# 3D Workshop
# TTE Valve imaging

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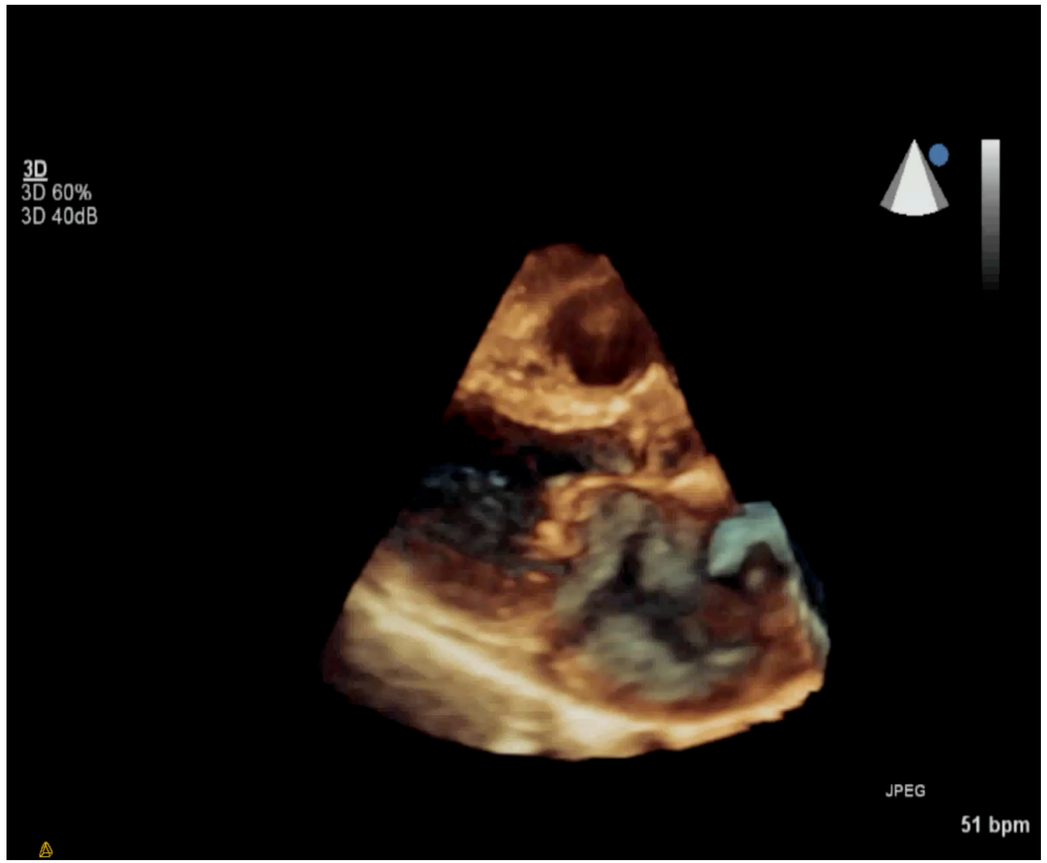
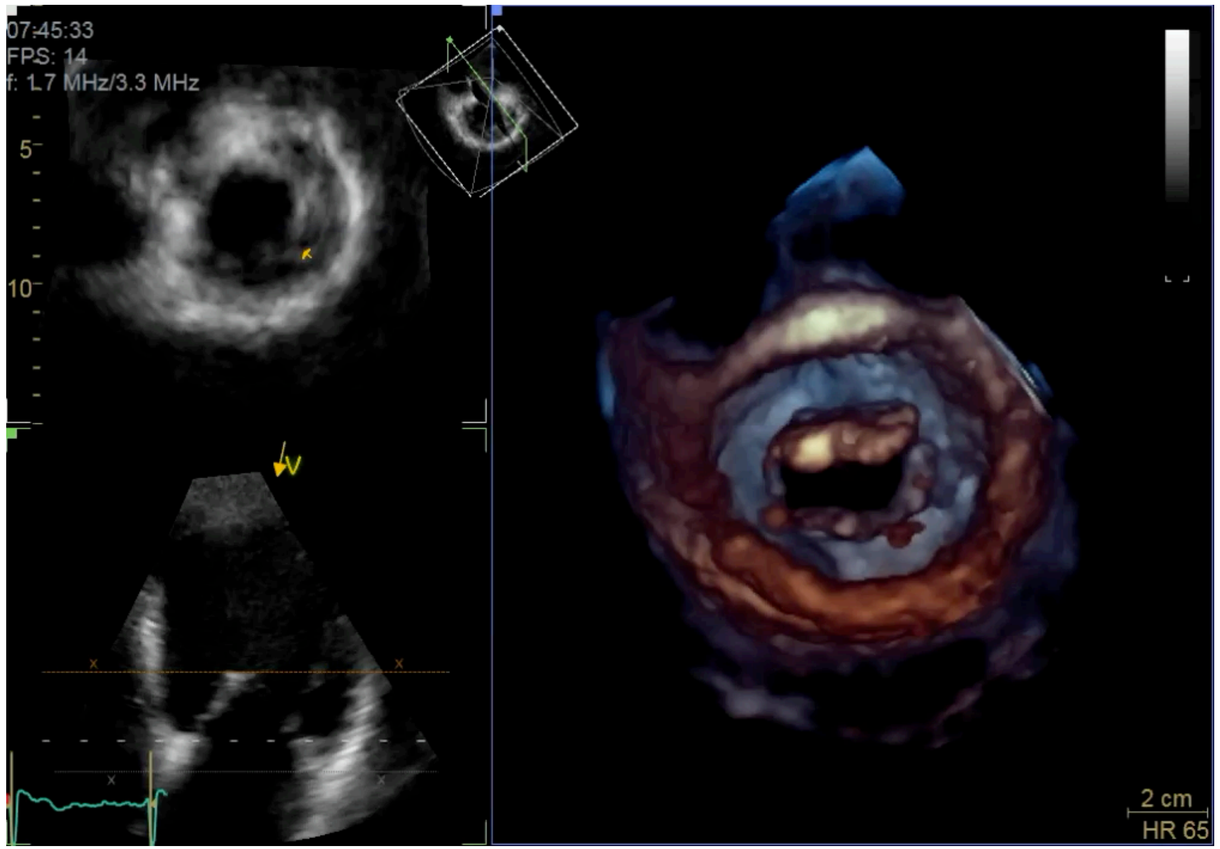
Disclosures: Caption Health, Bristol Myers Squibb (honorarium)

# Mitral Valve imaging



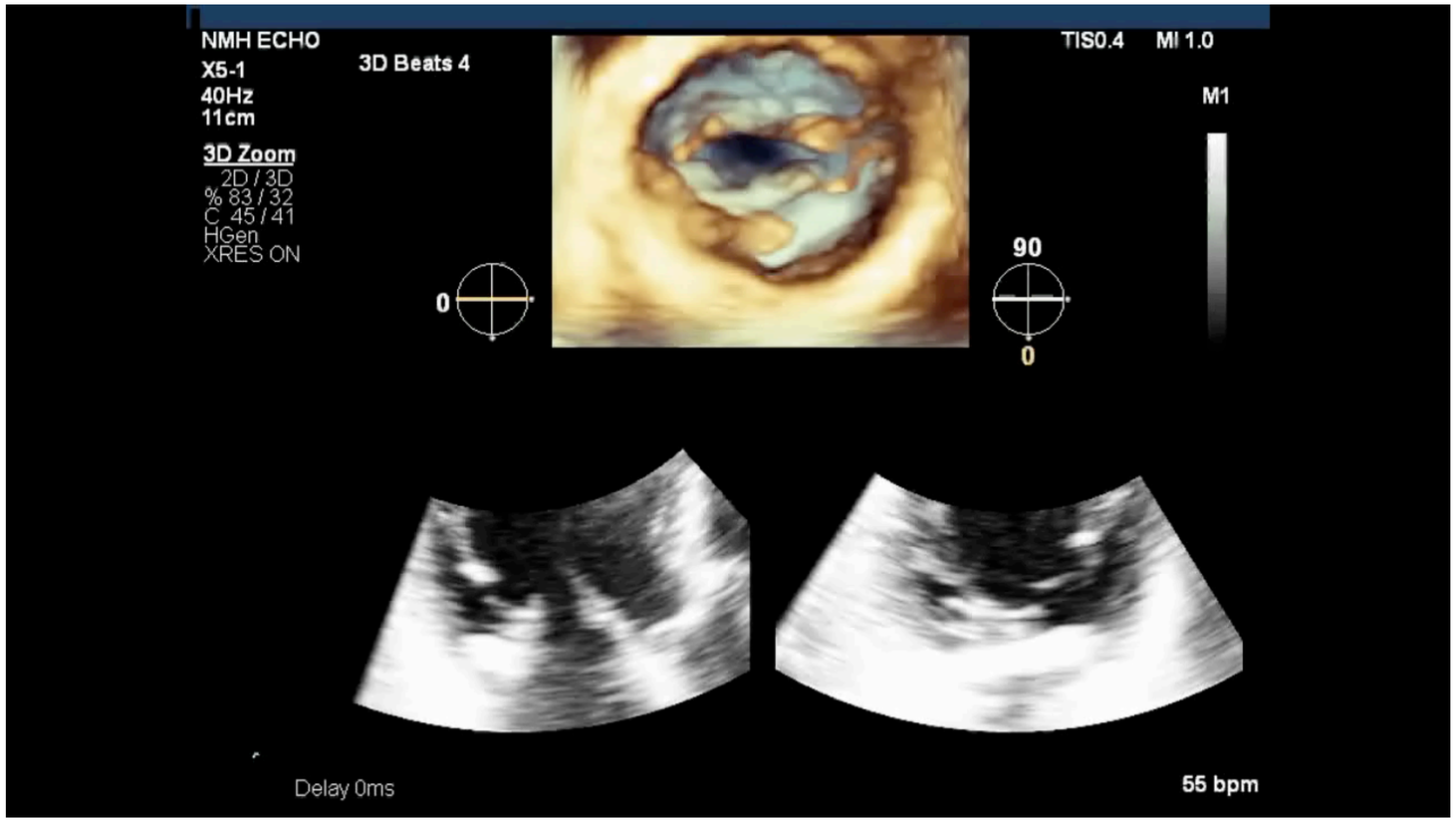

Mitral Stenosis



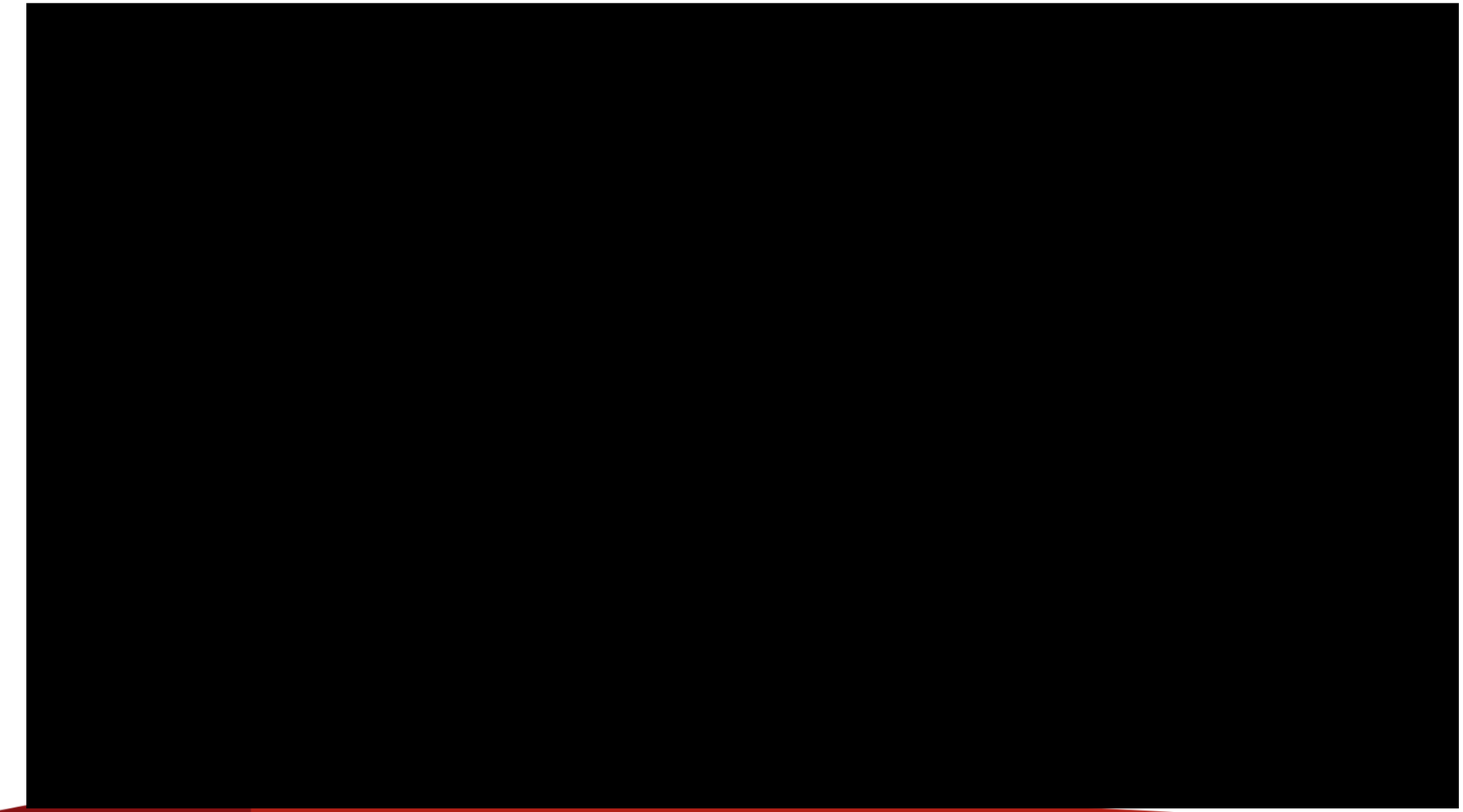

Mitral Regurgitation

# Components of a 3D volume

- *Which 3D tool should I use?*
  - For valves, consider 3D zoom
  - Use multi-beat acquisition if applicable - improves frame rate
- *What should I include in my volume?*
  - Mitral valve - seeing annulus and leaflets throughout the cardiac cycle
  - Surrounding structures for orientation



# “Check for stitch, you will” - Yoda



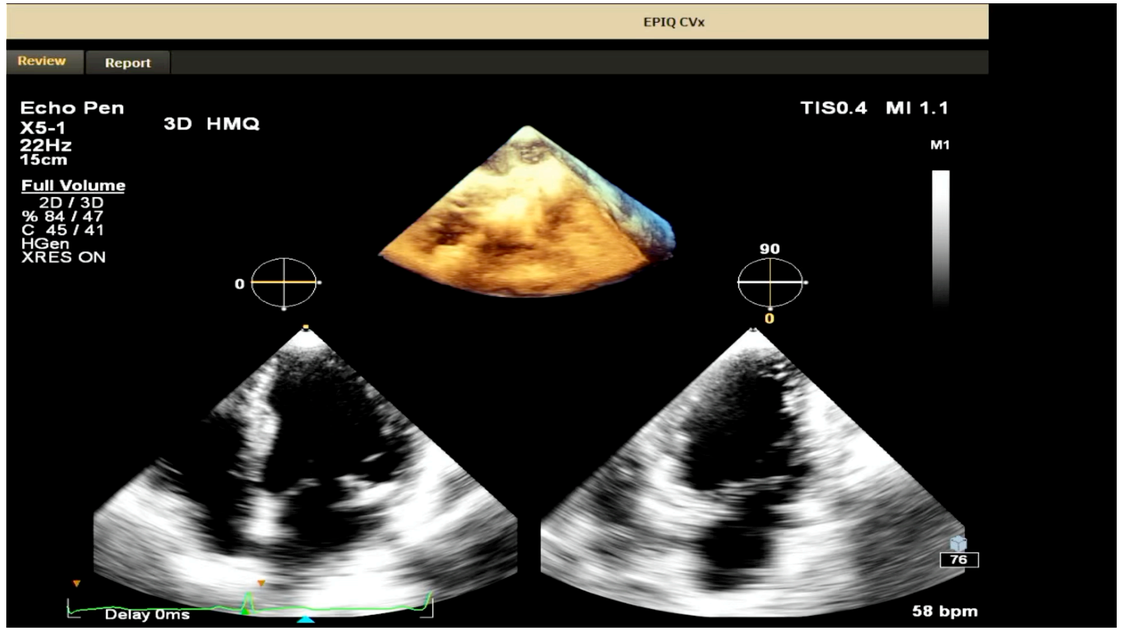
## Steps:

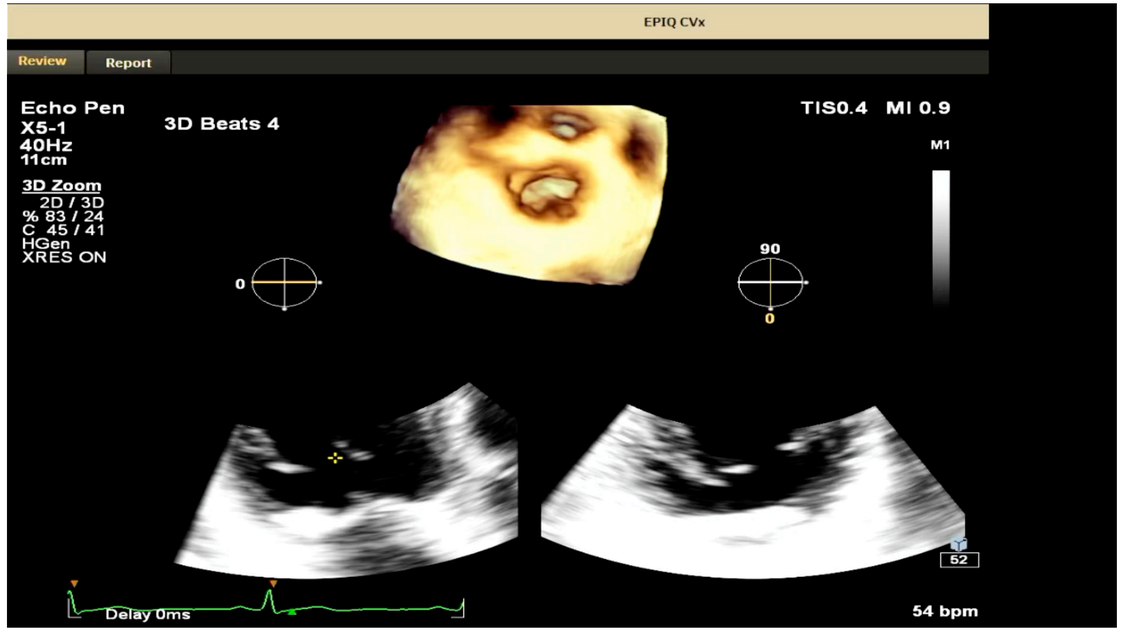
- Rotate the image towards you
- Use cropping tool to fan through the volume

# Adjusting 2D and 3D gain


- *Adjusting 2D gain*
  - Slightly over gain on acquisition - can always take out but hard to put back in
  - Will allow for more leaflet visualization
  - Adjust TGCs in location of valve
- *Adjusting 3D gain*
  - Post-processing can adjust 3D gain to develop the depth in the image
  - Can also help with decreasing “smoothness” of the volume

# Focused cropping



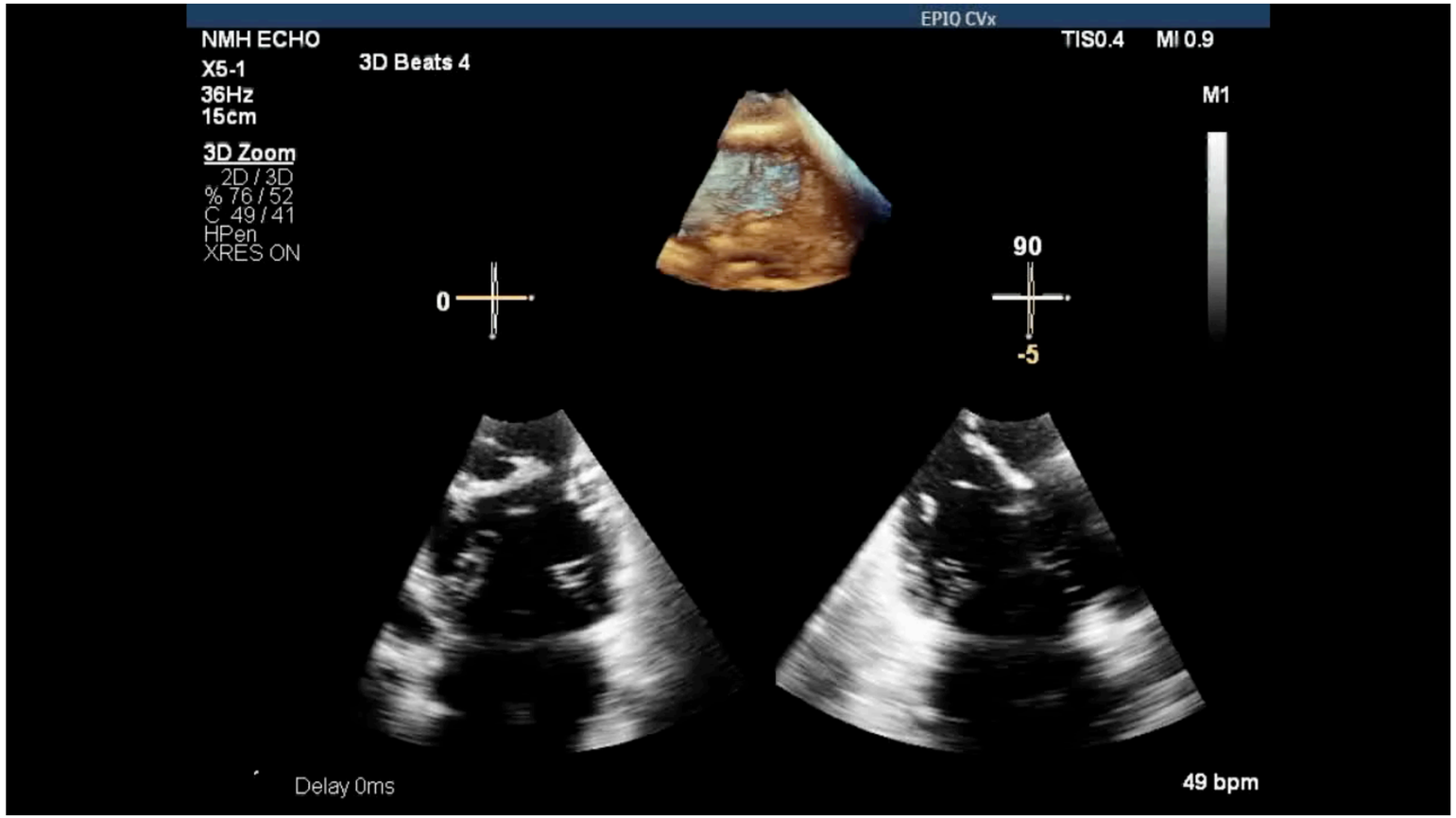
# Cropping the MV and MV orientation

- *Tips on performing MPR*
  - Lock planes so they stay orthogonal to one another
  - Use reference planes to understand orientation and location
  - View short axis plane to view valve en-face
  - Viewing MV from LA gives most information
  - Rotate MV to standard orientation - anterior leaflet/ AV on top (both ventricular or atrial perspective)

# 3D MV with color Doppler

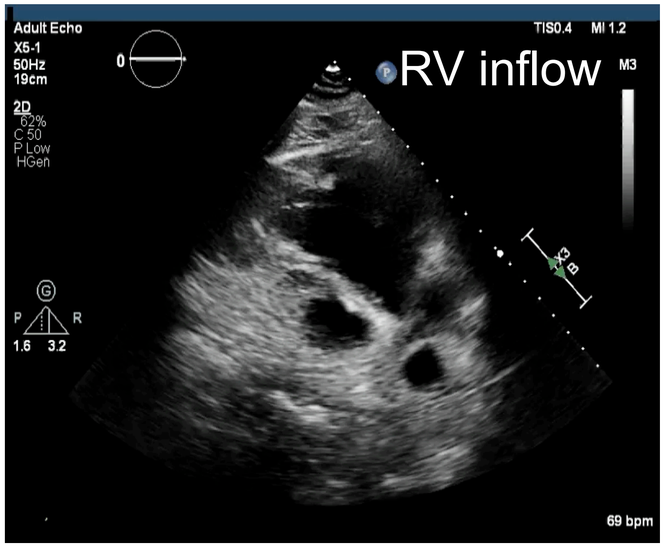
- Any 3D tool can be used with color
- Before acquisition:
  - Adjust color box in both planes to encompass the lesion
  - Adjust color line density if necessary - may bring in jet better
- Post processing:
  - Crop from atria to visualize origin and mechanism of jet
  - Adjust color transparency to see anatomy behind it
  - Rotate to standard orientation

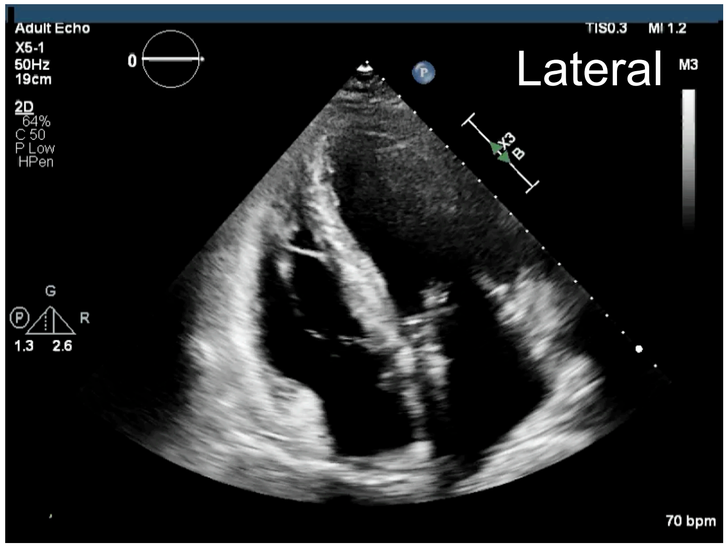
# Tricuspid Valve imaging

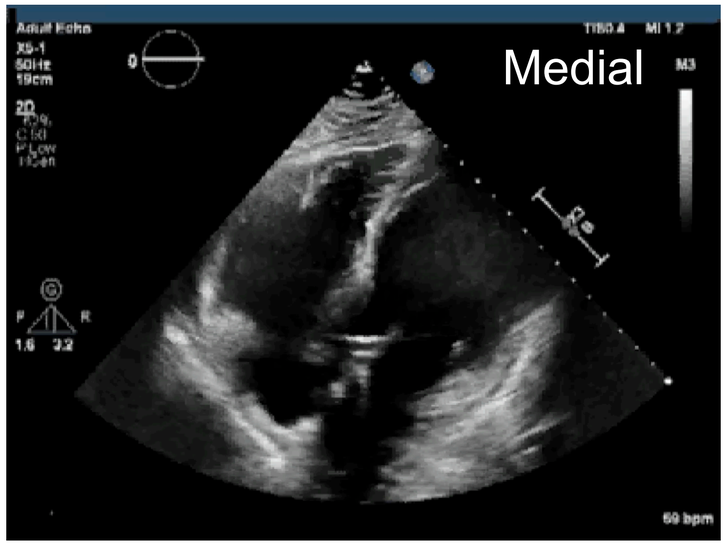


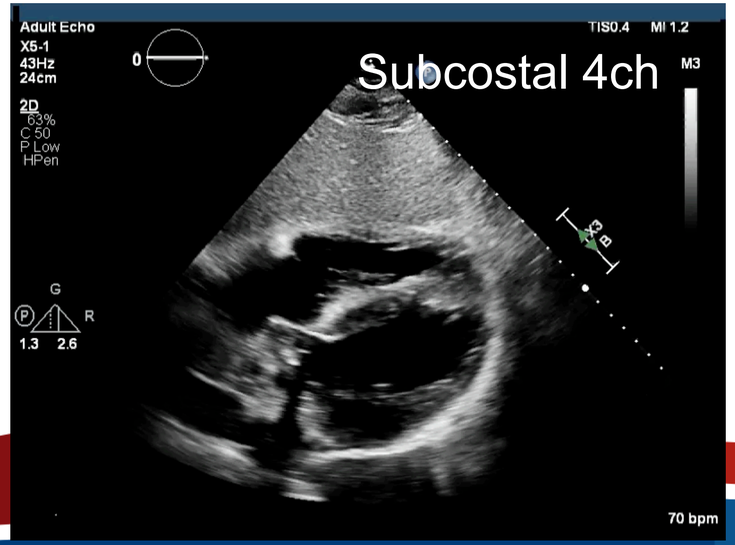

- ***What should I include in my volume?***
  - **Tricuspid valve - seeing annulus and leaflets throughout the cardiac cycle**
  - **Surrounding structures for orientation**
- ***Which view should I use?***
  - **Wherever you can see the valve the best**
  - **Unlike LVEF, does not rely on volumes so off axis images OK**

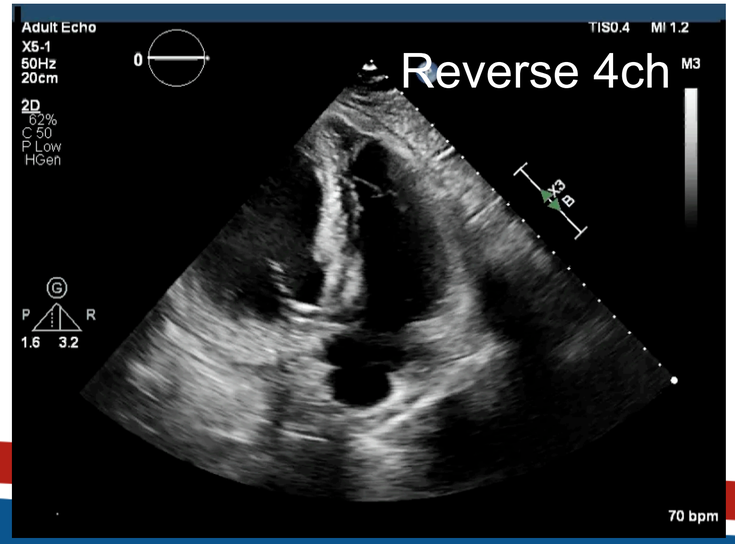
# Using multiple windows

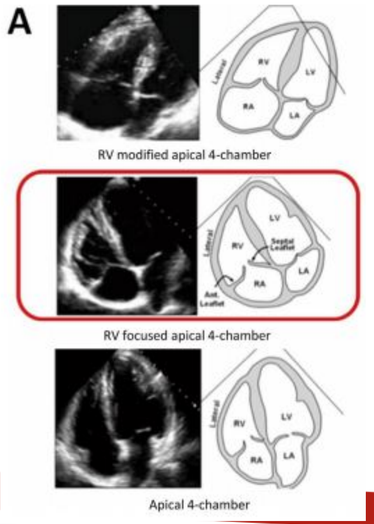
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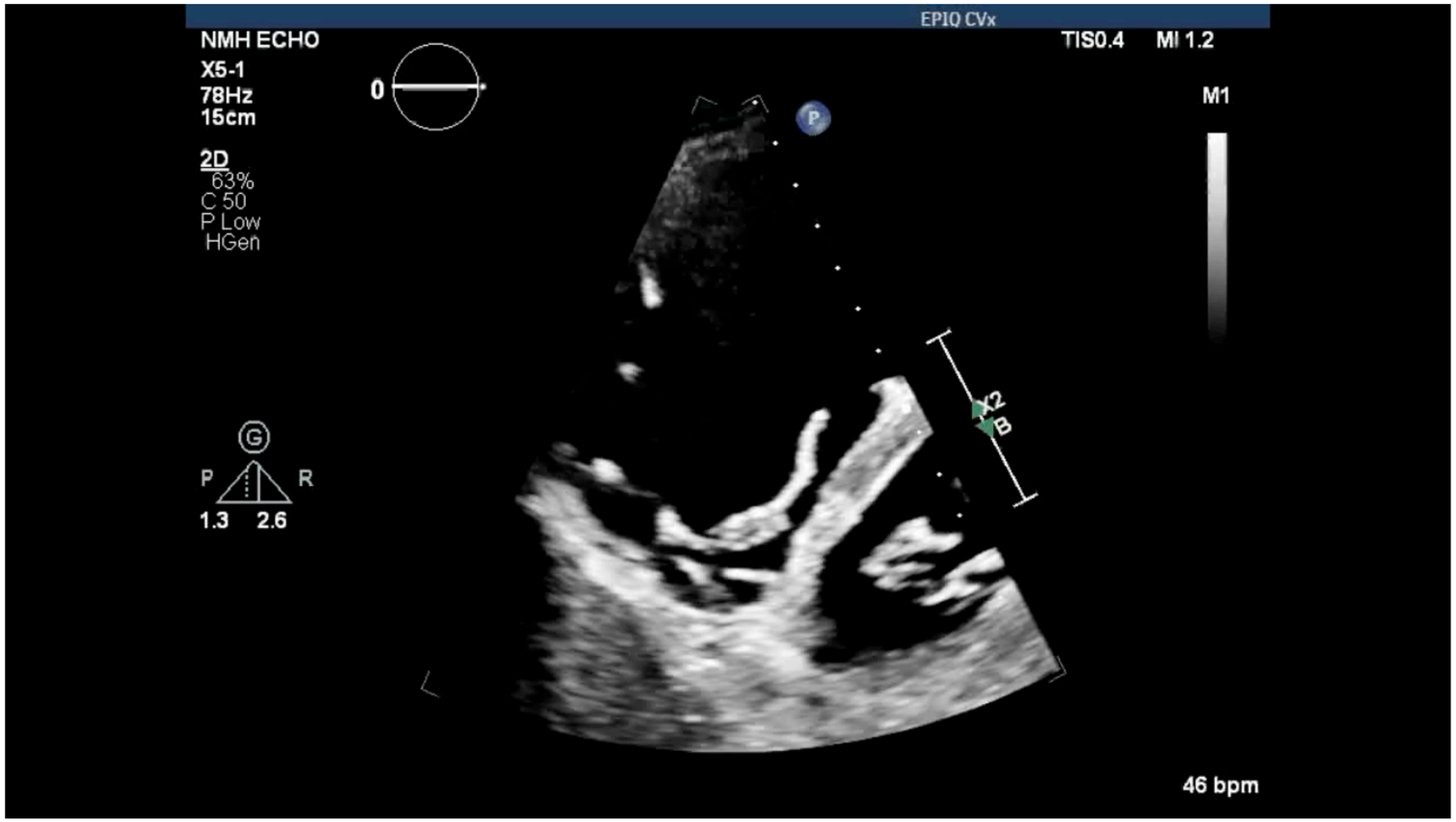
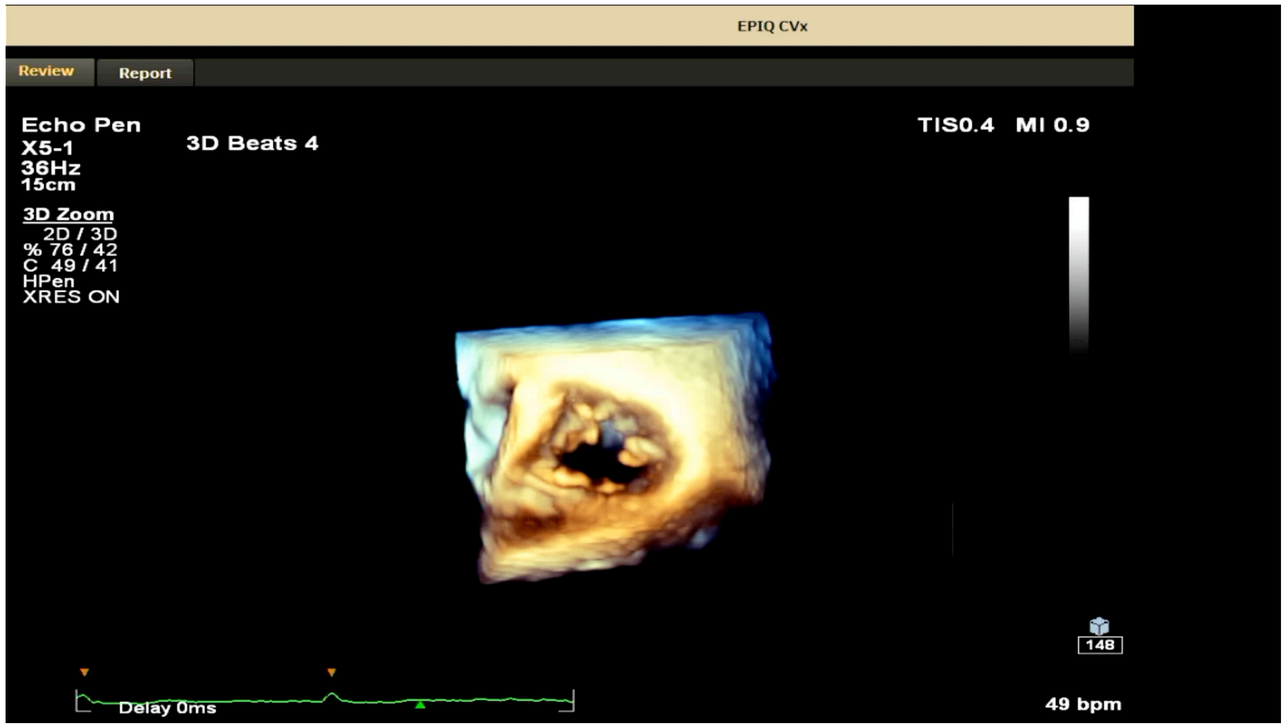
# What does 3D valve imaging add to my TTE exam?




- Valve anatomy
- Relationship to other structures
- Ventricular *and* atrial perspective
- Allows rotation and visualization of hard to see structures

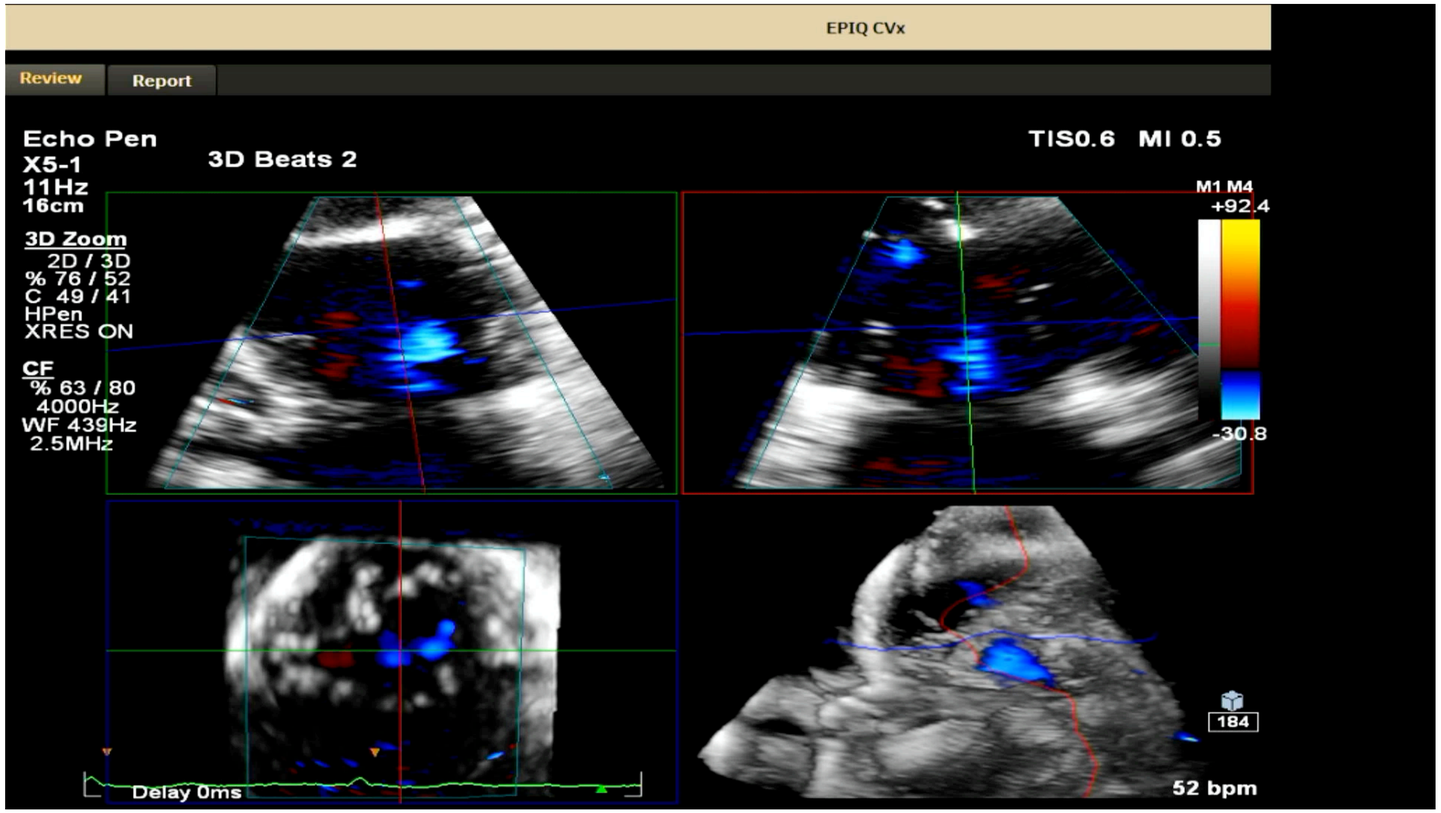
# TV orientation

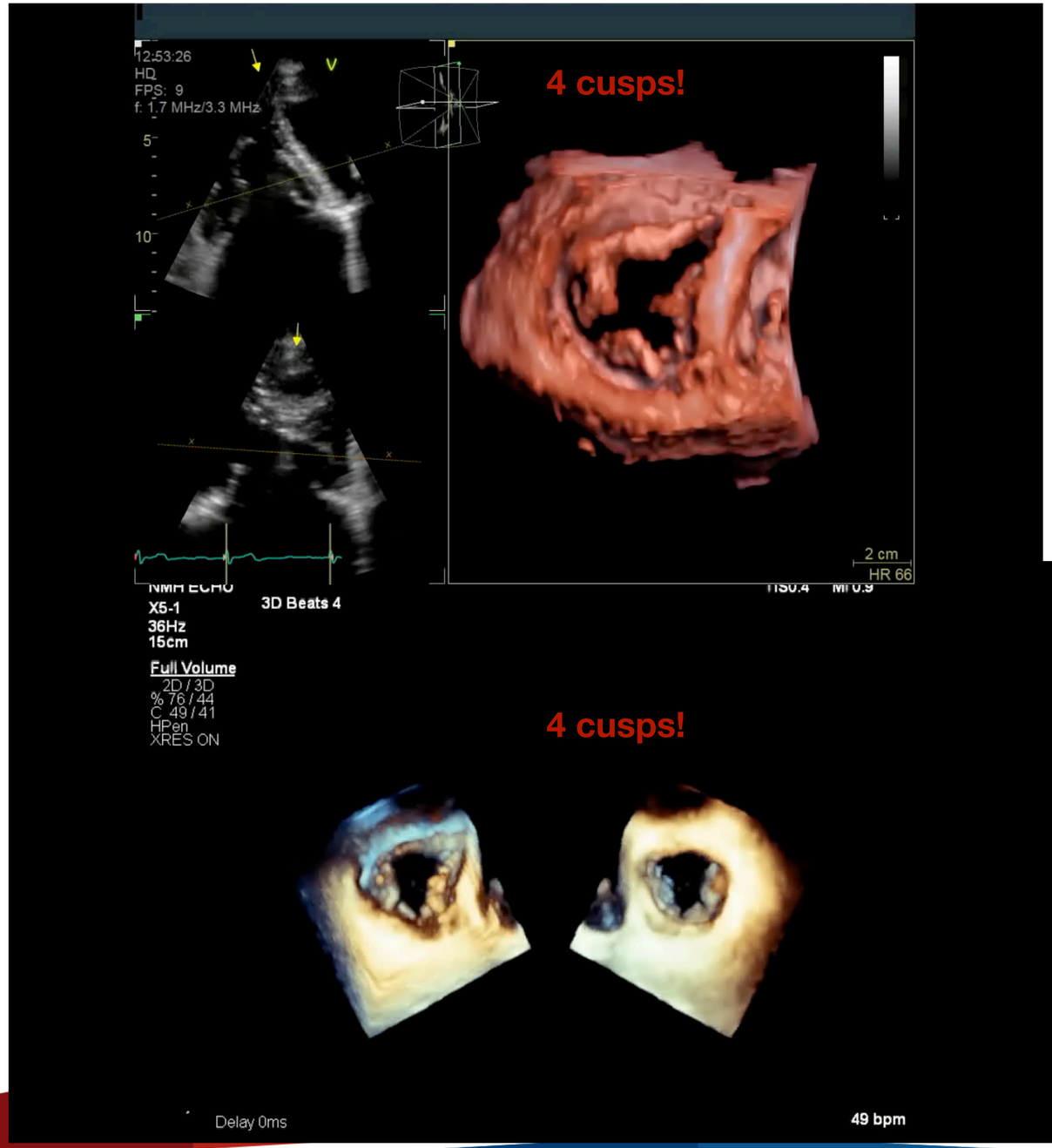


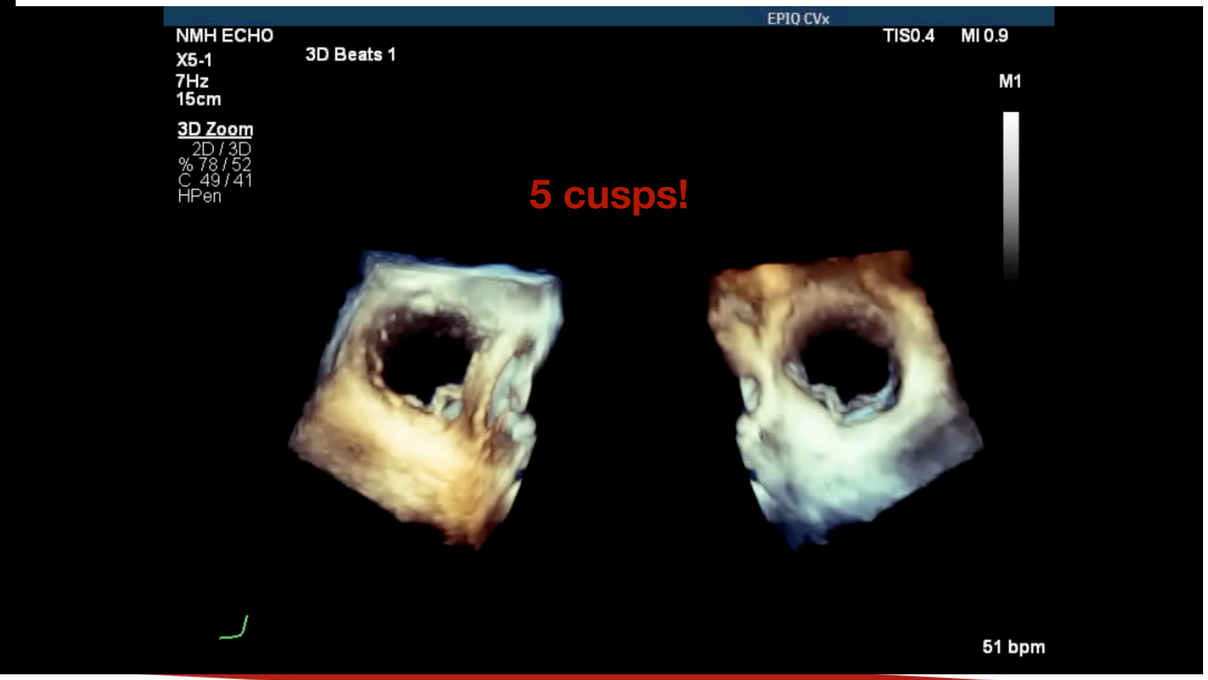

- After cropping, rotate to standard orientation before saving
  - ASE/ESE guidelines suggest septal leaflet to 6 o'clock
  - Interventional cases use septal leaflet at 3 o'clock, AV at 5 o'clock
  - Make sure to establish in your institution
- VERY important to ensure consistency

# Using MPR to measure PISA

- Lock planes - keeps planes orthogonal to one another
- Scroll through the cardiac cycle to the peak velocity (higher frame rate, more frames to choose from)
- Adjust cross-sectional line across leaflet tips and longitudinal lines through the valve
- Utilize “hide color”
- Can measure biplane PISA radius or trace EROA in the short axis view



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# Mahalo!