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39	☐ A	☐ B	☐ C	☐ D	☒ E

PRACTICE QUESTIONS

Cardiology Specialty Examination American College of Veterinary Internal Medicine (ACVIM)

CARSE

Cardiology Specialty Exam

EDITION

Demo

QUESTIONS

9

FORMAT

Limited Edition PDF

Before you begin

What this is

9 practice questions for Cardiology Specialty Examination American College of Veterinary Internal Medicine (ACVIM) **CARSE**, each with its answer key and an explanation. Answer a question before you read its key — the explanation is worth more once you have committed.

If something looks wrong

Send us three things and we will check it:

- the exam code, **CARSE**
- the question number
- the email address on your order

Write to **support@mometrix.net**. We reply within one business day.

QUESTION 1

SINGLE CHOICE

A 4-month-old Golden Retriever puppy is presented for evaluation of a continuous machinery murmur heard best at the left basilar region. Echocardiography reveals a patent ductus arteriosus (PDA). Which of the following best describes the direction of shunting in a typical left-to-right PDA?

- ☐ **A** Blood flows from the pulmonary artery to the aorta throughout the cardiac cycle
- ☒ **B** Blood flows from the aorta to the pulmonary artery throughout the cardiac cycle
- ☐ **C** Blood flows from the aorta to the pulmonary artery during systole and from the pulmonary artery to the aorta during diastole
- ☐ **D** Blood flows bidirectionally with equal volumes in both directions during systole and diastole

ANSWER B

WHY In a typical (left-to-right) PDA, systemic arterial pressure (aorta) exceeds pulmonary arterial pressure throughout both systole and diastole, so blood shunts continuously from the aorta into the pulmonary artery. This continuous pressure gradient produces the characteristic 'machinery' murmur. Option A is incorrect because pressure in the pulmonary artery is lower than aortic pressure. Option C describes reversal of the shunt (right-to-left/Eisenmenger physiology). Option D is incorrect because bidirectional shunting is not characteristic of an uncomplicated left-to-right PDA.

QUESTION 2

SINGLE CHOICE

Which echocardiographic finding is most characteristic of chronic degenerative mitral valve disease (myxomatous mitral valve degeneration) in small-breed dogs?

- ☐ A Systolic anterior motion (SAM) of the mitral valve with left ventricular outflow tract obstruction
- ☒ B Thickened, prolapsing mitral leaflets with mitral regurgitation and left atrial enlargement
- ☐ C Focal hyperechoic thickening of the subaortic region with a high-velocity turbulent jet across the aortic valve
- ☐ D Marked concentric left ventricular hypertrophy with diastolic dysfunction and a thick, 'stiff' left ventricle

ANSWER B

WHY Chronic degenerative (myxomatous) mitral valve disease is characterized by nodular thickening and elongation of the mitral leaflets, leading to prolapse and systolic regurgitation into the left atrium, with progressive left atrial and ventricular eccentric hypertrophy. Option A describes hypertrophic cardiomyopathy physiology. Option C describes subaortic stenosis. Option D describes hypertrophic cardiomyopathy or other causes of concentric LV hypertrophy, not primary mitral valve degeneration.

QUESTION 3

SINGLE CHOICE

A 6-year-old Maine Coon cat presents with acute paraparesis and absent femoral pulses. Echocardiography shows severe left ventricular concentric hypertrophy with dynamic outflow tract obstruction and a large, hypokinetic left ventricular lumen. Which of the following is the most likely cause of the paraparesis?

- ☐ A Systemic hypotension causing global cerebral hypoperfusion
- ☒ B Arterial thromboembolism originating from a left atrial thrombus
- ☐ C Pulmonary thromboembolism causing right heart failure
- ☐ D Aortic dissection with rupture into the lumbar musculature

ANSWER B

WHY Cats with severe hypertrophic cardiomyopathy are at high risk for arterial thromboembolism, most commonly 'saddle thrombi' lodging at the aortic trifurcation, producing acute pelvic limb paresis/paralysis, pain, and absent femoral pulses. The clinical picture (Maine Coon, LV hypertrophy, acute paraparesis with absent pulses) is classic. Option A would produce global signs rather than isolated pelvic limb deficits. Option C produces respiratory and right-sided signs. Option D is not a recognized feature of feline cardiomyopathy.

QUESTION 4

SINGLE CHOICE

On ECG, you identify a wide-complex tachycardia in a dog at a rate of 240 bpm with a regular R-R interval and atrioventricular dissociation. P waves are visible but unrelated to QRS complexes. Which arrhythmia is most likely?

- ☒ **A** Ventricular tachycardia
- ☐ **B** Supraventricular tachycardia with bundle branch block
- ☐ **C** Atrial fibrillation with aberrancy
- ☐ **D** Sinus tachycardia with first-degree atrioventricular block

ANSWER A

WHY A wide QRS complex tachycardia with a regular R-R interval and AV dissociation (independent P waves) is highly specific for ventricular tachycardia. Although SVT with aberrancy is possible, the AV dissociation strongly favors VT as the origin. Atrial fibrillation produces an irregularly irregular rhythm without discrete P waves, and sinus tachycardia would have narrow QRS complexes with consistent 1:1 P-QRS association.

QUESTION 5

SINGLE CHOICE

A dog with chronic degenerative mitral valve disease is being treated for congestive heart failure with furosemide, pimobendan, and an angiotensin-converting enzyme inhibitor. Which mechanism best describes the inotropic action of pimobendan?

- ☒ **A** Inhibition of phosphodiesterase III leading to increased intracellular cAMP and calcium sensitization of troponin C
- ☐ **B** Blockade of beta-1 adrenergic receptors reducing myocardial oxygen consumption
- ☐ **C** Inhibition of the Na⁺/K⁺-ATPase pump increasing intracellular sodium and secondary calcium loading
- ☐ **D** Calcium channel blockade reducing afterload and myocardial wall stress

ANSWER A

WHY Pimobendan is a benzimidazole pyridazinone with two principal actions: (1) inhibition of phosphodiesterase III, which increases intracellular cAMP and produces positive inotropy and vasodilation, and (2) calcium sensitization of cardiac troponin C. Option B describes beta-blockers. Option C describes cardiac glycosides such as digoxin. Option D describes calcium channel blockers such as diltiazem or amlodipine.

QUESTION 6

SINGLE CHOICE

A 10-year-old Golden Retriever is presented with collapse, muffled heart sounds, weak femoral pulses, and a jugular venous pulse that rises during inspiration (Kussmaul's sign). Echocardiography shows a large pericardial effusion with the heart visibly swinging within the pericardial sac. Which of the following is the most appropriate next step?

- ☐ A Begin aggressive intravenous fluid therapy and re-evaluate in 6 hours
- ☐ B Initiate oral antiarrhythmic therapy and schedule elective pericardiocentesis in 48 hours
- ☒ C Perform ultrasound-guided pericardiocentesis promptly to relieve tamponade
- ☐ D Administer a high dose of a corticosteroid to reduce presumed idiopathic pericarditis

ANSWER C

WHY Cardiac tamponade with hemodynamic compromise (collapse, muffled heart sounds, pulsus paradoxus-like signs, Kussmaul's sign, swinging heart) requires prompt pericardiocentesis to relieve intrapericardial pressure and restore cardiac output. Delays risk cardiovascular collapse. IV fluids alone will not relieve tamponade and may worsen it. Empiric corticosteroids are not indicated as a first intervention, and elective delay is inappropriate when tamponade physiology is present.

QUESTION 7

SINGLE CHOICE

Which echocardiographic Doppler finding most reliably supports a diagnosis of clinically significant pulmonary hypertension in a dog?

- ☒ **A** A peak tricuspid regurgitation velocity of 4.2 m/s with right ventricular enlargement
- ☐ **B** Aortic flow acceleration time of 180 ms with normal right ventricular dimensions
- ☐ **C** Pulmonary valve ejection velocity of 1.1 m/s with normal right ventricular outflow tract
- ☐ **D** Left atrial-to-aortic ratio of 1.8 with normal tricuspid regurgitation velocity

ANSWER A

WHY Using the simplified Bernoulli equation, a peak tricuspid regurgitation (TR) velocity of approximately 3.0 m/s or higher suggests a right ventricular-to-right atrial systolic pressure gradient of at least 36 mmHg, consistent with pulmonary hypertension when combined with supportive findings such as right ventricular enlargement or other signs of pressure/volume overload. Option B's acceleration time is within normal limits. Option C is a normal pulmonary outflow velocity. Option D describes left heart disease without right-sided findings of pulmonary hypertension.

QUESTION 8

SINGLE CHOICE

Which of the following is the most appropriate initial pharmacologic treatment for sustained, hemodynamically significant ventricular tachycardia in a dog that is not responsive to lidocaine?

- ☐ **A** Oral amiodarone as a single loading dose
- ☐ **B** Intravenous sotalol
- ☒ **C** Intravenous amiodarone given as a slow bolus followed by a constant-rate infusion
- ☐ **D** Subcutaneous atropine

ANSWER C

WHY For sustained, hemodynamically significant ventricular tachycardia refractory to lidocaine, intravenous amiodarone administered as a slow bolus (over several minutes) followed by a constant-rate infusion is a standard approach. Oral amiodarone has very slow and erratic absorption and is not appropriate for acute control. IV sotalol is generally not recommended for acute VT management in dogs due to risk of hypotension and proarrhythmia. Atropine is used for vagally mediated bradyarrhythmias, not ventricular tachycardia.

QUESTION 9

SINGLE CHOICE

A 7-year-old domestic shorthair cat is presented for evaluation of acute hindlimb paralysis with absent femoral pulses and cold, painful rear limbs. Thoracic auscultation reveals a gallop rhythm and a soft systolic murmur over the left sternal border. Which of the following cardiac disorders is the most likely underlying cause of this presentation?

- ☐ A Dilated cardiomyopathy with biventricular failure
- ☒ B Hypertrophic cardiomyopathy with left atrial enlargement and arterial thromboembolism
- ☐ C Restrictive cardiomyopathy with low-output failure
- ☐ D Unclassified cardiomyopathy with pericardial effusion

ANSWER B

WHY Feline hypertrophic cardiomyopathy (HCM) is the most common cardiomyopathy in cats and frequently presents with left atrial enlargement, congestive heart failure, and arterial thromboembolism (commonly affecting the distal aorta, producing acute hindlimb paralysis with absent femoral pulses). A gallop rhythm and soft murmur are typical auscultatory findings. Dilated cardiomyopathy is uncommon in cats and more often associated with biventricular failure rather than sudden aortic thromboembolism; restrictive cardiomyopathy and unclassified cardiomyopathy are less common than HCM.