

MI Processing - Setting Processing Limits

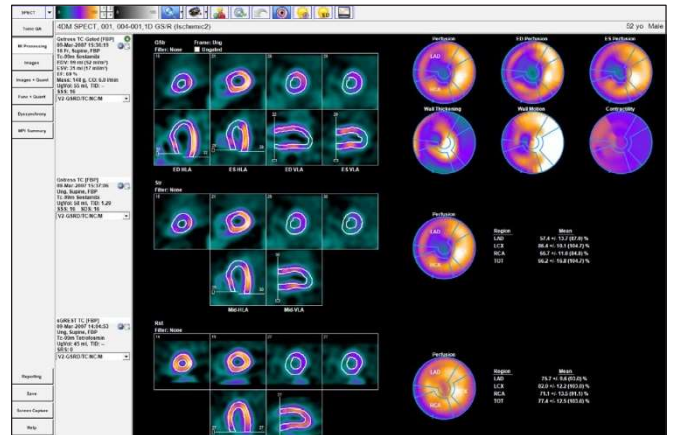
OVERVIEW

When Corridor4DM is launched with a patient image dataset, the application automatically quantifies perfusion and function estimates using previously configured settings. If the data for that patient contains 4DM saved results, the application displays quantified perfusion and function estimates based upon the previous user's saved processing. The **MI Processing** screen enables the user to perform quality assurance (QA) of 4DM processing applied to the patient image data. In addition to QA, the user can perform manual adjustments to the original 4DM quantification or the previous user's saved quantification. However, this should be performed only when necessary (e.g., poor orientation, inconsistent left ventricular contours, extra-cardiac activity).

HOW-TO GUIDE

QA MODE

The **MI Processing** screen initially displays in **QA mode** (Figure 1). This mode is used to verify the Left Ventricular (LV) surfaces and the location of the valve plane. Minor adjustments to the valve plane locations are performed here, and the adjustments immediately update the perfusion and quantitative values.



To perform patient image data QA, visually confirm the following for accuracy and consistency for each dataset:

- LV endocardial and epicardial surface contours** - The LV surface contours should outline the inner and outer surfaces of the myocardium while excluding extra-cardiac activity.
- LV centering, tilt, and orientation** - The LV slices for all patient image data present should be centered, tilted, and oriented symmetrically between all datasets to ensure accurate estimates and comparisons calculated by 4DM. Orient HLA slices so the apex of the heart faces 12 o'clock (see 1 Figure 2), and orient VLA slices so the apex of the heart faces 3 o'clock (see 2 Figure 2).
- HLA valve plane limit placement** - The polar map estimate within 4DM are calculated from placement of the valve plane limit on the HLA slice viewports. To be consistent with 4DM normals patient databases, click and drag the HLA valve plane limit so that it is placed near the mid-membranous septum (Figure 3) about 1-2 slices below the end of the septal wall. This minimizes the inclusion of slices involving the outflow tract and aortic valve.
- VLA basal limit placement** - The functional estimates within 4DM are calculated from the placement of the basal limit on the VLA slice viewports. The basal limit should be placed at the end of the left ventricle as seen on the anterior, lateral, and/or inferior walls within the VLA and HLA slice viewports. A useful guide to this location is where the color intensity drops to <50% of the mid-ventricular intensity. It may be helpful to change the Colorbar to Step10 (Figure 4) to see the 50% decrease clearly.

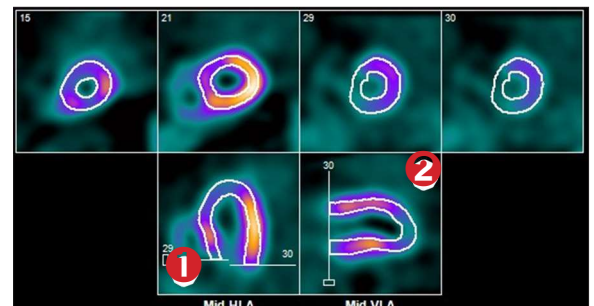


Figure 2. SA, HLA, & VLA slices centered and tilted correctly

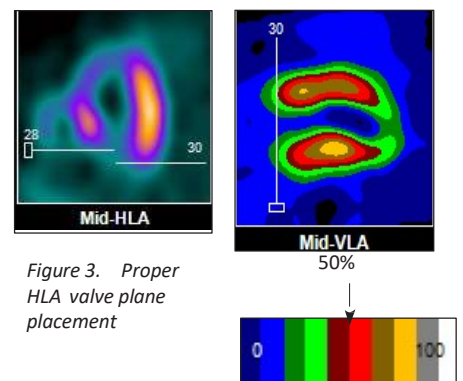


Figure 3. Proper HLA valve plane placement

Figure 4. Step10 color scheme & proper VLA basal limit placement

MANUAL PROCESSING MODE

If the surfaces do not contour the LV properly due to poor centering or orientation, click the **Manual Processing** icon (Figure 5) to go to the **Manual Processing** mode (Figure 7) which allows the user to perform adjustments to the automatically processed or previously saved user processing. [Click the **Return** icon (Figure 6) to go back to **QA** mode without applying any changes.]

To update processing manually, make necessary adjustments to the following for each dataset:

1. **LV centering** - Place the white crosshairs in the center of the short axis (SA) slice (Figure 8).
 - Note:** The long axis centering is updated based upon the basal and apical limit placement adjustments.
2. **LV tilt and orientation** - To adjust the orientation of the LV, position the mouse on the reorientation handles (see ① & ② Figure 9) and click and drag to obtain the desired tilt and orientation. The correctly oriented apex of the HLA slice should face 12 o'clock and the correctly oriented apex of the VLA slice should face 3 o'clock.
3. **LV basal limit** - The basal limit should be placed at the end of the left ventricle as seen on the anterior, lateral, and/or inferior walls within the VLA and HLA slice viewports (Figure 9). A useful guide to this location is where the color intensity drops to <50% of the mid-ventricular intensity (see ① Figure 10). It may be helpful to change the colorbar to Step10 (see ② Figure 10) to see the 50% decrease clearly. This limit is moved by a left mouse click and drag.
4. **LV apical limit** - The apical limit should be placed over mid-apical myocardium (see ② Figure 10). Left-click the square box in the apical myocardium to activate and manually adjust this limit to the mid-apical myocardium as necessary.
 - When the square box in the apical myocardium is clicked and turns white, it will lock the apical placement in place.
5. Click the **Process** icon (Figure 11) to apply adjustments and follow the instructions for reviewing the data in **QA** mode above.
6. 4DM is capable of displaying 4 datasets simultaneously and users who generate more than 4 datasets (e.g., AC and NC images or Dynamic data) must display and review all datasets for accurate quantification. Please refer to the 4DM User's Guide for instructions on using the **Dataset Layout Selector** to display additional datasets.

i	For advanced processing assistance, refer to the Constraints and Advanced Processing Reference Guides
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Figure 5. Manual Processing icon



Figure 6. Return icon

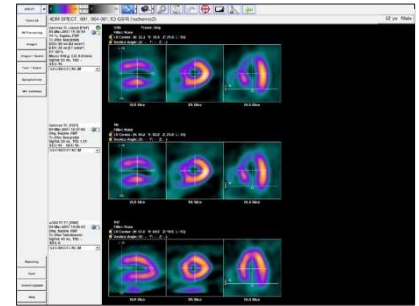


Figure 7. MI Processing Manual Processing mode

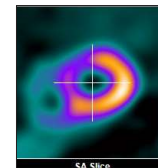


Figure 8. SA with centered crosshairs

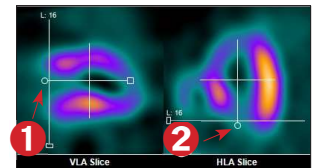


Figure 9. Properly oriented VLA & HLA slices

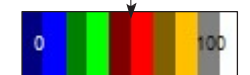
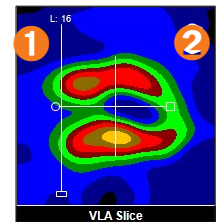


Figure 10. Step10 color scheme & proper VLA basal limit placement



Figure 11. Process icon



Figure 12. Reset icon

RESET MODE

If the patient image data needs to be reprocessed without any automatic processing or the previously saved result files (e.g. normalization, magnification, centering, tilt), click the **Reset** icon (Figure 12) to enter

Reset mode. The processing steps are the same as the **Manual Processing** mode. Please refer to the previous section for details.