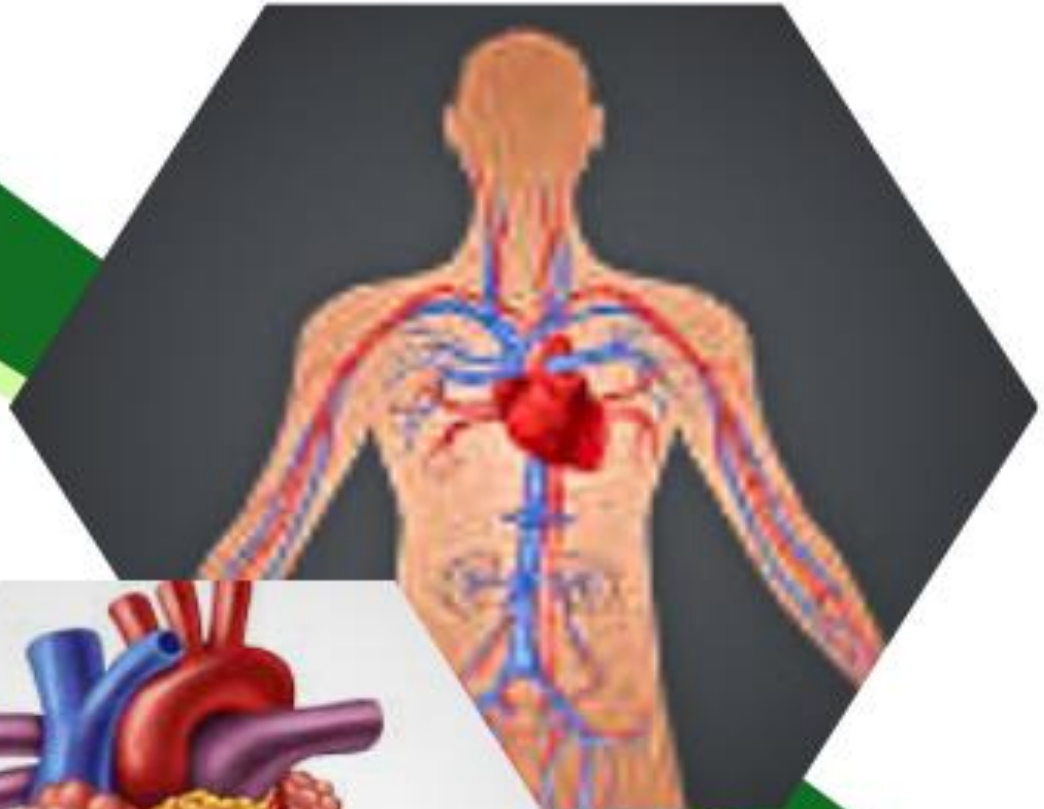


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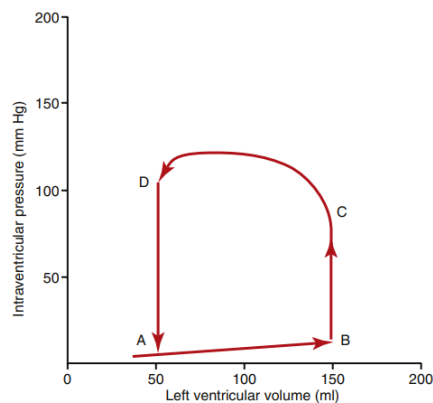
# CVS PHYSIOLOGY



**Writer:**  
**Corrector:**  
**Doctor:**

پبلیشنگ

A 60-year-old woman has a resting heart rate of 70 beats per minute, arterial pressure of 130/85 mm Hg, and normal body temperature. Use the pressure-volume diagram of her left ventricle below to answer Questions 1–4.



1. What is her cardiac output in milliliters per minute?
  - A) 2000
  - B) 3000
  - C) 4000
  - D) 6000
  - E) 7000
  
2. When does the first heart sound occur in the ventricular pressure–volume relationship?
  - A) At point B
  - B) Between point A and point B
  - C) Between point B and point C
  - D) Between point C and point D
  - E) Between point D and point A
  
3. When does the fourth heart sound occur in the ventricular pressure–volume relationship?
  - A) At point D
  - B) Between point A and point B
  - C) Between point B and point C
  - D) Between point C and point D
  - E) Between point D and point A
  
4. What is her ventricular ejection fraction?
  - A) 33%
  - B) 50%
  - C) 60%
  - D) 67%
  - E) 80%

5) A 30-year-old man has an ejection fraction of 0.25 and an end-systolic volume of 150 milliliters. What is his end-diastolic volume?

- A) 50 milliliters
- B) 100 milliliters
- C) 125 milliliters
- D) 200 milliliters
- E) 250 milliliters

6) In a resting adult, the typical ventricular ejection fraction has what value?

- A) 20%
- B) 30%
- C) 40%
- D) 60%
- E) 80%

7) A 60-year-old man's ECG shows that he has an R-R interval of 1.5 seconds at rest. Which statement best explains his condition?

- A) He has fever
- B) He has a normal heart rate
- C) He has decreased parasympathetic stimulation of the S-A node
- D) He is a trained athlete at rest
- E) He has normal polarization of the S-A node

8) What happens at the end of ventricular isovolumic relaxation?

- A) The A-V valves close
- B) The aortic valve opens
- C) The aortic valve closes
- D) The mitral valve opens
- E) The pulmonary valve closes

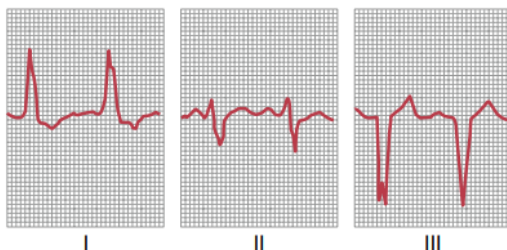
9) Which event is associated with the first heart sound?

- A) Closing of the aortic valve
- B) Inrushing of blood into the ventricles during diastole
- C) Beginning of diastole
- D) Opening of the A-V valves
- E) Closing of the A-V valves

10) Which phase of the cardiac cycle follows immediately after the beginning of the QRS wave?

- A) Isovolumic relaxation
- B) Ventricular ejection
- C) Atrial systole
- D) Diastasis
- E) Isovolumic contraction

A 60-year-old woman had an ECG recorded at a local emergency department after an automobile accident. Her weight was 70 kilograms (154 pounds), and her aortic blood pressure was 140/80 mm Hg. Use this information and the figure below to answer Questions 11–13.



11) What is the mean electrical axis calculated from standard leads I, II, and III shown in the woman's ECG?

- A) -90 degrees
- B) -50 degrees
- C) -12 degrees
- D) +100 degrees
- E) +170 degrees

12) What is the heart rate using lead I for the calculation?

- A) 70
- B) 88
- C) 100
- D) 112
- E) 148

13) What is her likely diagnosis?

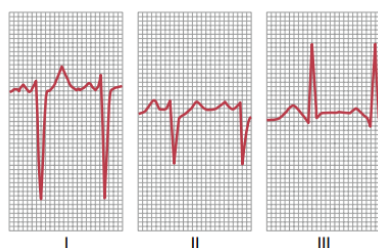
- A) Tricuspid valve stenosis
- B) Left bundle branch block
- C) Pulmonary valve stenosis
- D) Pulmonary valve insufficiency
- E) Aortic insufficiency

14) Which condition will usually result in left axis deviation in an ECG?

- A) Systemic hypertension
- B) Pulmonary valve stenosis
- C) Pulmonary valve regurgitation
- D) Rightward angulation of the heart
- E) Pulmonary hypertension

Questions 15 and 16

A 50-year-old woman was admitted to a local emergency department after a motorcycle accident. The following ECG was obtained.



15) What is her heart rate? Use lead I for the calculation.

- A) 56
- B) 66
- C) 76

D) 103

E) 152

16) What type of murmur is present in this patient?

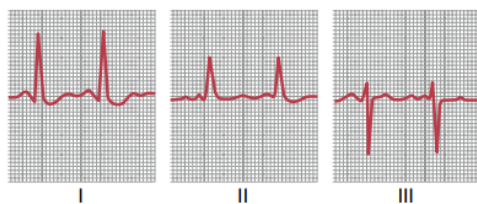
A) Aortic valve insufficiency

B) Left bundle branch block

C) Pulmonary valve stenosis

D) Right bundle branch block

E) Systemic hypertension



17) A 50-year-old man is a new employee at ABC Software. The above ECG was recorded during a routine physical examination. What is his likely diagnosis?

A) Chronic systemic hypertension

B) Chronic pulmonary hypertension

C) Second-degree heart block

D) Paroxysmal tachycardia

E) Tricuspid valve stenosis

18) A 60-year-old woman tires easily. Her ECG shows a QRS complex that is positive in the aVF lead and negative in standard limb lead I. What is a likely cause of this condition?

A) Chronic systemic hypertension

B) Pulmonary hypertension

C) Aortic valve stenosis

D) Aortic valve regurgitation

19) A 65-year-old patient with a heart murmur has a mean QRS axis of 120 degrees, and the QRS complex lasts 0.18 second. What is the likely diagnosis?

A) Aortic valve stenosis

- B) Aortic valve regurgitation
- C) Pulmonary valve stenosis
- D) Right bundle branch block
- E) Left bundle branch block

20) A 50-year-old man has been having fainting “spells” for about 2 weeks. During the episodes, his ECG shows a ventricular rate of 25 beats/min and 100 P waves per minute. After about 30 seconds of fainting, a normal sinus rhythm recurs. What is his likely diagnosis?

- A) Atrial flutter
- B) First-degree A-V block
- C) Second-degree A-V block
- D) Third-degree A-V block
- E) Stokes-Adams syndrome

21) An 80-year-old man had an ECG taken at his local doctor’s office, and the diagnosis was atrial fibrillation. Which condition is likely in someone with atrial fibrillation?

- A) Ventricular fibrillation, which normally accompanies atrial fibrillation
- B) Strong P waves on the ECG
- C) An irregular and fast rate of ventricular contraction
- D) A normal atrial “a” wave
- E) A smaller atrial volume than normal

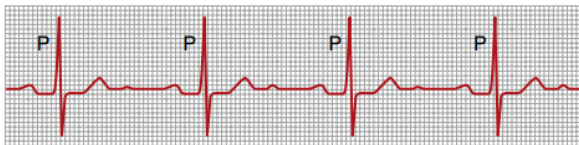
22) A 50-year-old man has a blood pressure of 140/85 mm Hg and weighs 90.7 kilograms (200 pounds). He reports that he is not feeling well, his ECG has no P waves, he has a heart rate of 46 beats/min, and the QRS complexes occur regularly. What is his likely condition?

- A) First-degree heart block
- B) Second-degree heart block
- C) Third-degree heart block
- D) Sinoatrial heart block
- E) Sinus bradycardia

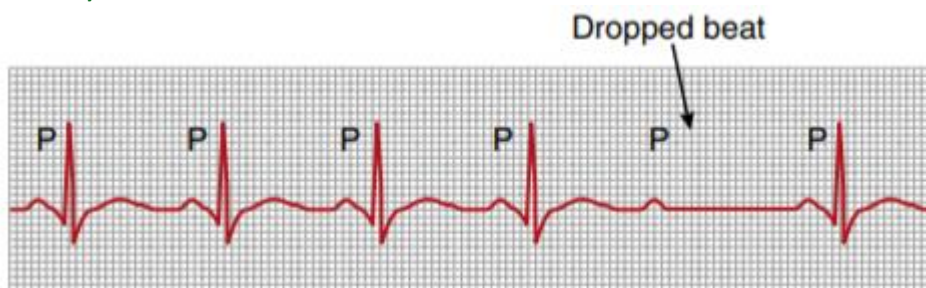


23) The following ECG tracing was obtained for a 60-year-old man who weighs 99.8 kilograms (220 pounds). Standard lead II is shown above. What is his diagnosis?

- A) A-V nodal rhythm
- B) First-degree A-V heart block
- C) Second-degree A-V heart block
- D) Third-degree A-V heart block
- E) Atrial flutter



24)



A 65-year-old man had the above ECG tracing recorded at his annual physical examination. What is the likely diagnosis?

- A) Atrial paroxysmal tachycardia
- B) First-degree A-V block
- C) Second-degree A-V block
- D) Third-degree A-V block
- E) Atrial flutter

Questions 25 and 26

A man had a myocardial infarction at age 55 years. He is now 63 years old. Use the standard limb lead I tracing on his ECG shown below to answer Questions 25 and 26.



25) What is his heart rate?



- A) 40 beats/min
- B) 50 beats/min
- C) 75 beats/min
- D) 100 beats/min
- E) 150 beats/min

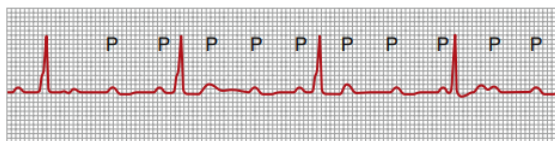
26) What is his current diagnosis?

- A) Sinus tachycardia
- B) First-degree heart block
- C) Second-degree heart block
- D) ST segment depression
- E) Third-degree heart block

Questions 27 and 28

An 80-year-old man went to his family physician for his annual checkup. Use the ECG tracing shown below to answer

Questions 27 and 28



- 27) What is his heart rate?
- A) 105
  - B) 95
  - C) 85
  - D) 75
  - E) 37
- 28) What is the likely diagnosis?
- A) Left bundle branch block
  - B) First-degree A-V block
  - C) Second-degree A-V block
  - D) Electrical alternans
  - E) Complete A-V block

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		E	A	B	D	D
		D	D	E	E	B
		B	A	A	C	A
		D	E	C	D	B
		E	A	E	E	

29) Which of the following clinical signs would be most obvious on examination of a patient with either tetralogy of Fallot or transposition of the great vessels?

- (A) Sweaty palms
- (B) Lack of femoral artery pulse
- (C) Pulmonary hypertension
- (D) Cyanosis
- (E) Diffuse red rash

30) The left recurrent laryngeal nerve recurs around the?

- (A) left primary bronchus
- (B) left subclavian artery
- (C) left subclavian vein
- (D) ductus arteriosus
- (E) left common carotid artery

31) The hepatic sinusoids that can be observed histologically in an adult liver are derived from the?

- (A) supracardinal veins
- (B) anterior cardinal veins
- (C) posterior cardinal veins
- (D) vitelline veins
- (E) subcardinal veins

32) A 9-year-old boy presents with complaints of numbness and tingling in both feet. Examination reveals no pulse in the femoral artery, increased blood pressure in the arteries of the upper extremity, and enlarged intercostal veins. Which of the following abnormalities would be suspected?

- (A) Double aortic arch
- (B) Tetralogy of Fallot
- (C) Postductal coarctation of the aorta
- (D) Right aortic arch
- (E) Abnormal origin of the right subclavian artery

33) The coronary sinus is derived from which of the following?

- (A) Truncus arteriosus
- (B) Bulbus cordis
- (C) Primitive ventricle
- (D) Primitive atrium
- (E) Sinus venosus

34) The conus arteriosus is derived from which of the following?

- (A) Truncus arteriosus
- (B) Bulbus cordis
- (C) Primitive ventricle
- (D) Primitive atrium
- (E) Sinus venosus

35) The proximal part of the aorta is derived from which of the following?

- (A) Truncus arteriosus
- (B) Bulbus cordis
- (C) Primitive ventricle
- (D) Primitive atrium
- (E) Sinus venosus

36) The trabeculated part of the right ventricle is derived from which of the following?

- (A) Truncus arteriosus
- (B) Bulbus cordis
- (C) Primitive ventricle
- (D) Primitive atrium
- (E) Sinus venosus

37) Tricuspid atresia is a cardiac malformation that involves which of the following septa?

- (A) Aorticopulmonary septum
- (B) Atrial septum

- (C) Atrioventricular septum
- (D) Interventricular septum

38) A muscular VSD is a cardiac malformation that involves which of the following septa?

- (A) Aorticopulmonary septum
- (B) Atrial septum
- (C) Atrioventricular septum
- (D) Interventricular septum

39) Tetralogy of Fallot is a cardiac malformation that involves which of the following septa?

- (A) Aorticopulmonary septum
- (B) Atrial septum
- (C) Atrioventricular septum
- (D) Interventricular septum

40) d-Transposition of the great arteries is a cardiac malformation that involves which of the following septa?

- (A) Aorticopulmonary septum
- (B) Atrial septum
- (C) Atrioventricular septum
- (D) Interventricular septum

41) The superior mesenteric artery is derived from which of the following?

- (A) Posterolateral arteries
- (B) Lateral arteries
- (C) Ventral arteries

42) The gonadal arteries are derived from which of the following?

- (A) Posterolateral arteries
- (B) Lateral arteries
- (C) Ventral arteries

43) The proximal part of the internal carotid artery is derived from which of the following?

- (A) Aortic arch 1
- (B) Aortic arch 2
- (C) Aortic arch 3
- (D) Aortic arch 4
- (E) Aortic arch 6

44) A portion of the arch of the aorta is derived from which of the following?

- (A) Aortic arch 1
- (B) Aortic arch 2
- (C) Aortic arch 3
- (D) Aortic arch 4
- (E) Aortic arch 6

45) The portal vein is derived from which of the following?

- (A) Vitelline veins
- (B) Umbilical veins
- (C) Anterior cardinal veins
- (D) Posterior cardinal veins
- (E) Subcardinal veins

46) The renal veins are derived from which of the following?

- (A) Vitelline veins
- (B) Umbilical veins
- (C) Anterior cardinal veins
- (D) Posterior cardinal veins
- (E) Subcardinal veins

47) The superior mesenteric vein is derived from which of the following?

- (A) Vitelline veins
- (B) Umbilical veins
- (C) Anterior cardinal veins

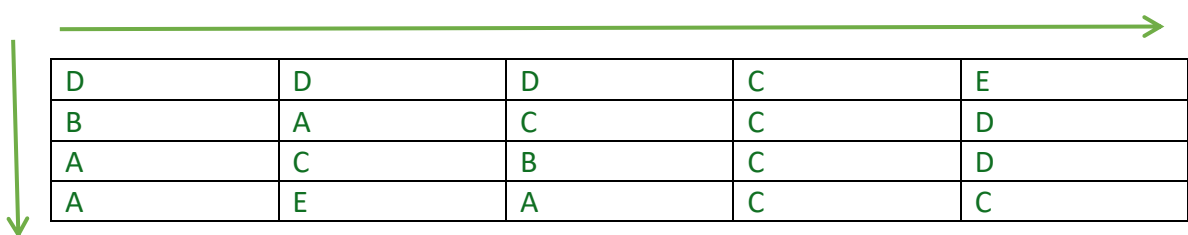
- (D) Posterior cardinal veins
- (E) Subcardinal veins

48) Closure of the foramen primum results from fusion of which of the following structures?

- (A) Septum secundum and the fused atrioventricular cushions
- (B) Septum secundum and the septum primum
- (C) Septum primum and the fused atrioventricular cushions
- (D) Septum primum and the septum spurium
- (E) Septum primum and the sinoatrial valves

49) A 3-day-old boy delivered at 32 weeks of gestation is experiencing respiratory distress syndrome. The physician detects a heart murmur characteristic of a patent ductus arteriosus, a diagnosis that is confirmed with an echocardiogram. Which embryonic structure is involved in this diagnosis?

- (A) Left third aortic arch
- (B) Right third aortic arch
- (C) Left sixth aortic arch
- (D) Umbilical arteries
- (E) Vitelline arteries



D	D	D	C	E
B	A	C	C	D
A	C	B	C	D
A	E	A	C	C

50) Which one of the following is the most common side effect of antihyperlipidemic drug therapy?

- A. Elevated blood pressure.
- B. Gastrointestinal disturbance.
- C. Neurologic problems.
- D. Heart palpitations.

E. Migraine headaches

51) JS is a 65-year-old man who presents to his physician for management of hyperlipidemia. His most recent lipid panel reveals an LDL cholesterol level of 165 mg/dL. His physician wishes to begin treatment to lower his LDL cholesterol levels. Which of the following therapies is the best option to lower JS's LDL cholesterol levels?

A. Fenofibrate.

B. Colesevelam.

C. Niacin.

D. Simvastatin.

E. Ezetimibe

52) AJ is a 42-year-old man who was started on niacin sustained-release tablets 2 weeks ago for elevated triglycerides and low HDL levels. He is complaining of an uncomfortable flushing and itchy feeling that he thinks is related to the niacin. Which of the following options can help AJ manage this adverse effect of niacin therapy?

A. Administer aspirin 30 minutes prior to taking niacin.

B. Administer aspirin 30 minutes after taking niacin.

C. Increase the dose of niacin SR to 1000 mg.

D. Continue the current dose of niacin.

E. Change the sustained-release niacin to immediate-release niacin.

53) CN is a 72-year-old male who is treated for hyperlipidemia with high-dose atorvastatin for the past 6 months. He also has a history of renal insufficiency. His most recent lipid panel shows an LDL cholesterol level of 131 mg/dL, triglycerides of 510 mg/dL, and HDL cholesterol of 32 mg/dL. His physician wishes to add an additional agent for his hyperlipidemia. Which of the following choices is the best option to address CN's dyslipidemia?

A. Fenofibrate.

B. Niacin.



C. Colesevelam.

D. Gemfibrozil.

E. Ezetimibe

54) Which of the following patient populations is more likely to experience myalgia (muscle pain) or myopathy with use of HMG CoA reductase inhibitors?

A. Patients with diabetes mellitus.

B. Patients with renal insufficiency.

C. Patients with gout.

D. Patients with hypertriglyceridemia.

E. Patients taking warfarin (blood thinner)

B D A B B

ما أثقل الحياة وأصعبها إن لم تكن الحياة مصوغة وفق الأحكام الشرعية لدينا  
كمسلمين و غاب عنها نظام دين الله.

نعيش فترة من عمر أمتنا لكأنه الزمن الذي يقول عنه سيد البشر:  
"سيأتي زمان على أمتي يذوب قلب المؤمن في جوفه كما يذوب الملح في  
الماء من شدة المنكر ولا يستطيع تغييره".

ما أصعب أن يموت المسلم على فراشه كما يموت البعير. ستبقى الحياة مريرة  
في غياب نظام الإسلام وسنبقى نحن الضحايا في أحداثها.