

Shear Wave

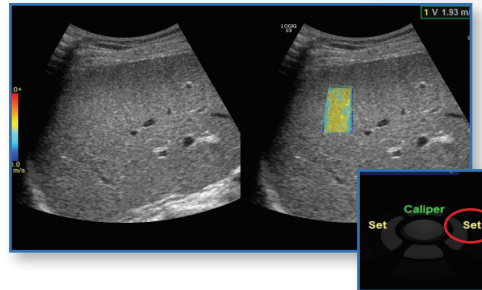
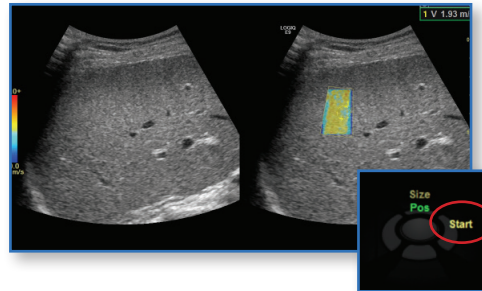
The Shear Wave feature on the LOGIQ E9 system is activated by using the Elasto Hard key which is located on the keyboard. Shear Wave Elastography is available on the C1-6, C1-6VN and 9L probes.



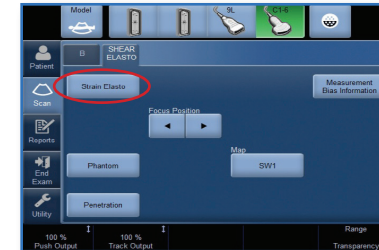
10. Print image
11. Unfreeze
12. To continue Shear Wave acquisition, select the right trackball key re-start
13. Take additional measurements as needed (system will auto-sequence as each measurement is taken. If measurement ROI does not appear, select Measure to activate)

Activating Shear Wave (Single Image)

1. Select C1-6 or C1-6VN probe
2. Select Elasto hard key on the keyboard
3. Locate optimal window for ROI placement
4. To start Shear Wave, select the right trackball key to start (Real-Time Shear Wave Elasto acquisition will begin)
5. Select freeze after Shear Wave image appears
6. Select measure on keyboard
7. Measurement ROI will pop-up within the color-coded Shear Wave map
8. Use Caliper and Set keys adjacent to trackball to change placement or size of the ROI, if desired
9. To save the measurement, select Set adjacent to trackball

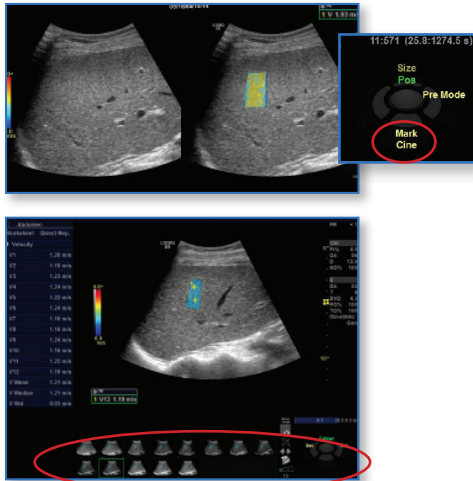


Notes: Machine defaults to automatically measure once Shear Wave image is frozen. First measurement taken will require user to select Measure. After first measurement is taken, additional measurements will pop up automatically. If measurement ROI does not appear, select Measure to activate. Measurements will be saved to the Abdominal Worksheet. System will auto-sequence through 12 measurements which can be seen on touch panel. User may switch between Shear Wave and Strain Elastography using Button on Touch Panel.



Measurements (Clip store)

- Follow steps 1-4 under Activating Shear Wave
- Select Print button (P1, P2, etc.) without freezing image
- Clip will store to archive
- Or if Mark Cine is set up...(See Tips and Tricks for set-up)
- To start acquiring clip, select Mark Cine on bottom trackball key
- When desired clip is acquired, select Print button without freezing
- Clip will store to clipboard



- Shear Wave Elasto will continue to be real-time live
- Take multiple clips as desired while Shear Wave Elasto continues live acquisition
- At any point, select Freeze to stop Shear Wave Elasto acquisition. To begin Shear Wave Elasto again, Unfreeze and select Start

Note: To retake a measurement, select Worksheet. Using trackball, highlight the value that you would like to retake. Select Delete Value on Touch Panel or left click when value is highlighted and select Delete Value. Return to Shear Wave Elasto and repeat measurement. The Auto-Sequence feature will automatically replace the deleted measurement and then continue auto-sequencing.

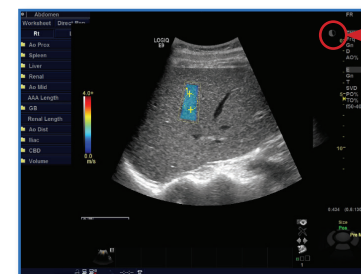
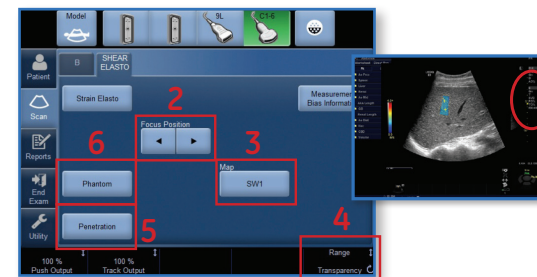


- Once you are finished acquiring clips, recall Clip from clipboard
- To select desired frame within Clip, use Frame by Frame Rotary knob to scroll through frames
- Once desired frame is seen, select Measurement key on keyboard
- Measurement ROI will pop up
- Select Set adjacent to trackball to save measurement
- After measurement is saved, an additional Caliper will pop up to take another measurement. (Multiple measurements may be taken within ROI)
- To select another frame within the clip, select Measure
- Use frame by frame rotary or the trackball to navigate to desired frame and take additional measurement



Tool	Definition	Clinical use
Overall Gain (1)	Changes the overall amount of color seen in the color-coded ROI area	Reducing gain will prevent lower quality velocity measurements from being displayed
Focal Position (2)	Focus position of the pulses that track the Shear Wave	Changing the focal position will change the focal point. The focal point is the area with the highest spatial resolution
Shear Wave Map (3)	Defines the relationship between Shear Wave Elasto color and tissue stiffness	Adjust the Shear Wave Elasto Map to provide different levels of color contrast within Shear Wave Elasto Color-Coded Map. Use E-gray for
Range (4)	Range pertains to the color assigned to each velocity tissue stiffness within the Shear Wave Elasto Color-Coded Map	Changing the range will change the color assigned to each velocity. Increasing range will show more blue. Decreasing will show more red
Transparency (4)	Defines the transparency of the Shear Wave Elasto Color-Coded Map	Adjust the transparency to change the appearance of the Shear Wave Elasto Map. Decrease transparency in order to see more vivid color within the Shear Wave Elasto Map. Increasing will show more of the B-Mode
Penetration (5)	Shear Wave Elasto shortcut for more penetration	Penetration Shortcut on Shear Wave Elasto Touch panel can be used for harder to image patients. Using this setting will decrease frame rate
Phantom (6)	Settings are optimized specifically for phantom testing	Use Phantom button setting only for imaging phantoms

Display	Definition
SVD (Sample Volume Depth)	Change the SVD via trackball
PO % (Push pulse Output)	Related to the power that generates the Shear Wave
TO % (Track Output)	Related to the Power used to track the Shear Wave



Countdown clock icon for Shear Wave frames

Note: The countdown clock informs you as to when the next Frame of Shear Wave Elastography is acquiring. If desired, user may enter and exit dual screen mode by pressing the Right Dual screen key above Freeze button on keyboard.

Tips and tricks

Shear Wave measurements may be added into Scan Assistant protocol. (Compatible with Scan Assistant feature)

To avoid disabling Auto-Sequence of measurements, do not hold down the clear button or press the clear button more than twice while measurements are active.

The color Map associated with tissue stiffness may be changed in the utility pages. Utility > System > System Imaging. Change under display section. (1)

Shear Wave Elasto Display Units may be changed in the Utility pages. Utility > System > System Imaging. Change under Display section. (1)

Avoid changing any image parameters during Shear Wave acquisition.

Each Shear Wave Elasto frame takes about 2-3 seconds to acquire. If setting up print controls for taking clips, make sure to set time to at least 6 seconds to acquire multiple frames of Shear Wave Elasto. Utility > Application > Print Controls > Under Time Based-Store. (2)

To store multiple frames, user may set up Mark Cine control. Mark Cine may be initialized within the Utility Pages: Utility > Application > Print Controls > Enable Mark Cine Control (3)

Changing the width of the Shear Wave Elasto ROI box will affect the frame rate. Changing the height of the Shear Wave Elasto ROI box will not affect the frame rate.

To avoid Imaging Artifacts

- Place ROI at least 1-2 cm away from liver capsule
- Avoid large vessels within ROI
- Patient motion – cardiac or respiratory
- User motion during sampling
- Place ROI depth at 2-6 cm

