GE

# LOGIQ™ Techniques

## Color Quantification and Volume Quantification

## Getting started

1. Acquire a 3-5 sec color clip within the area of interest.
2. Recall color clip from Thumbnails. On Touch Panel (TP), select Q-Analysis to begin Color Quantification.
3. System will acquire all color information from clip. Do not push any buttons until system is done acquiring all the information necessary to quantify color data and warning label on bottom of screen is no longer shown. (Cine Computation in progress! Please wait until operation is completed).

*Note: Avoid using the Quantification Tool on a Color (PDI) clip longer than 400 frames.*

*Color (or PDI) loops acquired without CrossXBeam™ process faster than those with CrossXbeam ON.*

## Select frame to analyze

1. Once Computation of Color Clip is finished, use pointer to select the desired frame to be analyzed.
2. Use trackball to move pointer to desired frame and select by using right set key.

*Note: You can also use: scroll frame by frame, start/end frame (using Rotary Knobs) to select desired frame.*



## Trace desired area to analyze

### Manual Trace

1. Using pointer, select Manual icon from the bottom left corner of the monitor. Then move pointer into the color box. Trace around area of interest using set key on soft keys around trackball. Once desired area is set, the acquired color data will be shown on the timeline graph.

### Ellipsoid

1. Using pointer, select Ellipsoid icon from the bottom left corner of the monitor. Move pointer into color box. The ROI size can be adjusted by using the body pattern and ellipse knob on the operator panel. The default shape can be adjusted by using the Set Sample Area Shape on the TP. Once the ellipsoid is placed within desired area, the acquired color data will be shown on the timeline graph.
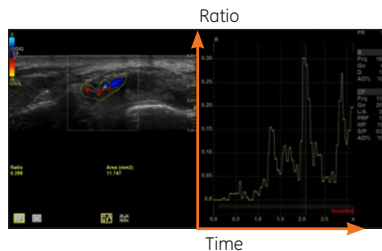


*Note: Color Q-Analysis provide tools for semi-quantitative assessment of inflammation in joints. For follow-up exams, use Ellipsoid ROI if you want to save ROI size from study to study.*

## Timeline graph

1. For statistics calculation, press "Statistics" button. The ratio is calculated and the area is shown.
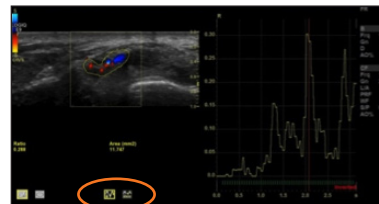


Ratio



Time

2. The ratio pertains to the number of Color Pixels compared to the overall number of pixels within the specified ROI (Region of Interest).

3. This ratio then correlates with the desired frame that is selected within the timeline. Time pertains to the selected frame (blue line) within the color clip.

*Note: Up to 8 ROI's may be placed on the image and will be displayed on the graph simultaneously. At anytime, Run/Stop can be selected on Touch Panel (TP) to replay clip.*
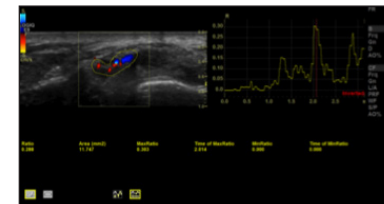
4. Using pointer and trackball, select icon below area to change between short and long form.

5. Short Form provides statistics for one selected frame. Within the frame selected, a ratio is given which includes the number of color pixels compared to total number of pixels within the Region of Interest.



*Note: Once Statistics is selected on TP, Timeline Graph will default to Short Form.*

6. Long form searches entire loop within the desired ROI for the individual frame which includes the maximum ratio and the individual frame which includes the minimum ratio. The corresponding minimum and maximum ratio values are then displayed on the screen in addition to the short form information.

| Tool | Definition | Clinical Use |
|------|-----------|--------------|
| **Disable frame (1)** | Allows users to delete previous frames. Depending on where frame line is currently located within timeline, selecting Disable Frame will disable each frame previous to that current frame. | Ability to disable unwanted frames within timeline. For example, frames with too much flash within image. |
| **Delete sample area (2)** | Drop Down – choices are Current Sample and Delete All. | Ability to delete current sample volume or start over by deleting all sample areas previously traced. |
| **Set sample area shape (3)** | Ellipsoid ROI can be manipulated using Set Sample Area Shape. Height, Width, and Tilt Angle can be changed and set as default for future studies. | Effective in providing physician with a more consistent follow up exam. |
| **Enable all frames (4)** | Enables all frames previously selected for deletion. | Easy way to make all frames active again. |
| **Copy and move sample area (5)** | Use trackball bringing up arrow. Place arrow within sample area desired to Copy. Then select Copy and move Sample area. Sample area will be copied. Then move to desired area of interest. | Gives clinician a copy and paste function. |
| **Export traces (6)** | Traces are exported as ASCII. | Exported traces may be put into an excel graph. |
| **First/Last/Run/ Stop (7)** | Functionality for reviewing clip. | Ability to review clip from beginning to end. |

## Getting started

1. Acquire a 3D PDI sweep in region of interest using a mechanical 3D/4D probe. This can be done by selecting the 3D/4D hard key on the keyboard. Then select start on the right trackball key. Once the sweep is finished you will be in a sectional plane display.
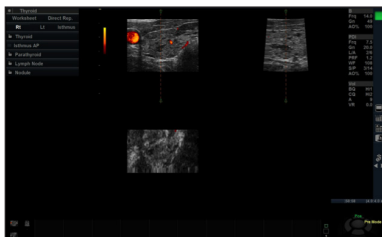


*Note: PDI Volume Quantification is a tool used with Power Doppler Imaging. Color Doppler is not applicable with this tool.*

## Define Volume of Interest to analyze

1. Select Vocal on TP.

2. To use VOCAL imaging, select start on the TP. A green arrow will appear on the screen. Using right set key and trackball, trace Volume of interest (VOI) around region of vascularity.

3. Use rotary knob on the bottom right corner of the TP to rotate Volume. The volume will be rotated 30 degrees each time. You will repeat tracing the volume of interest 6 times.

*Note: PDI Volume Quantification provides the tools for a semi-quantitative assessment of flow through a Volume of interest.*
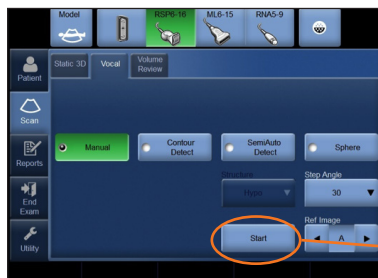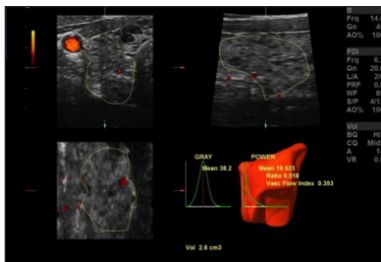
## Calculate volume

1. Once done tracing volume of structure, calculate volume on Touch Panel using Calc Volume button.

2. Select Static 3D tab.

3. Select Volume Histogram on Touch Panel (TP).

4. Gray and PDI histograms and indices will be calculated when VOI is defined.









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## Vascular Flow Index

1. Once Volume Histogram is selected on TP, the ratio, Vascular Flow Index and the mean will be seen calculated on the screen.

2. The ratio is determined by the number of weighted color voxels to total number of voxels within the Volume.

3. The Vascular Flow Index is a ratio of the sum of weighted color intensities to total number of voxels inside VOI. This Vascular index gives an estimation of blood supply through a tumor or vascular region due to flow estimation.

4. The mean is an average of all intensities. A Mean signal level for all the Power Doppler voxels inside VOI will be calculated.



### Imagination at work