CT Comprehensive Cardiac Assessment (CCA)

Purpose

Designed to assist the user in viewing, analyzing and quantifying dedicated Cardiac CT Angiograms, mainly for coronary arteries analysis on Coronaries CT Angiogram (CCTA) data.

The application offers cardiac function measurements based on automatic 3D model-based whole-heart segmentation as well as automatic extraction and visualization of the coronary tree. The user can edit and modify the segmentation and the derived parameters

Benefits

- Cardiac function measurements based on automatic 3D model-based whole-heart segmentation
- Automatic extraction and visualization of the coronary tree.
- The user can edit and modify the segmentation and the derived parameters

Workflow

Before you begin

- Transfer all necessary image series to the IntelliSpace Portal, such as gated contrast cardiac images.
- Set the preferred processing method in preferences.

To process Cardiac Coronary exams:

1. From the **Patient Directory**, select the study and series and click 

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Tip A feature of the IntelliSpace Portal is the ability to capture and save key images and displays. To capture a key image, select the image and press **SPACE** on the keyboard. To capture key displays, press **SHIFT** + **SPACE** on the keyboard.

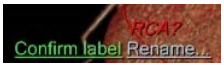
2. **Segmentation** is the first workflow stage. You can view details of the segmentation, make manual corrections, save the segmentation, and re-segment using anatomical landmarks.

   When you first load a heart study, the application performs a full segmentation procedure. The entire organ is segmented at one time based on a pre-defined model. The segmentation model consists of ventricles, atria, muscle, aorta, and coronary arteries.

Note The **Segmentation** stage allows you to view the tissue definitions created by the automatic segmentation function of the CCA application. Segmentation enables rapid analysis of the coronary arteries and cardiac function [after the images have been loaded into Comprehensive Cardiac Analysis (CCA)].

3. Analyze the tissue as needed.
4. After reviewing the results of the automatic segmentation, if necessary perform the following:
   - To perform re-segmentation, click  (**Activate seed**) and seed the pulmonary valve, mitral valve, and apex. Select **Re- Segment** > **Choose phases** and then click **Run Segmentation**.
   - To add coronaries, click  (**Add coronary**).
   - To make manual corrections, use the edit tools available under **Add coronaries**.
5. Click  (the forward arrow) next to **Segmentation** to move to step 2, **Coronary Extraction**.

Note Use the **Coronary Extraction** stage to view the heart anatomy: the aorta, the aortic valves, and the arteries in high detail. Arteries can be reformed into straightened views, and the heart can be viewed in the full volume rendered mode, including rotations, curved planes and cine display.

6. Coronary Extraction automatically extracts and labels the coronary arteries if identified during segmentation. You cannot move beyond the **Coronary Extraction** step until you have confirmed the automatic vessels extracted were identified correctly.
   - This can be done by clicking the checkmark in the vessel list 
   - Or by clicking Confirm label from the volumetric image 
7. Do one or more of the following
   - To name new vessels, point to the vessel in the top right viewport (Volume image), and when it turns yellow, click to name it.
   - To extract new vessels, under Extract Vessels click  (**Auto Track Vessel**) or  (**Manual Centerline Extraction**).
   - To edit vessel centerlines, under Edit Vessels select tools as needed.
8. To save a batch of cMPR, using the  (drop-drop arrow), select **Batch** > **Quick Batch** then **Save batch as**.
9. Click  (**Bookmark**) and set the bookmark in the **Save Bookmark** dialog box.
10. Click  (the Forward arrow) next to Coronary Extraction to move to step 3, **Coronary Analysis**.

Note: The **Coronary Analysis** step provides viewing and measuring tools to perform dimensional and quantitative measurements of the coronary arteries.

11. Under **Choose Vessel**, select the vessel you want to analyze.
12. Under **Choose Method**, select either the **Contours** or **Calipers** radio button to complete any vessel measurements.
13. Under **Choose Reference Lines**, select one or more of the check boxes as needed.
14. Under **Edit/Draw Contours**, do one of the following:
    - To perform vessel editing, click  (**Edit contours**).
    - To draw new lumen contours in the cross-section and sMPR viewports, click  (**Draw Contour**).
    - To save the table or images, click  (**Save as**) and select the way you want to save the images.
15. Click  (the Forward arrow) next to Analysis to move to step 4, **Functional**.

Note: The **Functional** stage of Comprehensive Cardiac Analysis allows you to analyze a variety of heart functions, including ventricular and atrial volumes, ejection fraction, stroke volume and cardiac output.

16. If appropriate phases are launched into the Functional stage. The End Systolic and End Diastolic phases are set automatically. In the **Set phases** dialog box, confirm the correctness of the phases.

Note In this quick step, the **Segmentation** method is used. For instructions on using the **Simpson** method, refer to the *IntelliSpace Portal Instructions for Use*.

17. Under **Choose Results**, select the **Table** and **Parameter** as needed.
18. Review the results.
19. Do one or more of the following:
    - To save the images, click  (**Save as**) and select the way you want to save the images.
    - To save tables in non-DICOM format, click  (**Save all tables as…**).
    - To save a key image(s), click the drop-down arrow next to Findings and select Key Images. Then select a single image and right-click  or press CTRL on the keyboard, select multiple images, and click  .
    - To bookmark the images, click  (**Bookmark**) and set the bookmark in the **Save Bookmark** dialog box.
    - To send the final images to the Reporting package, click  (**Send selected images to report**).
    - To send the patients clinical information to the report click the drop-down arrow next to the displayed reporting option and click  (**Report clinical results**).

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