

CT Myocardial Perfusion Workflow

VPMC-15834 D

CT Myocardial Perfusion

Overview:

- ▶ The Myocardial Perfusion application assists a trained user to identify hypo/hyper dense areas in the myocardium. Usually in patients with angina or previous myocardial infarctions. The application is used to assess the disease state and treatment. The software provides semi-automated heart and left ventricle segmentation and color polar maps of the myocardial tissue. Qualitative information is provided and may aid in identification of myocardial enhancement defects and follow up of such finding, when used by a qualified physician.
 - ▶ Select a Study
 - ▶ Perform Analysis
 - ▶ Review the Study
 - ▶ Edit the Mitral Valve Plane
 - ▶ Edit the Inner & Outer Apex Planes
 - ▶ Edit the Short Axis Sector Indicator
 - ▶ Edit the Contours
 - ▶ Review the results
 - ▶ Review the Polar maps
 - ▶ Define hypo-attenuated areas
 - ▶ Measure the muscle wall
 - ▶ Take Snapshots
 - ▶ Distribute Findings

CT Myocardial Perfusion - Load the Study

Select the Patient.

Double click to select the application or single click on thumbnail and click on the open button.

OR

The series are located below the applications. Choose the desired series. Double click the **Myocardial Perfusion** Application.

The screenshot displays the software interface for loading a CT Myocardial Perfusion study. At the top, a table lists patient studies with columns for application, patient name, ID, modality, scan number, date, and protocol. A red arrow points to the first row: CARDIAC MYO PERFUSION INF WALL ISCHEMIA, M, IA1-CV-101, CT, 644, 11 Jul 2012 13:09, ONE, CANON MYO PERFUSION, 111y. Below the table, a row of application thumbnails is shown, including Cardiac CT, Gallery, VScore, Cardiac Analysis Multi Vessel, Cardiac Analysis, Cardiac Functional Analysis, Multi Chamber Functional Analysis, TAVR Planning, EP Planning, Myocardial Perfusion (highlighted with a red box and labeled 640), Coronary Subtraction, Coronary CTA, Generic 3D, and Musculoskeletal. Below the applications, a 'Group selection' dropdown is set to 'CARDIAC MYO PERFUSION INF WALL ISCHEMIA'. Below this, two thumbnails of myocardial perfusion images are shown, labeled 'HALF 75% 1.65s C... 161/320' and 'HALF 80% 1.32s C... 161/320'. A red arrow points to the 'Open' button at the bottom right.

Application	Patient Name	Patient ID	Modality	Scan Number	Date	Protocol	Protocol Name	Age
CARDIAC MYO PERFUSION INF WALL ISCHEMIA	M	IA1-CV-101	CT	644	11 Jul 2012 13:09	ONE	CANON MYO PERFUSION	111y
CARDIAC MYOCARDIAL PERFUSION 2	F	EA1-CV-072	CT	884	31 Jan 2012 ...	ONE	CANON MYO PERFUSION	32y
CARDIAC PEDIATRIC CTA 3 MONTH OLD	F	IA1G-PCV-001	CT	641	20 Nov 2015 ...	GENESIS	RSNA 2019	
CARDIAC PIQE COLLATERALS	O	JA1P-CV-22303	CT	1281	01 Jan 2000 ...	PRISM_CARDIAC	PIQE	
CARDIAC PIQE COMP	O	UA1P-CV-22207	CT	1155	01 Jan 2000 ...	PRISM_CARDIAC	PIQE	

Applications: Results Study Algorithm Processing

Cardiac CT: Multi Modality Viewer, Gallery, VScore, Cardiac Analysis Multi Vessel, Cardiac Analysis, Cardiac Functional Analysis, Multi Chamber Functional Analysis, TAVR Planning, EP Planning, Myocardial Perfusion (640), Coronary Subtraction, Coronary CTA, Generic 3D, Musculoskeletal

Group selection: CARDIAC MYO PERFUSION INF WALL ISCHEMIA

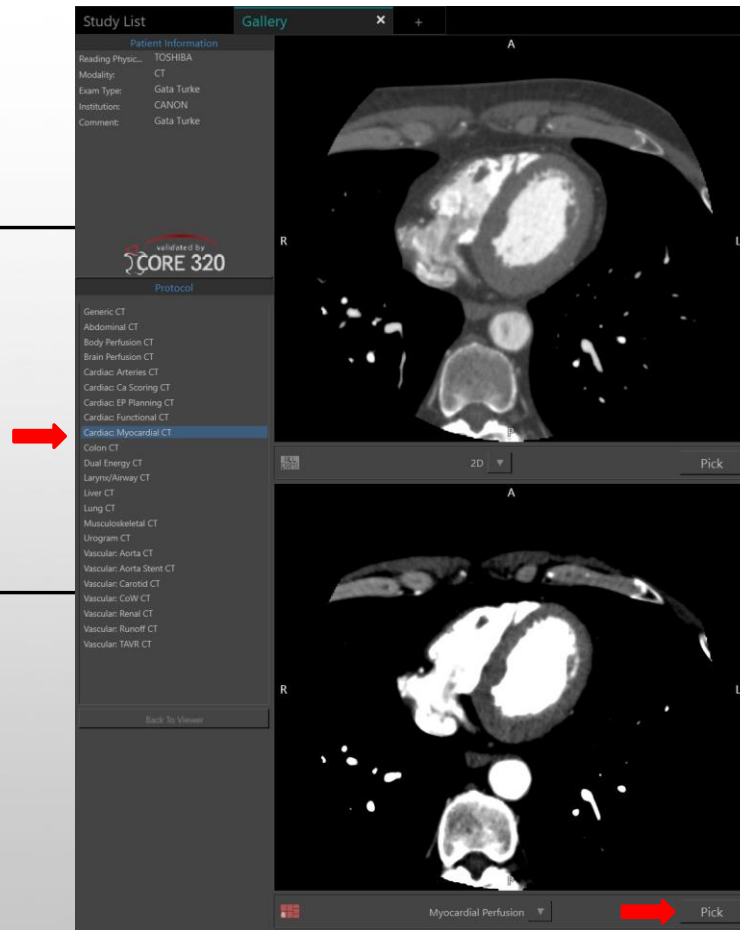
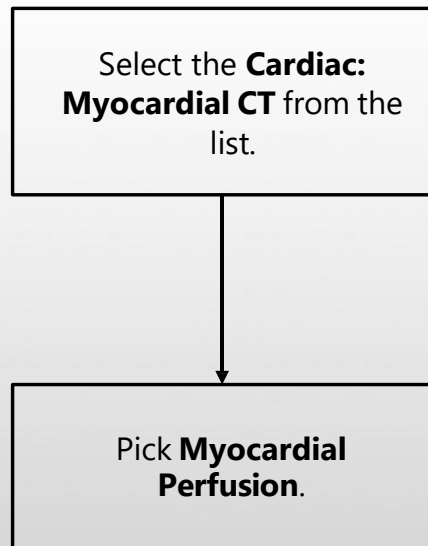
CARDIAC MYO PERFUSION INF WALL ISCHEMIA IA1-CV-101 (M 111y) CT 11 Jul 2012 13:09 CANON MYO PERFUSION

HALF 75% 1.65s C... 161/320 HALF 80% 1.32s C... 161/320

Tools List Images

Open

CT Myocardial Perfusion - Load the Study from Gallery

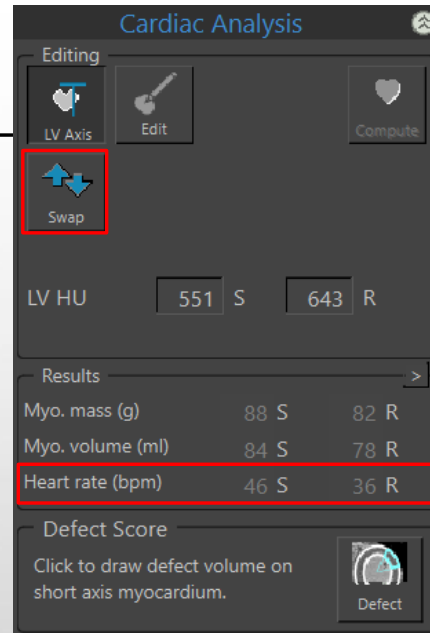


CT Myocardial Perfusion - Verify Rest and Stress

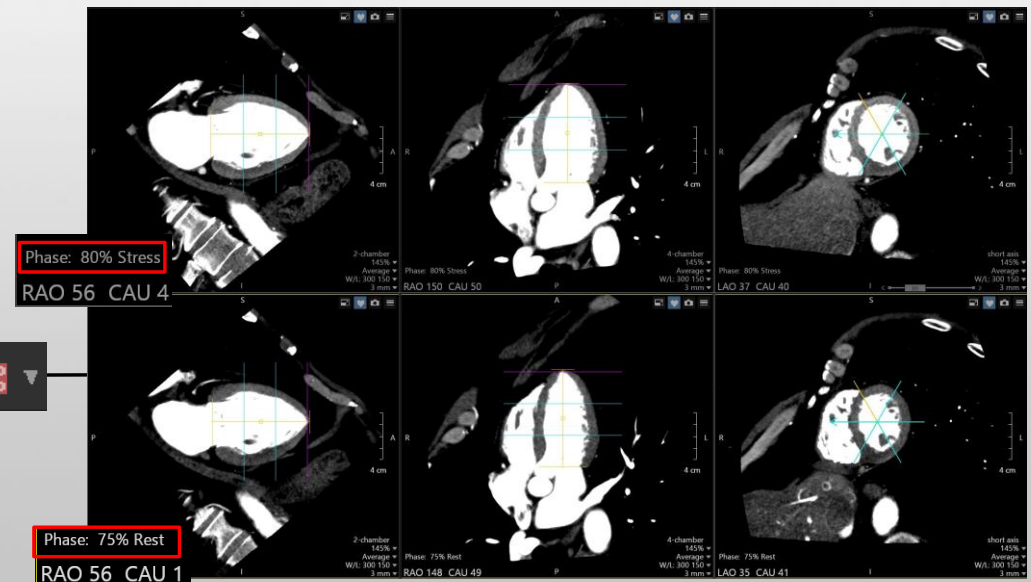
Look at the heart rate listed for each series to verify that the software identified the correct series as rest and stress.

If not, click on the swap button to switch the order of the volumes.

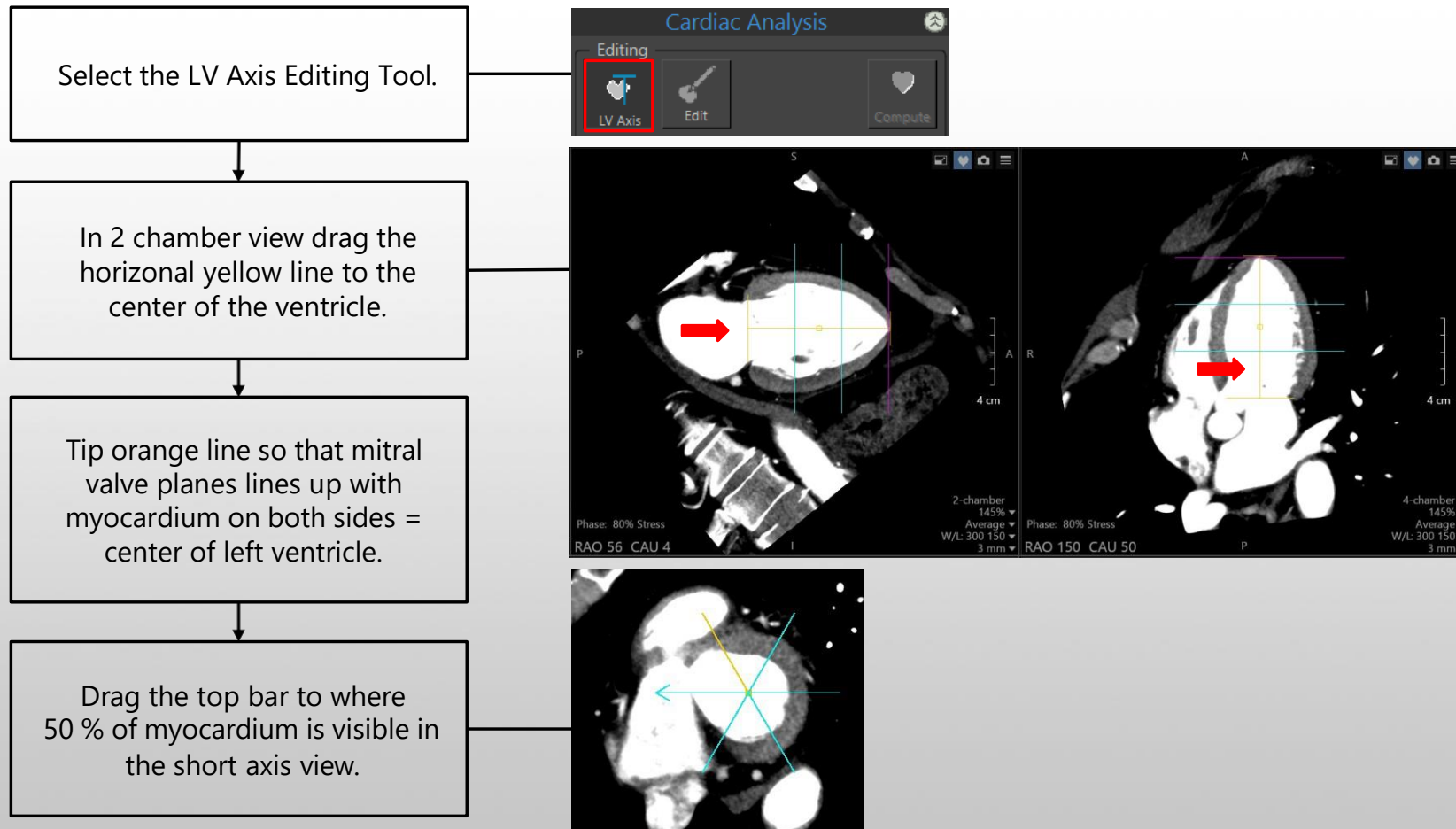
Change the layout to view both rest and stress together. Stress is loaded on top and Rest on the bottom.



Note: Vitrea uses the acquisition time stamp to select series 1 and 2. **Swap the volumes if the Stress scan was done first.**



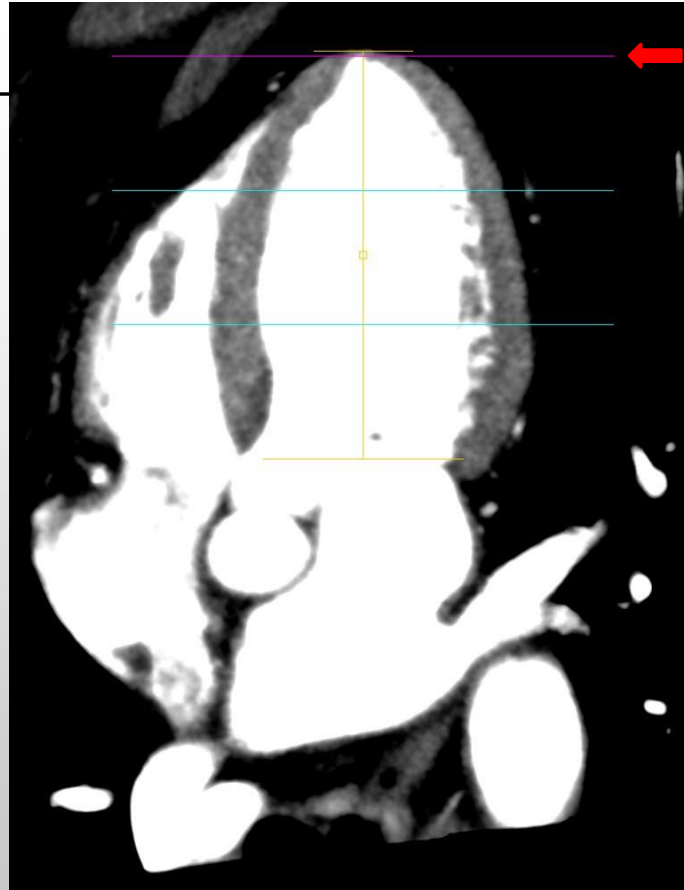
CT Myocardial Perfusion - Edit Mitral Valve Plane



CT Myocardial Perfusion - Edit Inner Apex Plane (Purple Line)

Double click on 4-chamber view to maximize the view.

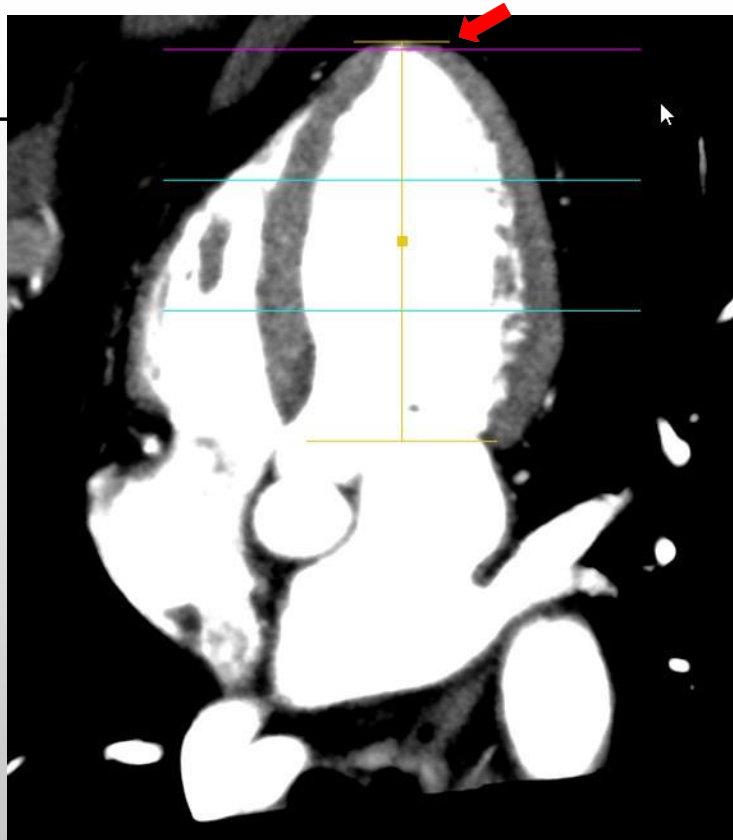
Drag the purple line to rest at the bottom of LV blood pool.



Tip: The blue slab/layer boundary lines remains equally spaced as you edit the mitral valve plane or inner apex plane.

CT Myocardial Perfusion - Edit Outer Apex Plane (Yellow Line)

Drag the short yellow line until it rests on the bottom of the myocardial apex.



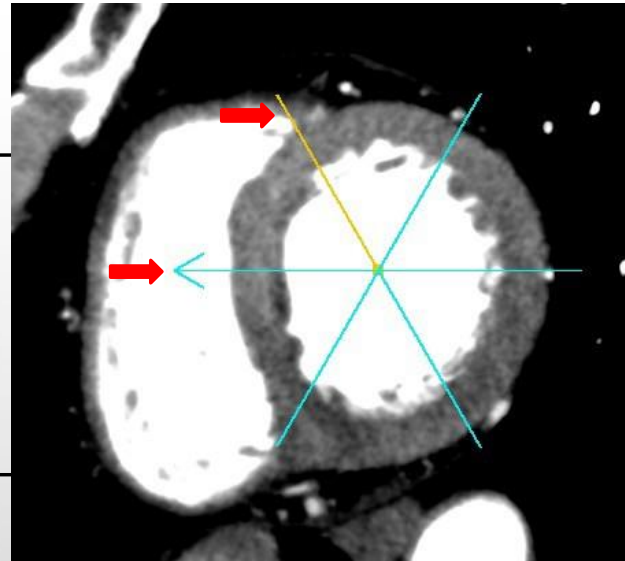
Note: Do the edits on the other series as well.

CT Myocardial Perfusion - Edit Short Axis Sector

In the short axis view, hover the cursor over the blue lines until the rotation handles display.

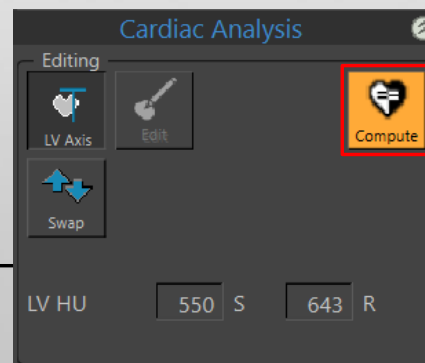
Rotate the lines until the arrow points to the septum and the yellow lines just to the right of the RV insertion point.

Click on **Compute** when all the edits are done.



Tip: Scroll through the images and adjust the yellow line in all the images.

Note: Do the edits on the other series as well.



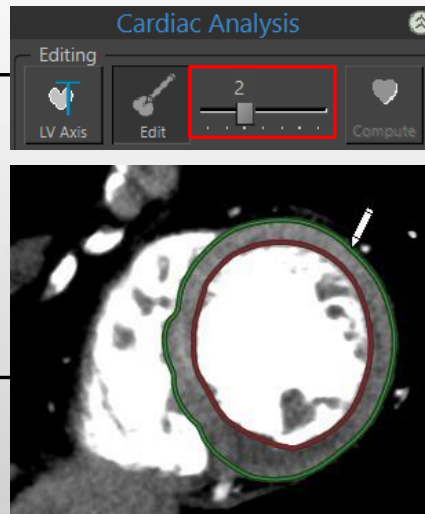
CT Myocardial Perfusion - Edit Contours

Click on Edit. The cursor changes to a pencil.

Use the slider bar to specify the number of slices the edited contours must be propagated to on either side.

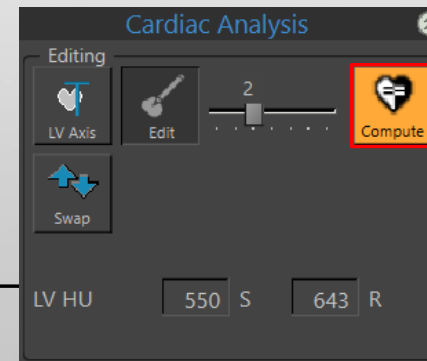
Use the pencil to redraw the contours where necessary.

Click on **Compute** when all the edits are done.

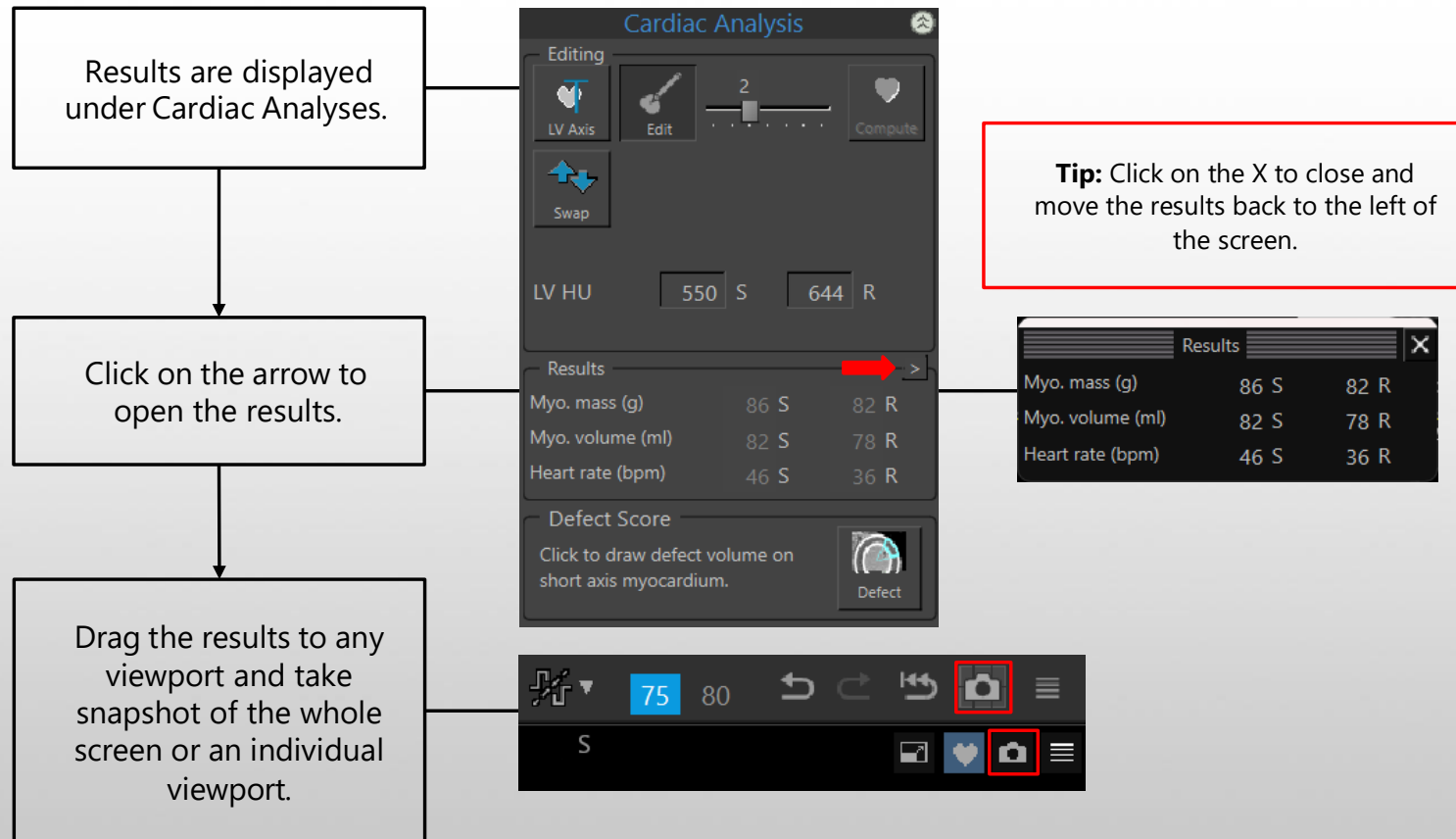


Note: Verify that the slider is set before editing the contours.

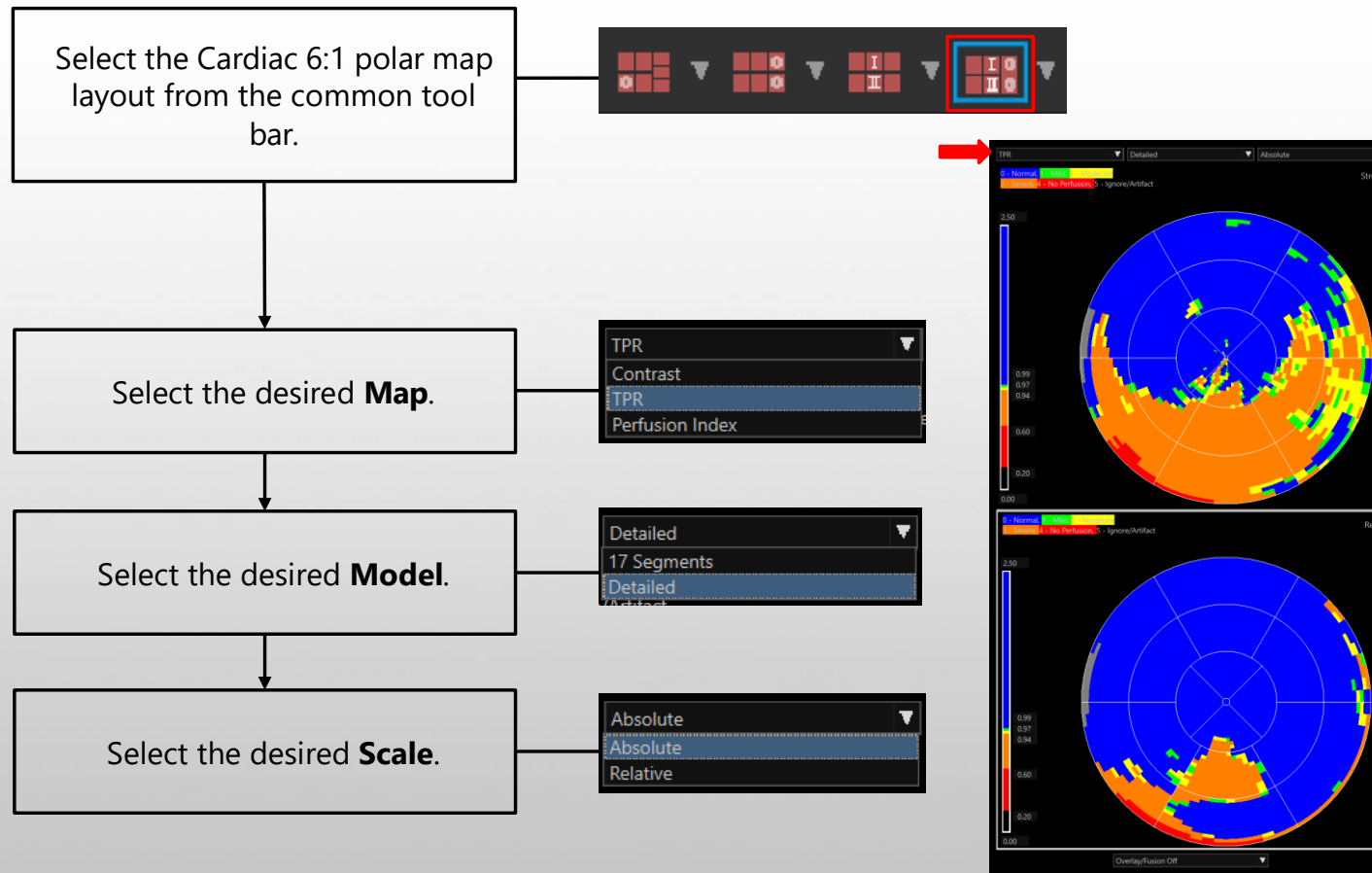
Note: Make sure there is no contrast, coronary vessels or air between the two contour lines.



CT Myocardial Perfusion - Review the results

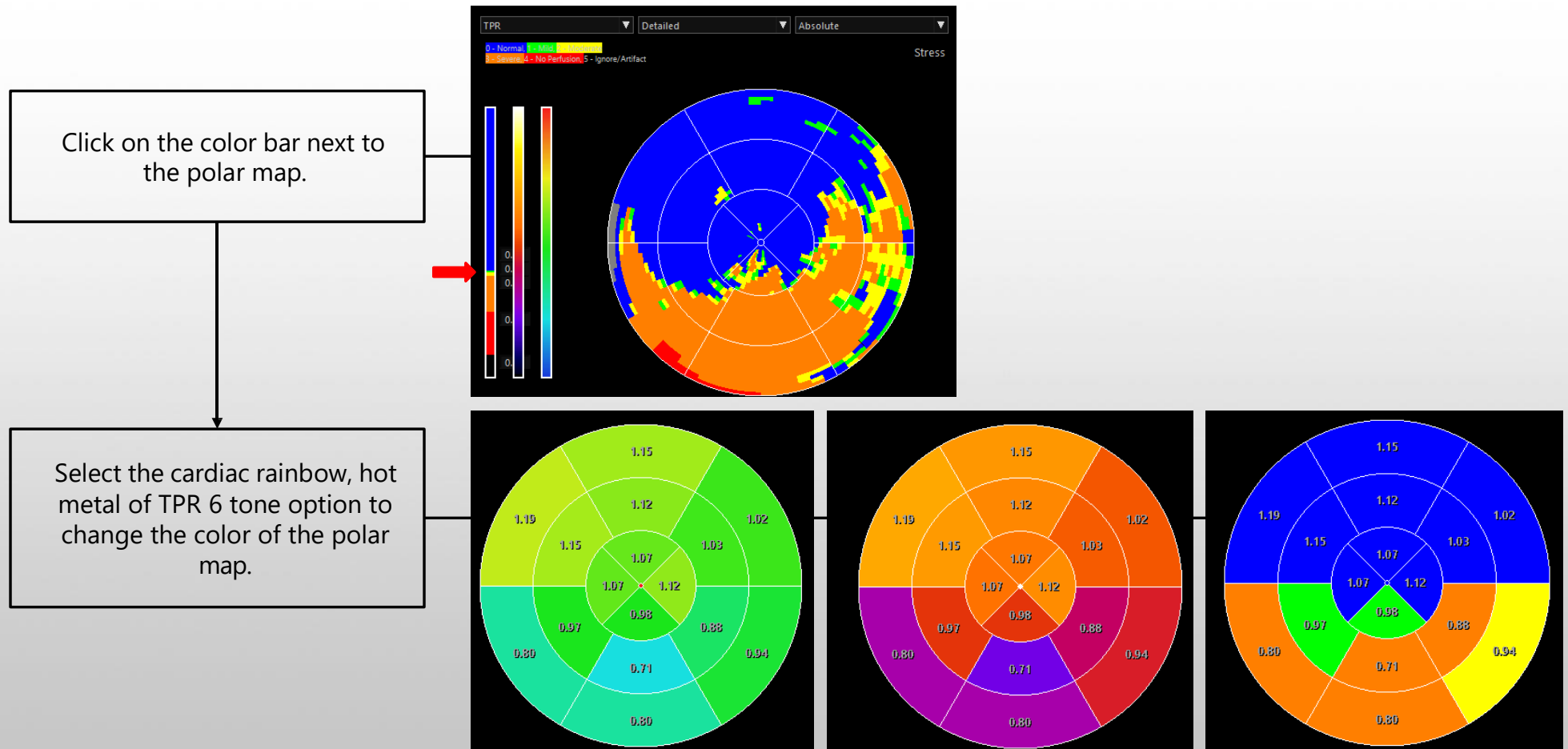


CT Myocardial Perfusion - Review the polar maps



Tip: Use the crosshair and click on the 17-segment Polar Map. The MPR image will update to that point for further evaluation.

CT Myocardial Perfusion – Adjust color of polar maps



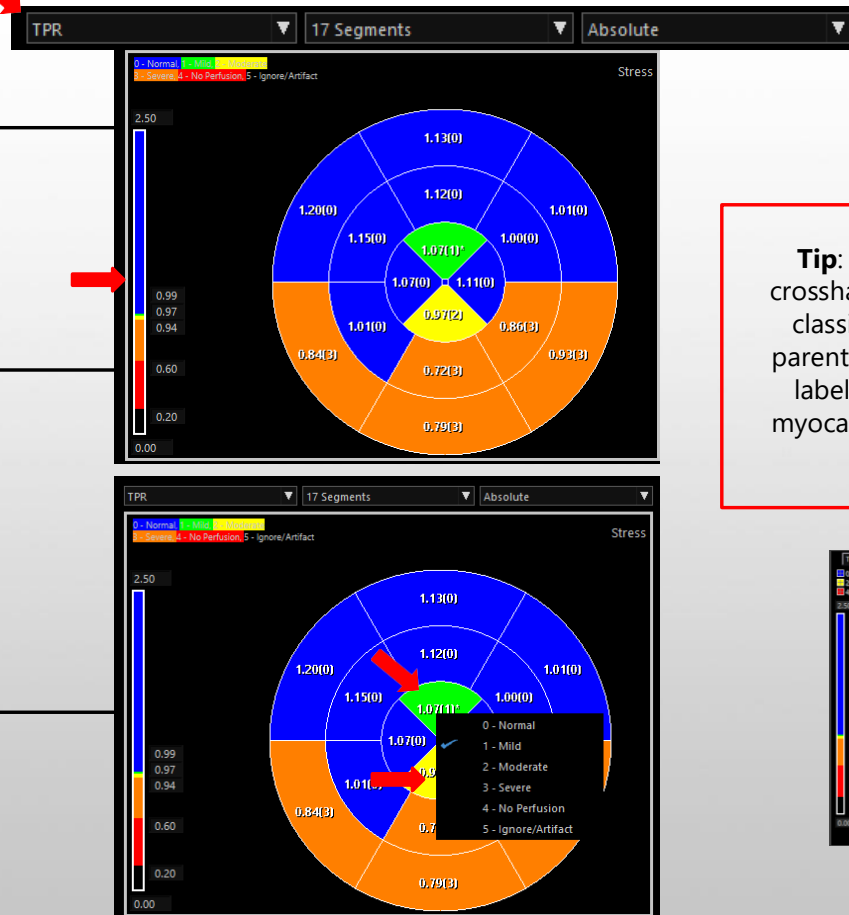
CT Myocardial Perfusion – Determine severity of a defect

Select:

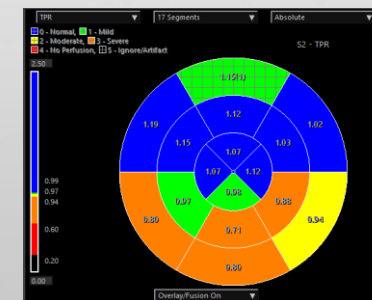
- ▶ TPR color map
- ▶ 17 Segment model
- ▶ Absolute Scale

Select the TRP 6 tone color scale. The severity of the defect is displayed in each segment.

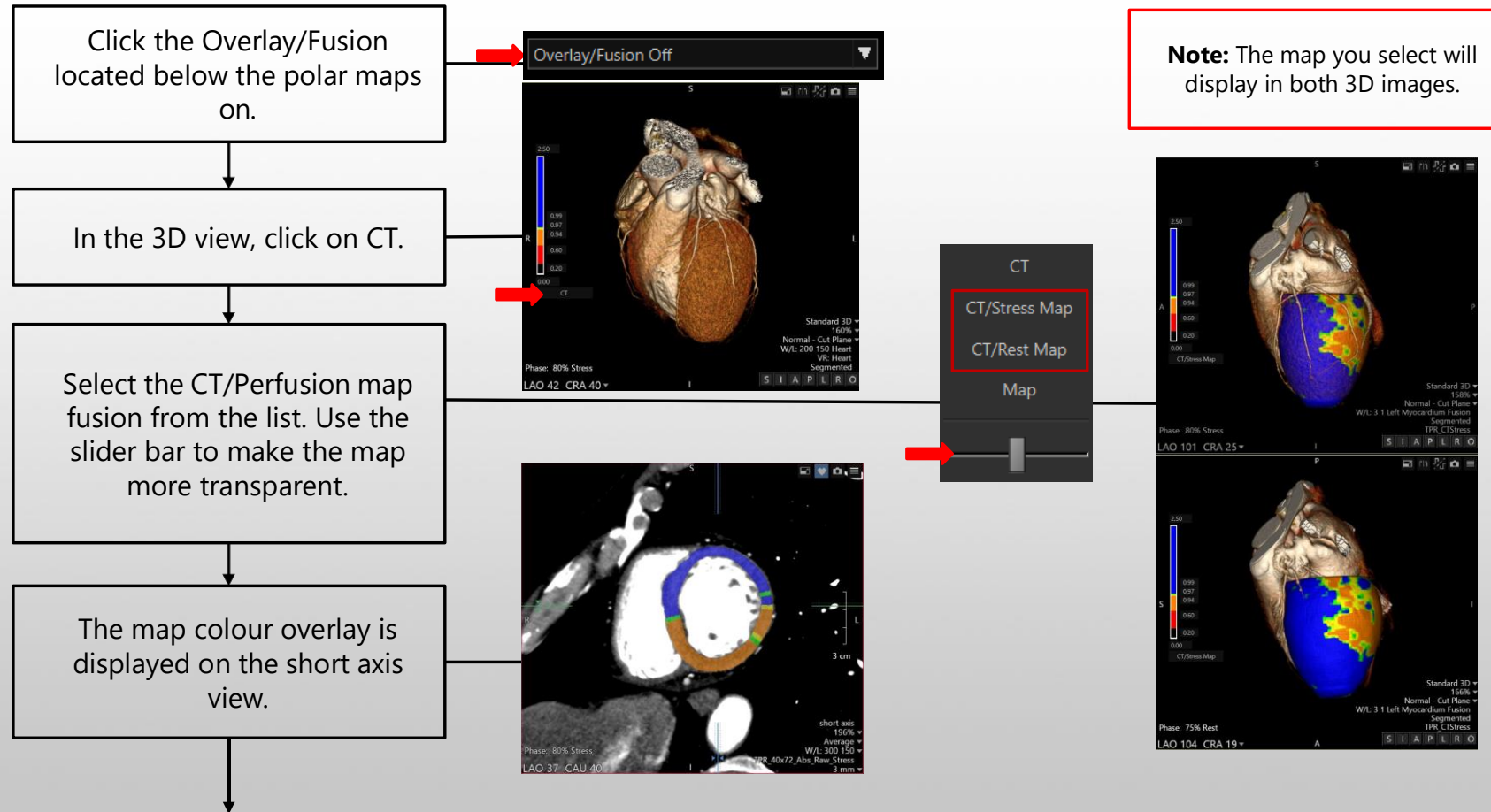
To change a finding, simply right click on each segment and select a different finding from the list.



Tip: Edited findings are marked with a crosshatch pattern on the segment and the classification number will display within parentheses. When findings are edited, the labels are automatically included in the myocardial report. The TPR map thumbnail updates in the Results tab.

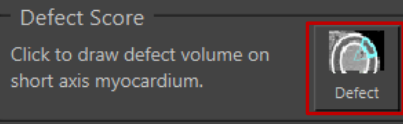


CT Perfusion - Display CT/Perfusion Map Fusion View



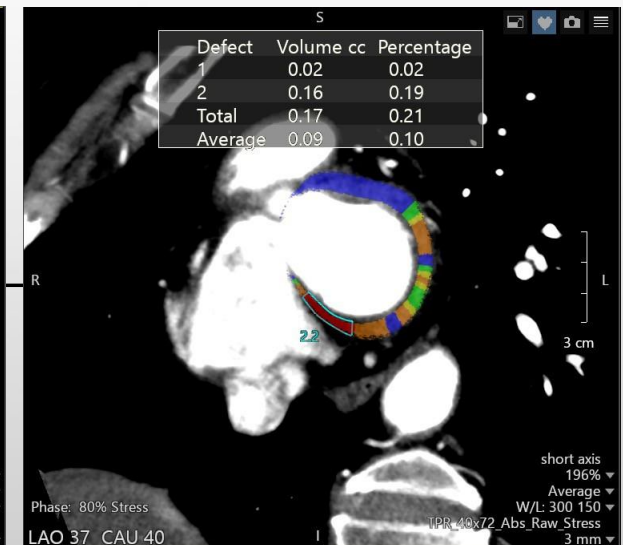
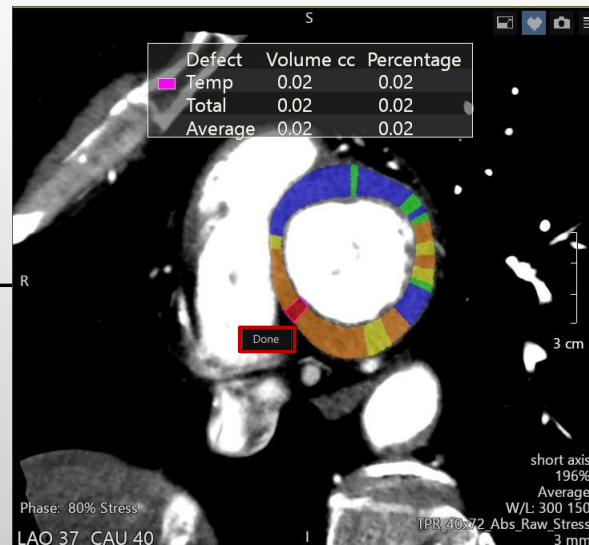
CT Myocardial Perfusion - Define Hypo-attenuated Areas

Click on **Defect** in the Defect score area.



Tip: Don't skip to many sliced. It might result in unsatisfactory interpolation.

Click and drag along the defect in the myocardium. Scroll a few slices and drag along the entire defect. When done, click on **Done**.

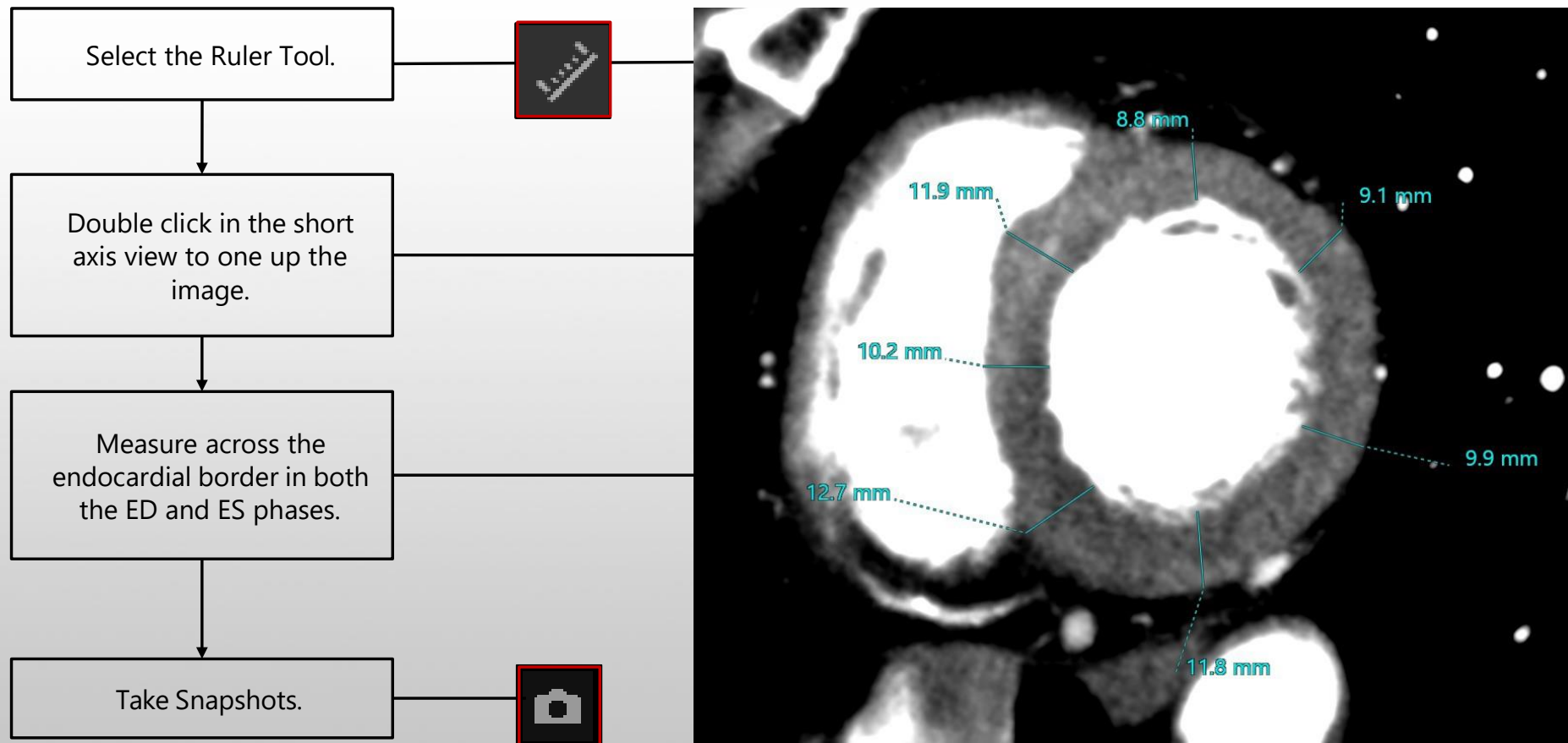


Take a snapshot.

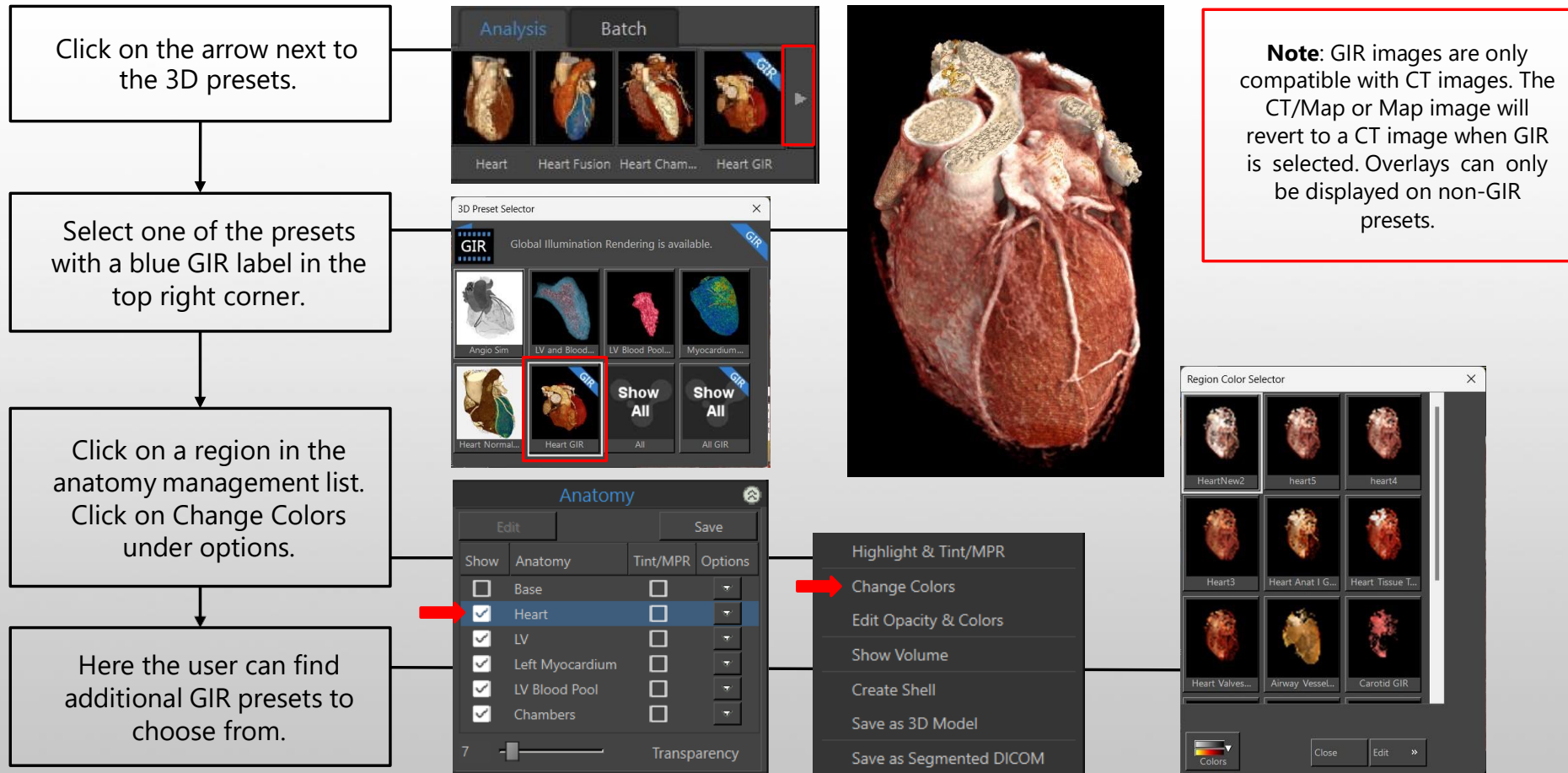


Note: Dialog box displays defect volume and % of myocardium.

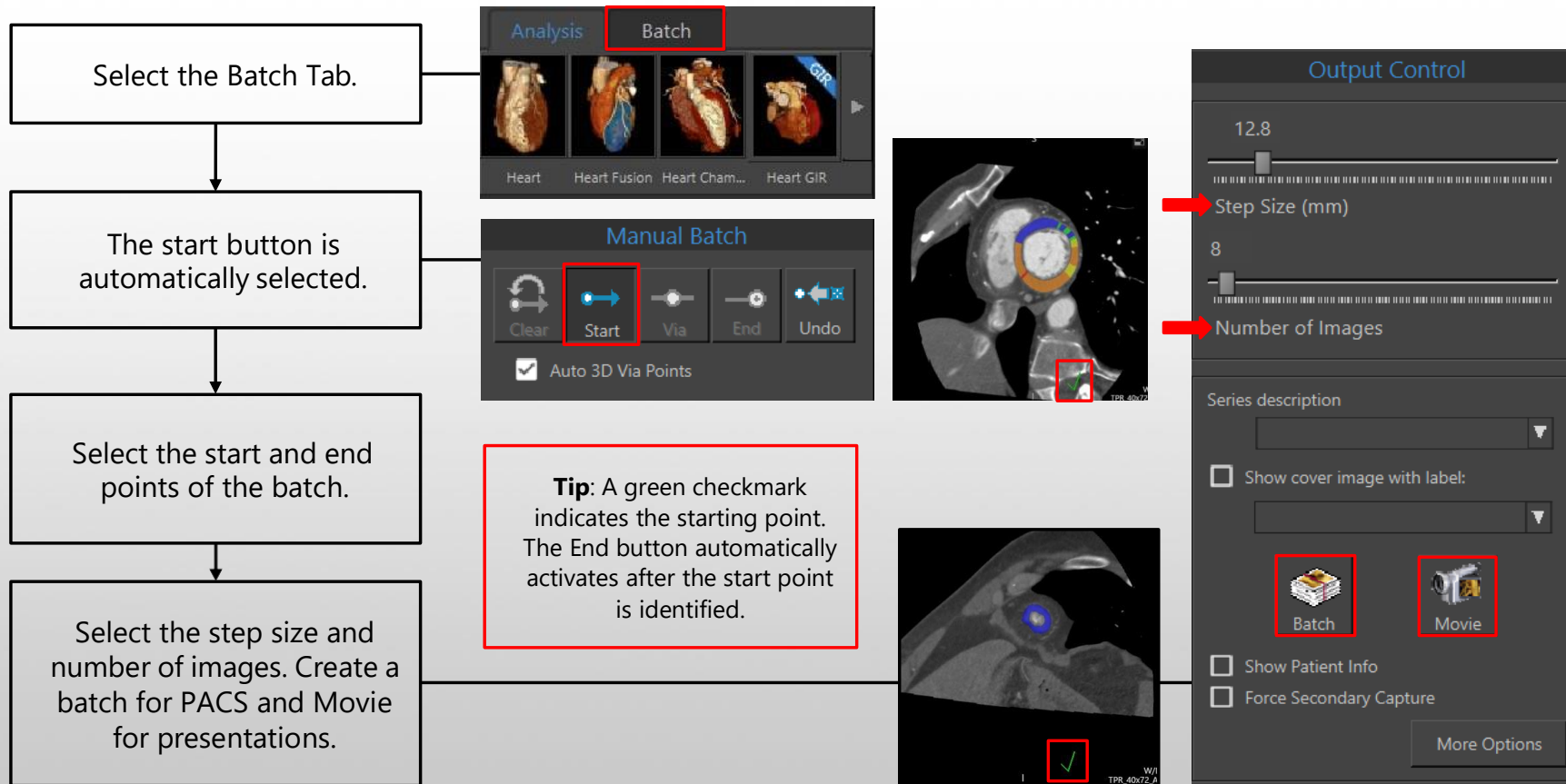
CT Myocardial Perfusion - Measure the Muscle Wall



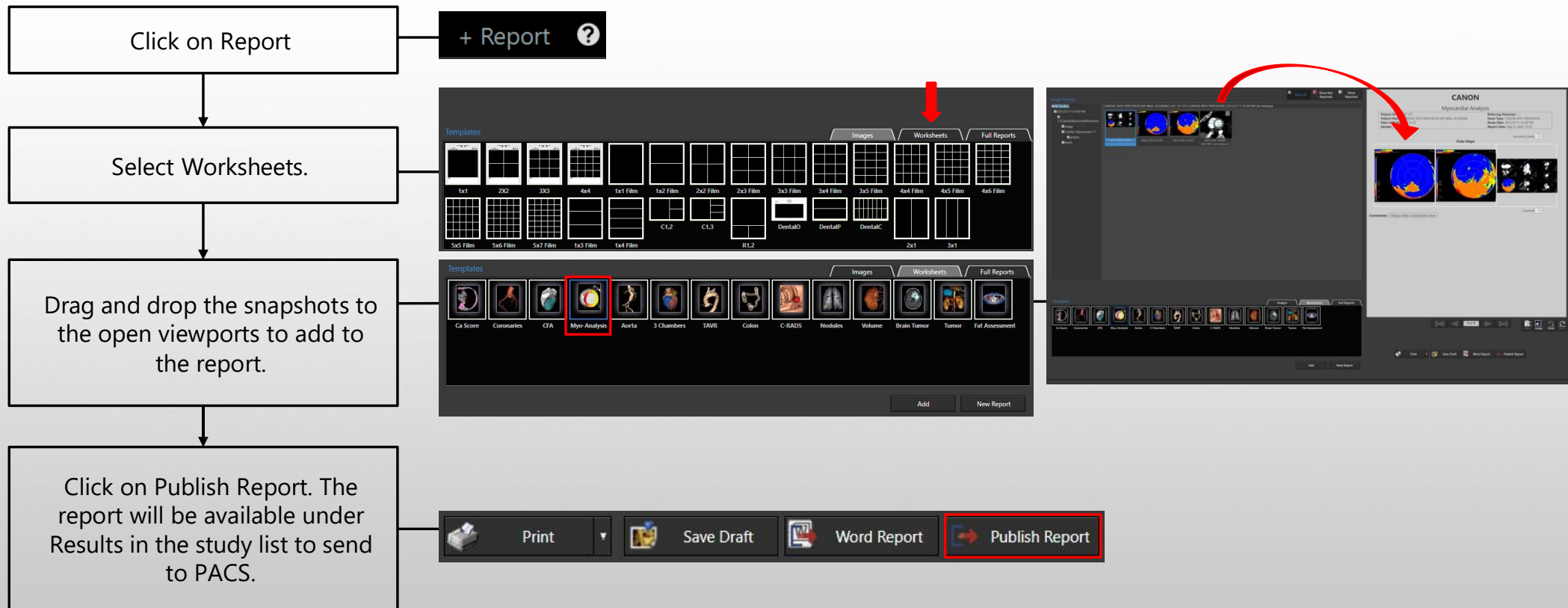
CT Myocardial Perfusion – Apply GIR to 3D view



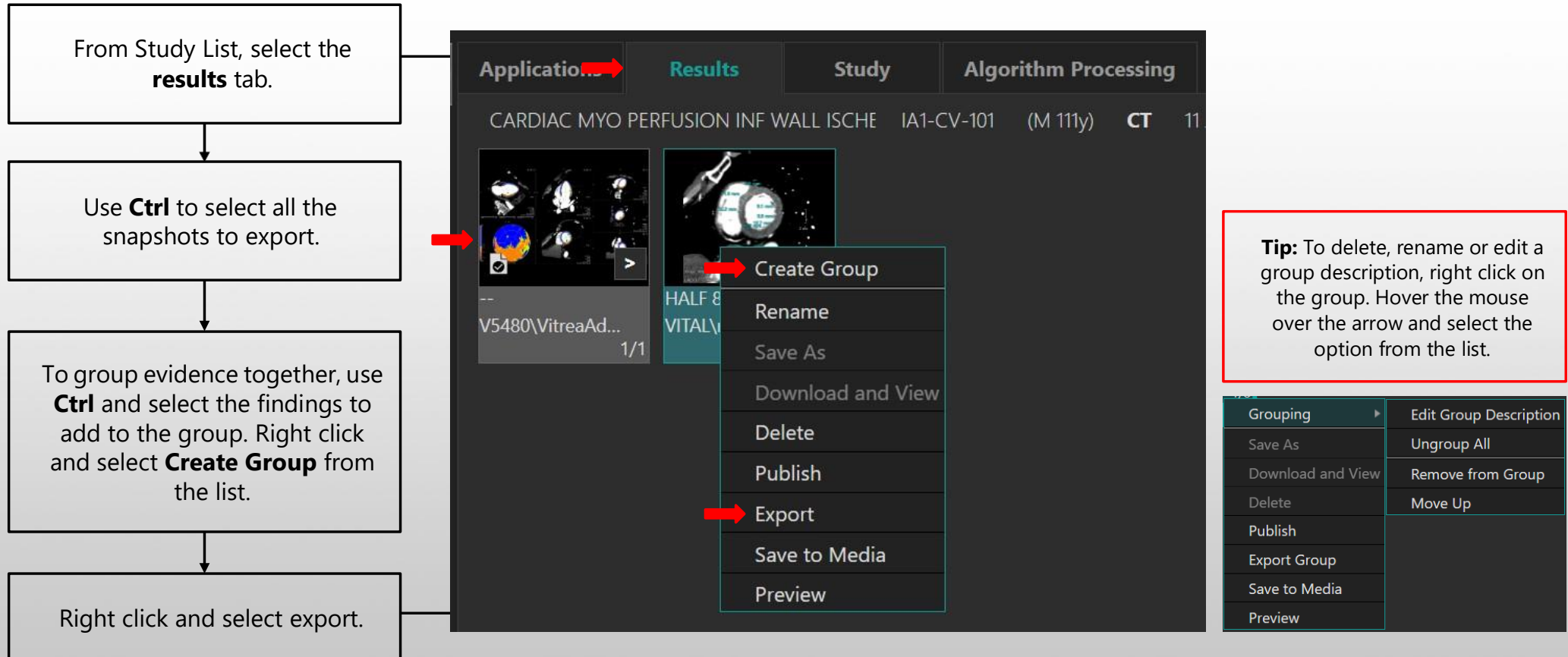
Myocardial Perfusion - Create Batches & Movies



CT Myocardial Perfusion - Report



CT Myocardial Perfusion - Distribute Findings: Export



CT Myocardial Perfusion - Distribute Findings: Export

Select the relevant DICOM destination.

Click on Export.

Export Studies

☒ 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 Myocardial Perfusion

Summary:

CT Myocardial Perfusion enables the visualization and analysis of perfusion deficits in the myocardium.

Review the steps for Myocardial Perfusion

- ▶ Select a Study
- ▶ Choose Protocol and Preset
- ▶ Perform Analysis
- ▶ Review the Study
- ▶ Edit the Short Axis Sector Indicator
- ▶ Edit the Mitral Valve Plane
- ▶ Edit the LV Contours and other regions as necessary
- ▶ Review the polar maps
- ▶ Define the defect areas in the myocardium
- ▶ Take Snapshots and create batches for export
- ▶ Distribute Findings

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