

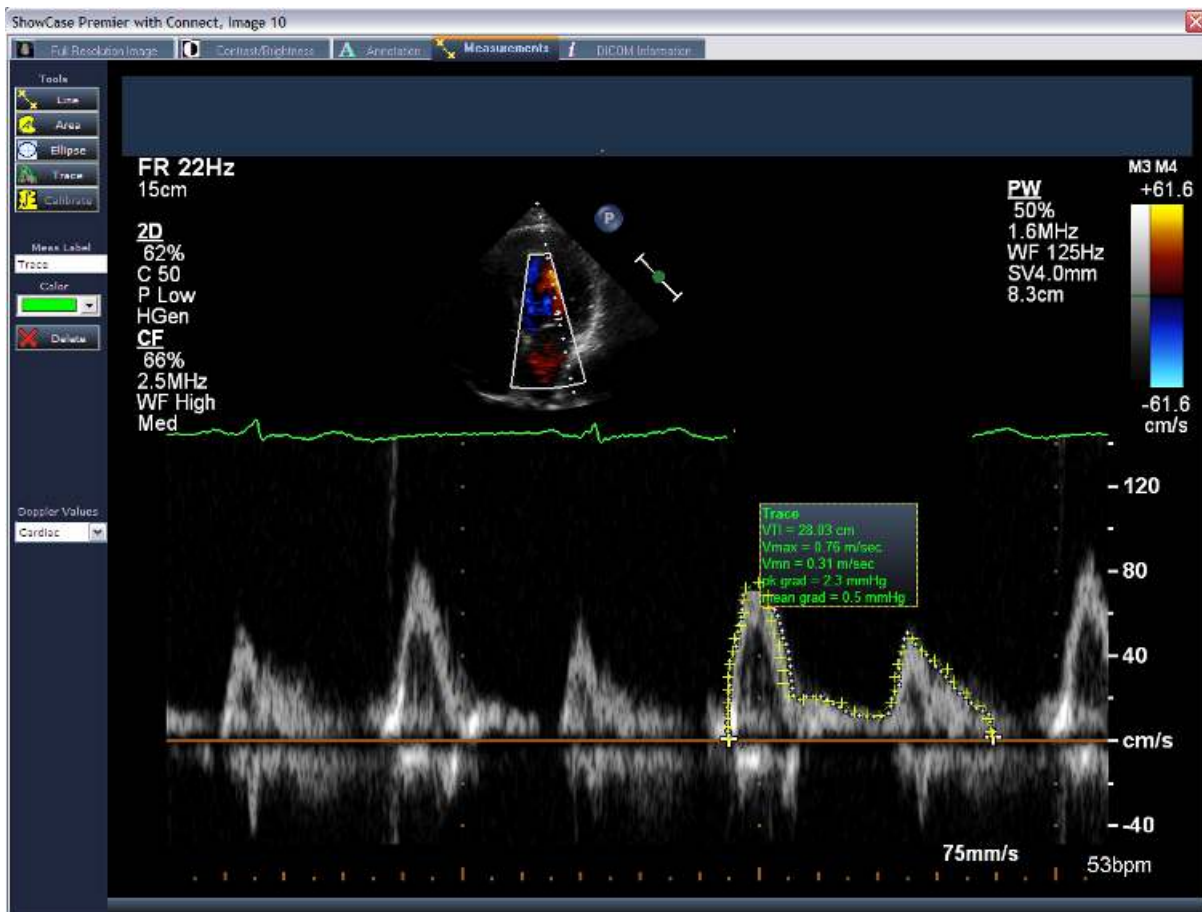


Making Image Measurements in ShowCase

ShowCase Premier provides a set of simple measurement tools for line, area and Doppler measurements. Measurement tools include **Line**, **Ellipse**, and free form **Area**. On ultrasound images, the **Line** tool provides measurements over the 2D, M-Mode, and Spectral Doppler regions. The Doppler trace tool provides measurements for both Cardiac and Vascular images. All ShowCase measurements are temporary; They are not added to structured report data or saved in an editable format. You can burn them into the image or you can export them in a spreadsheet.

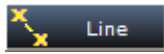
Making Measurements

To access the measurement tools, double-click on an image and select the **Measurements** tab.

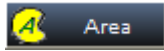


The **Tools** are on the left side of the window. After selecting (clicking on) a tool, move the cursor over the image to make a measurement. The cursor changes when it is over an area of the image where the tool is valid. The measurement values are displayed in a box adjacent to the measurement. This box can be positioned by selecting it and dragging it to a new location. A measurement can be selected by clicking on the measurement itself or on the box containing the measurement values. Once selected, the measurement can be edited by grabbing and moving the highlighted grab points.

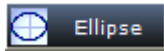
The **Meas Label** on the left allows you to label a selected measurement. The **Color** dropdown allows you to select a color for the current measurement. The **Delete** button removes the selected measurement.



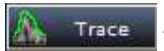
The **Line** tool gives a distance measurement when placed on a 2D image or 2D region of an ultrasound image. When placed on an M-Mode region, it provides a length, the vertical dimension, dT, the change in time, and a Slope. The Line tool also provides measurements in Spectral Doppler regions.



The **Area** tool lets you draw a free form area. It gives the area in square centimeters and the perimeter in centimeters.



The **Ellipse** tool lets you draw an ellipse to measure its area in square centimeters and its perimeter in centimeters.



The **Spectral Doppler Trace** tool is enabled for ultrasound images that include a Doppler strip. It allows you to click and drag or multiple-click a tracing over one cardiac cycle from begin systole to end diastole. For accurate results, please do not cross time discontinuities or trace multiple cycles.

Reviewing and Exporting Measurements



All of the measurements from an image series can be reviewed and exported from the Series Information dialog invoked by the Series Information button on the toolbar.

The screenshot displays a software interface with two main panels. The left panel, titled "Temporary Measurement Data", contains a list of measurements organized by image. The right panel, titled "Measurement Image", shows a grayscale ultrasound image with a white dashed outline around a specific region. Below the image, the area and perimeter values are displayed.

Image	Measurement	Value
Image 24	Area	12.16 cm ²
	Perimeter	12.95 cm
Image 28	Line	
	dV	0.49 m/sec
	dT	0.13 sec
	VP	0.66 m/sec
	V2	0.17 m/sec
	Decel Time	181 msec
	P½T	52 msec
	dP	1.74 MM HG

At the bottom of the interface, there is an "Export to..." button and two radio buttons: "text file" (selected) and "data file".

The **Temporary Measurement Data** area on the left contains a scrolling list of all of the measurements in the series organized by image. Selecting a measurement causes the corresponding image to appear on the right.

The **Export to...** button provides the ability to export all of the measurements listed to a text file or to a comma separated value (csv) file which can be read by database or spreadsheet programs like Excel.

ShowCase Measurements & Calculations on Images with Doppler Regions

2D region

Line tool

Distance, the length of the line in cm.

M-mode region

Line tool

Vertical line- length of the line in cm.

Non-vertical line

Vertical length of the line in cm.

dT – Elapsed time in sec between the left most point and the right most point.

Velocity - in m/sec (the slope of the line)

Spectral Doppler region – Image from a Cardiac Study

Line tool

dV – Change in velocity between the end points of the line in m/sec

dT – Change in time between the end points of the line in sec

VP – Peak velocity in m/sec

V2 – Velocity at the second end point in m/sec

Decel Time – Deceleration time in msec

P $\frac{1}{2}$ T - Pressure half-time in msec

dP – Pressure gradient in mm HG

Trace Tool

Velocity Time Integral (VTI)

Max Velocity in m/sec

Mean Velocity in m/sec

Peak Gradient in mmHg

Mean Gradient in mmHg.

Spectral Doppler region – Image from a Vascular Study

Line Tool

V1 – Velocity at the first point in m/sec

V2 – Velocity at the second point in m/sec

RI – Resistivity index (MaxV-MinV)/MaxV

S/D – Systolic to diastolic ratio V1/V2

dV – Change in velocity in m/sec

dT - Change in time in sec

Trace Tool

Peak Systolic Velocity in m/sec

End Diastolic Velocity in m/sec

Acceleration Time in sec

Resistivity Index

Systolic/Diastolic Ratio

Velocity Time Integral (VTI).