Multi-slice CT Scanner System
NeuViz 16 Essence
User Manual (Vol. 2)

NEUSOFT MEDICAL SYSTEMS CO., LTD.

CONTENTS

Chapter 8.   CTDSA

Chapter 9.   Tumor Assessment

Chapter 10.   Colon

Chapter 11.   Lung Nodule Assessment

Chapter 12.   Lung Density

Chapter 13.   Film

Chapter 14.   Report

Chapter 1. 2D Viewer

1.1 Overview

2D application provides several layouts to display one or more series. There are several choices for mode selection. It is possible to flip mages, sort images and do batch operations. 2D supports zooming the image, drawing ROI's and other basic operations. These options are found in the generic tool area.

1.2 2D Viewer Interface

In the home page, select the desired images from the patient list and choose the **2D** application.
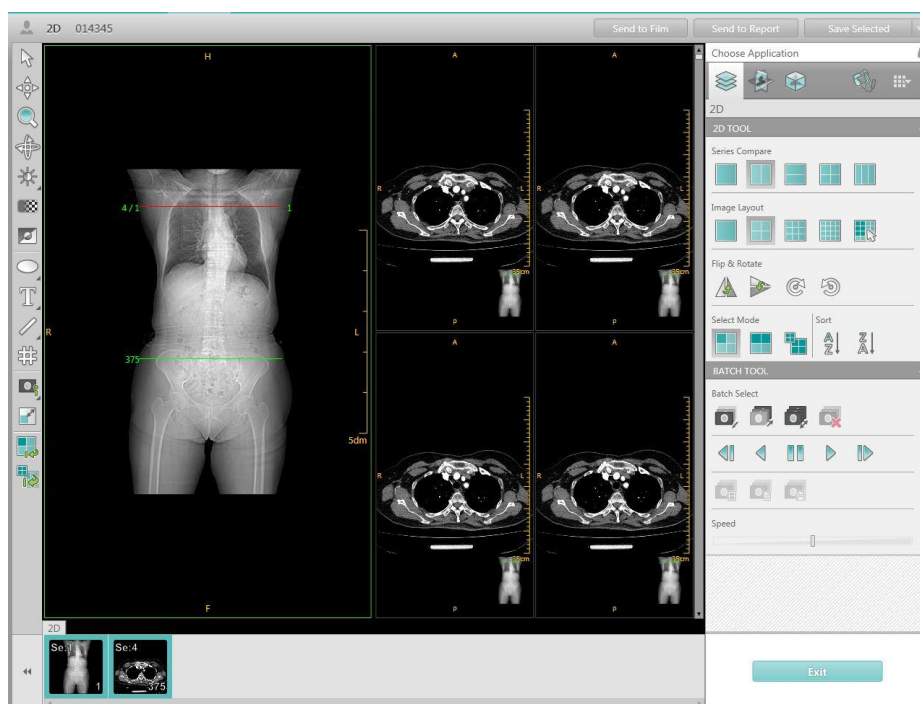
Figure 1-1 2D Interface

1.3 Menu Bar

A maximum of 4 applications can be displayed on the system menu bar. More than 4 applications can be displayed by expanding the button.
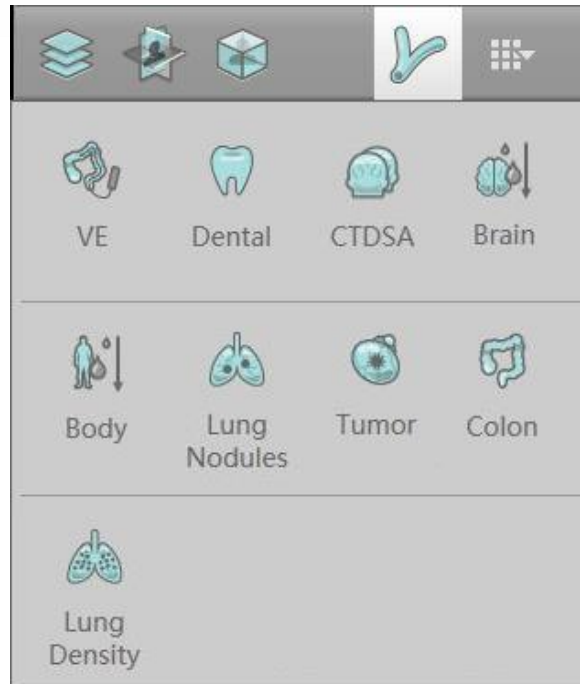
Figure 1-2 Application Options

1.4 Load Images

The number at the lower right corner of each Thumbnail shows how many images are contained in that series. To load the series double click the Thumbnail. Then the image series will be loaded.

Figure 1-3 Load Images

When you right click on the Thumbnail, the Series information is shown.
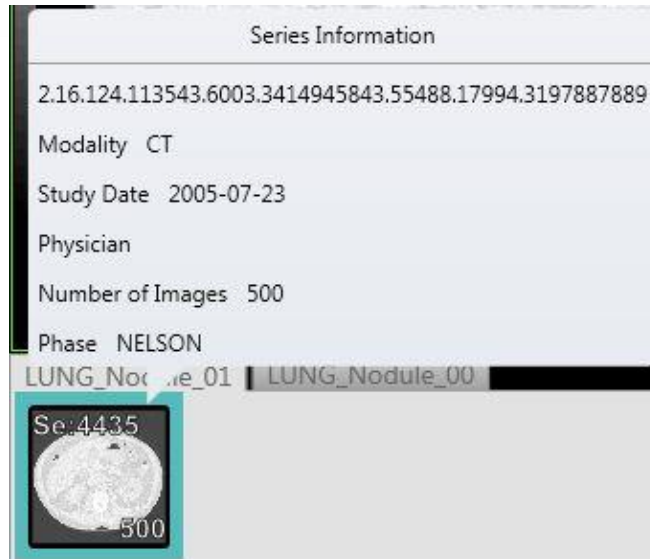
Figure 1-4 Series Information

1.5 Patient Information

Right click the patient icon, and the Patient Information appears.
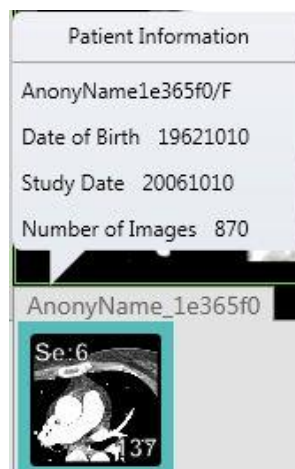
Figure 1-5 Patient Information

1.6 Image Display Region

The image display region can show the images in different layouts. The image layout format can be changed from 1*1 to 10*10.

1.6.1 Window Display

The four corners of the display window show the Patient Information and the Image Information according to the settings determined by the User.

1.6.2 Window Enlargement

Click the Enlarge icon ◄◄ on the left corner of the generic tool panel. Then the image display region will be shown in the enlarged format.

Click the Enlarge icon again, and then the image display region returns to the original display format.

1.6.3 Window Menu

Right click any image in the image display region, then the Right Key menu appears. The Right Key menu is composed of the following choices:

- **Select**

It is used to leaf through the images.

Select this function. The cursor turns to , click on an image and then drag up or down to quickly view the images.

- **Pan**

Select this function. The cursor turns to , click on an image and then drag to move the image to the desired position.

- **Zoom**

Select this function. The cursor turns to , click on an image and then drag up or down to zoom in or out.

- **Rotate**

Select this function. The cursor turns to , click on an image and then drag up or down to rotate the image as desired.

- **Modify Window Width and Level**

Select this function. The cursor turns to , click on an image and then drag up or down to change the desired WL level [Up to increase WL, down to decrease WL]. Drag left or right to change WW [Right to increase the WW level, Left to decrease the WW level].

- **Send to Film**

Select this function and the image will be sent to the Film Interface automatically.

- **Send to Report**

Select this function and the image will be sent to the Report Interface automatically.

- **ROI** [Select from the following ROI types]

    - **Rectangle**: Select Rectangle in the ROI menu or click on the generic tool panel area. Then the cursor turns to . Select the desired area on the image for measurement.

- **Ellipse**: Select Ellipse in the ROI menu or click ⬭ on the generic tool panel. Then the cursor turns to ⊙. Select the desired area on the image for measurement.

- **Polygon**: Select Polygon in the ROI menu or click ⬠ on the generic tool panel. Then the cursor turns to ◈. Select the desired area on the image for measurement.

- **Text**: Select Text in the ROI menu or click 𝕋 on the generic tools panel. Then the cursor turns to 𝔸. Draw a text edit box in the desired position.

- **Arrow**: Select Arrow in the ROI menu or click ↗ on the generic tool panel. Then the cursor turns to ↗. Draw an arrow on the image to point to what you want to draw attention to, such as anatomy or a text box.

- **Line**: Select Line in the ROI menu or click ✎ on the generic tool panel. Then the cursor turns to ◣. Draw the desired line on the image for measurement.

- **Polyline**: Select Polyline in the ROI menu or click 〰 on the generic tool panel. Then the cursor turns to ▽. Draw the desired line on the image for measurement.

- **Angle**: Select Angle in the ROI menu or click ◿ on the generic tool panel. Then the cursor turns to ∠. Draw the desired angle on the image for measurement.

- **Pixel Value**: Select Pixel Value in the ROI menu or click ⊹ on the generic tool panel. Then the cursor turns to ⊹. Click anywhere on the image to get the corresponding CT values for that pixel.

- **Profile**: Select Profile in the ROI menu or click ✖ on the generic tool panel. Then the cursor turns to ◣. Measure the CT values on a line which goes through the image.

- **Histogram**: Select Histogram in the ROI menu or click ⩙ on the generic tool panel. Then the cursor turns to ⊙. Select the desired area on the image for measurement.

- Display

- Text Orientation: Displays text orientation.

- 3D Orientation: Displays 3D orientation.

- Ruler: Displays Measurement Scale on the image.

- Gray Bar: Displays Gray Scale on the image.

• Window

- Normal: Display normal layout.

- Full Screen: Switch the image display to the full screen mode.

• Reset Image: The selected image returns to the original status.

• Display Location Line: Display Location Line on the Surview image.

• Display Surview image: Display demo Surview with Location Line on the image.

1.7 Control Panel

Control panel includes three parts: 2D Tool, Batch Tool and the Generic Tools.
2D Tool is specific to the 2D viewer.
Batch Tool is used to look at a select group of images.
Generic Tools are applicable for all viewers.

1.7.1 2D Tool

The 2D Tool includes the following:
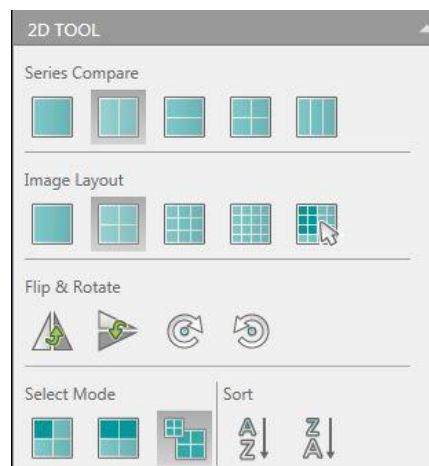
Figure 1-6 2D Tool

Series Compare:

There are 5 different series layouts. They are 1x1, 1x2, 2x1, 2x2 and

1x3.

Click the layout icon to select the desired layout.

Image Layout:

There are 5 different image layout formats. They are 1(Row)*1(Column), 2*2, 3*3, 4*4, customize.

Click the customize icon to set the number of the rows and columns visually. The number of the rows ranges from 1 to 10. The number of the columns ranges from 1 to 10.

Flip/ Rotate:

: Flip Horizontal

: Flip Vertical

: Rotate Clockwise

: Rotate Counter-clockwise

Selection Mode:

Image: Select one image according to the need. The selected image is framed in green.

Series: Select one series according to the need. The selected entire series is framed in green.

All: Select all the series in the Series List. All the series are framed green.

Sort:

Ascending: Sort the series in ascending order.

Descending: Sort the series in descending order.

1.7.2 Batch Tool

Figure below shows the Batch Tool, including Range, Batch and Cine.

Figure 1-7 Batch Tool

Batch Select

Start: Customize the first image in the batch of the images.
Select the image and click the icon. Then the image is labeled.

End: Customize the last image in the batch of the images.

After customizing the first image, select the last image and click the icon.

Then that group of images is selected.

All: Select all the images of the series for the batch.

Clear: Clear the images of the batch.

Cine

It's used to continuously display the group of selected images.

Step Backward: Play the batch of images step by step backward.

Backward: Play the batch of images backward.

Pause: Stop playing the batch of images.

Forward: Play the batch of images forward.

Step Forward: Play the batch of images step by step forward.

Speed: Adjust Cine Speed [Left to decrease the speed at which the images are scrolled through, and right to increase the speed].

Batch

Send Batch to Film: Send the selected group of images to the Film.

Send Batch to Report: Send the selected group of images to the Report.

1.7.3 Generic Tools

The generic tools are applicable for all the viewers.

Figure 1-8 Generic Tools

Modify Window Width and Level: Right click this button and select a protocol from the list. The images will be displayed according to the

selected protocol. The other option is Left click on the and drag the mouse right to left or up and down over the image to change the W/W or W/L.

Enhance and Smooth: Click this button and the cursor turns

to , click on the image and then drag up or down to the desired position.

Inverse：Select an image and then click this button . The images will be displayed by inverse color.

Grid: Click this button ⊞. A grid is over laid on the image.

Refer to **Chapter 1.6.3** Window Menu for more information regarding the other ROIs.

Enlarge: Click this button 🔳 and then the image display layout format becomes 1*1 even if the original layout was not 1*1. Click it again, the format returns to the original setting.

Reset All: All images return to the original status.

1.7.3.1 Image Output

Save Selected ⬇ Click the arrow in the right corner or right click in the Save Selected region. The Right Key menu appears. The Right Key menu is composed of the following options:

Save Selected, Save Displayed, Save Batch, and Save Marker.

Figure 1-9 Save Interface

• The image can be saved to Local, CD/DVD, USB, or Remote Server.

• It can be saved in the following formats:
 DICOM (derived), DICOM (screenshot), DICOM (PS), BMP, JPG, PNG, TIF and AVI.

•The DICOM (derived), DICOM (screenshot), DICOM (PS) images can be saved to Remote Server.

•The DICOM (derived), DICOM (screenshot) images can be saved to Local.

- For DICOM (derived), DICOM (screenshot) images, descriptions can be input in the Description area.

- Marker is a tool that you can use during your work flow to "save the state" of the current application.
You can re-open marker in Home to return to previous saved states.

Note:

- The derived image has the same size as the original image, and records the markers and measurement information as a graphic overlay. Some operations, such as WW/WL adjustment, zoom, maker and measurement are still possible on the derived image.

- The secondary capture image is just a screenshot saved in DICOM format. It is not possible to adjust WW/WL, zoom, or add any maker or measurement information to this type of image.

1.7.3.2 Image Display

: Click the arrow in the right corner or right click, then the Right Key menu appears. The Right Key menu is composed of the following options:

Image Information: Hide/Show the Patient Information on the image.

Detailed Information: Shows all the image parameters.

- Send to Film: Sends the image information to the film.

- Save: Saves the image information.

Image Information					
Patient ID	94299210	Image Number	1	Recon FOV	500mm
Study ID	1	Content Date	2015-01-16	Filter	
Patient Name	Test	Content Time	16:08:05	Matrix	512*512
Sex	Male	KVP	120kv	Center X,Y	0.0,0.0mm
Age	73Y	mAs		Window Width	2000
Hospital Name	解放军第210医院	X-Ray Tube Current	40mA	Window Center	200
Manufacturer's Model Name	NeuViz 128	Rotation Speed		O-Dose	OFF
Exam Protocol	Chest210	Collimation	2*0.625	AutoKV	OFF
Scan Type	SURVIEW	Tilt angle	0.0deg	Adaptive Filter	OFF
Patient Position	HFS	Table Position	430	MAR	OFF
Series Number	1	Table Height	388.9mm	ClearView	0%
Scan Length	450.0mm	Resolution	STANDARD	Plan Phase	
Exposure Time	4.5s	Slice Thickness	0.0mm	CTDIvol	0.1mGy
View Angle	180			Contrast Agent	

Send to Film   Save   OK

Figure 1-10 Image Information

1.7.3.3 Exit

Exit: Exit the post processing interface and go back to Home.

1.8 AVW Setting

Note:
• This function is only available for AVW, console software does not support it.

In the workstation, click the blank region on the right corner of the menu, then you can view Disk Space, Local IP address, Screen Setting.

Figure 1-11 AVW Setting

Screen Setting: Secondary screen can be set as Review, Film or Report, the default secondary screen is Film.
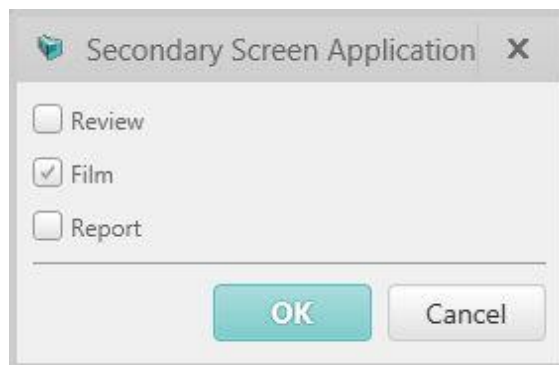
Figure 1-12 Secondary Screen Application

1.9 Keyboard shortcut

The system offers the following keyboard shortcuts listed below:

Table 1-1 Keyboard shortcut

Key	Function	Viewer
F1 through F11	Windowing pre-sets(According to preference	Common
F12	Auto Windowing	Common
Arrow Up or Page Up	Scroll up	Common

Arrow Down or Page Down	Scroll down	Common
Home	Scroll to beginning	Common
End	Scroll to end	Common
CTRL + P	Send image to Film	Common
CTRL + R	Send images to Report	Common
CTRL + A	Select All the images	2D,Film
CTRL + S	Save image	Common
Delete	Delete image	Common, Report and Film
ESC	Reset the mouse to select mode	2D,Film
Ctrl + Enter	Enlarge the view	Common
Alt + Enter	Full screen view	Common
Ctrl + Mouse left-click	Select image	Common
Shift+ Mouse left-click	Select image	Common
Hold the right button and move the mouse	Pan	Common
Hold the "left + right" button and move the mouse	Zoom	Common

Key	Function	Viewer
W	Play Forward	VE
S	Play Backward	VE
A	Move left	VE
D	Move right	VE
X	Move up	VE
Z	Move down	VE
E	Rotate clockwise	VE
Q	Rotate anti-clockwise	VE
Space	Play and pause	VE
A	Axial Orientation	3D
S	Sagittal Orientation	3D
C	Coronal Orientation	3D
R	Flip 3D image	3D
Ctrl+ mouse right-click	Rotate image when defining CPR curve	MPR, Define CPR
Delete	Delete seed point	MPR, Define CPR

Ctrl+ mouse left-click	Extend CPR curve	MPR, Define CPR
Ctrl + C	Copy	Film
Ctrl + X	Cut	Film
Ctrl + V	Paste	Film
Ctrl + B	Swap	Film

Chapter 2. MPR Viewer

2.1 Overview

MPR package is designed for multi-planar reconstruction CT images. The main features include image visualization, different image display mode, CPR, Oblique and Batch. Images can be played, draw ROI, reporting and printing. MPR can help radiologist evaluate lesions and provide important reference information for clinical treatment.

2.2 MPR Viewer Interface

In the home page, select the desired images from the patient list and choose the **MPR** application.

Figure 2-1 MPR Interface

2.3 Image Display Region

The MPR image display region with the layout of 2x2 is the default display. Four types of images are displayed simultaneously. They are Axial image (upper left), Coronal image (upper right), Oblique/curved surface reconstruction image (lower left), and Sagittal image (lower right)
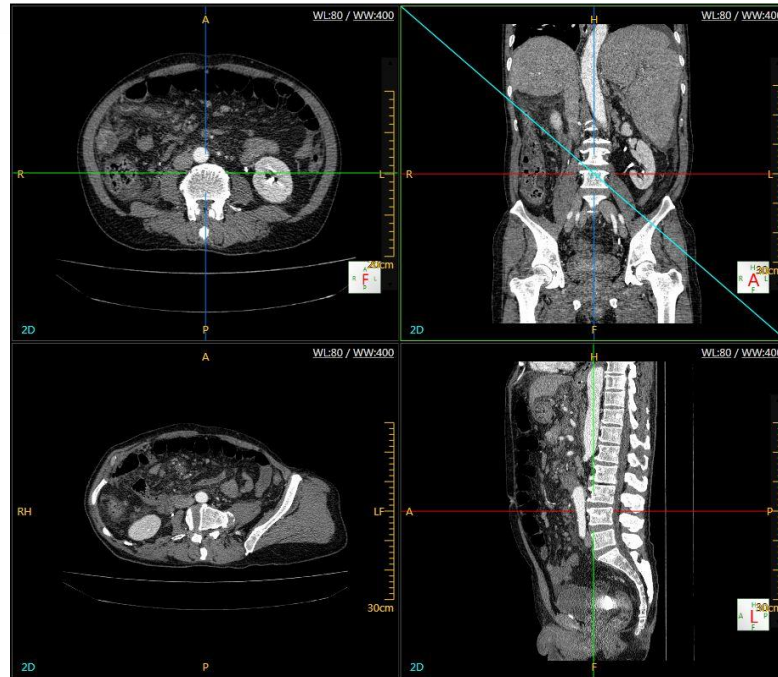
Figure 2-2 Image Display Region

2.3.1 Axial Image

It is located in the upper left corner of the image display region. The axial image is displayed with two cross lines by default. To show/hide the cross lines, select the Crosshair in the MPR Tools on the right of the display. One line represents the Sagittal plane and the other represents the Coronal plane. The crosshair can be rotated to any angle.

2.3.2 Coronal Image

It is located in the upper right corner of the image display region. The coronal image is displayed with two cross lines by default. To show/hide the cross lines, select the **Crosshair** in the **MPR Tools** on the right of the display. One line represents the Sagittal plane and the other represents the Axial plane. The crosshair can be rotated to any angle.

2.3.3 Sagittal Image

It is located on the lower right corner of the image display region. The sagittal image is displayed by default with two cross lines. To show/hide the cross lines, select the Crosshair in the MPR Tools on the right of the display. One line represents the Axial plane and the other represents the Coronal plane. The crosshair can be rotated to any angle.

Note:
- Rotate the cross lines. Then the corresponding image will change following the position of the line.

2.3.4 CPR image

This is located in the lower left corner of the image display region. Select Define Curve button on the MPR Tool panel, draw a path on the Axial image, Sagittal image or Coronal image. Then the CPR image is shown in the lower left corner of the image display region.

2.3.4.1 Image Display Mode

Four render modes are provided in the left corner of the image display region:
2D: Displays the original image.
MinIP: Displays the Minimum Intensity Projection images with the slice thickness.
AIP: Displays the Average Intensity Projection images with the slice thickness.
MIP: Displays the Maximum Intensity Projection images with the slice thickness.
Note:

- Slice thickness field is disabled in 2D mode but enabled in other modes.

Change the slice thickness:
Slice thickness value can be changed by editing the slice thickness edit box or dragging the slice bar.

After selecting the application option, the image display changes according to the change in slice thickness. During the process of clicking on the up and down arrow on the right side of the edit box to increase or decrease slice thickness. It is not necessary to press Enter to confirm.

Note:

- After selecting the application option, clicking the arrow at the right side of the edit box may cause a short delay.

2.4 Control Panel

The control panel includes MPR Tool, Batch Tool and Compare Tool. MPR Tool is specific for the MPR viewer.
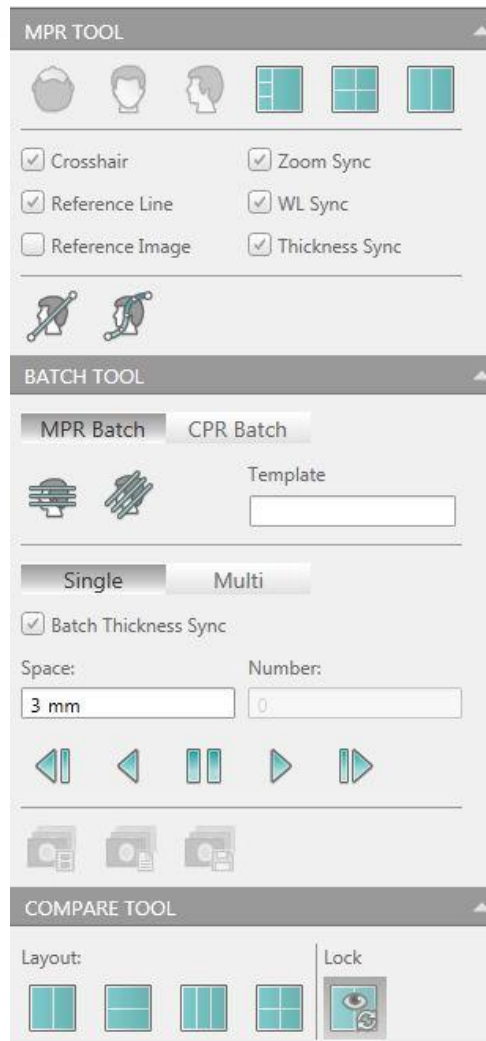
Figure 2-3 Control Panel

2.4.1 MPR Tool

Figure 2-4 MPR Tool

2.4.1.1 View Selection

Click the button on the front of the Options to select or cancel the function.

Crosshair: Show/Hide the crosshair on the images.

Zoom Sync: Check this option and then you can zoom the MPR image window synchronously.

Reference Line: Show/Hide the curve, oblique or batch line on MPR image.

WL Sync: Modify the WL of any window of the four, the other three are modified synchronously.

Reference Image: Show/Hide the mini image on the oblique/ curve/ batch reconstruction image.

Thickness Sync: Change the display mode to MIP, AIP or MinIP, then select one of the three windows, modify its thickness, the other two are modified synchronously.

2.4.1.2 Define Oblique

Define Oblique: This is used to generate Oblique surface images for the observation of space relationships with a specific angle.

2.4.1.3 Define Curve

Define Curve: This is used to generate curved surface images for the observation of space relationships between the focus and the surrounding tissues.
Note:
- Only one curve can be defined at a time.

2.4.1.4 Move Crosshair

The Crosshair can be panned or rotated. Rotating the crosshair displays different angles to observe the lesion and surrounding tissues.

Pan: Move mouse to the cross point; drag the left key to pan the crosshair.

Rotate: Move mouse to the end of crosshair; drag the left key to rotate the crosshair.

2.4.1.5 Layout

Select from these three options to show different page layouts: 3*1, 2*2 and 1*1.

2.4.2 Batch Tool

The Batch Tool consists of a three part function: define batch, modify batch and play batch.
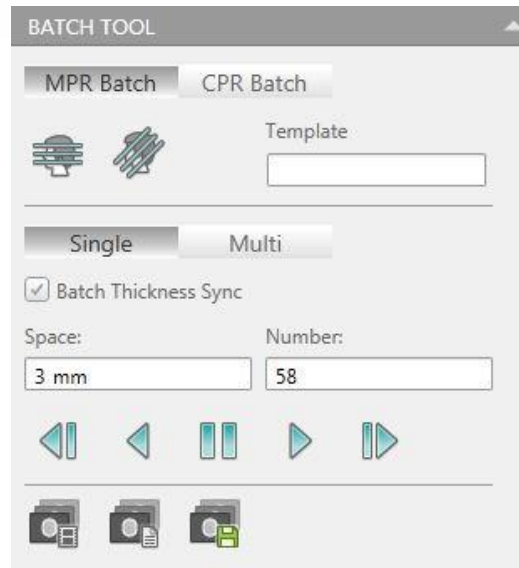
Figure 2-5 Batch Tool

2.4.2.1 Define Batch

Define MPR Batch: Click "Define Batch" button and then create a new batch component on MPR image.

Click the "Multi" button, then the user can draw several batches.

Choose "Batch Thickness Sync" then modify the space of batch. The thickness of the batch images are modified synchronously.

Delete Batch: Press the "Delete" key on the keyboard to delete batch.

Template: Save a batch as template. When a batch is defined the parameters can be saved as a Template. Templates can be saved to quickly achieve the desired parameters for subsequent studies.

Template store information including: space, number, location, render mode, thickness and WW/WL of a batch.

Space: Set the step size when playing the batch of images.

Number: Set the number of images in the batch.

Note:
   • The space and number are linked. The other one will be automatically built when the first one is defined.

Vertical Batch: Customize the vertical batch range of images.

Horizontal Batch: Customize the horizontal batch range of images. Blue lines will show on the axial and sagittal images after defining the batch range.

Define CPR Batch: A CPR curve must be defined before applying the CPR batch. Click "Define CPR Batch" button to create a CPR batch component, which is made up of a batch of curves.

2.4.2.2 Batch

Send Batch to Film: Send the batch to **Film**.
Send Batch to Report: Send the batch to **Report**.

2.4.2.3 Cine

This is used to continuously display the batch.

Step Backward: Play the batch of images step by step backward.

Backward: Play the batch of images backward.

Pause: Stop playing the batch of images.

Forward: Play the batch of images forward.

Step Forward: Play the batch of images step by step forward.

2.4.3 Compare Function
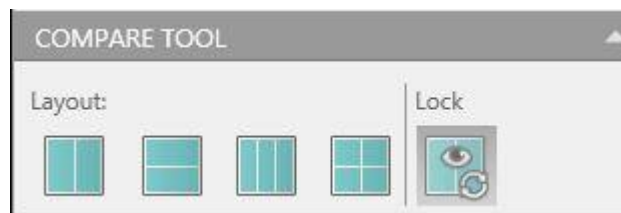
Figure 2-6 Compare Tool

The Compare function allows you to perform a side-by-side review of selected images.

There are different compare layouts: 1*2, 2*1, 1*3,2*2.

Select **Lock**, the compare images will be side-by-side when zooming and scrolling.

Note:
• Images of oblique, CPR and batch do not support compare function.

2.4.4 Right-Click Menu

Fusion：Two CT images can be fused, and some measurement tools are provided.
Other functions of right-click menu refer to Chapter 1.6.3 for more information.

Chapter 3. 3D Viewer

3.1 Overview

3D reconstruction application executes three-dimensional reconstruction for CT image. This includes image visualization, image cutting, removing bone, protocol edit, tissue management, segmentation, and the image playback function.

3.2 3D Viewer Interface

In the home page, select the desired images from the patient list and choose the **3D** application.
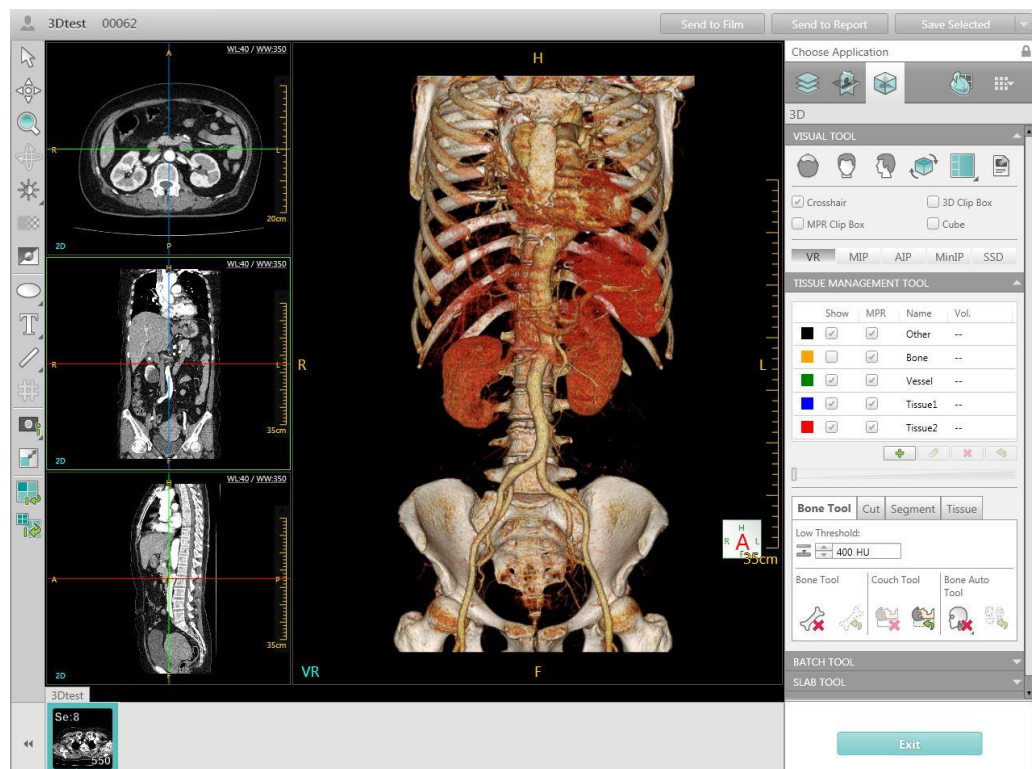
Figure 3-1 3D Interface

3.3 Image Display Region

The image display region of the 3D viewer interface includes two parts: Section Image Display Region and Volume Image Display Region.

Figure 3-2 Image Display Region

3.3.1 Section Image Display Region

As shown, the section image display region includes the axial display (top left), the coronal display (middle left) and the sagittal display (lower left). On each image, there are two perpendicular lines representing the different positioning planes. The green frame is around the active image.

3.3.2 Volume Image Display Region

The region displays the image resulting from the 3D reconstruction.

3.4 Control Panel

The control panel includes Visual Tool, Tissue Management Tool, Batch Tool, Compare Tool and Slab Tool.

3.4.1 Visual Tool
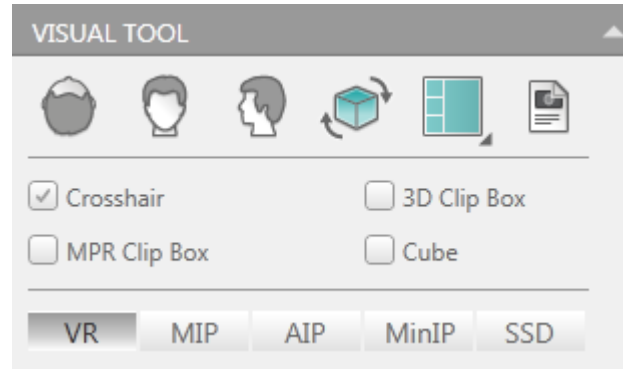
Figure 3-3 Visual Tool

3.4.1.1 View Selection

Crosshair: Show/Hide the crosshair on the section images.

3D Clip Box: Show/Hide the clip box on the volume image.

MPR Clip Box: Show/Hide the MPR box on the section images.

Cube: Show/Hide the cubic box on volume and MPR images.

Axial: Display the volume image in the axial projection.

Coronal: Display the volume image in the coronal projection.

Sagittal: Display the volume image in the sagittal projection.

Flip VR image: Flip the volume image.

Select these two options to show different page layouts: **3+1** and **2*2.**

3.4.1.2 Show Protocol

Protocol: Show/Hide the protocol list.

Add: Add a protocol to the protocol list.

Click the icon for the Edit Protocol dialog box. Select the CT value and the Opacity to create desired protocol.

When the cursor stays on the control point of the opacity line, the corresponding CT value and the Opacity will be shown automatically. Then the shape of the cursor becomes a crosshair. Drag to achieve an ideal CT value and Opacity of the control point.

Right click any sliders and then edit the color of the sliders in the Edit Color dialog box.
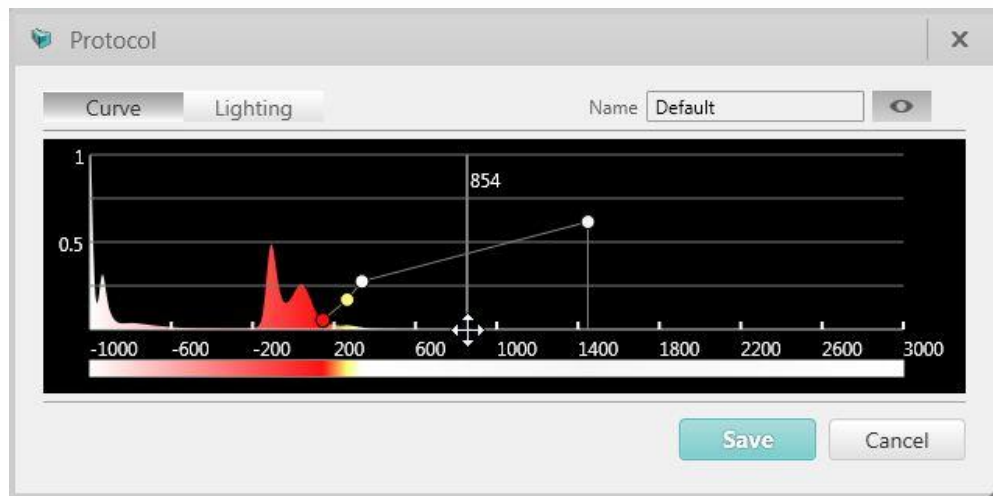
Figure 3-4 Edit Protocol dialog box

Edit: Edit the customized protocol.

Delete: Delete the customized protocol.

Note:

- The default protocols in the list cannot be changed or deleted.

3.4.1.3 3D Display Mode

3D display modes include SSD, MinIP, AIP, MIP and VR.

SSD (Shaded Surface Display)

Shaded Surface Display performs the reconstruction operation to the surface contour of organ tissue. This uses the threshold value segmentation method; it is also called Surface Shield Display (SSD). The reconstructed 3D images only displays the surface profile of the organs and cannot display the inner structure. Map the CT value of the cross sections of the tissues to be displayed to produce the 3D effect.

The advantage of the surface display is to provide a more direct space relationship between the diseased tissue and surrounding structure for the physician to have a better understanding of the overall position and form of the diseased tissue.

Click **SSD** to enter the surface shield display operation. The results will be displayed in the volume image display region.

Click ![icon] to select the desired color.

Figure 3-5 SSD

MinIP (Minimum Intensity Projection)

The MinIP records the Minimum Density value of every ray and projections to generate 2D images. The front and rear structures overlap with each other and the 3D images are generated. It is mainly used to display the trachea.

Click **MinIP** to enter the MinIP operation. The results will be displayed in the volume image display region.
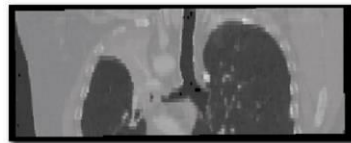
Figure 3-6 MinIP

AIP (Average Intensity Projection)

The AIP records the Average Density value of every ray and projections to generate 2D images with a similar effect as in X-ray images.

Click **AIP** to enter the AIP operation. The results will be displayed in the volume image display region.

Figure 3-7 AIP

MIP (Maximum Intensity Projection)

The MIP records the Maximum Density value of every ray and projection to generate 2D images. The front and rear structures overlap with each other and the 3D images are generated. This method compensates for the disadvantage of single angle imaging being insufficient in space relationship. It also reflects small changes in intensity values. The MIP has high clinical value because the image has high resolution and displays the 3D structure of blood vessels and the pathological changes in the bronchus, liver and lungs more clearly.

Click **MIP** to enter the maximum intensity projection operation. The results will be displayed in the volume image display region.

Figure 3-8 MIP

VR (Volume Rendering)

Click **VR** to conveniently switch between VR and SSD/MinIP/AIP/MIP.

3.4.2 Tissue Management Tool

The Tissue Management Tool includes the Tissue List and the Tissue Operation Tool.
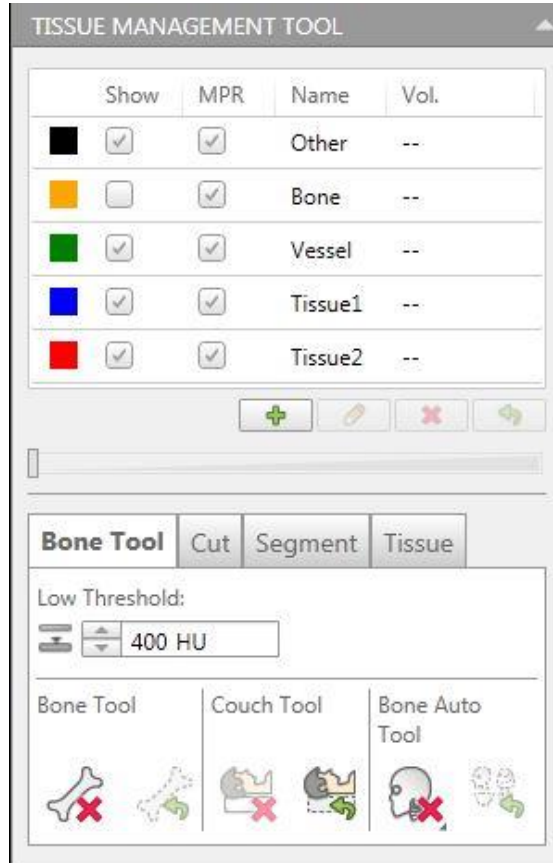
Figure 3-9 Tissue Management Tool

3.4.2.1 Tissue List

Tissue List displays the tissue type and the Tissue Volume. Check the option box below **Show** and **MPR** to define whether to display the tissue in the Sectional images.

Add: Add a tissue name and color.

Delete: Delete a tissue from the Tissue List.

Rename: Rename a tissue in the list.

Clear: Clear the tissue volume display.

3.4.2.2 Tissue Operation

Opacity: Define the tissue Transparency display.

Right click the Tissue list, the following menu is displayed.

Tissue Color: Set the dyed tissue color.

Tissue Protocol: Set the dyed tissue display protocol.

3.4.2.3 Bone Removal

Manually remove:
Manual bone removal is done using the Visual Tool.

1. Set the **Low Threshold**.

2. Click **Bone Removal**.

3. Click the bone that needs to be removed from the volume image on the volume image or on the MPR image.

4. The bone can be removed automatically.

Couch Removal:
Couch Removal: Removes the couch.

Undo Couch Removal: Cancel the Couch removal.

Automatic Bone Removal:
The user can remove the bone automatically with this function.

1. Right click the mouse on Auto Bone Remove button.

2. Select the option from the button list according to the series type.

3. The bone can be removed automatically.

To cancel the removal, click **Undo Bone Removal**.

3.4.2.4 Cut Tools

Include Cut: To cut the selected 3D reconstructed images.

Exclude Cut: To cut the unselected areas on the 3D reconstructed images.

Click **Include Cut** or **Exclude Cut** and select a point in the volume image display region to start cutting.

Move the mouse to draw the region to be cut. Click again to finish drawing. Then a message pops up inquiring whether or not to submit the cutting operation.

Click **OK** to start cutting. Click **Cancel** to cancel cutting and return to the status before the cutting operation began.

Undo Cut: To reset the system to the original state before the cutting operation began. Click **Undo Cut** to restore 3D image display images to the original state before cutting.

Note:

• This operation is only applicable in the volume image display region. To confine the cutting region within the volume display region, the cursor is restricted to the volume display region. Once the cutting region has been selected the mouse restriction is cancelled.

3.4.2.5 Segment Tools

High Threshold and **Low Threshold:** Set the maximum and minimum thresholds of the desired area selected for segmentation tool.

Dye: To manually select the tissue or area on the image:

1. Click **Dye**.

2. Click the area where the tissue is located and needs be changed. The area is dyed to the selected color.

Edit **Dye** parameters:

Dose: Adjust the Dose manually for better bone removal. Select the options from **Low**, **Medium** or **High** to adjust the dose.

Brush: Click the icon to brush the area.

Brush Parameters:

Brush Radius: Adjust the size of the brush by selecting the **Small**, **Medium** or **Large** option.

Eraser: Click the icon to erase the area that is dyed.

Eraser Parameters:

Eraser Radius: Adjust the size of the eraser by selecting the **Small**, **Medium** or **Large** option.

Contour segmentation: Draw the contour on different MPR layer and segment the contour region.

Fill: Click the icon to make the dyed area fully filled.

Expand: Click the icon to expand the dyed area.

Erode: Click the icon to decrease the edge of the dyed area.

3.4.2.6 Tissue

You can select the cardiac, colon, lung in the target list, click the segment button, the system will automatically extract the target tissue,

which is displayed in the VR window.

3.4.3 Batch Tool

The figure below shows the Batch tool, including Range, Batch and Cine.
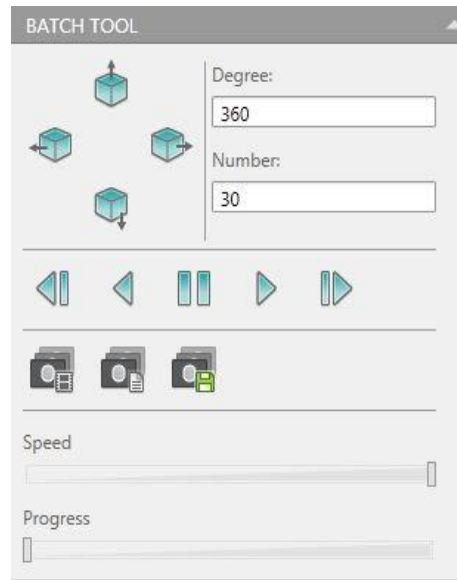
Figure 3-10 Batch Tool

3.4.3.1 Range

Left, **Up**, **Right and Down**: Click the direction icon and input rotation degree and image number. After defining the batch, click **Save** to save the batch, and then send the batch to **Film** or **Report**, or play the batch.

3.4.4 Slab Tool
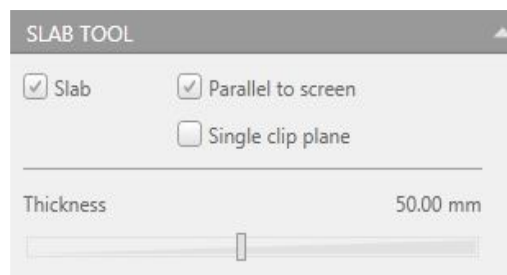
Figure 3-11 Slab Tool

Slab：Select Slab and display clipped image on VR image.

Parallel to screen：Adjust Slab model for parallel screen mode.

Single clip plane：Switch two planes to a single plane.

Users can adjust the slider to modify Slab thickness.

3.4.5 Compare Tool
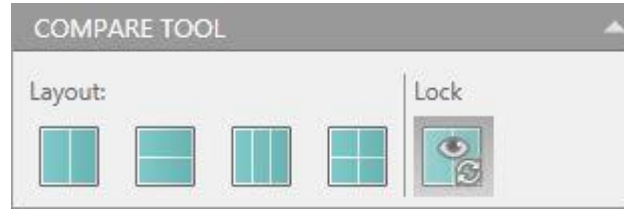
Figure 3-12 Compare Tool

The Compare function allows you to perform a side-by-side review for selected images.

Click any layout button in the compare tool to access the compare mode.

Double-click the image sequence to be compared, the image is automatically loaded into the layout.

Select **Lock**, the compare images will be side-by-side when zooming, rotating and modified Window Width and Level and so on.

There are four kinds compare layouts: 1*2, 2*1, 1*3, 2*2.

When you select a layout that is not in the compare tool, the system automatically exits compare mode.

3.4.6 Right-Click Menu

Figure 3-13 Right-click Menu

Refer to **Chapter 1.6.3** Window Menu for more Right-click menu information.

Chapter 4. VE Viewer

4.1 Overview

VE application can be used for navigating, viewing colon, lumen organization manually or semi-automatic, following the path to navigate, recording and playback.

4.2 VE Viewer Interface

In the home page, select the desired images from the patient list and choose the **VE** application.
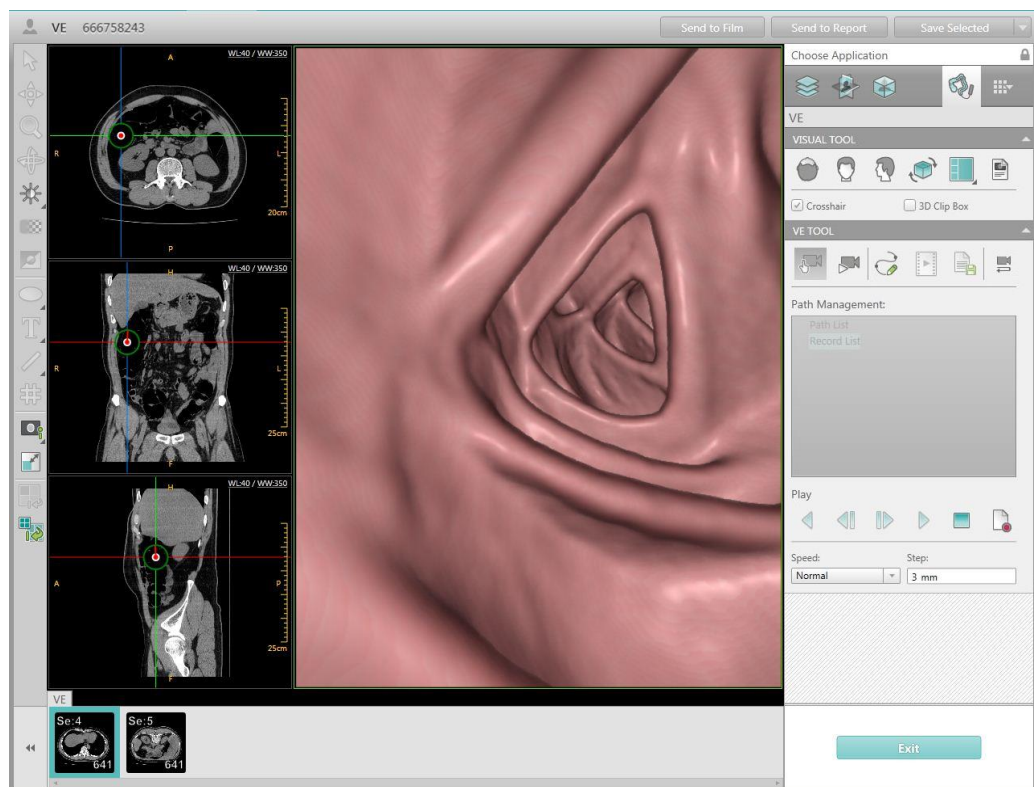
Figure 4-1 V E   Interface

Note:

- VE can process the images of the cavity organs such as trachea, enhanced vessel and vertebral canal etc.

4.3 Image Display Region
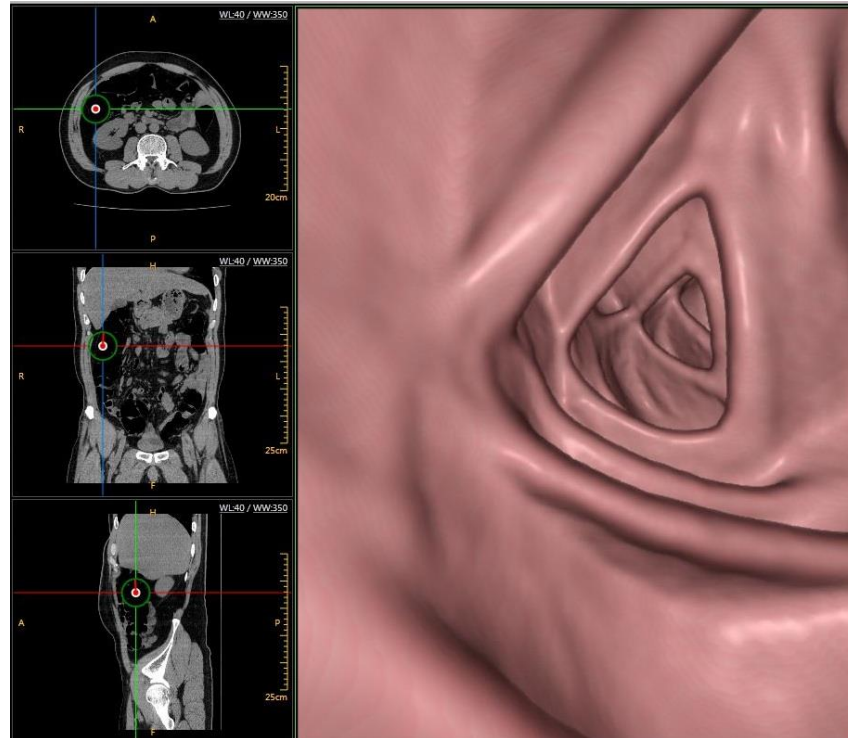
Figure 4-2 Image Display Region

4.3.1 Axial Image

The Axial Image is displayed in the upper left corner of the image display region. It is displayed with two perpendicular lines. The longitudinal line represents the sagittal plane and the transverse line represents the coronal plane.

4.3.2 Coronal Image

The Coronal Image is displayed in the middle left of the image display region. It is displayed with two perpendicular lines. The longitudinal line represents the sagittal plane and the transverse line represents the axial plane.

4.3.3 Sagittal Image

The Sagittal Image is displayed in the lower left corner of the image display region. The sagittal image is displayed with two perpendicular lines. The longitudinal line represents the coronal plane and the transverse line represents the axial plane.

4.3.4 VE Image

The VE Image is displayed on the right part of the image display region.

4.4 Control Panel

The control panel includes VE Tools and the Generic Tools. VE Tools are specific for the VE Viewer. Generic Tools are applicable for all Viewers.
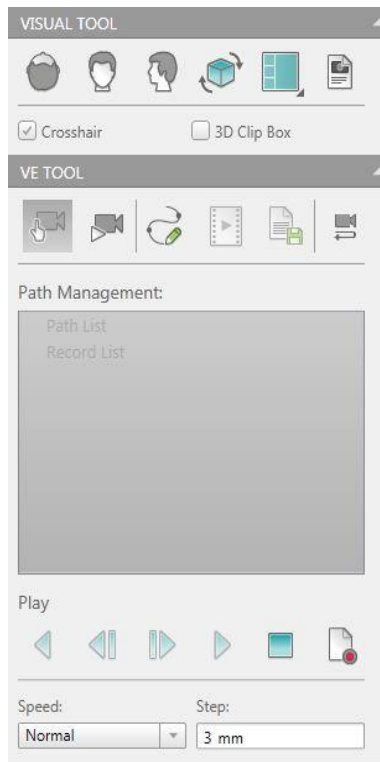
Figure 4-3 VE Tool

4.4.1 Navigation

There are three types of navigation modes, Manual, Semi-Automatic and Define Path.

Manual Flythrough: Used to customize the navigation position, direction, and path.

Note:

- The Manual Navigation Mode is the default mode when entering the VE viewer interface. When the Manual Navigation Mode is selected, you can define Camera Position, Direction, and Path.

Semi-Automatic Flythrough: Press down and hold left mouse button to navigate, release the button to stop navigation.

Navigation with a defined path:

Define Path: Customize a path for navigation. Click the icon, and move the cursor on the axial image, the coronal image or the sagittal image, and then draw several navigation points by left mouse single click, and double click to finish the path.

After defining the navigation path, click the **Forward/Backward** icon

to navigate along the defined path. During the process of navigating along the path, click the '**Stop**' button to stop navigating.

Note:

- When the navigation starts, the navigation position changes to the starting point of the path and the navigation direction changes to the direction of the path.

- Define a path, then the play function is able to be used.

- In manual navigation, manipulating the mouse wheel can change the navigation direction horizontally, and clicking can pause the navigation.

Reverse, Step Backward, Step Forward, Backward, Forward and Stop buttons are used to control the navigation.

Reverse: Reverse the camera direction.

Step Backward: Manually navigate backwards step by step.

Step Forward: Manually navigate forward step by step.

Backward: Manually navigate backward.

Forward: Manually navigate forward.

Protocol: Hide/Show the protocol list, in which protocols can be added, edited or deleted.

3D Clip Box: Hide/Show VR Box on the image.

Crosshair: Hide/Show crosshair on the image.

Path Management: Displays the defined path list which is also selectable.

Record: Save a record of the navigation.

Step: Define the length of the step.

4.4.2 Replay Mode

Record: Record navigation.

Click the **Record** button. Then click **manually Flythrough/Semi Fly through/Define Path** to record a customized navigation. Or, click **Reverse** or **Forward** to record an automatic navigation. Click the button **again** to stop the recording. Then the icon **Replay Mode** is active. Click **Replay Mode** button, figure 4-4 below shows the control panel displays.
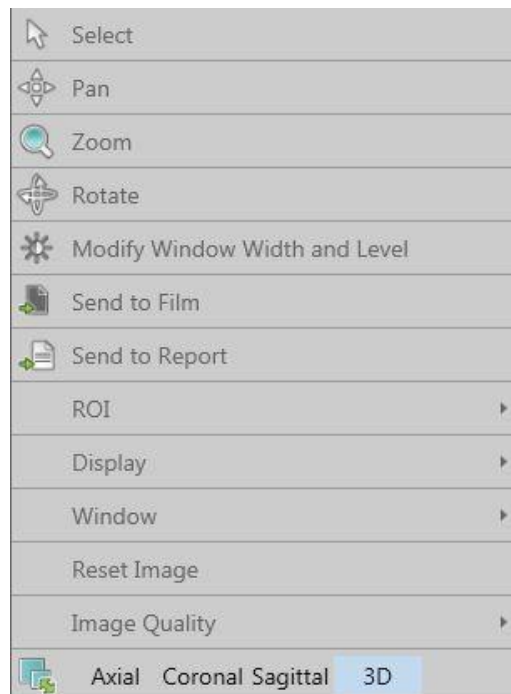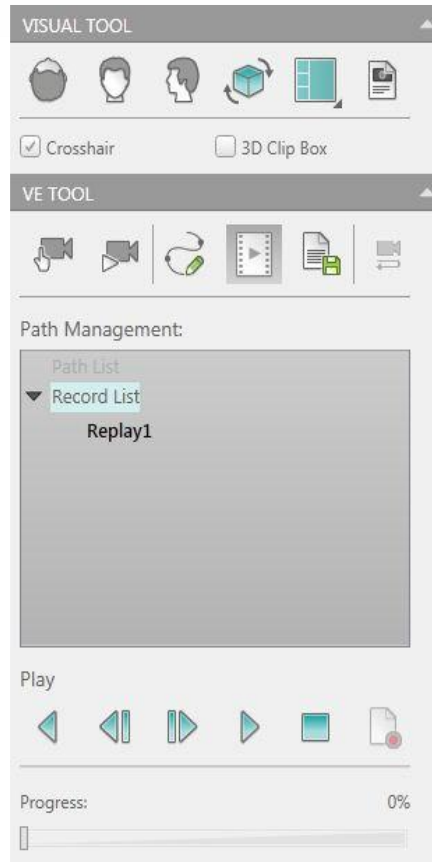
Figure 4-4 Replay Mode

4.4.3 Right-Click Menu
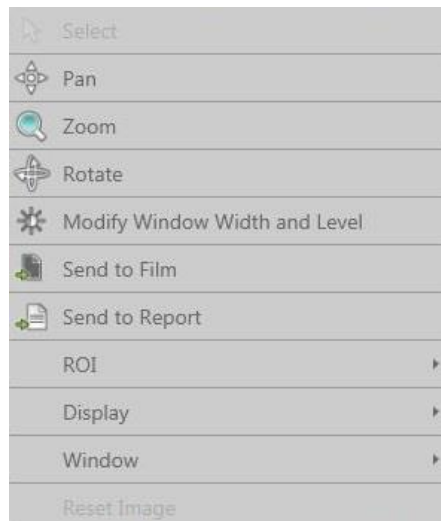
Figure 4-5 Right-Click Menu

Refer to **Chapter 1.6.3** Window Menu for more Right-click menu information.

Chapter 5. Dental

5.1 Overview

The Dental application is used to create true-size (life size) images of the Mandible and the Maxilla on film for assisting oral surgeons in planning the implantation of prostheses. The procedure consists of the following steps:

- Defining panoramic views.
- Defining sectional planes.
- Filming the reference, panoramic and sectional images in true size.

Note:

- For true size images, **Dental** uses the special film layout with a film size of "14 x 17".
- On every film, check the scales on the right side of the images to ensure the accurate size of the image.
- If filming the images in not true size, maybe the results are not true size.

5.1.1 Dental Scanning Hints

The following hints will be helpful in producing the best patient images for the Dental application:

- Instruct the patient to remove any dentures or partial plates.
- Use a tongue blade or folded gauze pad to separate the teeth. If the patient does not have teeth, the jaw should also be separated using a folded gauze pad.
- Ensure that the position of the region of interest is (maxillary or mandible) perpendicular to the table to optimize clinical results.

5.2 Dental Interface

In the home page, select the desired images from the patient list and choose the **Dental** application.

Figure 5-1 Dental Interface

The **Dental** workflow includes: **Set Plane, Define Curve** and **Cross Sectional**.

5.3 Set Plane

The first step is to define the optimal axial image for analysis.

Figure 5-2 Set Plane Tool

MPR Cross Line: Show/Hide cross line on MPR images.

There are two page layouts for review:
- **1+2**: Shows three orientations of the images: Axial, Coronal and Sagittal.
- **2*2**: Shows three orientations of the images: Axial, Coronal, Sagittal and Volume image.

5.4 Define Curve
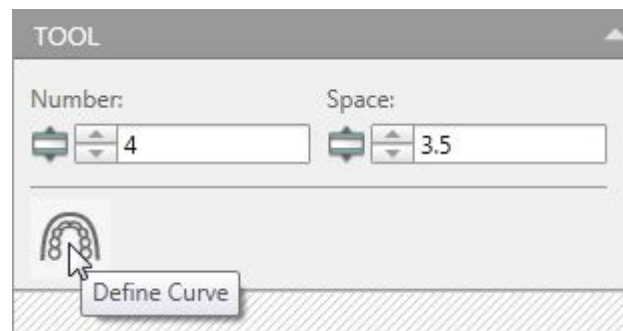
Figure 5-3 Define Curve Tool

Define Curve:
- Click the icon.
- Move the cursor into the axial image viewport, select a starting point and click it. Keep moving along the proposed curve, with the mouse button depressed while moving along the path. A green line will form to show the progress.
- When finished, double-click the end point of the curve.

The planning curves will display after double-clicking, and the panoramic images will display in the right viewport. The number of panoramic images depends on the number of curves.
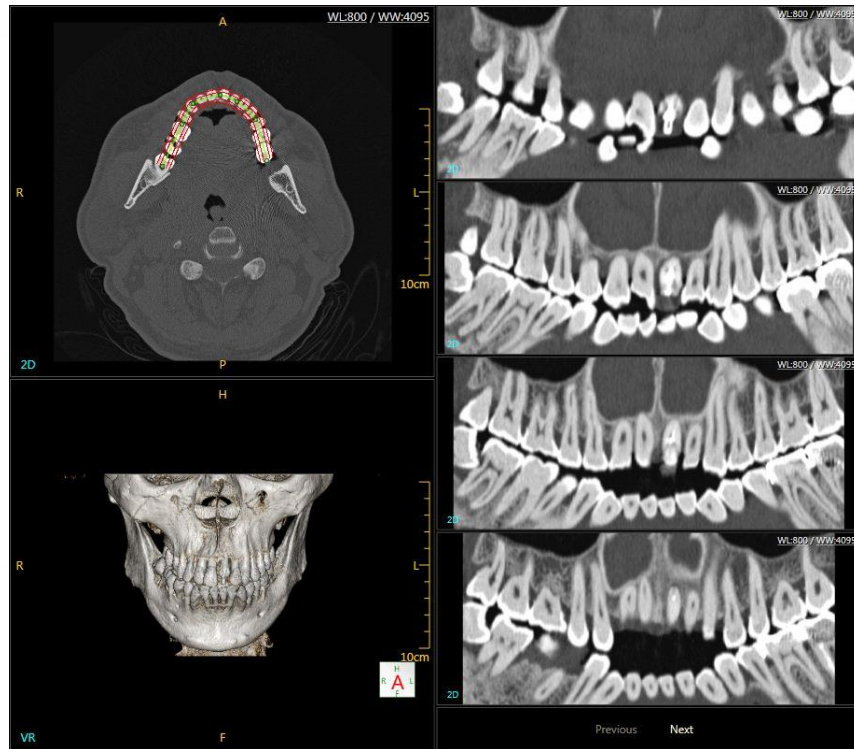
Figure 5-4 Panoramic Images

Check that the panoramic images are in the desired plane. **Next** or **Previous** button in the bottom of viewport allows all the images to be seen.

Set the number and space of the curves:
- Use the **Number** textbox to set the number of the curves.
- Use the **Space** textbox to set the space between the panoramic curves.

Edit Curve:
- Click the curve.
- Right click the mouse, and select **Edit Curve** in the right-click menu, the mouse becomes edit icon.
- Drag the point to the desired location.
- The curve connected at this point will move to the desired location and will display in real-time the panoramic images.

Pan Curve:
- Click the curve.
- Right click the mouse, and select **Pan Curve** in the right-click menu, the mouse becomes pan icon.
- Drag the curve to the desired location.
- The whole curve will move to the desired location and will display in real-time the panoramic images.

Delete Curve:
- Click the **Define Curve** icon again, the old curves will disappear.

To draw new curves, repeat the same steps as **Define Curve**.

5.5 Cross Sectional

When the panoramic image is satisfactory, click the **Cross Sectional** icon to begin the next stage of the workflow. The sectional image will display in the bottom-right window of the image display region.

The Sectional Operations define and display a series of sectional paraxial oblique image planes, perpendicular to the curvature of the Mandible or the Maxilla.
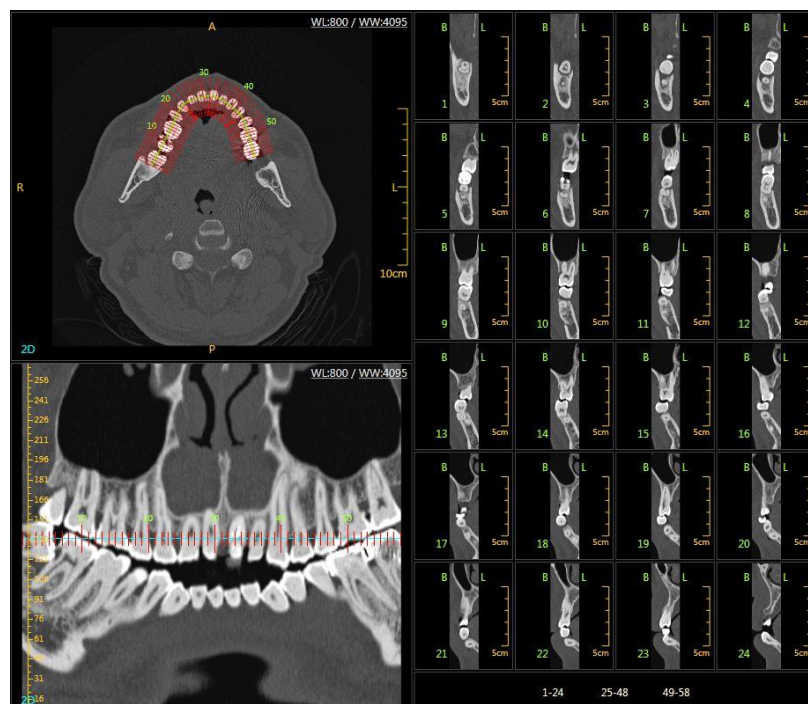
Figure 5-5 Cross Sectional Images

Shown above are sample sectional images, **Page Number** in the bottom of viewport allows all the images to be seen.

The B and L letters designate the Buccal and Lingual side of the teeth.

These tools allow creation and manipulation of several sets of sectional images.

Note:
- Sectional Operations cannot be accessed unless the **Define Curve** has been defined and the sectional images are shown.
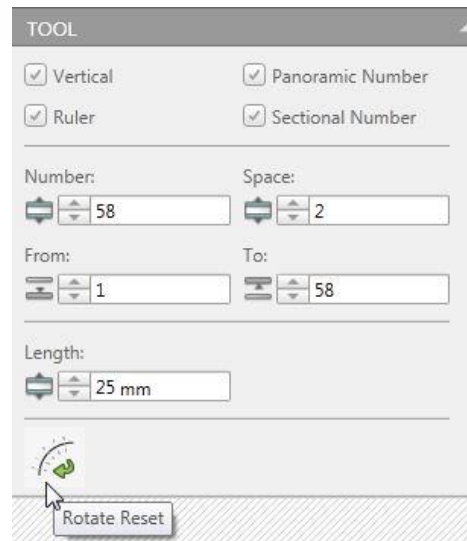
Figure 5-6 Cross Sectional Tool

Set the number and spacing of the sectional lines:
- Use the **Number** textbox to set the number of the sectional lines.
- Use the **Space** textbox to set the space between the sectional lines.

Set the displayed range of the sectional lines:
- Use the **From** and **To** textbox to set the displayed range of the sectional lines.

Set the length of the sectional lines:
- Use the **Length** textbox to set the length of the sectional lines.

Select Line Set:
- Move the mouse pointer to the required set.
- Click the set and then the selected set appears red, while all the other sets appear green.

Add Line Set:
- Decrease the number of sectional lines or shorten the spacing between those lines if necessary. This is in order to insure that there is enough space on the defined curves.
- Click on part of the defined curve where there are no sectional lines. Then a new set of sectional lines are displayed in red, while the original is displayed in green.

Note:
- Ensure that there is enough space on the curve. Otherwise the set will not be created.

Move Line Set:
- Move the mouse pointer to the required set.
- Click and hold while dragging the set to the desired location along the curves.

Delete Line Set:
- Move the mouse pointer to the desired set.
- Press **Delete** on keyboard to delete it.

Rotate Line Set:
- Move the mouse pointer to the required set.
- Click the set while dragging left or right until the desired angle is achieved.

Rotate Reset:
- Move the mouse pointer to the required set.
- Click the **Rotate Reset** icon, the set of sectional images returns to perpendicular to the curves.

Vertical: Show/Hide the Sectional Lines on the axial and panoramic images.

Panoramic Number: Show/Hide marks representing the original slice numbers on the panoramic images.

Ruler: Show/Hide the horizontal scale at the top of each section image.

Sectional Number: Show/Hide the original image slice numbers on the sectional images.

Chapter 6. Vessel Analysis

6.1 Overview

Vessel Analysis (VA) offers a set of tools for general vascular analysis. Bone removal, vessel extraction, and measurements can be easily performed. Various review modes may be used, such as MIP or VR.

⚠️**Caution:**

- **Always use the original CT images to correlate with existing pathology and/or anatomical study.**

- **Vessel Analysis should not be used as the SOLE incontrovertible basis for clinical diagnosis.**

- **Verify that Bone Removal does not remove vessel segments.**

- **Verify the accuracy of vessel extraction results and correct them manually when required.**

- **Verify the accuracy of the centerline curves on the screen and correct them manually when required.**

- **When extracting different types of vessels, the vessels type can be switched. For example when extracting the carotid and vertebral arteries, "Carotid" should be selected for extraction.**

6.2 VA Interface

In the home page, select the desired images from the patient list and choose the **VA** application.
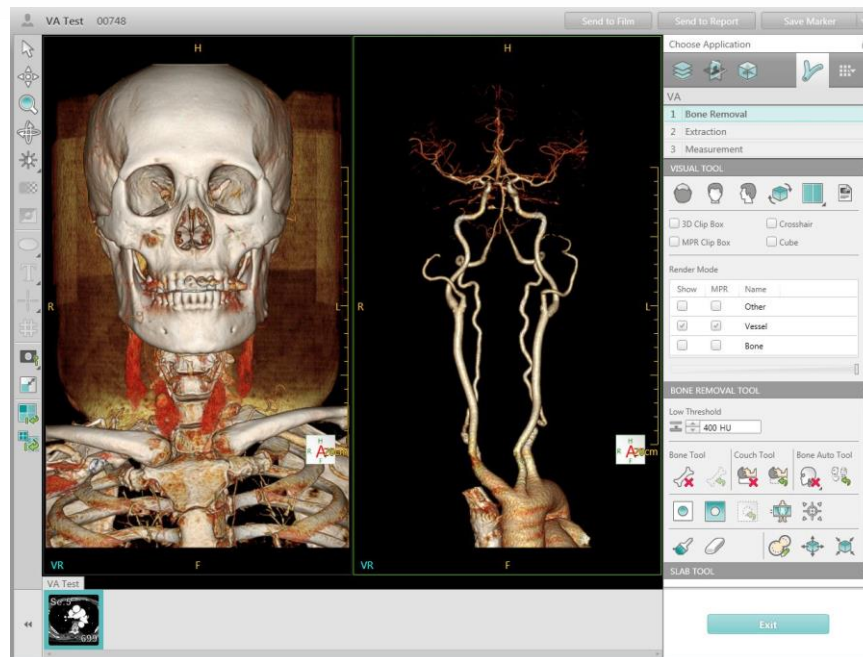
Figure 6-1 VA Interface

VA includes workflow of: Bone Removal, Extraction, Measurement.

6.3 Bone Removal Tool

The Bone Removal stage of VA contains a variety of tools used to reveal the vessel(s) of interest.

6.3.1 Visual Tool
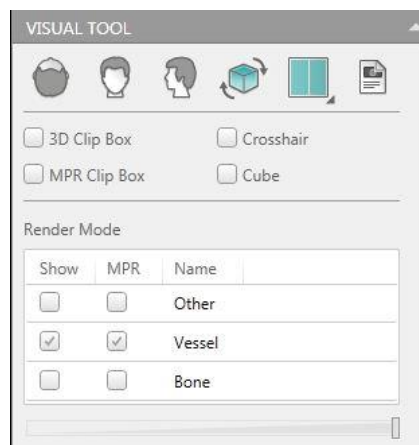
Figure 6-2 Visual Too

There are two page layouts for review:

1*1: Shows the two 3D images as the setting in the **Render Mode**.

2*2: Shows the three sectional MPR images and Volume image.

The image display region includes two parts: the MPR image display region and the volume image display region. The MPR image on the left include the axial, coronal and sagittal images.

Render Mode: Define the Volume image and MPR images display mode. The options are Bone only, Hide bone, Highlight Bone, Transparent Bone, Vessel only, Transparent Background and All.

Refer to Chapter **3.4** for more information regarding the other tools on this panel.

6.3.2 Bone Removal Tool & Slab Tool
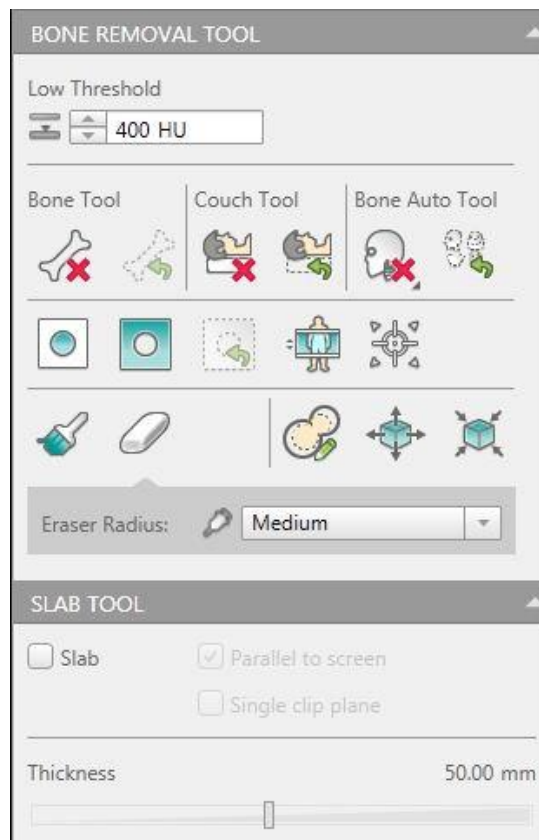
Figure 6-3 Bone Removal Tool & Slab Too

Use Bone Removal Tool to remove the bone manually:

1. Set the **Low Threshold**.

2. Click **Bone Removal**.

3. Click the bone that needs to be removed.

4. The bone can be removed automatically. To cancel the removal, click Undo Bone Removal.

5. To remove the couch, click Couch Removal. To cancel the Couch removal, click Undo Couch Removal.

Auto removed Bone:

There are 5 selections the user can select：

Head Neck, Chest Abdomen (Vessel), Chest Abdomen, Lower Limb, Bone Fragment. To cancel the removal, click **Undo Bone Removal.**

The vessels will be extracted after Head Neck and Chest Abdomen (Vessel) bones are removed.
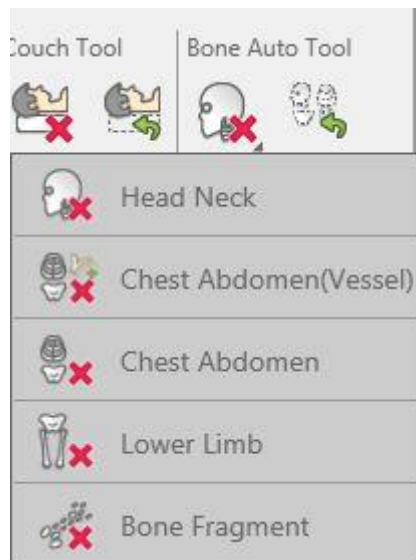
Figure 6-4 Automatic bone removal Tool

VOI Cut : The tissue can be cut in the VOI region.

Manual Segmentation : User can hold the mouse button in the view to segment the tissue.

Contour segmentation: Draw the contour on a different MPR layer, and segment the contour region. Refer to Chapter **3.4** for more information regarding other tools on this panel.

6.4 Extraction
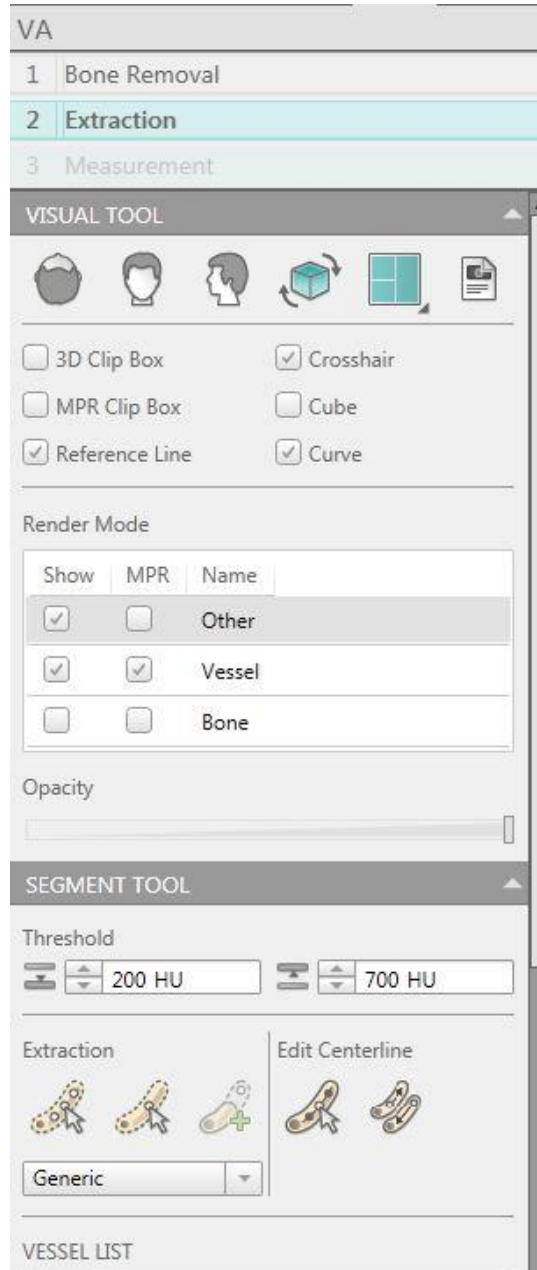
Figure 6-5 Vessel Extraction

The Extraction stage is used for extracting the vessel path, either automatically or manually.

6.4.1 Visual Tool
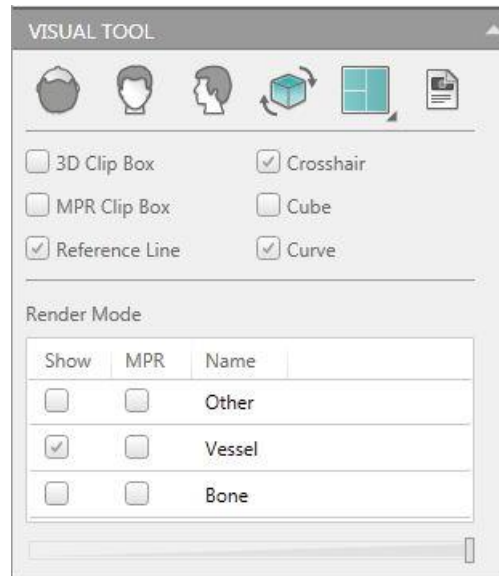
Figure 6-6 Visual Tool

There are four page layouts for review:

: Displays the CPR image (On the top left), MPR image (On the bottom left) and Volume image (On the right of the viewport).

: Displays the three sectional MPR images (On the top of the viewport), CPR MIP (On the bottom left) and Volume image (On the bottom right).

: Displays the three sectional MPR images and Volume image.

: Displays the CPR images of character and reference line and "elongated" vessel image. The "elongated" image is the straightened MPR view of the vessel.

Crosshair: Show/Hide the crosshair on the section images.

MPR Clip Box: Show/Hide the MPR box on the section images.

3D Clip Box: Show/Hide the clip box on the volume image.

Cube: Show/Hide the cubic box on volume and MPR images.

Curve: Show/Hide the curve on the volume image.

Reference Line: Show/Hide the Reference Line on the section images.

Render Mode: Define the volume and MPR images display mode.

Refer to *Chapter* **3.4** for more information regarding other tools on this panel.

6.4.2 Segment Tool
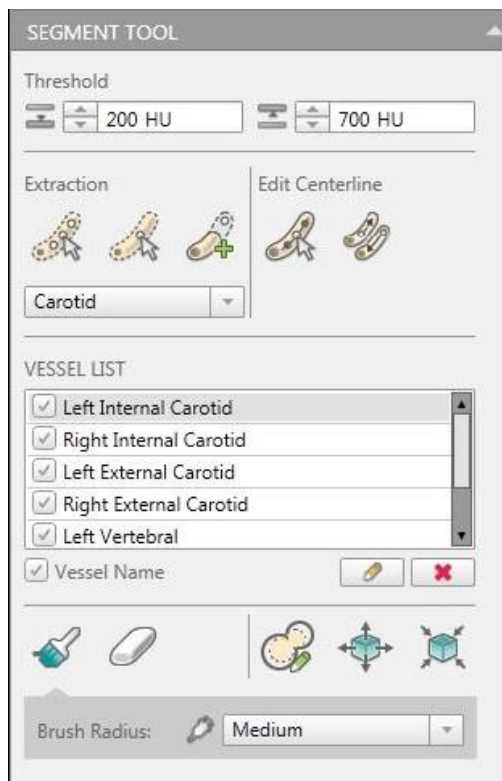
Figure 6-7 Segment Tool

Extraction:

One-point: Select a seed point on the 3D image or the MPR image.

Multi-point: Define at least two seed points on the 3D image or the MPR image.

Edit Centerline: Edit the centerline after the path is generated.

Modify Centerline: Modify points on the centerline.

Switch CPR direction: Exchange two end points of the vessel.

Vessel list: Lists the vessels extracted. The vessels can be deleted and renamed.

6.5 Measurement Tool

The Measurement function is enabled after the VA calculation is completed. Click **Measurements** to enter the interface.
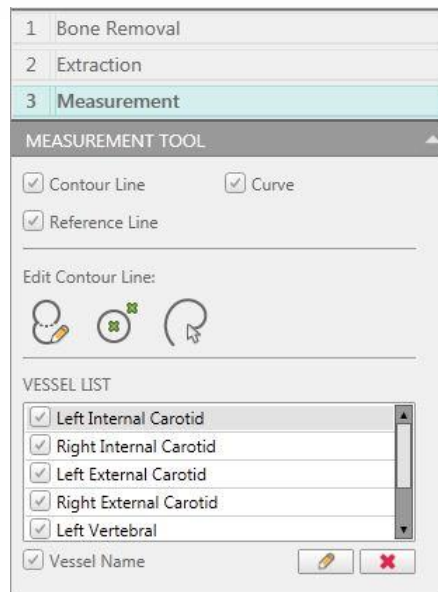
Figure 6-8 Measurement Tool

Contour Line: Show/hide contour line of the ROI.
Edit Contour Line: The user can use this function to:
1. Edit contour.
2. Define contour by two points.
3. Draw contour line manually.

Measurement workflow consists of the measurement result table, MPR&CPR image and Diam. /Area curve.
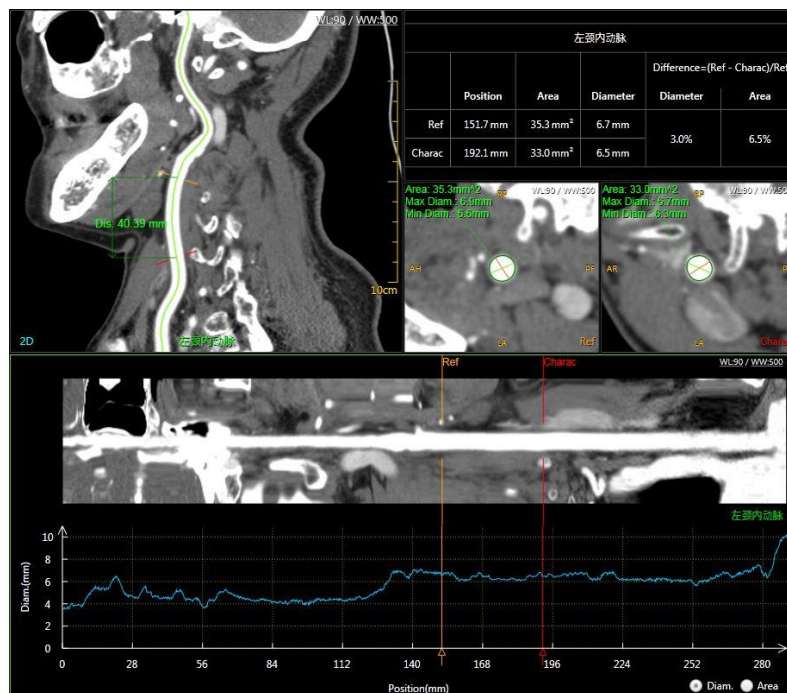
Figure 6-9 Measurement Interface

6.6 Right-Click Menu

Right click on the images to show the Right-Click menu. Refer to **Chapter 1.6.3** for information about these functions.

Chapter 7. Perfusion

Perfusion analysis includes two Viewers: **Brain Perfusion** and **Body Perfusion.**

7.1 Brain Perfusion

Brain Perfusion is a blood flow imaging application that analyzes the uptake of injection contrast bolus, in order to determine functional blood flow. The information displays a specific Region of Interest [ROI]. The ROI is scanned in the same position and at the same time intervals, as per the expected rate of change.

7.1.1 Brain Perfusion Interface

In the home page, select the desired images from the patient list and choose the **Brain** application.

Figure 7-1 Brain Interface

Note:

- For brain perfusion, the loaded series must be scanned dynamically at the same slice.

The perfusion workflow is specific for the perfusion operation, including Preprocess, Reference Vessel, Calculate, Gray or Pseudo Color and so on.

Every perfusion follows the steps below:

- Load the perfusion series.

- Preprocess the images.

- Select Reference Vessel.

- Calculate.

- Evaluate the function images.

⚠️

Caution:
- **The CT Perfusion application should not be used as the only basis for clinical diagnosis.**
- **Ensure that the scan duration is sufficient to cover the contrast period as well as the entire first pass of the contrast particles injected. 40~50 seconds is suggested as scan duration.**
- **A scan interval must be no longer than 2 seconds. 1 second is suggested.**
- **The contrast injection must be sufficiently rapid as to provide reasonable enhancement.**
- **During the entire scanning process, keep the patient's head still. Otherwise, there will be unreliable functional images.**

7.1.2 Preprocess

The Image area includes the Reference image area and the original image area.

7.1.2.1 Reference Image Area

The Reference image area is in the right corner of the perfusion interface. It is used to display the reference (original) image before perfusion calculation and the tMIP image (time Maximum Intensity Projection) after the perfusion calculation.

7.1.2.2 Play

The Play Tool is used to display the images based on time for the loaded perfusion images. It provides an easy way to find motion artifacts.
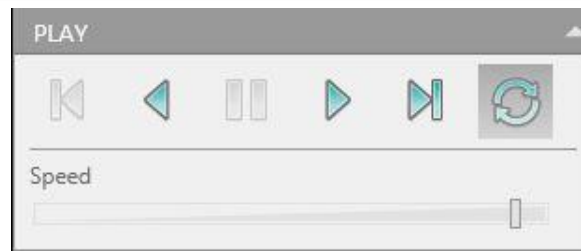
Figure 7-2 Play Tool

- Click **Play** to start displaying the reference images.
- Click **First** or **Last** to show the first or last image.
- Drag the slide on the scrollbar to adjust the display speed of the loaded images.
- Click **Loop** to display the loaded images in a cycle. Click again to cancel.
- Click **Pause** to pause the image display.
- Click **Stop** to stop the image display.

7.1.2.3 Using Images

Delete Image: To delete the images which are not suitable for analysis.

Recalculate Image: After the middle images with motion artifacts are deleted, new normal images will be created automatically in their place based on the nearby image.

Manual Register: To open the **Manual Register** dialog box for setting the register image, pan, rotate, flag and other operations.

7.1.3 TDC

After pre-processing the images, click the **TDC** icon on the workflow bar to enter the Select Reference Vessel interface.
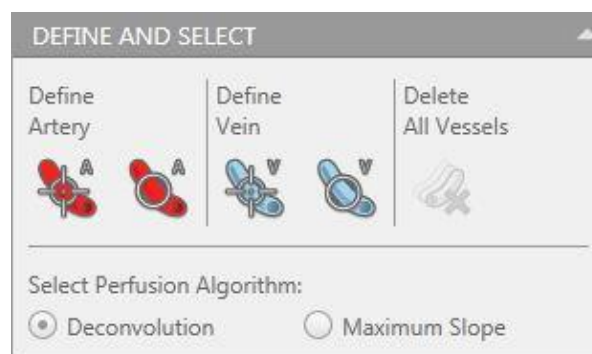
Figure 7-3 TDC Tool

Define Artery:

To define the vessel ROI, click the **Define Vessel by Point** or **Define Vessel by ROI** icon. Then drag the mouse into the Reference Image Area to find an artery vessel Point/ROI. Release the mouse. The ROI will be shown on both the Reference image and the tMIP image in the Image area. The associated curve will also be shown in the TDC Graphics Area. It allows defining up to 10 arteries.

Define Vein:

To define the vessel ROI, click the **Define Vessel by Point** or **Define Vessel by ROI** icon. Then drag the mouse into the Functional Image Area to find a vein vessel Point/ROI. Release the mouse. The ROI will be shown on both the Reference image and the tMIP image in the Image Area. The associated curve will also be shown in the TDC Graphics Area. You can only define 1 vein.

Algorithm: Used to define the calculate algorithm: Deconvolution or Maximum Slope.

7.1.4 Map

After finding an ideal vessel ROI, click the **Map** icon for further calculation. The tMIP image will be shown in the Reference Image Area. The Function Image Area by default displays all four kinds of post-processing images simultaneously.

7.1.4.1 Function Image Area

The Function image area is in the upper right corner of the Perfusion Interface. Before the perfusion calculation, it is used to display tMIP image (time Maximum Intensity Projection); after the perfusion calculation, it is used to display image showing the perfusion processing.

4 kinds of post-processing images can be created:

- **Cerebral Blood Flow**
- **Cerebral Blood Volume**
- **Mean Transit Time**
- **Time to Peak**
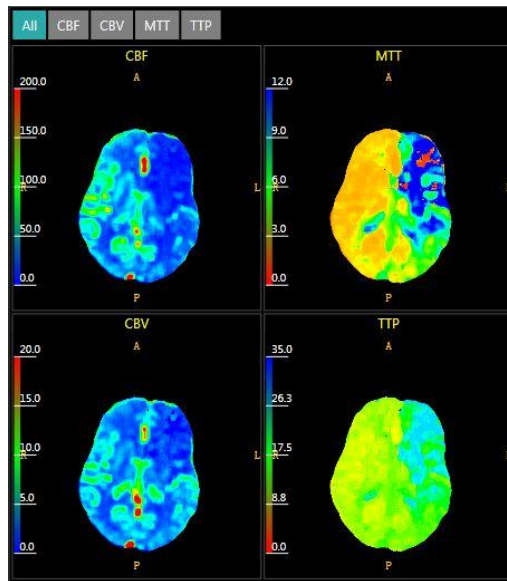
Figure 7-4 Post-processing Images

By manually switching between the options above the functional image area, one of the 4 images can be displayed. Or select **All** to display all 4 of the images simultaneously in this area.

7.1.4.2 TDC Graphics Area

The TDC Graphics area is in the lower left corner of the perfusion interface. It is used to display the TDC (Time Density Curve) graphics of the Tissue ROIs.
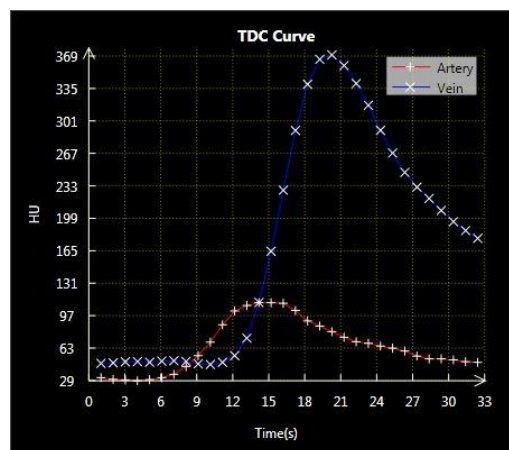
Figure 7-5 TDC Graphics

7.1.4.3 Table Report Area

The Table Report area is in the lower right corner of the perfusion interface. It is used to display the AV (Average Value) of all the Tissue ROI perfusion parameters.

Figure 7-6 Table Report

- CBF: Cerebral Blood Flow.

- CBV: Cerebral Blood Volume. The volume of blood in a defined portion of the brain at any given time. CBV=CBF*MTT.

- MTT: Mean Transit Time. Can be oversimplified to be considered the time it takes blood to flow from a major cerebral artery feeding a given region of the brain to the major cerebral vein draining that region.

- TTP: Time to Peak. The time that elapses between the start of an IV contrast injection and the maximum attenuation of the contrast enhanced blood as it passes through a defined region of the brain

7.1.4.4 Display Mode
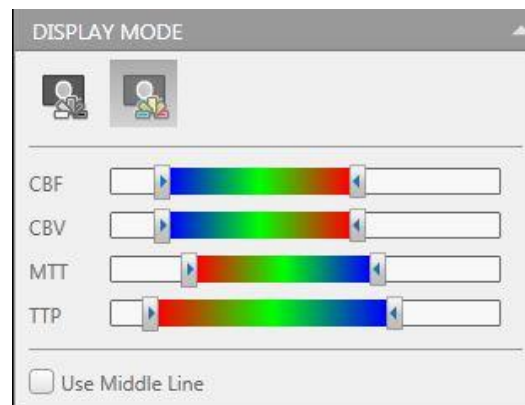
Figure 7-7 Display Mode

The function image display could be set as a pseudo Color Map or Gray Map by clicking the icon below display mode.

Drag the slide on the scrollbar to adjust the window of the display value.

Use Middle Line: Show/Hide middle line on the images. It also can be used for mirror ROI.

7.1.4.5 Define and Measure

Figure 7-8 ROI Tool

Define Tissue ROI:

After the calculation, click the **Define Tissue ROI by Ellipse** or **Define Tissue ROI by Polygon** icon. Then define the tissue ROI on the image in the Image Area. At most 10 ROIs can be defined at one time.

If **Use Middle Line** is selected, click one of the two icons to find the tissue ROI. In this condition, at most 5 tissue ROIs can be defined. At the same time their counterparts will be shown on the other side of the line.

Note:
- After calculation, the data of these ROIs will display in the report table of the Table Report Area.

Delete All ROIs: Cancel all defined tissue ROIs.

Measure Map Pixel Value: Measure the pixel value on the image.

7.2 Body Perfusion

Body Perfusion is a blood flow imaging application that analyzes the uptake of contrast bolus, in order to determine functional blood flow. This includes information concerning a specific Region of Interest [ROI]. The ROI is scanned in the same position and at the same time intervals, as per the expected rate of change.

7.2.1 Body Perfusion Interface

In the home page, select the desired images from the patient list and choose the **Body** application.

After loading the images, the system requires you to select the protocol:

- Liver Protocol.
- Tumor Protocol (Not in Liver).

7.2.2 Liver Protocol

7.2.2.1 Pre-processing

Refer to **Chapter 7.1.2** for more information about this operation.

7.2.2.2 TDC

After pre-processing the images, click the TDC icon to enter the Select Reference Vessel interface.

Figure 7-9 TDC Tool

Define Liver Artery: Click the Define Vessel by Point or Define Vessel by ROI icon to define liver artery.

Define Portal Vein: Click the Define Vessel by Point or Define Vessel by ROI icon to define portal vein.

Define Spleen Region: Click the Define Vessel by Point or Spleen Region to define Spleen Region.

Select ROI: Set the ROI to be calculated. If not, the system will calculate all the images.

7.2.2.3 Map

After selecting the ideal vessel ROIs, click the **Map** icon for further calculation.

Before the calculation, click the **Define Tissue ROI by Ellipse** or **Define Tissue ROI by Polygon** icon. Then define the tissue ROI on the image in the Image Area. The data from those ROIs will be shown in the table report area.

The report table is used to display the average value of all the liver perfusion parameters.

In the Function image area, you can display the general perfusion Maps viewport in 7 different forms. Click on a tab at the top of the viewport to select:

Figure 7-10 Map

- All: (default) click to display all 6 perfusion maps in the area.

- HAP: display the Hepatic Artery Perfusion map.

- HPP: display the Hepatic Portal Perfusion map.

- HAI: display the Hepatic Artery Perfusion Index map.

- HPI: display the Hepatic Portal Perfusion Index map.

- TLP: display the Total Liver Perfusion map.

- TTP: display the Time to Peak map.

7.2.3 Tumor Protocol

7.2.3.1 Preprocess

Refer to **Chapter 7.1.2** for more information about this operation.

7.2.3.2 TDC

After pre-processing the images, click **TDC** icon to enter the Select Reference Vessel interface.
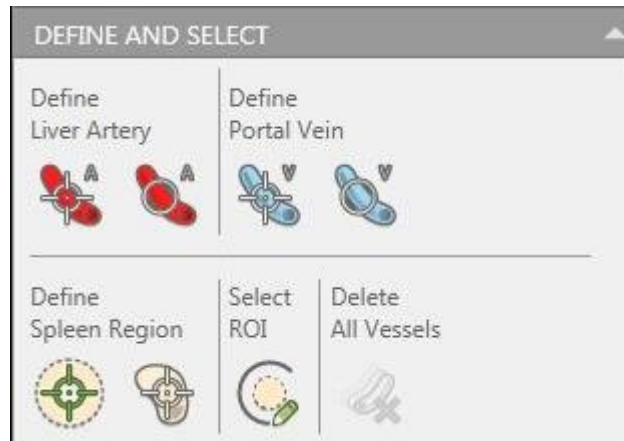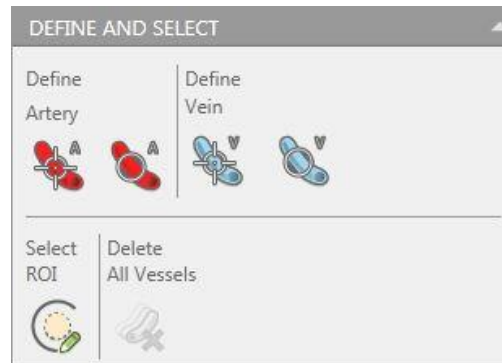
Figure 7-11 TDC Tool

Define Liver Artery: Click the Define Vessel by Point or Define Vessel by ROI icon to define liver artery.

Define Portal Vein: Click the Define Vessel by Point or Define Vessel by ROI icon to define portal vein.

Select ROI: To set the ROI to be calculated. If not, the system will calculate all the images.

7.2.3.3 Map

After selecting the ideal vessel ROIs, click the **Map** icon for further calculation.

Before the calculation, click the **Define Tissue ROI by Ellipse** or **Define Tissue ROI by Polygon** icon. Then define the tissue ROI on the image in the Image Area. The data for those ROIs will be shown in the table report area. The report table is used to display the average value of all the liver perfusion parameters.
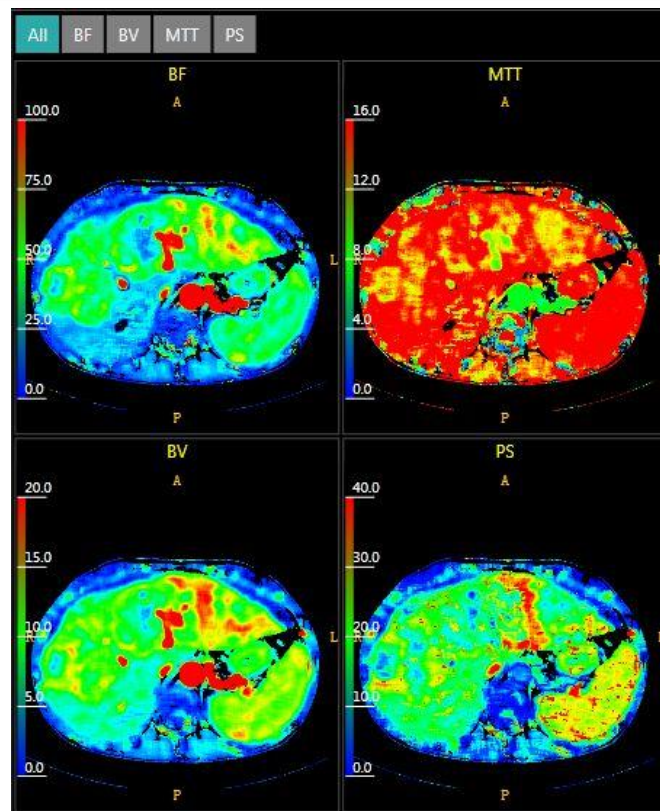
Figure 7-12 Map

In the Function image area, you can display the general perfusion Maps viewport in 5 different forms. Click on a tab at the top of the viewport to select:
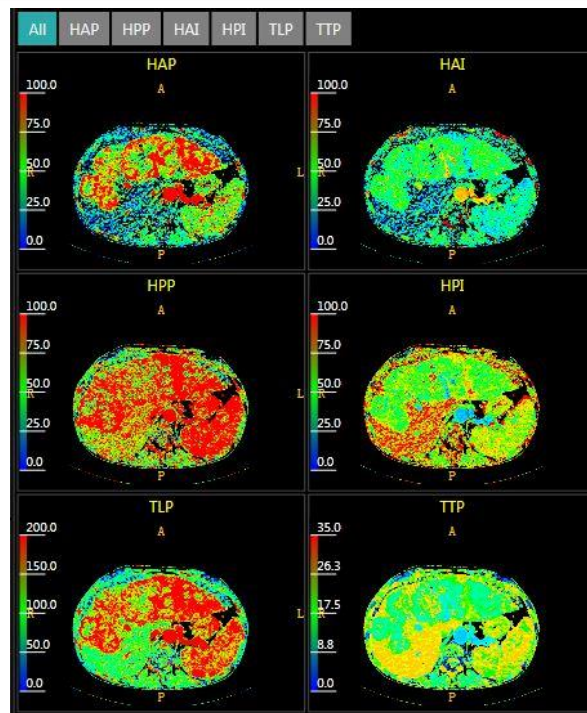
- All: (default) click to display all 4 perfusion maps in the area.
- BV: display the Blood Volume map.
- BF: display the Blood Flow map.
- MTT: display the Mean Transit Time map.
- PS: display the Permeability Surface map.

7.2.4 Calculation

7.2.4.1 Liver Protocol

The peak time of the Spleen enhancement, which is also mentioned as time to peak, is set as the assumed demarcation point of the hepatic artery phase and portal vein phase.

HAP is calculated by the liver TDC before this time point; the HPP is calculated after this time point.

HAP=the maximum gradient of liver TDC before the time point/Peak time of hepatic artery enhancement

HPP=the maximum gradient of liver TDC after the time point/Peak time of portal vein enhancement

HAI=HAP/(HAP+PVP)

HPI=PVP/(HAP+PVP)

7.2.4.2 Tumor Protocol

BF= The maximum gradient of TDC/Maximum Input artery enhancement

BV= The maximum enhancement/Maximum Input artery enhancement

$$\frac{c(t)}{b(t)} = PS \cdot \frac{\int_0^t b(t)\,dt}{b(t)} + BV$$

Where: C(t) represents the TDC of the tumor and b(t) represents the TDC of the artery.PS and BV are calculated through least squares.

Chapter 8. CTDSA

8.1 Overview

CT Digital Subtraction Angiography (CTDSA) offers a fast bone removal tool which subtracts the bone mask from every contrast phase of the dataset. This technique is well adapted to those neuro cases in which patient motion does not introduce bone deformation.

Only these images can be analyzed by the CTDSA:

- From the same patient
- From the same study
- With same thickness and increment
- With same center X and center Y
- With same FOV
- With same couch height
- With same Tube Voltage
- With same Filter

Note:

- **The total image number must be less than 3200.**
- **The duplicate position images shall be more than 30.**

8.2 CTDSA Interface

In the home page, select the desired images from the patient list and choose the **CTDSA** application.
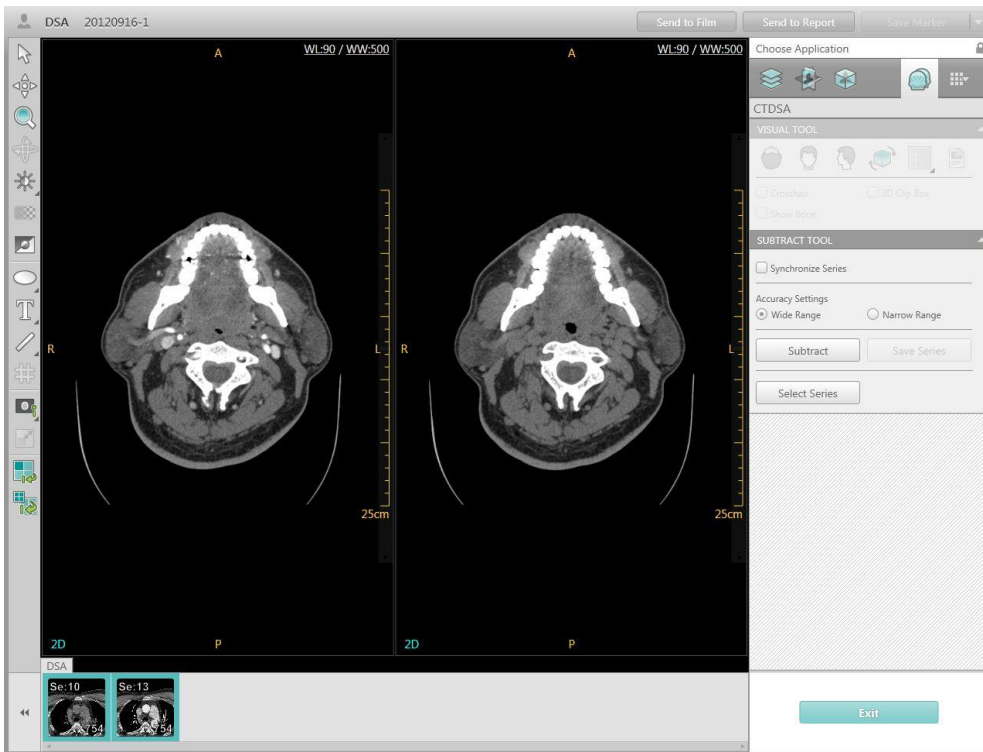
Figure 8-1 DSA Interface

The **CTDSA** Tool includes **Visual Tool** and **Subtract Tool.**

8.3 Image Display Region
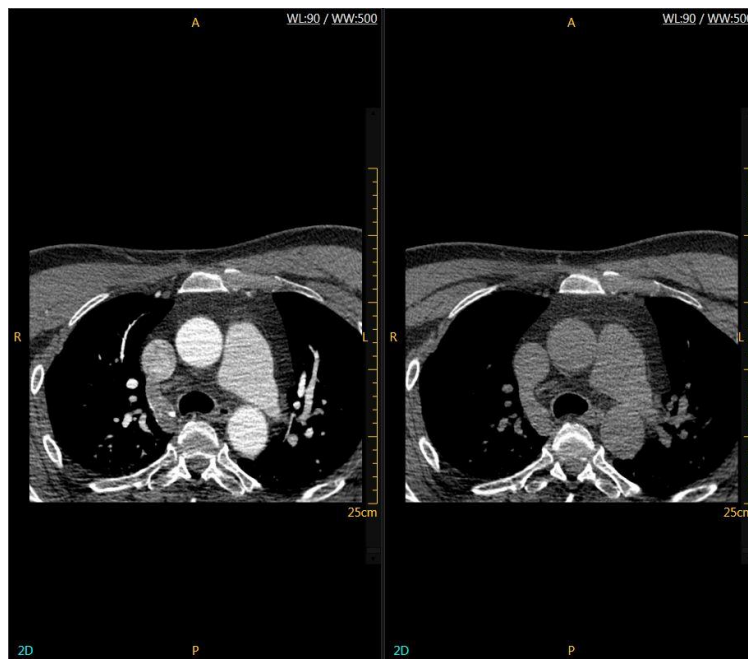
Figure 8-2 Image Display Region

8.4 Tool panel

After subtraction buttons on the Tool panel can be used to highlight.

8.4.1 Visual Tool
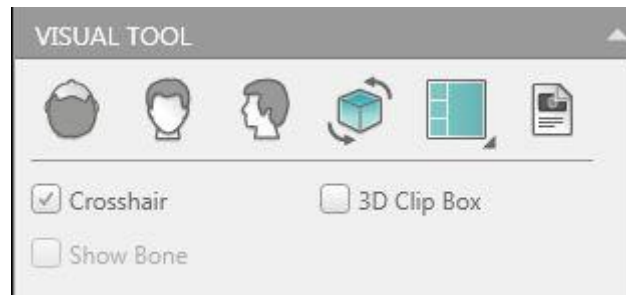
Figure 8-3 Visual Tool

Crosshair: Show/Hide the crosshair on the image.
3D Clip Box: Show/Hide the clip box on the 3D image.
Show Bone: Show/Hide the bone on the image.
Axial: Display the volume image in the axial direction.
Coronal: Display the volume image in the coronal direction.
Sagittal: Display the volume image in the sagittal direction.
Flip VR image: Flip the volume image.
Protocol: Show/Hide the protocol list.
There are three page layouts for review:
1*2: Displays the contrast series and non-contrast series images.
3+1: Displays the three sectional MPR images and subtraction result image.
2*2: Displays the contrast series and non-contrast series images on the left; displays the subtraction result series and subtracted bone series image on the right.

8.4.2 Subtract Tool
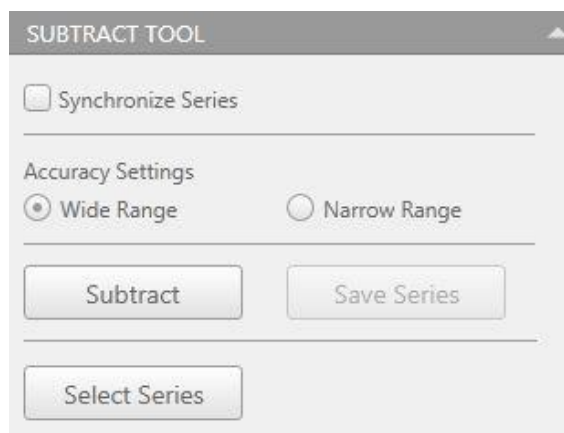
Figure 8-4 Subtract Tool

Synchronize Series: Synchronize series automatically.

Choose the subtraction accuracy setting: **Narrow Range** or **Wide Range**, then click **Subtract** to process the series. The system will automatically display the subtraction images in the result viewport and generate the subtracted bone series in the series list.
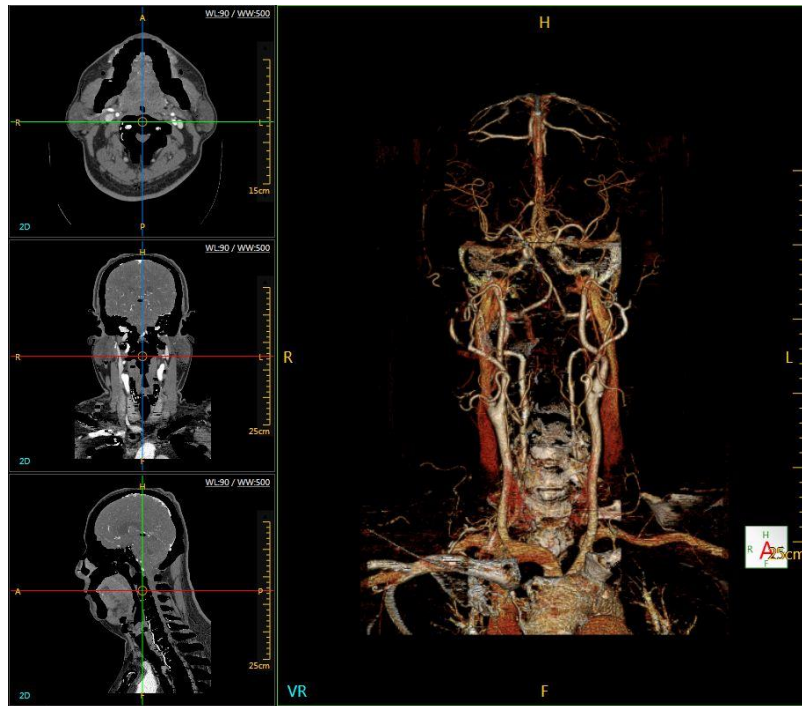
Figure 8-5 Subtraction Result

Save Series: Save subtraction results.

Select Series: Select a series for subtraction.

8.5 Manual Edit
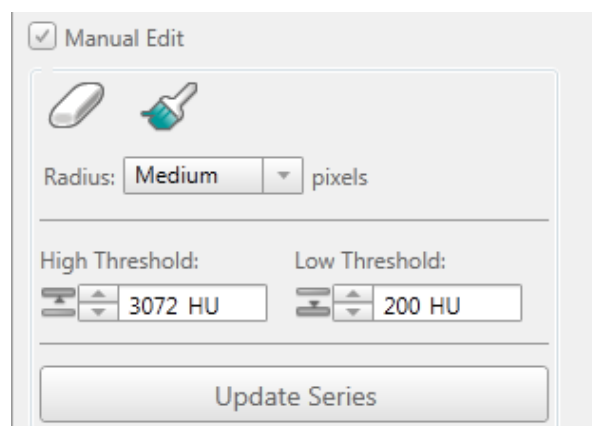
Figure 8-6 Manual Edit

Choose CTA series, you can edit results and then click **Update Series** button.

Chapter 9.   Tumor Assessment

9.1 Overview

Tumor application can define and view lesions through original series and follow-up series, two studies can be compared. This can determine growth of a tumor.

9.2 Tumor Interface

In the home page, select the desired images from the patient list and choose the **Tumor** application.
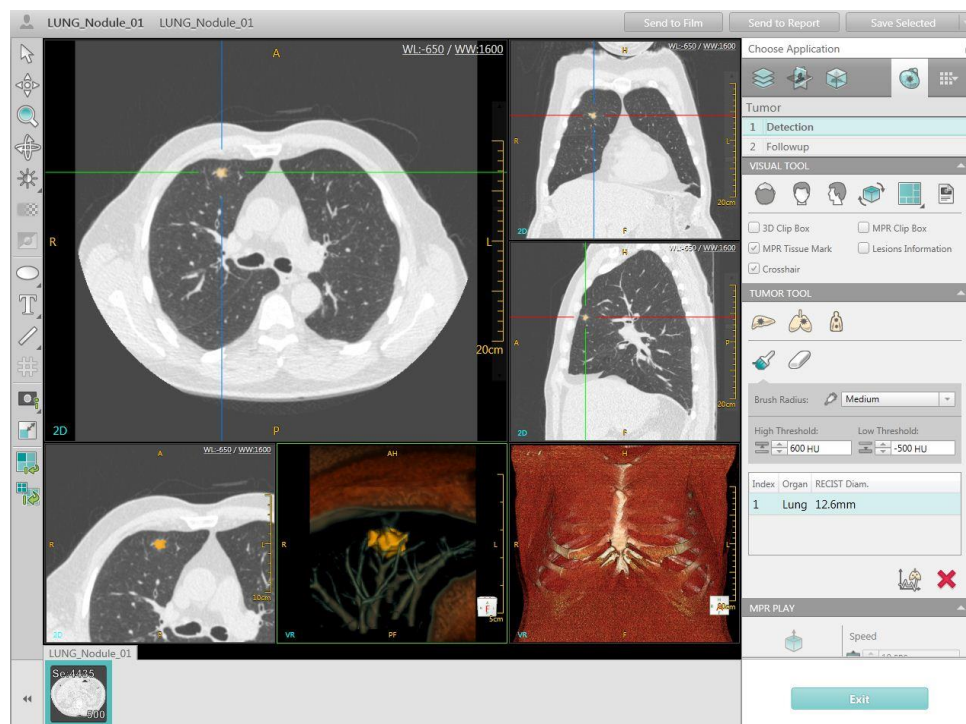
Figure 9-1 Tumor Interface

9.3 Assessment Toolbox

At the top of the control panel is the assessment toolbox, which provides access to a set of guided workflow steps.

The order of steps in the analysis toolbox is:

● **Detection**

● **Follow-up**

Click on the toolbox to select from the list of workflow steps, or to move forward or back one step.

Only a series of images meeting the following parameters can be analyzed by Tumor Analysis:

• From the same patient

• With the same thickness and FOV

• Image Thickness less than 5mm

Note:

• It is only possible to load 4 series at one time into the Tumor Analysis tool.

9.4 Detection

The Detection Tool includes: **Visual Tool, Tumor Tool** and **MPR Play**.

9.4.1 Visual Tool
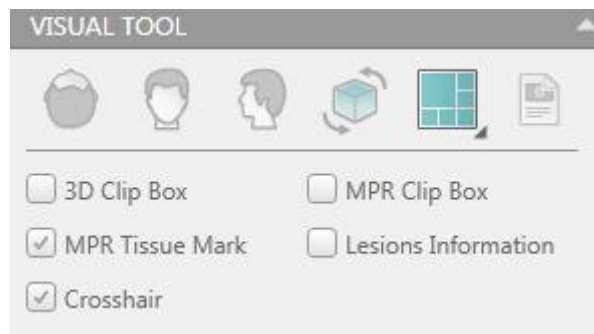
Figure 9-2 Visual Tool

There are two page layouts for review:

2*2: Displays three sectional MPR images and a VR image.

1+2+3: Displays an Axial image on the top left; Displays lesion MPR and VR image on the bottom left; Displays Coronal, Sagittal and VR image on the right.

MPR Tissue Mark: Show/Hide the tissue mark on MPR image.

Lesions Information: Select this box to display the lesion information list, including Organ, RECIST Diam., Max.Vertical Diam., WHO Area, Volume, Avg and Max.Z Diam.

Refer to **Chapter 3.4.1** Visual Tool for more information regarding the tools on this panel.

9.4.2 Tumor Tool
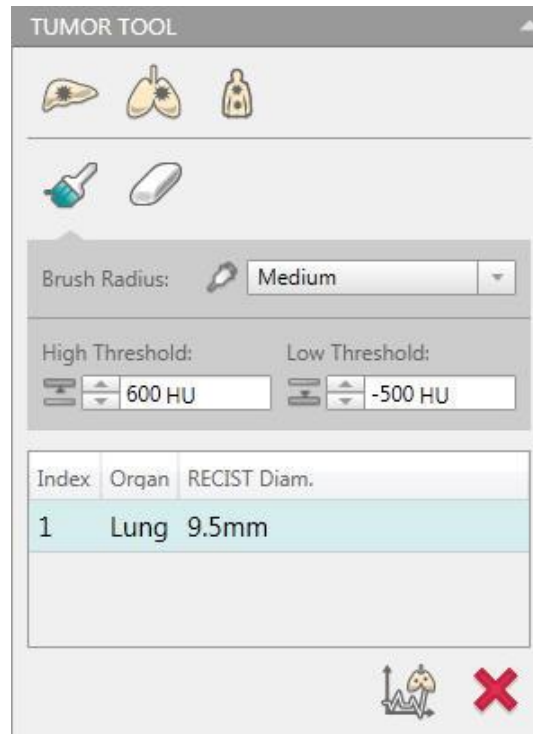
Figure 9-3 Tumor Tool

Select the **Liver**, **Lung** or **Body** icon to extract a lesion, the system will automatically segment and highlight the lesion.

Enter the value of **High Threshold** and **Low Threshold** to get a more accurate result if necessary. Or click the arrow next to the text box to increase/decrease the number.

The lesion list will be updated after you mark the lesion.

Brush: Click the icon to brush the lesion area.

Eraser: Click the icon to erase the lesion area that is dyed.

Simultaneously the lesion information is calculated and added into the lesion information list.

Del. Lesion: Delete the lesion in the list.
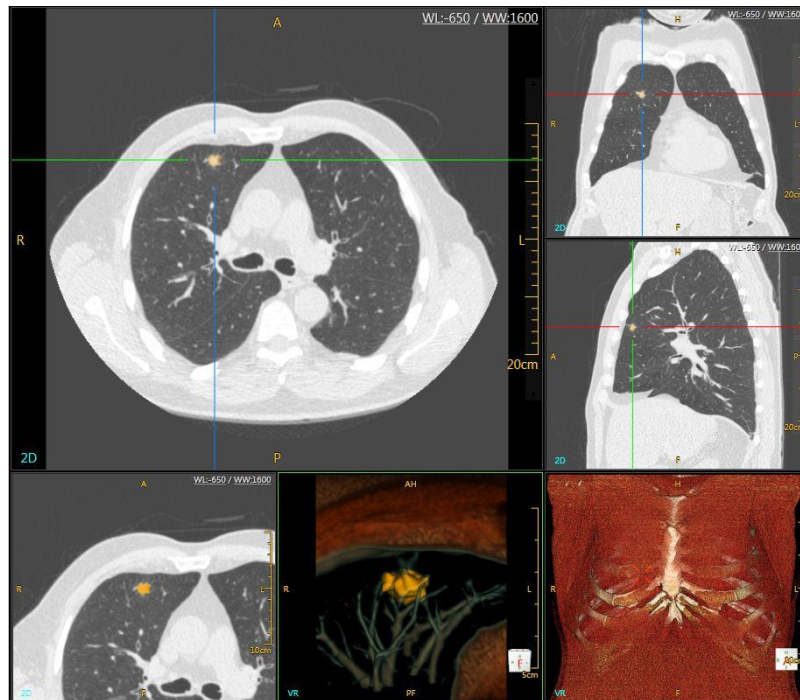
Figure 9-4 Define a Lesion

9.4.3 MPR Play
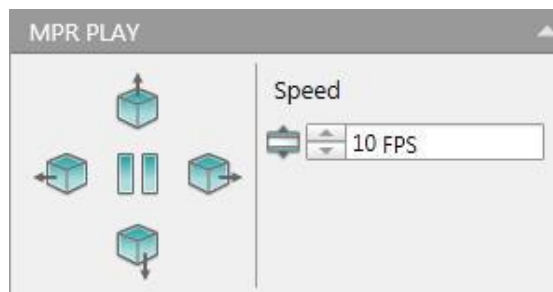
Figure 9-5 MPR Play Tool

Rotate Left, **Rotate Up**, **Rotate Right**, **and Rotate Down**: Select the direction icon to play the MPR images. Select the arrow next to the **Speed** text box to increase/decrease the play speed.

9.5 Follow-up

Click **Follow-up** to enter the interface. It is necessary to select two series for analysis.

After selecting the follow-up series, the system will automatically calculate the follow-up study and compare it with original study.
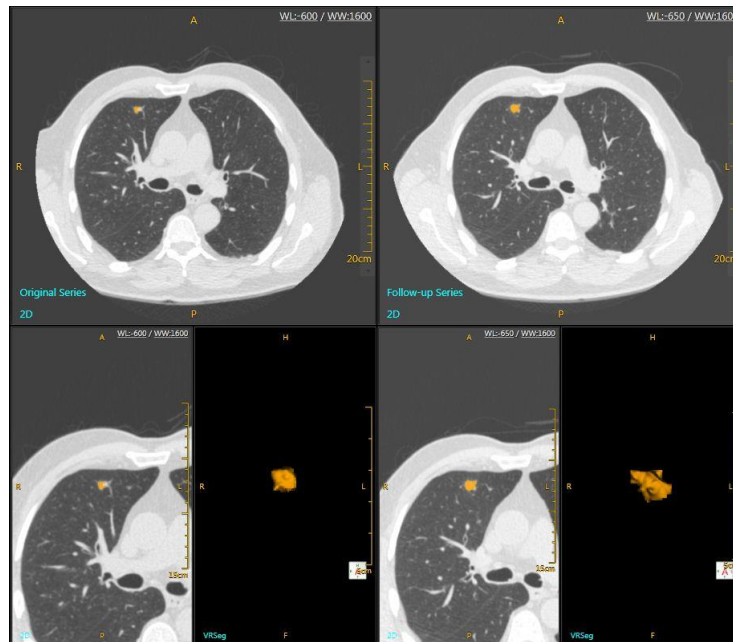
Figure 9-6 Follow-up Interface

9.5.1 Visual Tool
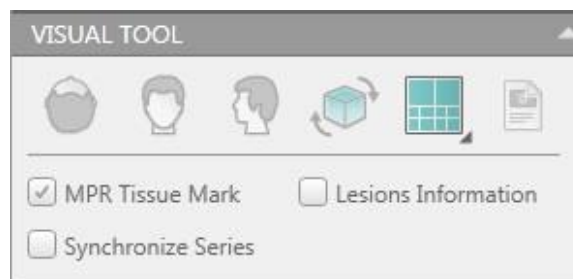
Figure 9-7 Visual Tool

There are two page layouts for review:

2*2: Displays the Axial images and Lesion VR image of the Original Series and Follow-up Series.

2+4: Displays the Original series on the left. The layout is Axial image on the top and Lesion MPR and VR image on the bottom. Displays the follow up series on the right. The layout is Axial image on the top and Lesion MPR and VR image on the bottom.

Synchronize Series: View the Original series and Follow-up series synchronously.

9.5.2 Tumor Tool

Display the lesion information list of the original series and the

follow-up series.

Compare Lesion: To show the Compare Result under the list.

Figure 9-8 Tumor Tool

Del Comparison: Delete the compare result.

9.5.3 MPR Play

Refer to **Chapter 9.4.3** MPR Play for more information regarding the tools on this panel.

9.6 Right-Click Menu

Right click on the images to show the Right-Click menu. Refer to **Chapter 1.6.3** Window Menu for more Right-click menu information.

Chapter 10. Colon

10.1 Overview

Colon Application provides various diagnostic information for the colon. Such as the size and position of colonic polyps.

10.2 Colon Interface

In the home page, select the desired images (consist of two series at most) from the patient list and choose the **Colon** application.
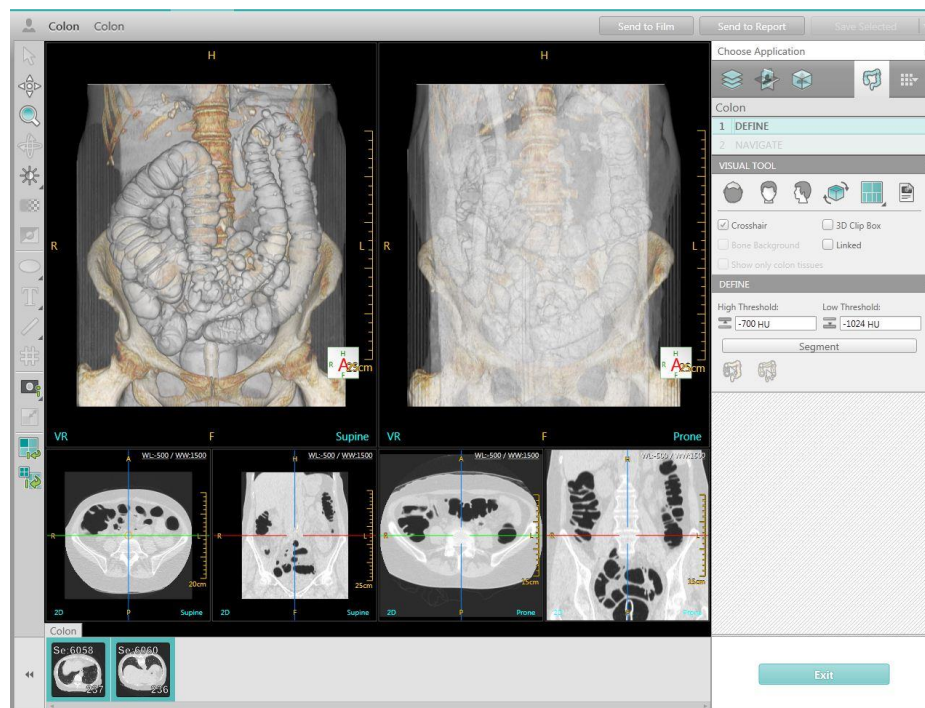
Figure 10-1 Colon Interface

The Colon application includes two steps of workflow.
The order of steps in the workflow is:
- **Define**
- **Navigate**

10.3 Define

In the **Define** Stage, you can:
- Segment the colon.
- Edit the colon.
- Edit the centerline.

The Define Tool includes **Visual Tool** and **Define**.

10.3.1 Visual Tool
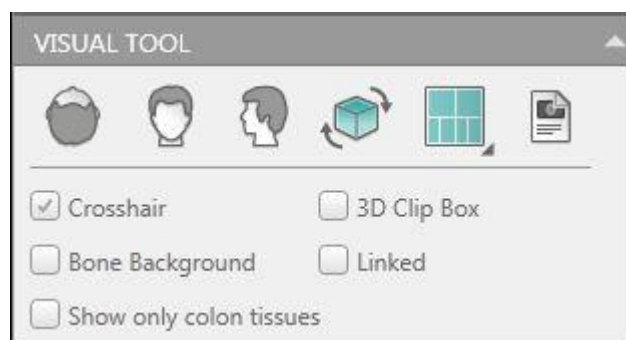
Figure 10-2 Visual Tool

Crosshair: Show/hide the crosshair on MPR image.
3D Clip Box: Show/hide the clip box on 3D image.
Bone Background: Show/hide the bone background on the image.
Linked: The two series will navigate synchronously.
Show only colon tissues： Show/hide the rejected tissues.

10.3.2 Define
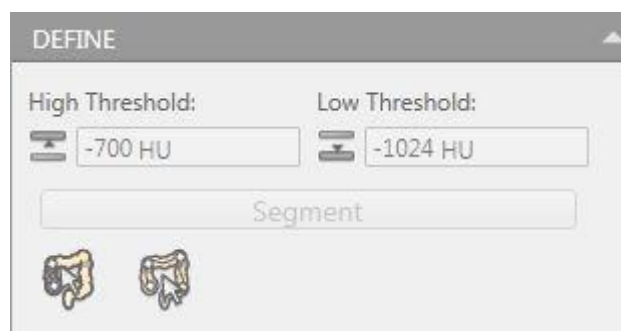
Figure 10-3 Define Tool

After loading the desired study, click **Segment** to segment the air-filled colon. You will **Accept** or **Reject** the suggested colon components. The invalid component will be set as grey. You can hide/show the invalid colon component.

After accepting the segment：

- Select **Edit Centerline** to edit the centerline.

- Select **Delete Centerline** to delete the centerline.
- Select **Delete the Centerline before the Point** to delete the centerline before the point.
- Select **Delete the Centerline after the Point** to delete the centerline after the point;
- Select **Switch End Points** to switch the end points of the centerline.

Figure 10-4 Edit Centerline

When you finish the define process, click **Finish** to enter next stage.

10.4 Navigate

Click **Navigate** to enter the interface after you have confirmed the colon. The Navigate stage provides a variety of visualization functions.

- A scroll bar in the middle of the viewport allows you to quickly visualize the entire colon along the center line.

- The navigation tools allow you to fly through the colon in cine fashion, continuously or step by step.

10.4.1 Navigate Tool
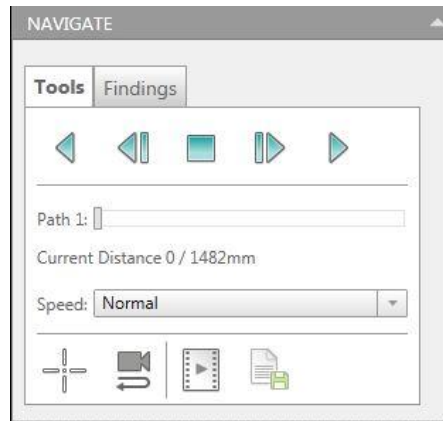
Figure 10-5 Navigate Tool

Series Selection: allows you to view two scans of the same patient, **Prone** and **Supine**.

Colon Page Layout: Right-click or click the arrow on the bottom right corner of the icon to select different page layouts for viewing the colon images:

- **Unfold**: Layout displays the overview VR image, cross sectional image and the end view on the top of the viewport, the unfold view is on the bottom of the viewport.
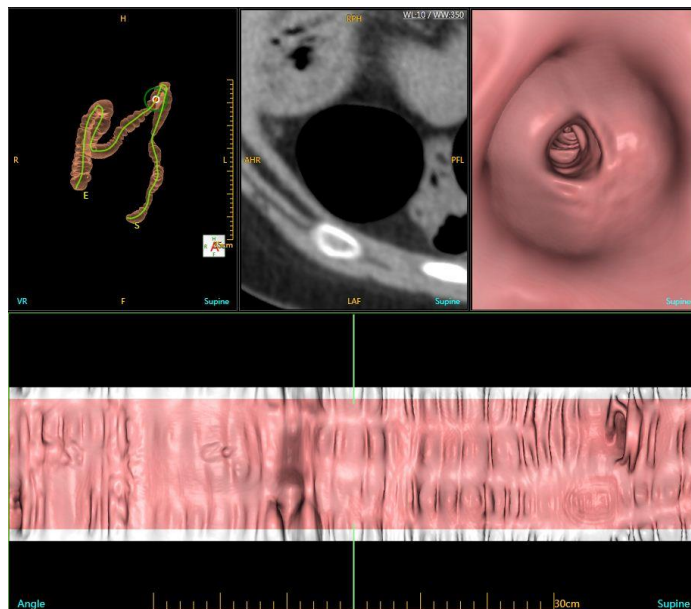
Figure 10-6 Unfold

- **Unfold + VE**: Is a **2*2** layout to display the unfold view and end view on the top of the viewport, the overview VR image and cross sectional image on the bottom of the viewport.
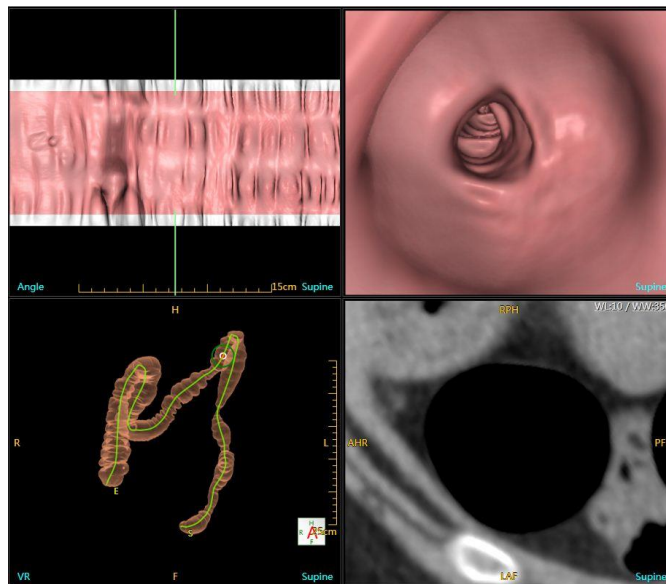
Figure 10-7 Unfold + VE

Standard: Layout displays the overview VR image and end view on the top of the viewport, the cross sectional MPR images on the bottom of the viewport.
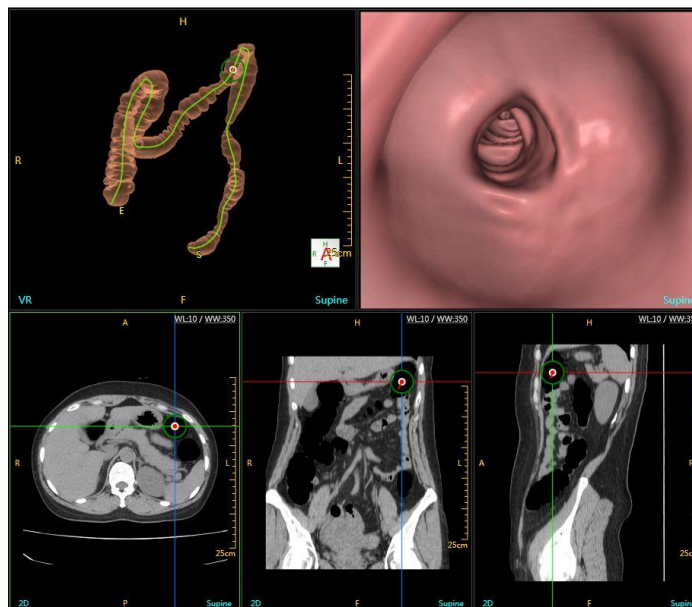
Figure 10-8 Standard

If you select **Compare** to perform a comparison analysis between the two series, there are two page layouts for viewing.

- **Compare VE + VR**: **2*2** layout displays the supine series on the left of the viewport with end view and overview VR image; the prone series on the right of the viewport with end view and overview VR image.
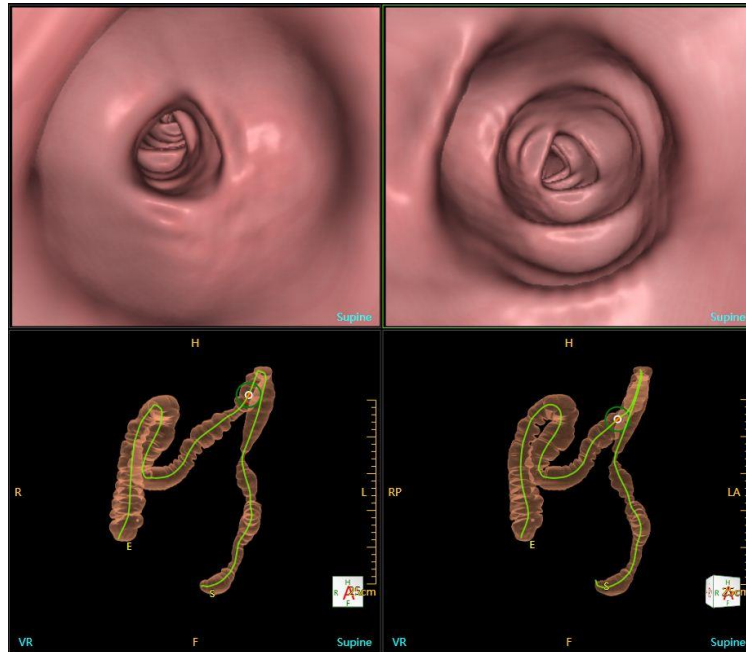
Figure 10-9 Compare VE+VR

- **Compare Double Unfold**: **2+4** layout displays the supine series on the top of the viewport with unfold view, overview VR image and cross sectional image; the prone series on the bottom of the viewport with unfold view, overview VR image and cross sectional image.
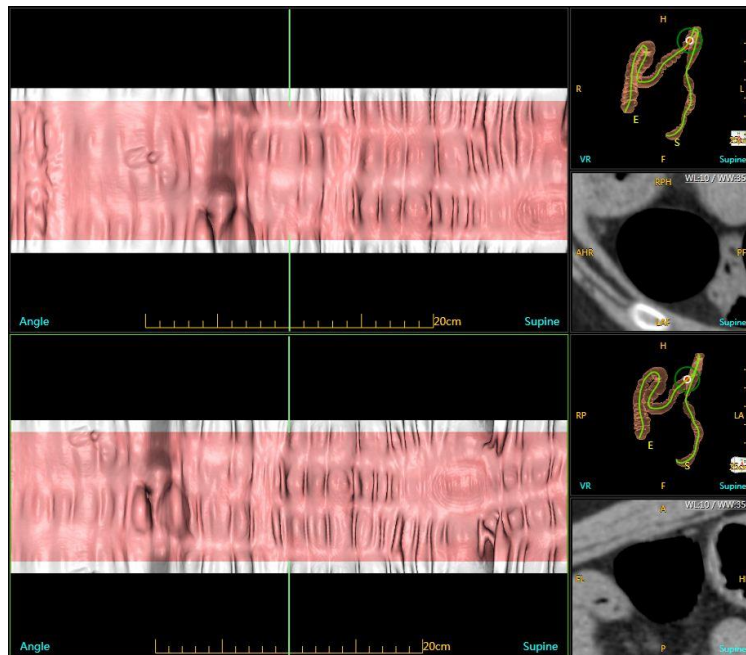
Figure 10-10 Compare Double Unfold

10.4.2 Polyp Tools

Finding: Marks the polyp in the end view. It is displayed on the unfold view and added into the polyp list. The maximum diameter of the polyp, the distance between the polyp and the start/end point, the description and the demo picture are also displayed on the polyp list.

Figure 10-11 Polyp

Click the description to view and modify the polyp detail information.
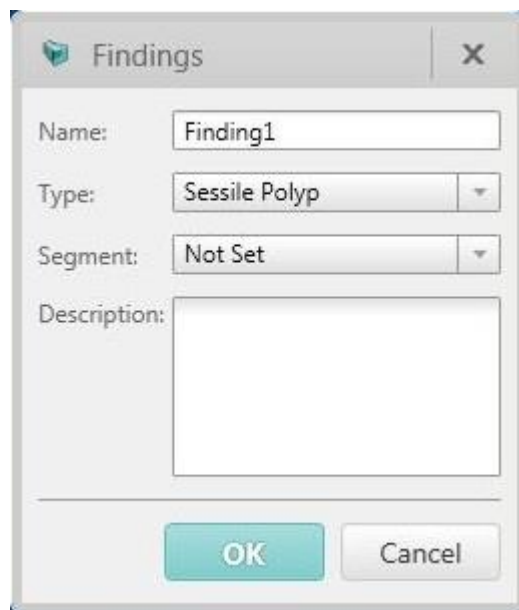
Figure 10-12 Polyp description

Findings Management: To manage all findings by a finding list. Users can accept, reject and delete the selected findings.

Chapter 11. Lung Nodule Assessment

11.1 Overview

Lung Nodule application can define and view lesions using the original series and follow-up series. Two studies can be compared to determine growth of nodules.

11.2 Lung Nodule Interface

The Lung Nodule Assessment assists the radiologist with the detection and quantification of pulmonary nodules and lesions. If a follow-up study of the patient has been acquired, the two studies can be compared. The growth of nodules can be tracked over time.

In the home page, select the desired images from the patient list and choose the **Lung Nodules** application.

Figure 11-1 Lung Nodules Interface

11.3 Assessment Toolbox

At the top of the control panel is the assessment toolbox, which provides access to a set of guided workflow steps.

The order of steps in the analysis toolbox is:

- **Detection**

- **Follow-up**

Click on the toolbox to select from the list of workflow steps, or to move forward or back one step.

11.4 Detection

The Detection Tool includes the **Visual Tool, Lung Nodule Tool** and **MPR Play**.

11.4.1 Visual Tool
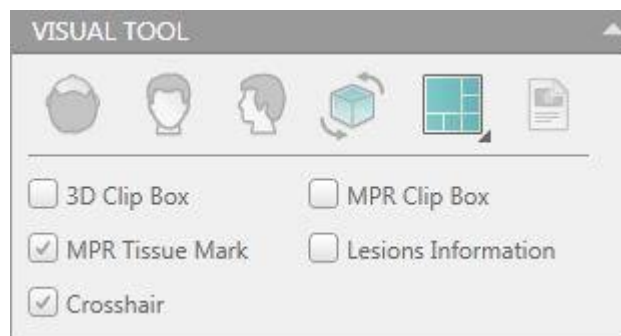
Figure 11-2 Visual Tool

There are two page layouts for review:

2*2: Displays three sectional MPR images and the VR image.

1+2+3: Displays the Axial image on the top of left; the lesion MPR and VR image on the bottom left; and the Coronal, Sagittal and VR image on the right.

MPR Tissue Mark: Show/Hide the tissue mark on MPR image.

Lesions Information: Select this box to display the lesion information list, including Volume, Avg, Max. Z Diam., Location, Shape, Border and Comments. You can click the drop-down arrow to select the desired explanation for Location, Shape and Border.

Refer to **Chapter 3.4.1** Visual Tool for more information regarding the tools on this panel.

11.4.2 Lung Nodule Tool
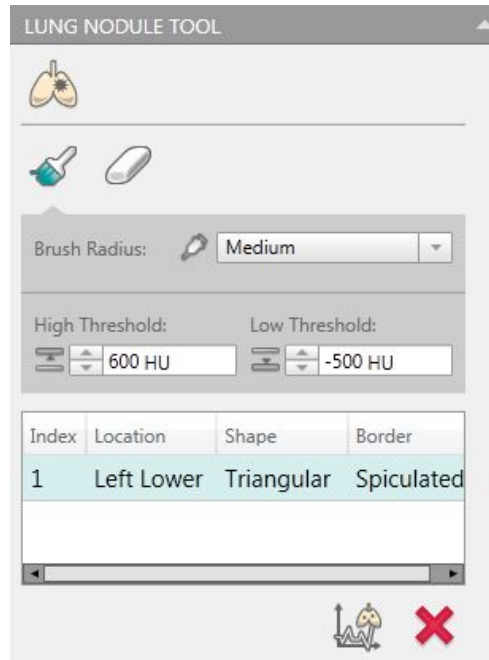
Figure 11-3 Lung Nodule Tool

Click **Select Lesion** icon to extract a lesion. The system will automatically segment and highlight the lesion.

Enter the value of **High Threshold** and **Low Threshold** to get a more accurate result if necessary. Or click the arrow next to the text box to increase/decrease the number.

The lesion list will be updated after you mark the lesion.

Brush: Click the icon to brush the lesion area.

Eraser: Click the icon to erase the lesion area that is dyed.

Simultaneously the lesion information is calculated and added into the lesion information list.

Del. Lesion: Delete the lesion in the list.

Figure 11-4 Define a Lesion

11.4.3 MPR Play
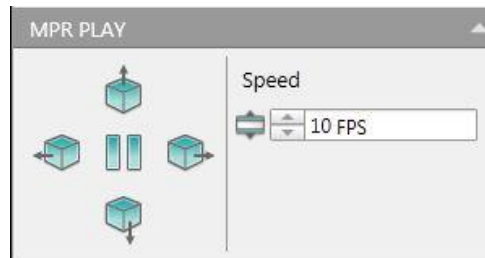
Figure 11-5 MPR Play Tool

Left, **Up**, **Right and Down**: Select the desired direction icon to play the MPR images. Click the arrow next to the **Speed** text box to increase/decrease the play speed.

11.5 Follow-up

Click **Follow-up** to enter the interface. Select a second series for analysis.

After selecting the follow-up series, the system will automatically calculate the follow-up study and compare it with original study.

11.5.1 Visual Tool

Figure 11-6 Visual Tool

There are two page layouts for review:

2*2: Displays the Axial images and Lesion VR image of the Original Series and Follow-up Series.

2+4: Displays the Original series on the left, with the Axial image on the top and the Lesion MPR and VR image on the bottom. Displays the Follow-up series on the right, with the Axial image on the top and the Lesion MPR and VR image on the bottom.

Synchronize Series: View the Original series and Follow-up series synchronously.

Lesions Information: Select this box to display the lesion information list, including Volume, Avg, Max.Z Diam., Volume Double Time, Location, Shape, Border and Comments.

11.5.2 Lung Nodule Tool
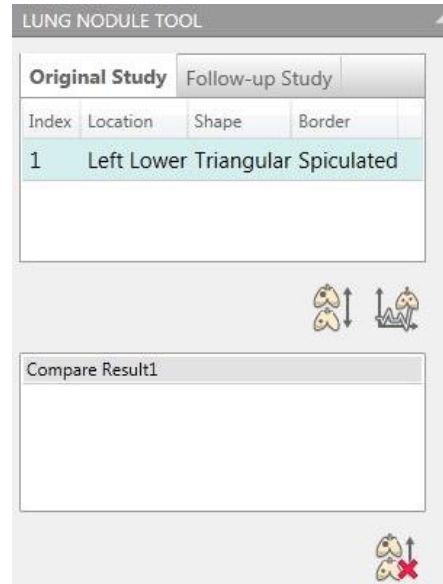
Figure 11-7 Lung Nodule Tool

The Lung Nodule Tools interface displays the lesion information list of the original series and t h e f ollow up series.

Compare Lesion: To display the Compare Result under the list.

Del. Comparison: Delete the Compare Result.

11.5.3 MPR Play

Refer to **Chapter 11.4.3** MPR play for more information.

11.6 Right-Click Menu

Right click on the images to show the Right-Click menu. Refer to **Chapter 1.6.3** Window Menu for more Right-click menu information.

Chapter 12. Lung Density

12.1 Overview

The Lung Density application is an automated application that provides the physician with quantitative (Volumetric) lung emphysema measurement and a visual representation of the diffusion of the emphysema.

12.2 Lung Density Interface

In the home page, select the desired images from the patient list and choose the **Lung Density** application.
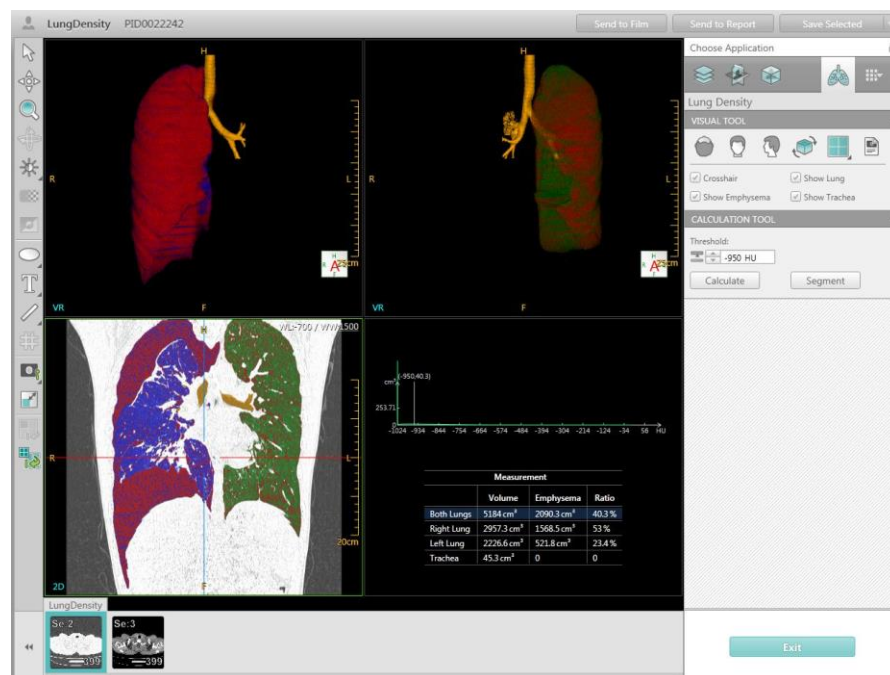
Figure 12-1 Lung Density Interface

Note:
- Only compare the lung scan with the same respiratory state.

12.3 Visual Tool

Figure 12-2 Visual Tool

Axial: Display the volume image in the Axial direction.

Coronal: Display the volume image in the Coronal direction.

Sagittal: Display the volume image in the Sagittal direction.

Flip VR Image: Flip the volume image.

There are two page layouts for review:

2*2: Display the left Lung and right Lung VR image on the top of the viewport. Display the Coronal Lung MPR image, the measurement result histogram and the table on the bottom of the viewport.

2+3: Display the Coronal Lung MPR image and measurement result histogram and table on the top of the viewport. Display the Coronal Lung MPR image, left Lung and right Lung VR image on the bottom of the viewport.

Crosshair: Show/Hide the cross line on MPR image.

Show Lung: Show/Hide the lung image.

Show Emphysema: Show/Hide the emphysema image.

Show Trachea: Show/Hide the trachea image.

12.4 Calculation Tool

Threshold: Set max threshold to calculate emphysema.

Figure 12-3 calculation Tool

Click the **Segment** button and the auto segmentation is performed on the left and right lungs and the trachea.
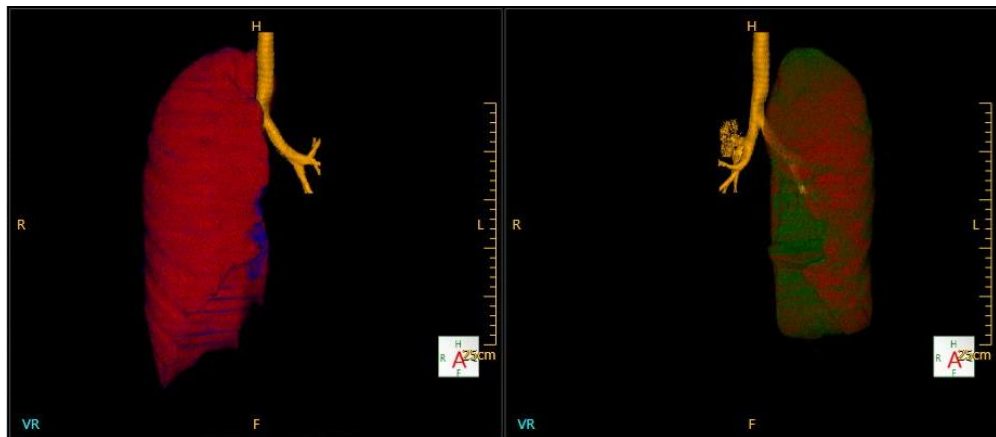
Figure 12-4 Segment Display

Simultaneously, the measurement result table displaying the volume and emphysema calculation result are displayed. Also a histogram displaying the CT number distribution of the lung volume are shown in the corresponding image area.

Select **Calculate** to calculate the results again after you make any changes.
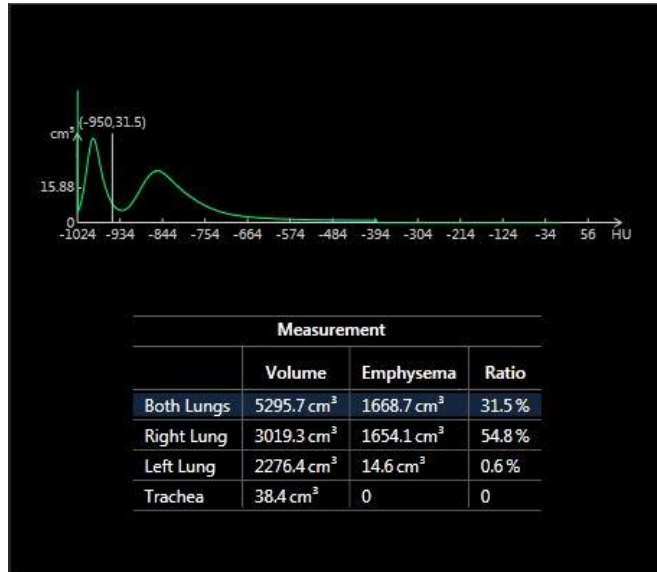
Figure 12-5 Measurement Result

Chapter 13. Film

13.1 Overview

The Film application is mainly used to receive images, view, management, set layout, print preview, print and so on.

13.2 Film Interface

In the home page, select the desired images from the patient list and choose the **Film** application. Or in **Review**, select the desired images and choose **Send to Film** button.
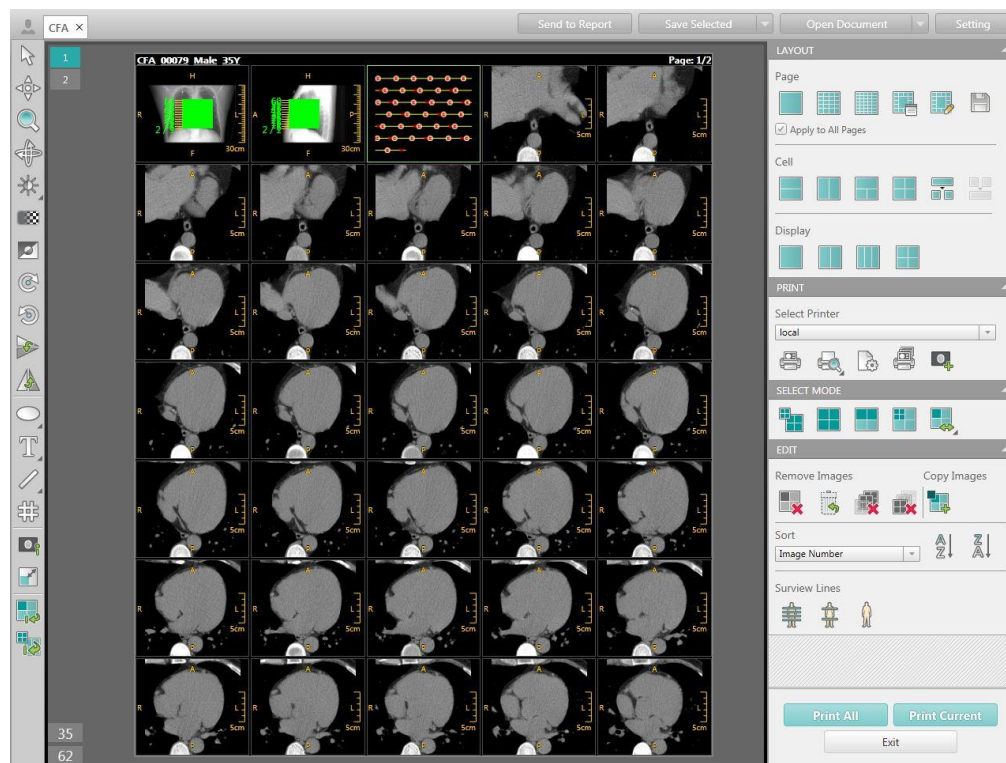
Figure 13-1 Film Interface

The **Film** interface includes: **Information Bar**, **Image Display Region**, and **Control Panel** which includes **Generic Tools**. It is used for viewing, rearranging, windowing and zooming images before printing them.

13.3 Information Bar

The information bar includes the patient information, film page number, the quantity of images on the current film, and the total quantity of images. Select any one of the page number icons to review the desired pages contents.

13.4 Control Panel

The control panel includes Layout, Print, Select Mode and Edit.
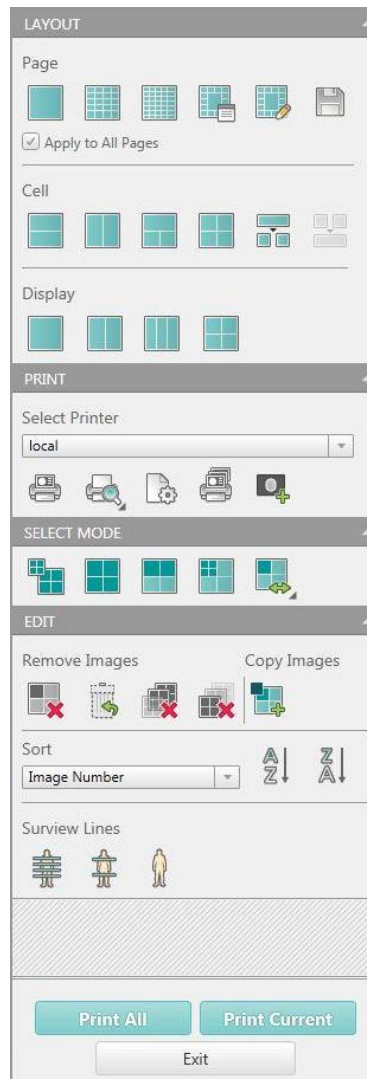
Figure 13-2 Control Panel

13.4.1 Layout

13.4.1.1 Page

STANDARD\1x1: To film in 1on1 format.

STANDARD\4x5: To film in 20 on 1 format.

STANDARD\5x7: To film in 35 on 1 format.

Other: Select from the 14 other standard layouts or a custom layout. Once you have selected the desired layout, the current film layout will automatically change accordingly. Select **Set as Default Layout** to set the selected layout as the default film layout. Or select **Delete** to delete the layout from the list.

Custom Split Page: Customize the number of rows and columns for the page layout. Click **Ok** to apply the page layout.

Save Page Layout: Save the layout you created into the custom layout list.

Apply to All Pages: If this box is checked the change will affect all the pages in the Film viewer. Or the changes are only applied to the current page.

13.4.1.2 Cell

Split Cell: Provides four standard formats to separate the images, to combine images into one film box or separate images from one film box.

Custom Split Cells: Separates the images from one sub window. Select the window and click **Custom Split Cells** on the control panel to customize the separate cell column and row numbers. Then the images in the window will be separated.

You can also select multiple cells to split simultaneously.

Combine Cell: Select desired images, and click **Combine Cell** on the control panel, the selected images will be combined into one sub window.

13.4.1.3 Display

Split Cell: Switch to view between single page layout and multiple pages layout.

1*1: Display one page film in the image display region.

1*2: Display two pages film in the image display region.

1*3: Display three pages film in the image display region.

2*2: Display four pages film in the image display region.

13.4.2 Print

Printer List: Switch a printer. The printer chosen will be the default one for later use.

Custom Print: Set the selected printer, printer scope, copies before print.

Print Preview: Preview the film to be printed.

Paper Print: Click the arrow on the right bottom corner of **Print Preview** icon or right-click this icon, select **Paper Print** to print images on paper.

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Page Setting: Set the film page size.

Print Queue: View and manage print queue and history.

Add Test Images: Choose the test image from the list and add it into the Film Viewer.

Print All: Print all of the films.

Print Selected: Print current film.

13.4.3 Select Mode

All: Select all images.

Page: Select all images on the same page.

Series: Select all images in the same series.

Cell: Select all images on the same page with the same cell format.

Reverse Selected: Cancel the current selection, and select all the other unselected images.

Cancel Selected: Click the arrow on the right bottom corner of the **Reverse Selected** icon or right-click this icon, select **Cancel Selected** to cancel the current selection.

13.4.4 Edit

13.4.4.1 Delete

Delete the Selected: Delete the selected images.

Restore Last Deleted: Restore the previous deleted images. The system can restore up to three steps back.

Delete Other Pages: Delete all the images on all the other pages.

Delete Current Page: Delete all the images on the current page.

13.4.4.2 Copy Selected

Copy Selected: Select images and click **Copy Selected**, the copied image will be displayed following the last image in the image display region.

13.4.4.3 Sort

Ascending: Sort the selected images in ascending order by Image Number, Series ID, Slice Location, Time, Name Study ID and Series Number.

Descending: Sort the selected images in descending order by Image Number, Series ID, Slice Location, Time, Name Study ID and Series Number.

13.4.4.4 Surview Lines

Show All Surview Lines: Show all the surview lines on the surview image.

Show First And Last Surview Lines: Show the first and last surview lines on the surview image.
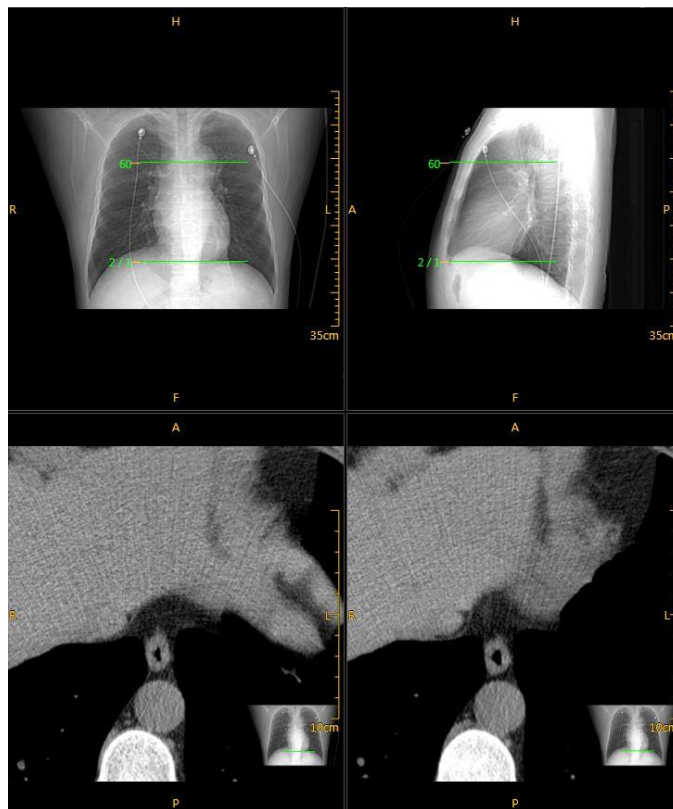
Figure 13-3 Show First and Last Surview Lines

Hide Surview Lines: Hide all the surview lines on the surview image.

Note:
- When the surview images are not loaded, this function is disabled.

13.4.5 Generic Tools

Open Document: Open the document list to select one document to continue working.

Save Document: Save all the images in their current state and page layout as a document.

Setting: Change filming setting, include printer setting, page setting and other setting.

Refer to **Chapter 1.7.3** Generic Tools for more information about the other generic tools.

13.5 Right-Click Menu
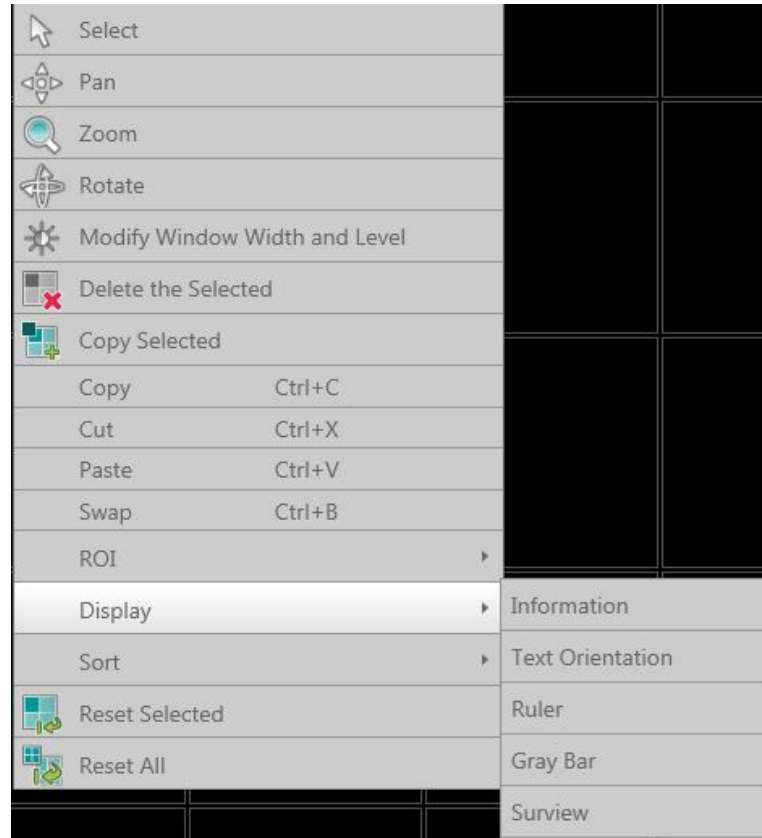
Figure 13-4 Right-Click Menu

Delete the Selected: Refer to **Chapter 13.4.4.1** Delete.

Copy Selected: Refer to **Chapter 13.4.4.2** Copy Selected.

Copy: Copy the selected images.

Cut: Cut the selected images.

Paste: Paste the copied or cut images to the specified position.

Swap: Swap the position of the cut images and the specified images.

Display: Show/Hide **Information**, **Text Orientation**, **Ruler**, **Gray Bar** and **Surview**.

Sort: Refer to **Chapter 13.4.4.3** Sort.

Reset Selected: Reset the current selection of images to its original state.

Reset All: Reset all the images to the original state.

For the other options on Right-Click menu, refer to **Chapter 1.6.3** Window Menu.

Chapter 14. Report

14.1 Overview

The Report application assist doctors in documenting patient's disease. Post processing Applications send Dicom images and data information to the report. The doctor can choose a report template or custom templates. The report can be sent to a printer.

14.2 Report Interface

The **Report** workflow includes: **Information Bar**, **Control Panel** and **Report Area**. It also provides a **Report Template Editor** to create or modify report templates.
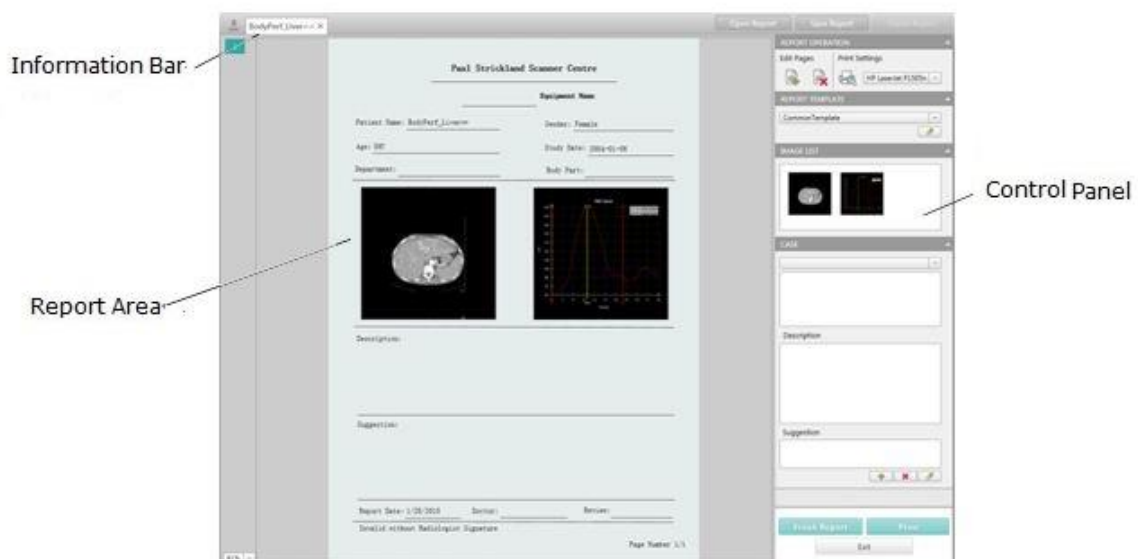
Figure 14-1 Report Interface

To load an image to the **Report** Interface, do one of the following:
- Select the image of interest in **Review**, and click the **Send to Report** icon on the generic tool panel.

- Click the **Images** tab on the Image Information List area in the **Home** interface. Select the image, and then click **Send to Report** in the right key menu or on the control panel.

Several reports for different patients can be loaded into the **Report** Interface. Multiple report tabs will be automatically generated for each patient. The patient name is displayed on the tabs in the left top corner.

14.3 Information Bar

The information bar displays the patient information, page information and zoom percentage.

Open Report: Open an existing report from the **Report** list.

Save Report: Save the current report to the **Report** list.

Export Report: Export the report to the local, USB or remote device. Only structured reporting supports saving to the local and remote destination. The saved structured reporting can be reloaded to the **Report** application.

14.4 Control Panel

Add Report Page: Add a new report page.

Delete Report Page: Delete the current report page.

Print Preview: Preview the report to be printed.

Printer List: Select a printer from the printer list.

Report Template: Select a report template from the **Report Template** List.

Report Template Edit: Edit a new report template.

Image List: Display the images loaded into the report interface. Double click the image to load it into the image display region of the report.

Note:
- To display images, select an image and drag it into the image area of the report.
- Press the **Delete** key on the keyboard or right click to select **Delete** to remove the selected images from image list.

Case: Select a case template in the **Case** list.

Add: Add the case information into current report page.

Cover: Replace the case information in the current report page.

Set: Add a new, modify or delete case template in the **Case Manage** Interface.

Finish Report: After modifying the report, click this icon to finish the report process and save the report.

Print: Print the current report.

14.5 Case Template

This section introduces steps to create, modify, or delete a case template. This includes steps and remove the template from the **Case Tem- plate** list on the control panel.

To create a case template:
1. Click the **Set** button. The **Case Manage** dialog box opens.

2. Click the **Case Edit** tab.

3. Select **Case** folder in the **Case Library** box, and right click it.

4. Click **Add** in the right key menu. Name and save the case parts.

5. Right click the folder and click **Add** from the right key menu to create a case template.

6. Enter the descriptions in the **Description** and **Suggestion** boxes, Click **Save**.

7. The new case template will display in the **All Case** box of the **Selected Case Template** tab. Click the **->** to add this case template to the **Selected Case Template** box, then use it in the **Case Template** list on the control panel. In the same way, click the **<-** to remove this case template from the Selected **Case Template** box, then it will not be seen in the **Case Template** list on the control panel.

To modify a case template:
1. Select a case template in the **Case Edit** list on the control panel.

2. Click the template in the **Case Edit** box.

3. Modify the description.

4. Click **Save** on the control panel to apply the modifications to the case template.

To delete a case template:
1. Click the **Set** button. The **Case Manage** dialog box opens.

2. Click the **Case Edit** tab.

3. Select a template in the **Case Library** box, and right click it.

4. Click **Delete** in the right key menu.

14.6 The General Workflow of Report

1. Send the desired images to the **Report** Interface.

2. Select **Report** on the workflow bar, then enter the **Report** interface. The loaded image is automatically displayed in the **Image list** box.

3. Select a report template in the **Report Template** list on the control panel. Some information is loaded automatically according to the template setting. Enter any other information if necessary.

4. Highlight the image display region, and double click on an image in the **Image list** box. Then the image will be displayed in the image display region.

5. Manually type in **Description** area and **Suggestion** area, or select a case template in the **Case Template** list on the control panel.

6. Save and finish report.

7. Select a printer to print the report.

Note:
- **Finish Report** will make the report read-only. **Save Report** will save an editable report.

- Ensure the correct paper size is in use before printing.

- The printed report will be a validated one by default, and will not be editable.

14.7 Report Template Editor

Report templates can be modified and saved according to the hospital's needs. Click the **Report Template Edit** button, then the **Report Template Edit** dialog box opens. Report template editor includes **Menu Bar**, **Designing Tools** and **Canvas**.
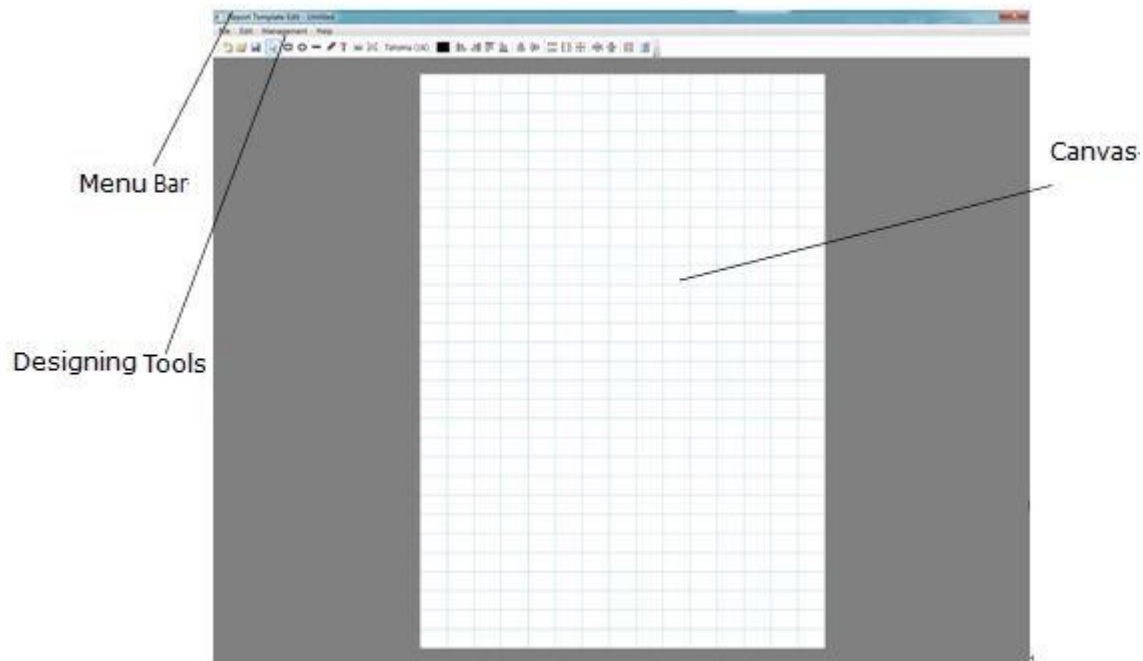
Figure 14-2 Report Template Editor

14.7.1 Menu Bar

The menu bar includes **File**, **Edit**, **Management** and **Help**.

14.7.1.1 File

Click **File** to open the list:

New: Setup a new template.

Open: Select a template and open it.

Save: Save the template.

Save As: Save the template as a new one.

Recent Files: Open the recent template list.

Exit: Exit the **Report Template Editor** interface.

14.7.1.2 Edit

Click **Edit** to open the list:

Select All: Select all the objects on the canvas.

Unselect All: Cancel the selection of all the objects on the canvas.

Delete: Delete the selection of the objects on the canvas.

Delete All: Delete all the objects on the canvas.

Move to Front: Move the selected object to the front layer.

Move to Back: Move the selected object to the back layer.

14.7.1.3 Management

Click **Management** to open the list:

Page: Open the **Page Set** dialog box to configure template size, width and height.

Content: Open the **Content Management** dialog box to configure the content of the report field and DICOM Tag.

Template: Open the **Template Management** dialog box to preview and configure the template.

14.7.1.4 Help

Click **Help** to open the list:

Restore factory setting: Restore back to the factory setting.

About: Show information of the **Report Template Designer**.

14.7.2 Designing Tools

Standard Toolbar: Refer to **Chapter 14.7.1.1** File and **Chapter 14.7.1.4** Help.

Draw Toolbar:
- **Pointer**: Select an object.
- **Rectangle**: Draw a rectangle.
- **Ellipse**: Draw an ellipse.
- **Line**: Draw a line.
- **Polyline**: Draw a polyline.
- **Text**: Draw an area for text input.
- **Image**: Draw an area for image input.
- **Table Area**: Draw an area for table input.
- **Font**: Set the font of the objects.
- **Color**: Set the color of the objects.

Layout Toolbar: Design layout for all of the textbox and images are displayed in the report template.

- **Left Align**: Align the selected objects to the left side.

- **Right Align**: Align the selected objects to right side.

- **Top Align**: Align the selected objects to the top.

- **Bottom Align**: Align the selected objects to the bottom.

Note:

- Alignment operations all the objects align by the upper/lower/right/left Limit of the selected area.

Horizontal Center: Place the selected object in the horizontal center of the canvas.

Vertical Center: Place the selected object in the vertical center of the canvas.

Same Width: Make the selected objects the same width as the last selected object.

Same Height: Make the selected objects the same height as the last selected object.

Same Size: Make the selected objects the same size as the last selected object.

Horizontal Spacing Equal: Make the selected objects the same horizontal spacing as the last two selected object.

Vertical Spacing Equal: Make the selected objects the same vertical spacing as the last two selected object.

Grid: Show/Hide the grid of the canvas.

NeuViz 16 Essence

User Manual (Vol. 2)

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