CBCCT
Certification Board of
Cardiovascular Computed Tomography

APCA™
Alliance for Physician
Certification & Advancement

# Cardiovascular Computed Tomography Examination
# Content Outline Summary

| | Domain | Percentage |
|---|---|---|
| 1 | Performing Pre-Exam Tasks | 14% |
| 2 | Performing In-Suite Exam Functions | 16% |
| 3 | Interpreting and Managing CT Findings | 55% |
| 4 | Performing Post-Scan Tasks and Reporting Findings | 15% |
| Total | | 100% |

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**(Detailed Outline)**

| 1. | Performing Pre-Exam Tasks 14% | Knowledge, skill and/or ability related to performing pre-exam tasks |
|---|---|---|
| | | |
| 1.A | Review prior focused medical history and clinical information | Knowledge of test relative and absolute contraindications<br>Knowledge of proper breath holding techniques<br>Knowledge of medications used in cardiovascular CT (such as beta blockers, calcium blockers, nitrates and ivabradine)<br>Knowledge of informed consent<br>Knowledge of diagnostic capabilities and limitations of the test<br>Knowledge of cardiovascular tests and alternative options<br>Knowledge of cardiovascular medicine as it pertains to cardiovascular CT, including calcium scoring<br>Knowledge of appropriate use criteria and relevant guidelines<br>Skill in communicating with patients, other physicians and other healthcare providers<br>Ability to integrate information and modify the planned procedure as required<br>Ability to identify critical information that might affect test indication, appropriateness, safety and performance |
| 1.B | Evaluate clinical indications considering appropriate use criteria | |
| 1.C | Educate referring physician and other health care providers | |
| 1.D | Perform or direct pre-test counseling for patient | |
| 1.E | Screen for contraindications | |
| 1.F | Perform or direct pre-test patient preparation and test instructions | |
| **2.** | **Performing In-Suite Exam Functions 16%** | **Knowledge, skill and/or ability related to performing in-suite exam functions** |
| | | |
| 2.A | Supervise patient (pre-test, intra-scan, post-test) treatment optimization | Knowledge of cardiovascular CT physics<br>Knowledge of contrast resolution and signal-to-noise ratios<br>Knowledge of contrast administration and contrast agents<br>Knowledge of how pacemakers affect cardiac CT scanning<br>Knowledge of pacemaker optimization options<br>Knowledge of proper ECG gating techniques and trouble-shooting<br>Knowledge of radiation dose reduction strategies<br>Knowledge of scanner capabilities and limitations<br>Knowledge of scanning protocol options<br>Knowledge of signs, symptoms and management of adverse contrast reactions<br>Knowledge of venous access and injection options, issues and complications<br>Ability to articulate instructions to technologists<br>Ability to assess scan artifacts and determine remedy<br>Ability to identify poor quality scans and make adjustments in scanning reconstruction<br>Ability to identify significance of and manage heart rate and arrhythmias<br>Ability to recognize and manage cardiovascular or other clinical distress |
| 2.B | Manage heart rate and recognize arrhythmias | |
| 2.C | Adjust pacemaker settings as applicable for optimal scanning | |
| 2.D | Select scanning protocol and troubleshoot scanning acquisition problems | |
| 2.E | Perform scan quality assessment | |
| 2.F | Practice radiation safety principles | |
| **3.** | **Interpreting and Managing CT Findings 55%** | **Knowledge, skill and/or ability related to interpreting and managing CT findings** |
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| 3.A | Check for scan artifacts | Knowledge of standard nomenclature for coronary segments and dominance<br>Knowledge of various artifacts, their sources and their potential remedies (including artifacts related to bright structures, image processing artifacts and motion artifacts)<br>Ability to adjust scan parameters for cardiac vein scanning<br>Ability to apply proper acquisition modes (including LVADs)<br>Ability to apply protocols pertinent to cardiac chambers<br>Ability to apply protocols pertinent to cardiac function and assessment<br>Ability to apply protocols pertinent to valvular evaluation<br>Ability to assess pulmonary number, size, location and anomalies<br>Ability to correctly recognize and categorize coronary stenoses, location, severity, significance and risk<br>Ability to differentiate high risk from low risk coronary anomalies<br>Ability to identify non diagnostic scans or segments<br>Ability to interpret calcium score (including Agatston score, plaque volume, plaque mass, percentile) |
| 3.B | Assess coronary anatomy | |
| 3.C | Quantify coronary artery stenosis | |
| 3.D | Assess coronary stents | |
| 3.E | Assess coronary artery bypass grafts | |
| 3.F | Assess chronic total occlusions | |
| 3.G | Perform plaque characterizations (e.g., identify high risk plaque) | |

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|---|---|---|
| 3.H | Assess coronary anomalies | Ability to measure size and categorize pericardial thickness<br>Ability to measure size and function of cardiac chambers<br>Ability to recognize and classify segmental and global cardiac function and pathology<br>Ability to recognize aortic pathology<br>Ability to recognize appendage pathology<br>Ability to recognize cardiac chamber pathologies<br>Ability to recognize cardiac devices (including variety and impact on interpretation)<br>Ability to recognize cardiac vein pathology<br>Ability to recognize congenital heart disease<br>Ability to recognize coronary anomalies<br>Ability to recognize high risk plaque features (such as high plaque volume, positive remodeling, spotty calcification, napkin ring sign, low attenuation plaque)<br>Ability to recognize indications for cardiac vein assessment<br>Ability to recognize indications for pulmonary vein assessment<br>Ability to recognize mediastinal and hilar pathology<br>Ability to recognize myocardium pathology (e.g., infarction, perfusion, aneurysm, masses, viability)<br>Ability to recognize non coronary calcium (such as MAC)<br>Ability to recognize pathology related to device (e.g, pacer, ICD, hemodaynamic support, etc.)<br>Ability to recognize pathology of other non-vascular structures (such as bones, other soft tissue, etc.)<br>Ability to recognize pleural effusions<br>Ability to recognize pulmonary nodules/tumors<br>Ability to recognize pulmonary vein pathology<br>Ability to recognize septum pathology<br>Ability to recognize the differences in scanning and interpreting bypasses of different types and locations<br>Ability to recognize the differences in scanning and interpreting stents of different sizes and types<br>Ability to recognize the differences in scanning parameters for known chronic total occlusions<br>Ability to recognize the limitations of distinguishing subtotal and total occlusions<br>Ability to recognize the pertinent anatomic considerations when interpreting known chronic total occlusions<br>Ability to recognize therapeutic and prognostic implications of coronary pathology |
| 3.I | Assess pulmonary veins | |
| 3.J | Assess cardiac veins | |
| 3.K | Assess cardiac chambers | |
| 3.L | Assess cardiac function | |
| 3.M | Assess pericardium | |
| 3.N | Assess native/artificial valves | |
| 3.O | Assess myocardium | |
| 3.P | Assess appendage | |
| 3.Q | Assess septum (atrial/ventricular) | |
| 3.R | Assess percutaneous valvuloplasty procedures (e.g., feasibility of, TAVR, etc.) | |
| 3.S | Assess congenital heart disease | |
| 3.T | Assess aorta | |
| 3.U | Assess pulmonary artery | |
| 3.V | Assess vascular anomalies | |
| 3.W | Assess common lung disease, pulmonary nodules/tumors and pleural effusions | |
| 3.X | Assess mediastinal and hilar pathology | |
| 3.Y | Assess other non-vascular structures (e.g., bones, soft tissue) | |
| 3.Z | Assess calcium scoring | |
| **4.** | **Performing Post-Scan Tasks and Reporting Findings 15%** | **Knowledge, skill and/or ability related to performing post-scan tasks and reporting findings** |
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| 4.A | Supervise reconstruction protocols | Knowledge of the storage parameters for raw and reconstructed data<br>Knowledge of reformatting types, including strengths and limitations<br>Knowledge of DICOM and PACS storage capabilities and limitations<br>Knowledge of image quality resolutions (such as contrast, temporal, spatial and field-of-view)<br>Ability to reconstruct raw data<br>Ability to utilize full capacity of workstation tools<br>Ability to reconstruction and post-processing options and indications for use<br>Ability to actively reformat multi planar images to improve image quality and diagnostic accuracy |
| 4.B | Actively perform post-processing (i.e., manipulation and reformatting at workstation) | |
| 4.C | Evaluate and treat adverse contrast reactions and extravasations | |
| 4.D | Evaluate and manage contrast-induced nephropathy | |