



PTS Reading Week Question Series 2021

Cardio

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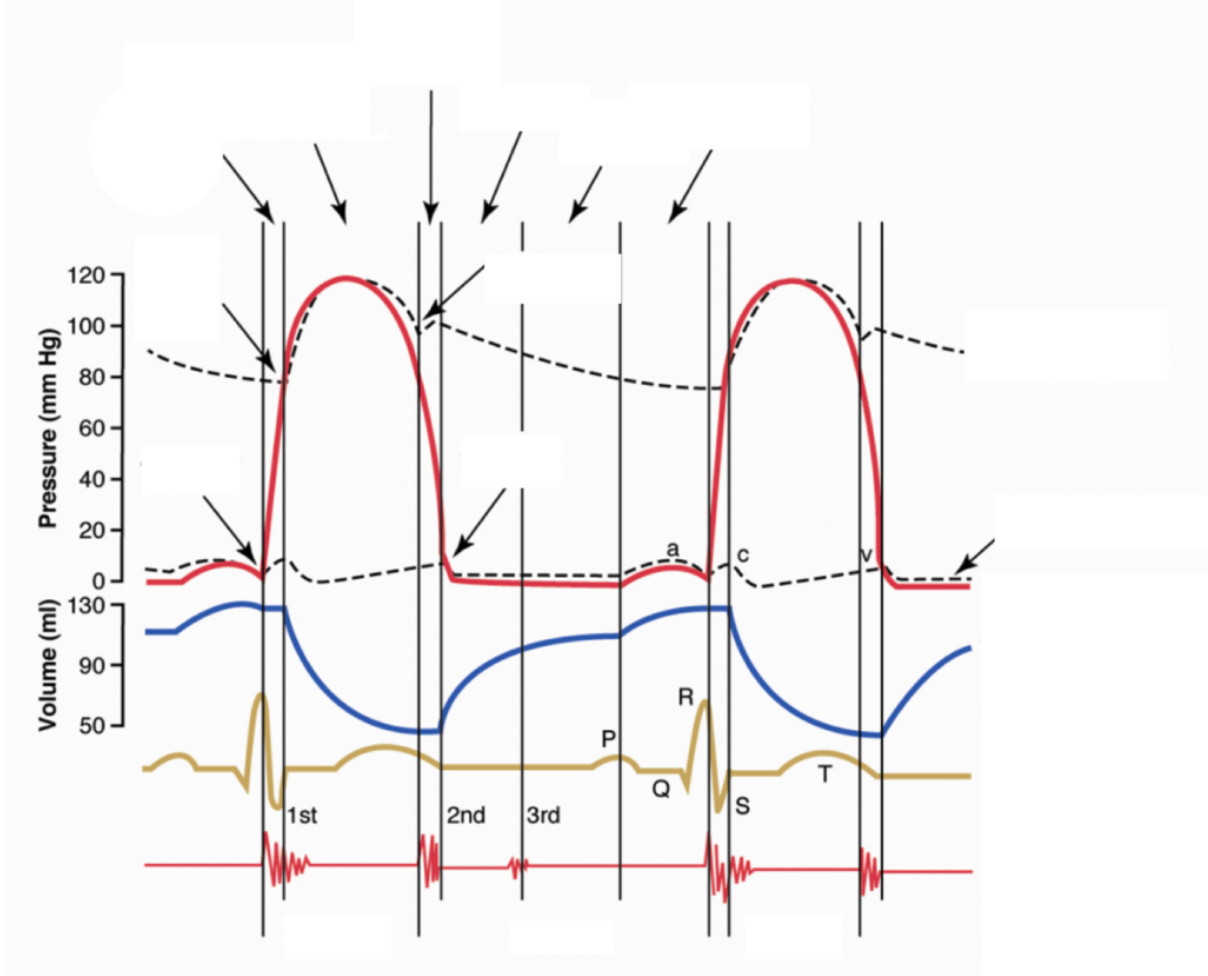
Editor

Faith Solanke

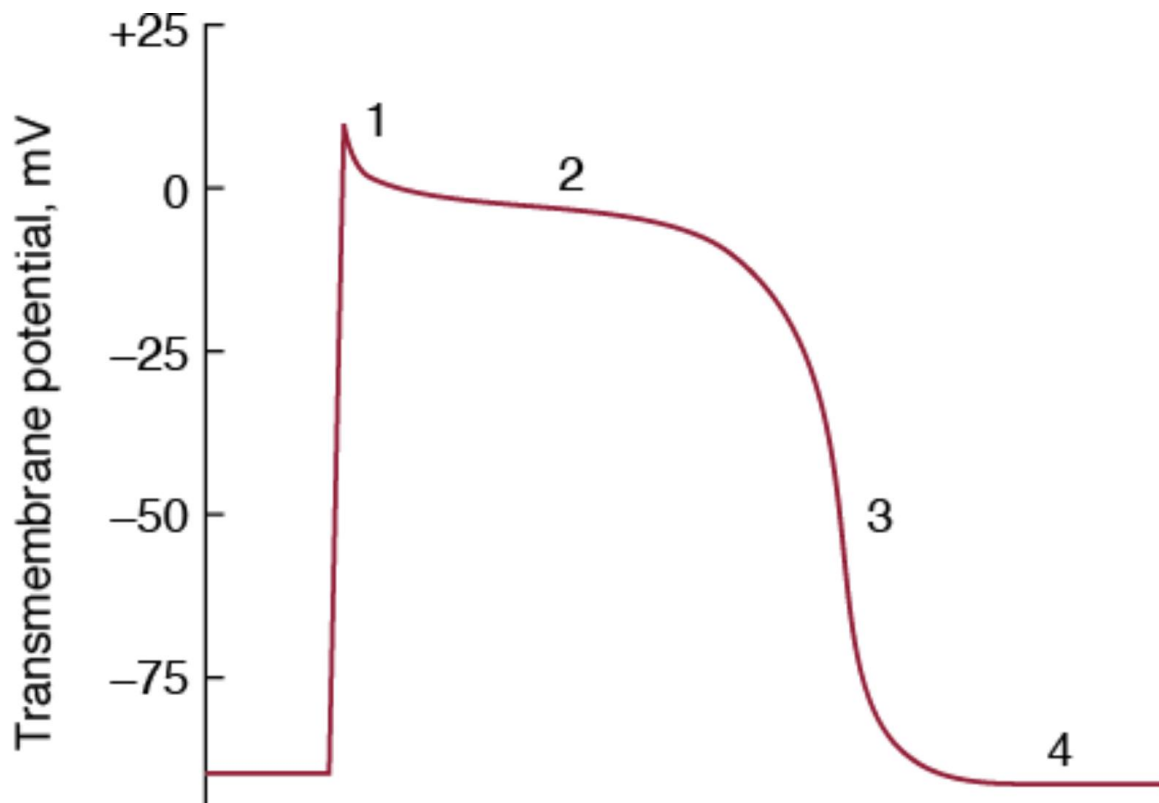
Question contributor

Shadha Shabani

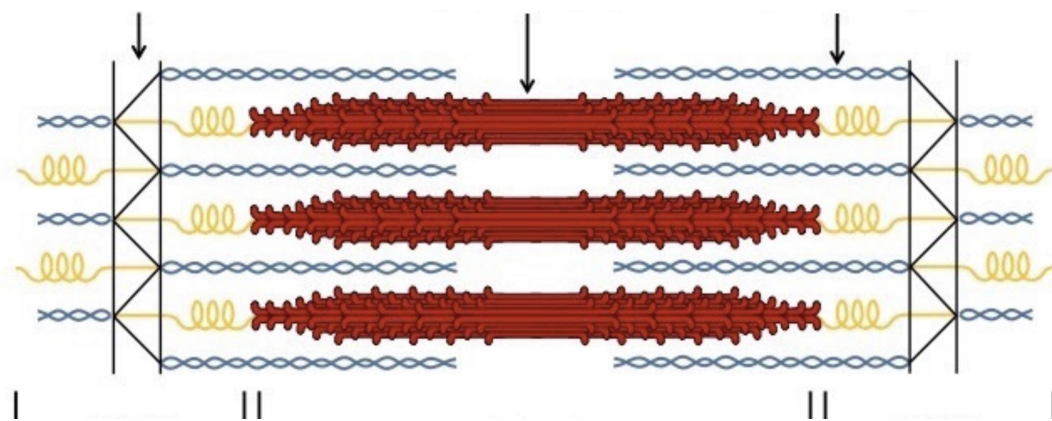
1. What is the position of the apex heart beat?
2. Which structures form the right and left heart borders?
3. Where is the SAN located?
4. What foetal structure is the fossa ovalis the remains of?
5. Which artery supplies the PDA to provide right dominance?
6. What is the consequence of an LAD occlusion, and a RCA occlusion?
7. Outline systole and diastole as part of the cardiac cycle
8. How long does the cardiac cycle last?
9. What causes the dicrotic notch?
10. Label a Wigger-Lewis diagram



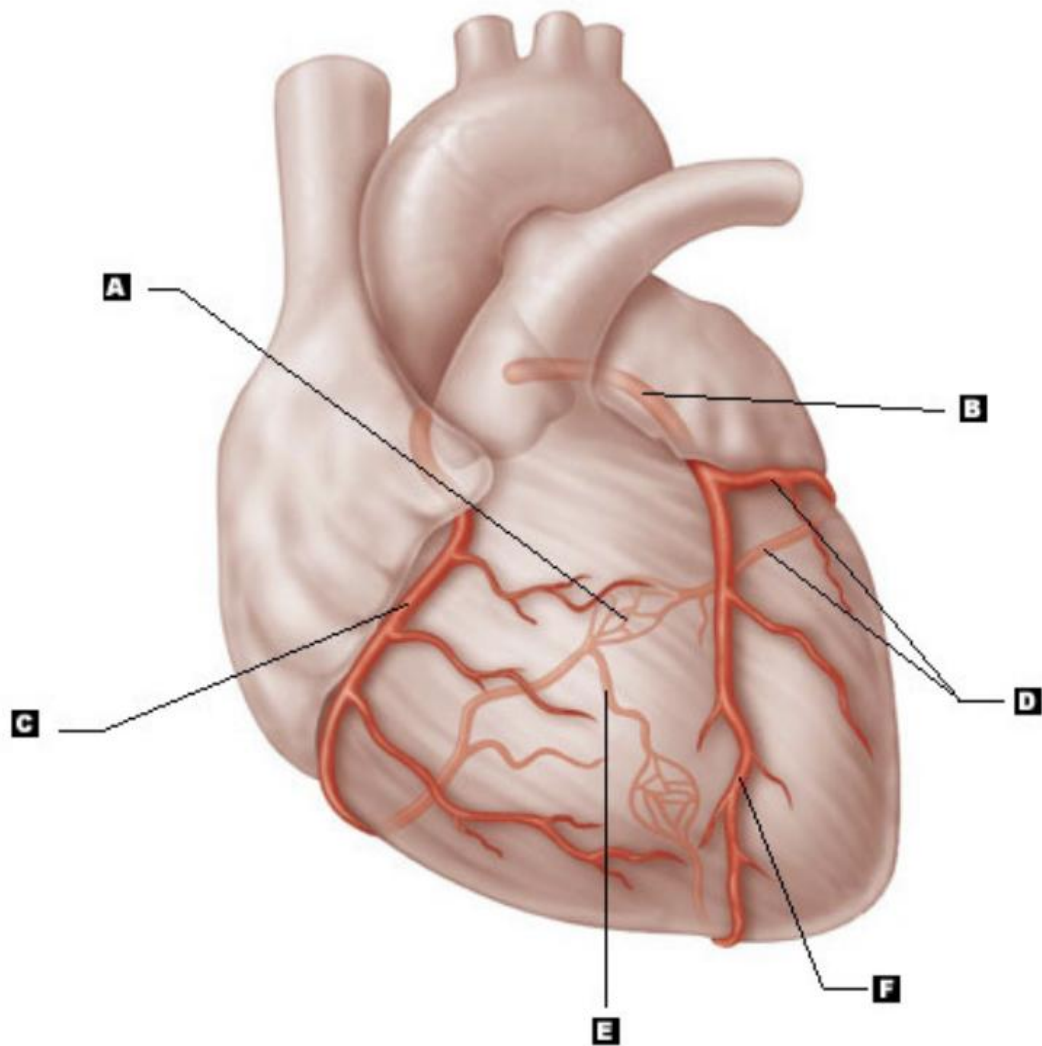
11. Label a myocyte action potential curve graph



12. Label the regions of a sarcomere



13. Label the vessels of coronary circulation:

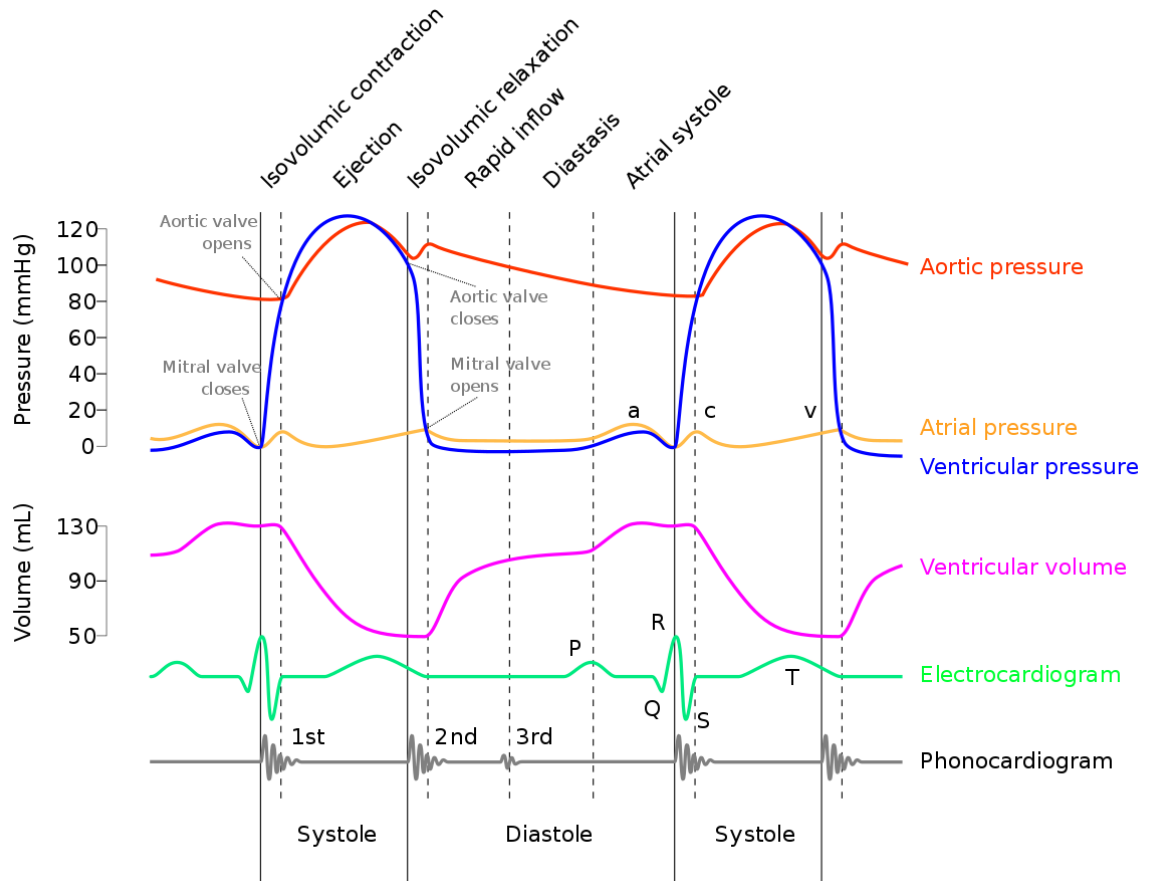


14. How does cardiac muscle differ from skeletal muscle?
15. Explain the role of the Medullary Cardiovascular Centre in central circulation control
16. Where are central chemoreceptors found and what do they respond to?
17. Where are peripheral chemoreceptors and arterial baroreceptors located?
18. Describe the normal electrical conduction pathway of the heart
19. Which nerve provides parasympathetic innervation of the heart?

20. Define tachycardia and bradycardia
21. Define cardiac output
22. Which coronary artery is most likely to result in a fatal heart attack?
23. Which nerve innervates the pericardium?
24. What is the purpose of the ductus arteriosus in the foetal cardiovascular system?
25. What is pulmonary oedema in the presence of normal central venous pressure a sign of?
26. What is severe pulmonary hypertension a cause of?
27. Which nerve most frequently supplies the AVN?
28. Describe the process by which the first breath taken by a foetus causes a transition from foetal circulation to post-natal circulation
29. Which part of the gastrula forms the cardiovascular system?
30. What do the first and second heart fields develop into?
31. Where are the heart's pacemaker cells located?

Answers and Explanations

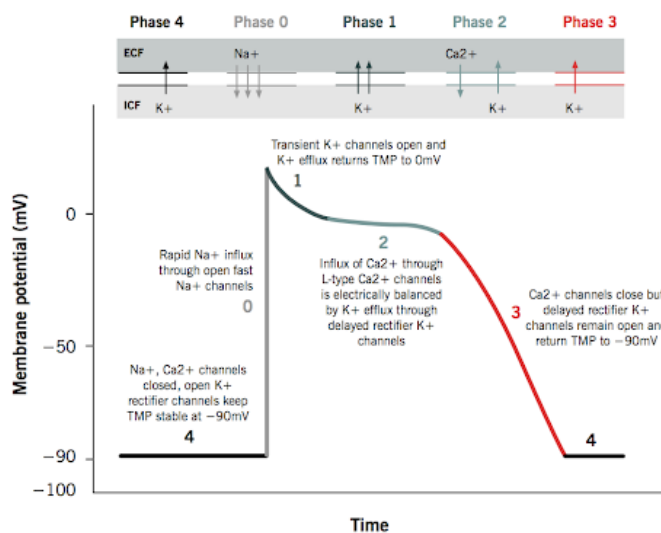
1. The apex heart beat can be auscultated at the left 5th midclavicular intercostal space
2. The left heart border is formed from: the aortic arch, left pulmonary artery, left atrial appendage and left ventricle. The right heart border is formed from: the superior vena cava and right atrium
3. The SAN is located in the sulcus terminalis of the right atrium
4. The fossa ovalis is the remains of the foetal foramen ovale
5. The right coronary artery supplies the posterior descending artery in 70-80% of individuals, providing right dominance
6. LAD occlusion will impair conducting ability; RCA occlusion will cause an inferior myocardial infarction
7. Cardiac cycle consists of systole (0.3sec): isovolumetric ventricular contraction and blood ejection, and diastole (0.5sec): isovolumetric ventricular relaxation, ventricular filling and atrial contraction
8. The cardiac cycle lasts 0.8 seconds
9. The dicrotic notch is caused by an increase in aortic pressure upon closure of the aortic valve- this happens due to the blood rebounding against the valve



10.

Action potential of cardiac muscles

Grigoriy Ikonnikov and Eric Wong



11.

12. A= anasomosis; B= LCA; C= RCA; D= Circumflex artery; E= Posterior Descending Artery; F= LAD

13. Cardiac muscle is striated, branching and contains intercalated discs- these features are not found in skeletal muscle
14. The medullary cardiovascular centre contains the sympathetic pressor region (causes increased BP by increasing vasoconstriction), and the parasympathetic depressor region (causes decreased BP by inhibiting the pressor region)
15. Central chemoreceptors are found in the medulla and respond to decreased pH
16. Peripheral chemoreceptors and arterial baroreceptors located in the aortic arch and carotid sinus
17. The normal electrical conduction pathway of the heart is: SAN → atrial contraction → AVN → bundle of His → Purkinje fibres → ventricular contraction
18. Parasympathetic innervation to the heart is provided by the vagus nerve
19. Tachycardia: fast heart rate over 100bpm; bradycardia: slow heart rate below 60bpm
20. Cardiac Output= Heart Rate x Stroke Volume
21. Left main coronary artery
22. The phrenic nerve innervates the pericardium
23. The ductus arteriosus is the connection between the pulmonary artery and the aorta, so it allows blood to bypass the non-functioning foetal lungs by shunting blood from the pulmonary artery to the aorta
24. Pulmonary oedema in the presence of normal central venous pressure is a sign of left heart failure. If the left side of the heart is impaired, blood backs up to the pulmonary system, leading to increased hydrostatic pressure and blood leaving the vessels into the tissues (oedema); raised central venous pressure indicates right side failure
25. Severe pulmonary hypertension is a cause of right side heart failure. Severe pulmonary hypertension means the right ventricle must work harder to pump blood through the pulmonary artery, so the right ventricle is unable to generate sufficient pressure and starts to fail
26. The RCA supplies the AVN
27. First breath expands the lungs causing pulmonary vasodilation which reduces pulmonary pressure. As the ductus arteriosus is no longer needed, the pulmonary shunt closes, increasing left atrial pressure, which causes the foramen ovale to close
28. The CV system is formed from the mesoderm

29. The first heart field develops into the left ventricle; the second heart field develops into the right ventricle, atria and outflow tracts

30. The heart's pacemaker cells are located in the SAN

We hope you have found these questions useful. Please fill out our feedback form so we can improve;

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