Volume Edit

The Volume Edit module provides interactive segmentation tools for manual and semi-automated object definition of structures using an intuitive 3D interface. This exercise will provide an overview of how these tools can be used to interactively build an object map.

1. Select **MRI_3D_Head** from the Analyze Workspace, and open the Volume Edit module (**Segment > Volume Edit**).

2. Click the **Add Object** button to add a new object. Change the **Name** to **Skin** and **Color** to **Tan**.

3. Select the **Semi-Automatic** tab, and then select **Threshold**.

4. Adjust the threshold using the double-ended slider. Set the **Minimum Threshold** to **44** and the **Maximum Threshold** to **255**. Click the **Define Object** button.

5. The next step is to extract the brain. Select **Object Extractor**, and click the **Add Object** button, change the **Name** to **Brain** and **Color** to **Pink**. In the Transverse orientation, move to slice 135.

6. Click to set a seed point within the white matter (figure 2).

7. Adjust the **Minimum Threshold** to **48** and the **Maximum Threshold** to **141**. Click **Extract Object**.

tip To toggle through intensity display options, press Ctrl+F9 on your keyboard. Review the options and decide which is most useful to you.
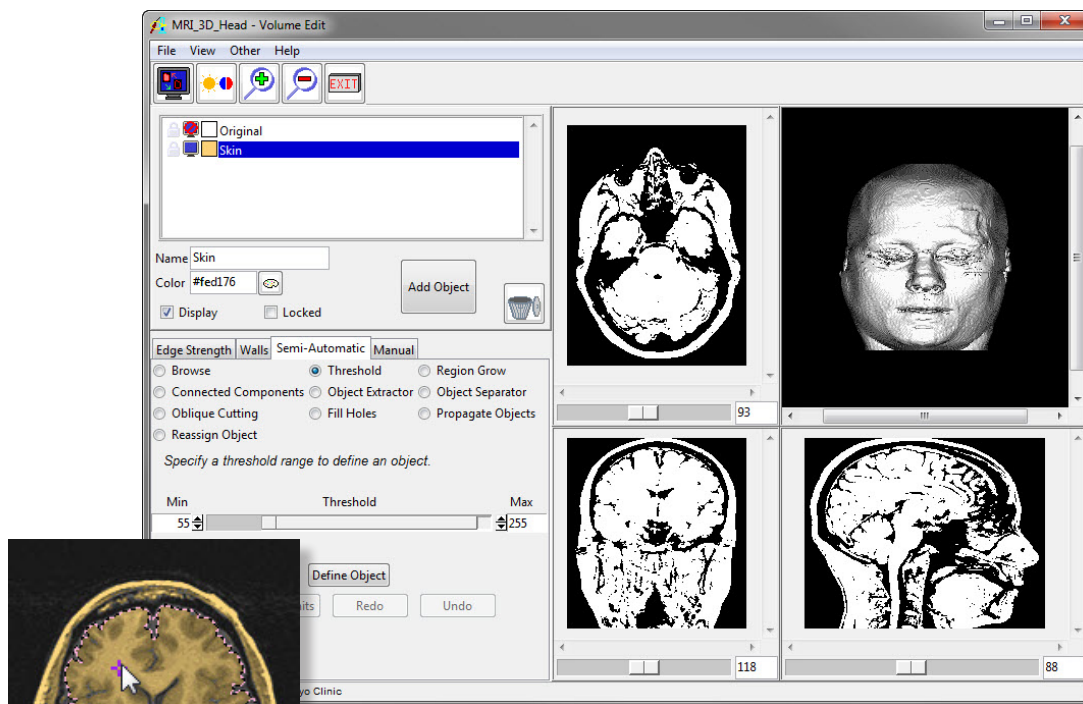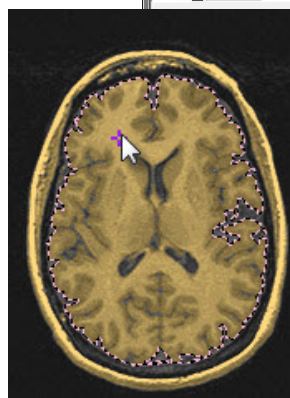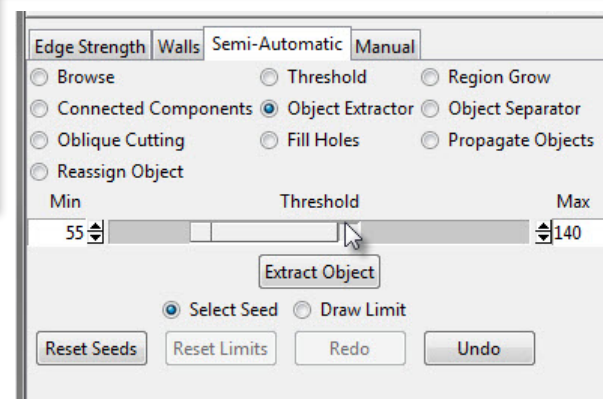

Figure 1

Figure 2

Figure 3

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Volume Edit

8. The brain will be extracted as the second object in the object map.

9. Once the brain object has been extracted, select the **Manual** tab.

10. To extract the ventricles, click the **Add Object** button. Change the **Name** to **Ventricles** and **Color** to **Green**. Select the **Auto Trace** tool.

11. Move to Transverse Slice **130** and set a seed point within the Ventricles.

12. Set the **Threshold Minimum** to **1** and the **Threshold Maximum** to **48** (figure 4). If there are unconnected regions that should belong to the same object, click to set additional seed points.

13. To automatically advance the seedpoints to the next slice, set **Auto Advance** to Forward, then click **Apply**.

14. Click the **Apply** button until the ventricles are defined. If needed, click the **Reset Seeds** button and click to place new seed points inside the ventricles (figure 5).

15. To review the segmentation on the rendering, right click on the render window and select **Transparency** (figure 6). To rotate the rendering, click and drag with the middle mouse button.

16. To save the created object map for use in other Analyze modules, choose **File > Save Object Map**. Close the Volume Edit module before proceeding to the next exercise.
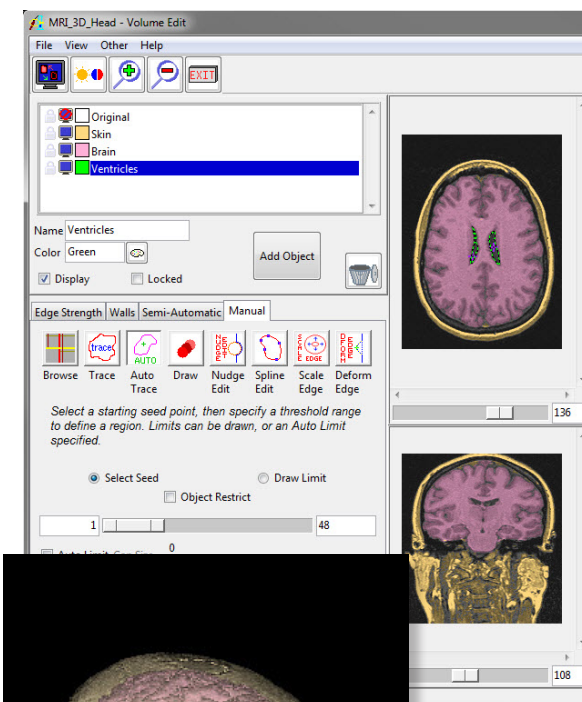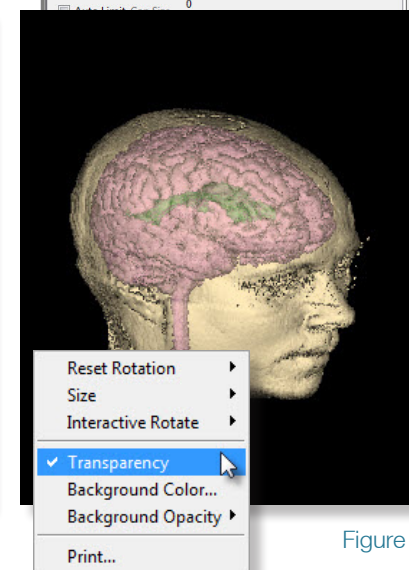

Figure 4

Figure 5

Figure 6

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