CHAPTER 4 - SUMMARY OF OPERATIONS

This chapter summarizes the sequence of operations that you will perform with AutoBone.

1. STARTING AUTOBONE

To start using AutoBone:

1.Select the series to be analyzed and then select Volume Viewer.

2.In the **Select a Protocol Category** panel, click on **(General)**, **(Abdomen),** or **(Lower Extremity)**.

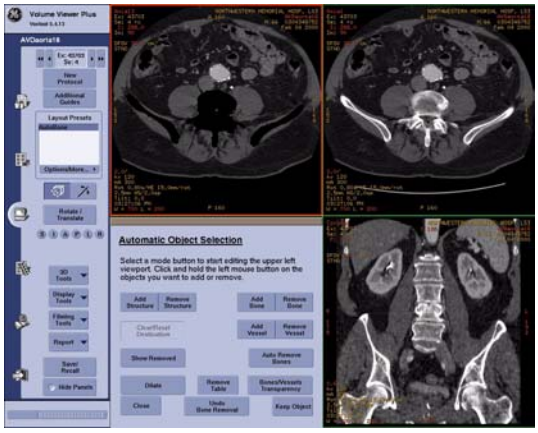
3.Select the **AutoBone** protocol.

CAUTION

AutoBone is to be used with CT images of the abdomen and/or lower extremity only.

2. REVIEWING IMAGES

Once the data set has completely loaded into the Volume Viewer as a MIP view, and the AutoBone process has achieved, it is important to review the data to make sure that the automatic segmentation is satisfying.



To review images:

1.Click on the red text **3D** in the upper left viewport, and select **Axial** in the drop down menu.

2.Use the Review Controller slider to scroll to the first image of the data set. Note that the Axial 2 view and the Axial views are synchronized to the same location.

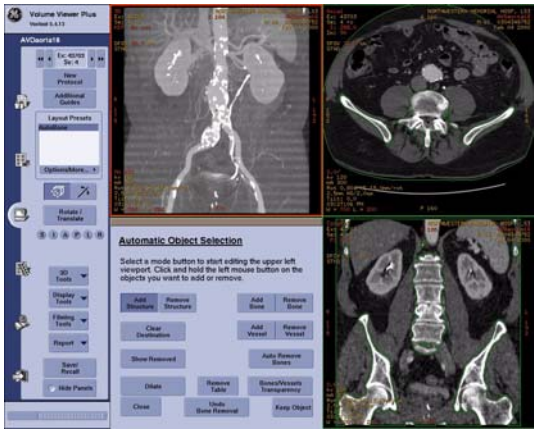
3.Scroll through the data set and view the images to validate that only voxels representing bone are masked (black), and that all the bony structure has been removed.

3. REFINING THE VOLUME

AutoBone include tools that may be used to refine segmentation by quickly adding or removing data. It is essential to review the resulting images to make sure that no critical vessel has been masked and that the images are acceptable for the purpose of the analysis.

3-1. Restoring Data to the Volume

If you find that AutoBone has inadvertently removed data other than bone, you can restore the data to the model.



To restore data to the model:

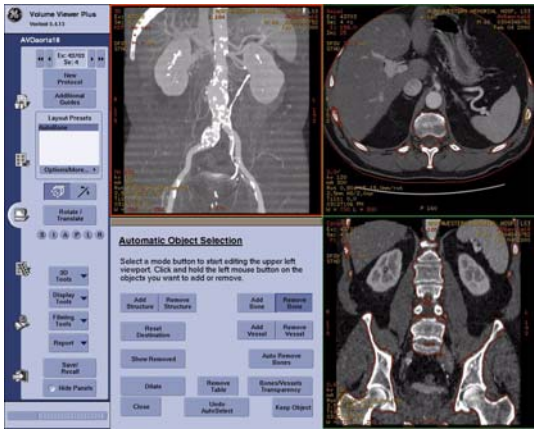
1.Locate the portion of anatomy that you want to restore. Note that moving your 3D cursor to the region of the vessel will automatically update all viewports.

2.Select **(Add Structure)** in the **Automatic Object Selection** panel. Then click and hold on the vessel until the vessel paints green in the planar viewports. Release the mouse when the vessel is sufficiently restored.

3.After reviewing the entire data set, click on the red text **Axial 2**, drag to **3D** and release. This will restore the MIP view.

3-2. Removing Bone from the Volume

If you find that the segmented volume still contains bony structure, you can remove it from the model.



To remove data from the model:

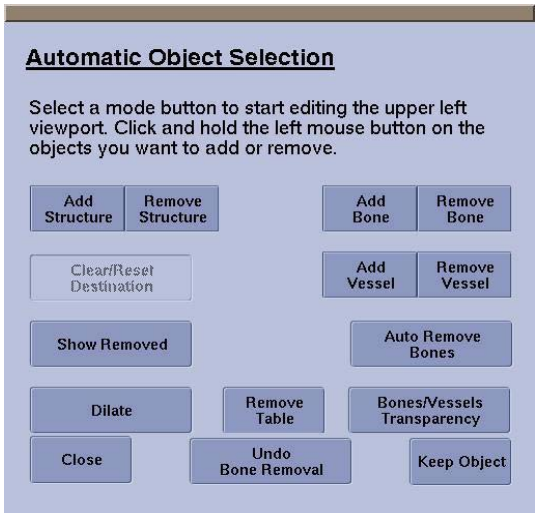
1.Locate the portion of anatomy that you want to remove. Note that moving your 3D cursor to the region of the vessel will automatically update all viewports.

2.Select **(Remove Bone)** in the **Automatic Object Selection** panel. Then click and hold on the bone until the bone disappears from the planar viewports. Release the mouse when the bone has completely disappeared.

3.After reviewing the entire data set, click on the red text **Axial 2**, drag to **3D** and release. This will restore the MIP view.

3-3. Using AutoBone options

The **Automatic Object Selection** panel allows you to modify the primary view (red border) by adding/ removing objects or bones.



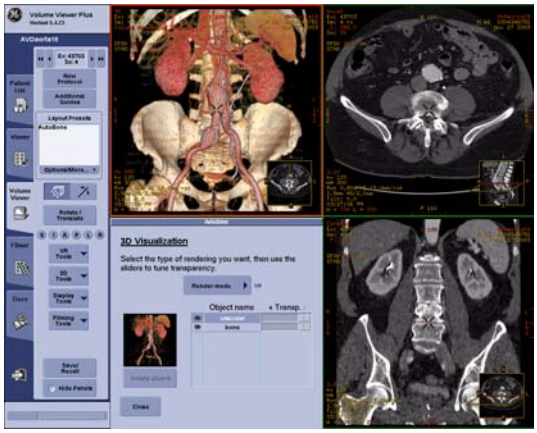
- The **(Add Structure)** button allows you to visualize an object. First, you are asked whether you want to clear the primary view. You may then select the object of interest by clicking on it on a secondary view. The object appears on the primary view. It is recommended to use the **(Add Structure)** button on 2D views only.
- The **(Remove Structure)** button obstructs the object defined by the current cursor position and keeps everything else on the primary view.
- The **(Add Bone)** button allows you to visualize a bone. First you are asked whether you want to clear the primary view. You may then select a bone by clicking on it on a secondary view. The bone appears on the primary view. It is recommended to use the **(Add Bone)** button on 2D views only.
- The **(Remove Bone)** button obstructs the bone defined by the current cursor position and keeps everything else on the primary view.
- The **(Reset Destination)** button allows you to delete the primary view.
- The **(Remove Table)** button removes the table.
- The **(Show Removed)** button allows you to display the removed parts. This then becomes the current view, and it is the earlier feature of interest that is removed from view.
- The **(Auto Remove Bones)** function automatically removes bones from the data set.
- The **(Dilate)** button allows you to add layers of voxels to the surface of the current object.
- Click on the **(Bones/Vessels Transparency)** button to display the volume in 3D render mode (MIP or VR) and to modify transparency.
- Click on the **(Close)** button to close the panel.
- The **(Undo Bone Removal)** button allows you to undo up to 8 processing steps. The name of this button changes to reflect your most recent action.

- The **(Keep Object)** button keeps the object defined by the current cursor position and deletes all other objects not physically connected to it via one or more voxels.

After refining data, it is suggested to follow the process described in Section 2 "Reviewing images" again to assure that all critical vessels remain in the model.

4. USING MULTI-OBJECT VIEWS

In visualization mode, AutoBone displays a VR model as a default view, but it also supports multi-objects MIP and Volume Rendering views. Using the Transparency slide bars, images can be manipulated to view vessels only, or transparent bone can be restored for landmark.



To apply transparency to the volume:

1.In the **Automatic Object Selection** panel, click on **Bones/Vessels Transparency**.

2.Select the **Render mode**.

3.Move the slide bars to adjust the opacity of bone or vessels in the model, zero being equal to no bone/vessels, 100 being equal to the original model.

4.Click **Cancel** to revert to the original MIP single-object view.

Note:

For complete information on manipulating and film/save of the MIP and VR models refer to the Volume Viewer Plus User Guide.

Just as in Volume Viewer Plus, you may use the **Save/Recall** function to manage 3D objects: During the segmentation, AutoBone automatically builds two separate models representing bone and vessels. They are respectively called *Bone* and *Vascular*, and are stored as an icon view in the **Save/Recall** panel.