INTERVENTIONAL CARDIOLOGY Blueprint

For traditional, 10-year Maintenance of Certification (MOC) exam and Longitudinal Knowledge Assessment (LKA®)

ABIM invites diplomates to help develop the Interventional Cardiology MOC exam blueprint

Based on feedback from physicians that MOC assessments should better reflect what they see in practice, in 2016 the American Board of Internal Medicine (ABIM) invited all certified interventional cardiologists to provide ratings of the relative frequency and importance of blueprint topics in practice.

This review process, which resulted in a new MOC exam blueprint, will be used on an ongoing basis to inform and update all MOC assessments created by ABIM. No matter what form ABIM's assessments ultimately take, they will need to be informed by front-line clinicians sharing their perspective on what is important to know.

A sample of over 275 interventional cardiologists, similar to the total invited population of interventional cardiologists in age, gender, time spent in direct patient care, and geographic region of practice, provided the blueprint topic ratings. ABIM used this feedback to update the blueprint for the MOC assessment (beginning with the Fall 2017 administration).

To inform how assessment content should be distributed across the major blueprint content categories, ABIM considered the average respondent ratings of topic frequency and importance in each of the content categories.

To determine prioritization of specific assessment content within each major medical content category, ABIM used the respondent ratings of topic frequency and importance to set thresholds for these parameters in the exam assembly process (described further under *Detailed content outline* below).

Purpose of the Interventional Cardiology MOC Assessments

MOC assessments are designed to evaluate whether a certified interventional cardiologist has maintained competence and currency in the knowledge and judgment required for practice. The exam emphasizes diagnosis and management of prevalent conditions, particularly in areas where practice has changed in recent years. As a result of the blueprint review by ABIM diplomates, the MOC assessments place less emphasis on rare conditions and focuses more on situations in which physician intervention can have important consequences for patients. For conditions that are usually managed by other specialists, the focus will be on recognition rather than on management.

Assessment format

The traditional, 10-year MOC exam is composed of 220 single-best-answer multiple- choice questions, of which approximately 35 are new questions that do not count in the examinee's score. Examinees taking the traditional, 10-year MOC exam will have access to an external resource (i.e., UpToDate®) for the entire exam.

The LKA for MOC, is a five-year cycle in which physicians answer questions on an ongoing basis and receive feedback on how they're performing along the way. More information on how exams are developed can be found at abim.org/about/exam-information/exam-development.aspx.

Most questions describe patient scenarios and ask about the work done (that is, tasks performed) by physicians in the course of practice:

- **Diagnosis:** making a diagnosis or identifying an underlying condition
- **Testing:** ordering tests for diagnosis, staging, or follow-up
- **Treatment/Care Decisions**: recommending treatment or other patient care
- **Risk Assessment/Prognosis/Epidemiology:** assessing risk, determining prognosis, and applying principles from epidemiologic studies
- **Pathophysiology/Basic Science:** understanding the pathophysiology of disease and basic science knowledge applicable to patient care

ABIM is committed to working toward health equity and believes that board-certified physicians should have an understanding of health care disparities. Therefore, health equity content that is clinically important to each discipline will be included in assessments, and the use of gender, race, and ethnicity identifiers will be re-evaluated.

Some questions require interpretation of pictorial material, such as coronary angiograms, ventriculograms, intravascular ultrasound images, nuclear perfusion studies, computed tomograms, magnetic resonance images, electrocardiograms, echocardiograms, and peripheral vascular imaging studies.

Exam tutorials, including examples of question format, can be found at abim.org/maintenance-of-certification/exam-information/interventional-cardiology/exam-tutorial.aspx.

Content distribution

Listed below are the major medical content categories that define the domain for the Interventional Cardiology traditional, 10-year MOC and LKA. The relative distribution of content is expressed as a percentage of the total assessment. To determine the content distribution, ABIM considered the average respondent ratings of topic frequency and importance. Informed by these data, the Interventional Cardiology Approval Committee and Cardiovascular Board have determined the medical content category targets shown below.

CONTENT CATEGORY	TARGET %
Case Selection and Management	**23%**
Procedural Techniques	**22%**
Complications of Coronary Intervention	**8%**
Catheter-Based Management of Noncoronary Disease	**10%**
Basic Science	**5%**
Anatomy, Anatomic Variants, and Anatomic Pathology	**6%**
Pharmacology	**14%**
Cardiac Imaging and Assessment	**7%**
Miscellaneous	**5%**
Total	**100%**

How the blueprint ratings are used to assemble the MOC assessment

Blueprint reviewers provided ratings of relative frequency in practice for each of the detailed content topics in the blueprint and provided ratings of the relative importance of the topics for each of the tasks described in *Assessment format* above. In rating importance, reviewers were asked to consider factors such as the following:

- High risk of a significant adverse outcome
- Cost of care and stewardship of resources
- Common errors in diagnosis or management
- Effect on population health
- Effect on quality of life
- When failure to intervene by the physician deprives a patient of significant benefit

Frequency and importance were rated on a three-point scale corresponding to low, medium, or high. The median importance ratings are reflected in the *Detailed content outline* below. The Interventional Cardiology Approval Committee and Cardiovascular Board, in partnership with the physician community, have set the following parameters for selecting MOC assessment questions according to the blueprint review ratings:

- At least 75% of questions will address high-importance content (indicated in green)
- No more than 25% of questions will address medium-importance content (indicated in yellow)
- No exam questions will address low-importance content (indicated in red)

Independent of the importance and task ratings, no more than 15% of questions will address low-frequency content (indicated by “LF” following the topic description).

The content selection priorities below are applicable beginning with the Fall 2017 traditional, 10-year MOC exam and are subject to change in response to future blueprint review.

Note: *The same topic may appear in more than one medical content category.*

Detailed content outline for the Interventional Cardiology traditional, 10-year MOC exam and the LKA

✓ – ***High Importance***: *At least 75% of questions will address topics and tasks with this designation.*

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CASE SELECTION AND MANAGEMENT *(23% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
CHRONIC ISCHEMIC HEART DISEASE *(7% of exam)*					
Clinical characteristics (demographics and comorbidities)	✓	✓	✓	✓	⁄
Laboratory abnormalities and cardiac catheterization (hematology, coagulation, and chemistry)	✓	✓	✓	✓	⁄
Renal insufficiency and cardiac catheterization	✓	✓	✓	✓	✓
Noninvasive testing before diagnostic catheterization	✓	✓	✓	✓	✓
Selection of treatment modality	✓	✓	✓	✓	✓
Interventional therapy	✓	✓	✓	✓	✓
Surgical therapy	✓	✓	✓	✓	⁄
Medical therapy	✓	✓	✓	✓	✓
Preoperative cardiac evaluation for noncardiac surgery	✓	✓	✓	✓	⁄
Preoperative revascularization before noncardiac surgery	✓	✓	✓	✓	⁄
UNSTABLE ANGINA AND NON-ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION (UA AND NSTEMI) *(6% of exam)*					
Evaluation and risk stratification of the UA and NSTEMI	✓	✓	✓	✓	✓
UA/NSTEMI – pharmacologic management	✓	✓	✓	✓	✓
UA/NSTEMI – timing of cardiac catheterization	✓	✓	✓	✓	✓
UA/STEMI – percutaneous coronary intervention (PCI)	✓	✓	✓	✓	✓

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CASE SELECTION AND MANAGEMENT *continued…* *(23% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION (STEMI) *(6% of exam)*					
STEMI systems of care	✓	✓	✓	✓	✓
Primary PCI – procedure	✓	✓	✓	✓	✓
Primary PCI – stents	✓	✓	✓	✓	✓
Primary PCI – thrombectomy	✓	✓	✓	✓	✓
Primary PCI – outcomes	✓	✓	✓	✓	✓
Right ventricular infarction **LF**	✓	✓	✓	✓	✓
Multivessel PCI	✓	✓	✓	✓	✓
Primary PCI following cardiopulmonary arrest	✓	✓	✓	✓	✓
STEMI – differential diagnosis	✓	✓	✓	✓	✓
Acute aortic dissection **LF**	✓	✓	✓	✓	✓
Therapeutic hypothermia	✓	✓	✓	✓	✓
Fibrinolytic therapy **LF**	✓	✓	✓	✓	✓
Transfer for PCI	✓	✓	✓	✓	✓
Rescue PCI **LF**	✓	✓	✓	✓	✓
Surgical therapy in STEMI **LF**	✓	✓	✓	✓	✓
Medical management after STEMI	✓	✓	✓	✓	✓
STEMI COMPLICATIONS *(4% of exam)*					
Shock	✓	✓	✓	✓	✓
Cardiac Arrest	✓	✓	✓	✓	✓
Electrophysiologic complications	✓	✓	✓	✓	✓
Emergency pacing **LF**	✓	✓	✓	✓	✓
Acute respiratory distress	✓	✓	✓	✓	✓
Mechanical complications (mitral regurgitation [MR], ventricular septal defect [VSD], rupture, pseudoaneurysm) **LF**	✓	✓	✓	✓	✓

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PROCEDURAL TECHNIQUES *(22% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
PLANNING AND EXECUTION OF INVASIVE AND INTERVENTIONAL PROCEDURES *(6% of exam)*					
General decision-making	✓	✓	✓	✓	✓
Access-site selection	✓	✓	✓	✓	✓
Radial access	✓	✓	✓	✓	/
Femoral access	✓	✓	✓	✓	✓
Other access (ulnar, brachial) **LF**	/	/	/	✗	✗
Vascular access closure devices	✓	✓	✓	✓	✓
Pericardiocentesis **LF**	✓	✓	✓	✓	✓
Right heart catheterization	✓	✓	✓	✓	✓
Right ventricular biopsy **LF**	/	/	/	✗	/
LESION SUBSETS *(6% of exam)*					
Ostial	✓	✓	✓	✓	/
Bifurcation	✓	✓	✓	✓	✓
Long	✓	✓	✓	✓	✓
Tortuous	✓	✓	✓	✓	/
Calcified	✓	✓	✓	✓	/
Restenosis	✓	✓	✓	✓	✓
Complex single-vessel disease	✓	✓	✓	✓	✓
Multivessel disease	✓	✓	✓	✓	✓
Saphenous vein graft disease	✓	✓	✓	✓	/
Coronary artery bridge **LF**	/	/	/	/	/
PCI in the anomalous coronary **LF**	/	/	/	/	/
Left main	✓	✓	✓	✓	✓
Chronic total occlusion	✓	✓	✓	✓	/

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PROCEDURAL TECHNIQUES *continued…* *(22% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
SELECTION AND USE OF EQUIPMENT *(6% of exam)*					
Guide catheters	✓	✓	✓	✓	✓
Guidewires	✓	✓	✓	✓	✓
Balloon catheters	✓	✓	✓	✓	✓
Bare metal stents	✓	✓	✓	✓	✓
Drug-eluting stents	✓	✓	✓	✓	✓
Plaque modification (Rotational atherectomy, orbital atherectomy, lithotripsy, laser) **LF**	✓	✓	✓	✓	✓
Embolic protection devices	✓	✓	✓	✓	✓
Intraaortic balloon pump counterpulsation	✓	✓	✓	✓	✓
Impella **LF**	✓	✓	✓	✓	✓
TandemHeart PTVA **LF**	✗	✗	✗	✗	✗
Extracorporeal membrane oxygenation (ECMO) **LF**	✗	✗	✓	✗	✗
PCI TECHNICAL TROUBLESHOOTING AND PROBLEM SOLVING *(4% of exam)*					
Failure to engage guide catheter	✓	✓	✓	✓	✓
Failure to cross lesion with guidewire **LF**	✓	✓	✓	✓	✓
Failure to cross lesion with device **LF**	✓	✓	✓	✓	✓
Failure to dilate lesion **LF**	✓	✓	✓	✓	✓

COMPLICATIONS OF CORONARY INTERVENTION *(8% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
CARDIAC *(5% of exam)*					
Coronary dissection	✓	✓	✓	✓	✓
Abrupt closure of coronary artery **LF**	✓	✓	✓	✓	✓
Stent thrombosis **LF**	✓	✓	✓	✓	✓
Coronary thromboembolism **LF**	✓	✓	✓	✓	✓
Air embolism **LF**	✓	✓	✓	✓	✓

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COMPLICATIONS OF CORONARY INTERVENTION *continued…* *(8% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
CARDIAC *continued… (5% of exam)*					
No reflow LF	✓	✓	✓	✓	✓
Periprocedural myocardial infarction LF	✓	✓	✓	✓	⊘
Perforation LF	✓	✓	✓	✓	✓
Tamponade LF	✓	✓	✓	✓	✓
NONCARDIAC *(3% of exam)*					
Systemic thromboembolism LF	✓	✓	✓	⊘	⊘
Cerebrovascular complications LF	✓	✓	✓	✓	✓
Bleeding and hemorrhage	✓	✓	✓	✓	✓
Vascular access and major vessel dissection LF	✓	✓	✓	✓	✓
Aortic dissection (due to PCI) LF	✓	✓	✓	✓	⊘
Acute limb ischemia LF	✓	✓	✓	✓	⊘

CATHETER-BASED MANAGEMENT OF NONCORONARY DISEASE *(10% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
HEMODYNAMICS *(2% of exam)*					
Arterial pressure evaluation	✓	✓	✓	✓	⊘
Right heart catheterization	✓	✓	✓	✓	⊘
Valvular stenosis	✓	✓	✓	✓	✓
Valvular regurgitation	✓	✓	✓	✓	✓
Shunt quantification LF	✓	⊘	✓	⊘	⊘
EVALUATION AND CASE SELECTION IN STRUCTURAL AND VALVULAR HEART DISEASE *(4% of exam)*					
Structural heart disease	✓	✓	✓	✓	⊘
Mitral valve	✓	✓	✓	✓	⊘
Aortic valve	✓	✓	✓	✓	✓
Pulmonic valve LF	⊘	⊘	⊘	✗	✗

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CATHETER-BASED MANAGEMENT OF NONCORONARY DISEASE *continued…* *(10% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
EVALUATION AND CASE SELECTION IN STRUCTURAL AND VALVULAR HEART DISEASE *continued… (4% of exam)*					
Tricuspid valve	⊘	⊘	⊘	⊘	⊘
Hypertrophic cardiomyopathy **LF**	✓	✓	✓	✓	⊘
Patent foramen ovale	⊘	⊘	⊘	⊘	⊘
Atrial septal defect **LF**	⊘	⊘	⊘	⊘	⊘
Coarctation **LF**	⊘	⊘	⊘	⊘	✗
Ventricular septal defect **LF**	⊘	⊘	⊘	⊘	⊘
EVALUATION AND CASE SELECTION IN NONCARDIAC VASCULAR DISEASE *(4% of exam)*					
Carotid disease	✓	✓	✓	✓	⊘
Subclavian disease **LF**	⊘	⊘	⊘	⊘	⊘
Aortic disease	⊘	⊘	✓	⊘	⊘
Chronic aortic dissection **LF**	⊘	⊘	⊘	⊘	⊘
Renal artery stenosis	⊘	⊘	⊘	⊘	⊘
Iliac and femoral arterial disease	✓	✓	✓	✓	⊘
Peripheral interventional therapy	✓	✓	✓	✓	⊘
Ankle-brachial index	✓	✓	✓	✓	⊘

BASIC SCIENCE *(5% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
VASCULAR BIOLOGY *(3% of exam)*					
Normal vascular biology **LF**	⊘	⊘	⊘	⊘	⊘
Atherosclerosis	✓	✓	✓	✓	⊘
Atherosclerotic plaque	✓	✓	✓	✓	✓
Vascular injury	⊘	⊘	✓	⊘	⊘
Vasoreactivity	⊘	⊘	⊘	⊘	⊘
Reperfusion injury	⊘	⊘	⊘	⊘	⊘

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BASIC SCIENCE *continued…* *(5% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
VASCULAR BIOLOGY *continued… (3% of exam)*					
Effects of diabetes mellitus	✓	✓	✓	✓	⁄
Restenosis after balloon percutaneous transluminal coronary angioplasty (PTCA)	✓	✓	✓	⁄	⁄
Restenosis after stent PCI	✓	✓	✓	✓	⁄
Vascular remodeling	⁄	⁄	⁄	⁄	⁄
Microvascular dysfunction	⁄	⁄	⁄	⁄	⁄
PHYSIOLOGY *(2% of exam)*					
Clotting cascade	⁄	⁄	⁄	⁄	⁄
Platelet function	⁄	⁄	⁄	⁄	⁄
Thrombosis and thrombolysis	✓	⁄	⁄	⁄	⁄
Lipid metabolism and lipid abnormalities	✓	✓	✓	✓	⁄
ANATOMY, ANATOMIC VARIANTS, AND ANATOMIC PATHOLOGY *(6% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
CARDIAC *(5% of exam)*					
Normal coronary anatomy, dominance	✓	✓	✓	✓	⁄
Anomalous left circumflex **LF**	✓	⁄	⁄	⁄	⁄
Anomalous left coronary **LF**	✓	⁄	⁄	⁄	⁄
Anomalous right coronary **LF**	✓	⁄	⁄	⁄	⁄
Indications for surgery for coronary anomalies **LF**	✓	⁄	✓	✓	⁄
Collateral vessels	✓	⁄	⁄	⁄	⁄
Coronary fistulas **LF**	⁄	⁄	⁄	⁄	⁄
Coronary ectasia and aneurysm	⁄	⁄	⁄	⁄	⁄
Other anatomic abnormalities **LF**	⁄	⁄	⁄	✗	✗

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ANATOMY, ANATOMIC VARIANTS, AND ANATOMIC PATHOLOGY *continued…* *(6% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
CARDIAC *continued… (5% of exam)*					
Angiographic assessment of coronary flow (Thrombolysis in Myocardial Infarction Trial [TIMI] flow grade)	✓	✓	✓	✓	/
Angiographic assessment of microcirculation (TIMI myocardial perfusion grade)	/	/	/	/	/
Flow and perfusion effects of arterial spasm, or microembolization	/	/	/	/	/
Left ventriculography	✓	✓	✓	✓	/
Left ventricular dysfunction – stunning and hibernation	✓	✓	✓	✓	/
Takotsubo syndrome	✓	✓	✓	✓	/
Spontaneous Coronary Artery Dissection (SCAD)	✓	✓	✓	✓	✓
EXTRACARDIAC *(<2% of exam)*					
Aortic arch anatomy and variants **LF**	/	/	/	/	/
Arterial anatomy of the cerebral vessels **LF**	/	/	/	✗	✗
Arterial anatomy of the upper extremities and variants	/	/	/	/	/
Arterial anatomy of the abdominal vessels **LF**	/	/	/	/	/
Arterial anatomy of the lower extremities and variants	/	/	/	/	/
Superior vena cava (SVC) and inferior vena cava (IVC) anatomy and variants **LF**	/	/	/	✗	✗

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PHARMACOLOGY *(14% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
GENERAL *(4% of exam)*					
Vasopressors	✓	✓	✓	✓	✓
Inotropes	✓	✓	✓	✓	✓
Vasodilators	✓	✓	✓	✓	⊘
Moderate sedation	✓	⊘	✓	⊘	⊘
Reversal agents **LF**	✓	⊘	✓	⊘	⊘
Local anesthetic agents	⊘	⊘	⊘	⊘	⊘
Drug-eluting stent (DES) compounds	✓	✓	✓	✓	✓
Fibrinolytic agents **LF**	⊘	⊘	⊘	⊘	⊘
Anti-arrhythmic agents	✓	✓	✓	✓	✓
Anti-anginal agents	✓	✓	✓	✓	✓
Anti-lipid agents	✓	✓	✓	✓	✓
INTRAVENOUS ANTIPLATELET AGENTS *(<2% of exam)*					
Eptifibatide	⊘	⊘	⊘	⊘	⊘
Tirofiban **LF**	⊘	⊘	⊘	⊘	⊘
Cangrelor **LF**	⊘	⊘	⊘	⊘	⊘
ORAL ANTIPLATELET AGENTS *(3% of exam)*					
Aspirin	✓	✓	✓	✓	✓
Clopidogrel	✓	✓	✓	✓	✓
Prasugrel	✓	✓	✓	✓	✓
Ticagrelor	✓	✓	✓	✓	✓
Cilostazol **LF**	⊘	⊘	⊘	⊘	⊘
Platelet function testing (genotype and phenotype) **LF**	⊘	⊘	⊘	✗	✗

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PHARMACOLOGY *continued…* *(14% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
INTRAVENOUS ANTICOAGULANTS *(2% of exam)*					
Unfractionated heparin	✓	✓	✓	✓	✓
Low-molecular-weight heparins	✓	✓	✓	✓	✓
Bivalirudin	✓	✓	✓	✓	✓
ORAL ANTICOAGULANTS *(2% of exam)*					
Warfarin	✓	✓	✓	✓	✓
Novel oral anticoagulants	✓	✓	✓	✓	✓
CONTRAST AGENTS *(2% of exam)*					
Contrast physics	⊘	⊘	⊘	⊘	⊘
Osmolality and other properties **LF**	⊘	⊘	⊘	⊘	⊘
Contrast-induced Nephropathy **LF**	✓	✓	✓	✓	✓
Contrast allergy and anaphylactoid reactions **LF**	✓	✓	✓	✓	✓
CARDIAC IMAGING AND ASSESSMENT *(7% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
GENERAL TESTS *(<2% of exam)*					
Stress testing	✓	✓	✓	✓	⊘
Stress test imaging	✓	✓	✓	✓	⊘
Transthoracic echocardiography	✓	✓	✓	✓	⊘
Transesophageal echocardiography	✓	✓	✓	✓	⊘
Intracardiac echocardiography **LF**	✗	✗	✗	✗	✗
Magnetic resonance imaging **LF**	⊘	⊘	⊘	✗	✗
Computed tomography angiography (CTA)	⊘	⊘	⊘	⊘	✗
Structural cardiac imaging **LF**	⊘	⊘	⊘	✗	✗

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✓ – ***Medium Importance***: *No more than 25% of questions will address topics and tasks with this designation.*

✗ – ***Low Importance***: *No questions will address topics and tasks with this designation.*

LF – ***Low Frequency***: *No more than 15% of questions will address topics with this designation, regardless of task or importance.*

CARDIAC IMAGING AND ASSESSMENT *continued…* *(7% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
DIAGNOSTIC CORONARY IMAGING *(5% of exam)*					
Catheter shapes and sizes	✓	✓	✓	✓	✓
Angiographic views and techniques	✓	✓	✓	✓	✓
Coronary lesion morphology (plaque, stenosis, and thrombus)	✓	✓	✓	✓	✓
Fractional flow reserve (FFR), instantaneous wave-free ratio (iFR), and coronary flow reserve (CFR)	✓	✓	✓	✓	✓
Intravascular ultrasonography (IVUS)	✓	✓	✓	✓	✓
Optical coherence tomography (OCT) **LF**	✓	✓	✓	✗	✗
Microvascular assessment (example, MINOCA) **LF**	✓	✓	✓	✓	✓
X-RAY RADIOGRAPHY *(<2% of exam)*					
Radiation physics and safety	✓	✓	✓	✓	✓
Radiographic imaging chain **LF**	✓	✓	✓	✗	✗
Radiation exposure parameters	✓	✓	✓	✓	✓
Risks, injury, and methods of control	✓ – Task not otherwise specified				
Equipment operation and imaging techniques	✓	✓	✓	✓	✓

MISCELLANEOUS *(5% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
ETHICAL AND LEGAL ISSUES AND RISKS *(<2% of exam)*					
Patient consent	✓	✓	✓	✓	*Not Applicable*
Patient safety	✓	✓	✓	✓	*Not Applicable*
Ethics and professionalism	✓	✓	✓	✓	*Not Applicable*
Documentation requirements for operative and invasive procedures	*Not Applicable*	✓	✓	✓	*Not Applicable*

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MISCELLANEOUS *continued…* *(5% of exam)*	**Diagnosis**	**Testing**	**Treatment/ Care Decisions**	**Risk Assessment/ Prognosis/ Epidemiology**	**Pathophysiology/ Basic Science**
PROCEDURE-RELATED DATA *(2% of exam)*					
Statistics and literature interpretation	⊘	⊘	✓	✓	*Not Applicable*
Epidemiology	⊘	⊘	⊘	⊘	⊘
Cost, cost-effectiveness, and quality of life	⊘	✓	✓	⊘	*Not Applicable*
QUALITY OF CARE AND PROCEDURE APPROPRIATENESS *(2% of exam)*					
Clinical quality measurement and performance improvement *(<2% of exam)*	⊘	✓	✓	⊘	*Not Applicable*
Appropriate Use Criteria (AUC)	⊘	✓	✓	⊘	*Not Applicable*
Adverse event reporting and device surveillance	⊘	⊘	⊘	⊘	*Not Applicable*
Heart Team Approach	⊘	⊘	✓	✓	*Not Applicable*