



GE Healthcare

## **Vivid™ Tutorial Series: Automated Ejection Fraction (Auto EF) 2.0**

Auto EF is a semi-automatic measurement tool used for calculation of the global EF

- EF value is calculated by Simpson Method Of Disks (MOD) for each individual view and MOD Bi-plane Ejection Fraction for the whole Left Ventricle (LV).
  - The system should be configured to store 100 ms before and after each heart cycle (Config-Imaging-Global). If the acquisition has more than one heart cycle, the analysis will by default be performed on the second to last heart cycle.
  - Ensure a stable ECG trace and acquire apical 4 chamber and apical 2 chamber 2D cine loops.
  - > 40 FPS required. A higher frame rate is required for higher heart rates.
  - The entire myocardium should be visible, and the depth range should include the entire left ventricle.
1. Open one of the stored apical views and click on **Measure** tab.
  2. Select **AutoEF** in the Measure menu.
  3. The system will try to identify a suitable pair of apical views for the analysis. If this succeeded, the tool will launch and start up in the **Define ROI** stage with the selected apical view.
  4. If identification of a suitable pair failed, the tool will launch and start up in the **Select View** stage. Select either the **A4CH** or **A2CH** depending on which view is being analysed.
  5. In **Define ROI** stage, verify that the view annotation shown to the upper left of the screen (in green) is correct. If it is not, either click the **Select View** stage button to reannotate to the correct view or click on a different A4CH image in the clipboard. Clicking on a different image will discard analysis of the current loop and replace it with clipboard image. Select the correct view (**A4CH**) for the new image.
  6. Pay attention to the left/right orientation of the image, if the image orientation is wrong, go back to the **Select view** stage press **Left-Right Flip** and verify the view by annotating it as **A4CH** again.
  7. In the **Define ROI** stage, an automatic endocardial ROI is generated (green-dotted line). The endocardial border trace may be edited by clicking and dragging the endocardial contours. If necessary, to reset the automatic ROI, click the **yellow back arrow**. When satisfied, either stop moving the cursor and wait for automatic processing or click on **Process**.
  8. If the automatic ROI fails to define the correct ROI, a 3-Point ROI alternative can be used. Press the **3-Point ROI** button. This will prompt to click on 3 specific landmarks. When the third landmark is selected, a ROI is generated and can be further edited as for the automatic ROI. To use a different frame for the ROI trace, press **Stop** to pause the playback, click to the acquired frame to be analysed and the 3-Click method can be used. Click on **Process** when satisfied.
  9. Results are then demonstrated. The running loop is shown on the left, the green dotted line marks the inner border of the chamber. If poor tracking exists, the system automatically displays the border in red.
  10. Frames with maximal volume (End Diastole) and minimal volume (End systole) are displayed on the right side.
  11. Click on **EF dual** to only display the ED (blue) and ES (green) frames. Results for each view are summarized in a table on the right side.
  12. Tracking validation: Inspect the ROI traces for ES and ED. If visually correct, press either **Approve and Select next** to continue to analyse the second apical view or **Approve and Exit** if only one apical view is to be analysed.
  13. Tracking correction: Adjust any misaligned points on the endocardial border traces at ES and ED by clicking and dragging the anchor points to a new position. If different frames need to be selected for ES and ED, click on the **ES frame** and **ED frame** controls and adjust the endocardial border trace as necessary. Clicking on **Reprocess** will go back to the Define ROI stage.
  14. To store the results select **Approve and Exit**. A dual screen shot will be generated as a thumbnail image for later reprocessing if required.
  15. To discard results select **Cancel**

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