

AFI

Important things -
Always to remember

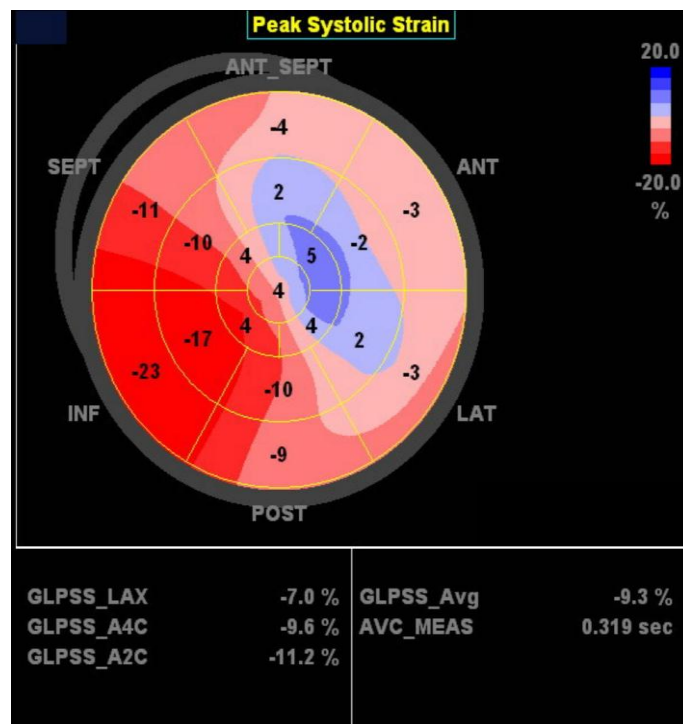


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NOTE

This hand out is additional training material.
For more information please refer to the user manual and/or reference manual.
Or have a look on the white paper collection.

AFI – always to remember

Setup of the Scanner

General

This setup only needs to be done once on the scanner.

Configuration

Press Config (F2).

Select the **Imaging** button on the lower part of the screen.

Then choose the tab for Global settings.

There are two possibilities to set up time frames:

Time before / after each heart cycle.

Change the default setting and enter 100 for both (before and after).

Press Config (F2) again to exit the configuration page (settings are automatically stored).

What is it doing

Usually the system stores a cineloop from beginning of one R-wave to beginning of another R-wave. With this new setup the system takes additionally 100 ms before and after the normal triggering of the loop. This is to make sure that all frames within a complete heart cycle are analyzed.

What is it not doing

It's not affecting the review of the loop. The loop will run smooth when reviewed on the screen.

Which images can be analyzed

AFI can process and analyze data acquired on any GE Vivid product that meets the algorithm's minimum requirements.

Images in any other format than raw data cannot be analyzed.

Definition of the region of interest

The three-click method

This method requires the user to place two points at the annulus and one at the apex. The algorithm will assess the placement of the points, and if needed, override the placement and correct the position of the points.

What is it doing

With help of this three orientation points the system defines a region of interest.

What is it not doing

It is not tracking the endocardial border. The ROI is defining the area around the myocardium that will be analyzed.

You need to check if the ROI is on the right position and if the size fits to the thickness of the myocardium.

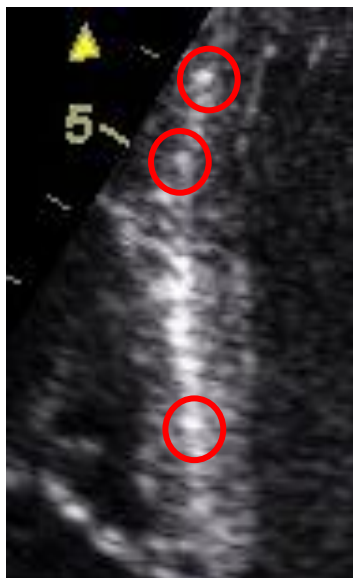
Detecting features

What is it doing

The system is detecting as much as possible features inside the ROI.

What is a feature?

A feature is a unique acoustic pattern resulting from the interaction of ultrasound energy with tissue. These unique patterns can be tracked automatically over periods of the cardiac cycle. From these features the system is building groups.



Identifying groups

What is it doing

The system is looking for a constellation of features that is visible also in the following frames. Like a group of stars in the sky that gives us a very unique constellation. Motion and velocities are analyzed by calculating frame-to-frame changes using “natural acoustic tagging.” New feature constellations keep coming into the image as old ones fade away.

The tracking

Similar in concept to MRI tagging, 2D Strain analyzes motion by tracking tags (“natural acoustic markers”) in the ultrasonic image in two dimensions. These natural markers are used in a way similar to the magnetic tags in MRI. As with tagged MRI, the tags are short lived; one cannot expect the natural acoustic markers to persist throughout the entire cardiac cycle, mainly due to their movement in and out of the imaging plane. However, unlike MRI, in which the entire tagging fades out and limits the analysis time to only part of the heart cycle, ultrasound’s new acoustic markers keep coming in as some of the previous markers fade out.

Tracking validation

However, 2D Strain is image-quality dependent. The two main issues that adversely affect 2D Strain for difficult patients include clutter and “speckle noise.” Under these circumstances, the 2D Strain algorithm optimally trades off resolution to gain noise immunity. Besides the image quality it’s a need to have the myocardium inside the sector throughout the whole heart cycle.

Be aware:

When you change the tracking quality manually from red to green you need to have a close look if you can rely on this curve.