QLAB 10.0 Quick Card: Mitral Valve Navigation [A.I.] (MVN [A.I.]) Q-App

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8 steps to essential MV data! Anatomical models and guided steps to improve workflow efficiency. Speckle for annulus tracking and leaflet tracing.

MVN requires a X7-2t 3D data set with ECG.

MVN Task Guidance Steps:

1. ES Frame Confirmation: Auto ES feature selects the end systolic frame (step tab is closed and checked green). **To select another frame**, click on **1. ES Frame Confirmation** tab to re-open and click arrows to preferred frame. Press **Confirm** (selected frame will be flagged). (figure 1) Auto ES is calculated on beat length which will be frame rate dependent.
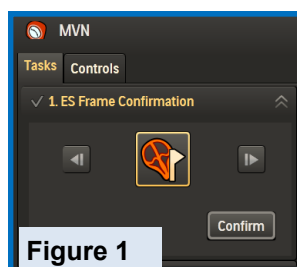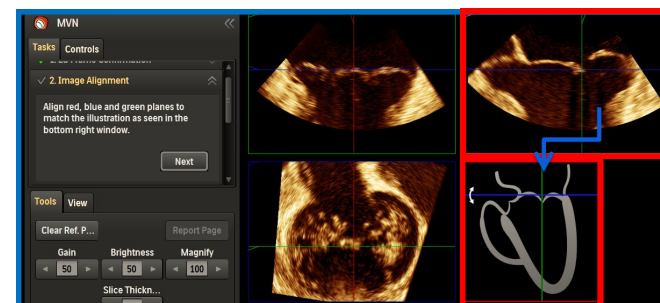

Figure 1

Figure 2

Figure 3

Figure 4

2. Image Alignment: Rotate Red plane to align view with model (figure 2); Move and tilt the **blue line** to transect the annular points. Align the **green plane** so the **red line** is centered (figure 3). Use the **blue plane** as reference to confirm that Aorta and LV are aligned like model. **TIP**: Do not move the line placement, just tilt the red line to align Aorta to LV. (figure 4). Press **Next. See additional tips on page 5 of this quick guide.**

3. Ref Pt. Selection: Place the **AL** and **PM** points in green plane and left click to set. Move cursor to the red plane, place the **A** and **P** reference points and left click. To edit the red **Nadir** and **AO** points, place cursor over the point; and then left click and hold to move to position. Press **Next.** (figure 5) The blue progress bar indicates that the algorithm is processing results.

Figure 5

* Results display in the Right Panel. (figure 6). A green box next to the measurement indicates **Specified** and a red box **Unspecified**.

4. Annulus Editing: If no editing is necessary, press **Done** and proceed to the next step**.**

If editing is necessary, left click and hold any annulus point in the red or green planes to move. Rotate the annulus by clicking the arrows on the image. The blue plane is for reference only. Press **Done**.

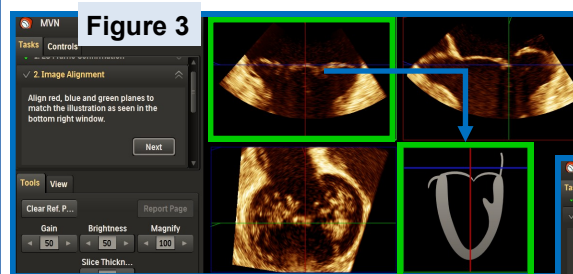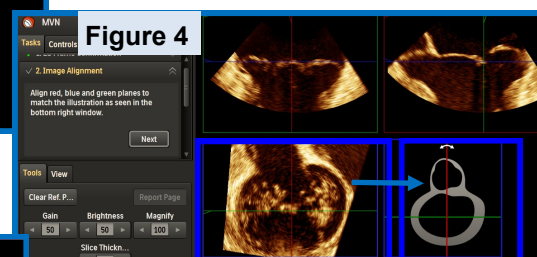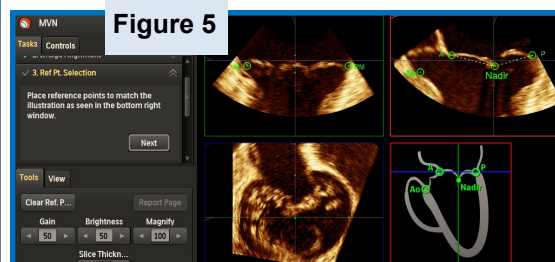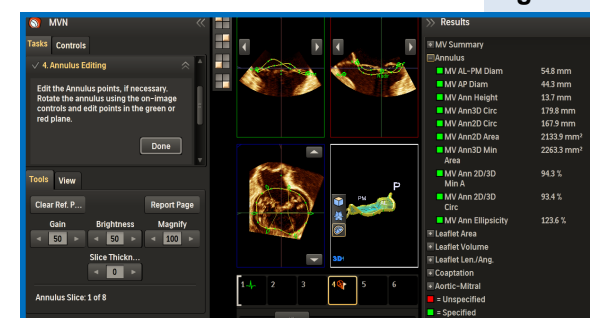**Note: the bolded box borders and arrows in the figures were added to the images in this quick card.**

Figure 6

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Steps 5 through 8 are **Optional Steps** for **Leaflet Editing** and **Papillary Tip Selection**.

5. **Commissure Editing:** Left click and hold points to adjust if necessary; then press **Next**. (figure 8)

6. **Leaflet Editing:** Left click leaflet trace points and edit if necessary. Navigate the image using the arrows on image. Press **Next** (scroll down to see Next button). (figure 9)

   Note: Recalc Leaflets* will clear manual edits unless Cancel is selected**.**

7. **Border Editing:** Right click to specify the coaptation points. Left click and hold to adjust border points, if necessary. (figure 10) Press **Next.**

8. **Papillary Tip Selection:** Mark the papillary muscle tips if visible. Press **Done.**

The default display is **Model.** Choose **Tenting Surface, Min. Surface** or **Leaflets Ap ...**(figure 11). For addition displays, click on **Slices** (figure 12) or **Volume** (figure 13) in the **View** tab. Use "hand" to rotate. The **Tools** tab (figure 14) has display optimization options.
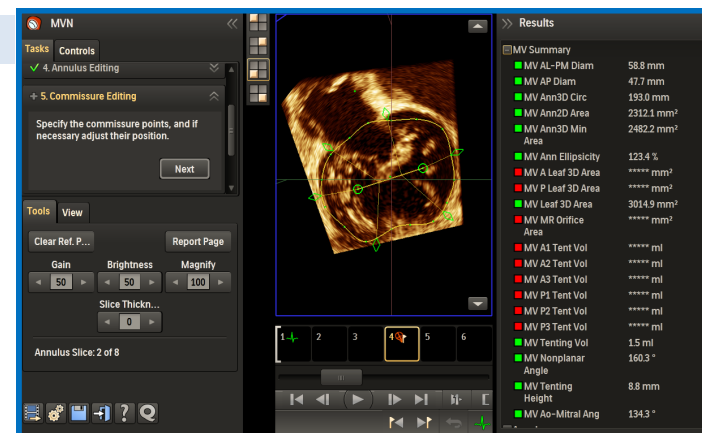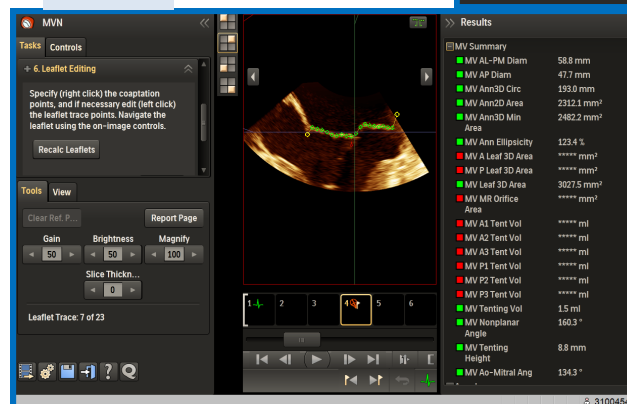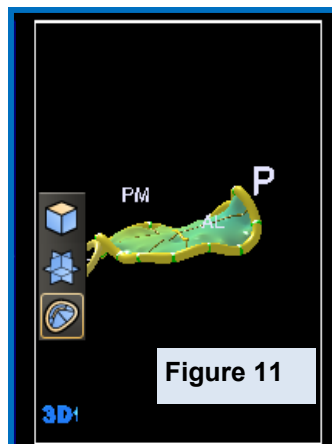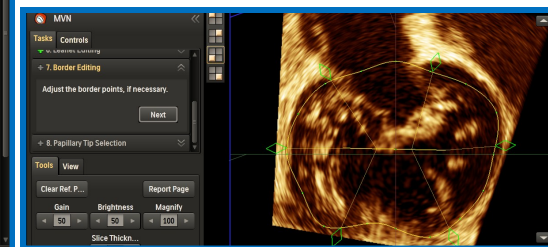
Figure 8
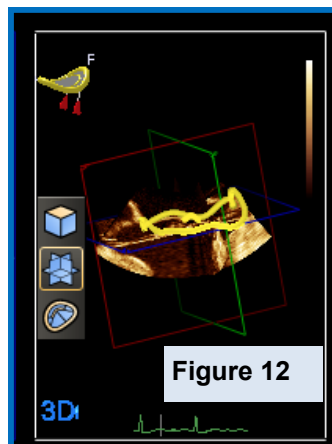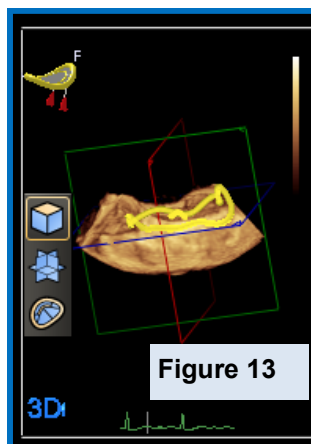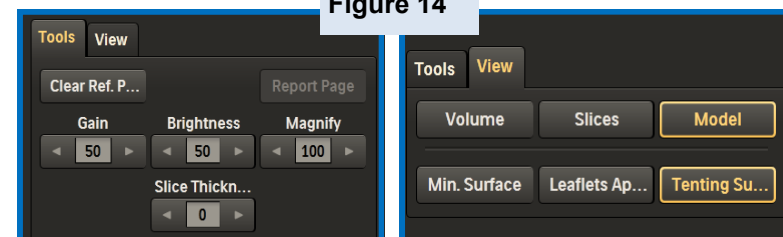
Figure 9

Figure 10

Figure 11

Figure 12

Figure 13

Figure 14

Tools & View Tabs: Located in the bottom left panel.

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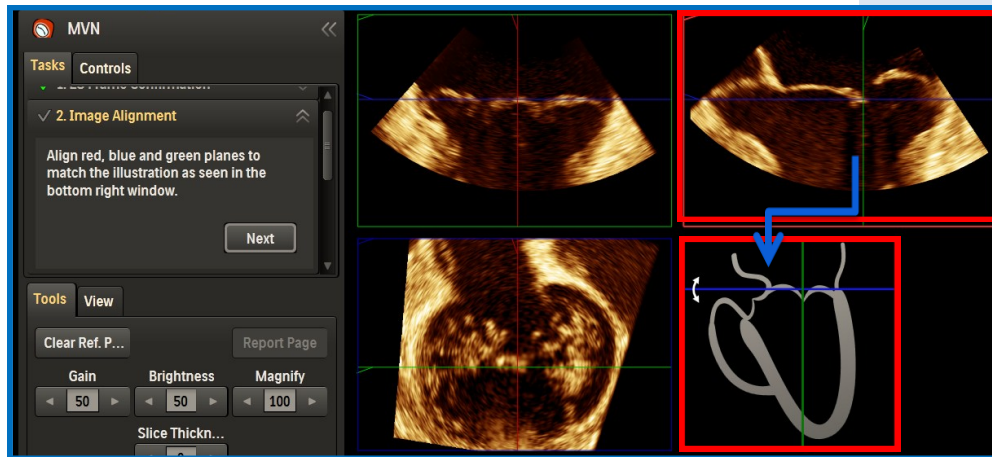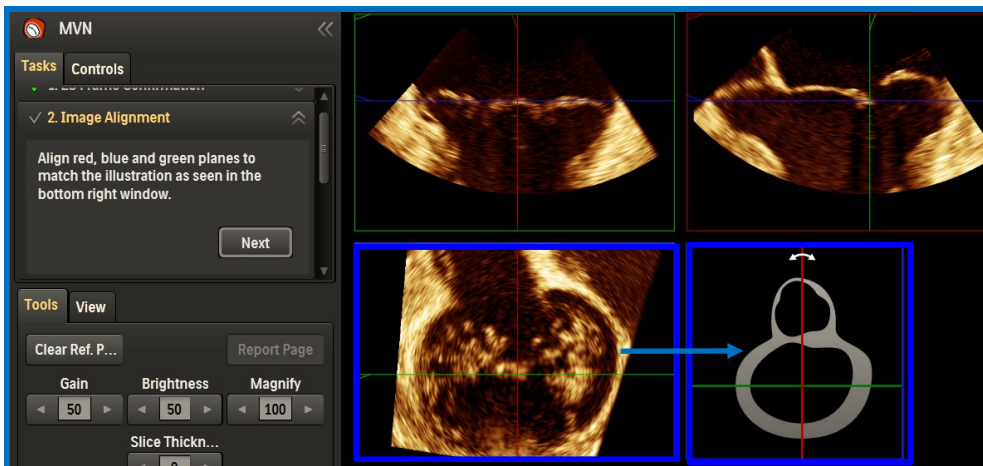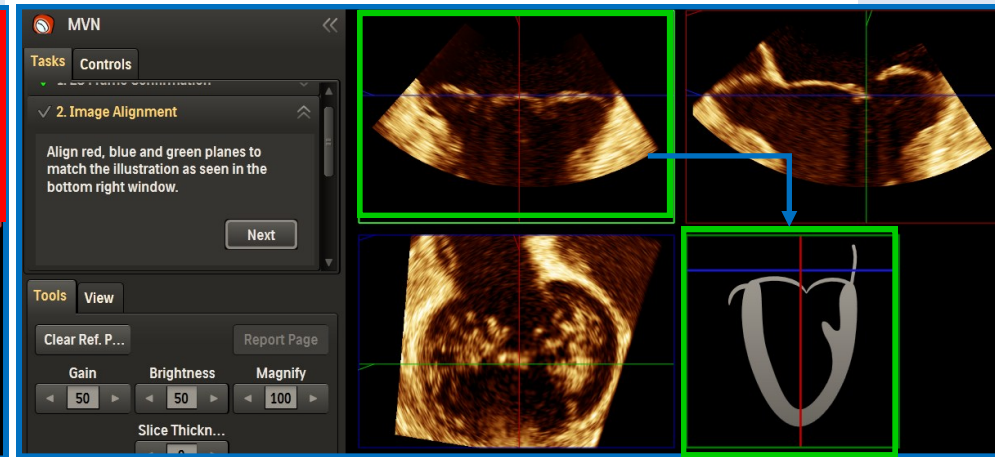The following pages are enlarged images of the figures in the prior pages
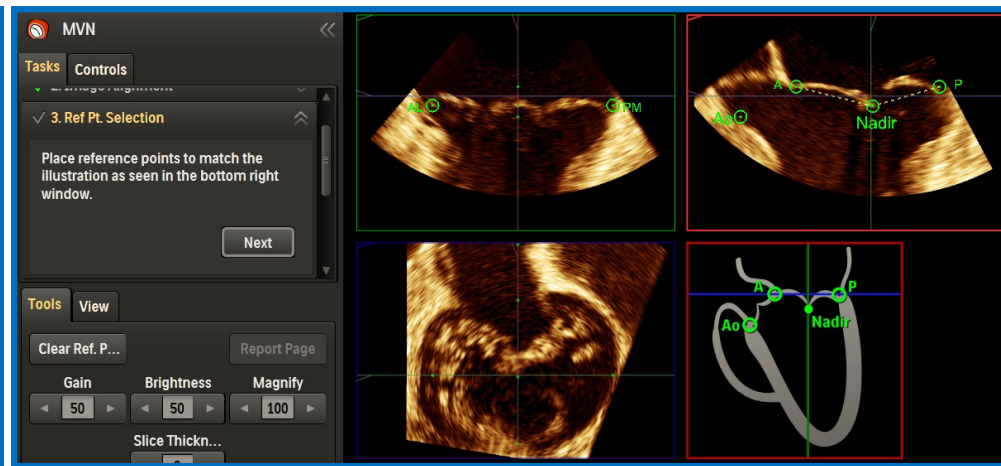

Figure 2

Figure 3

Figure 4

Figure 5
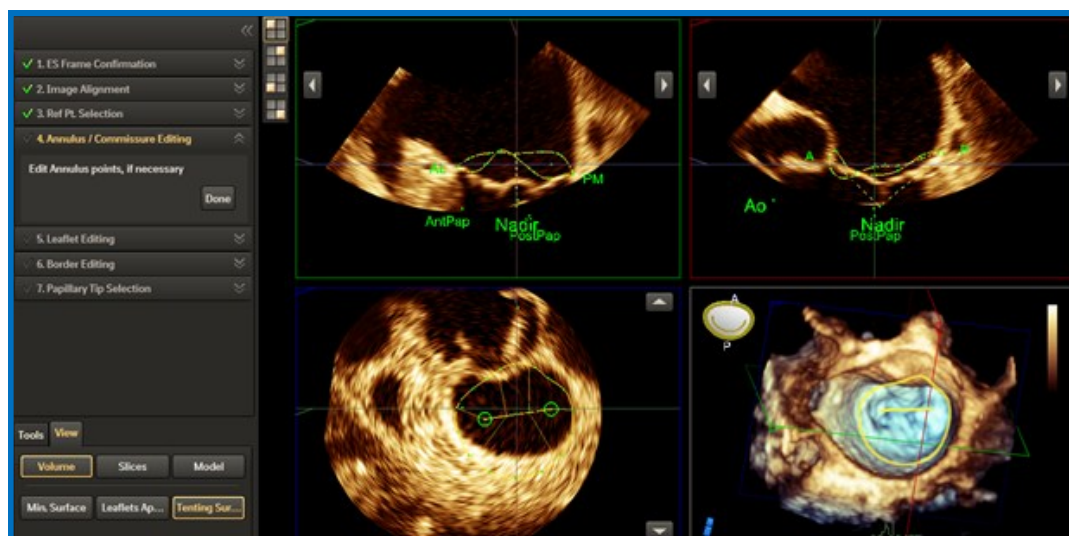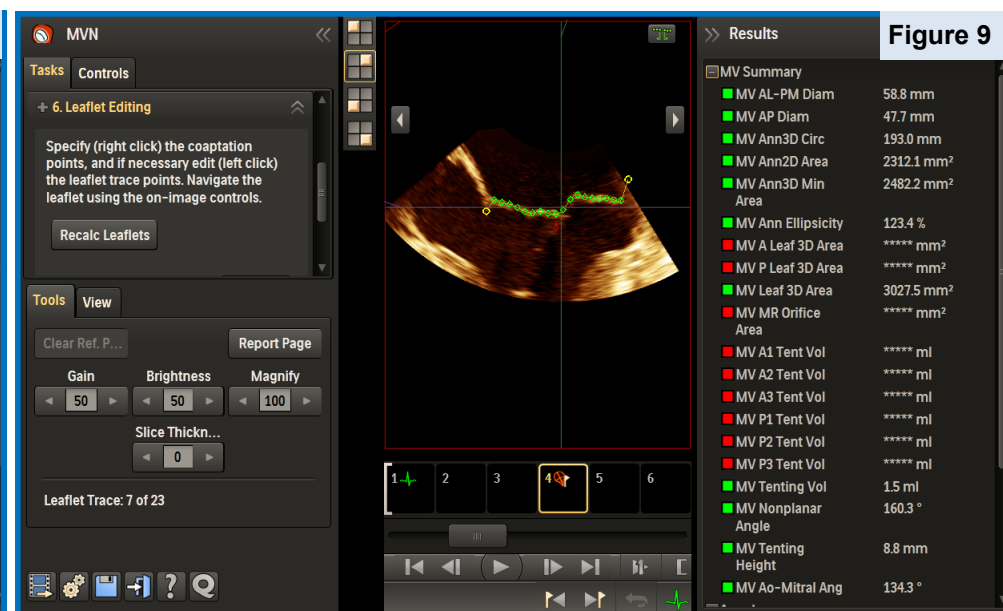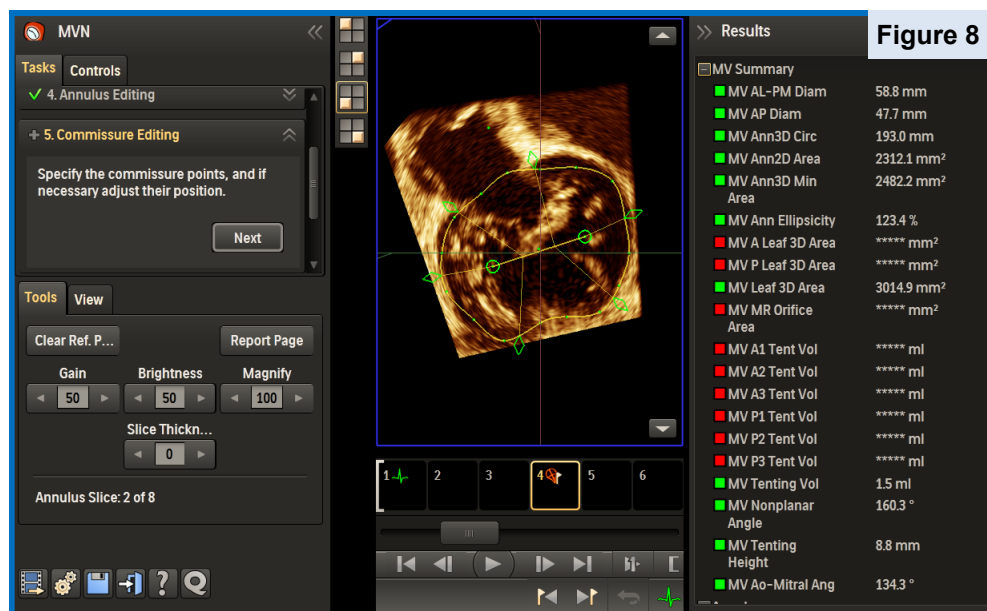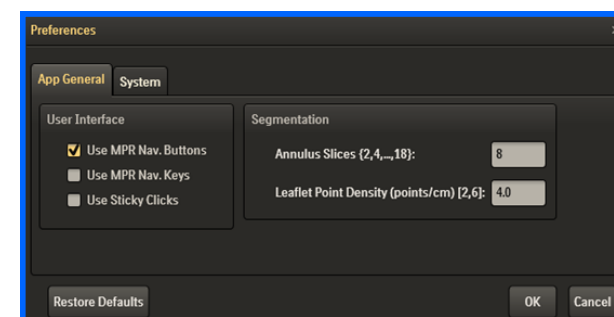
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Figure 8

Figure 9

Example of completed MVN [A.I.] with rotated 3D Volume view

Preference Tabs: Under the App General tab the User Interface and Segmentation options may be customized.

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WOWS: 88% fewer steps to essential mitral valve data. **Speckle** technology improves leaflet tracing and annular tracking .

Demo and Workflow Tips:

- The End Systole frame is automatically selected.

- **Step 4-Annulus Editing pointers**:

  1. Inter-user variability of point placement may cause differences in results. Ensure the annular points are placed on tissue to confirm accurate tracking. Image alignment and reference point placement (A, P AL, PM) are critical in defining the generated annulus. The MVN algorithm checks user point placement against its determination of the annulus location, and if the points are greater than 5mm beyond where the algorithm thinks the annulus is, then the algorithm defaults to the user point location. So a small difference in point placement can lead to different results for the same image. Reference data in a published paper shows how users of all levels can look at the same image but see very different locations and shapes for the annulus.

  2. Rotate the 3D model to confirm annular shape.

- Once annulus is defined, the annular border overlay on the short axis view will not necessarily follow the exact shape of the annular anatomy in that view, because the annulus is generally not flat. View the long axis views in the red and green plane to confirm accurate annular point placement. The blue plane is only for **Image Alignment** in Step 2, do not use blue plane as reference in Steps 3 and 4.

- After Completion of Step 4, point out the Results in the Right Panel. Rotate the volume to "en face" and hover over the results. An outline/overlay will display with results. For Example: **MV Ann 2D Circ.** acts like a "virtual sizing Tool". This is very useful for guidance in selecting the correct annular sizing for mitral valve procedures.

- **Steps 5-7** are optional, typically for advanced users. However, clinicians that perform these steps will find them much e*asier* with less editing needed due to leaflet speckle tracing.

- To Clear Reference Points click on Tools tab (bottom Left Panel) click on "Clear Ref…"

- To Reset dataset click on Controls tab (top Left Panel) , then Click on **Reset MPR.**