

MI Processing - Setting Processing Limits

OVERVIEW

When Corridor4DM is launched with patient image data, the application automatically processes and quantifies perfusion and function estimates using default settings prior to interaction by the user. 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 processing or the previous user's saved processing. 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 perfusion and function quantitative values.

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

- 1. 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.
- 2. 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).
- 3. HLA valve plane limit placement** - The polar map estimates within 4DM are calculated from the 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.
- 4. VLA basal limit placement** - The functional estimates within 4DM are calculated from the placement of the basal limit on the VLA slice viewports. Click and drag the VLA basal limit, so that it is placed where the color intensity drops to <50% of the mid-ventricular intensity. It may be helpful to change the color scheme to **Step10** (Figure 4) to see the 50% decrease clearly.

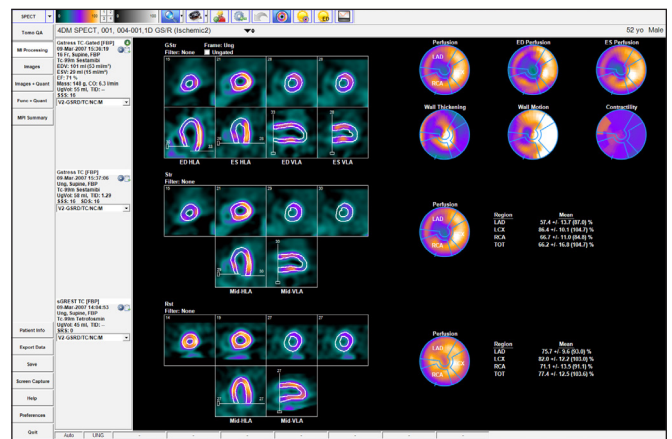


Figure 1. MI Processing QA mode

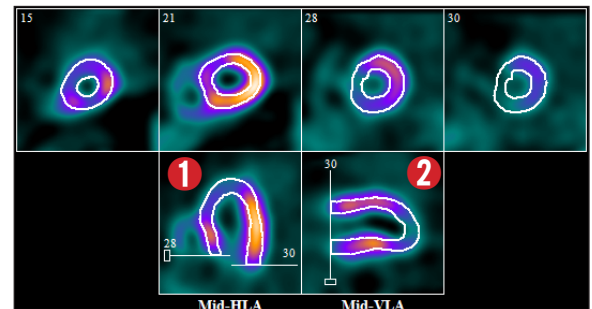


Figure 2. SA, HLA, & VLA slices centered and tilted correctly

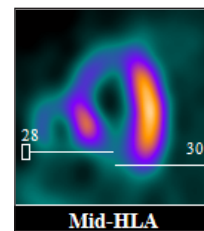


Figure 3. Proper HLA valve plane placement

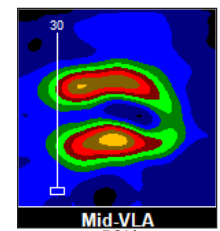


Figure 4. Step10 color scheme & proper VLA basal limit placement

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 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.



Figure 5. Manual Processing icon




Figure 6. Return icon

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

- 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.
- 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.
- LV apical and 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. 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** (Figure 10) to see the 50% decrease clearly. The apical limit should be placed over mid-apical myocardium (see 2 Figure 10). Both of these limits are moved by left mouse click and drag.
- Click the **Process** icon (Figure 11) to apply adjustments and follow the instructions for reviewing the data in **QA** mode above.

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.

 For advanced processing assistance, refer to the **Constraints** and **Advanced Processing** Reference Guides

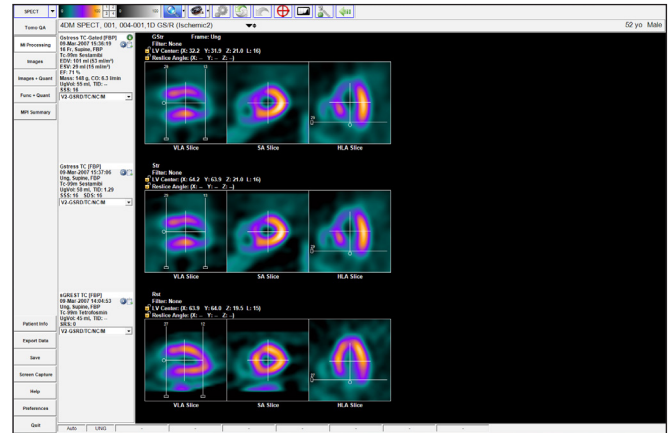


Figure 7. MI Processing Manual Processing mode

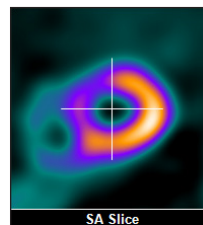


Figure 8. SA with centered crosshairs

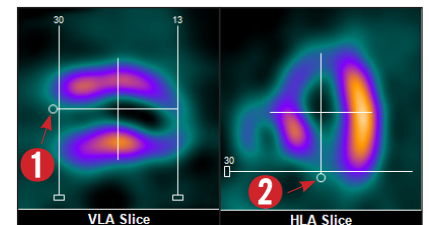


Figure 9. Properly oriented VLA & HLA slices

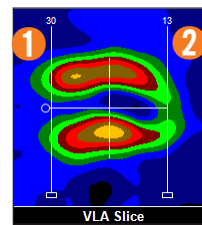


Figure 10. Step10 color scheme & proper VLA basal limit placement



Figure 11. Process icon



Figure 12. Reset icon