

FUJIFILM

Protocol



FujiFilm: SCENARIA View + Focus Edition

This patient preparation protocol aligns with the 2016 SCCT Guidelines for the performance and acquisition of coronary computed tomographic angiography.¹

Patient Preparation

The referring physician or provider should review the patient's history and screen them prior to the CCTA for any contraindications such as contrast allergies, pregnancy, renal impairment, and clinical instabilities (acute myocardial infarction, heart failure, and severe hypotension).¹

Note: Cleerly is unable to analyze coronary artery bypass grafts. If a CABG study is submitted, Cleerly will reject the scan. However, pacemakers and stents are acceptable for analysis.

If a patient cannot cooperate with scan preparation, acquisition, and/or breath-hold instructions then it is best advised to forgo the CCTA scan. It is pertinent that the patient collaborates with CT technologists to achieve a high quality scan.

Patients should be informed of the preparation at the time of scheduling their CCTA. It is recommended that patients discontinue solid foods at least 3–4 hours before their scan to reduce nausea and a potential spike in heart rate, however water and clear fluids are acceptable and encouraged to consume. The patient should discontinue caffeine or stimulants 12 hours before the scan as this can decrease the ability to lower and stabilize the heart rate. The patient may continue to take routine medications under the direction of their physician. Since Nitroglycerin may be administered, it is important to discontinue the use of erectile dysfunction medication 72 hours before the scan (24 hours for sildenafil) and 24 hours post scan.¹

The 2016 SCCT guidelines for the performance and acquisition of CCTAs recommends the use of Nitroglycerin and beta-blockers to enhance image quality. Cleerly recommends a Nitroglycerin dose of 0.8 mg, as it falls within guideline parameters and represents an optimal range to achieve consistent coronary vasodilation for improved visualization. A best practice is to wait 5 minutes post Nitroglycerin administration to ensure proper vasodilation. Beta-blockers can be prescribed by the patient's referring physician or upon arrival at the discretion of a qualified medical professional.

The guidelines recommend to pre-medicate patients with 50 mg metoprolol by mouth 12 hours before the scan and another 50–100 mg metoprolol by mouth 1 hour before the scan. Slow-release forms of beta-blockers should not be used. Supplement IV beta-blockers can be administered to help reduce the patient's heart rate immediately prior to the exam. If Supplemental IV beta-blockers are called for, then it is common practice to administer 5 mg of IV metoprolol followed by 5 minutes of monitoring. If the target heart rate is not reached and the patient's vitals allow for it, this process can be repeated for a total dose of up to 20–25 mg.¹

Even if the patient's heart rate is within the target threshold, it is common practice to administer a small dose of beta-blockers to stabilize and to avoid an elevated heart rate due to contrast administration.¹

It is essential to educate and instruct the patient of what to expect during the scan such as breathing instructions, IV contrast administration, and scan duration. Convey clear expectations for the patient. For example, explain what the patient can expect before, during, and after the scan and the purpose of beta-blockers and Nitroglycerin. Brief the patient on potential side effects of the contrast and medication. By informing the patient this can drastically reduce anxiety thus help produce excellent image quality.

Guidelines Suggested ECG-Gated Acquisition

- ▲ Prospective gating should be utilized if the heart rate is at, or below, the target heart rate and if there is minimal variance (< 4 bpm).
- ▲ Retrospective gating should be utilized if the heart rate is greater than the target heart rate and/or if there is significant variance (≥ 4 bpm). ■

Rotation Time

0.35 seconds

Target Heart Rate

≤ 60 bpm

Acquisition

Scanogram

Length (mm)	350 mm
Auto Voice	Chest
AP kV	100
AP mA	25
Lateral kV	100
Lateral mA	25

Comments: Patient Position:Supine

Patient's arms above their head and outside of the scan range. Iso-center the laser to the patient's heart. Lateral shifting can be done after the scanogram if it was not done manually before the scanogram. Place ECG electrodes as anatomically depicted on the labeled electrodes and IV access under institutional policies. Avoid placing ECG leads on the clavicles, and place ECG leads on the patient after the arms are above the head.

Calcium Score

Field of View	210 mm
Auto Voice	Chest
kVp	120
Minimum mA	10
Maximum mA	700
R-R Scanning Window	75% (default) and 60 HR

Comments: Scanners have a cardio conductor that records pre-acquisition HR during a breath hold. Practice breath-hold sets the parameters for each patient.

Predict Scan Sequence: Bolus Tracking

mA	35
kVp	100–120
Scan Time (s)	0.35
Bow Tie	Normal
Monitoring Delay (s)	7.0
Monitoring ISD (InterScan Delay)	1.0
Number of Scans	22
Enhancement Threshold (HU)	100–125 HU above baseline
ROI Placement	Descending aorta

Comments: By monitoring the contrast effect, you can check the contrast effect in real time. The disadvantage is the corresponding increase in the X-ray dose. Therefore, you must consider the exposure dose to determine if the use of a predict scan is appropriate. When you perform a predicted scan, adjust the scan conditions, including the tube current and tube voltage, to keep the exposure dose as low as reasonably achievable.

Prospective

Prospective CCTA	
Scan Type	ECG-triggered
Scan Position	Carina to the apex of the heart
Rotation Time(s)	0.35
Delay (s)	7
kV	120
mAs	110
Once the phase is set for the best reconstruction, the dose will be fixed for prospective scanning	
Recon Type Recon Phase	Segment 75%
Cardiac Gating	Yes
Thickness collimation (mm)	0.63 mm x 64
Direction Table Index	OUT
Recon Index Scan Interval	0.63 mm
Recon Options	52 OFF (filter.no iterative reconstruction)

Comments: Prospective acquisition recommended for steady heart rates within 50–59 bpm. An alert will happen when patients present with ≤ 40 bpm.

Retrospective

Retrospective CCTA	
Scan Type	ECG-triggered
Scan Position	Carina to the apex of the heart
Rotation Time(s)	0.35
Delay (s)	7
kV	120
mAs	110
Recon Type Recon Phase	Segment 75%
Pitch	0.1719
Cardiac Gating	Yes
Thickness collimation (mm)	0.63 mm x 64
Direction Table Index	OUT
Recon Index Scan Interval	0.63 mm
Recon Options	52 OFF (filter.no iterative reconstruction)

Comments: Retrospective acquisition recommended for heart rates ≥ 60 bpm.

Reconstructions

Multiphase	
Phases Requested (Prospective)	71%, 73%, 75%, 77%, 79%
Phases Requested (Retrospective)	30%, 35%, 40%, 50%, 60%, 70%, 75%, 80%
DFOV	≤ 180 mm
Region	Cardiac
Filter	Standard and Sharp
Image Filter	Off
Cardio StillShot when applicable	
Recon Algorithm	IPV, CORE Plus
Vendor's Iterative Reconstruction	52 OFF (filter.no iterative reconstruction)
Slice Thickness (mm)	0.63 mm
Interval (mm)	0.63 mm

Best Diastolic and/or Best Systolic	
DFOV	≤ 180 mm
Region	Cardiac
Recon Option	CORE Plus, Cardio StillShot
Filter	Standard and Sharp
Image Filter	Off
Vendor's Iterative Reconstruction	Intelli IPV
Slice Thickness (mm)	0.63 mm
Interval (mm)	0.63 mm

Contrast Protocol

kVp	Iodine Concentration (mg/mL)	Volume (mL) @ Standard Injection Rate (mL/s)	Large Habitus Volume (mL) @ Standard Injection Rate (mL/s)	Saline Chaser
100	320	65–70 mL @ 5.0–5.5 mL/s		40 mL
	350	55–60 mL @ 4.0–4.5 mL/s		40 mL
	370	55–60 mL @ 4.0–4.5 mL/s		40 mL
120	320	78–85 mL @ 6.0–6.5 mL/s	90–97 mL @ 7.0–7.5 mL/s	40 mL
	350	65–70 mL @ 5.0–5.5 mL/s	78–85 mL @ 6.0–6.5 mL/s	40 mL
	370	65–70 mL @ 5.0–5.5 mL/s	78–85 mL @ 6.0–6.5 mL/s	40 mL

Formula: (scan delay time + acquisition time) x flow rate = contrast volume¹

¹Abbara S, Blanke P, Maroules CD, et al. SCCT guidelines for the performance and acquisition of coronary computed tomographic angiography: A report of the society of Cardiovascular Computed Tomography Guidelines Committee: Endorsed by the North American Society for Cardiovascular Imaging (NASCI). *J Cardiovasc Comput Tomogr*. 2016 Nov-Dec;10(6):435-449.