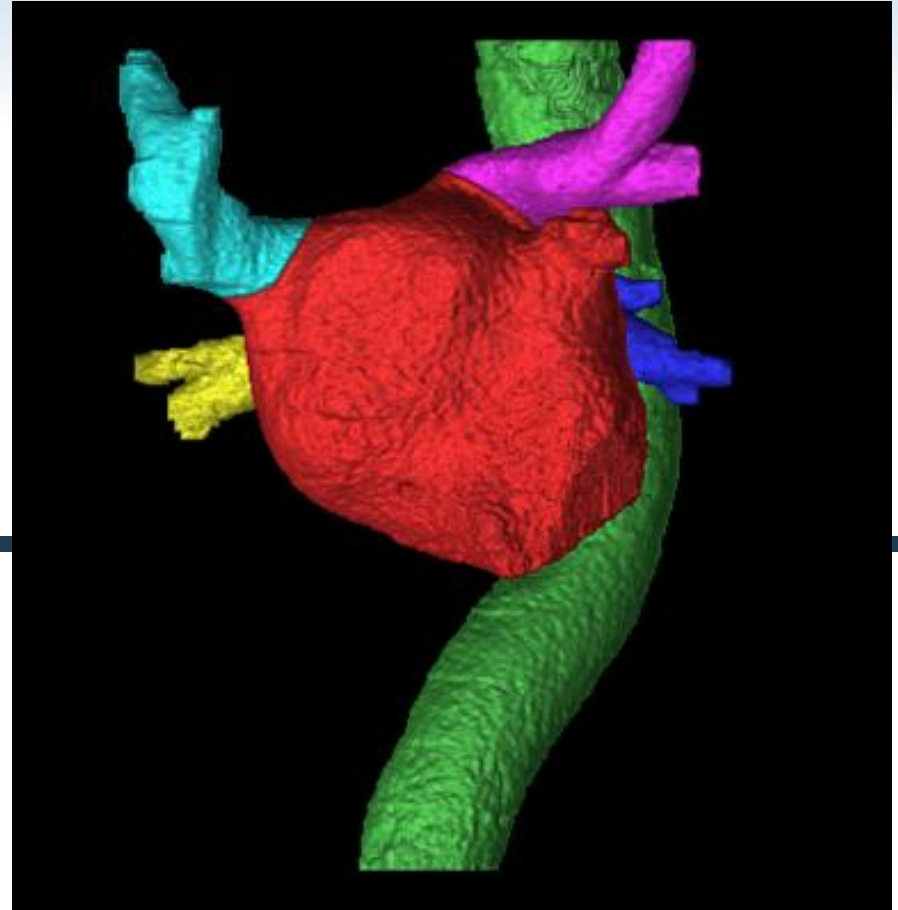


Analyze Webinar – August 25, 2011

# Cardiac Segmentation using Volume Edit

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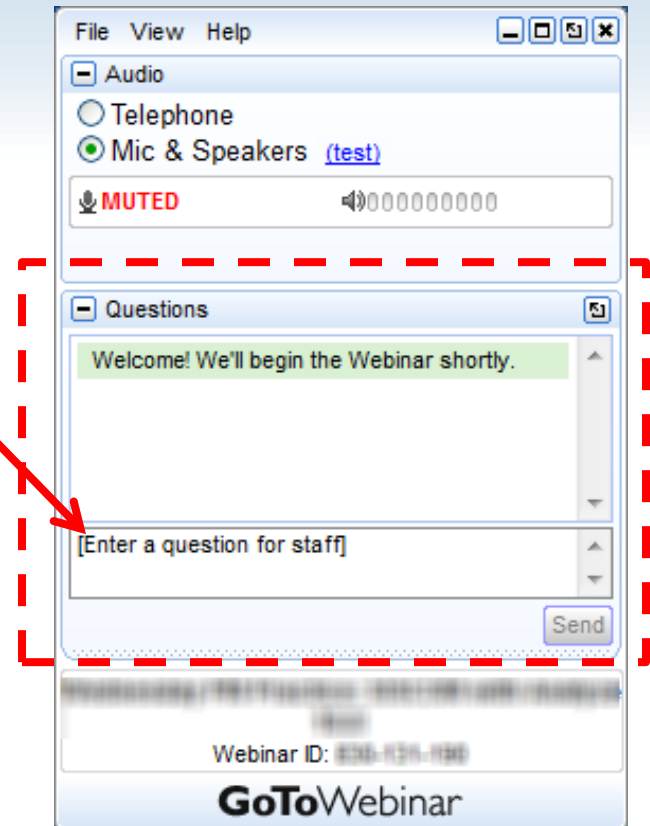
# Webinar Agenda

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- ◆ Estimated Duration: 30 minutes
- ◆ Webinar Agenda:
  - Using Volume Edit in Analyze 10.0 for cardiac segmentation from CT images
  - Questions & Answers
- ◆ Webinar Objectives:
  - Introduction to the new Volume Edit module in Analyze 10.0
  - Demonstrate how Volume Edit can be used for segmentation, in particular cardiac segmentation from CT images

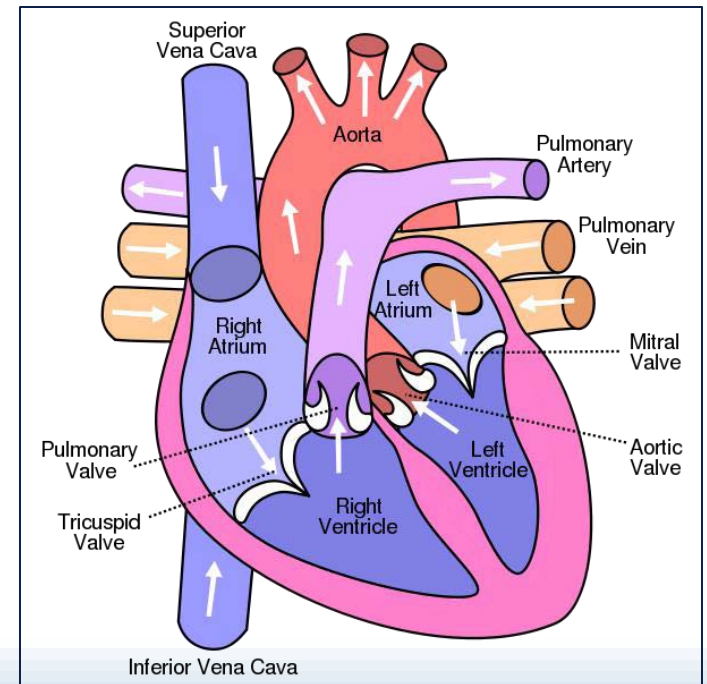
# Webinar Notes

- ◆ Questions during the Webinar
  - Use “Questions” pane of your GoToWebinar control panel
- ◆ After the Webinar
  - Webinar registrants will receive an email from Analyze Webinars that contains a link to the recording tomorrow



# Cardiac Segmentation

- ◆ Uses for cardiac segmentation
  - Ventricular mass
  - Ejection fraction
  - Wall thickness
  - Myocardial perfusion



# Volume Edit

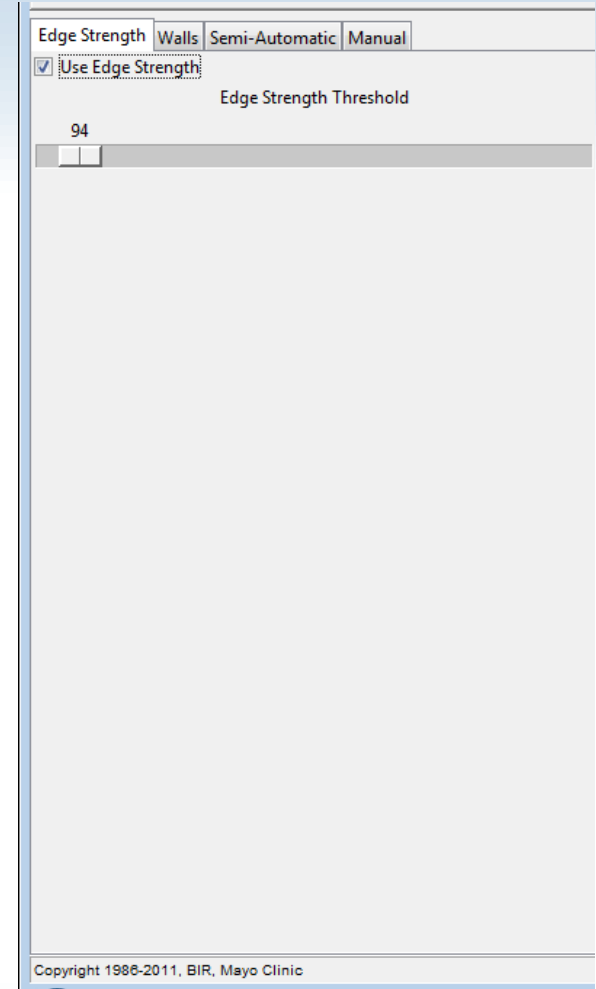
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- ◆ New to Analyze 10.0
  - Found under the “Segment” menu
- ◆ Interactive segmentation tools
  - Semi-automated
  - Manual
- ◆ Intuitive 3D interface
  - Direct viewing of all three orthogonal planes
  - 3D rendering

# Volume Edit

- ◆ Edge Strength

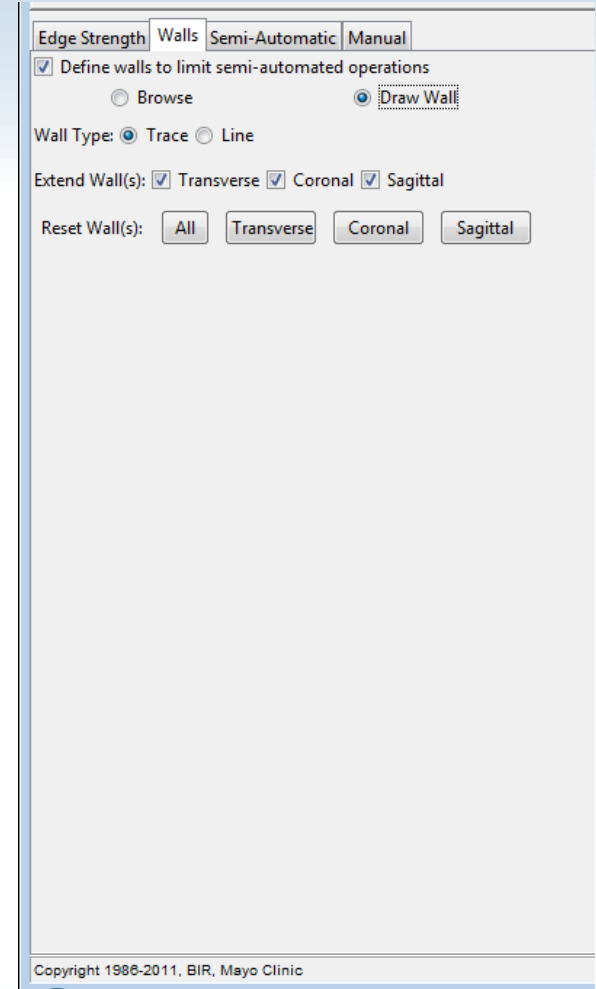
- Masks volume with threshold range of Sobel filter gradients
  - Each gradient identifies the direction of the largest possible increase in voxel intensity value and the rate of change in that direction
  - All voxels with gradient values less than or equal to the threshold value are seen in white when slider button is pressed
- Helps prevent semi-automated operations from jumping across high gradient borders (“edges”)
  - Semi-automated operations only applied to voxels less than or equal to the threshold value



# Volume Edit

## ◆ Walls

- A “stack” of traces or lines that limits semi-automatic operations
  - Similar to a 2D “limit” used for an auto trace
  - Trace or line is defined on a single image and then linearly interpolated within each orientation
- Define a separate wall in each orientation
- One wall per orientation



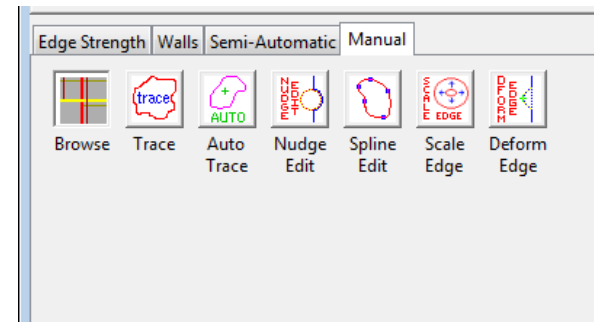
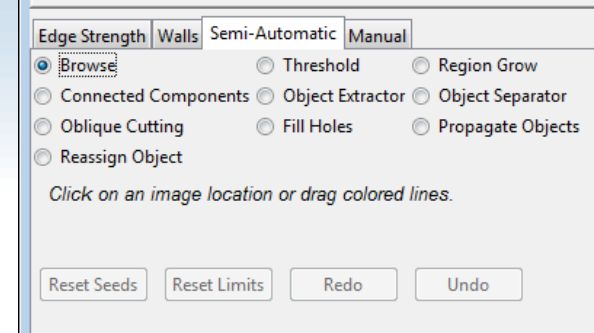
# Volume Edit

- ◆ Semi-Automatic

- Thresholding
- Region Growing
- Morphological-based

- ◆ Manual

- Slice by slice region definition
  - Speed it up with “Copy Forward/Backward” options
- Good for “cleaning up” segmented regions
- Define regions on the 3D rendering using the Trace tool



# Before Cardiac Segmentation

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- ◆ Possible pre-processing steps:
  - Oblique reformatting
    - Oblique Sections
    - Volume Render (Tools > Display > Oblique Sections)
  - Spatial filtering
    - Smoothing: Low Pass or Median filter

# Cardiac Segmentation using Volume Edit

Demonstration



# After Cardiac Segmentation

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- ◆ Potential uses for segmented cardiac structures:
  - Volume measurement (Region of Interest)
  - Surface generation and export (Surface Extractor)
  - 2D line measurements (Line Profile)
    - Requires explicit segmentation of grayscale data
      - Save object(s) as a binary mask (View > Objects, 'Save Binary')
      - Multiply binary mask by grayscale data (Image Calculator/Image Algebra)
  - Functional assessment (Region of Interest)
    - Load a coregistered functional map with object map

Questions?

# In Conclusion

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- ◆ Watch for an email from Analyze Webinars tomorrow
- ◆ Find out about upgrade pricing - [sales@analyzedirect.com](mailto:sales@analyzedirect.com)
- ◆ Try Volume Edit during a free trial of Analyze 10.0 - [www.analyzedirect.com/evaluate](http://www.analyzedirect.com/evaluate)
- ◆ Suggest a topic for a future Webinar - [webinars@analyzedirect.com](mailto:webinars@analyzedirect.com)
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