DUMPSBOSS.

AE Adult Echocardiography Examination

ARDMS AE-Adult-Echocardiography

Version Demo

Total Demo Questions: 15

Total Premium Questions: 155

Buy Premium PDF

https://dumpsboss.co

support@dumpsboss.co

support@dumpsboss.co
dumpsboss.co

Topic Break Down

Topic	No. of Questions
Topic 1, Patient Care and Safety	4
Topic 2, Image Acquisition and Doppler	56
Topic 3, Cardiac Anatomy and Physiology	22
Topic 4, Cardiac Pathology	73
Total	155

QUESTION NO: 1

In patients with interrupted aortic arch, which structure allows Wood to flow into the descending aorta?

A. Persistent left superior vena cava

B. Left carotid artery

C. Foramen ovale

D. Patent ductus arteriosus

ANSWER: D

Explanation:

Patent ductus arteriosus is correct because interrupted aortic arch creates a complete discontinuity between the ascending aorta and the descending thoracic aorta. Consequently, systemic perfusion to the lower body depends on ductal flow. In fetal circulation, the ductus arteriosus normally connects the main pulmonary artery to the descending aorta. After birth in an infant with interrupted aortic arch, this connection permits blood ejected from the right ventricle into the pulmonary artery to reach the descending aorta, usually in a right-to-left ductal direction, thereby supplying the distal aortic circulation. This is why interrupted aortic arch is considered a ductal-dependent congenital heart lesion: narrowing or closure of the ductus can rapidly cause poor lower-body perfusion, metabolic acidosis, shock, and cardiovascular collapse. Echocardiographic assessment should therefore evaluate arch continuity, the ductal connection, ductal shunt direction, ventricular function, and associated intracardiac lesions. The word “Wood” appears to be a typographical error; the relevant physiology is blood flow into the descending aorta. Authoritative overviews of interrupted aortic arch and its reliance on a patent ductus are available from NCBI Bookshelf: Interrupted Aortic Arch and Merck Manual: Interrupted Aortic Arch.

QUESTION NO: 2

An intravenous drug user presents with a fever of unknown origin, flu-like symptoms, dyspnea, and chest pain. Which ultrasound finding is mostly likely associated with this presentation?

A. Aortic dissection

B. Hypertrophic cardiomyopathy

C. Mitral valve prolapse

D. Endocarditis

ANSWER: D

Explanation:

Endocarditis is the most likely diagnosis because injection-drug use is a major predisposing factor for infective endocarditis. Repeated intravenous access can introduce microorganisms, particularly *Staphylococcus aureus*, into the bloodstream; these organisms may adhere to the endocardial surface and form valvular vegetations. In this clinical setting, infection frequently involves the right-sided valves, especially the tricuspid valve. Tricuspid vegetations can embolize to the pulmonary circulation, producing septic pulmonary emboli that account for dyspnea and pleuritic chest pain in addition to fever and influenza-like systemic symptoms.

Echocardiography is central to evaluation. The characteristic ultrasound finding is a mobile, irregular echogenic mass attached to a valve leaflet or other endocardial structure, often accompanied by valve destruction or regurgitation. Transthoracic echocardiography is commonly the initial study and is particularly useful for identifying the often relatively large tricuspid vegetations seen in injection-drug-associated infection; transesophageal echocardiography is used when image quality is limited or suspicion remains high. This presentation should prompt urgent blood cultures and echocardiographic assessment because early diagnosis guides targeted antimicrobial treatment and evaluation for complications. Guidance on diagnostic imaging and management is available from the European Society of Cardiology infective endocarditis guidelines and the CDC clinical guidance on infective endocarditis.

QUESTION NO: 3

What is a normal response to dobutamine stress testing?

A. An increase in left ventricular cavity size and an increase in systolic blood pressure

B. An increase in left ventricular cavity size and a decrease in systolic blood pressure

C. A decrease in left ventricular cavity size and a decrease in systolic blood pressure

D. A decrease in left ventricular cavity size and an increase in systolic blood pressure

ANSWER: D

Explanation:

A decrease in left ventricular cavity size and an increase in systolic blood pressure is the expected normal physiologic response to dobutamine stress. Dobutamine predominantly stimulates beta-1 adrenergic receptors, producing increased myocardial contractility and heart rate. In a normal myocardium, augmented contractility generates more vigorous systolic wall thickening and ejection, so the left ventricular end-systolic cavity becomes smaller at progressively higher doses. This hyperdynamic response is a fundamental feature assessed during stress echocardiography; all visualized left ventricular segments should demonstrate enhanced contraction rather than new or worsening dysfunction.

Dobutamine also increases cardiac output through its inotropic and chronotropic effects. Although blood-pressure responses must be monitored individually throughout testing and can vary with baseline vascular tone, the typical normal hemodynamic pattern includes maintenance or an increase in systolic blood pressure as cardiac output rises. A fall in systolic pressure may occur in selected circumstances and requires clinical interpretation, but it is not the standard paired response described in this question. Stress-echo imaging and hemodynamic monitoring are therefore interpreted together to establish an appropriate physiologic response. The American Society of Echocardiography describes dobutamine stress echocardiography protocols and the expected augmentation of myocardial function in its stress echocardiography guideline. Additional clinical context is available from the NCBI StatPearls review of pharmacologic stress testing.

QUESTION NO: 4

Which type of valvular lesion most commonly requires further evaluation with a non-imaging transducer?

A. Aortic stenosis

B. Mitral regurgitation

C. Tricuspid regurgitation

D. Pulmonic stenosis

ANSWER: A

Explanation:

Aortic stenosis is the valvular lesion most commonly requiring interrogation with a non-imaging continuous-wave Doppler transducer, often called a Pedoff probe. Accurate assessment of aortic stenosis depends on recording the highest obtainable transvalvular velocity because the simplified Bernoulli equation calculates the pressure gradient from velocity squared. Even small underestimation of peak velocity can therefore substantially underestimate the peak and mean aortic valve gradients and may lead to undergrading stenosis severity. The small, non-imaging probe is designed for sensitive continuous-wave Doppler interrogation and can be used from multiple acoustic windows—particularly the right parasternal, suprasternal, and apical windows—to find the Doppler beam alignment most parallel to the often eccentric high-velocity aortic jet. Comprehensive aortic-stenosis examination requires use of multiple windows and documentation of the highest velocity signal, rather than relying solely on the standard imaging transducer from one view. This practice is emphasized in professional echocardiography recommendations for Doppler evaluation of aortic stenosis. See the ASE guideline for echocardiographic evaluation of aortic stenosis and the American Society of Echocardiography guideline recommendations.

QUESTION NO: 5

An apical two-chamber view in a patient with a recent anterior myocardial infarction demonstrates severe apical akinesis, but the endocardial border at the apex is poorly visualized. Which technique is most appropriate to improve exclusion of a left ventricular apical thrombus?

A. Left ventricular opacification with an ultrasound-enhancing agent

B. Increasing two-dimensional gain at the apex

C. Increasing the color Doppler scale

D. Using pulsed-wave Doppler at the mitral leaflet tips

ANSWER: A

Explanation:

Left ventricular opacification with an ultrasound-enhancing agent is correct because contrast improves delineation of the endocardial border and opacifies the ventricular cavity. A thrombus appears as a persistent filling defect surrounded by contrast and is especially important to identify in an akinetic or aneurysmal apex. Increasing two-dimensional gain can worsen near-field clutter and does not reliably distinguish thrombus from poorly seen myocardium. Color Doppler assesses blood-flow direction and velocity but does not provide the same cavity opacification for thrombus detection.

QUESTION NO: 6

Which statement is considered true regarding tricuspid annular plane systolic excursion (TAPSE)?

A. It is a measure of right ventricular diastolic function.

B. It is an indirect measure of left ventricular systolic function.

C. It is angle dependent.

D. The lower reference value is 13 mm.

ANSWER: C

Explanation:

It is angle dependent. TAPSE is obtained by placing an M-mode cursor through the lateral tricuspid annulus in an apical four-chamber view and measuring the annulus's systolic displacement toward the apex. Because this measurement records motion only along the direction of the M-mode cursor, the cursor must be closely aligned with the true longitudinal direction of annular excursion. Misalignment can underestimate the actual displacement; therefore, TAPSE is considered angle dependent. This practical feature is important during image acquisition: an optimized right-ventricle-focused apical view and careful cursor alignment are needed for a reliable value. TAPSE is a simple, reproducible index of longitudinal right-ventricular systolic performance, but its interpretation should account for the fact that it reflects predominantly longitudinal motion of one annular site and can be influenced by imaging alignment and loading conditions. The American Society of Echocardiography describes acquisition of TAPSE using M-mode aligned with lateral tricuspid annular motion in its right-heart assessment recommendations. See the ASE right-heart assessment guideline and the ASE/EACVI chamber quantification recommendations.

QUESTION NO: 7

Which of the following occurs during the strain phase of the Valsalva maneuver?

A. Decreased preload

B. Decreased afterload

C. Increased preload

D. Increased afterload

ANSWER: A

Explanation:

Decreased preload occurs during the strain phase of the Valsalva maneuver. This phase follows forceful expiration against a closed glottis, which markedly raises intrathoracic pressure. The elevated pressure compresses the great thoracic veins and impedes systemic venous return to the right atrium. After a brief interval, reduced right-sided filling leads to reduced pulmonary venous return and therefore diminished left-ventricular filling. In echocardiographic terms, this is a transient reduction in preload.

The preload reduction lowers left-ventricular stroke volume and alters transmitral Doppler filling. In a patient with impaired relaxation and elevated filling pressures, mitral E-wave velocity commonly falls with Valsalva strain, potentially changing a seemingly normal E/A ratio into an impaired-relaxation pattern. This preload response is why a correctly performed Valsalva maneuver can help identify pseudonormal left-ventricular filling when evaluating diastolic function. The maneuver must have an adequate and sustained strain effort for these Doppler changes to be meaningful. The American Society of Echocardiography describes use of Valsalva-induced preload reduction in diastolic-function assessment, and a detailed physiologic review is available from ASE/EACVI diastolic function recommendations and StatPearls: Valsalva Maneuver.

QUESTION NO: 8

A patient with increased left ventricular wall thickness has low-voltage QRS complexes, biatrial enlargement, restrictive filling, and reduced global longitudinal strain with relative preservation of apical strain. Which diagnosis is most consistent with this echocardiographic pattern?

A. Cardiac amyloidosis

B. Hypertensive left ventricular hypertrophy

C. Hypertrophic obstructive cardiomyopathy

D. Athlete’s heart

ANSWER: A

Explanation:

Cardiac amyloidosis is most consistent with this pattern. Infiltration of the myocardium produces apparent ventricular wall thickening, impaired relaxation and compliance, progressive atrial enlargement, and restrictive filling physiology. The discrepancy between increased wall thickness on echocardiography and low-voltage QRS complexes is a useful clinical clue. Relative preservation of apical longitudinal strain compared with more reduced basal and midventricular strain, often described as apical sparing, further supports cardiac amyloidosis. These findings should prompt correlation with clinical features and appropriate laboratory and multimodality evaluation.

QUESTION NO: 9

Which finding is most consistent with this M-mode image?

A. Rheumatic mitral stenosis

B. Mitral valve prolapse

C. Mitral valve annuloplasty ring

D. Systolic anterior motion of the mitral valve

ANSWER: A

Explanation:

Rheumatic mitral stenosis is characterized on mitral-valve M-mode by rheumatic leaflet thickening and restricted diastolic opening. A classic pattern is reduced or absent normal posterior motion of the posterior mitral leaflet, so that both leaflets move anteriorly during diastole (“parallel” anterior motion). The anterior leaflet may show a reduced E–F slope, reflecting impaired early diastolic leaflet closing in the setting of obstruction to transmitral flow. These findings result from commissural fusion and leaflet/subvalvular fibrosis, which are characteristic structural effects of rheumatic mitral valve disease. M-mode is useful for recognizing this classic morphology, although contemporary assessment of stenosis severity should integrate two-dimensional imaging, Doppler-derived transmitral gradients, and mitral valve area because M-mode findings alone do not quantify severity. The American Society of Echocardiography’s recommendations describe the importance of combining valve morphology with Doppler and planimetric assessment in mitral stenosis evaluation. See the ASE guideline for native valvular regurgitation and stenosis assessment and the NCBI StatPearls review of mitral stenosis.

QUESTION NO: 10

During an agitated-saline contrast study, dense opacification of the right atrium is followed by appearance of bubbles in the left atrium within three cardiac cycles. Which finding is most likely?

A. Intracardiac right-to-left shunt

B. Isolated left-to-right atrial septal shunt

C. Severe mitral regurgitation

D. Normal pulmonary venous drainage

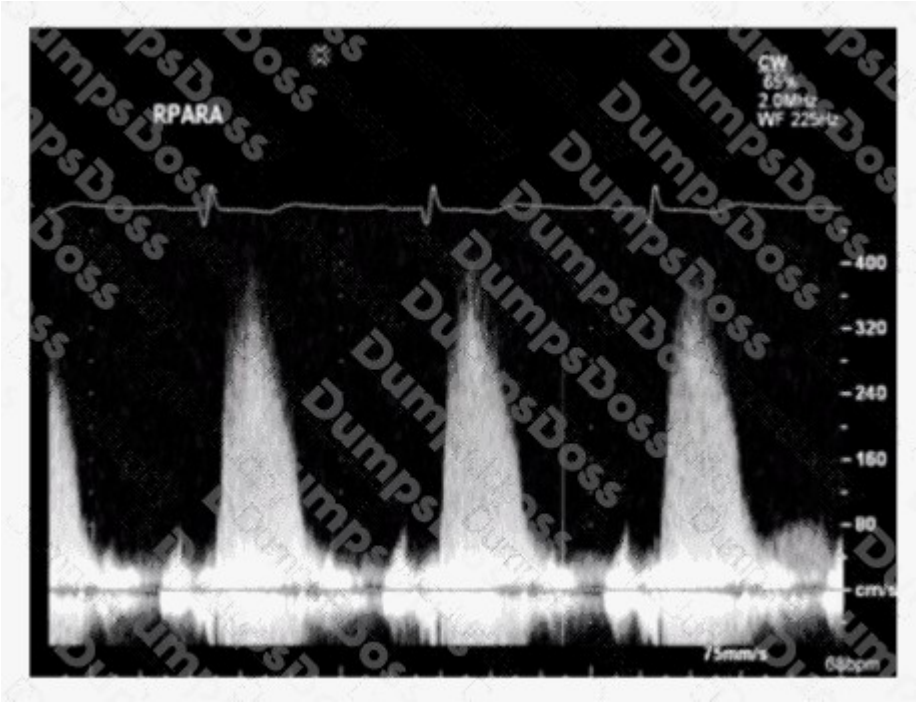
ANSWER: A

Explanation:

An intracardiac right-to-left shunt is most likely because early appearance of agitated-saline microbubbles in the left atrium after right-sided opacification is characteristic of transit across an interatrial communication, such as a patent foramen ovale or atrial septal defect. A properly performed Valsalva maneuver or cough may transiently increase right atrial pressure and facilitate right-to-left passage through a patent foramen ovale. Delayed left-sided appearance after several additional cardiac cycles is more suggestive of transpulmonary passage rather than an intracardiac shunt.

QUESTION NO: 11

Which patient positioning is best for obtaining the waveform seen in this image obtained by a non-imaging transducer?



A. Laying on left side

B. Laying on right side

C. Laying on back with chin down

D. Laying on stomach with left arm raised

ANSWER: B

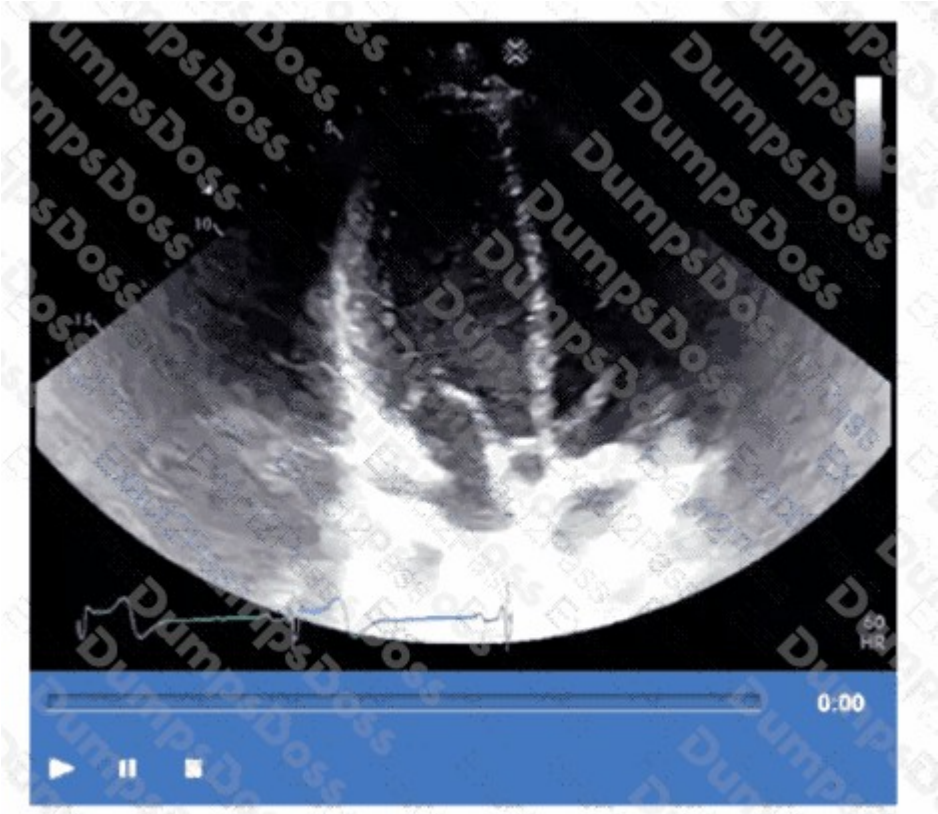
Explanation:

Laying on right side is the best positioning for obtaining the high-velocity continuous-wave Doppler waveform from the right parasternal acoustic window with a non-imaging (PEDOF) transducer. Right lateral decubitus positioning improves access to the right parasternal border and can improve alignment of the Doppler beam with the direction of left ventricular outflow and aortic valve jet flow. Because Doppler-derived velocity depends strongly on parallel alignment between the ultrasound beam and blood flow, even a modest improvement in alignment can produce a more accurate recording of the maximal velocity.

A PEDOF probe is particularly useful when interrogating a suspected high-velocity jet because it permits sensitive continuous-wave Doppler sampling along the entire ultrasound line. In comprehensive Doppler acquisition, the sonographer should seek the envelope with the highest, most complete velocity signal from multiple windows rather than relying on one standard view. The right parasternal window, facilitated by right-side positioning, is an important alternate window for this purpose and may reveal a higher peak velocity than an apical acquisition. This approach is consistent with professional echocardiography guidance for Doppler assessment of aortic stenosis and other high-velocity outflow signals. See the ASE/EACVI recommendations for echocardiographic assessment of aortic stenosis and the ASE adult comprehensive transthoracic echocardiography guideline.

QUESTION NO: 12

Which adjustment should be made to optimize this video?



A. Increase compression

B. Decrease overall gain

C. Increase time gain compensation in the near field

D. Decrease time gain compensation in the far field

ANSWER: C

Explanation:

Increase time gain compensation in the near field is the appropriate adjustment because the superficial portion of the echocardiographic sector is insufficiently bright relative to deeper structures. Time gain compensation (TGC), also called depth gain compensation, permits depth-specific amplification of returning ultrasound echoes. Raising the TGC control corresponding to the near field selectively increases displayed echo amplitude from superficial tissue and anterior cardiac structures, creating a more uniform level of brightness from the top to the bottom of the image. This is preferable to altering a global control when the deficiency is limited to one depth range.

Appropriate gain optimization is important in adult echocardiography because inadequate near-field signal can obscure structures closest to the transducer and reduce confidence in assessment. TGC should be adjusted while observing the entire sector so that blood pool and myocardium are displayed with balanced brightness and diagnostically useful contrast. The American Society of Echocardiography emphasizes optimization of image settings as part of acquisition of comprehensive transthoracic echocardiographic examinations; see its guideline for comprehensive transthoracic echocardiography. General ultrasound-image formation principles, including depth-related attenuation and compensation, are also reviewed by the NCBI Bookshelf ultrasound overview.

QUESTION NO: 13

Which condition is most plausible based on the finding indicated by the arrow on this image?

A. Cardiac tamponade

B. Constrictive pericarditis

C. Pulmonary embolism

D. Pulmonary hypertension

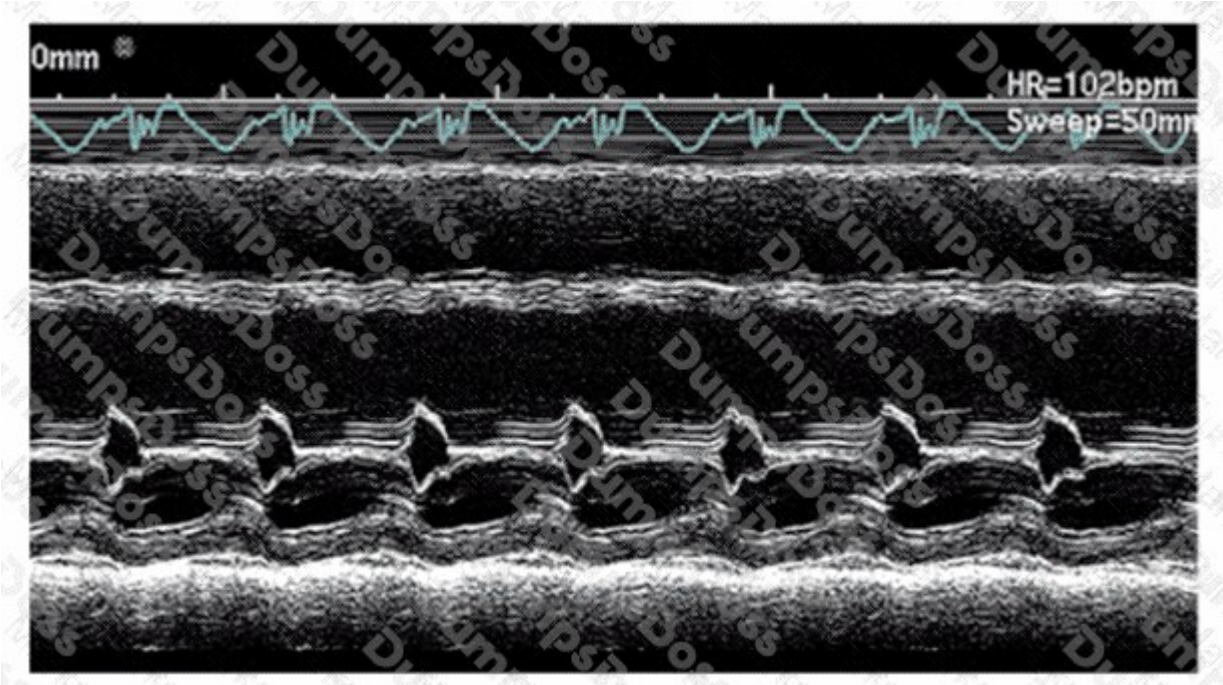
ANSWER: B

Explanation:

Constrictive pericarditis is the most plausible diagnosis because the indicated M-mode finding is an early-diastolic interventricular septal bounce (also termed septal shudder). In constriction, a rigid, noncompliant pericardium permits rapid ventricular filling at the onset of diastole but abruptly limits further expansion once the fixed intrapericardial volume is reached. This produces marked ventricular interdependence: with respiration, changes in filling of one ventricle are transmitted to the other, causing characteristic abnormal interventricular septal motion. The early-diastolic septal shift can be appreciated on two-dimensional imaging or M-mode and supports constrictive physiology when interpreted with the full echocardiographic assessment, including respirophasic ventricular inflow variation, hepatic-vein Doppler findings, and tissue-Doppler annular velocities. The American Society of Echocardiography identifies interventricular dependence and respiration-related septal shift as key echocardiographic features used in evaluating suspected constrictive pericarditis. See the ASE recommendations for multimodality cardiovascular imaging of pericardial disease and the European Society of Cardiology pericardial-disease guidelines.

QUESTION NO: 14

Which condition is most likely demonstrated by this M-mode image?



A. Dilated cardiomyopathy

B. Hypertrophic cardiomyopathy

C. Mitral valve prolapse

D. Mitral stenosis

ANSWER: D

Explanation:

Mitral stenosis is demonstrated by the characteristic M-mode appearance of restricted diastolic excursion of the mitral valve leaflets, particularly anterior leaflet diastolic doming. Rheumatic involvement commonly produces commissural fusion, leaflet thickening, and subvalvular changes that impede normal valve opening. On an M-mode tracing through the mitral valve, the

normal rapid early-diastolic opening pattern is replaced by a reduced opening slope, often described as a flattened E–F slope, with persistent abnormal anterior leaflet curvature or “hockey-stick” doming. These findings reflect the fixed obstruction to transmitral flow during diastole. M-mode can therefore provide a classic qualitative clue to mitral stenosis, although contemporary assessment also requires two-dimensional imaging, color Doppler, continuous-wave Doppler transmitral velocity, mean diastolic gradient, and valve-area assessment. The American Society of Echocardiography notes that echocardiography is central to defining mitral stenosis anatomy and hemodynamic severity, while the ASE M-mode recommendations describe the normal and abnormal mitral leaflet motion patterns used in image interpretation. See the ASE guideline resource library and the ASE comprehensive transthoracic echocardiography guideline.

QUESTION NO: 15

A patient with known mitral stenosis has a planimetered mitral valve area of 1.3 cm^2 on two examinations. During the second examination, the heart rate is 120 beats/min because of fever and anemia, and the mean transmitral gradient increases from 5 mm Hg to 12 mm Hg. Which interpretation is most appropriate?

A. The mitral valve area has necessarily decreased

B. The increased gradient reflects increased flow across a fixed valve area

C. The patient has developed severe aortic regurgitation

D. The planimetered mitral valve area is invalid in sinus tachycardia

ANSWER: B

Explanation:

The increased mean gradient is most likely related to increased transmitral flow and shortened diastolic filling time. Mean transmitral gradient is flow dependent and rises when cardiac output and heart rate increase, even if the anatomic mitral valve area is unchanged. Tachycardia further shortens diastole, increasing the hemodynamic effect of a fixed stenotic orifice. The gradient therefore should not be interpreted in isolation as evidence that the valve area has suddenly become smaller; valve morphology, planimetry, heart rate, rhythm, and flow conditions must be considered together.