reynold’s number to be high, which of the following is true regarding Reynolds number?

A) Thrombosis would decrease Reynold's number
B) Anemia causes an increase in Reynold's number

Ans: B

Q19: If you removed a kidney for a patient, what will be the effect on total resistance

A) Total resistance will increase
B) Total resistance will decrease
C) Total resistance will not change

Ans: A

Q20 : Changes in compliance of the veins cause redistribution of blood between the veins and the arteries

A) True
B) False

Ans: A

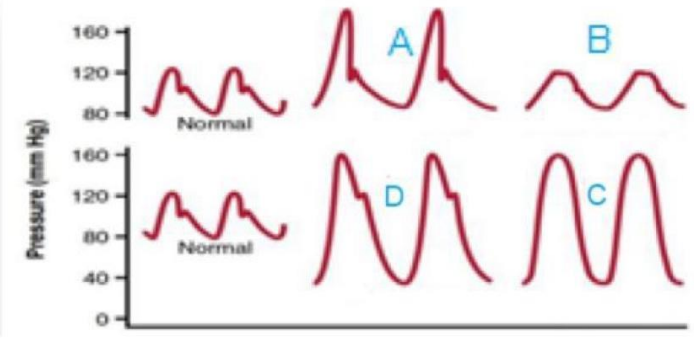
Q21 : Which of the following has the highest velocity of blood flow ?

A) Aorta
B) Capillaries
C) small arteries
D) Arterioles

Ans: A

Arteries

Q1: Which graph represents aortic regurgitation :



Ans: C

Q2: Arterial stiffness results in which of the following?

A. Increased pulse pressure
B. Increase in Stroke volume
C. Decreased heart rate

Ans: A

Q3: Which of the following is most probably a cause of high pulse pressure?

A) Increased compliance
B) Decreased compliance

Ans: B

Q4: An old man has a blood pressure of 180/100, A probable cause of his high pulse pressure is :

Answer : Decreased arterial compliance

Q5: Which of the following does not increase pulse pressure?

A) Aortic regurgitation
B) Aortic stenosis
C) Arteriosclerosis
D) Patient ductus arteriosus

Ans: B

Q6: Pulse pressure increases in :

Answer : Patient ductus arteriosus

Q7: A patient present with symptoms of chronic HTN and aortic stiffness , how does that affect blood pressure in the Aorta ?

A) increase systolic pressure, decreases diastolic

B) decreases diastolic and MAP

Ans: A

Arterioles

Q1: Which of the following statements is correct?

Answer: intermittent flow by contraction of precapillary sphincter and metarterioles prevent the flow to capillaries .

Q2: After sleeping in your hand for a while, you wake up and feel numbness, a few moments later it becomes red and warm, the possible explanation behind this is :

Answer : reactive hyperemia

Q3: A patient had a saphenous vein implanted what change will occur?

A) Inward eutrophic remodeling
B) Outward remodeling
C) Outward hypertrophic remodeling
D) Hypertrophic remodeling

Ans: C

Q4: Applying heat at the site of injury will cause the arteriole to?

A) Dilate
B) Constrict
C) No change

Ans: A

Q5: Which of the following causes vasodilation?

A) Cold temperatures
B) Endothelin
C) Angiotensin II
D) NO

Ans: D

Q6: The correct mechanism of auto regulation in cerebral perfusion?

A) NO
B) Myogenic activity
C) Sympathetic stimulation
D) Angiotensin II

Ans: B

Q7: . A patient with renal failure undergoes dialysis, and arteriovenous (A-V fistula) directly from the radial artery to the antecubital vein of the forearm is created to permit vascular access for dialysis. What occurred to the venous side?

A) Inward eutrophic remodeling
B) Hypertrophic remodeling
C) Outward remodeling
D) Outward hypertrophic remodeling

Ans: D

Q8: Which of the following is a vasoconstrictor ?

A) Bradykinin
B) Histamine
C) Endothelin

Ans: C

Q9 : Which of the following is true regarding local control of tissue blood flow?

A) Reactive hyperemia is when a tissue becomes highly active , such as an exercising muscle so the rate of the blood through a tissue increases .
B) Active hyperemia is when the blood supply to a tissue is blocked for a few seconds to hours then is unblocked, blood flow through a tissue usually increases immediately.
C) Angiogenesis is stimulated by increased metabolic requirements and tissue hypoxia .

Ans: C

Q10 : Increased tone of arteries and resistance vessels can be due to

Answer : Increased endothelin

Q11 : High Oxygen level is also a vasodilator

A) True
B) False

Ans: B
Low O2

Q12 : Which of the following is mostly true?

A) A few minutes after removal of the obstruction there will be increased blood flow
(the answer is meant to describe reactive hyperemia) .
B) Another option said that reperfusion occurred after an hour .

Ans: A

Q13 : Peripheral and central chemoreceptors are most sensitive to O2

A) True
B) False

Ans: B
sensitive to CO2 , PH

Q14 : In the AV fistula from radial artery to the antecubital vein for dialysis patient, what kind of vascular changes take place :

A) outward hypertrophic remodeling of radial artery
B)outward remodeling of antecubital vein

Ans : A

Q15 : Which of the following statements is correct :

Arterioles induce the largest decrease in pressure by having a small diameter and therefore, high resistance.

Nervous Control of The Circulation

Q1: While administerating fluids IV to a patient, her heart rate increased, then she requested to use a toilet, the most accessible explanation is :

A) Atrial stretching incresed the heart rate
B) Atrial stretching induced production of ADH

Ans: A

Q2: Upon standing up after lying down, blood pressure drops then raises back to normal immediately, the physiologic explanation behind this is :

Answer : nucleus tractus solitarius stimulates vasoconstrictor centers .

Q3: Which of the following is correct about Baroceptors?

Answer: maintain the stability of blood pressure .

Q4: Which of the following is true about chemoreceptors ?

A) Are located in aortic and carotid bodies
B) The central are more sensitive to changes of PO2
C) The peripheral are more sensitive to changes in PCO2 and PH

Ans: A

Q5: True regarding neural BP control:

A) Information from the carotid sinus and aortic arch baroreceptors is caried by vagus nerve .
B) The carotid sinus baroreceptors are responsive to increases or decreases in arterial pressure .

Ans: B

Q6: Increased right atrial pressure will lead to:

Answer : Increased sodium loss

Q7: What factors cause stimulation of peripheral chemoreceptors?

Answer : Low O_2, High CO_2, Low pH

Q8: What do baroreceptors not do ?

Answer : Decrease Renin secretion

Q9: In case of sudden increase in the peripheral pressure, what happens to the afferent impulses from baroreceptors and the effect of the efferent vasoconstrictor ?

Answer : Increased afferent impulses from baroreceptors,
decreased efferent vasoconstrictor effect .

Q10: Baroreceptor reflex does NOT work at all in patients with hypertension.

A) True
B) False

Ans: B

Blood Pressure Control

Q1: Upon standing up after lying down, blood pressure drops then raises back to normal immediately, the physiological explanation behind this is:

A) Increased vagal stimulation of the heart via the nucleus ambiguus.

B) Inhibition of the sympathetic chain to reduce peripheral resistance.

C) Nucleus tractus solitarius stimulates vasoconstrictor centers.

D) Sudden increase in atrial stretch receptor firing.

E) Parasympathetic activation of peripheral arterioles.

Ans: C

Q2: Which of the following is a function of Angiotensin 2?

A) Acts on hypothalamus to decrease thirst.

B) Acts directly on the arterioles by binding to G protein coupled AT2 receptors to cause vasoconstriction.

C) Acts directly on the kidney to increase excretion of water and Na+.

D) Acts on zona glomerulosa cells of the adrenal cortex to stimulate the synthesis and secretion of aldosterone.

Ans: D

Q3: Elevated blood pressure will induce vasoconstriction.

A) True

B) False

Ans: A

Special Circulations

Q1: Applying heat at the site of injury will cause the arteriole to?

A) Dilate

B) Constrict

C) No change.

Ans: A

Q2: The correct mechanism of autoregulation in cerebral perfusion?

A) NO

B) Myogenic activity

C) Sympathetic stimulation

D) Angiotensin II

Ans: B

Veins

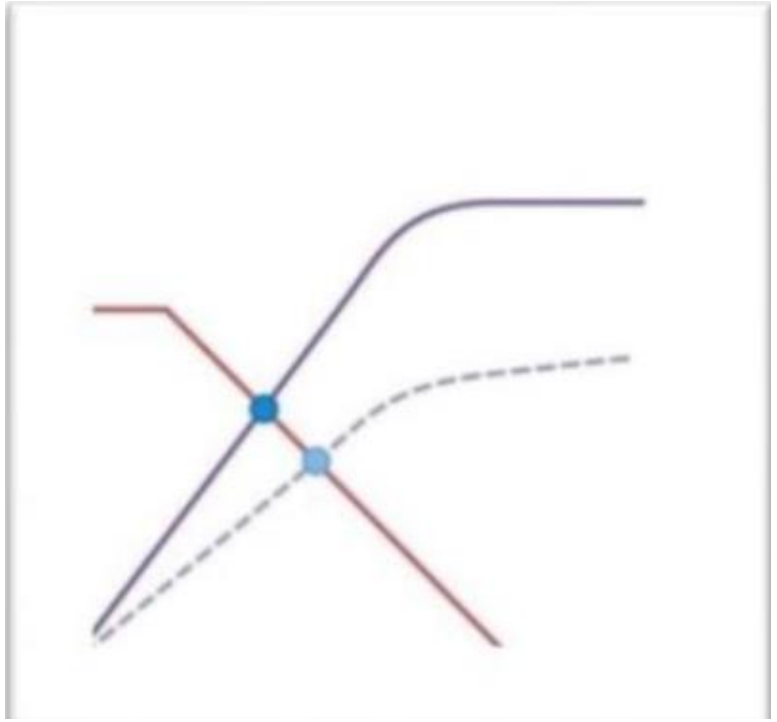
Q1: What condition could result in this change of slope of CO curve?

A) Taking Digoxin.

B) Decreased TPR.

C) HF with decreased contractility.

D) Hemorrhage.



Ans: C

Capillaries & Lymphatics

Q1: A man working in an office develops an edema in his leg, he took a walk and afterwards the edema was gone, the main cause for this?

A) Valvular deformities

B) Reduced muscle pump

Ans: B

Q2: A patient has peripheral edema, after running some tests it appears that he has liver abnormality and decreased albumin levels, the edema occurred due to which of the following reasons?

A) Decreased oncotic plasma pressure.

B) Increase of capillary permeability.

C) Increase in the hydrostatic pressure.

Ans: A

Q3: The lymphatic vessels are affected by sympathetic stimulation.

A) True.

B) False.

Ans: A

Practical

Q1: While working in the emergency department, a student approached you and asked about the electrode placement in lead II, what's your answer?

A) Positive electrode on left arm, negative electrode on right arm.

B) Negative electrode on left arm, positive electrode on left foot.

C) Negative electrode on heart, positive electrode on left foot.

D) Positive electrode on right arm, negative electrode on left foot.

E) Negative electrode on right arm, positive electrode on left foot.

Ans: E

Q2: A 28-yo woman came in with complaints of heart palpitations. ECG examination has found a prolonged QT interval, the attending physician asks you what waves/segments does the QT interval include?

A) QRS complex alone.

B) QRS complex + ST segment.

C) QRS complex + ST segment + T wave.

D) PR segment + QRS complex.

E) None of the above.

Ans: C

Q3: Your uncle was diagnosed with atrial fibrillation (A-fib), what is true about this condition?

A) It's life-threatening.

B) It increases ventricular filling.

C) Management includes anti-coagulants if not contraindicated.

Ans: C

Q4: During your cardiology rotation, your attending physician asks you of the causes of sinus tachycardia. Which of the following is one of them?

A) Sleep.

B) Athletes.

C) Old age.

D) Parasympathetic stimulation.

E) Fever.

Ans: E

Q5: What is the axis of the heart on the shown ECG?

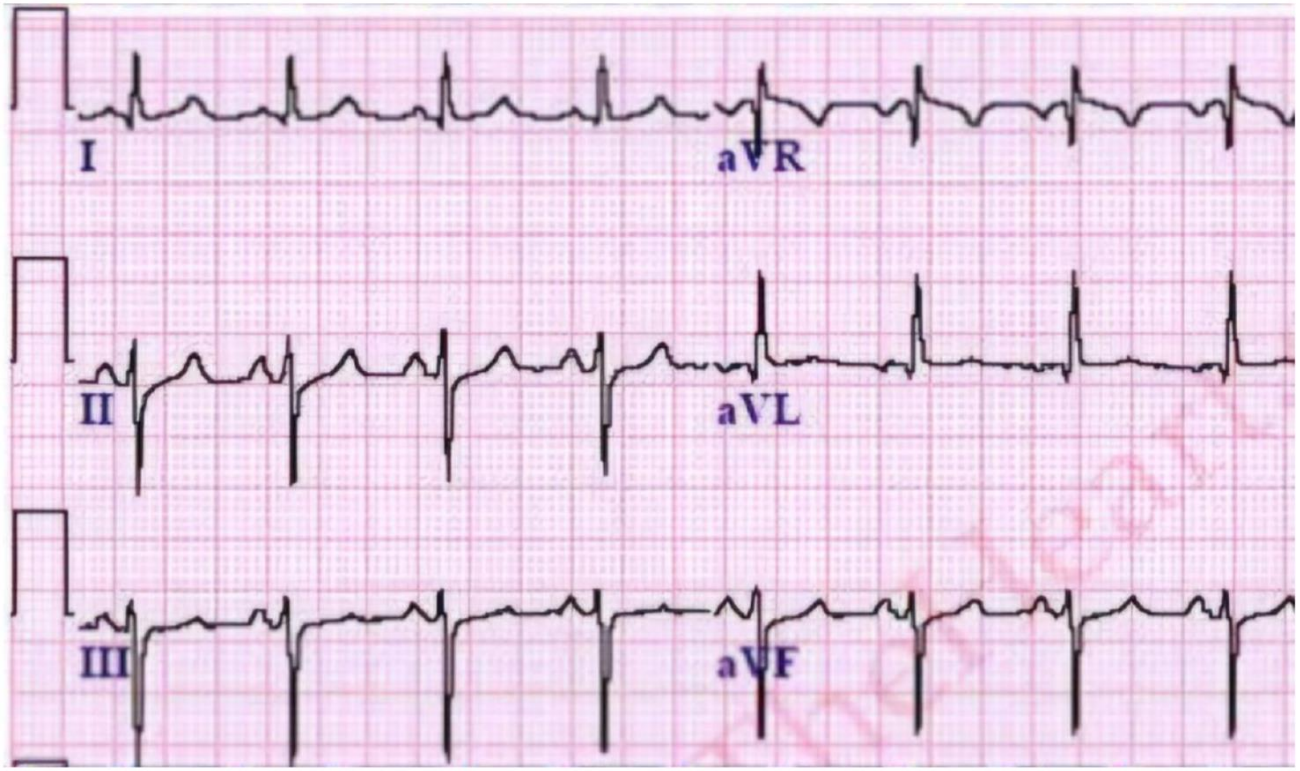
A) Right axis deviation.

B) Left axis deviation.

C) Normal axis deviation.

D) Extreme axis deviation.

E) Cannot be determined.



Ans: B

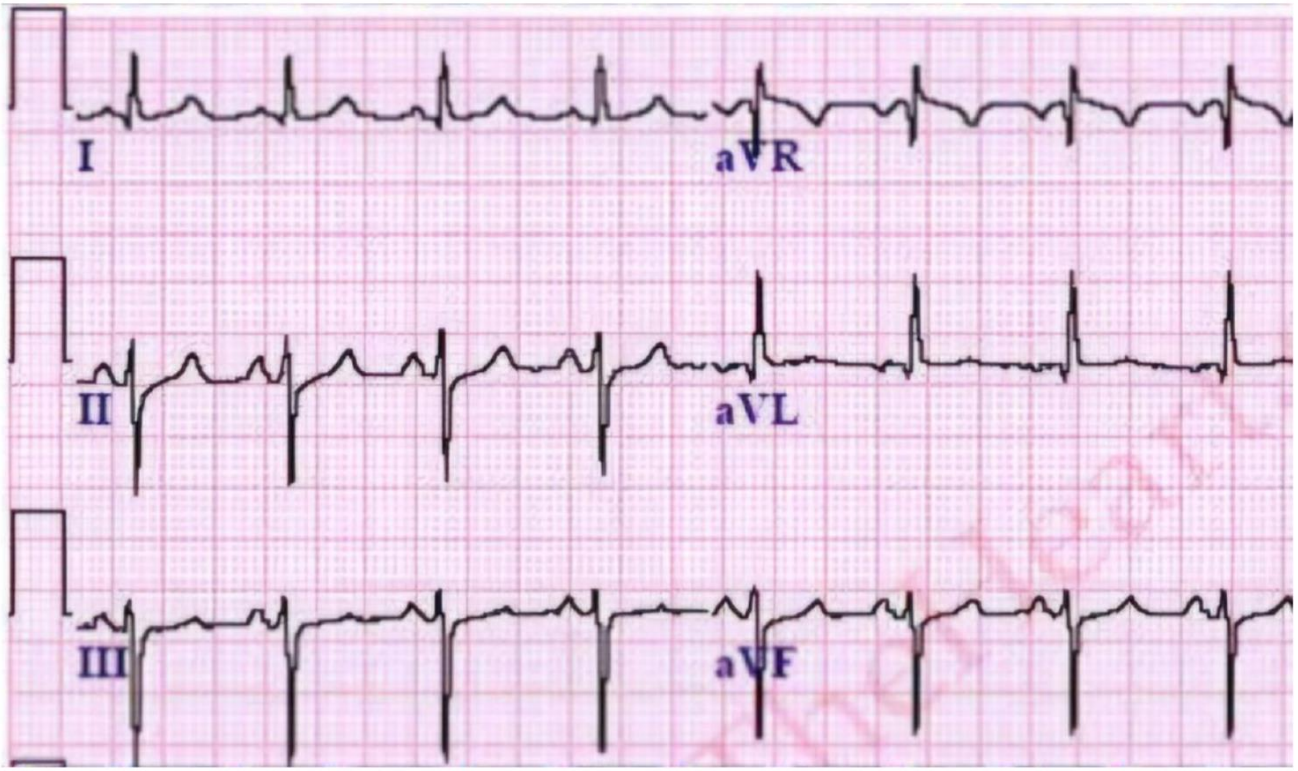
Q6: What is the pathological condition displayed on the ECG?

A) ST elevation showing an inferior wall MI.

B) ST elevation showing an anterior wall MI.

C) ST elevation showing a posterior wall MI.

D) ST depression.



Ans: A

Q7: This is an ECG of a 75-yo woman who came in with complains of dizziness, syncope. What is the phenomenon showcased?

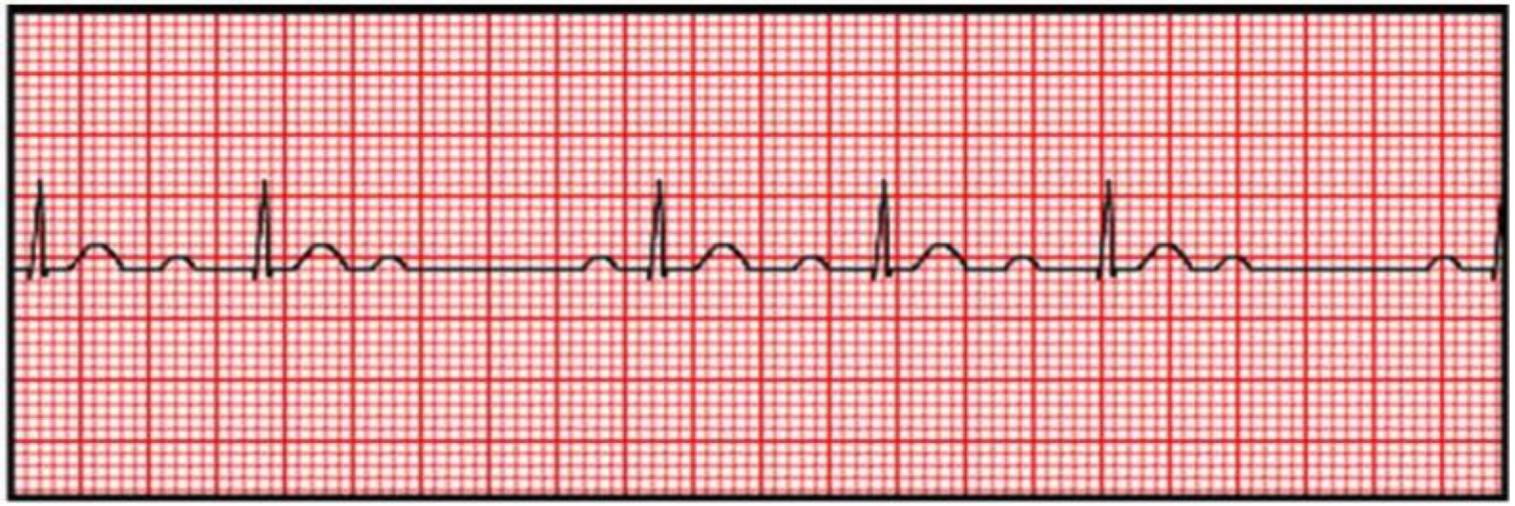
A) First degree AV block.

B) Mobitz type 1 AV block.

C) Mobitz type 2 AV block.

D) Mobitz type 3 AV block.

E) Cardiac arrest.



Ans: B

Q8: What is the arrhythmia:

A) Atrial flutter.

B) Atrial fibrillation.

C) Bradycardia.

Ans: A

NOT INCLUDED

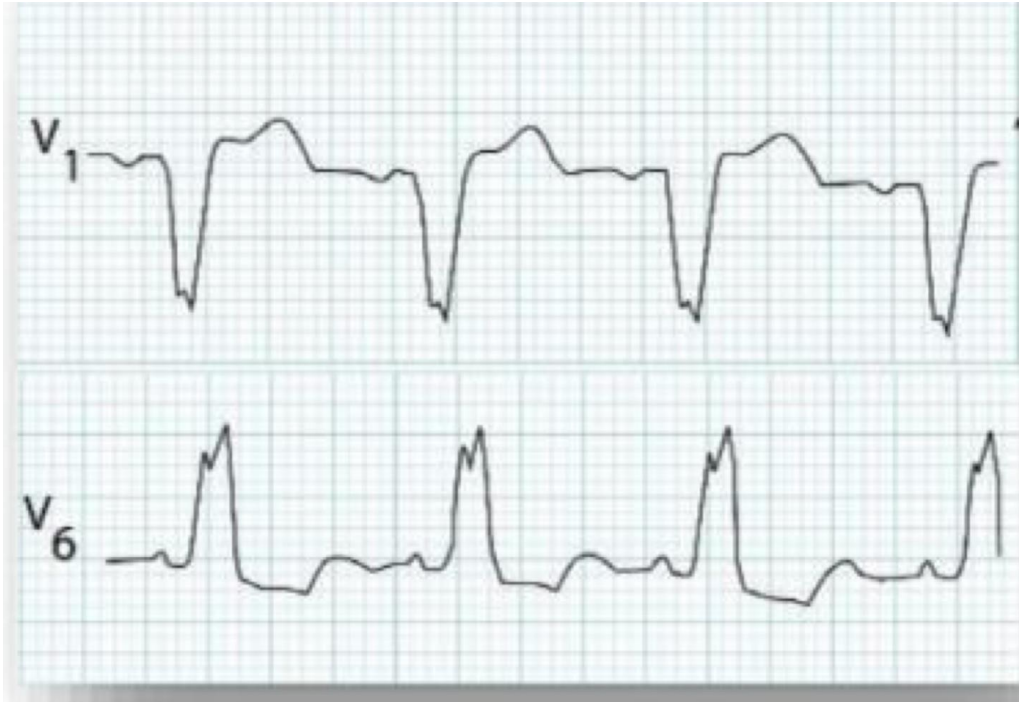
Q9: Diagnosis:

A) Left bundle branch block.

B) Atrial fibrillation.

C) Ventricular fibrillation.

D) Hyperkalemia with peaked T wave.



Ans: A

Q10: Find the duration of PR interval in the ECG:

A) 0.12 sec.

B) 0.2 sec.

C) 0.32 sec.

D) Cannot be calculated.

Ans: C

Q11: Right axis deviation lies within:

A) +90, +180

B) -30, -90

C) 0, +90

D) 0, -90

Ans: A

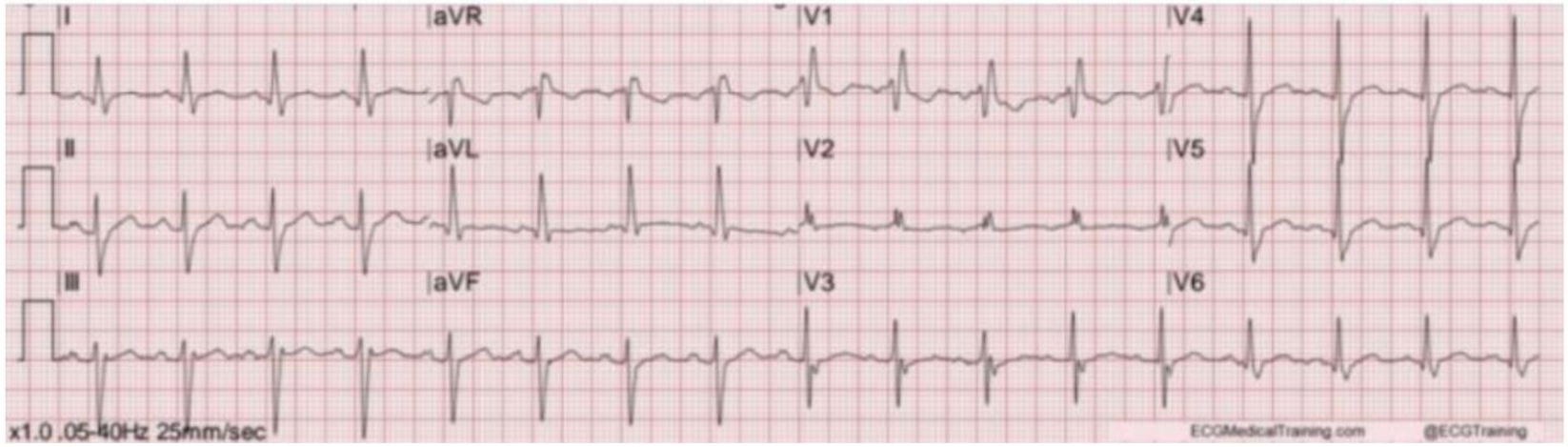
Q12: One of the following is true regarding the following ECG:

A) Left axis deviation.

B) Heart rate = 100 bpm.

C) Bradycardia.

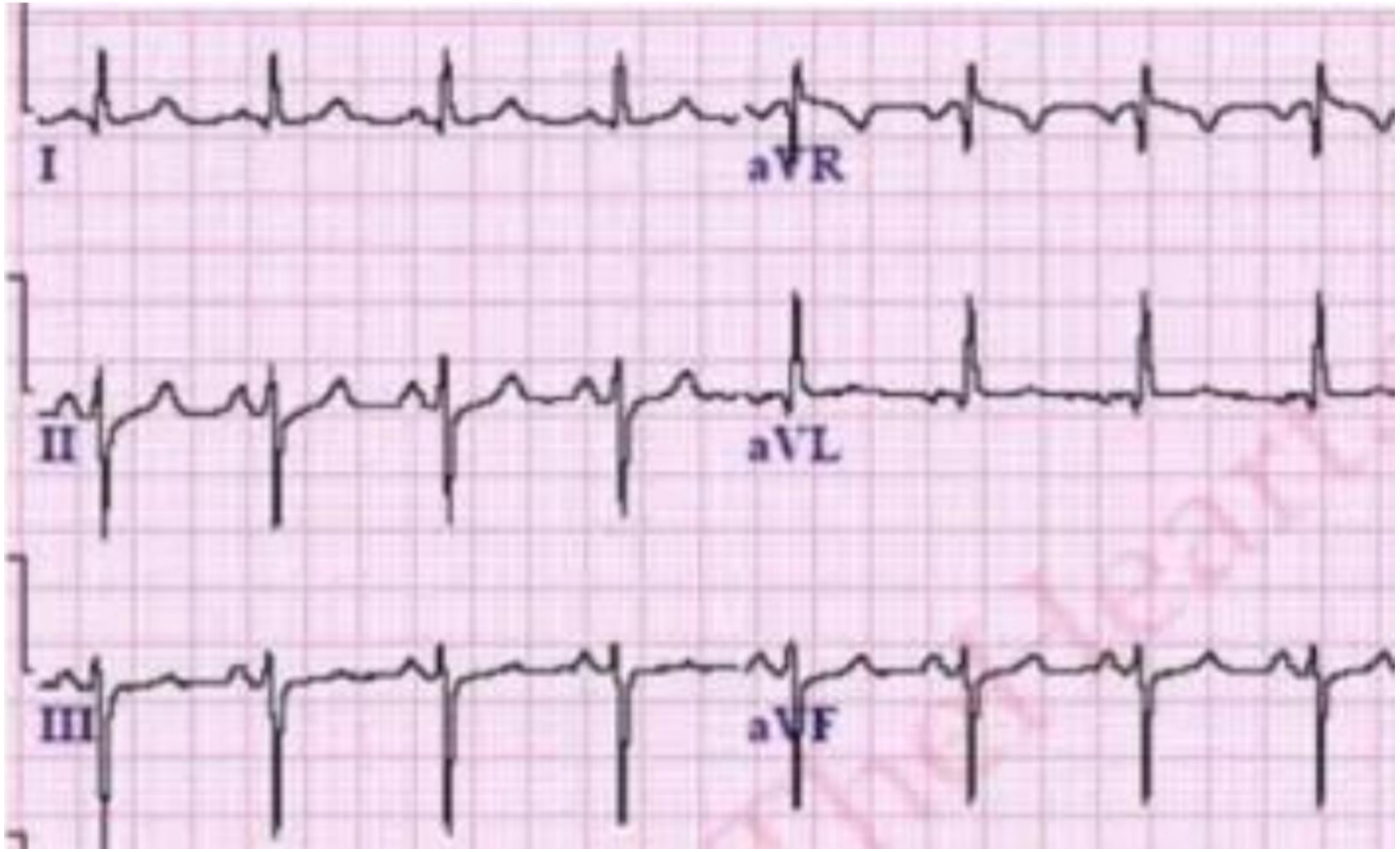
D) Severe right axis deviation.



E) Nothing can be determined from the information provided.

Ans: B

Q13: This ECG shows:



A) Left axis deviation.

B) Normal axis.

C) Right axis deviation.

D) Severe right axis deviation.

E) Nothing can be determined from the information provided.

Ans: A

Q14: This ECG reflects:

A) Wenckebach periodicity

B) Hyperacute T wave

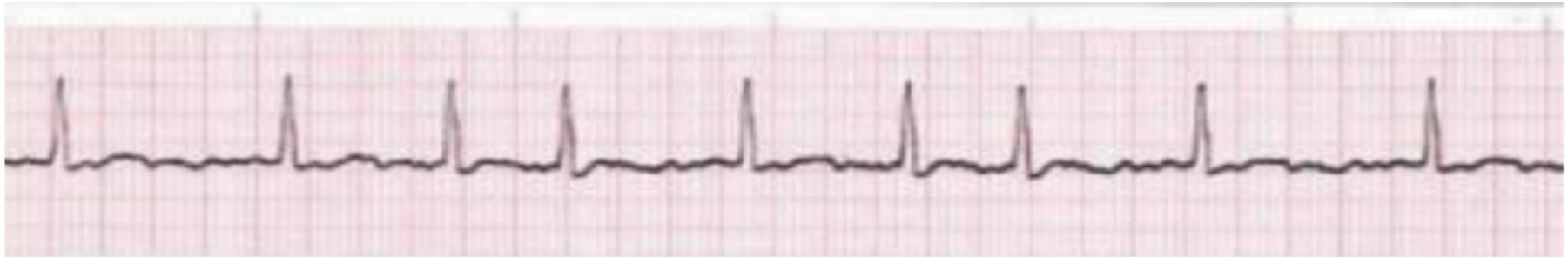
Ans: A

Q15: This ECG shows:

A) Ventricular fibrillation.

B) Bradycardia.

C) Atrial fibrillation.



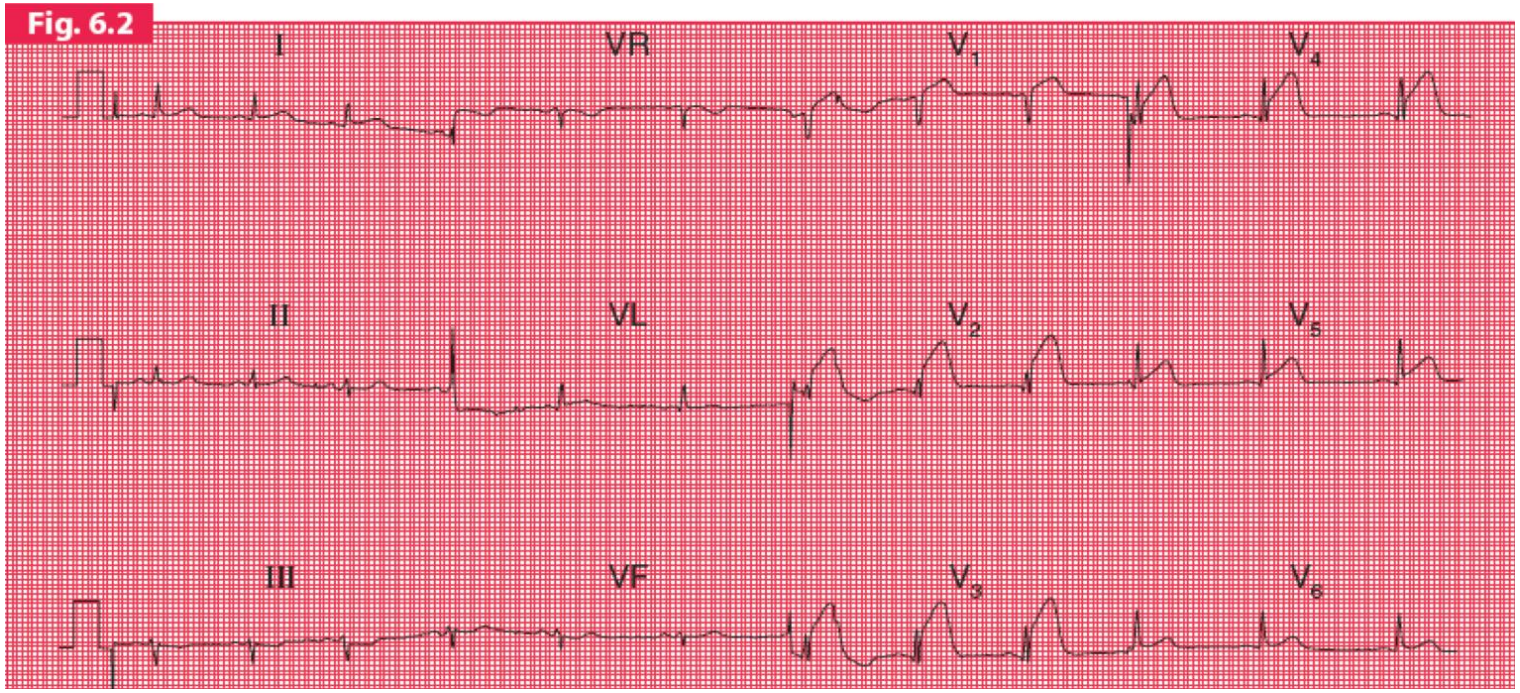
Ans: C

Q16: This ECG shows:

A) Inferior wall infarction.

B) Anteroseptal wall infarction.

C) None.



Ans: B

Q17: The appearance of P pulmonale is due to which of the following:

A) Right ventricular hypertrophy.

B) Left atrial enlargement.

C) Right atrial enlargement.

Ans: C

Q18: Which of the following is wrong about ECG recording and management:

A) V5 electrode is placed on the fifth intercostal space, left mid-clavicular line.

B) The yellow electrode is placed on the left arm, the red electrode is placed on the right arm.

C) Make sure the skin is clean and dry.

D) Ask the patient to take off jewelry, belts, clothing that is pressuring him.

E) Apply the gel in sufficient amounts.

Ans: A

Correct ans :V4

Q19: An abnormal P wave on the ECG indicates an abnormality in the:

A) Right bundle branch.

B) Atria.

C) Ventricles.

D) AV node.

E) Left bundle branch.

Ans: B

Q20: You have the following choices:

1.Lead I. 2. Lead II. 3. Lead III. 4. aVR. 5. aVF.

The mentioned above that are unipolar and read the electrical activity of the frontal plane are:

A) 1,2,3.

B) 4,5.

C) 1,4.

D) 4,2.

E) 6.

Ans: B

Q21: This ECG strip was recorded with standard speed and calibration. This ECG strip clearly shows:

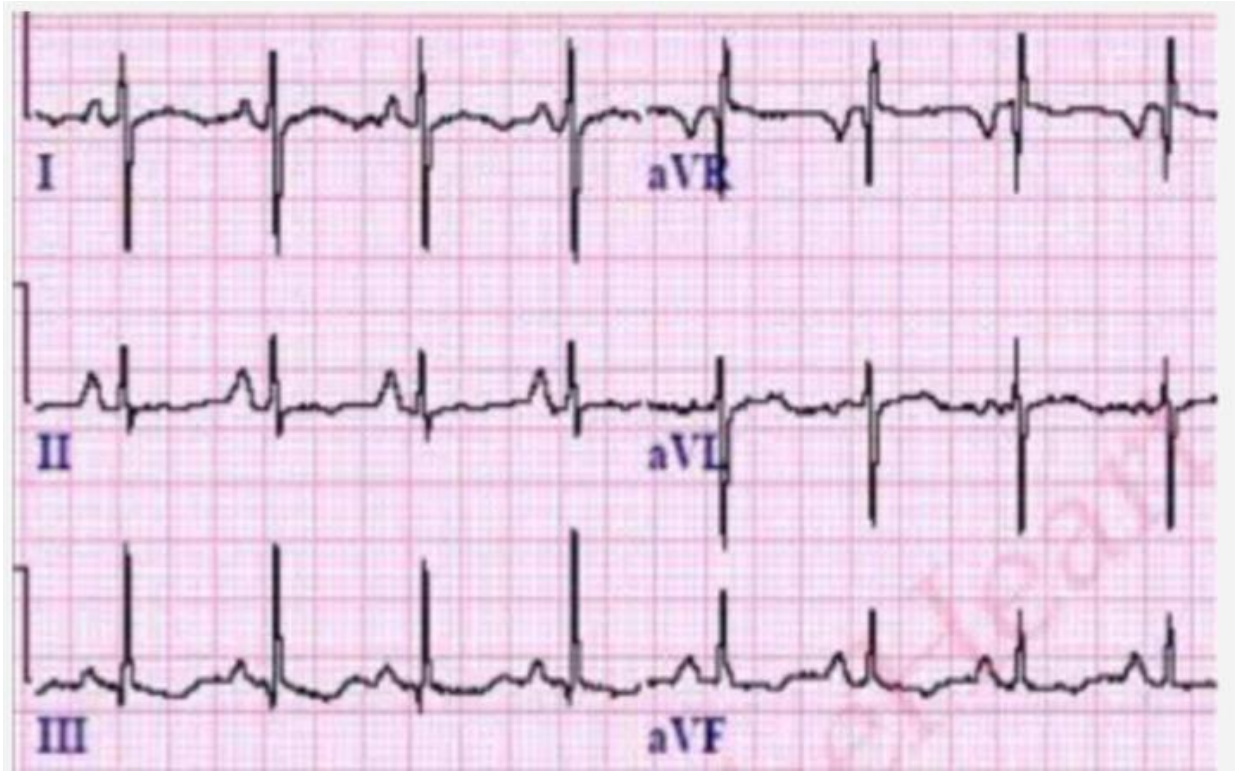
A) Isoelectric QRS complex in Lead III.

B) Inverted T wave in lead aVF.

C) Left axis deviation.

D) Right axis deviation.

E) ST segment depression in Lead I.



Ans: D

Q22: The right interpretation of the following ECG is:

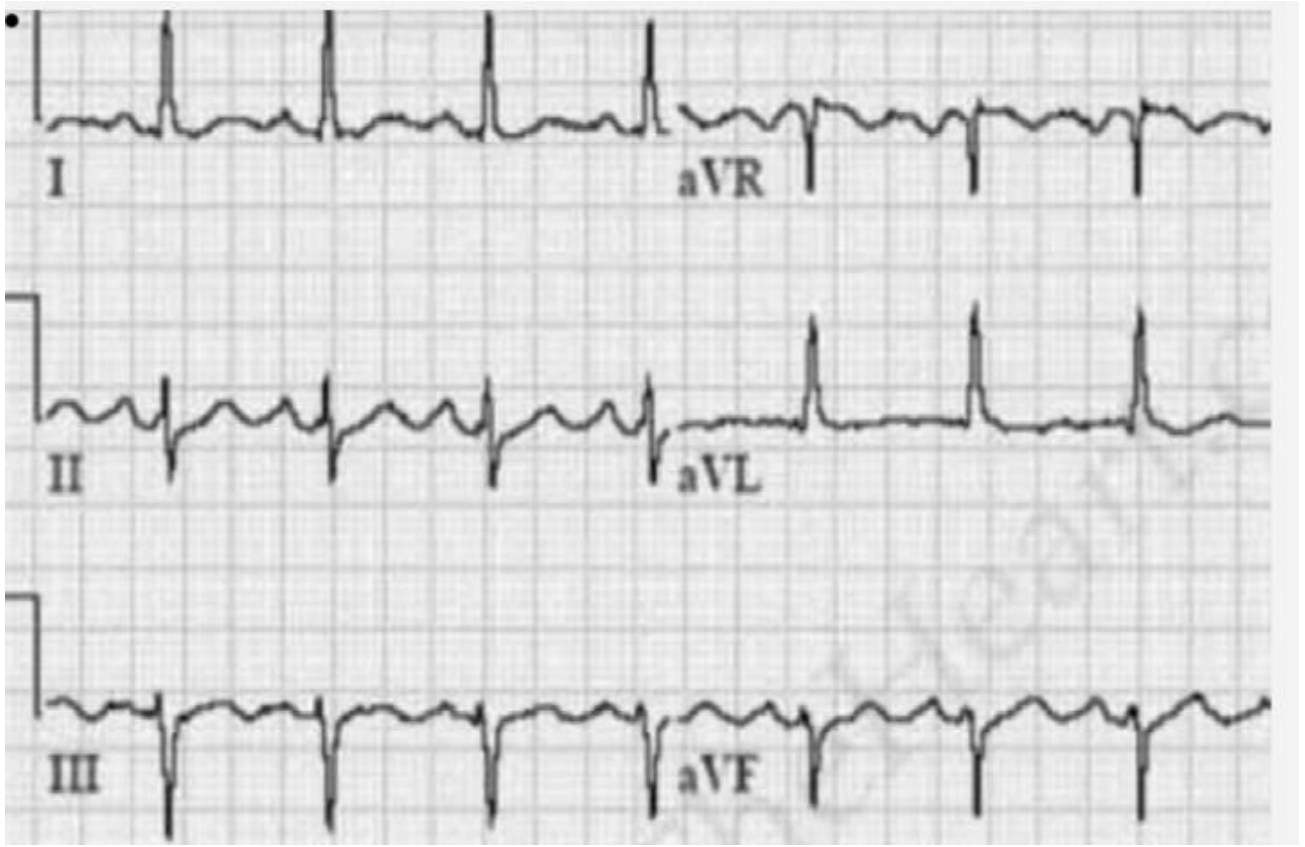
A) Normal.

B) Right axis deviation.

C) Left axis deviation.

D) Extreme left axis deviation.

E) Extreme right axis deviation.



Ans: C

Q23: All of the following combinations are true EXCEPT:

A) V2 –left sternal edge, 4th intercostal space.

B) V3 –midway between V2 and V4.

C) Red lead –right arm.

D) Green lead –Left leg.

E) V1 –right 2nd intercostal space.

Ans: E

Q24: If an abnormality was only found in lead II, III, aVF, most probably there is a problem in:

A) Anterior septal part of ventricles.

B) Inferior parts of ventricles.

C) Lateral part of ventricles.

D) Base of ventricles.

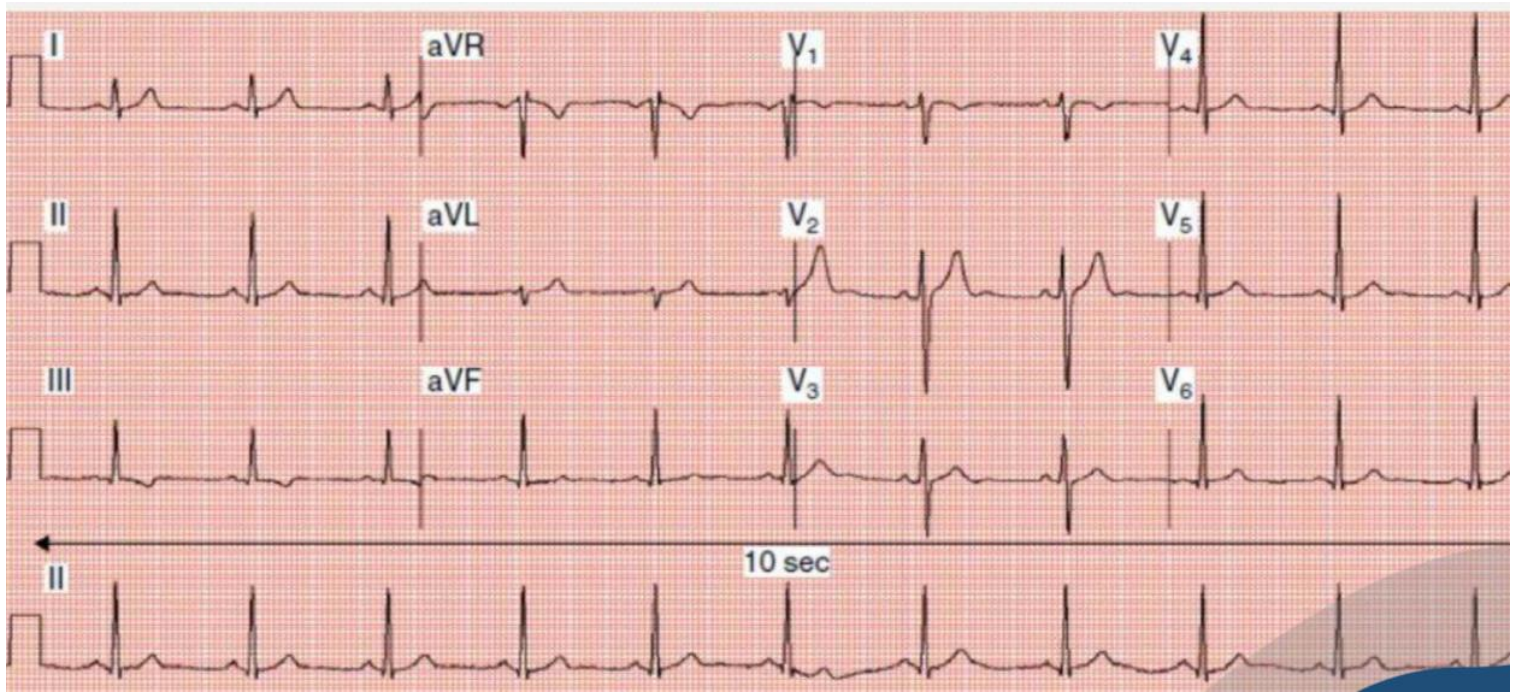
E) None of the mentioned choices is correct.

Ans: B

Q25: Regarding this ECG:

A) Pathological Q waves.

B) Normal progression of QRS.



Ans: B

Q26: Which of the following is true regarding this ECG?

A) The progression of R wave is abnormal in chest leads.

B) Heart rate is normal.

C) This patient is suffering from arrhythmia.

D) This patient may have right axis deviation.

Ans: B

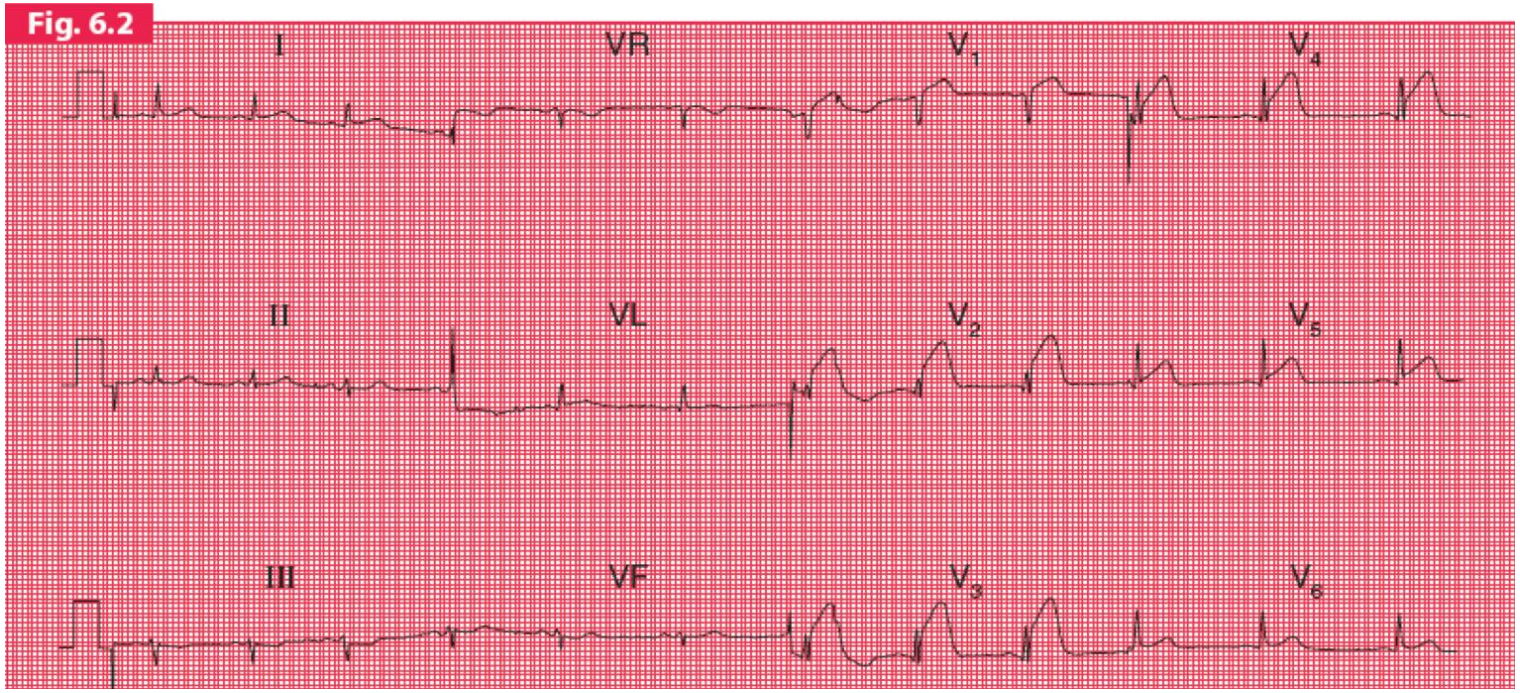
Q27: This ECG shows:

A) Acute MI.

B) Atrial flutter.

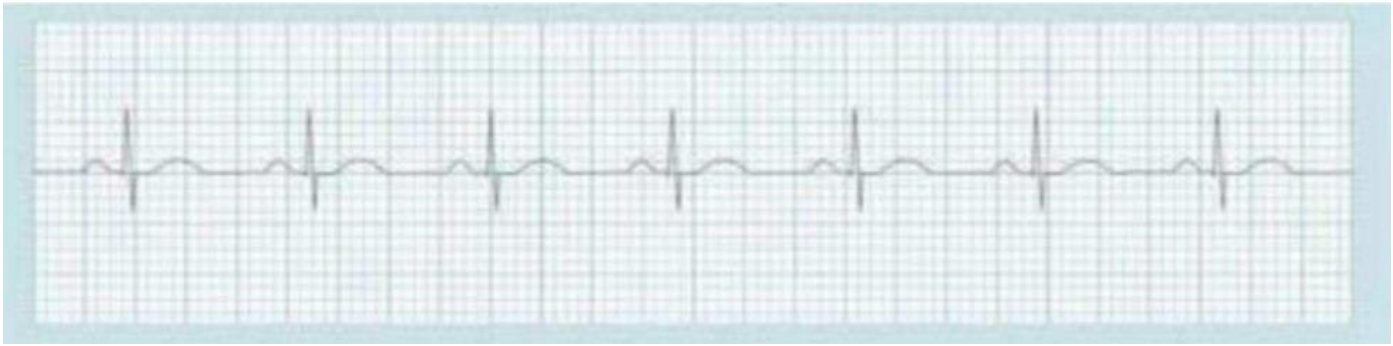
C) Atrial fibrillation.

D) Sinus tachycardia.



Ans: A

Q28: Study the following ECG strip (Lead II) carefully and choose the correct statement. The strip was recorded with standard speed and calibration.



A) The heart rate is 75 bpm.

B) The PR interval is 0.24 s.

C) The ST shown in this ECG is due to myocardial ischemia.

D) The ECG shown above is normal sinus rhythm.

E) The QRS complex duration shown in this ECG is due to left bundle branch block.

Ans: D

Q29: What abnormality can be seen in the following ECG strip which was recorded with standard speed and calibration?

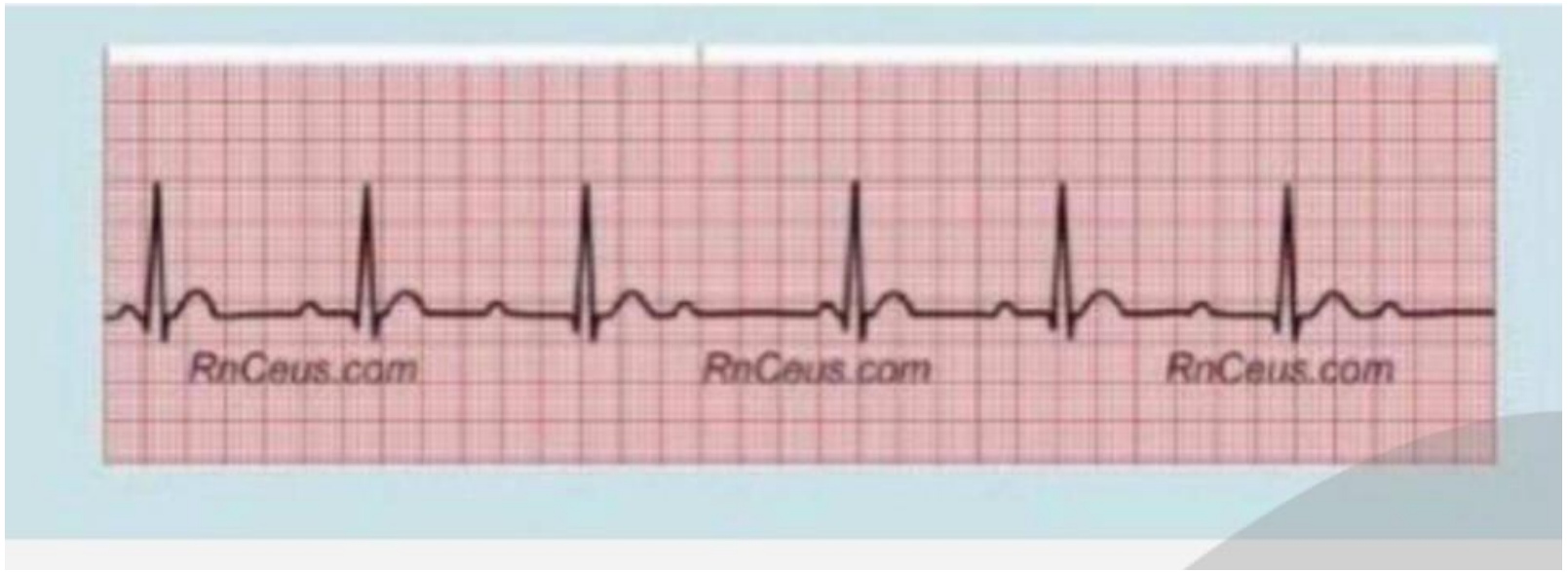
A) First degree heart block.

B) Second degree heart block.

C) Atrial flutter.

D) Third degree heart block.

E) Normal sinus rhythm.



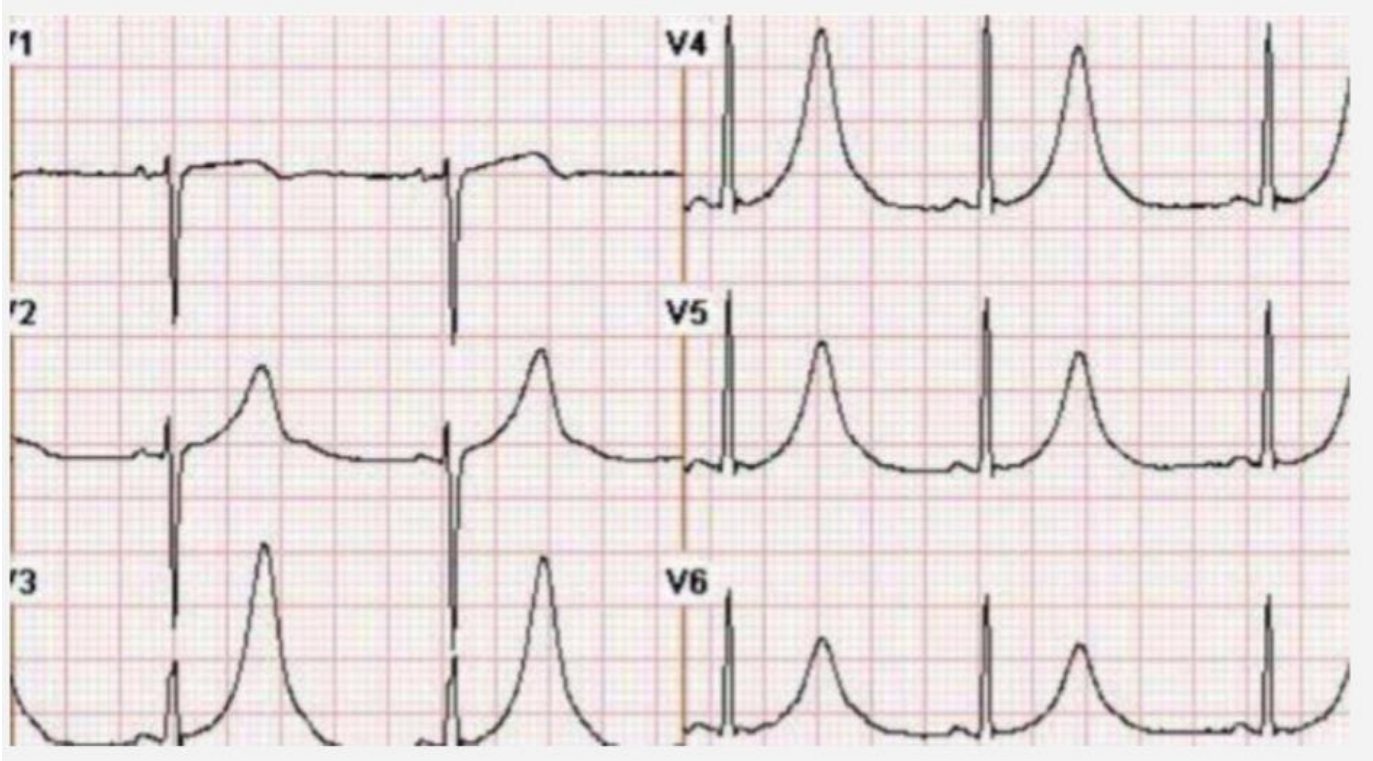
Ans: B

Q30: Which of the following causes this ECG?

A) Hyperkalemia.

B) Hypokalemia.

C) Ischemia.



Ans: A

Q31: This ECG shows: (all normal calibration and speed)

A) Angina.

B) Third degree heart block.

C) Second degree heart block with conducted beats.

D) Atrial flutter.

Ans: C

Scan the QR code or click it for FEEDBACK

Corrections from previous versions:

Versions	Slide # and Place of Error	Before Correction	After Correction
V0 → V1			
V1 → V2			