CCTA Access Initiative Community of Practice (CoP) #2

NOVEMBER 21, 2024

Ontario Health
CorHealth Ontario

Agenda

TIME	TOPIC	PURPOSE	PRESENTER
2 mins	Welcome & Land Acknowledgement		Erin McPherson Jana Jeffrey
10 mins	Review on CCTA Access Initiative	Information	Dr. Chow
25 mins	CT Quality Acquisition	Information/Discussion	The Ottawa Heart Institute
20 mins	Roundtable Discussion / Q&A	Discussion	All

Land Acknowledgement

CCTA Access Initiative

CCTA Access Initiative: Update

Goal: Improve access and ensure appropriateness of CCTA

- Facilitate a gradual shift of appropriate patients to CCTA from ICA
- Balancing change in referral patterns with concurrent reduction in CCTA wait times

Update:

- For FY 2024/25, MOH provided incremental base funding for ~10,000 CT hrs, or the equivalent of ~6,667 CCTA volumes
- 2024/25 funding allocations are based on a modeled volume distribution and initially focused on hospitals with Regional Cardiac Programs (RCPs), which provide patients with a comprehensive suite of cardiac services
- We continue to work with the Ministry to determine additional growth needs for future fiscal years

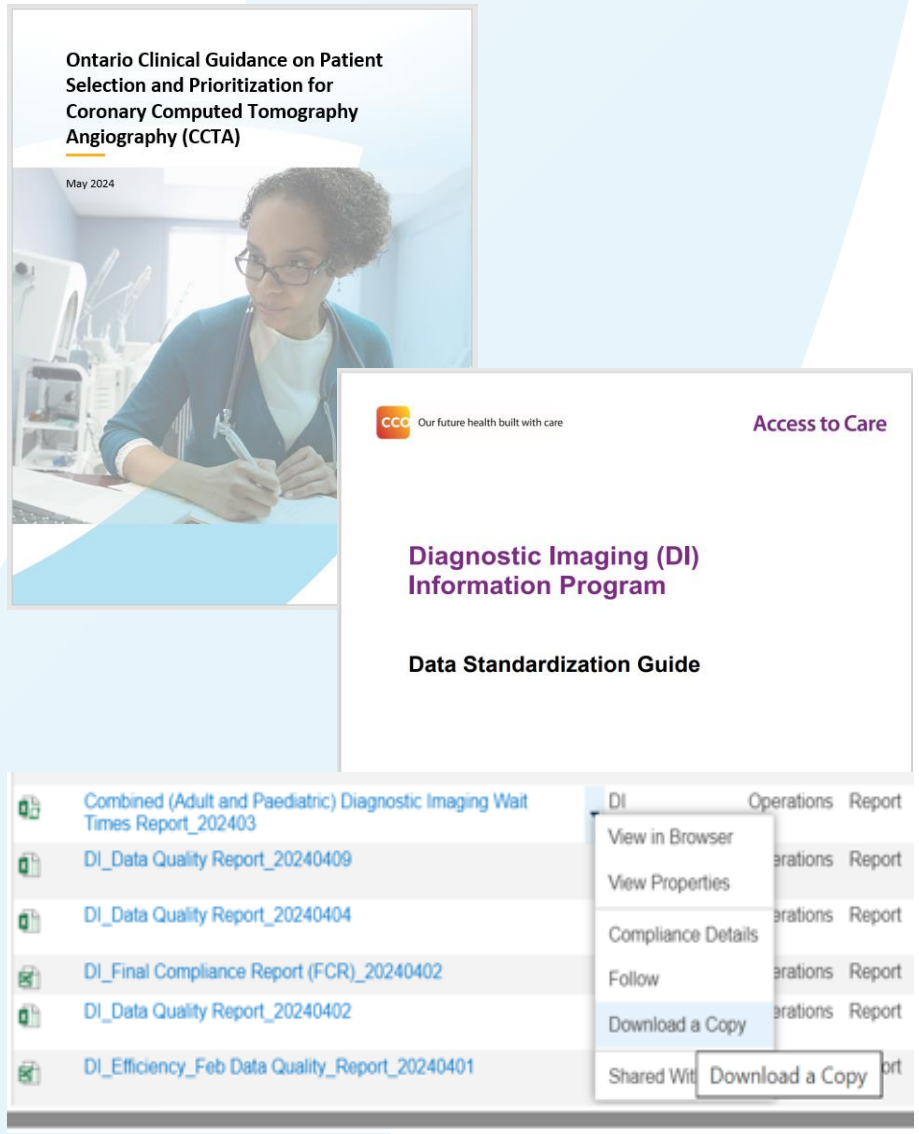
Change Management Strategies:

- Successful first Community of Practice - 81 in attendance from 17 sites across all 5 OH Regions. HHSC highlighted CCTA efficiency success through team collaboration and streamlined workflows
- Measurement and reporting will occur through the Health Data Collection Service (HDCS), previously known as the self–reporting initiative (SRI), starting in Q3. Working through challenge of identifying CCTA from general cardiac CT scans

Change Management: Improve access and ensure appropriateness

CCTA Tool Kit

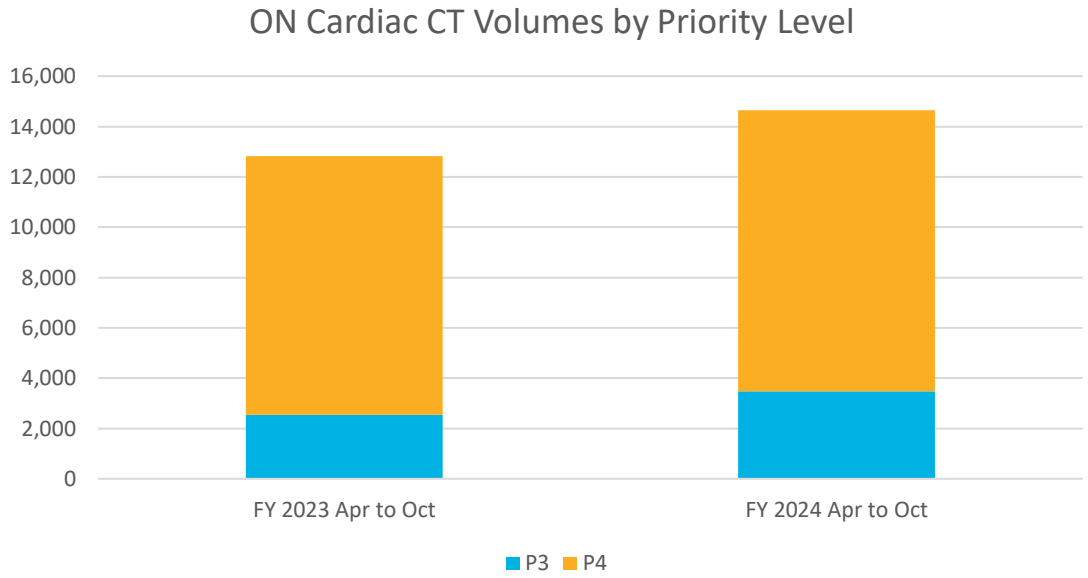
- *Ontario Clinical Guidance on Patient Selection and Prioritization for Coronary Computed Tomography Angiography (CCTA)* May 2024
- CCTA-related updates to the DI Data Standardization Guide
- Instructions on accessing cardiac wait times data in the Diagnostic Imaging Wait Times Reports on the ATC Information site

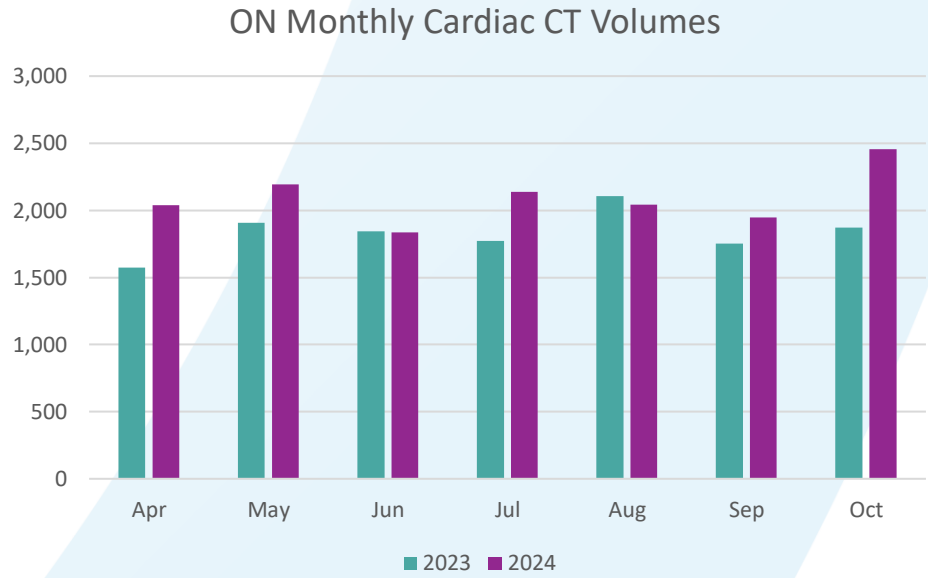


Community of Practice:

- Share best practices and opportunities to improve efficiency
- Supporting uptake of clinical guidance on patient selection and appropriate patient triaging (Priority 3 versus Priority 4)

Provincial Cardiac CT Volumes, 2023 vs 2024 (Apr to Oct)



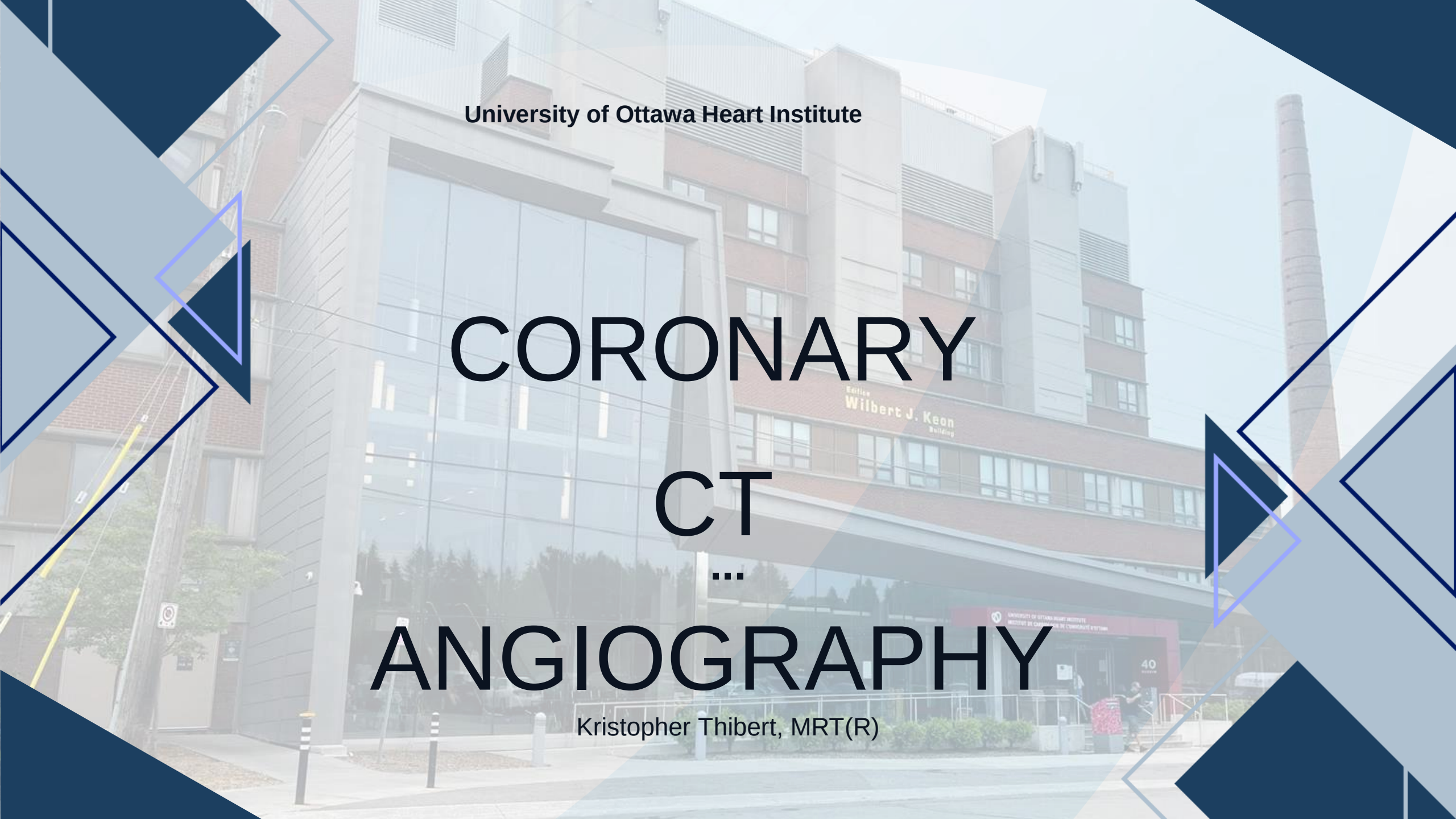


- There have been ~37% more P3 and ~9% more P4 cardiac CTs completed in Apr-Oct of this FY, compared to the same period in 2023.
- From Apr-Oct 2024, the overall change in volumes is +14% (compared to 2023).

Data source: Wait Times Information System (WTIS) via iPort, retrieved November 13, 2024. Includes Priority levels 3 and 4 cases only. Note that data are for Cardiac CTs only, as WTIS does not capture CCTA specifically. CCTA volumes comprise ~90-95% of all cardiac CT volumes

QPMM Feedback: Key themes

- Most programs are tracking to utilize their program's additional base funded CCTA hours
- Health human resources and existing capacity/demand for CT imaging remain a challenge for programs
- Local processes being developed to ensure appropriate selection and referral of patients who can appropriately be redirected from ICA to CCTA (P3 with a target of 10 days)
    - **Programs are eager to understand models/partnerships between cardiology and radiology**
- Data burden – strong endorsement to lobby for updates WTIS to capture CCTA volumes



University of Ottawa Heart Institute

CORONARY CT ANGIOGRAPHY

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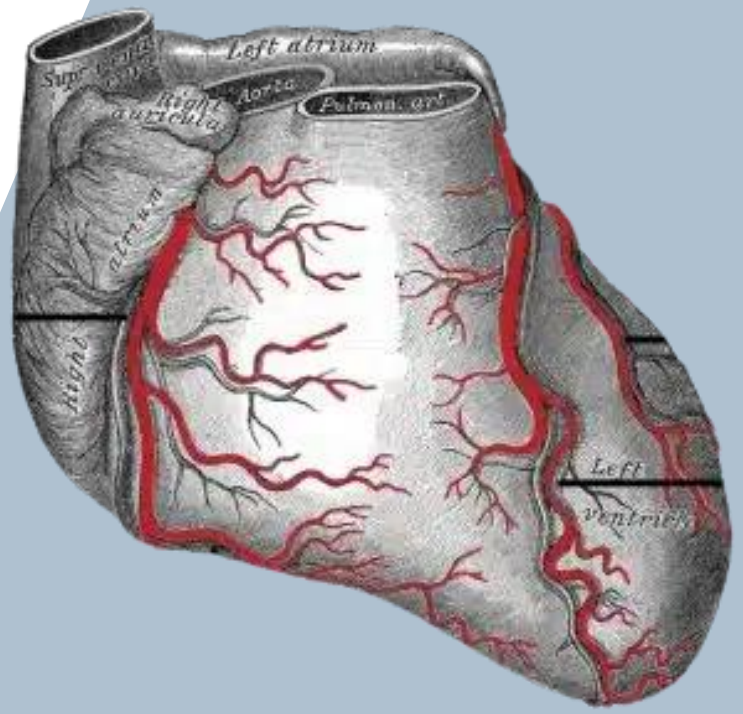
Kristopher Thibert, MRT(R)

Purpose of CCTA

- Minimally invasive
- Pre-op assessment
- Evaluation of cardiac anomalies
- Evaluation of grafts



Indications

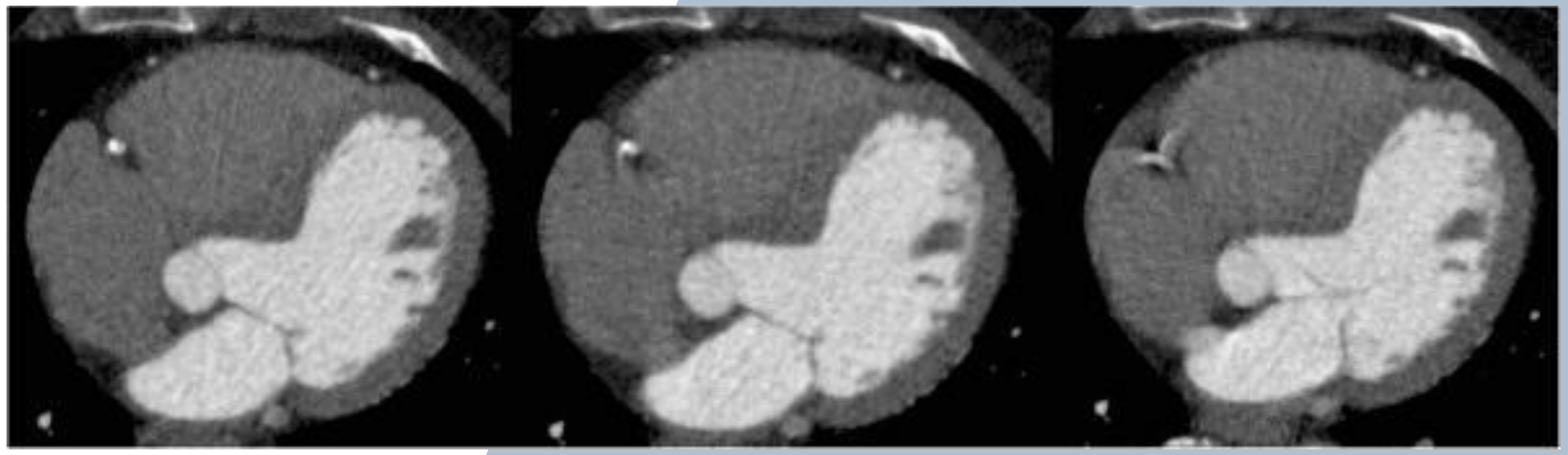
- Symptomatic patients
  - Low to moderate risk
- New onset Heart Failure (HF)
- Abnormal stress imaging

Contraindications

- Elevated Agatston score
- Hx of CAD with stents
- Contrast allergy
- Asymptomatic, low-risk patients
- Pregnancy
- Compliance challenges
- Alternative imaging
- Patient size
- Claustrophobia

Importance

- Slows heart rate
- Improves image quality
- Optimal Diastolic phase
- Target below 60 bpm
- Metoprolol
- Ivabradine



UOHI Protocol

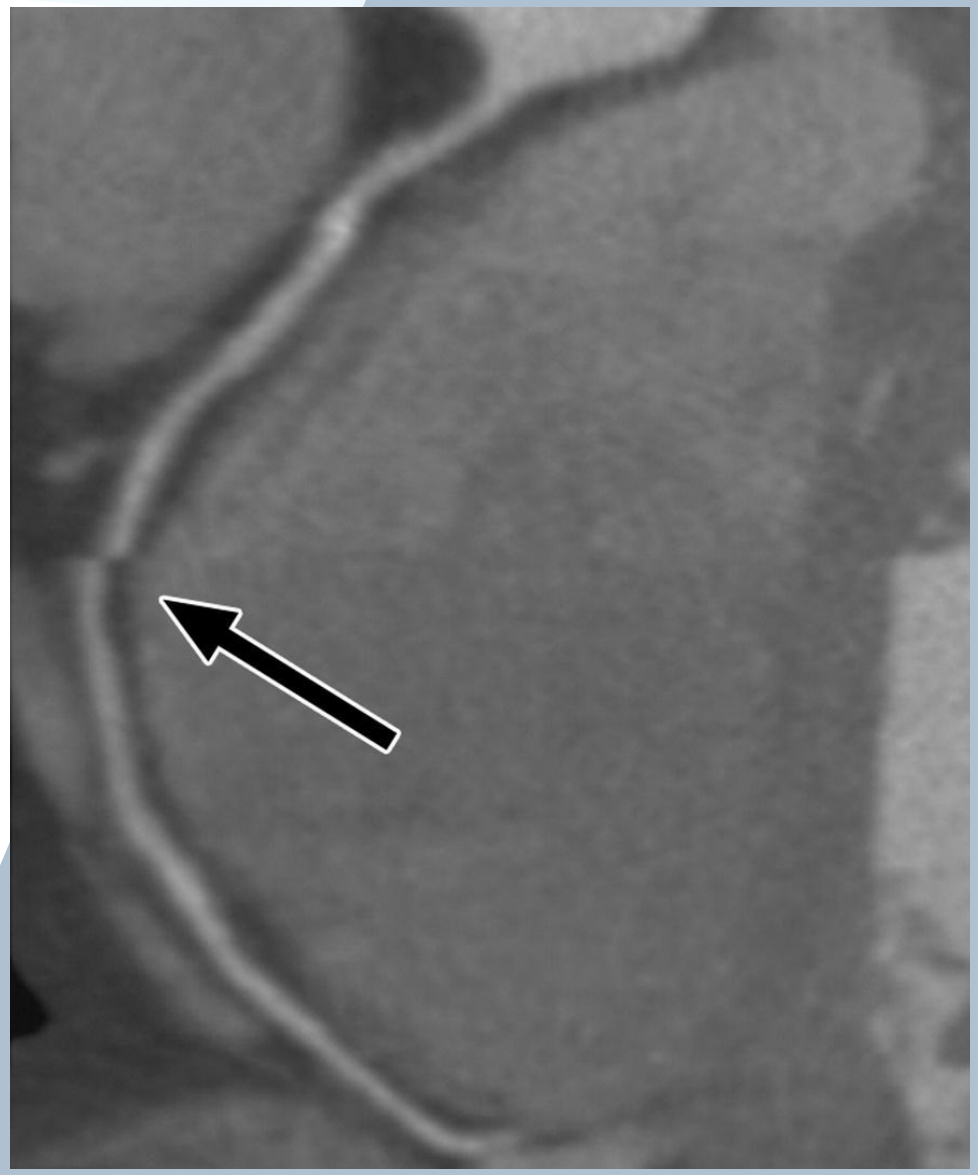
- Agressive beta-blocking
- Greatly reduces motion artifacts
- Reduces heart rate variation
- Reduces need for repeat scans
- Increases diagnostic quality of images
- More available scan options

Contraindications

- Asthma
- COPD
- Second or third degree AV block
- Severe bradycardia
- LVEF <30%
- O2 saturation <95%
- Symptomatic hypotension

UOHI Protocol

- PO Metoprolol
- 100mg: HR >69 and BP >120
- 75mg: HR 65-69 and BP >110
- 50mg: HR 60-64 and BP >110
- 25mg: HR 57-59 and BP >110
- Reassess after 60 minutes and give more as needed
- Target HR below 60



UOHI Protocol

- IV metoprolol given on table
- 2mg, 3mg, 5mg every 2-3 minutes
- Maximum 25mg

Administration

- Two doses (0.4mg/ea) sublingual
- One dose if BP >100mmhg
- Whitheld if BP <90mmhg
- Increases coronary size
- Better quality images

Contraindications

- Severe aortic stenosis
- Erectile dysfunction medication
- Allergy
- Advised not to take by MD
- BP below 90mmhg

Iodine contrast media

- 20-25 cc test bolus
- 50-100 cc undiluted
- 40/60 50cc mixed bolus
- 20cc saline push
- 5-8 cc/second
- Omnipaque 350

Nursing

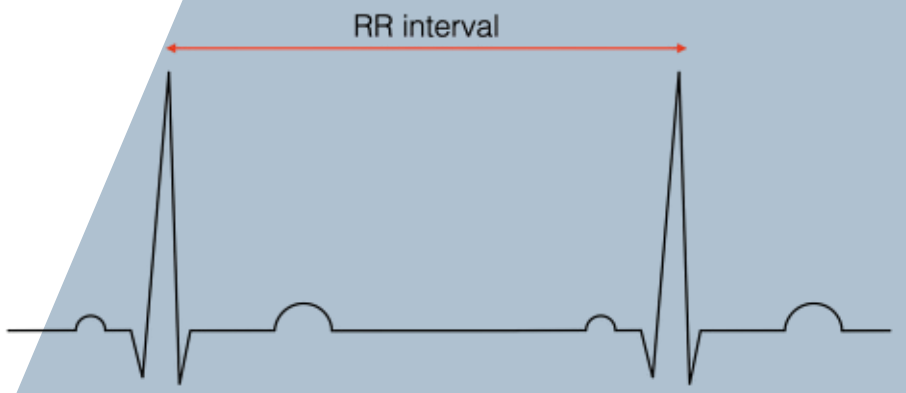
- Patient medical history
- Document medication
- ECG
- Administer beta-blockers
- Monitor patient post-scan
- Insert and/or remove IVs (time permitting)
- Contact cardiology fellows if there are issues

Technologist

- Patient identifictaion
- Breathing instructions
- Dye information/ questions
- Nitroglycerin information/ questions
- ECG leads
- IV Access

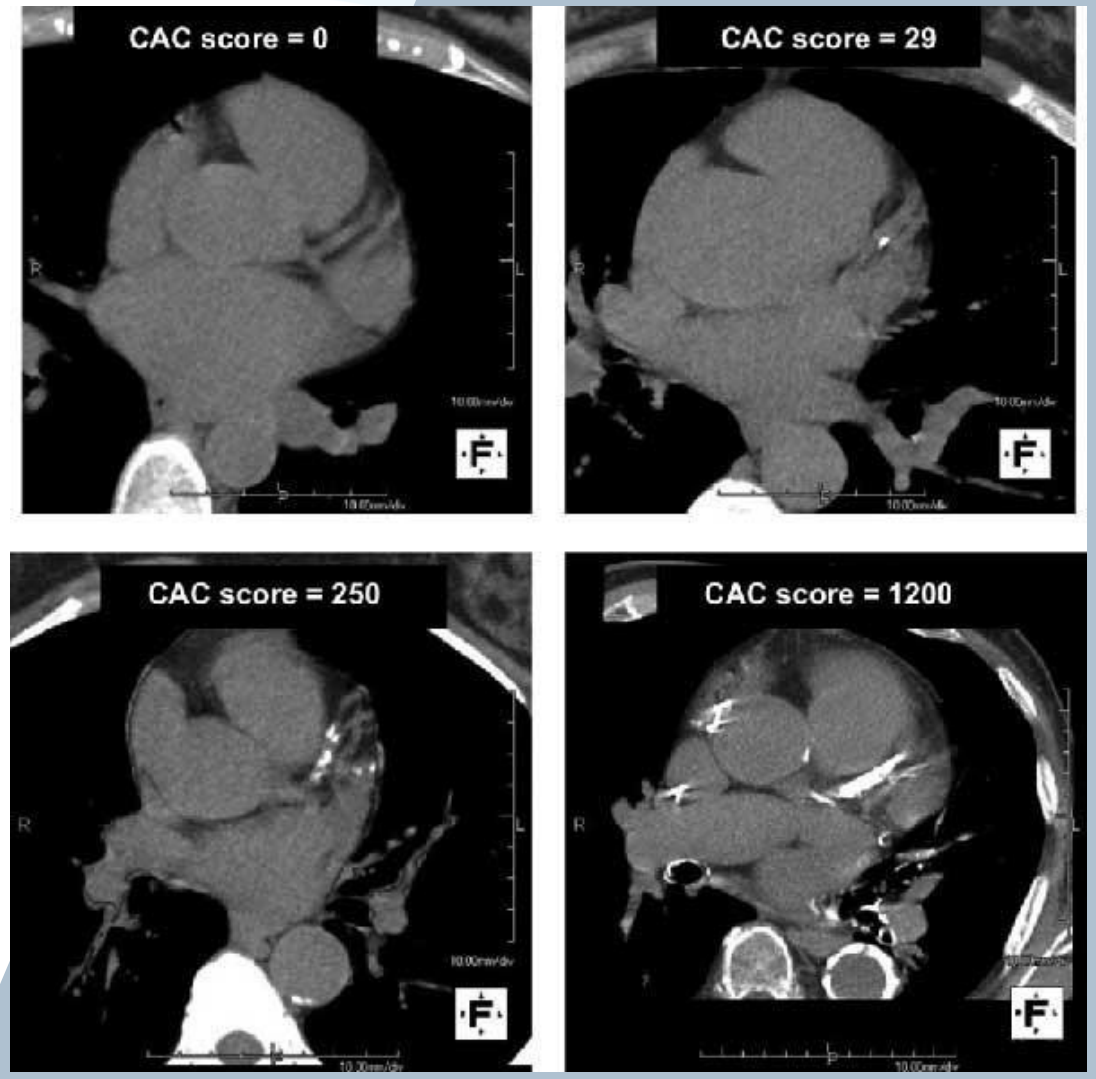
Planning

- Scouts (topograms)
- Coronary Artery Calcium Scan (CAC)
- Test Bolus
- Cardiac Angiogram
- Repeats as needed



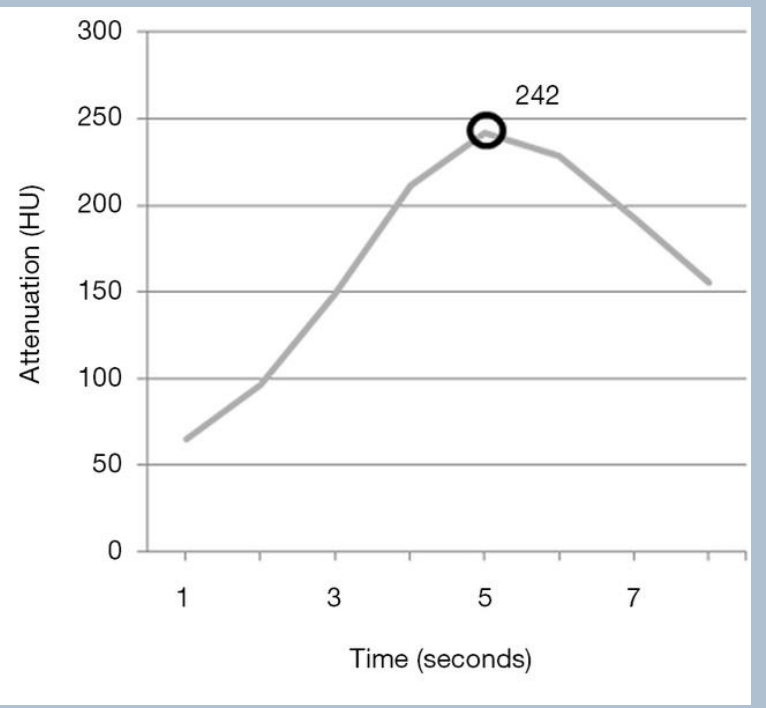
Calcium Score

- Low dose scan
- Sequential or flash
- Can lead to completion of test before dye is given



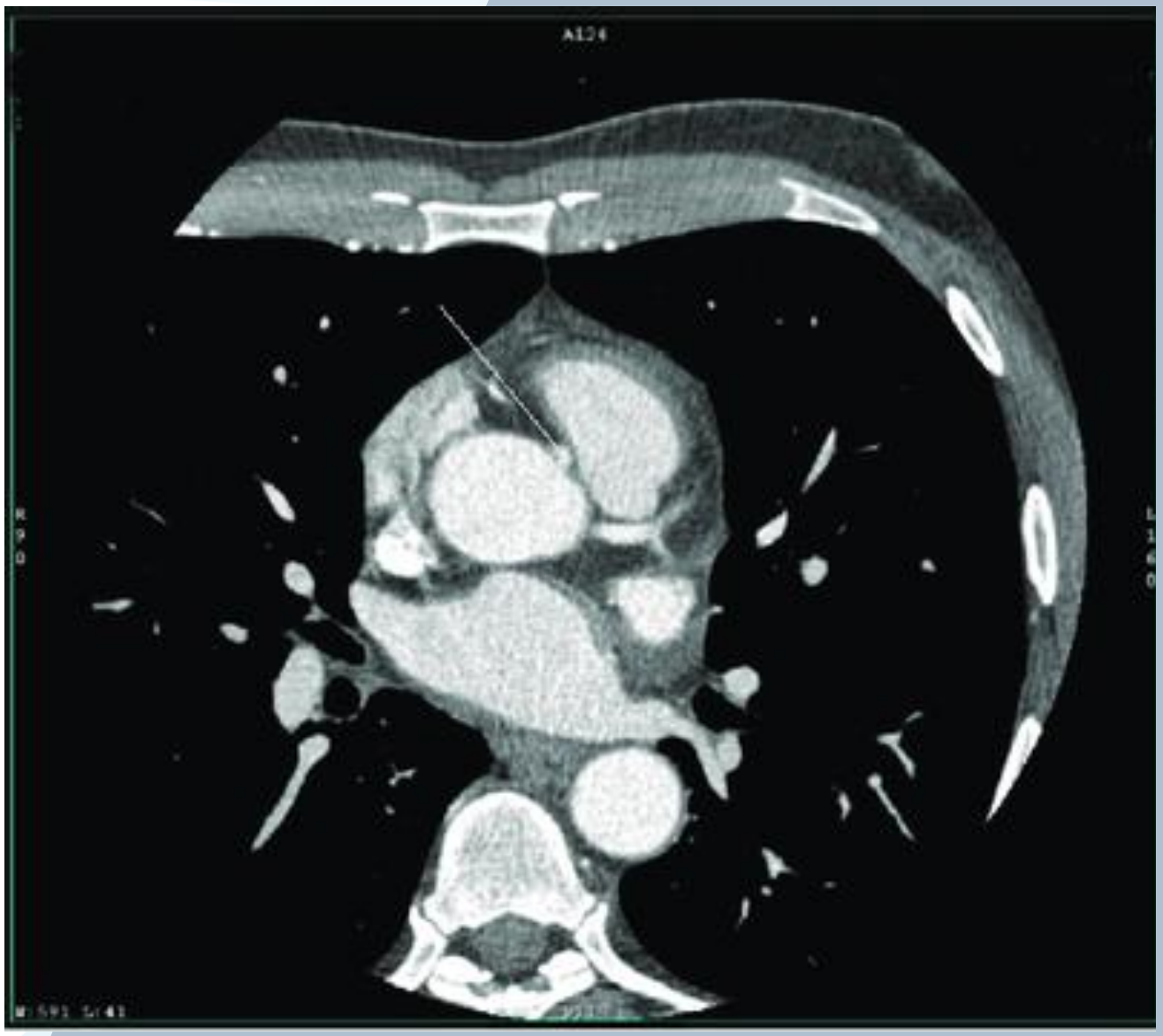
Test Bolus

- Preferred timing method
- Accounts for individual HR and EF
- No extra time needed for breathing instructions
- Measured at origin of coronaries, in aorta
- 20-25cc bolus
- 10 second delay
- Scans every 2 seconds
- 100 HU target



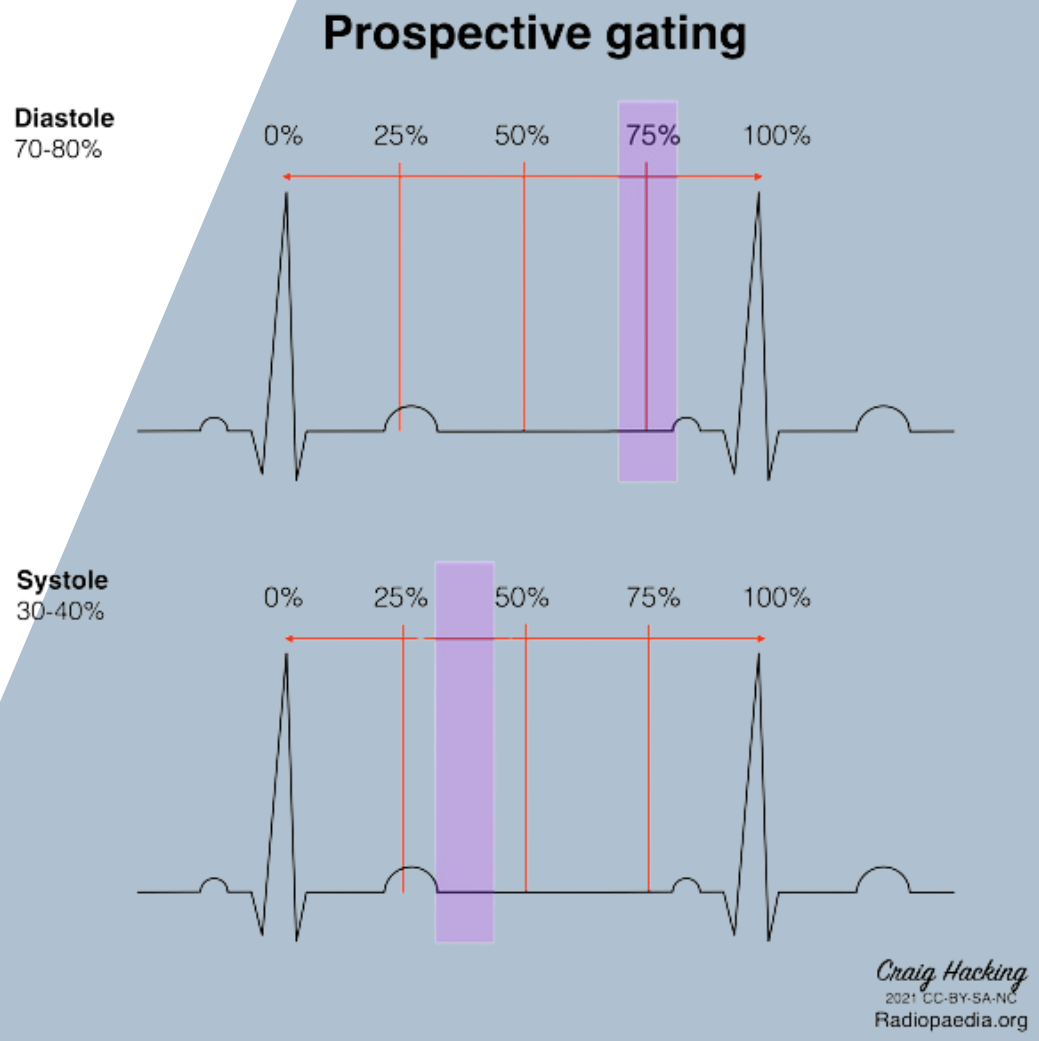
Angiogram

- Can be acquired in diastole or systole
- Sequential (step and shoot)
- 3-4 acquisitions
- 128 slices 0.6mm per acquisition
- Rotation speed of 0.28 revolutions/second



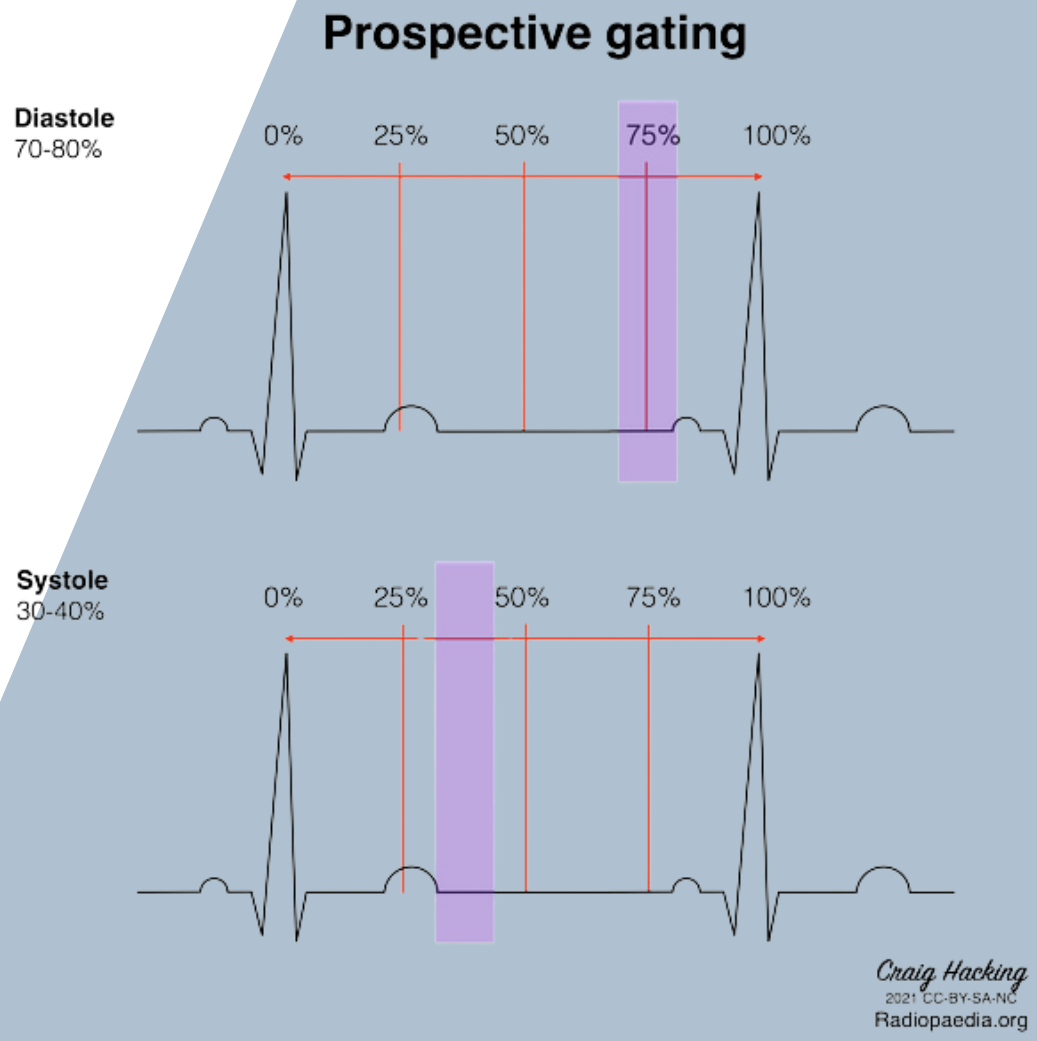
Diastole

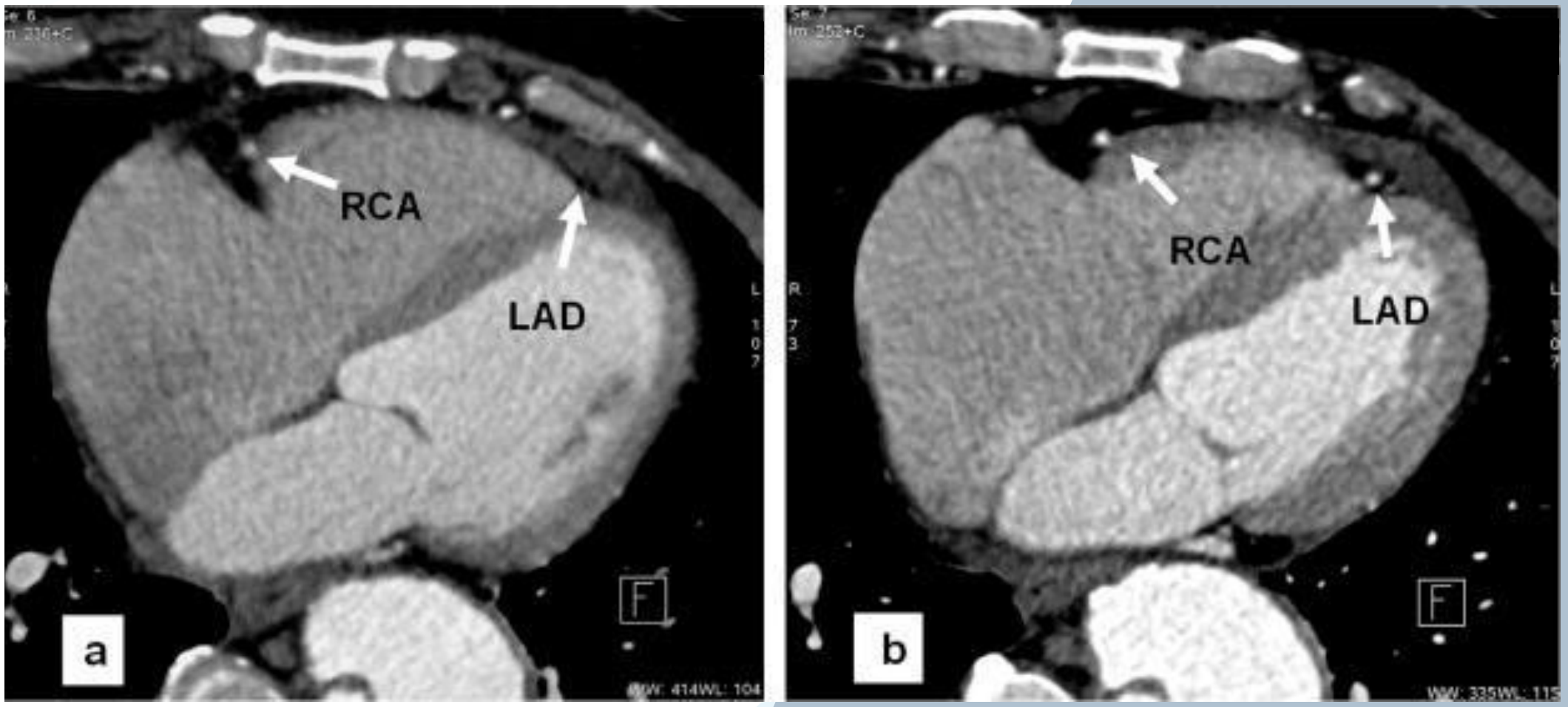
- Preferred prospective scan
- 70-80% R-R interval
- Less motion
- More suseptible to HR variation
- Higher resolution



Systole

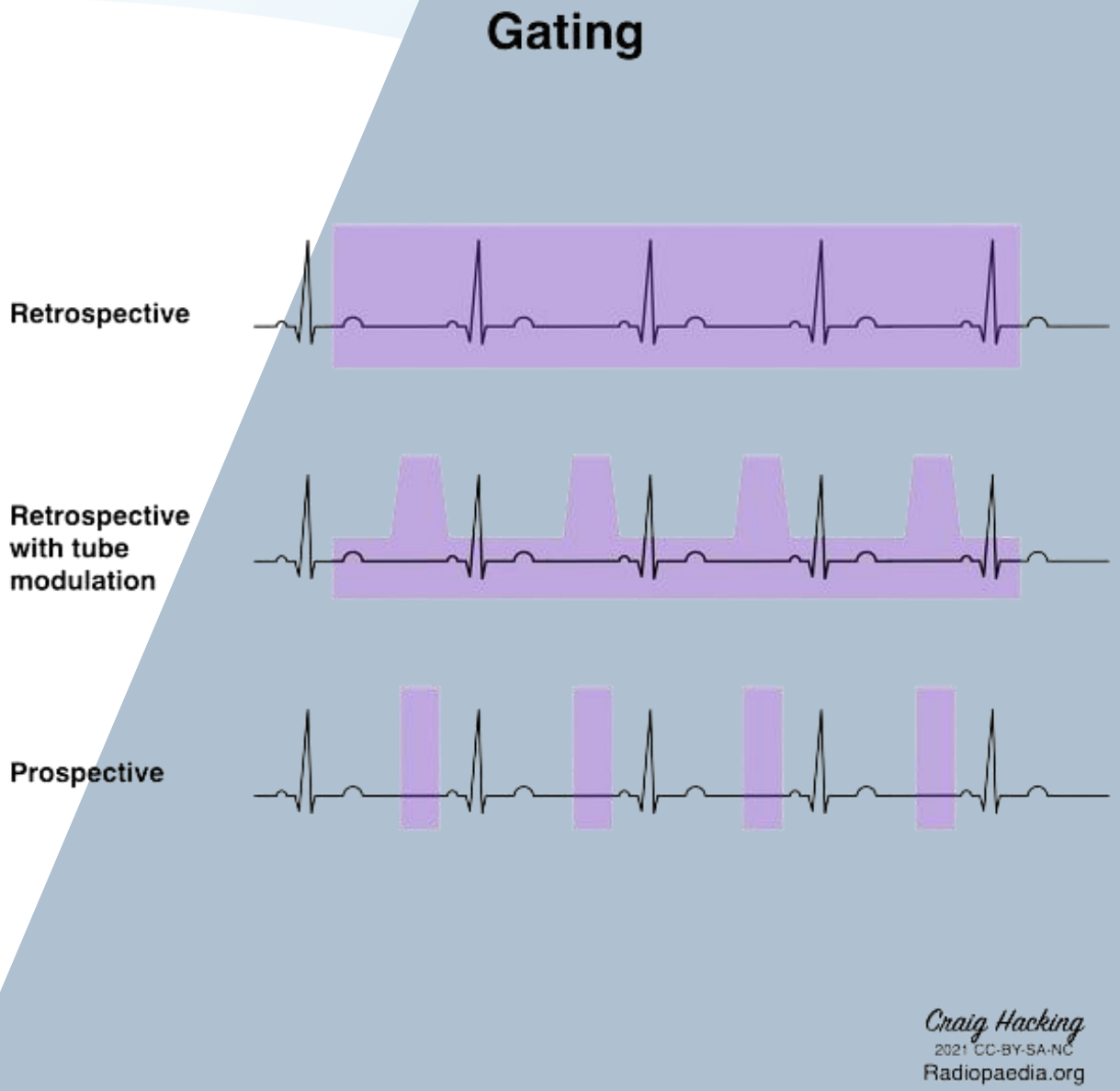
- Best scan method for irregular or fast HR
- 30-35% R-R interval (350ms)
- Lower resolution
- More forgiving for irregular HR or very short R-R intervals




RCA
LAD
a
RCA
LAD
b

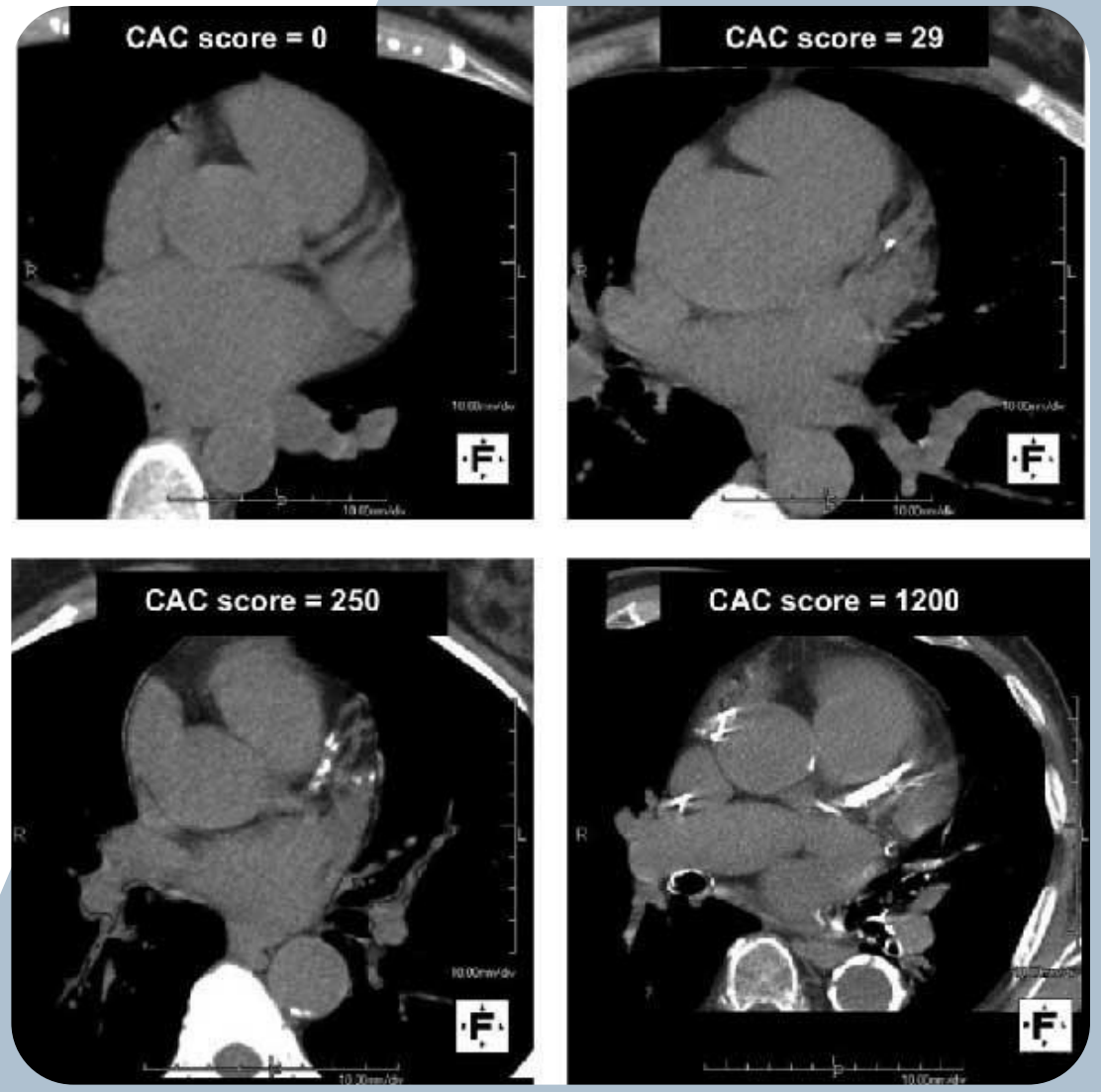
Retrospective

- Imaging during whole cardiac cycle
- Can be dose modulated to reduce dose
- Much higher dose
- Higher level of detail of moving structures
- Good for functional or valve studies
- Typical uses include vegetation and TAVIs



Post scan

- Images quickly reviewed
- Ensure filling of appendage
- Repeats done due to motion, artifact or to rule out LAA clot

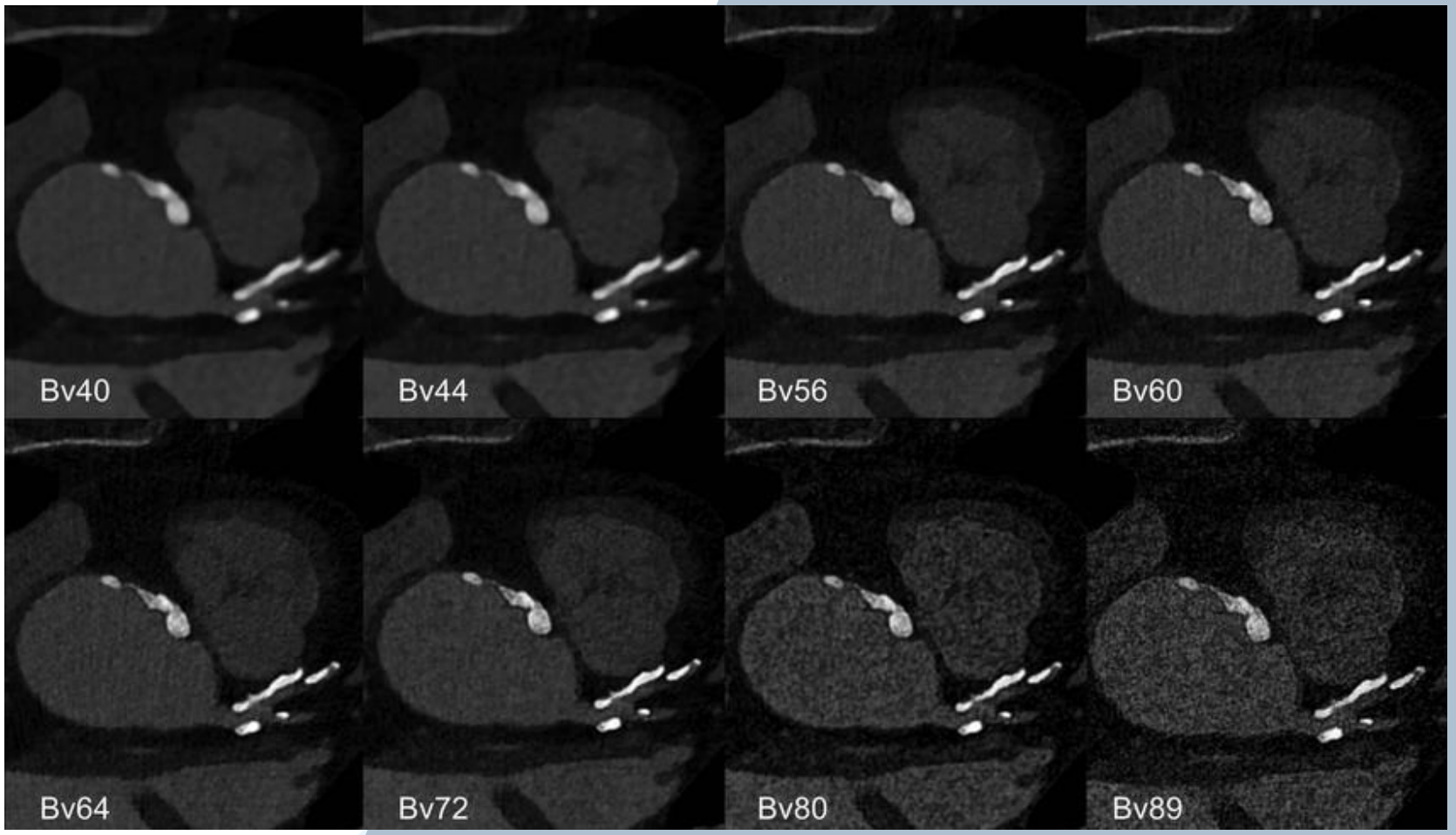


Viewing Windows

- CAC W350 L50
- CTCA W800 L100

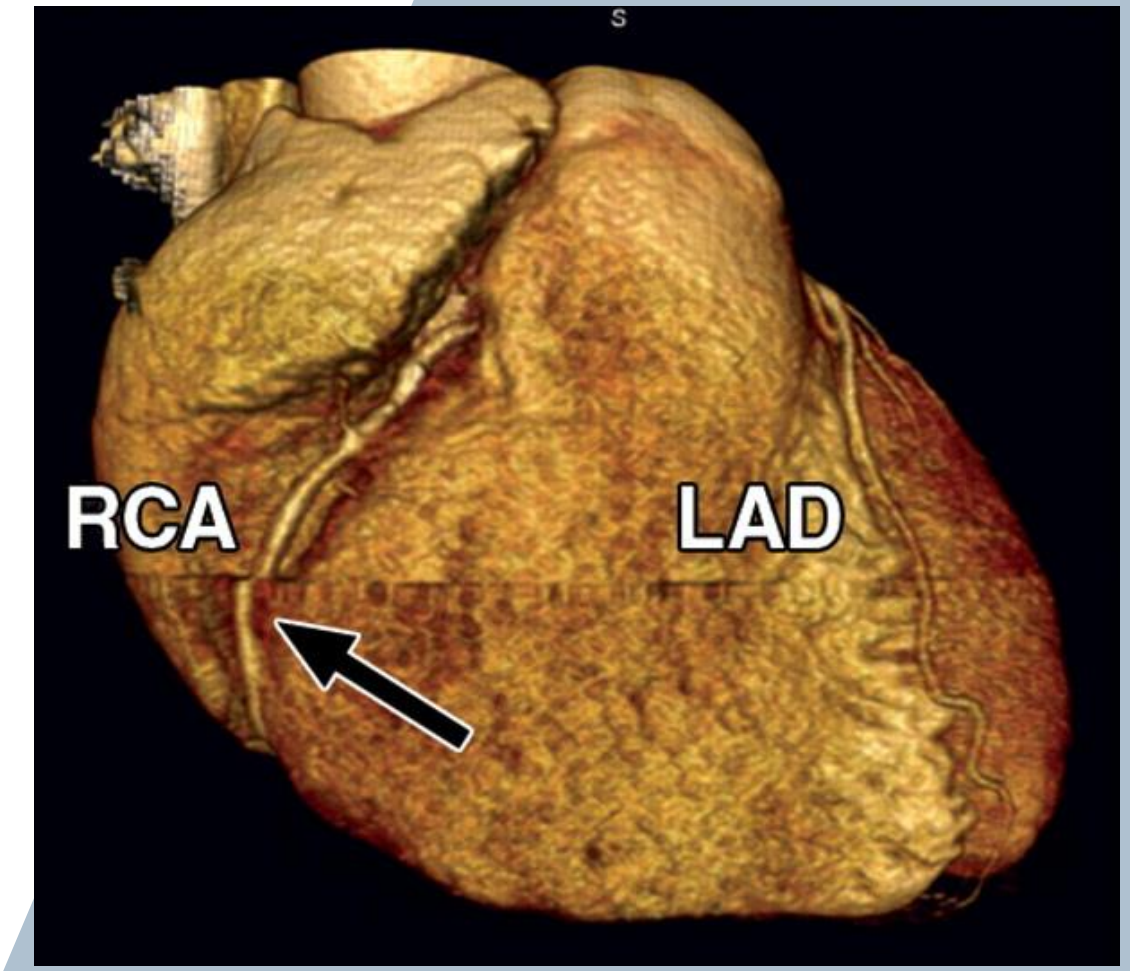
Kernels

- Convolution Algorithm
- Standardized
- BV41f
- BV38, 41f, 55 (padding)
- QR36 for CAC



Breathing

- Due to diaphragm motion
- Improper patient coaching
- Inability to cooperate
- Stair step artifact
- Usually requires repeat



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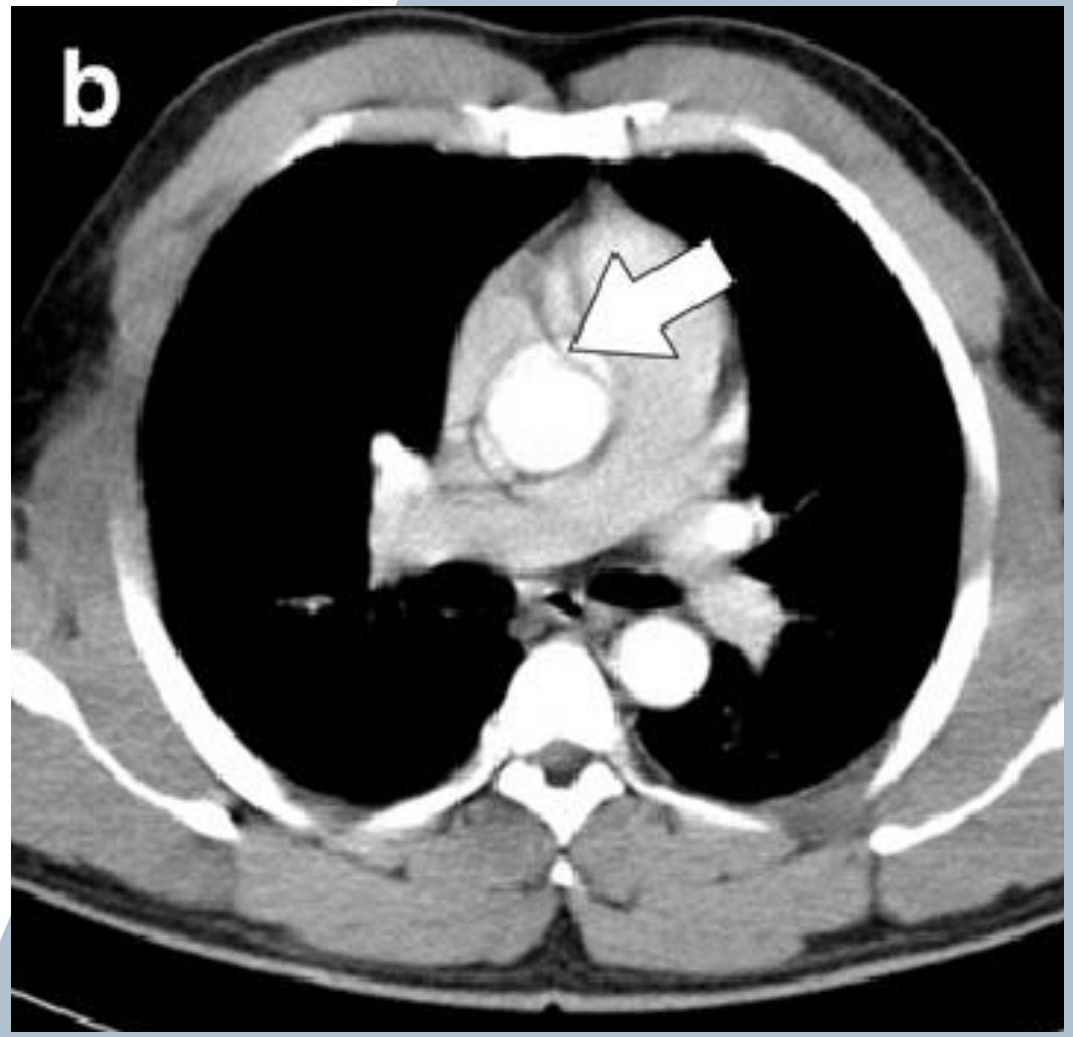

Metal

- Streaking appearance
- Worse closer to artifact origin
- Usually caused by leads or sternal wires
- Occasionally caused by metal plates
- Can be reduced with IMAR

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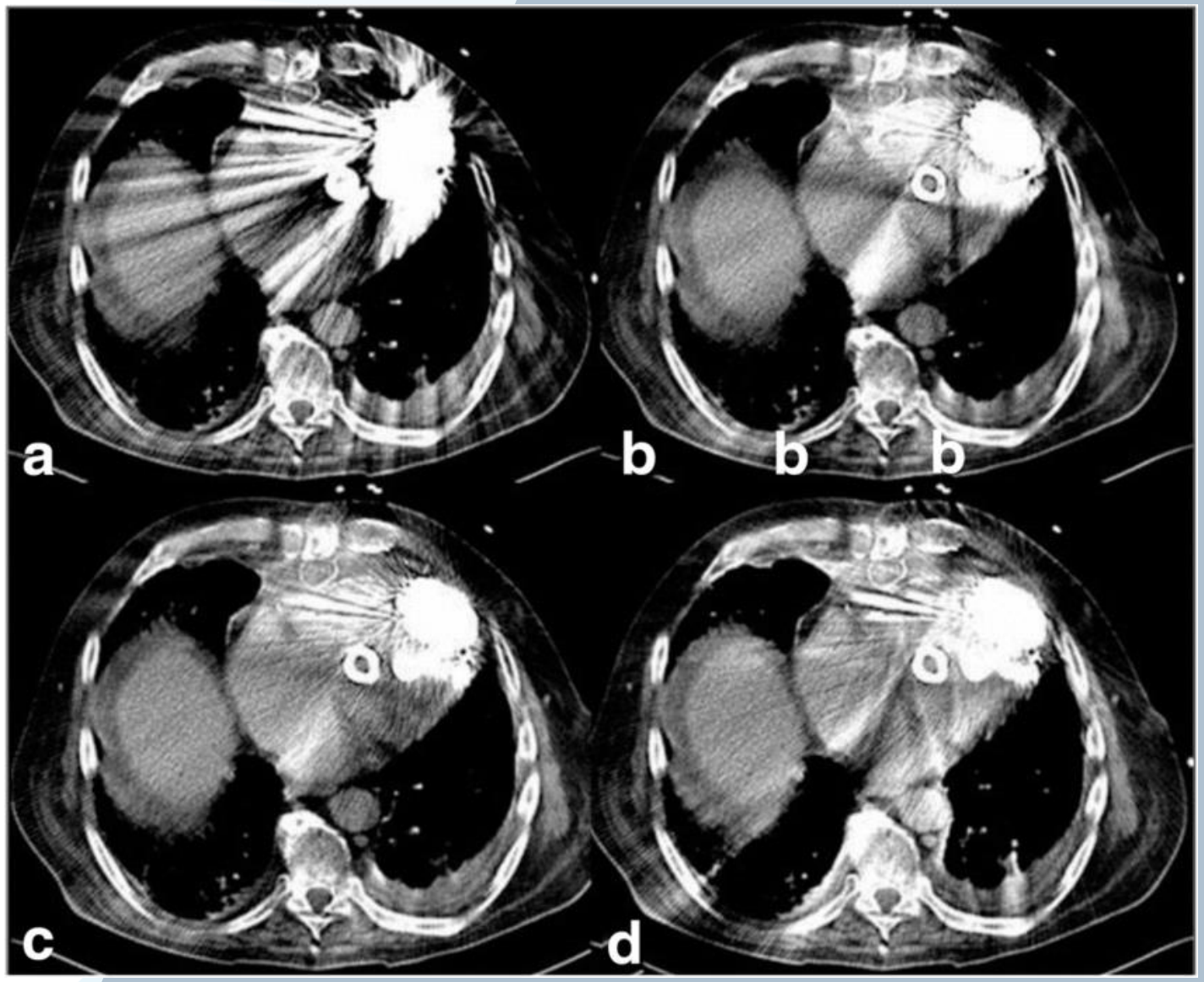
- IMAR uses extrapolation, reduced accuracy



Dye

- Dye density artifact
- Usually from SVC
- Mixed bolus reduces this artifact

Siemens Somatom

- Calcium score
  - CTDIvol: 1.5 mGy
  - DLP: 30 mGy*cm
- Angiogram (including CAC)
  - CTDIvol: 21 mGy
  - DLP: 336 mGy*cm

ALARA

- As Low As Reasonably Achievable
- Diagnostic images with lowest dose possible
- Protects patient population from radiation
- Time, distance, shielding
- Flash CT

Examination	Mean effective dose
Background radiation	3 mSv/year
Chest X-ray	0.1 mSv
Calcium scoring	2 mSv
Chest CT	5–7 mSv
CT abdomen and Pelvis	8–11 mSv
Coronary angiography	5.6 mSv
PTCA	6.9 mSv
Coronary angiography with PTCA	9.3 mSv
Coronary Angiography + PTCA + Stent	13 mSv
SPECT-MIBI	11 mSv
SPECT-Thallium	25 mSv
Coronary CTA (males)	6.7–10.9 mSv
Coronary CTA (Females)	8.1–13.0 mSv

Questions Received

Questions Received

1) Should calcium score alone (i.e., no injection of contrast) be counted as a CCTA volume?	No
2) If the contrast portion of the CCTA exam is not done based the extent of calcification seen on the pre-contrast scan should this exam be counted as a CCTA Volume?	Yes
3) Should pre and post care time be included in the reported CCTA hours?	For this project, CCTA reported hours should reflect the total episode of care (i.e., not limited to the scan time hours)

Utilizing the Community: Future Questions

If you have a question you would like to pose this community of practice (either via poll or roundtable discussion), please contact Erin McPherson at Erin.mcpherson@ontariohealth.ca.

Roundtable Discussion

Cardiac Partner Engagement Cycle 2024/2025

Cardiac Services Table:

Jan 16, 2025

- Purpose: Provide strategic leadership and advice to define priorities that promote integrated care for cardiac patients and guide, monitor and lead initiatives to improve the delivery of high -quality cardiac care in Ontario
- Attendees:
  - Clinical Expertise from across Ontario
  - Hospital Leadership
  - Ontario Health Regions & the Ministry of Health

QPMM Check-in calls:

Jan 28, 29 and Feb 6, 2025

- Purpose: Quarterly outreach to facilitate a bi-directional conversation with cardiac centers to review volumes, provide updates on provincial initiatives and discuss facility needs and concerns
- Attendees:
  - Operations Director of the Cardiac Program (HA)
  - Executive VP – Cardiology Program
  - Medical Director of the cardiac program
  - Head of Cath Lab / Head of CV Surgery
  - Finance / Decision support staff
  - Quality leads

Cardiac Partners Update:

Nov 2024 - Electronic Push

- Purpose: Provide updates on key priorities/initiatives underway to improve the delivery of high-quality cardiac care in Ontario
- Attendees: Cardiac clinical community in Ontario

Next Steps

- Continue to monitor uptake of the 10,000 CT hours dedicated to CCTA
- Q3 Check-ins through QPMM with the 20 regional cardiac centres scheduled for January 28/29 and Feb 6, 2025. DI colleagues are encouraged to attend and participate in discussions
- OH will continue to host CCTA Community of Practices every 2-3 months to support this initiative (late Feb, 2025 – date TBD)
  - Planned Topic: Horizon scanning for CCTA care
- We welcome teams to volunteer to share their experiences at a future session.
- Feedback/questions on CCTA CoP format is encouraged to Erin McPherson: erin.mcpherson@ontariohealth.ca

Thank you

Appendix

Current State: Diagnostic Imaging Priority Levels in Ontario

- **Priority 1 Emergent** – Target of 24 Hours. An examination necessary to diagnose and/or treat disease or injury that is immediately threatening to life or limb.
- **Priority 2 Urgent** – Target of 48 Hours. An examination necessary to diagnose and/or treat disease or injury and/or alter treatment plan that is not immediately threatening to life or limb. Includes all inpatients except where imaging is unrelated to patient admission based on clinical indication.
- **Priority 3 Semi-urgent** – Target of 10 Days. An examination necessary to diagnose and/or treat disease or injury and/or alter treatment plan, where provided clinical information requires that the examination be performed sooner than the P4 benchmark period
- **Priority 4 Non-urgent** – Target of 28 days. An examination necessary to diagnose/treat disease or injury, where the provided clinical information does not require the study to be performed within the Semi-Urgent time frame (P3 benchmark period of 10 days)