

CT Cardiac CTA Workflow

VPMC-15831 E

CT Cardiac CTA

Overview:

- ▶ The CT Cardiac analysis application provides a variety of tools and views to evaluate the heart, coronary arteries and surrounding tissues. The software automatically segments and track the centerlines of multiple coronary arteries, generates curved planar reformations and cross vessel views for lumen and diameter reviews. All views may be edited, measured, captured and exported.
 - ▶ Select protocol Cardiac Analysis application and load selected cardiac phases
 - ▶ Perform 3D Overview and Review Study Quality
 - ▶ Evaluate contrast enhancement
 - ▶ Click Heart Oblique Mode and view the short axis, 2 and 4 chamber views
 - ▶ Perform Vessel Walk, then Perform Vessel Probe to analyze vessels
 - ▶ Rename vessels
 - ▶ Click Extend Tool to add to the vessel length
 - ▶ Edit centerline and contours
 - ▶ Evaluate for stenosis using the Lesion Analysis Tool
 - ▶ Evaluate plaque burden using ^{SURE}Plaque
 - ▶ Click 3D Review Modes including the Cath view for analysis
 - ▶ Apply Inverted MIP reset
 - ▶ Create GIR image
 - ▶ Click Native thickness MPR to view a VR MIP image
 - ▶ Create 3D Batch Rotation of vessels with semi-transparent Heart
 - ▶ Create and export snapshots and batch reformats, and export findings.

CT Cardiac CTA - Load the study

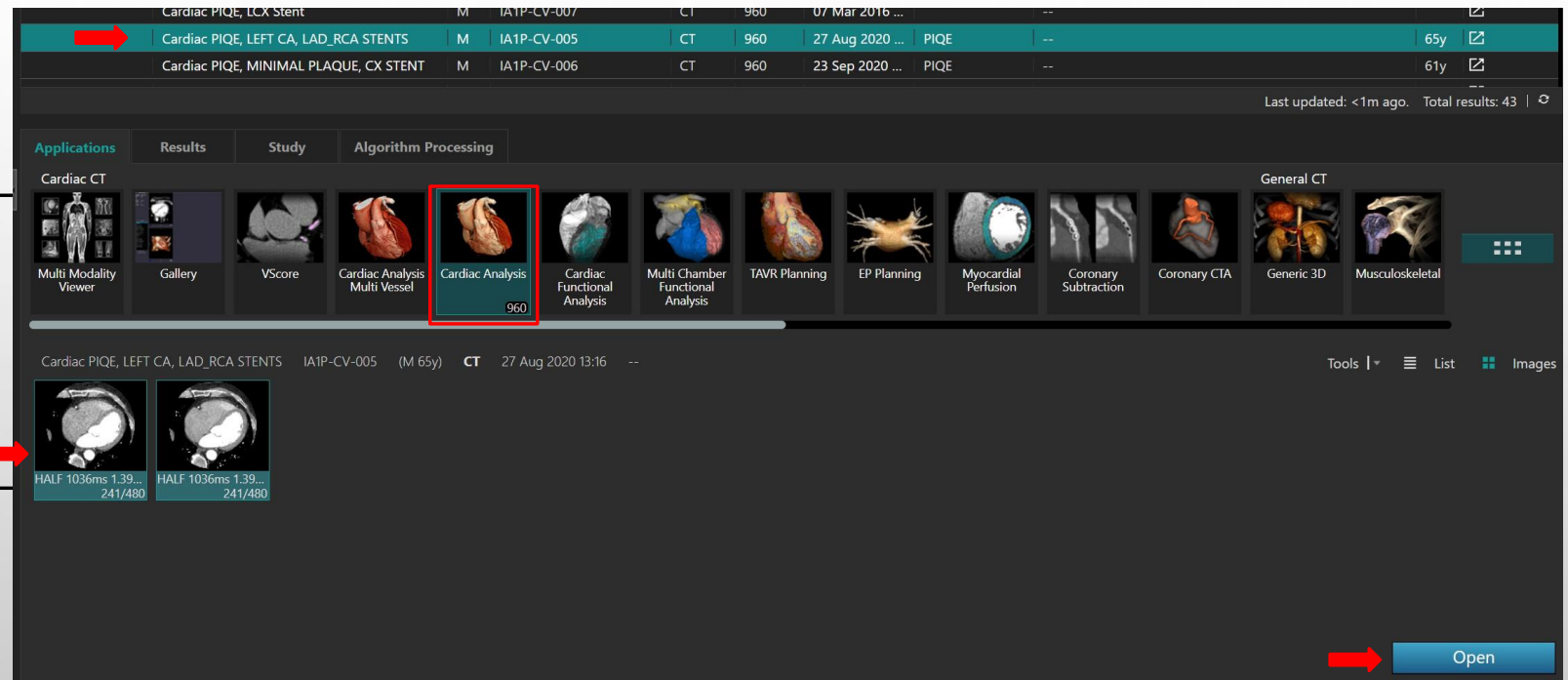
Select the patient.

Double click the **Cardiac Analysis** Application.

OR

Single left click on the application. Verify that the correct volumes were selected and click on **Open**.

Tip: Can select multiple phases for analysis.



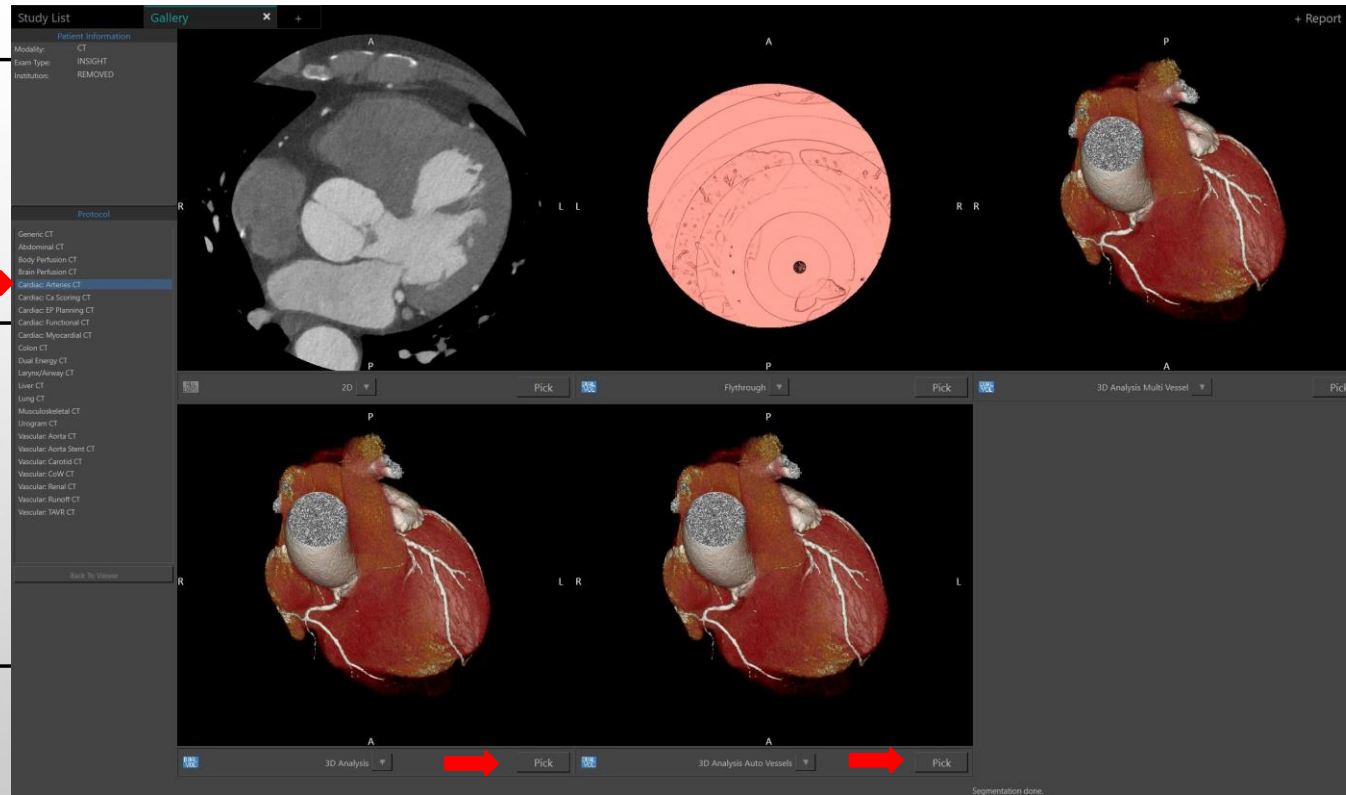
CT Cardiac CTA - Load the study from Gallery

Select Protocol **Cardiac Arteries CT**.

Select **3D Analysis** to **manually** select vessels. Click **Pick**.

OR

Select **3D Analysis Auto Vessel** for **automatic** vessel segmentation. Click **Pick**.



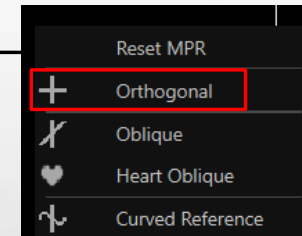
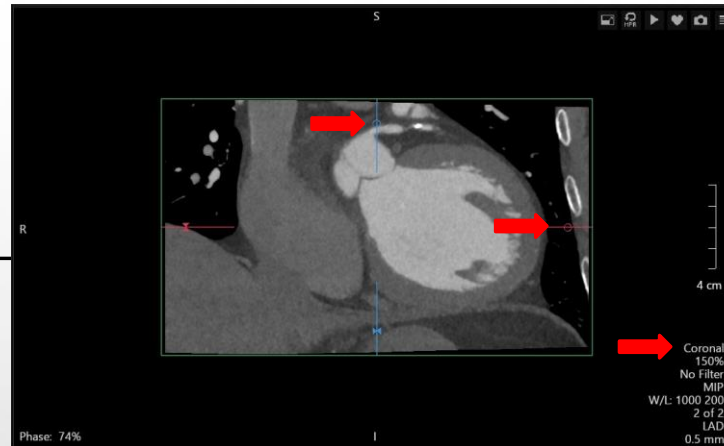
Tip: Auto Vessels selection only displays LAD, RCA and CX in all selected phases.

CT Cardiac CTA - Perform 3D overview

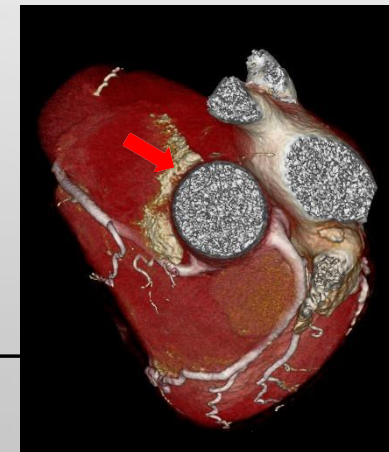
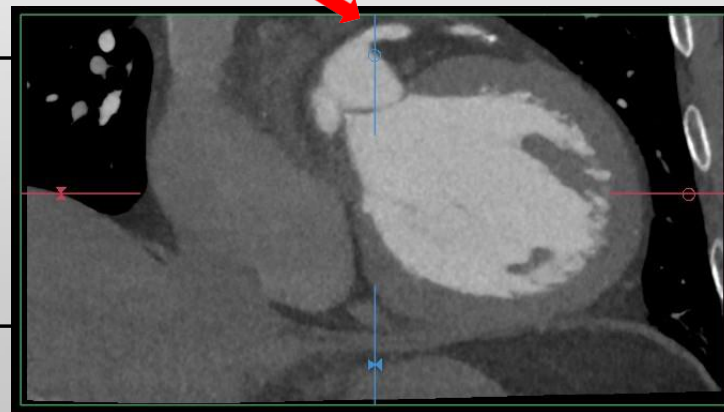
Double click on the circle at the end of the crosshair to select Orthogonal Mode. Or select Orthogonal from the dropdown in the bottom right corner of the viewport.

Right mouse and scroll through the Coronal images until the highest point of the LAD is seen.

Drag the green line to just above the LAD (or the vessel with the highest origin).



Tip: By cutting away the excess, the origins of the LAD and RCA will be more visible.



CT Cardiac CTA - Perform 3D overview

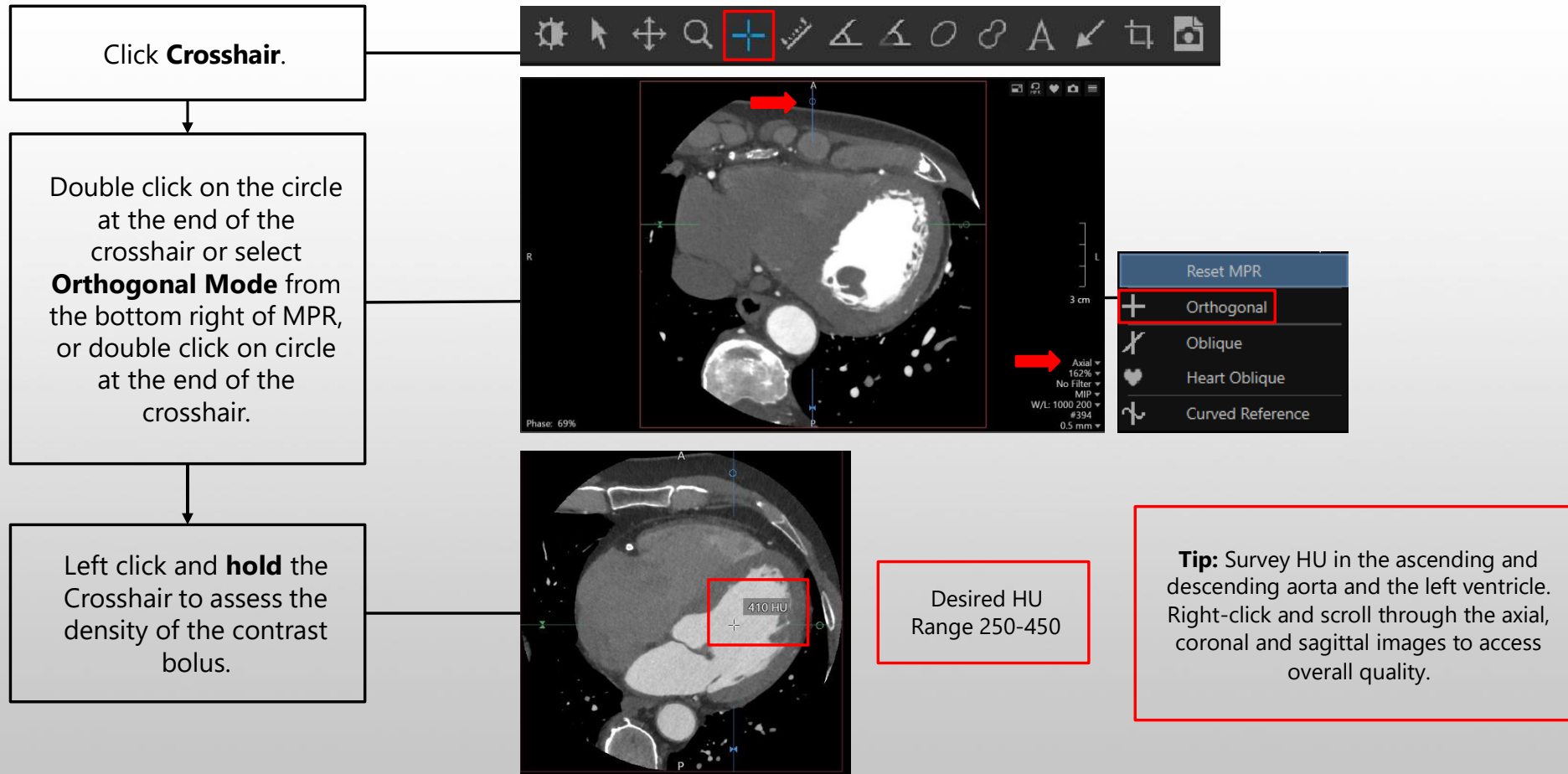
Double Click **anywhere in the** 3D image to view a one-on-one image.

Right click and drag to **rotate** the **3D** image. Double Click to go back to 4-1 view.



Tip: Review the 3D anatomy and the image quality.

CT Cardiac CTA - Evaluate contrast density



CT Cardiac CTA - Check for motion artefacts

Right mouse and scroll to a mid-sagittal slice. Look at the sternum and spine and verify that no step artifacts are present.



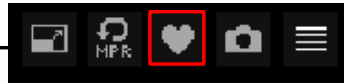
Tip: If a step artifact is seen in the heart, but the sternum and spine is still intact, the step could potentially be removed with a Phase Xact reconstruction on the CT.

CT Cardiac CTA - Review Heart Oblique Mode

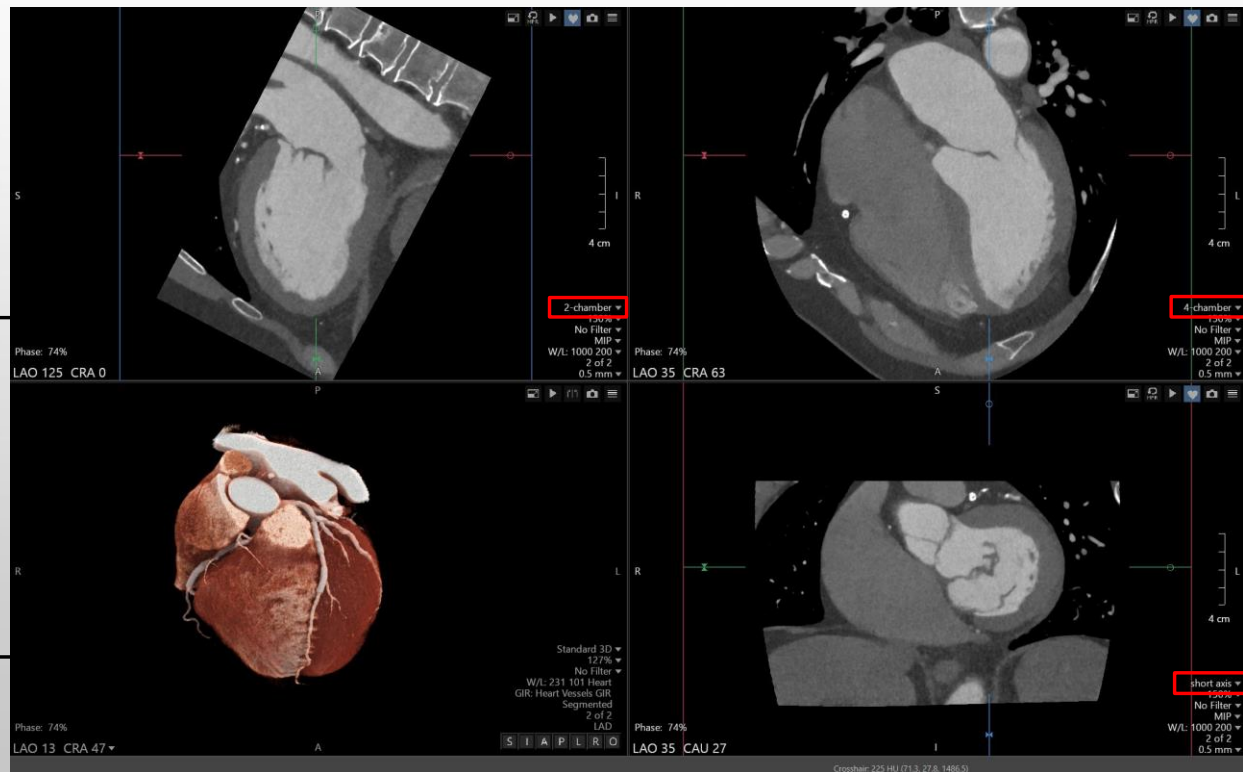
Click **Heart Oblique Mode** in the upper right corner of the MPR oblique view.

The Heart Oblique Mode button **toggles** between the orthogonal views, the cardiac short axis, 2 and 4 chamber views.

Right-click and scroll to review the cardiac chamber views.

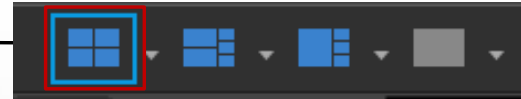


Tip: When the heart oblique mode is active the button changes to a blue color.

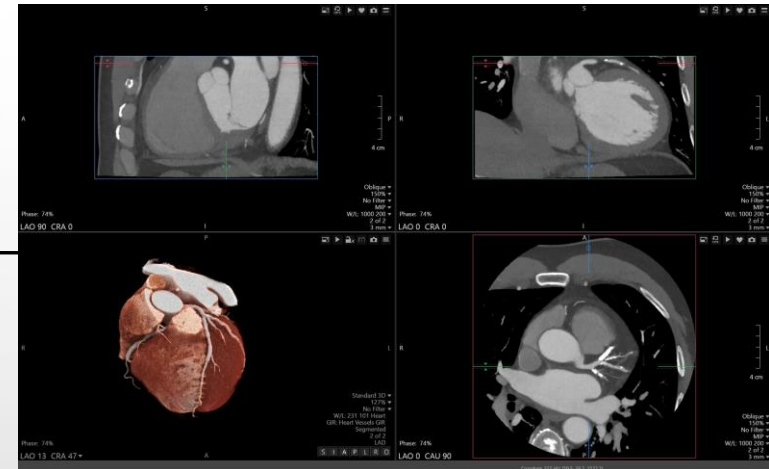
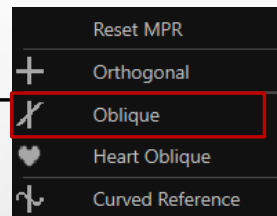


CT Cardiac CTA - Vessel Walk

Click the 4:1 image display. Click axial MPR.

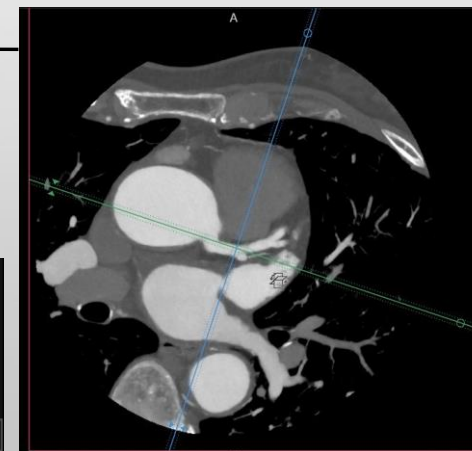
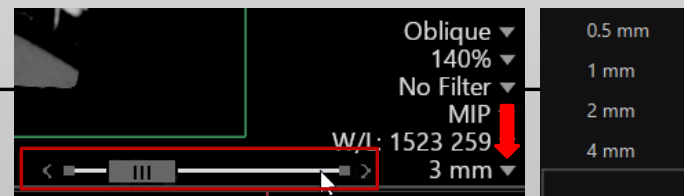


Click **Oblique** mode from the bottom right corner of MPR.



Click **crosshair** on the vessel. The cursor becomes an oblique orientation tool. Click and drag to rotate the image.

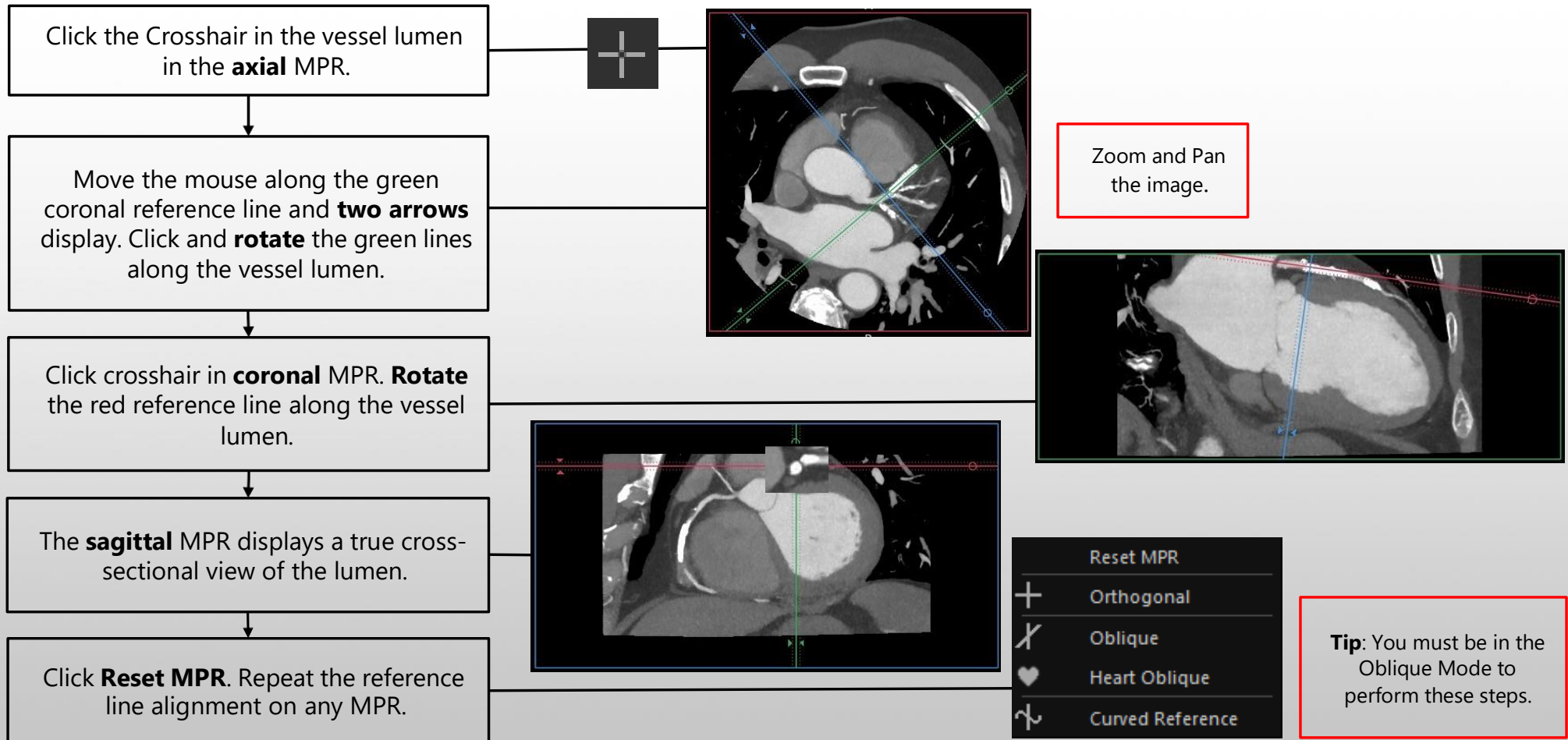
Thicken **MIP** by selecting a value from the dropdown. Or hover the cursor next to slice thickness. A slider bar will appear. Drag the slider bar to change the slice thickness.



Tip: Oblique vessel walk can be performed in all viewports.

Tip: For the best results, set the thickness to the MIP thickness to the vessel diameter.

CT Cardiac CTA - Vessel Walk



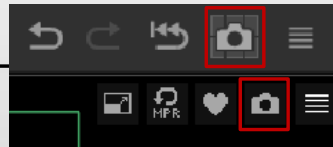
CT Cardiac CTA - Snapshot

Save a key image with the key image tool on the common toolbar or take a snapshot with the snapshot icon.



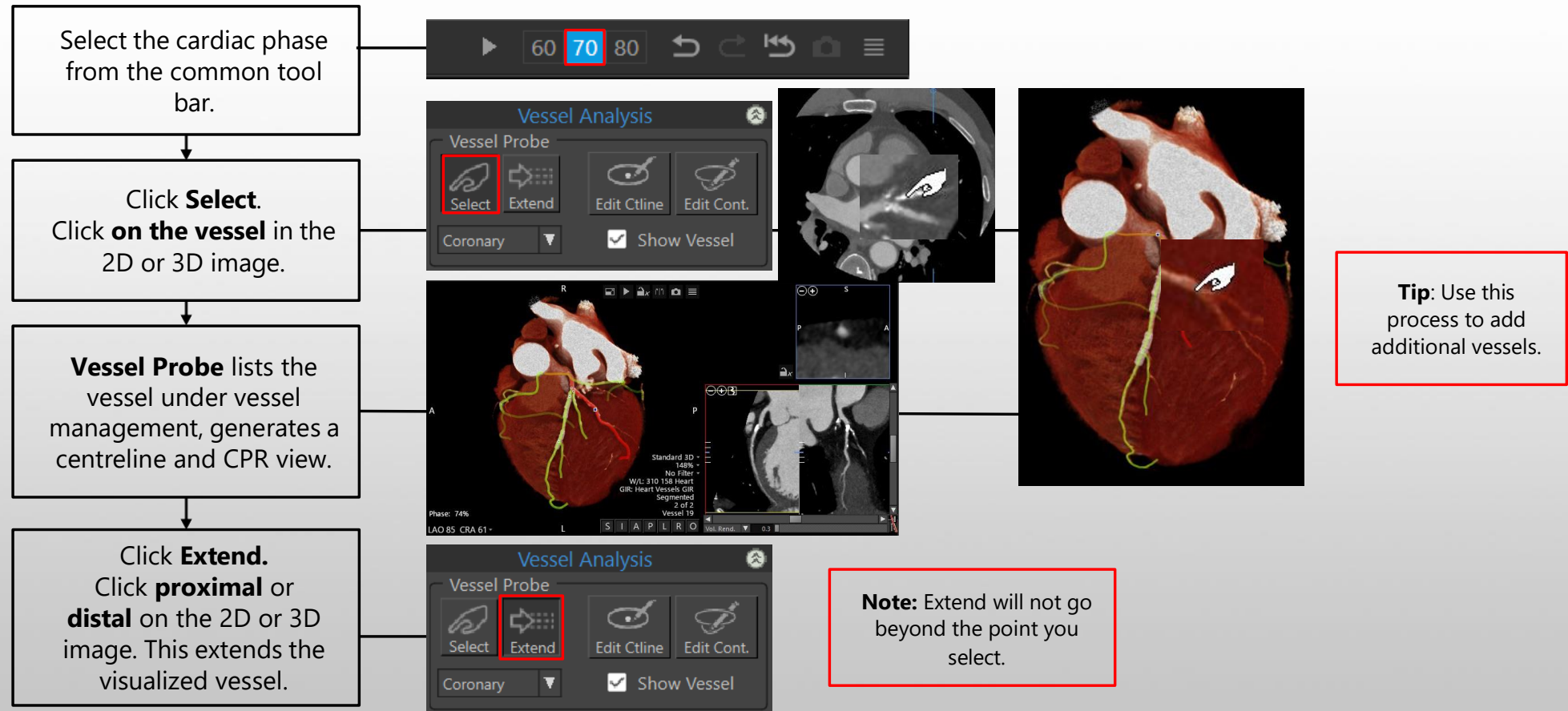
Tip: It is important to remember to take a snapshot. Only a snapshot can be restored later. Once a snapshot is restored you will be able to continue post processing your image.

Snap icon can be accessed from the 3D or 2D image in the upper right corner of viewport to create the snapshot.

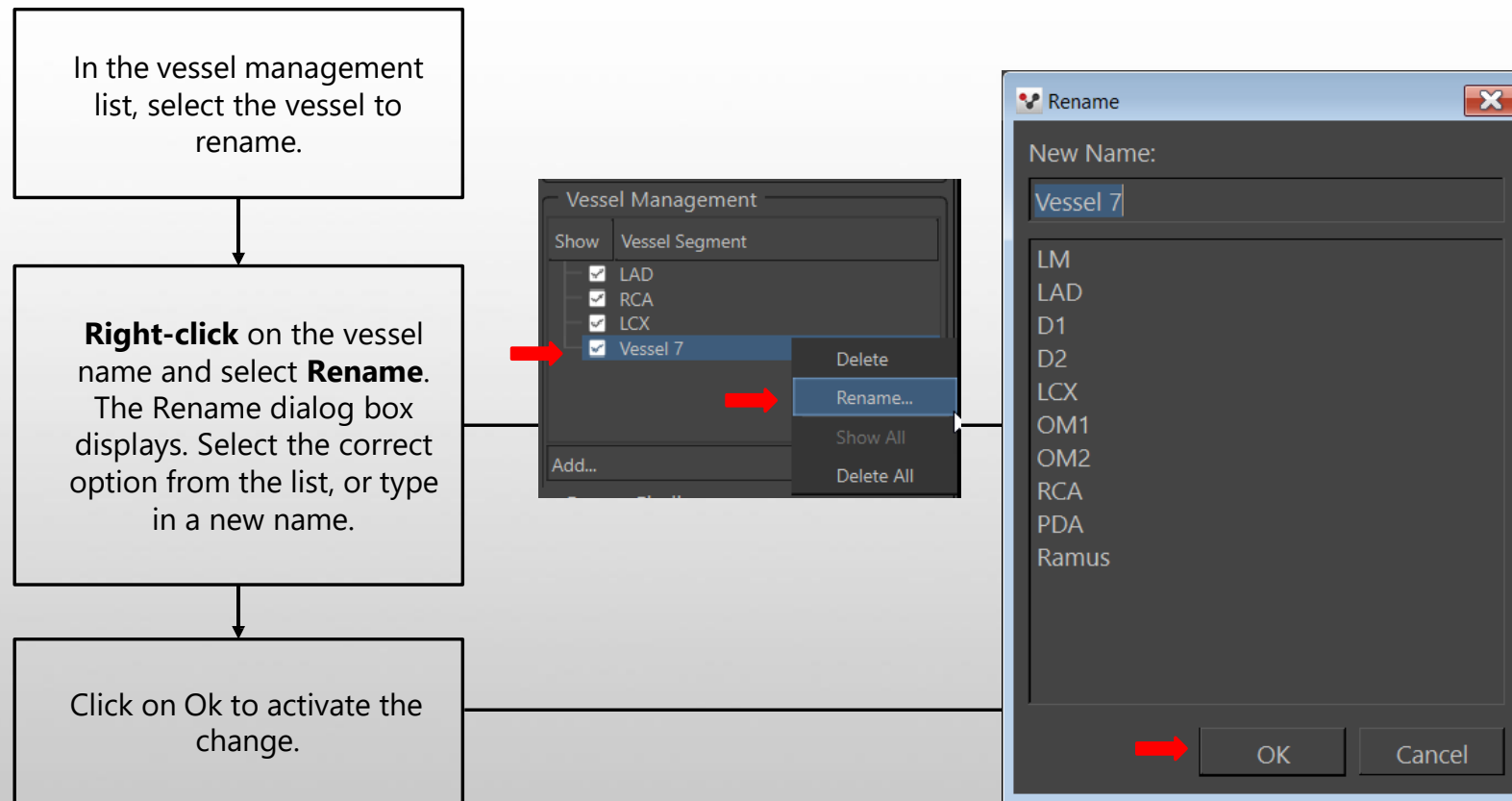


CT Cardiac CTA – Manual Vessel Probe Analysis

- ▶ Vessel Probe is an option for Cardiac CTA to isolate and analyse the vessel.



CT Cardiac CTA - Rename Vessels



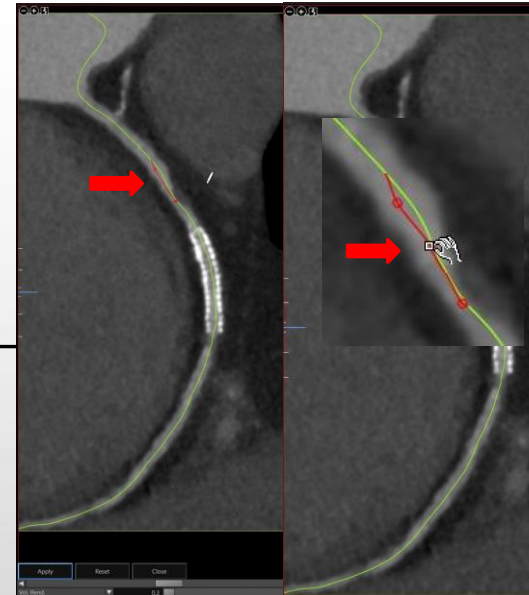
CT Cardiac CTA - Centerline Edits

Right-click in the **CPR** view. Click **Edit Centreline**.

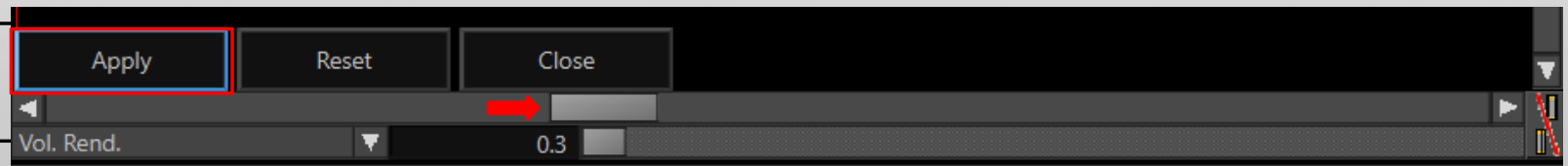
Click and **deposit red points** to adjust the centreline by dragging the red points.

Click **Apply** saves the edits. Click **Close** to end.

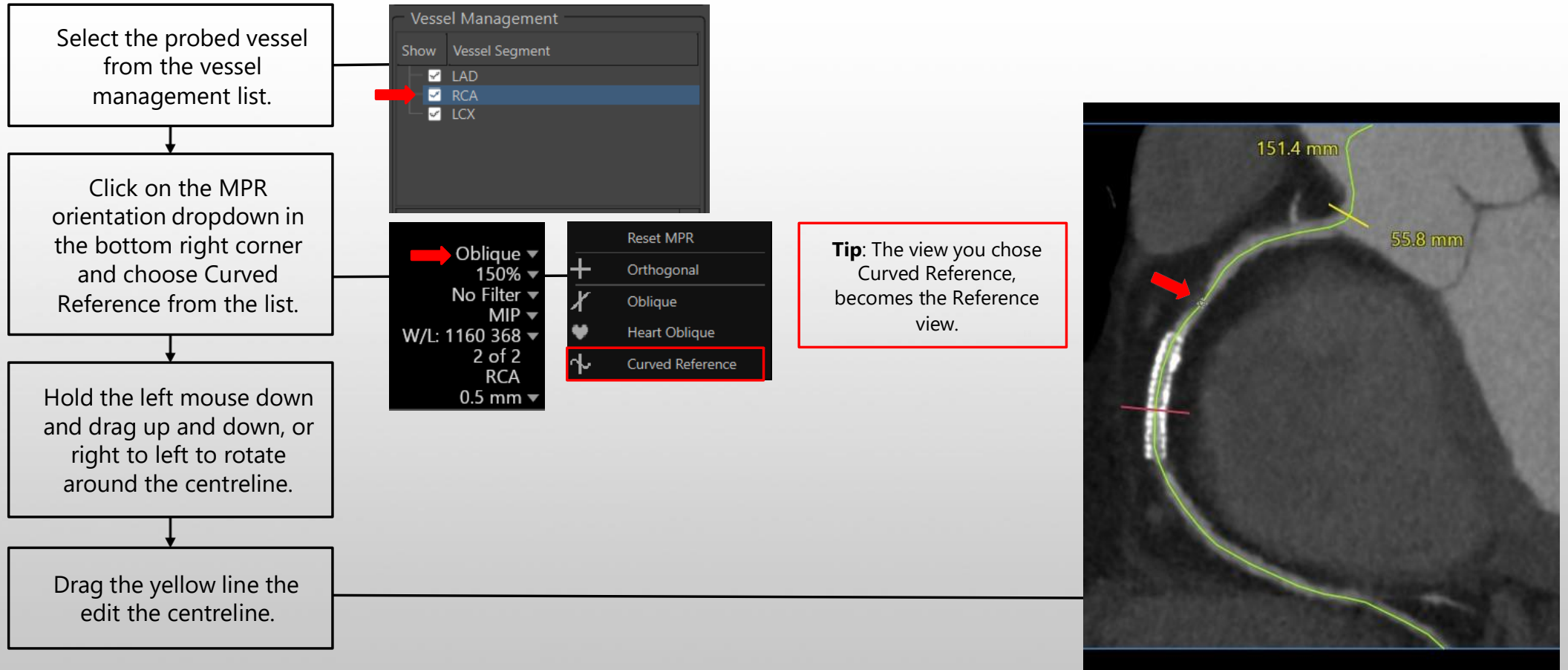
Click and **drag** the slider bar at bottom of the CPR view to rotate the image.



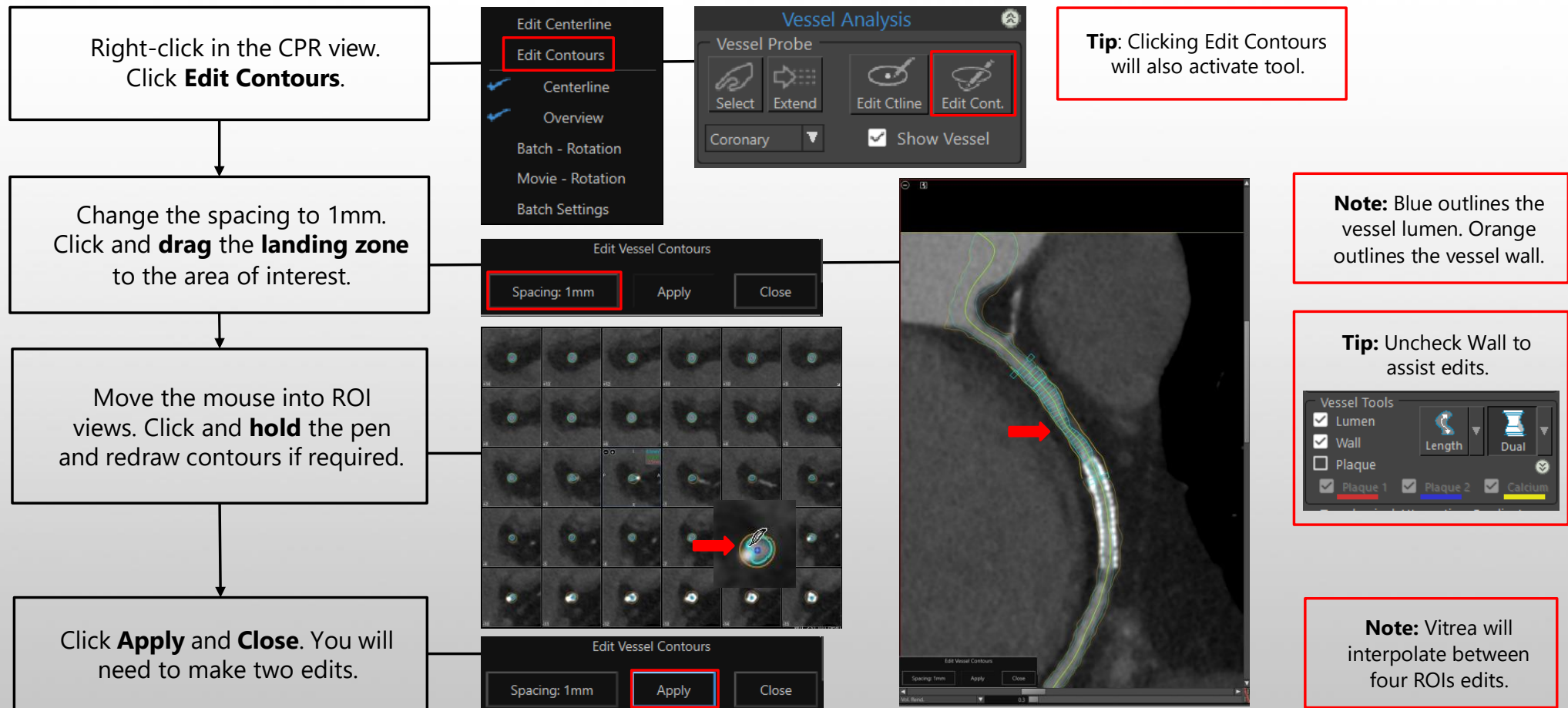
Tip: The yellow line is the centreline.



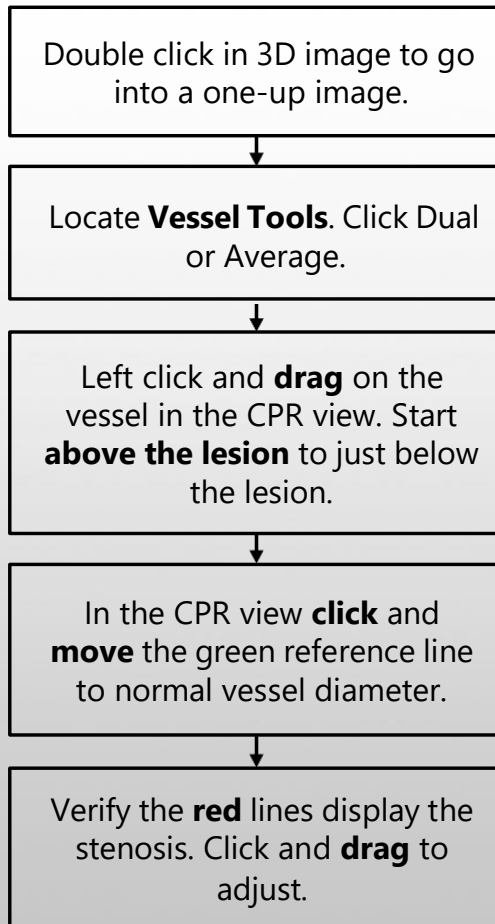
CT Cardiac CTA - Centerline Edits on Curved MPR



CT Cardiac CTA - Edit Contours



CT Cardiac CTA - Lesion Tool Analysis



Tip: It is recommended to use dual reference point for a vessel that naturally tapers down (e.g. a coronary artery) or bifurcating artery.

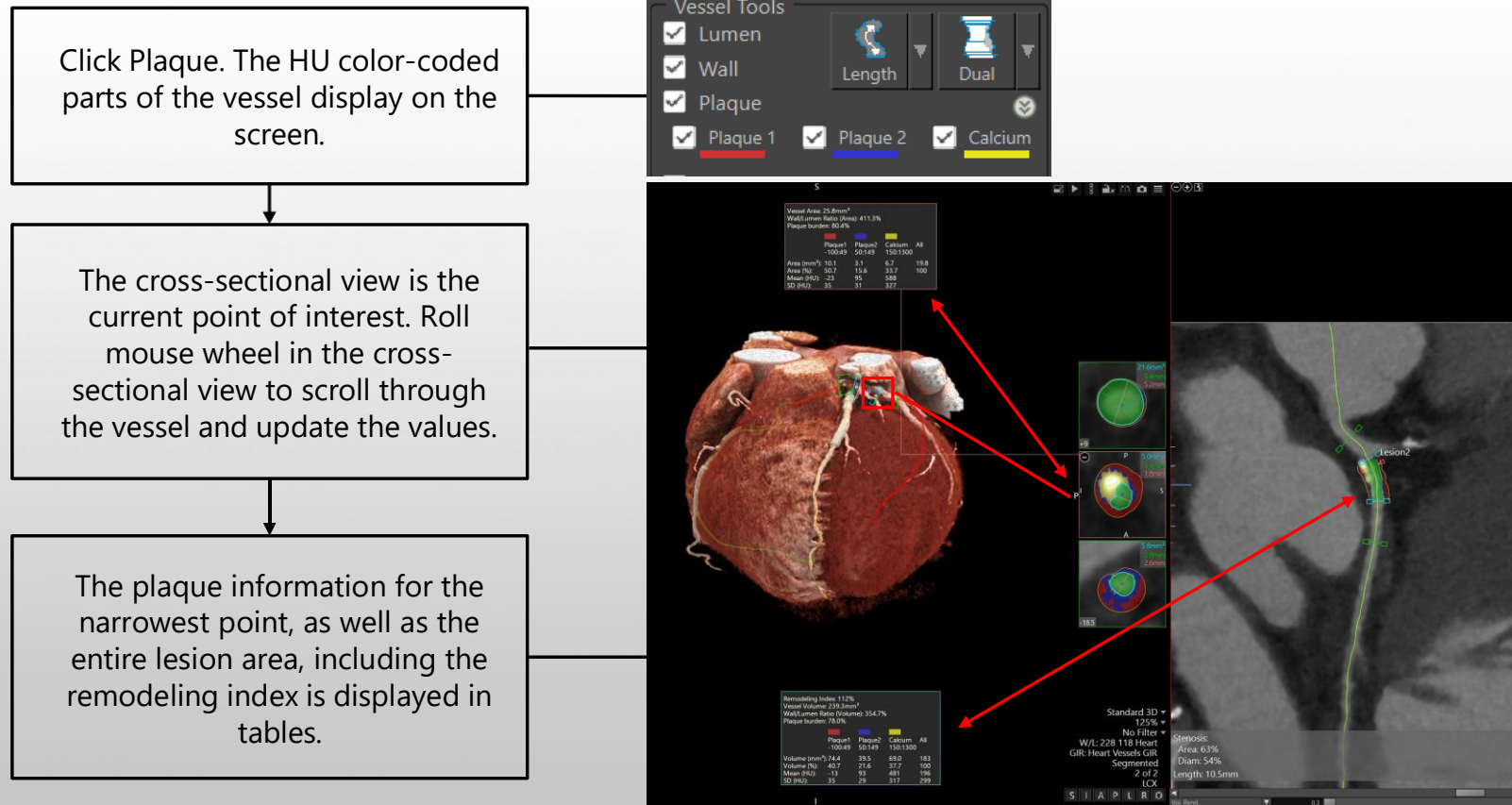
Tip: Stenosis value displays on the CPR image.

Stenosis:
Area: 63%
Diam: 54%
Length: 10.5mm

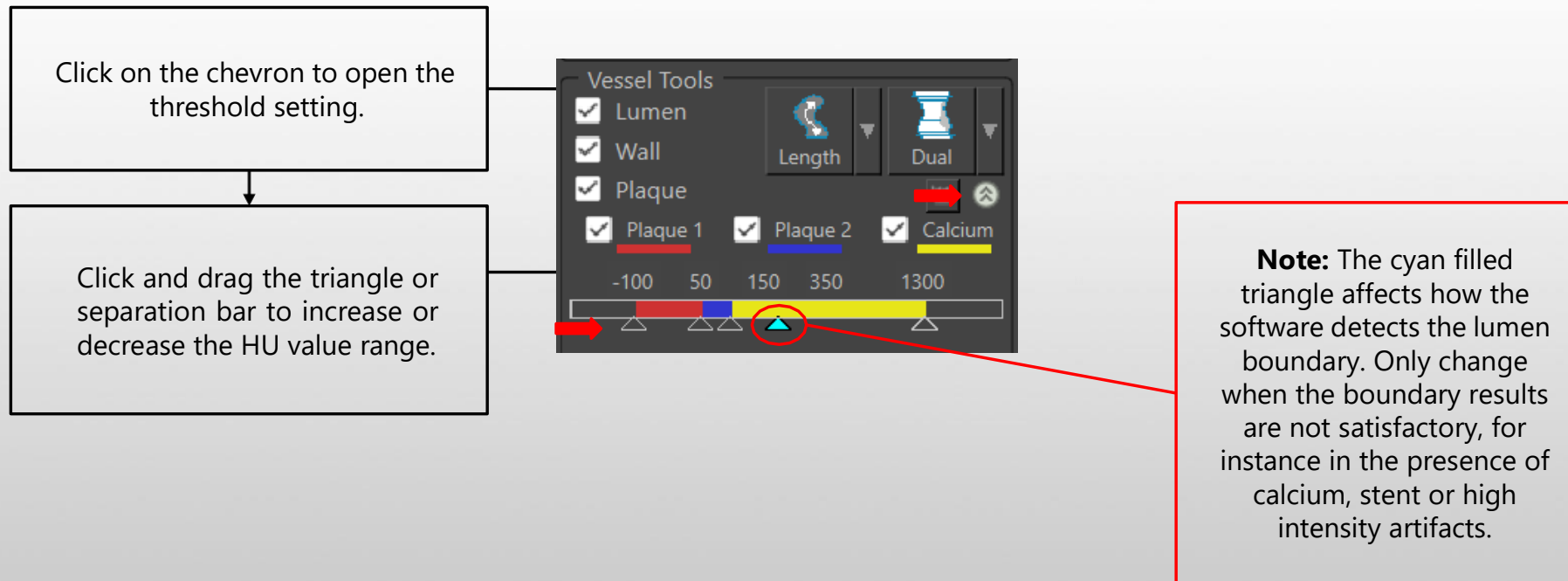
Note: The stenosis point within an identified lesion is initialized to the minimum luminal area, and not to the minimum luminal diameter of the overall identified lesion.

CT Cardiac CTA - Plaque Burden

- SurePlaque visualizes the coronary lumen, walls and plaque.



CT Cardiac CTA – Adjust HU settings for SurePlaque



CT Cardiac CTA - Perivascular CT Density

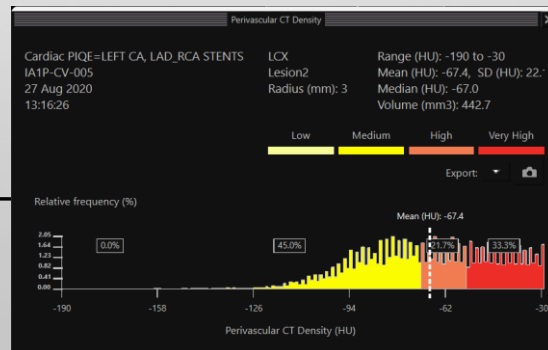
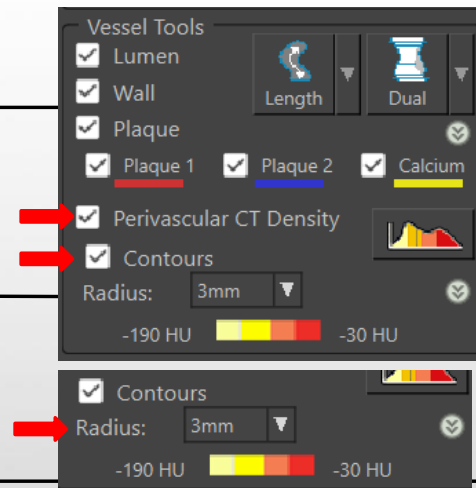
- Perivascular CT density can be used to visualize and obtain statistical analysis on perivascular densities in the coronary arteries.

Click on the checkbox to enable Perivascular CT density.

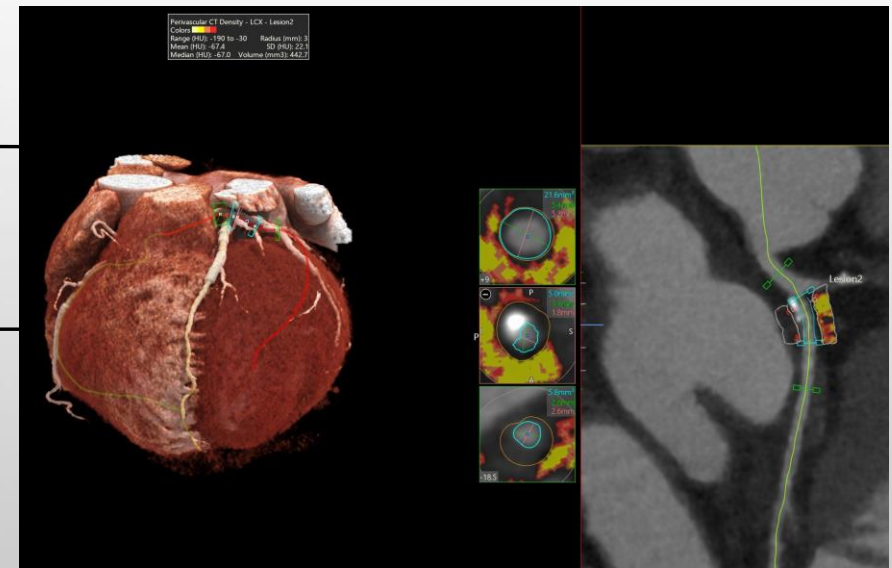
To display the inner and outer contours, check the Contours box.

Select the desired Radius from the dropdown menu.

Click on the histogram button to display the relative frequency percent of HU ranges defined in the settings bar.



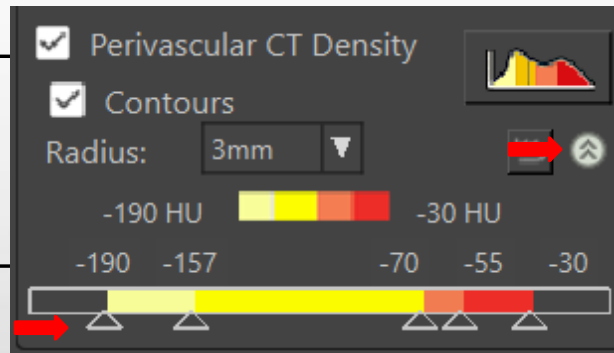
Note: Perivascular CT Density is a separately licensed feature.



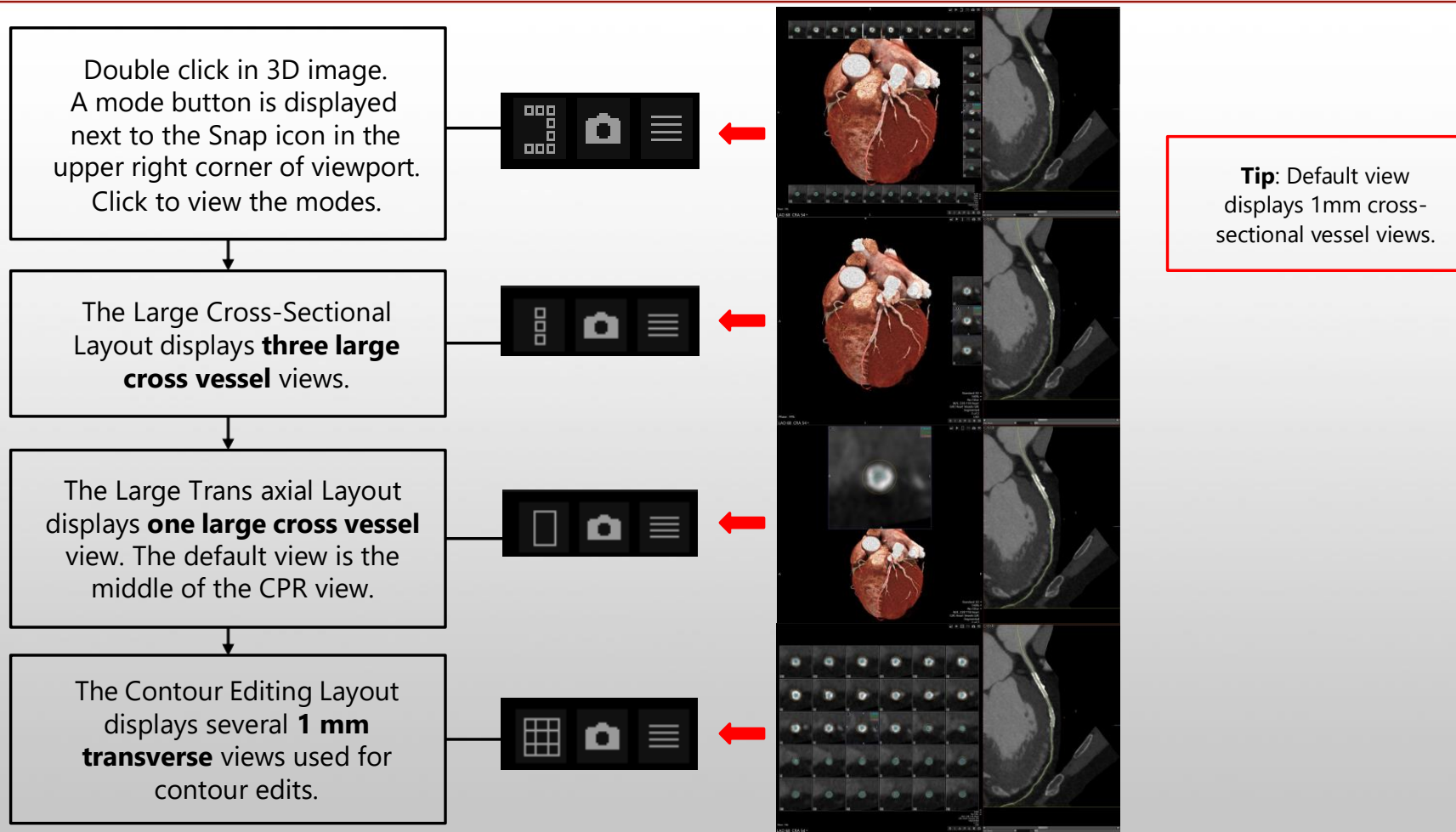
CT Cardiac CTA – Adjust HU settings

Click on the chevron to open the threshold setting.

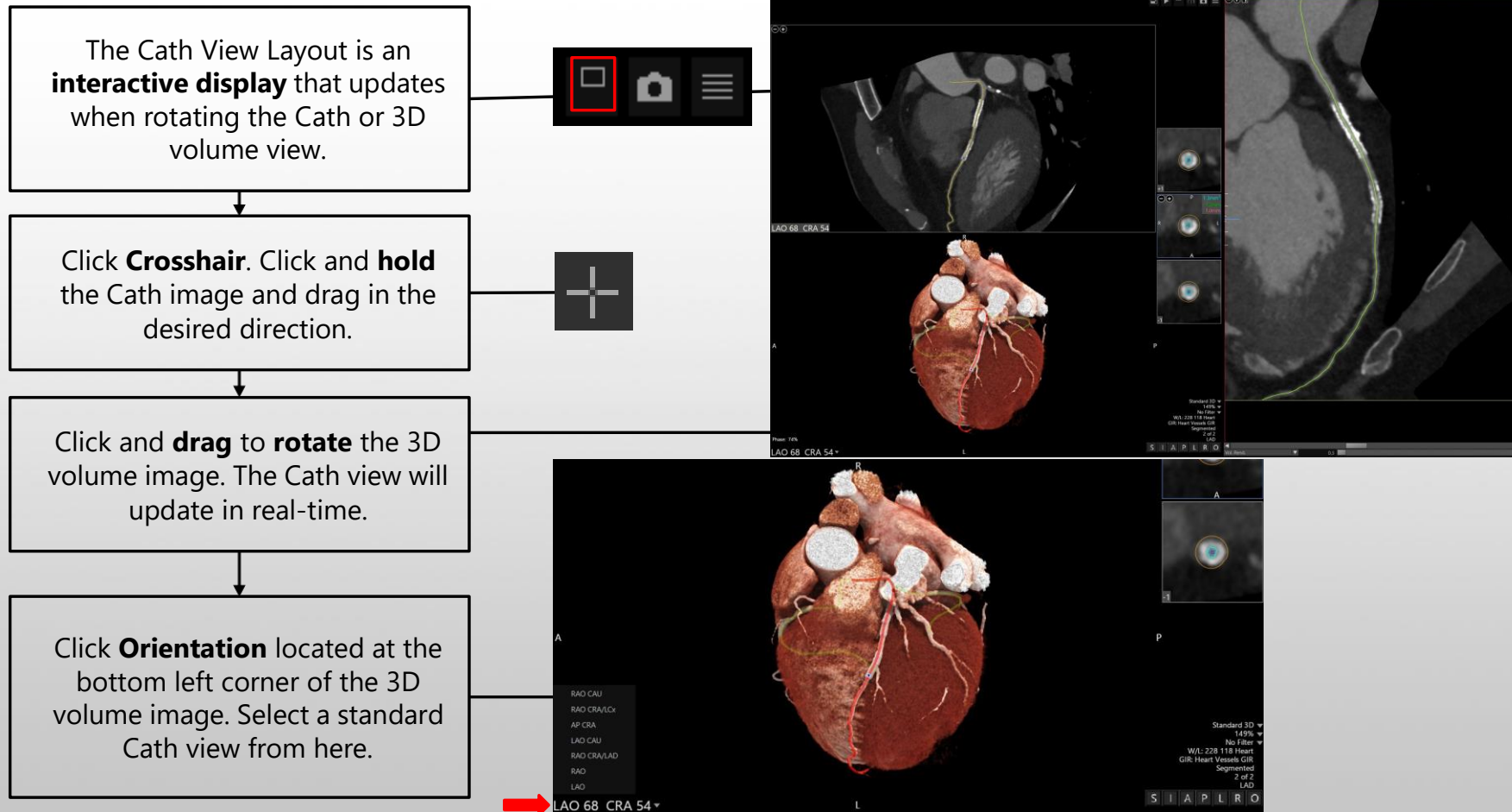
Click and drag the triangle or separation bar to increase or decrease the HU value range.



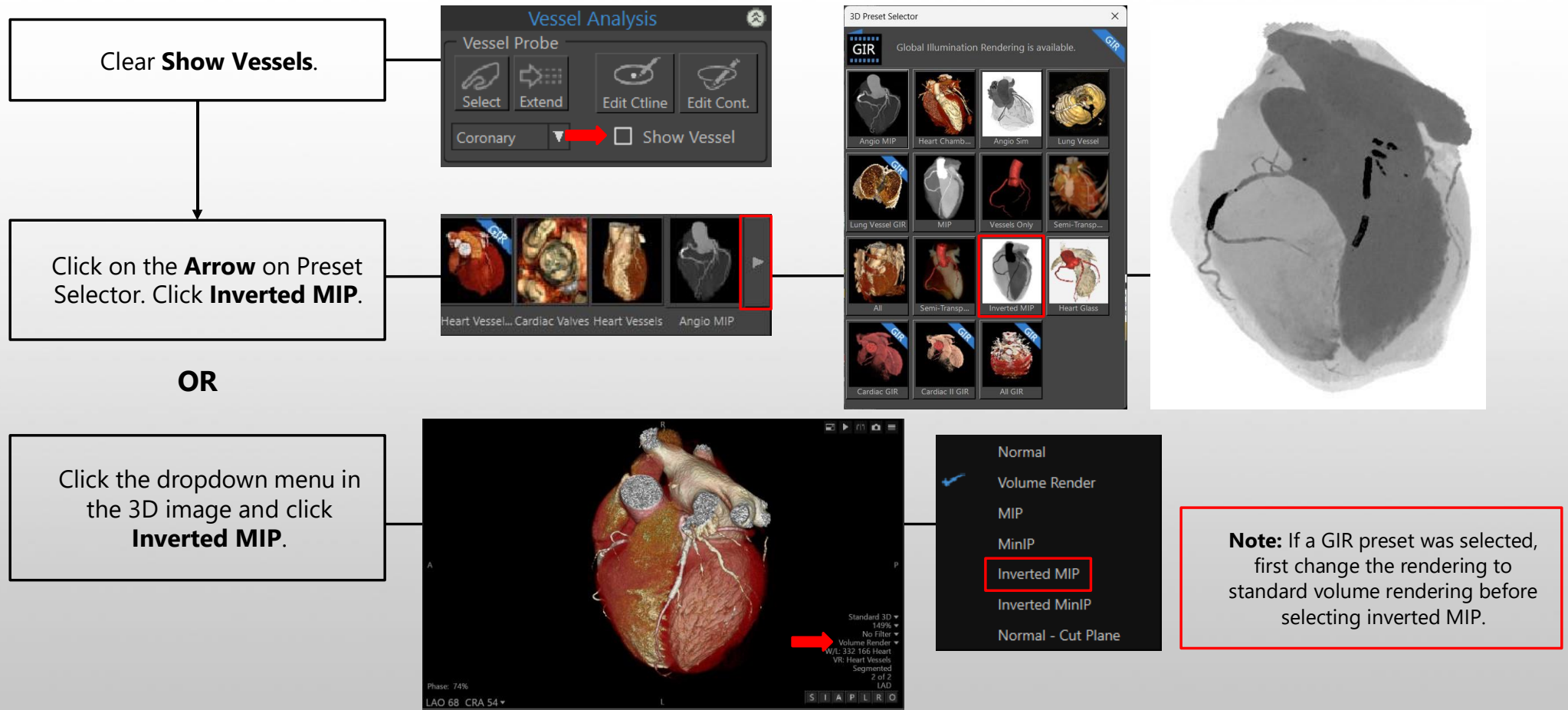
CT Cardiac CTA - 3D Review Modes



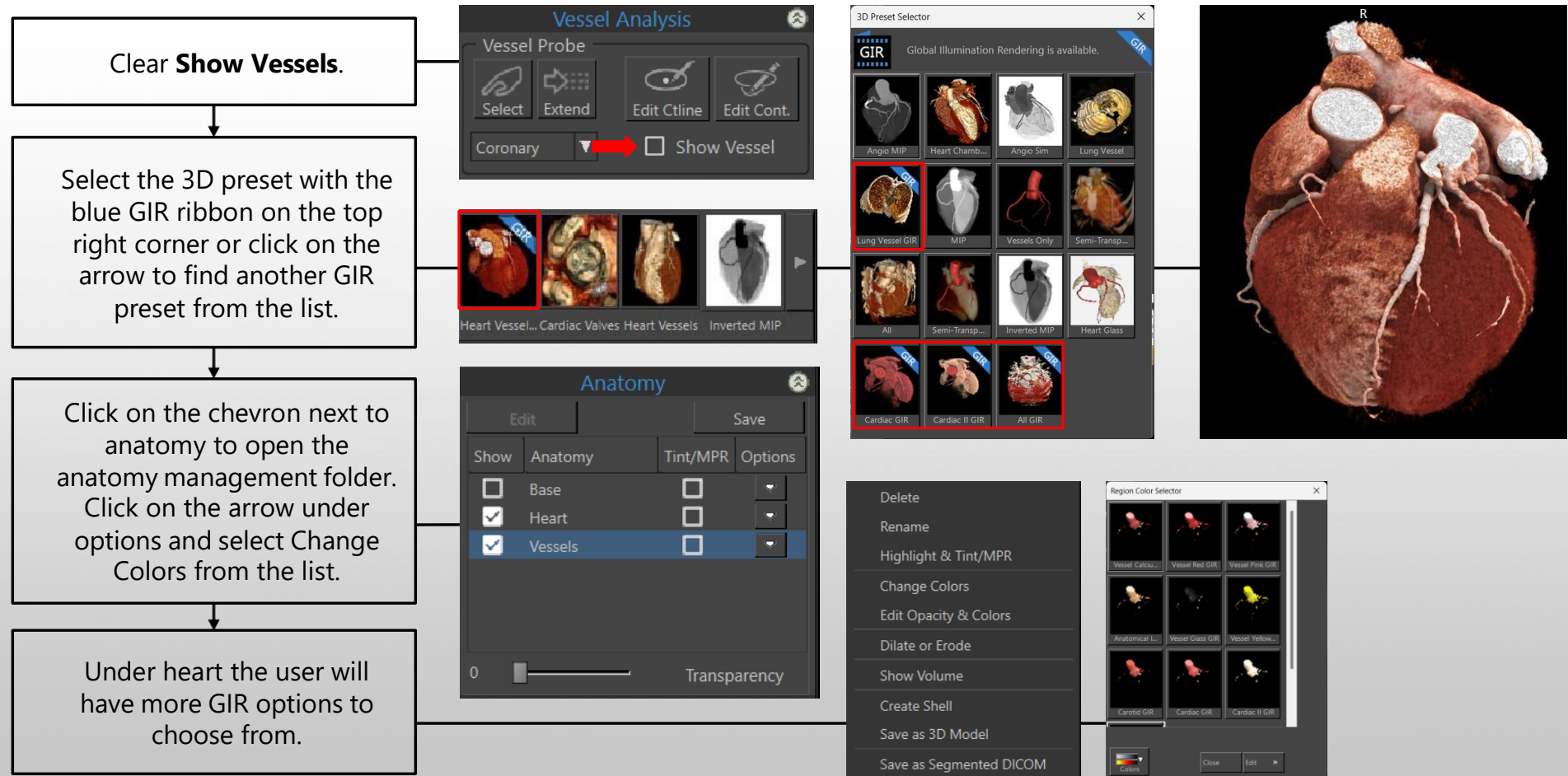
CT Cardiac CTA - 3D Cath Mode



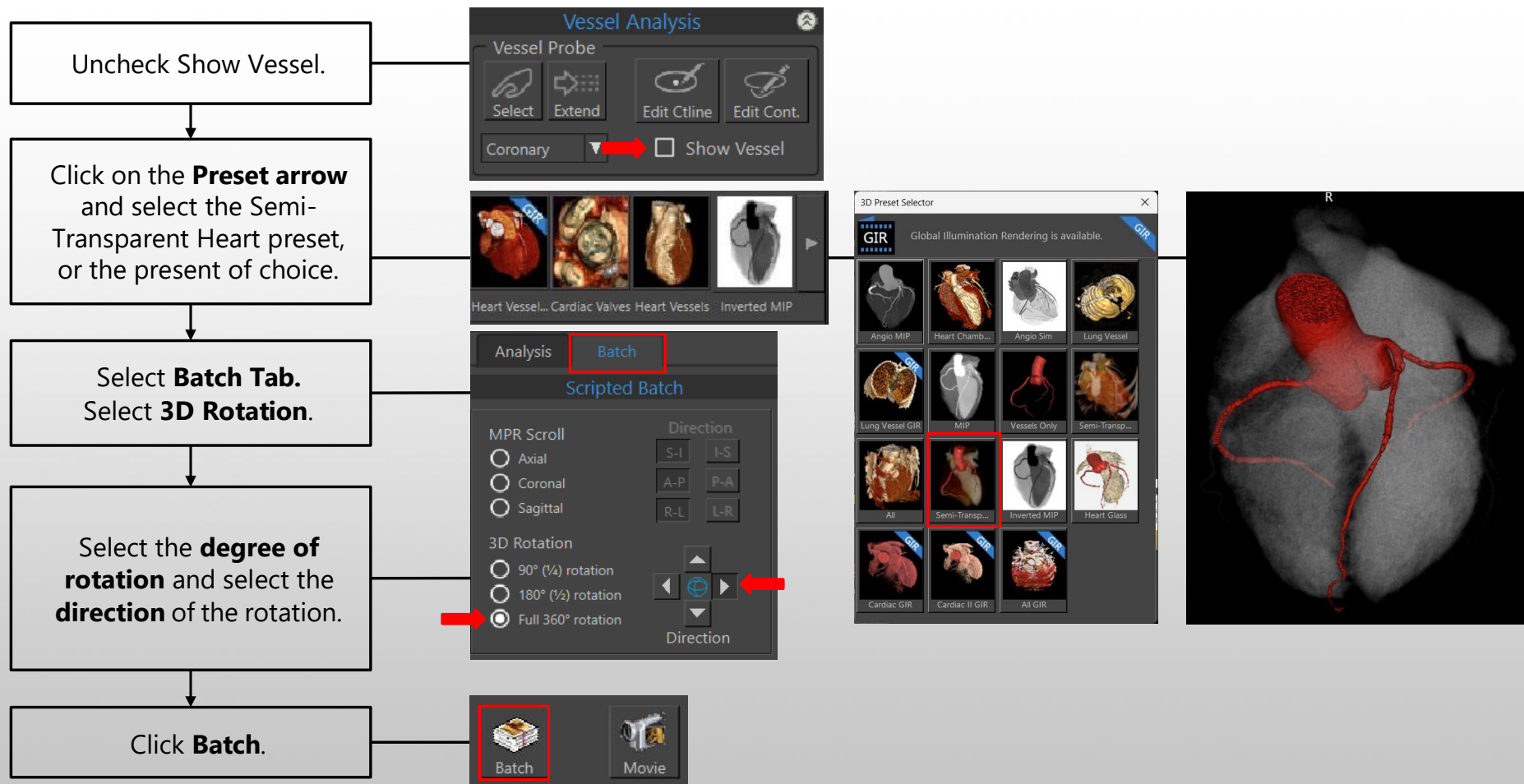
CT Cardiac CTA - Apply Inverted MIP



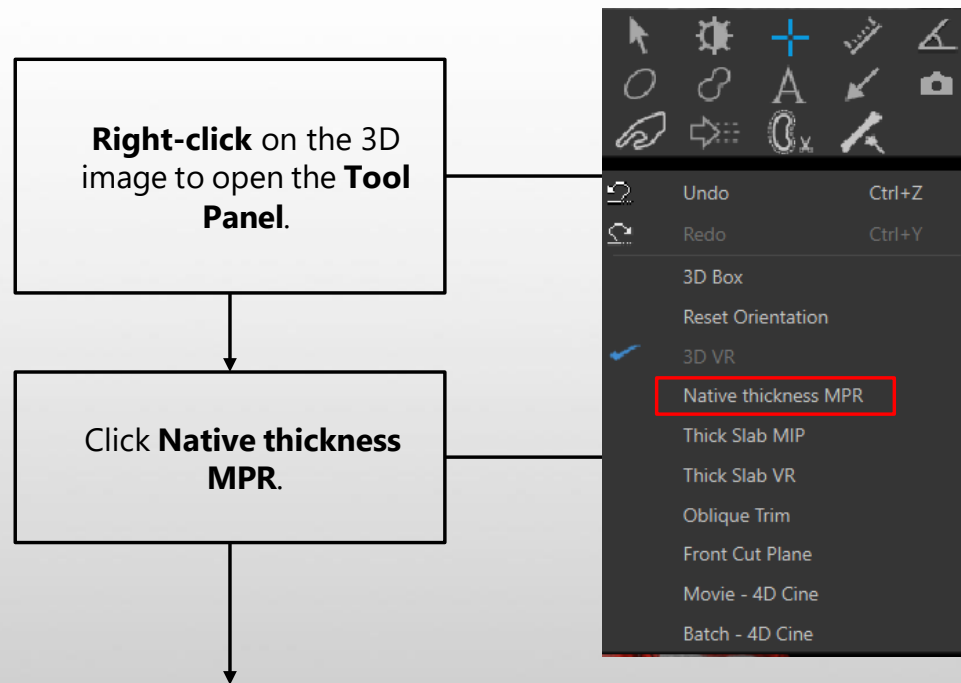
CT Cardiac CTA – Apply GIR to 3D view



CT Cardiac CTA - 3D Batch Rotation

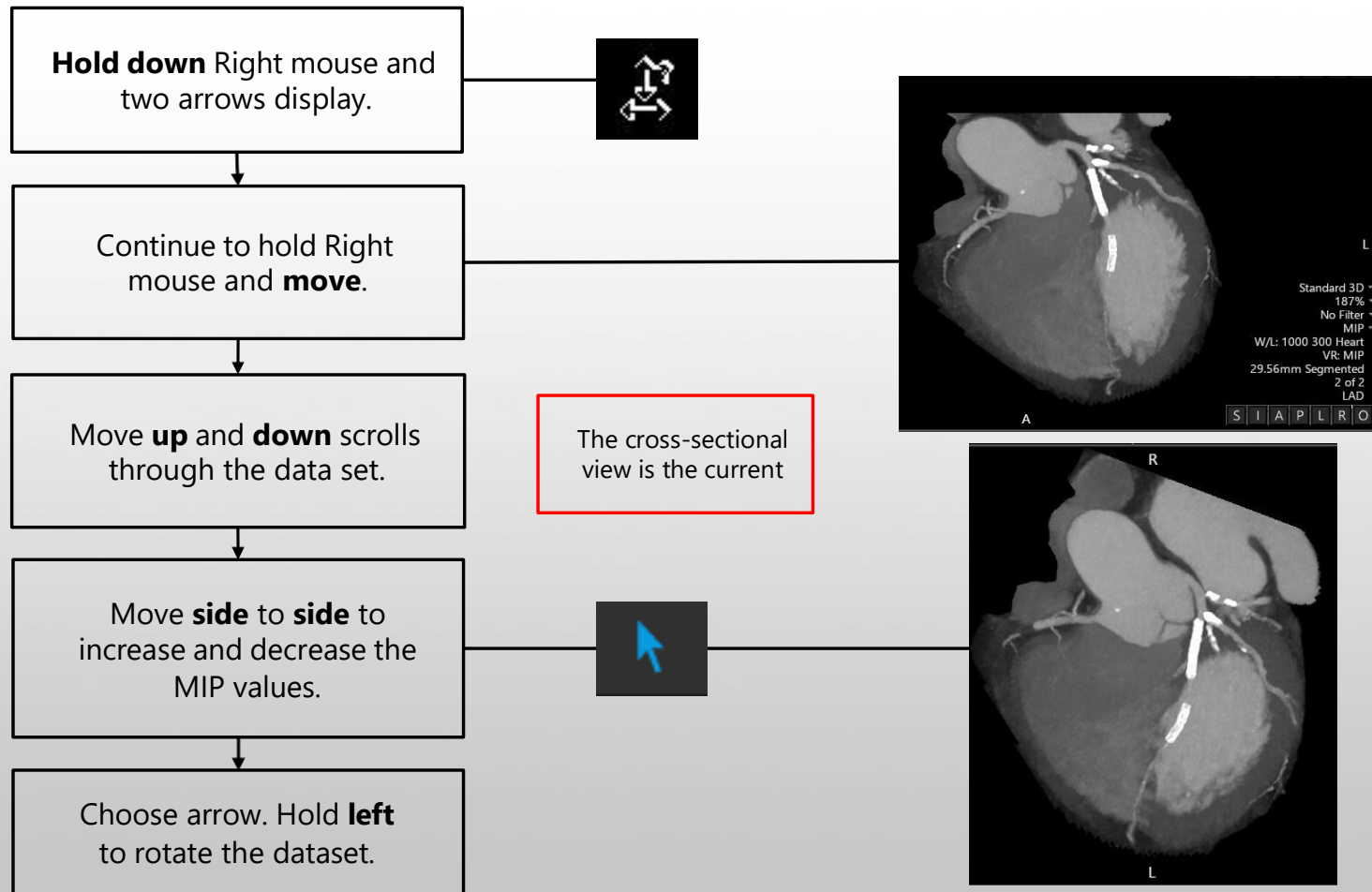


CT Cardiac CTA - Native Thickness MPR



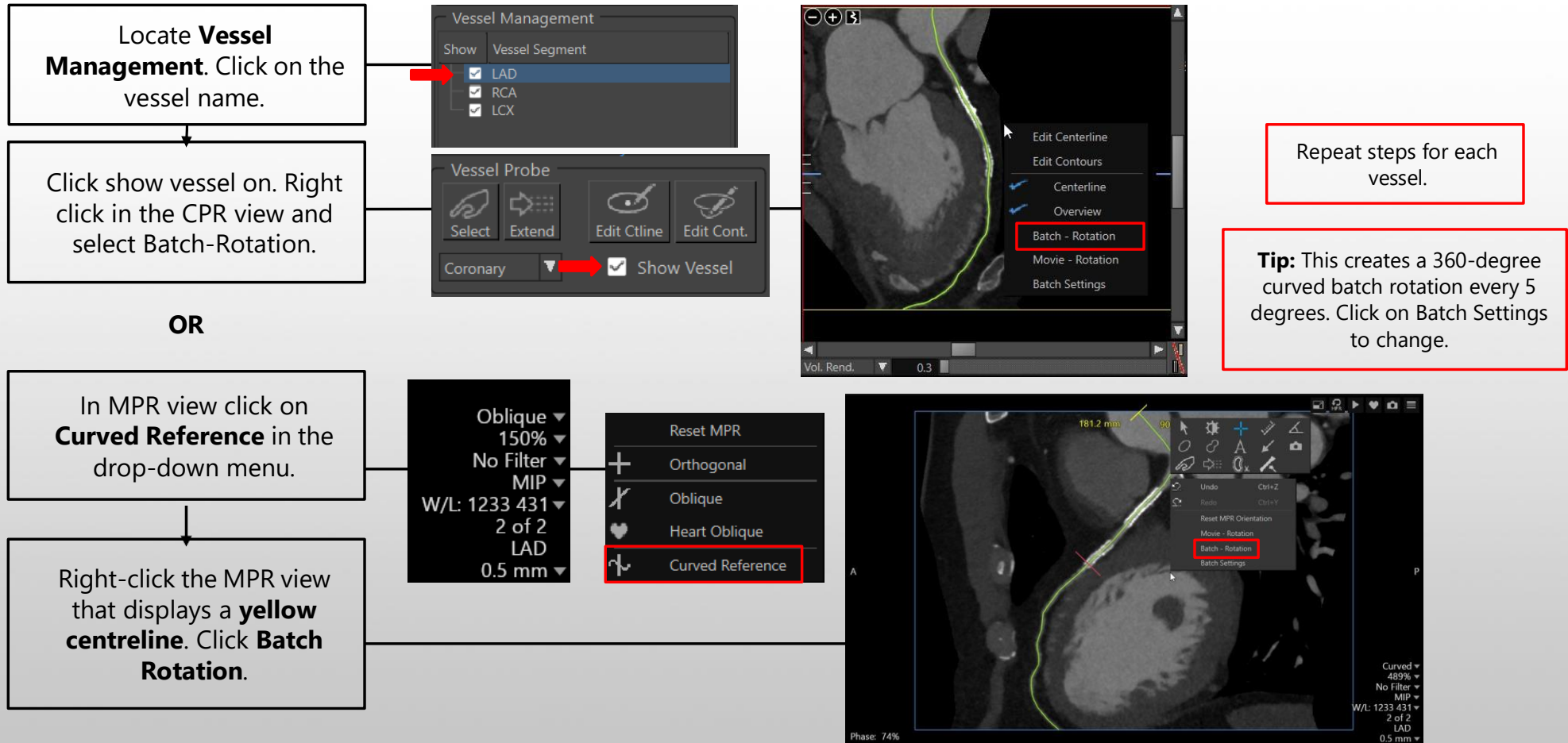
Tip: This tool provides the capability to view the heart in a VR MIP projection. The MIP thickness can be increased or decreased as you use right mouse to drag left and right.

CT Cardiac CTA - Native Thickness MPR

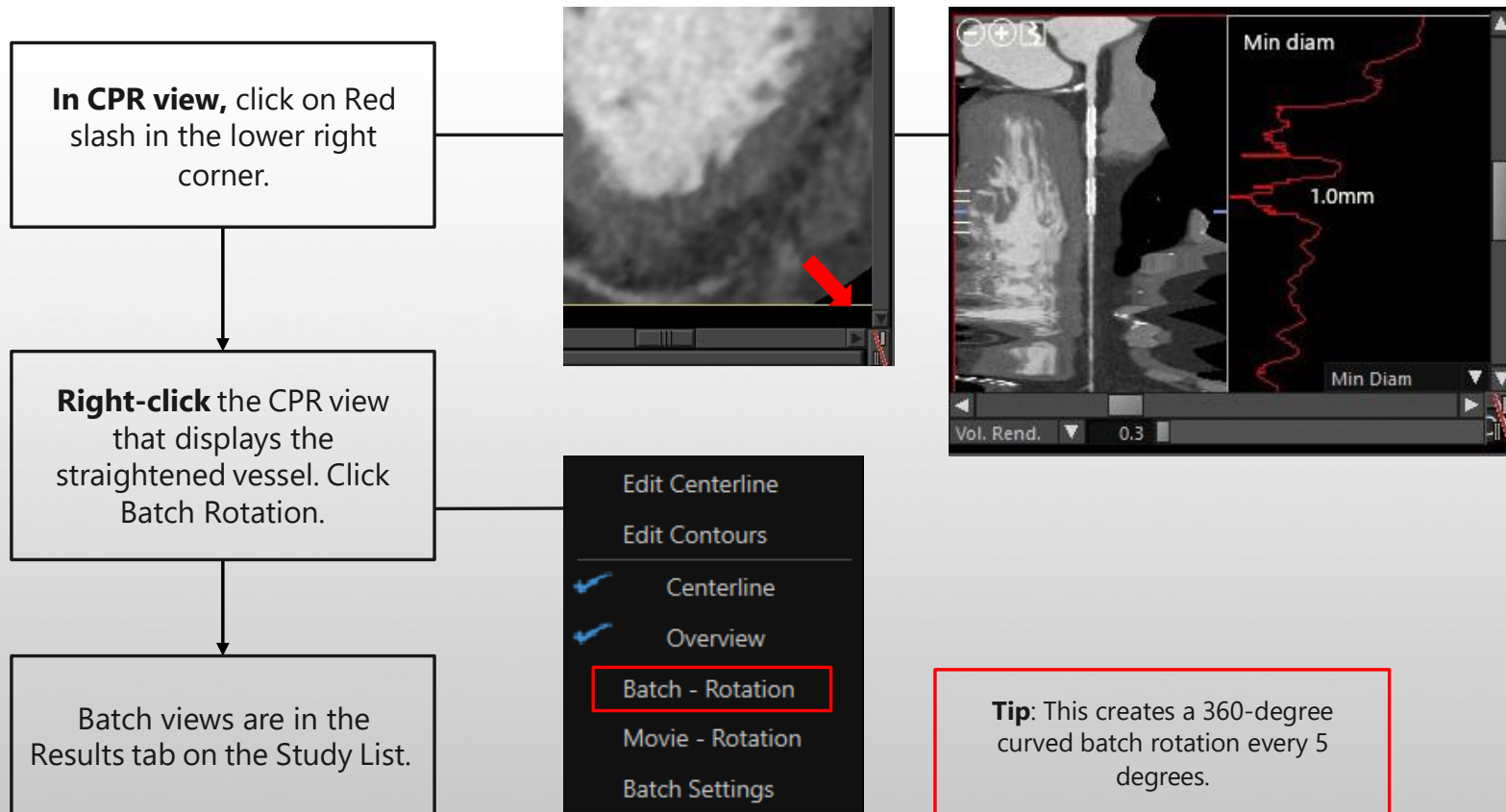


Tip: Locate the ROI. Press the wheel to display the yellow crosshairs and pan to place ROI in the center. This will lock the ROI at the center point and allow you to rotate around the surrounding vessels.

CT Cardiac CTA - Automated Batch Rotation



CT Cardiac CTA – Batch Rotation of Straightened Vessel



CT Cardiac CTA – Cardiac Report Findings

- Use Report Findings to report on vessels, grafts, and stents

Select the segment that will be added to the report.

Select normal if no pathology is found. Otherwise select unreadable, or other and use the dropdown menus to describe stenosis, plaque type and morphology.

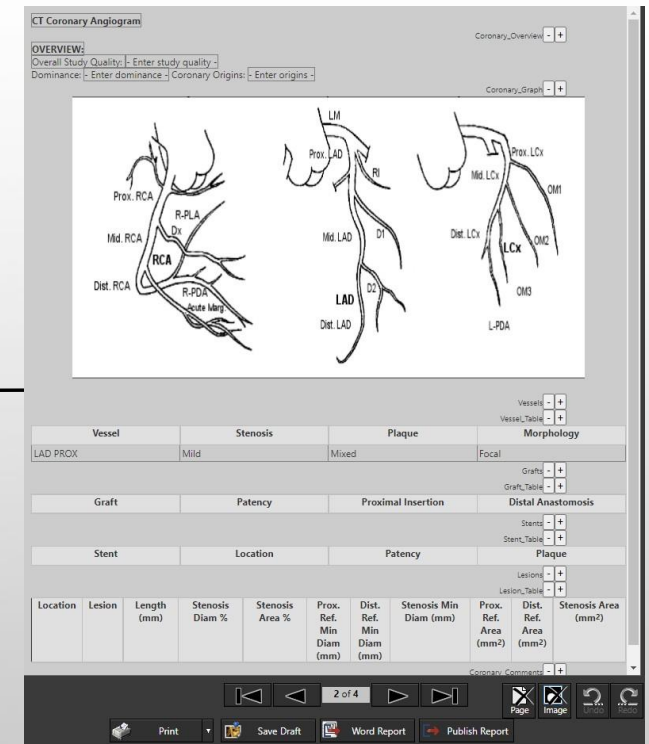
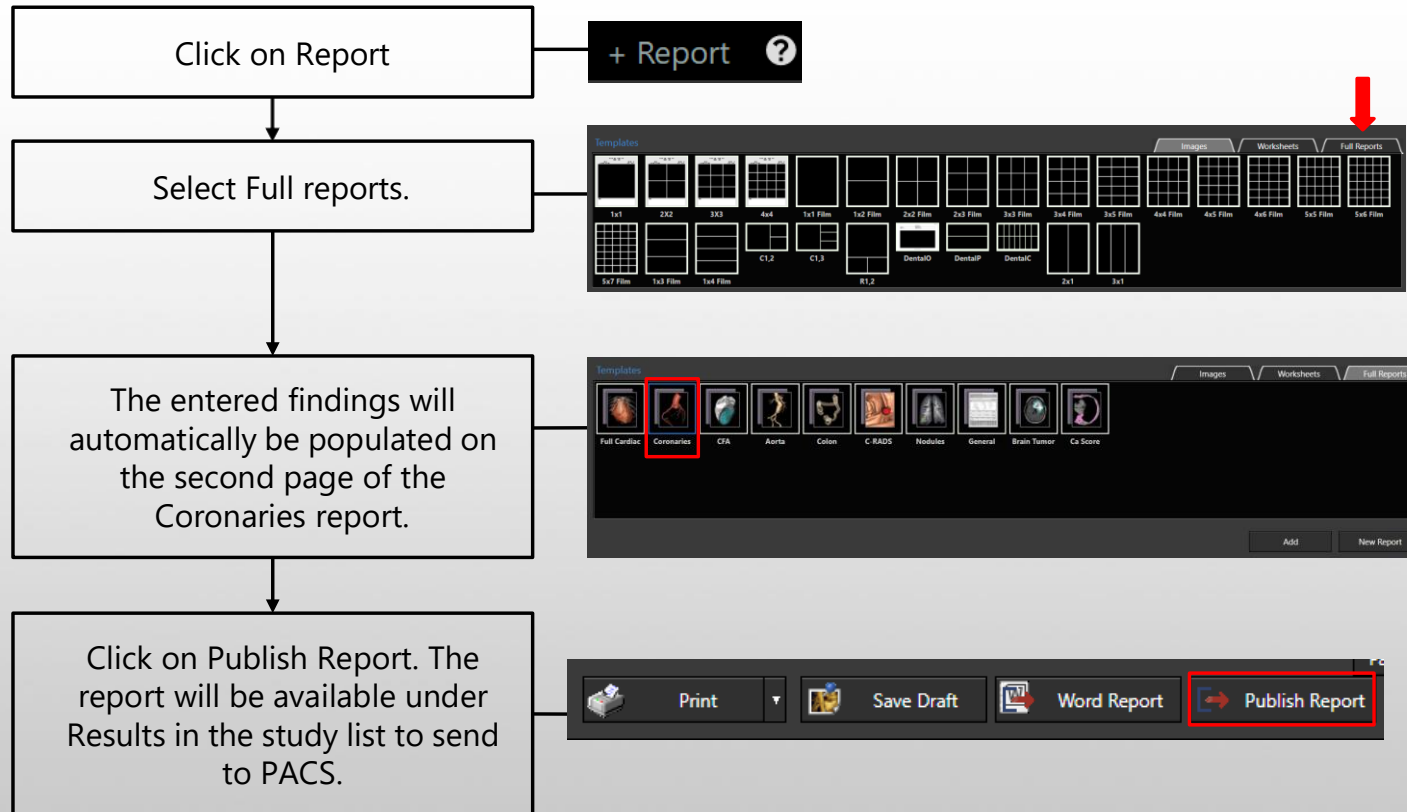
Click on comment to manually add additional comments.

Tip: To report on the entire vessel, select All segments. The option will be greyed out until normal or unreadable finding is selected.

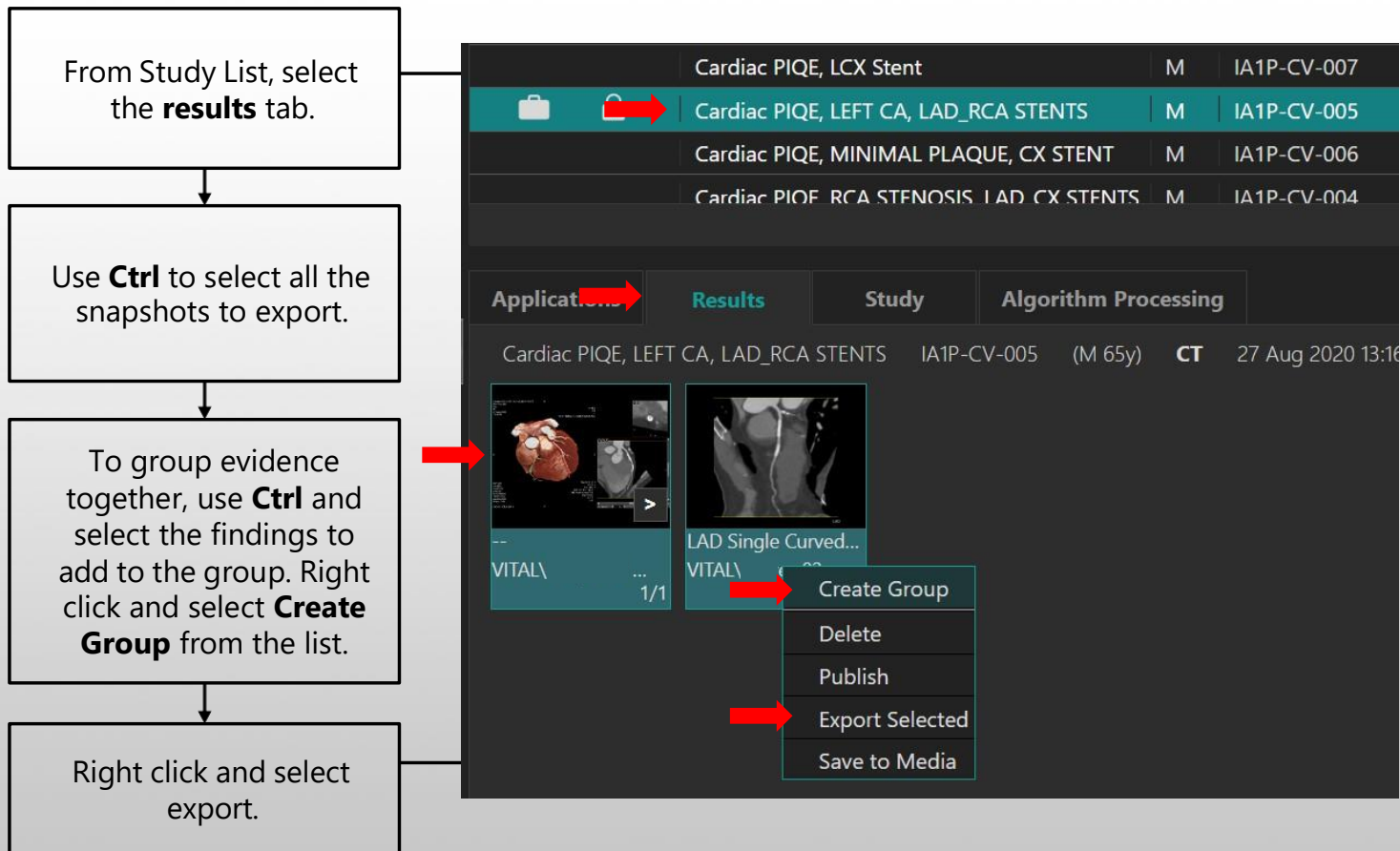
Note: If the 3D analysis, or 3D auto vessel protocol is used, the user will also have the option to add additional vessels to the report.

The diagram illustrates the workflow for reporting findings in CT Cardiac CTA. It features three 'Report Findings' panels and a 'Comments' dialog box. The first panel shows the 'All Segments' option selected. The second panel shows the 'Normal' radio button selected, with the 'Stenosis' dropdown menu open, displaying options like 'No Stenosis', 'Mild', 'Moderate', etc. The third panel shows the 'Comments...' button highlighted. Arrows connect instructional text boxes to these UI elements. A red box highlights the 'Tip' about selecting 'All Segments', and another red box highlights the 'Note' about adding vessels in 3D analysis.

CT Cardiac CTA – Cardiac Report Findings



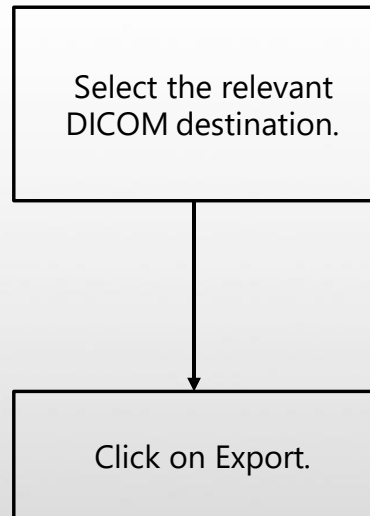
CT Cardiac CTA - Distribute Findings: Export



Tip: To delete, rename or edit a group description, right click on the group. Hover the mouse over the arrow and select the option from the list.

Grouping	Edit Group Description
Save As	Ungroup All
Download and View	Remove from Group
Delete	Move Up
Publish	
Export Group	
Save to Media	
Preview	

CT Cardiac CTA - Distribute Findings: Export



Export Studies

Content

- ☒ 1 Results, reports, and groups selected
- ☐ Add studies

0 Studies | 0 Results | 0 Reports | 1 Groups will be exported

Destination

No destination archives were found in the system configuration

Options

- ☐ Include annotations on images
- ☐ Exclude non-dicom results
- ☐ Exclude all restorable results
- ☐ Exclude large Vitrea restorable images
- ☐ Convert to grayscale

Change all series descriptions:

Edit Patient or Anonymize

- ☐ Edit Patient
- ☐ Anonymize

Export **Cancel**

CT Cardiac CTA

Summary:

CT Cardiac Analysis enables physicians to determine the presence and extent of coronary obstructive disease, evaluate the anatomy of the heart and surrounding tissues by displaying the extracted anatomy in a variety of views.

Review the steps for Cardiac CTA:

- ▶ Select protocol Cardiac Analysis
- ▶ Review the quality of the study
- ▶ Review automated vessel selection and investigate vessels
- ▶ Perform Vessel Walk
- ▶ Capture Snapshots
- ▶ Use vessel probe to select additional vessels
- ▶ Edit the vessel Centerline and Contours where necessary
- ▶ Use lesion tool to investigate lesion and analyze plaque burden using ^{SURE}Plaque
- ▶ Click 3D Review Modes for analysis
- ▶ Review the vessels in the VR MIP view by selecting Native thickness MPR
- ▶ Generate snapshots and rotation batches with preferred rendering preset
- ▶ Export to PACS or other destination

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For over 100 years, the Canon Medical Systems 'Made for Life' philosophy prevails as our ongoing commitment to humanity - generations of inherited passion creates a legacy of medical innovation and service that continues to evolve as we do. By engaging the brilliant minds of many, we continue to set the benchmark, because we believe quality of life should be a given, not the exception.

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