

# ACUSON Sequoia Ultrasound System

3D/4D Ultrasound Imaging Technology in OB  
(VB10)

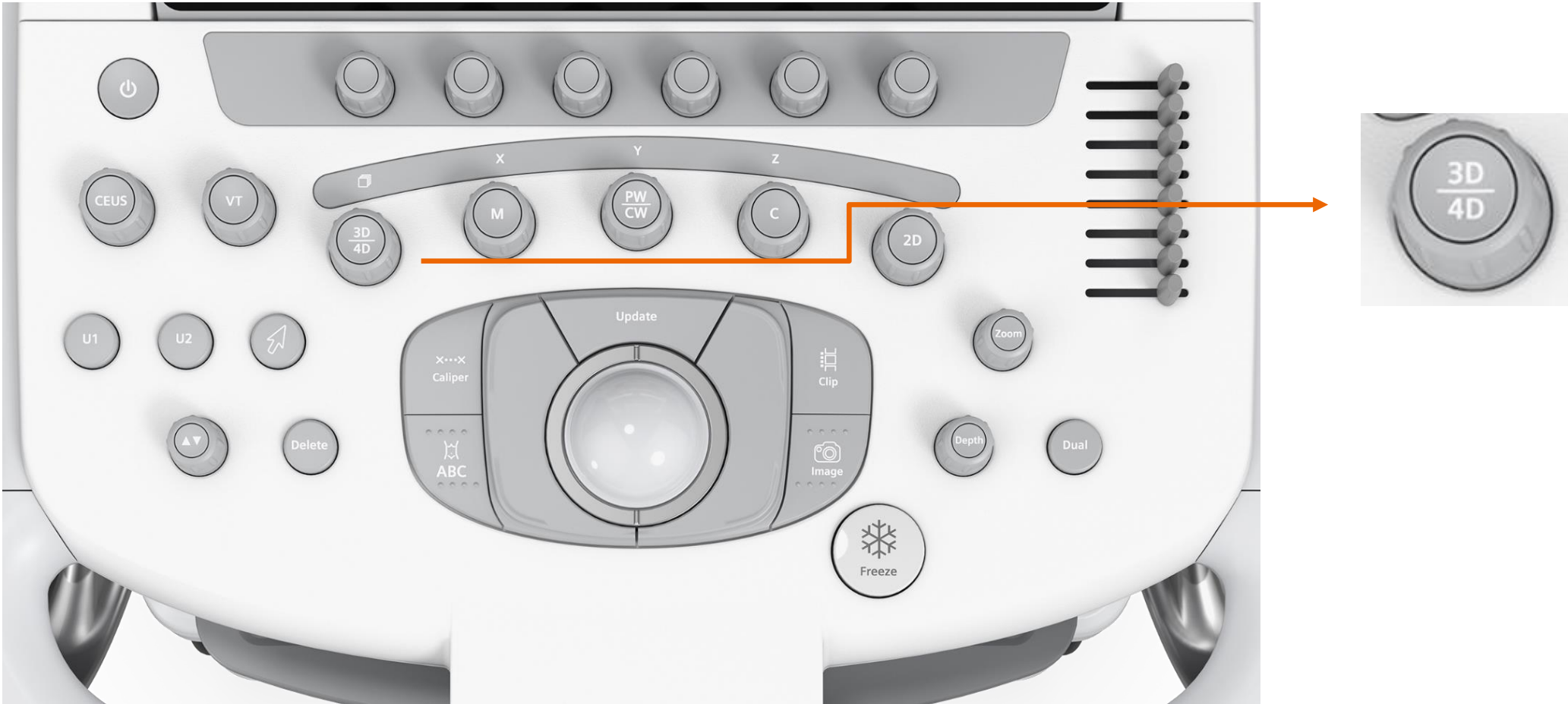


# Objectives

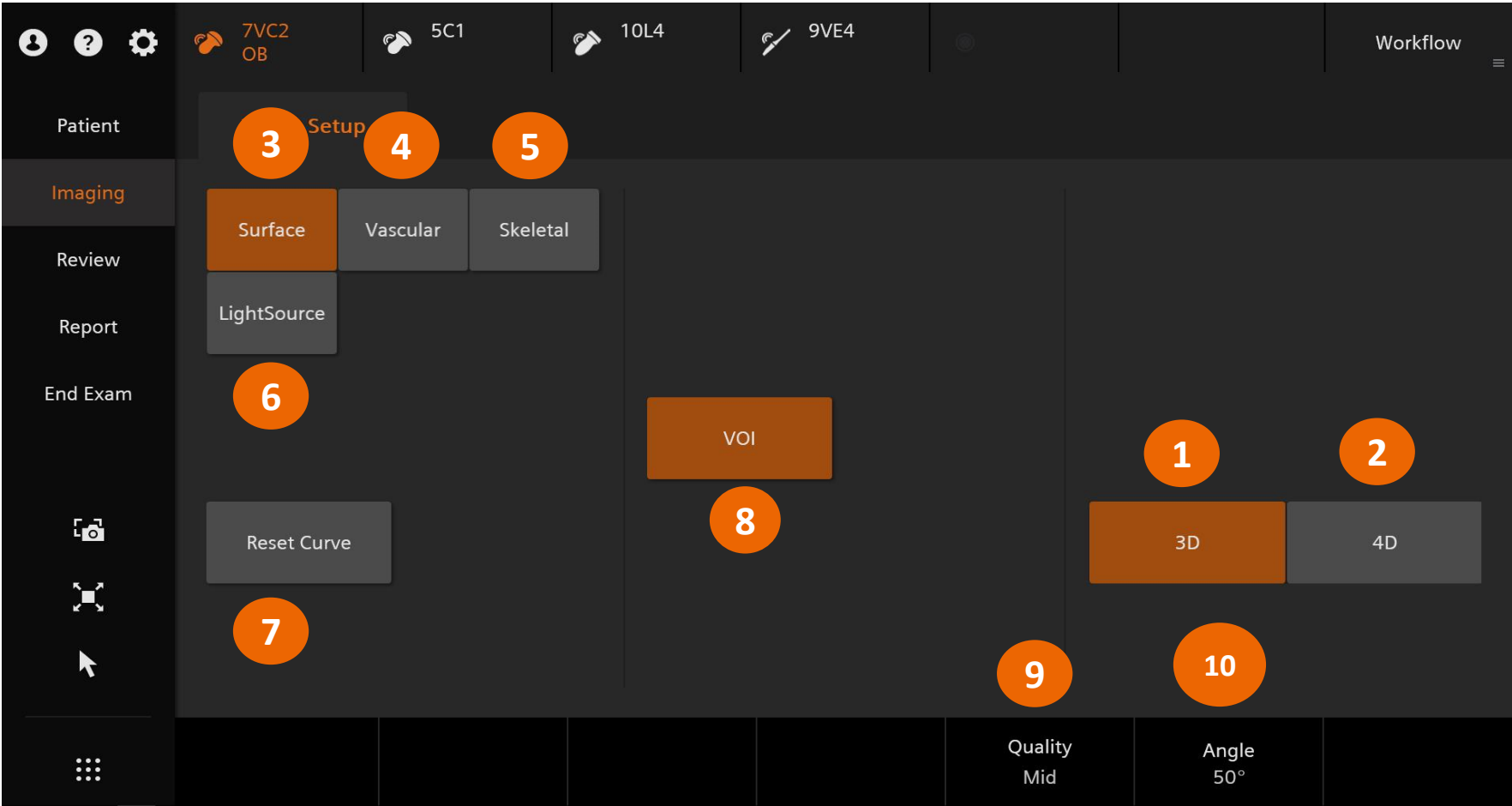
- **Outline activation and volume acquisition**
- Describe volume manipulation
- Demonstrate optimization tools
- Explain FlexPlane Tool
- Explain Multislice feature
- Define volume store and editing
- Describe reviewing stored volumes



# Activate 3D/4D



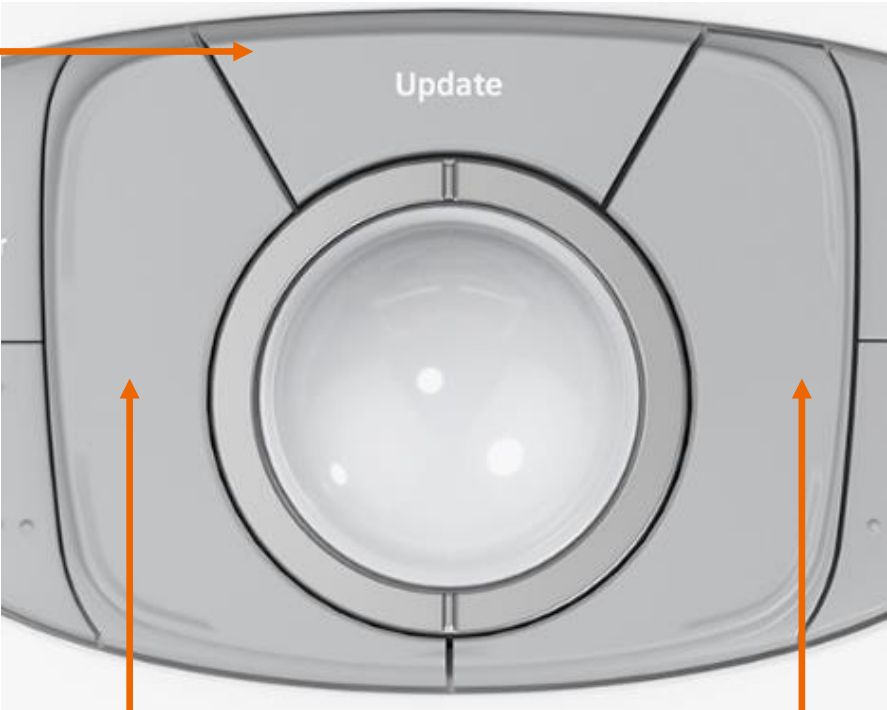
# Touch Screen



# Home base

**Update**

Starts acquisition



**Set**

Size, position and  
curve of the ROI/VOI



Home Base Display

# Volume monitor layout



7VC2  
OB  
TIB:0.48  
TIC:1.27  
TIS:0.48  
MI:0.66  
4.5vps  
95%  
4D  
0dB/DR65  
Q Mid  
V 50°  
Th60  
Op72  
S3  
Br0  
Con60  
MPR:  
MapD/T5  
Vol:  
MapA

Volume Imaging parameters

Volume display field

Home Base display

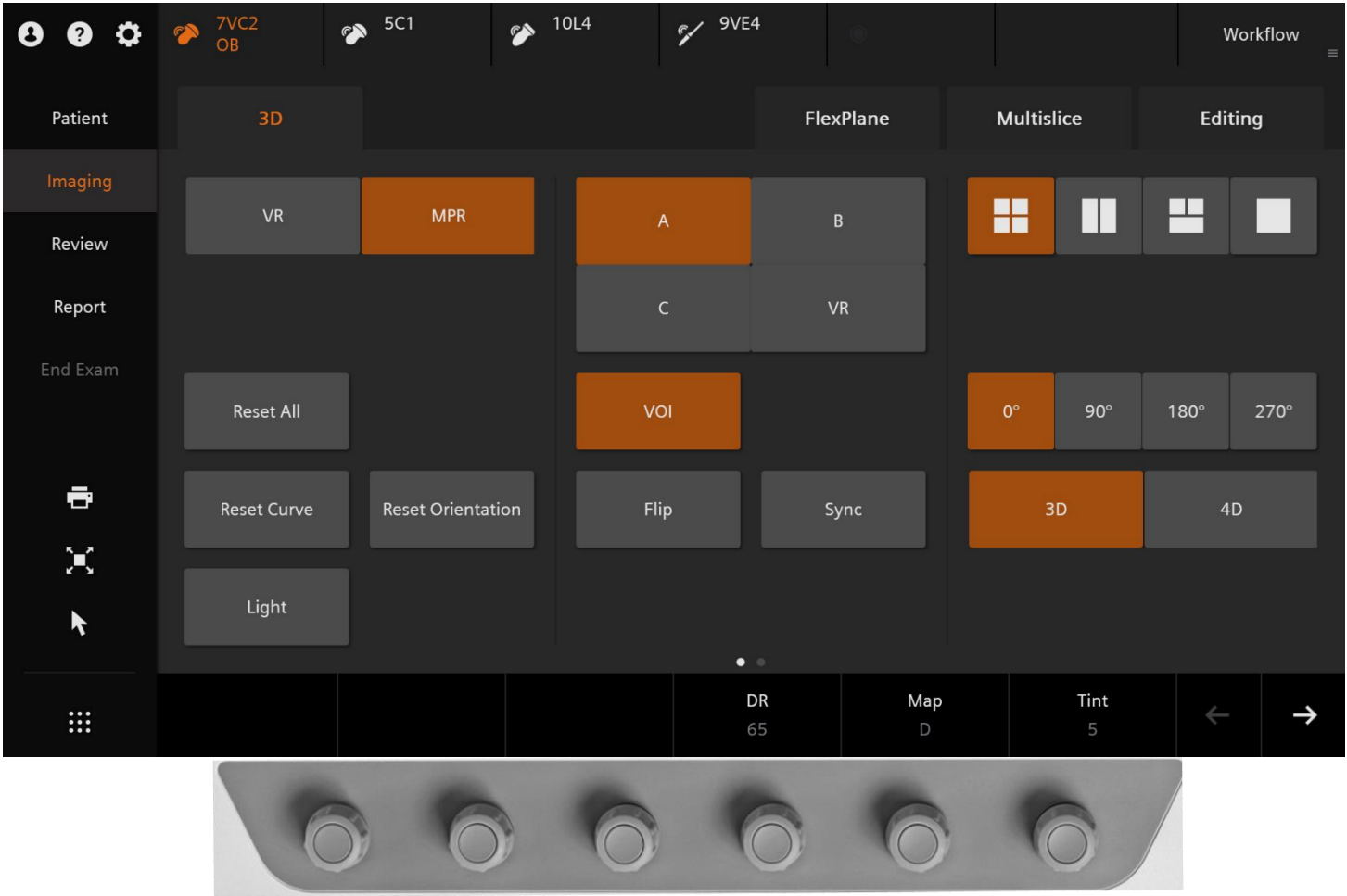


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- Outline activation and volume acquisition
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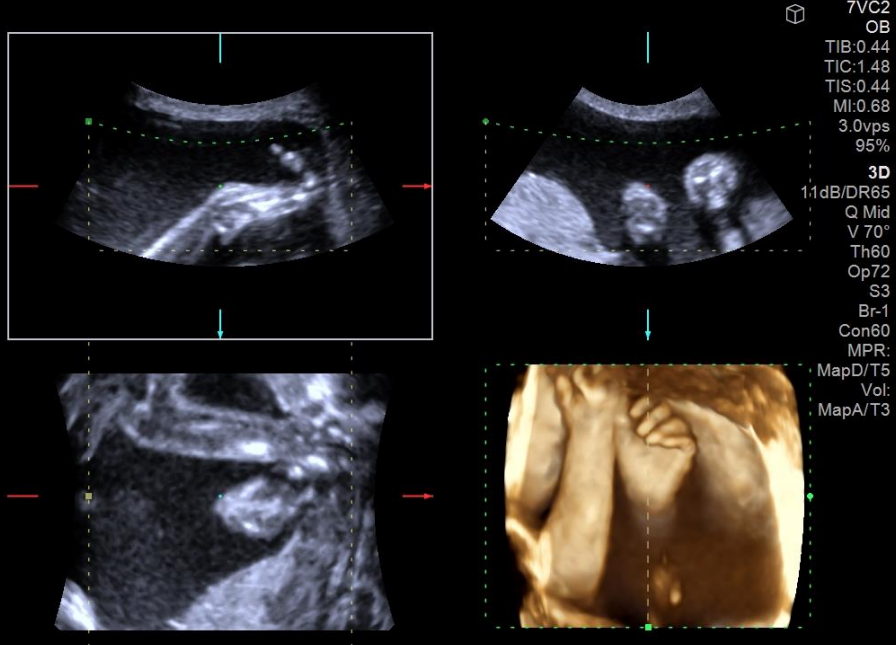
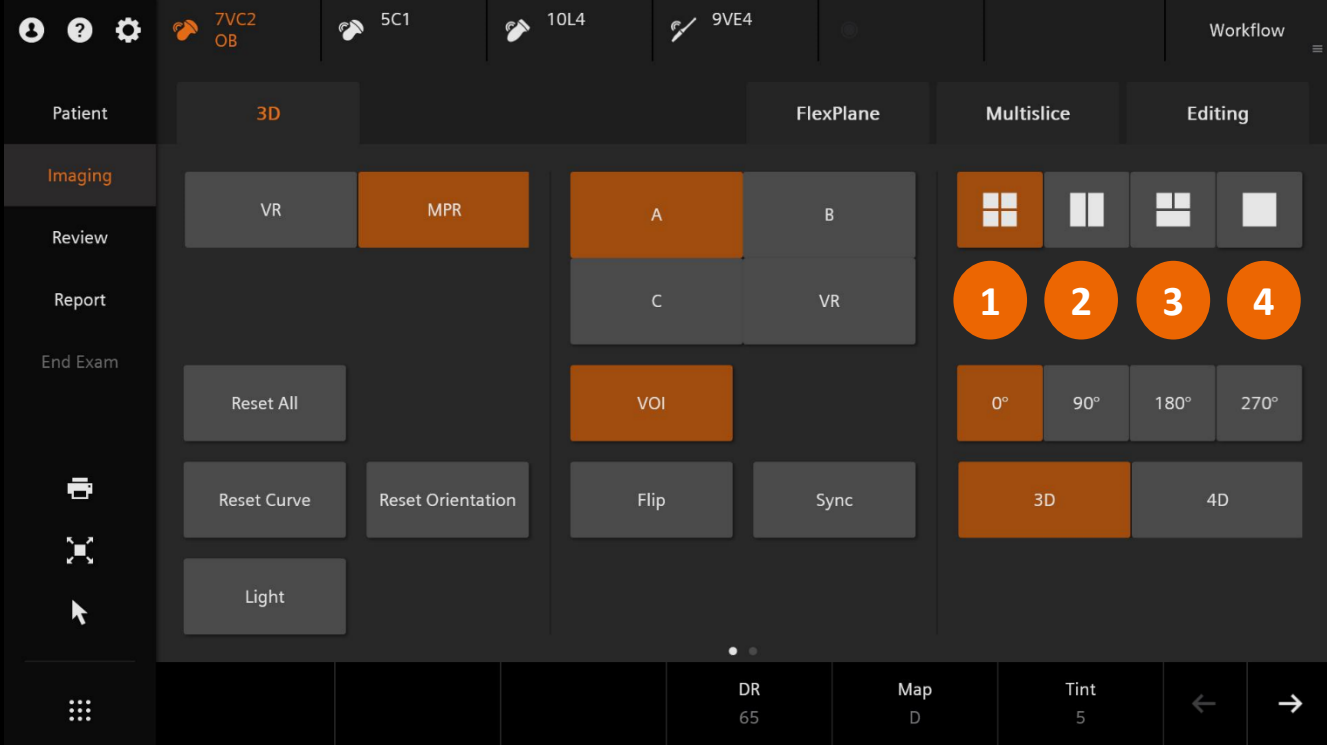


# Volume Touch Screen



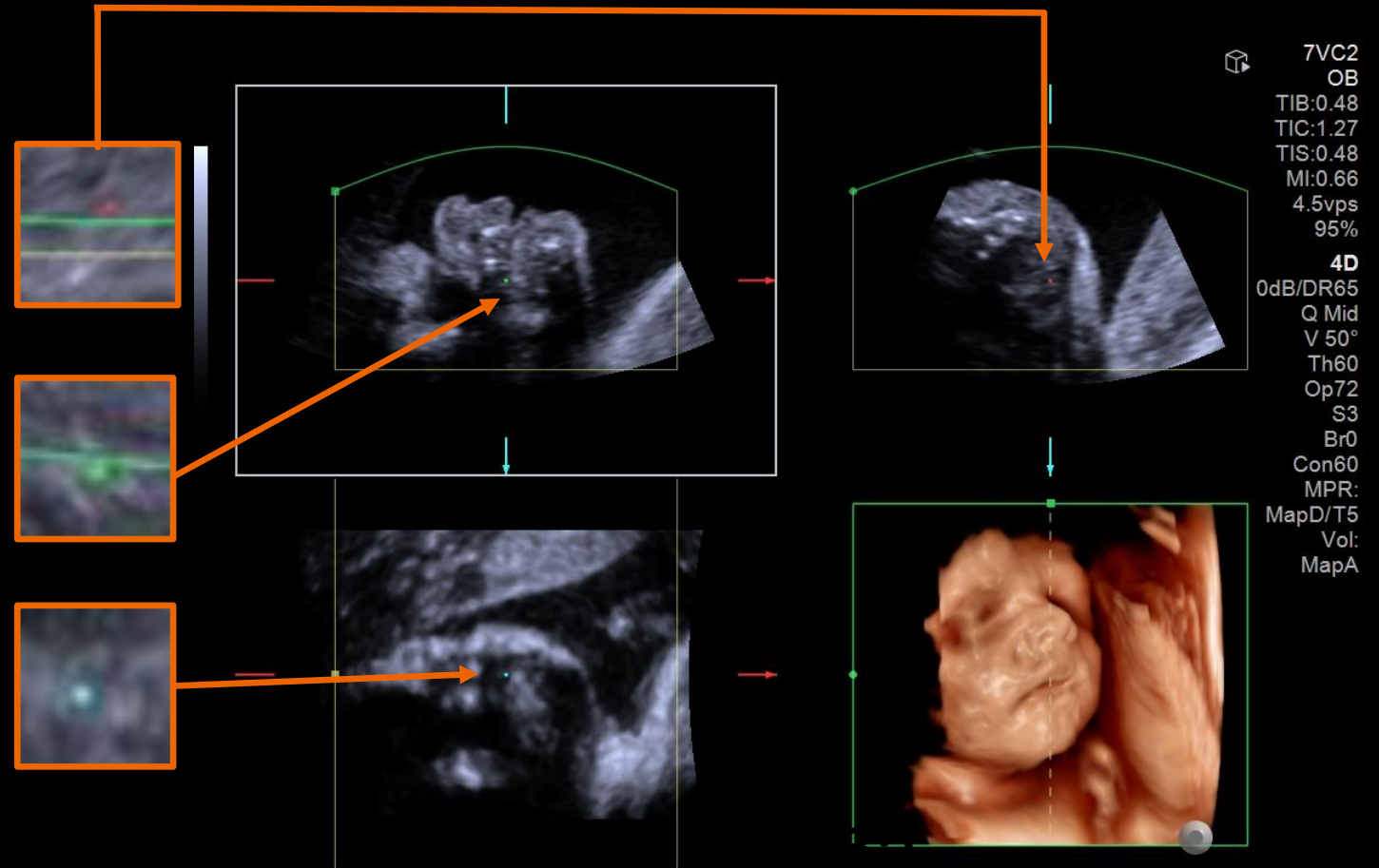


# Display format

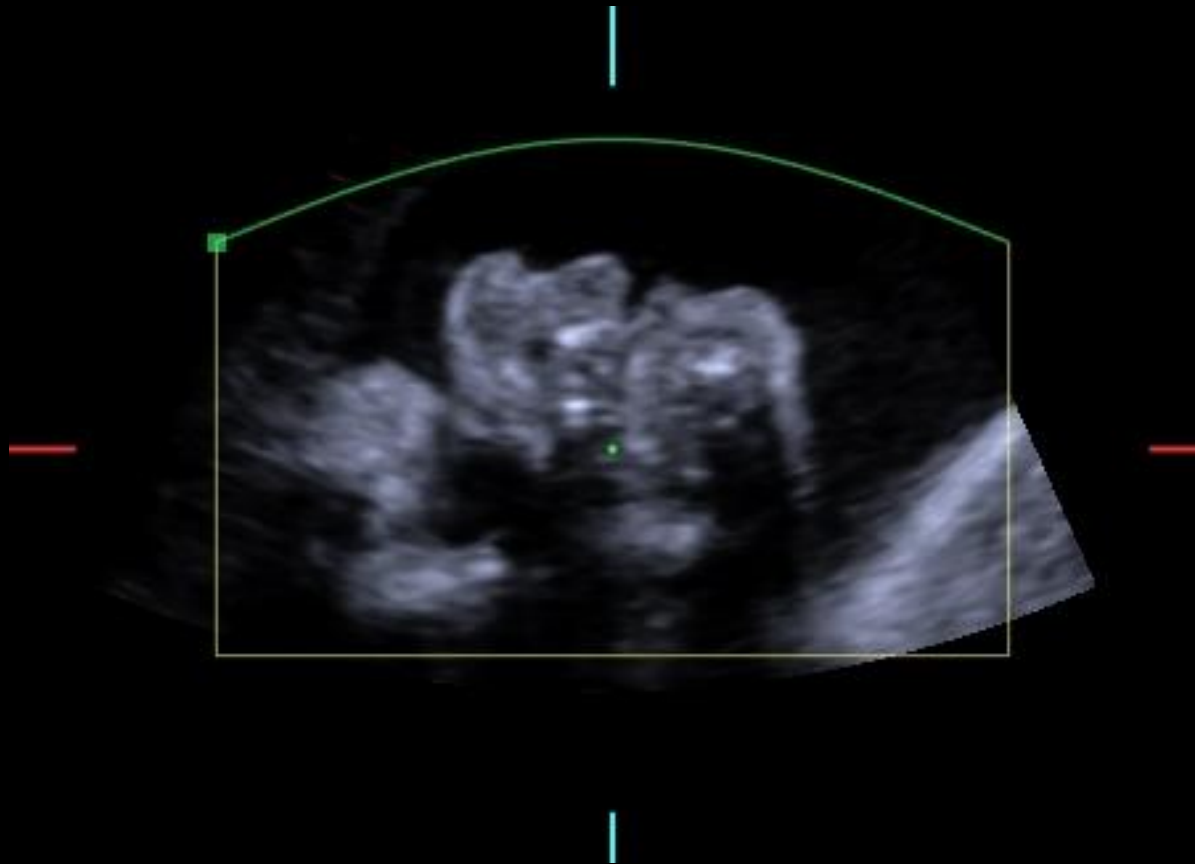


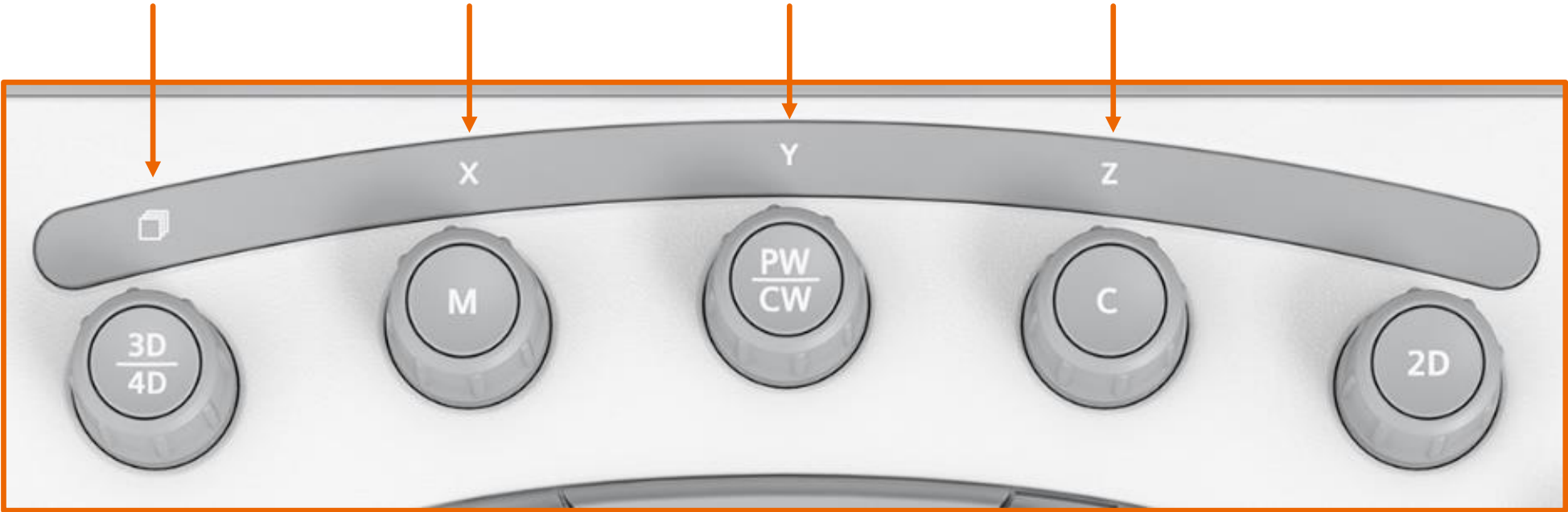
# Reference point

- The reference marker is the pivot point to manipulate the Multiplanar Reconstruction (MPR) planes
- It represents the point where the A, B, and C plane intersect
- Place the desired anatomy at the reference point to display in all three planes

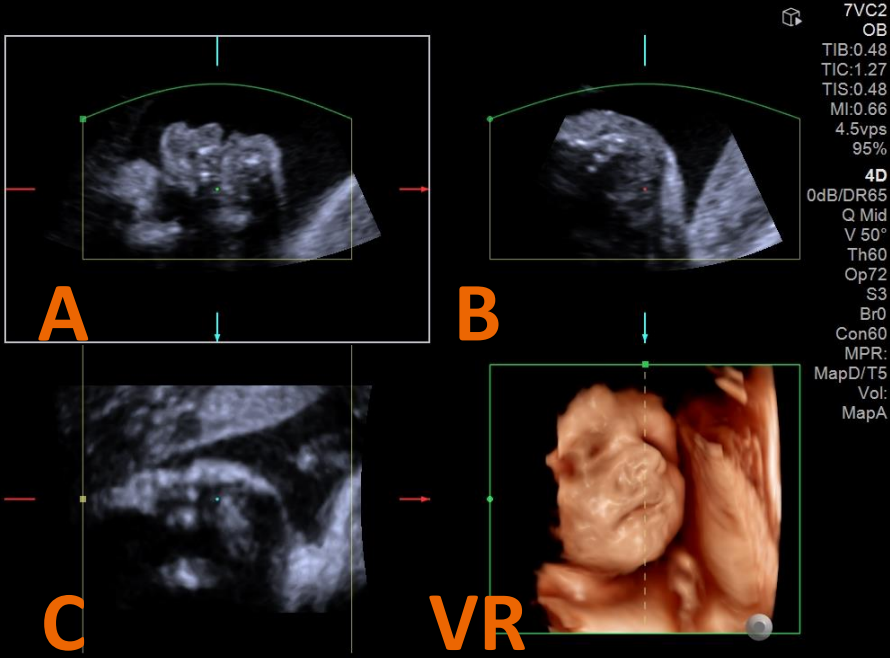
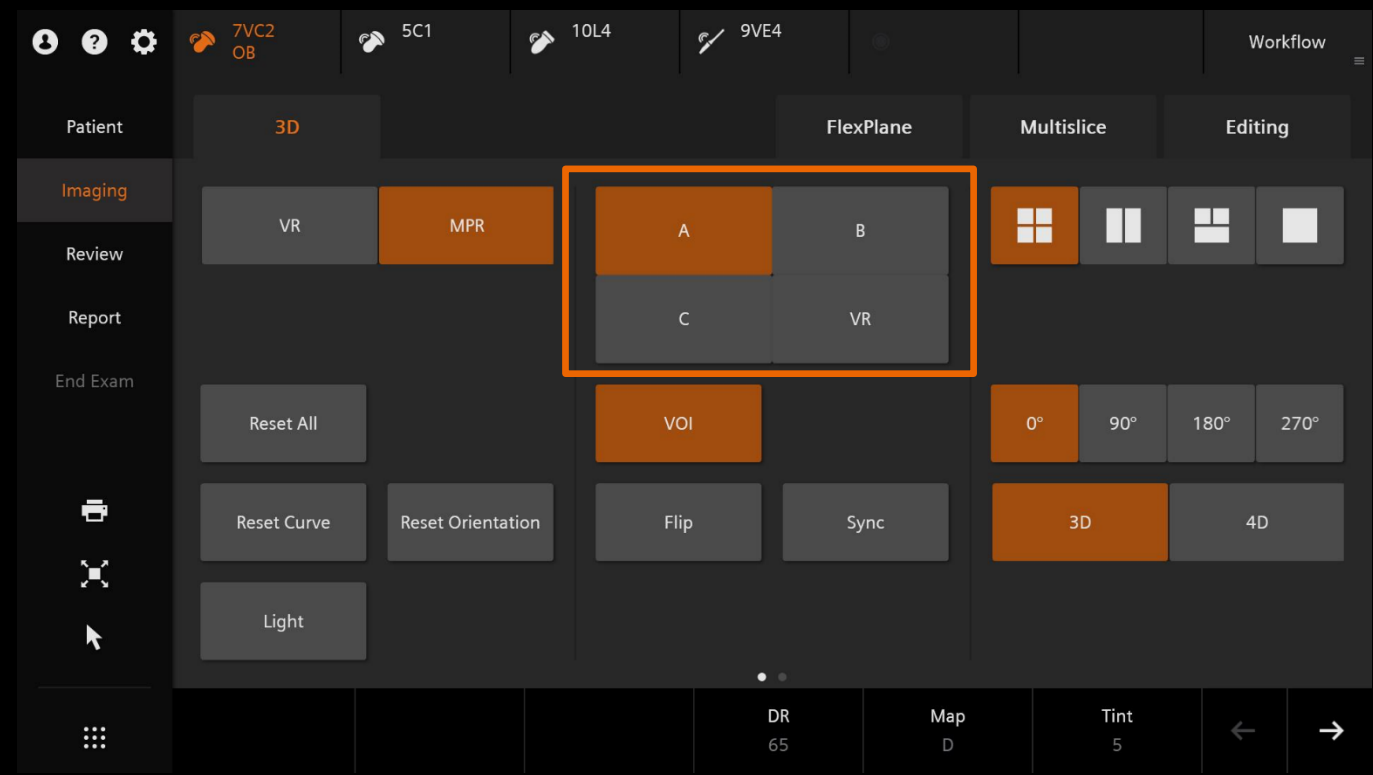


# VOI Size and curve

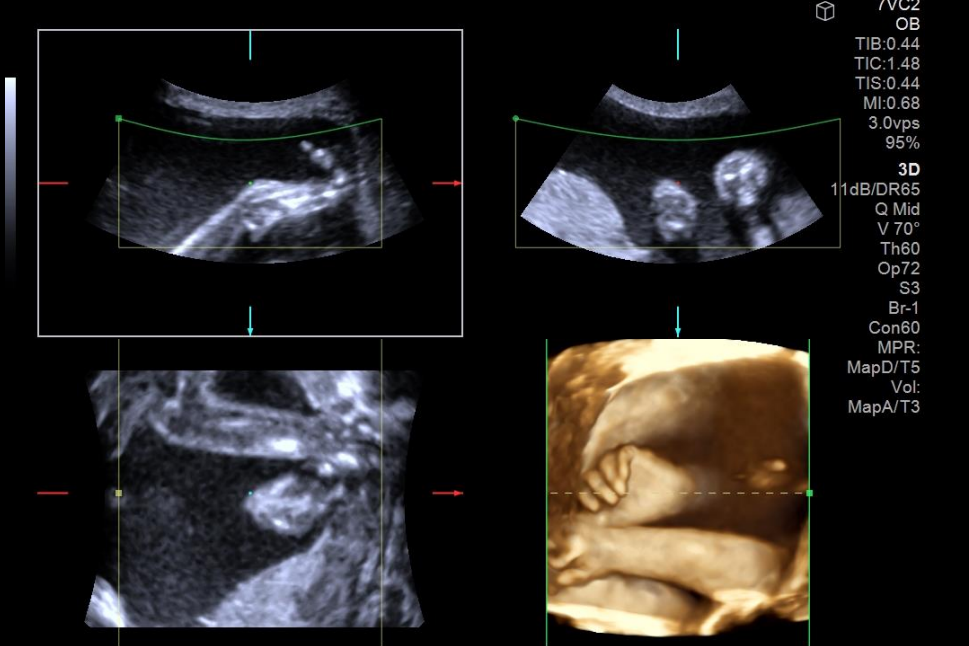
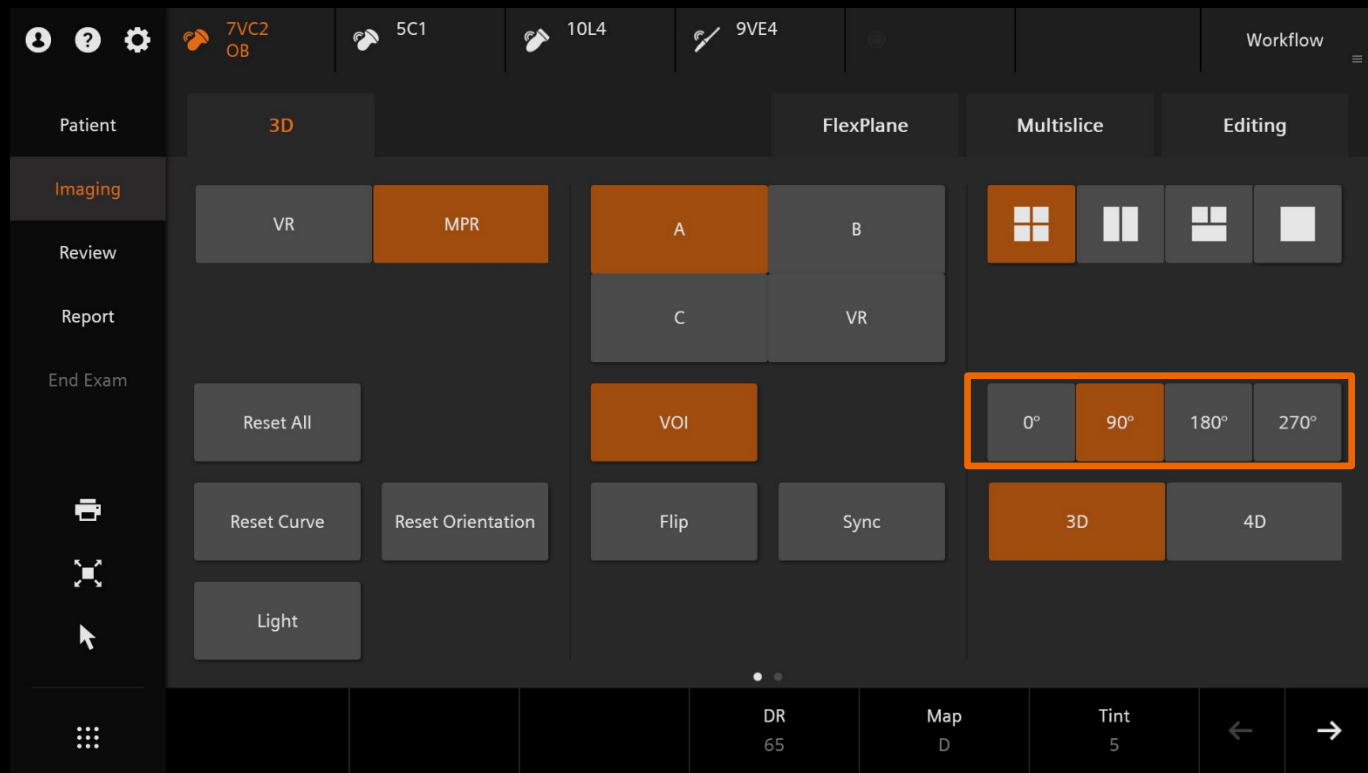




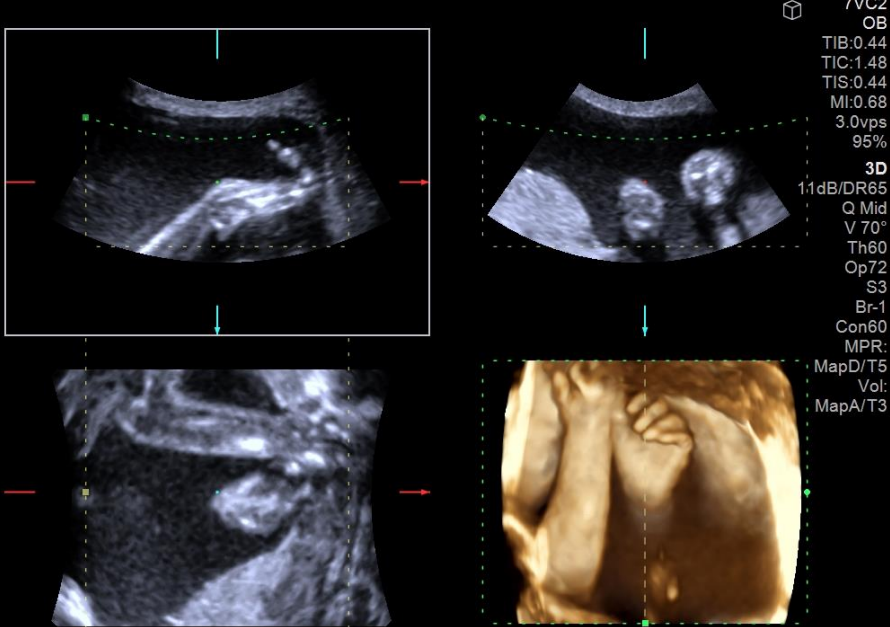
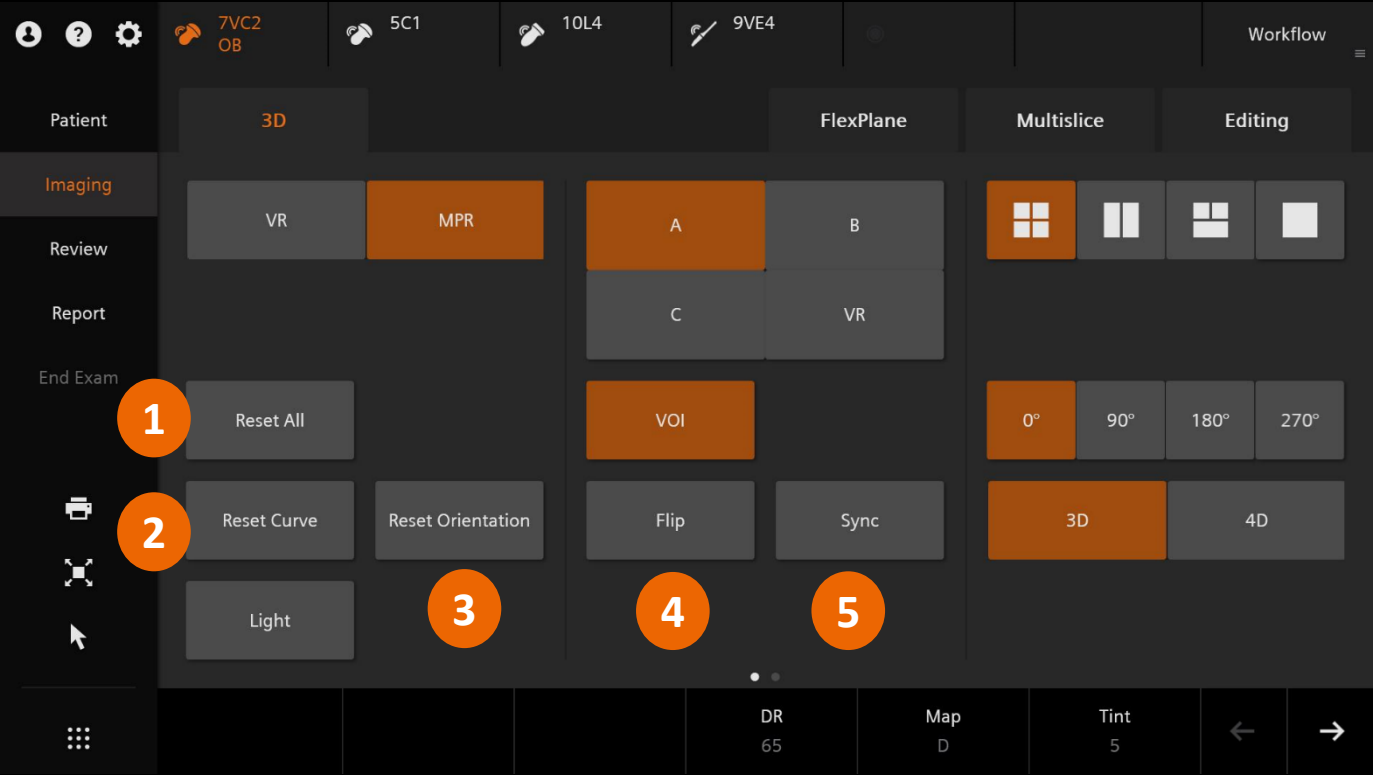
# Quadrant selection



# Volume rendering rotation

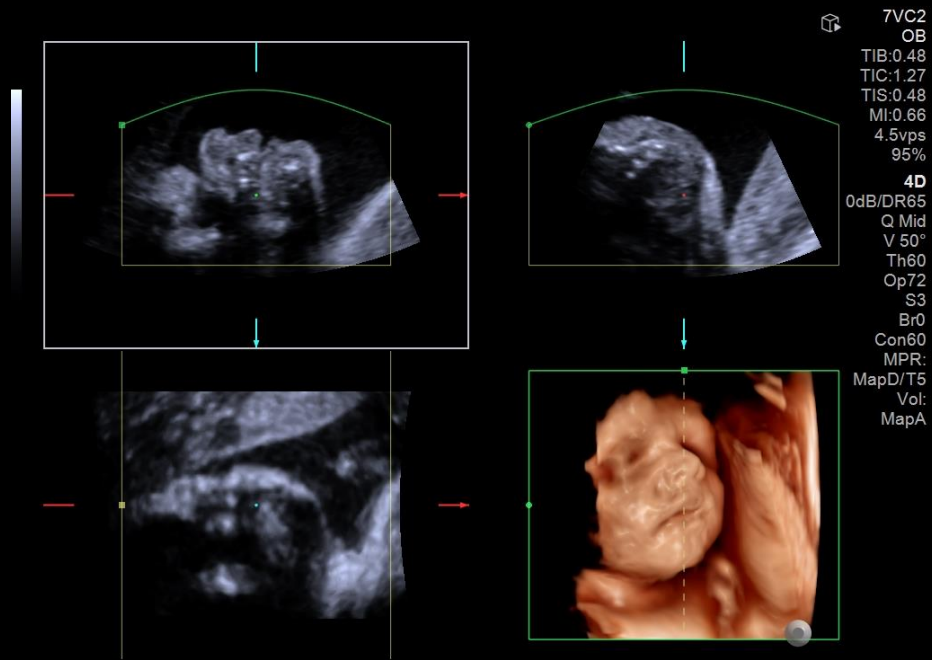
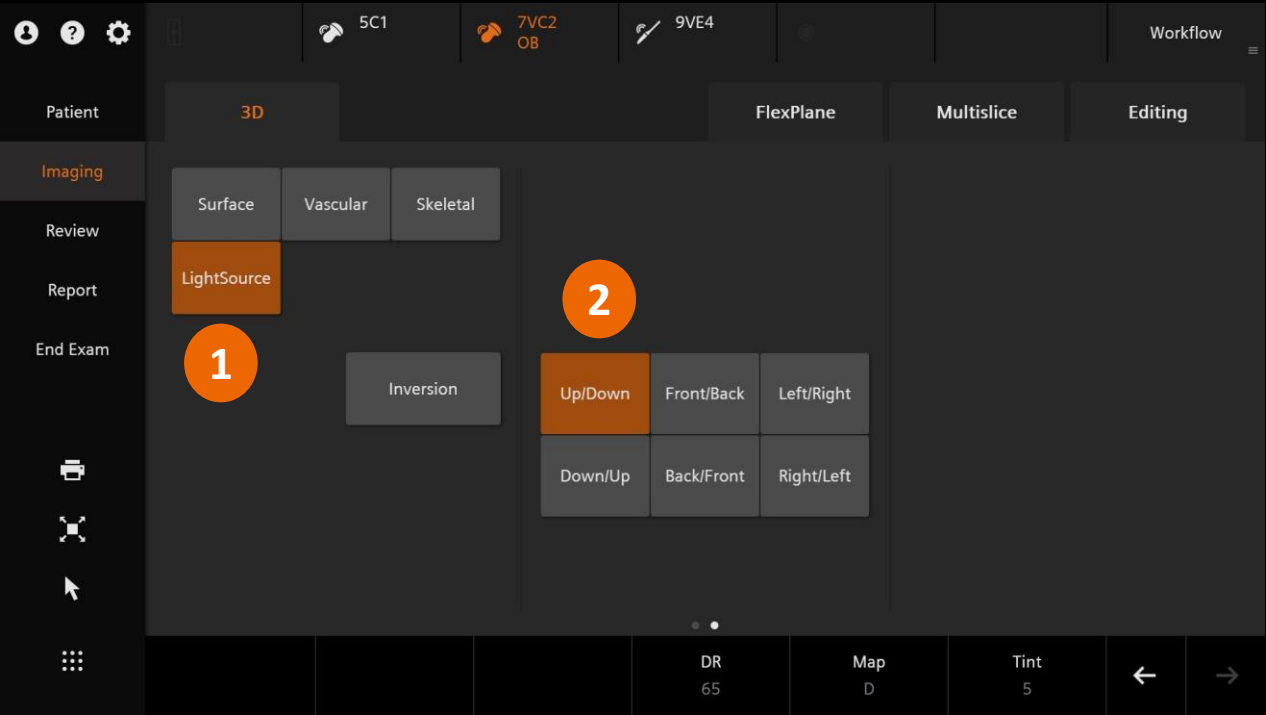


# Touch Screen keys





# Touch Screen keys



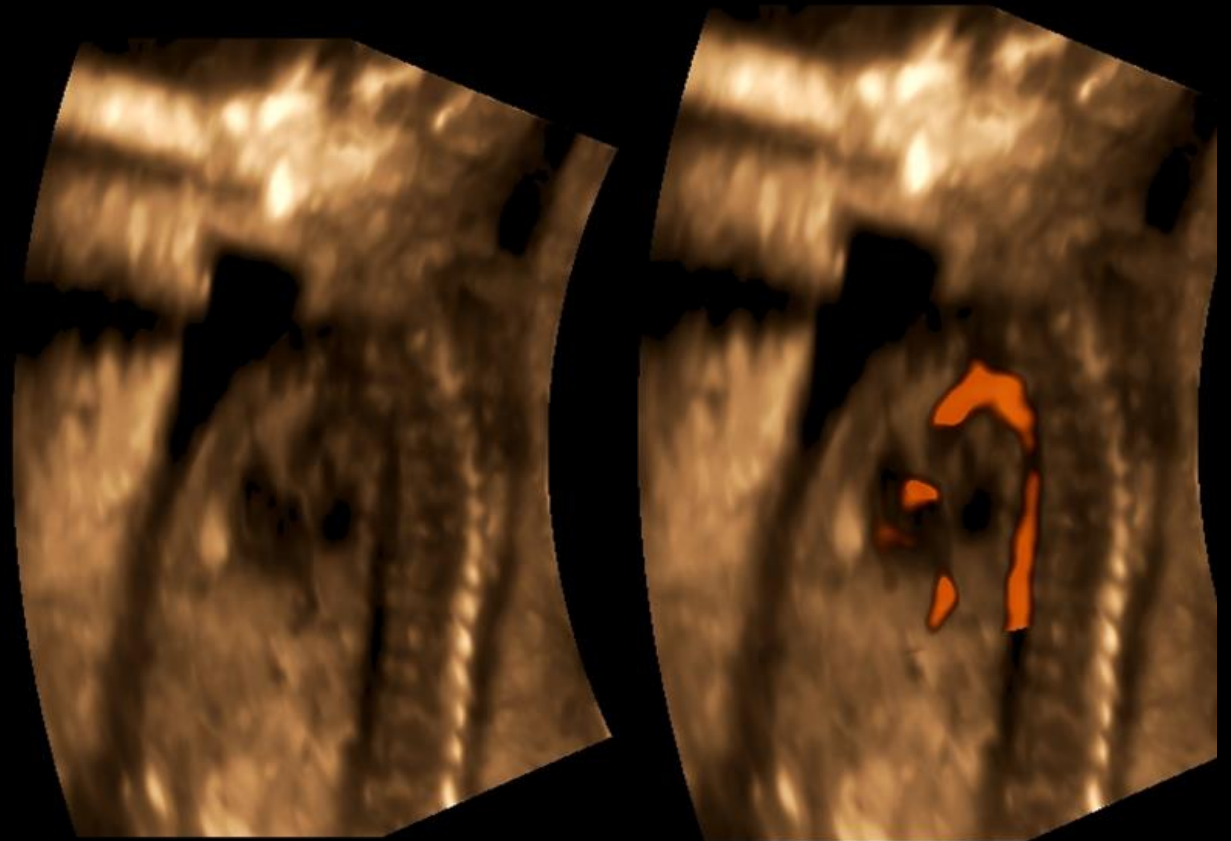


- Smooths the image contours
- Creates a soft sculptured appearance for highlighting surface features
- Uses the mode specific selections for opacity percentage and threshold
- Includes eight tint options



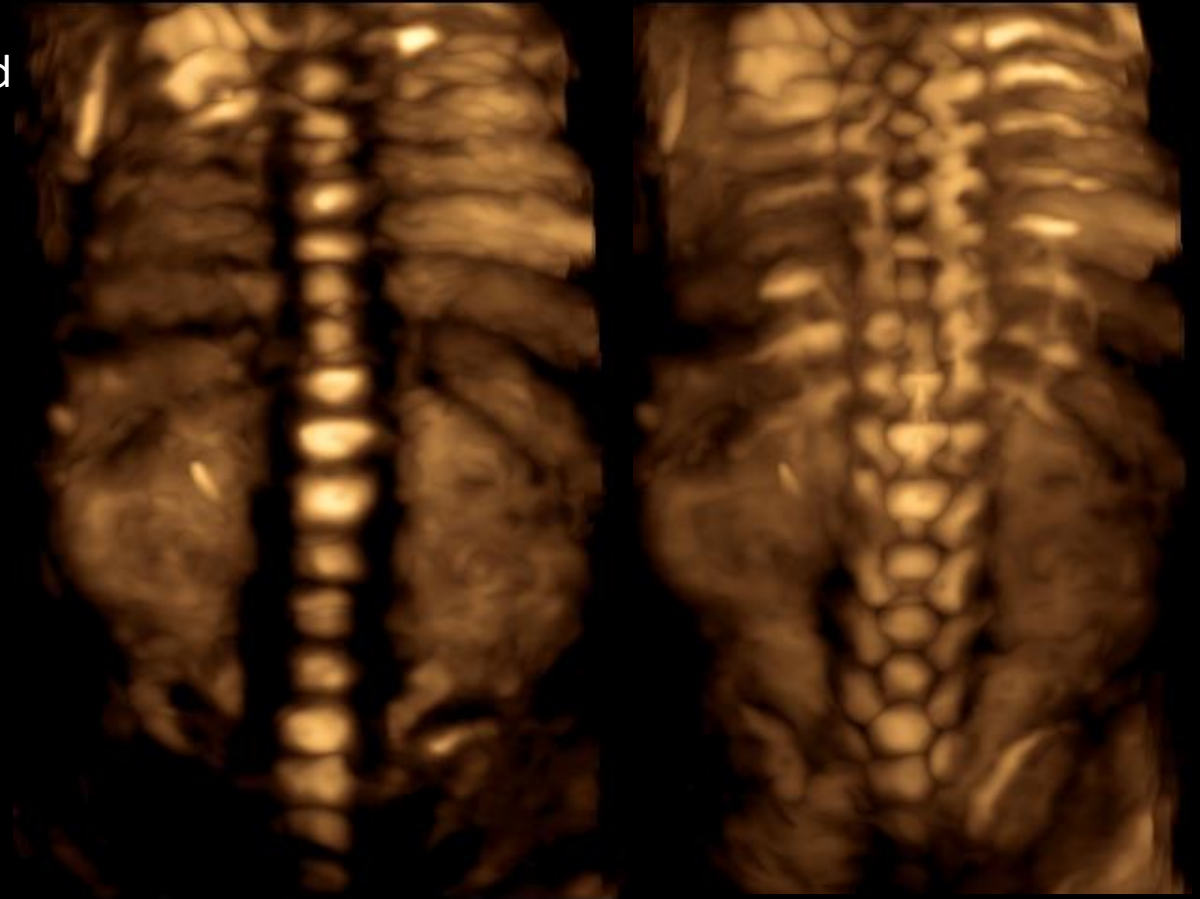
Limits the display to minimum-value pixels with the lowest value along each projection of the volume to aid in visualizing hypo-echoic lesions and large vascular structures

- Fetal vessels, umbilical cord
- Cystic structures
- Abdominal vascularity



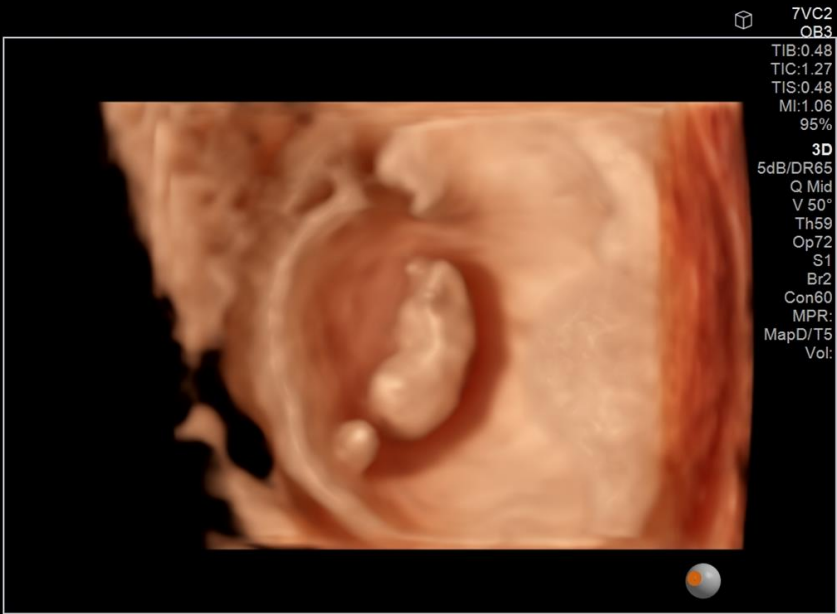
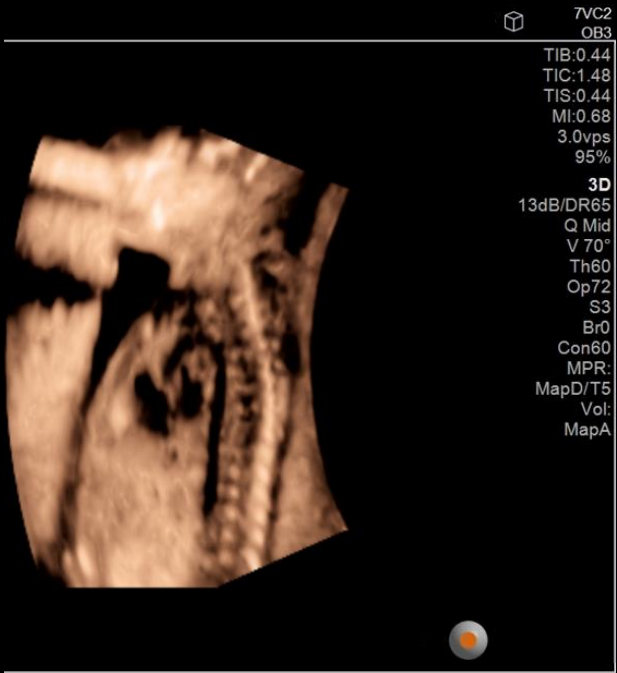
Limits the display to maximum-value pixels with the highest value along each projection of the volume to aid in visualizing hyper-echoic structures

- Fetal Spine
- Bony Structures
- Intrauterine devices



- Increase depth perception
- Reveal surface details
- Deeper understanding of relational anatomy

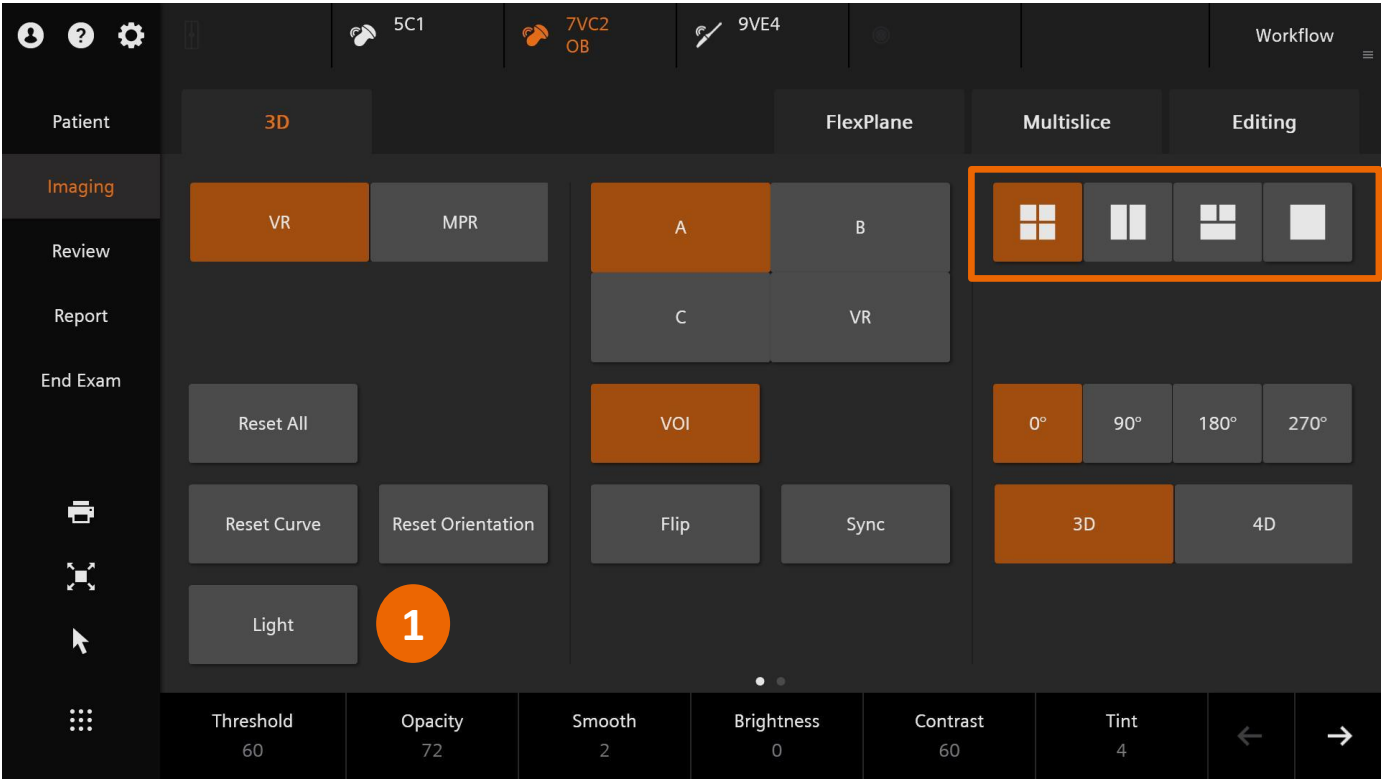






1. Select **Light**

The light will default to on when a 1x1 display format is utilized



# LightSource

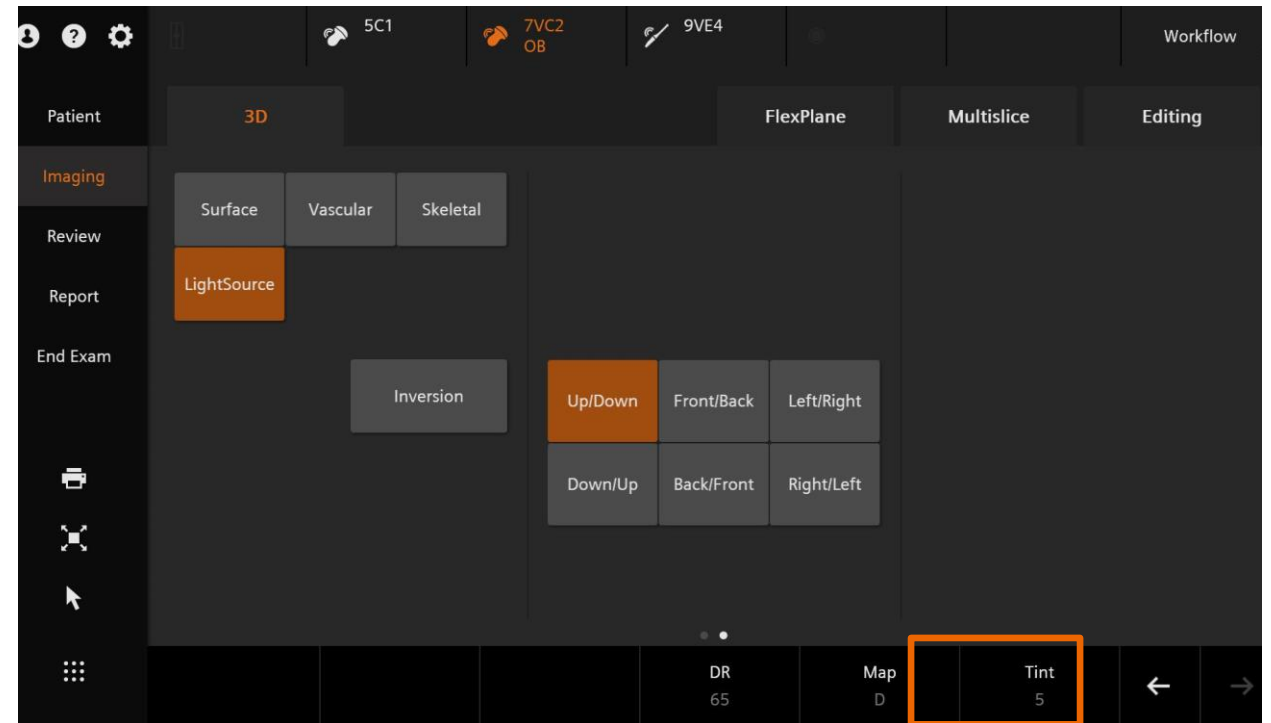
2. Use the trackball to adjust the point LightSource direction
3. The arrow on the point LightSource icon indicates the direction the light is shining



LightSource Tints provide

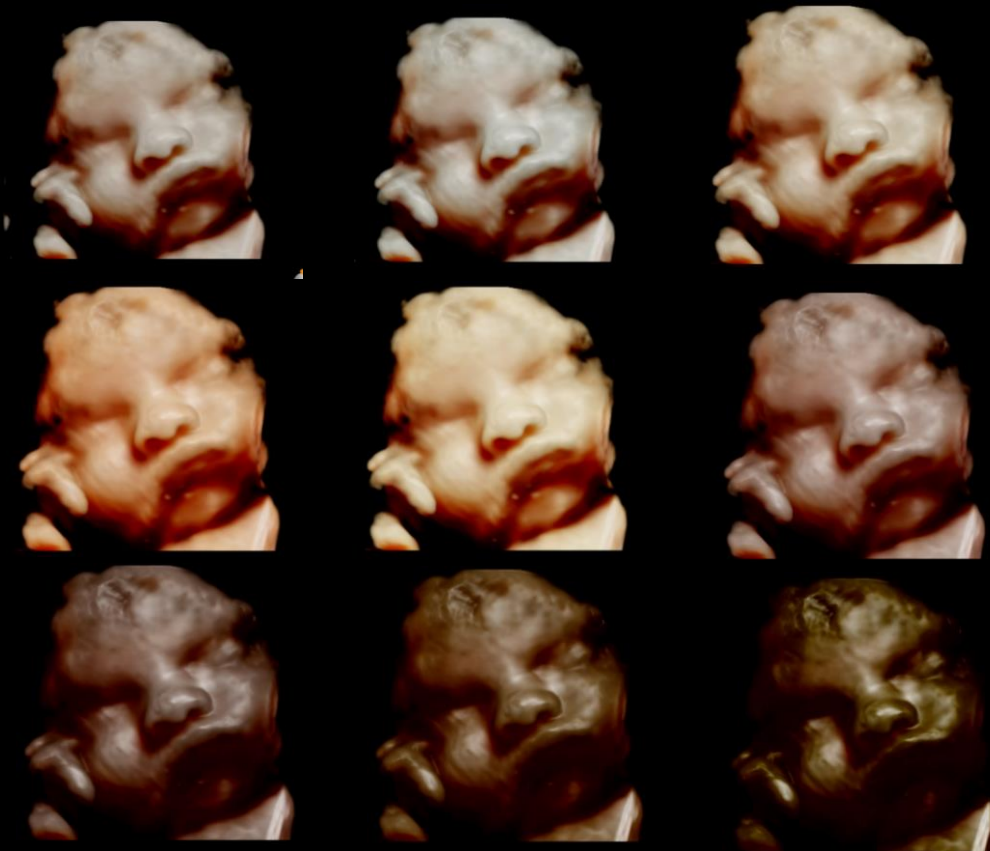
- Diversity in tints and skin tones
- A more even appearance to the surface render
- Enhance gynecological features

Available on the 7VC2 and the 9VE4

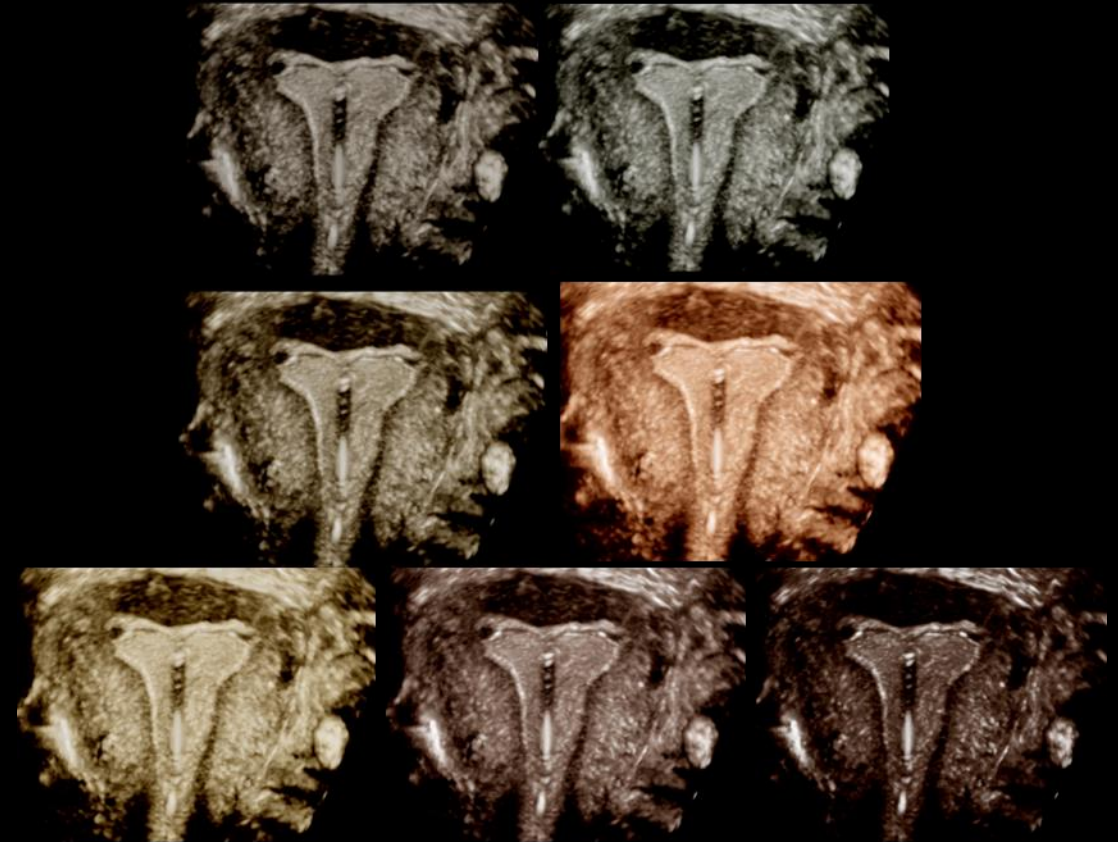




7VC2



9VE4

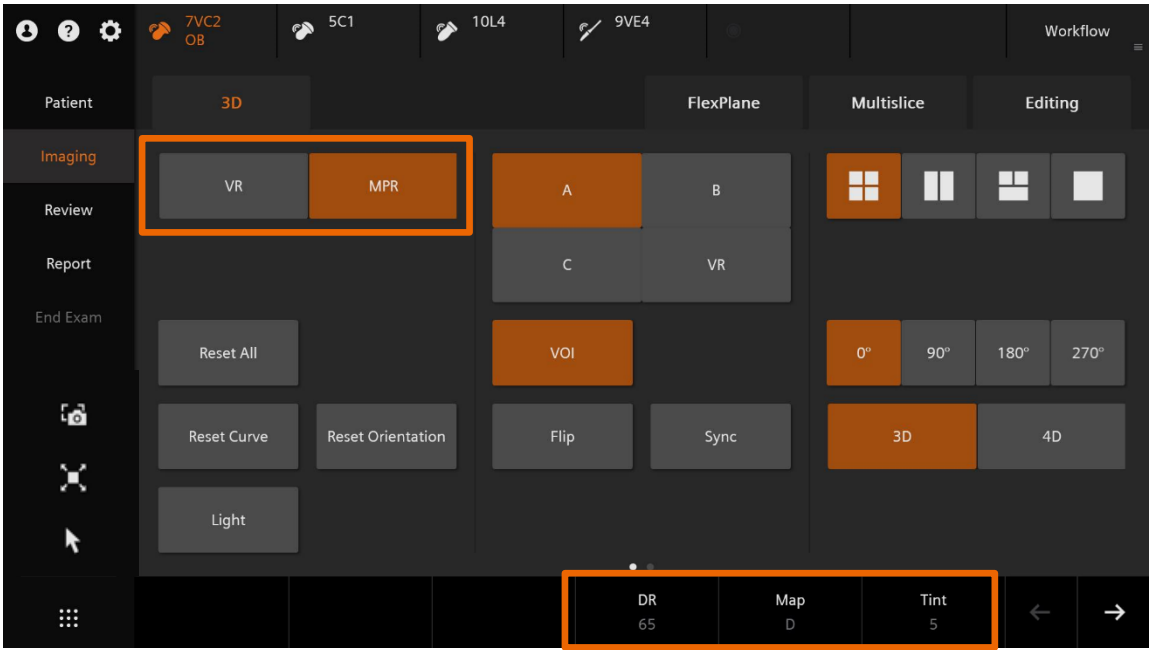
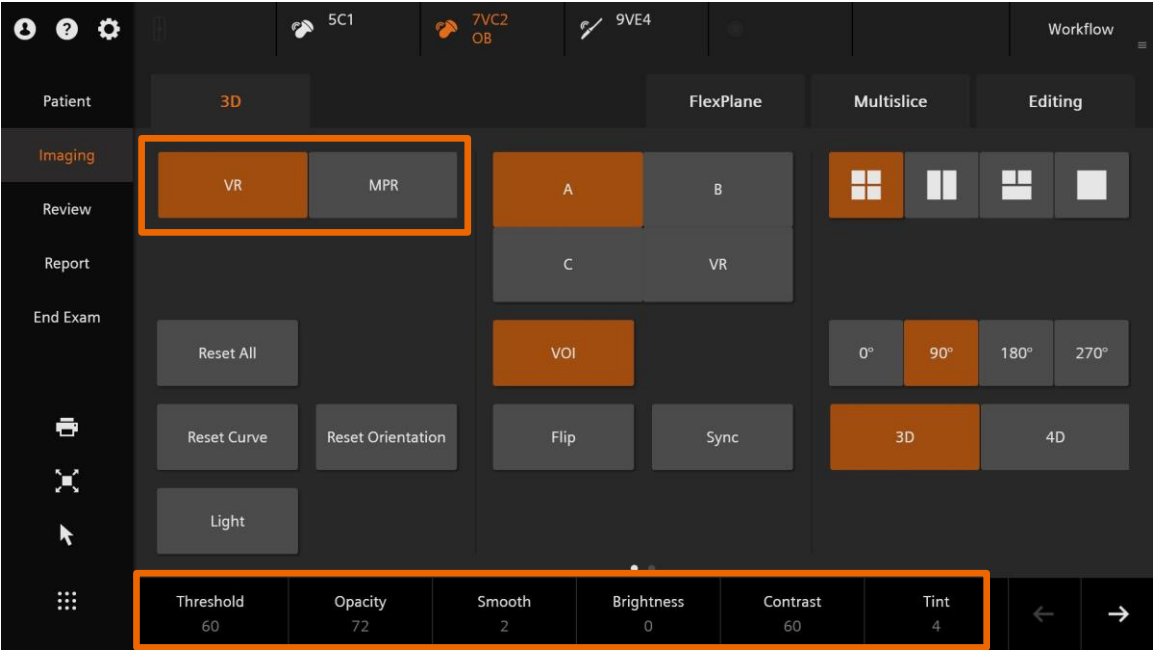


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# Optimization tools



# VR - Threshold

- Sets the threshold for the opacity curve
- Removes small echoes or noise that contain values lower than the selected threshold
- A lower setting creates a more saturated image
- Available for VR mode only



Threshold

0



Threshold

47

- Adjusts the percentage of opacity in the volume to create a softer or more sculptured appearance
- Decrease the value for a more transparent look
- Increase the value for more solid look
- Available for VR mode only



Opacity

18



Opacity

68



- Adjusts the amount of smoothing applied in the rendered volume
- Range is 0 – 4
- Available for VR mode only



Smooth

0



Smooth

3

- Adjusts the brightness of the rendered volume
- An increase in brightness increases the saturation of voxels that have a higher and lower voxel value
- Available for VR mode only



Brightness

-16



Brightness

9

- Adjusts the percentage of contrast on the rendered volume
- Increase the value for increased contrast or decrease for less contrast
- Available for VR mode only



Contrast

45



Contrast

66

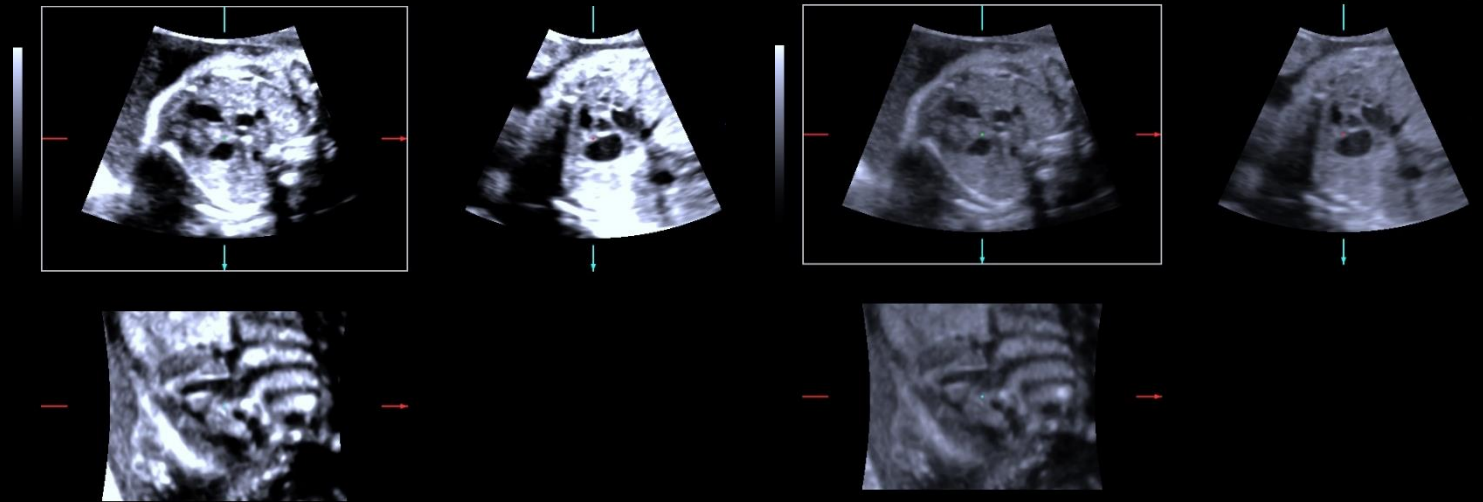


- Applies the selected Tint to the rendered volume in Surface/Vascular/Skeletal
- Some Tint colors may require image adjustment
- A separate tint control is available for the MPR's and in LightSource



# MPR – Dynamic Range

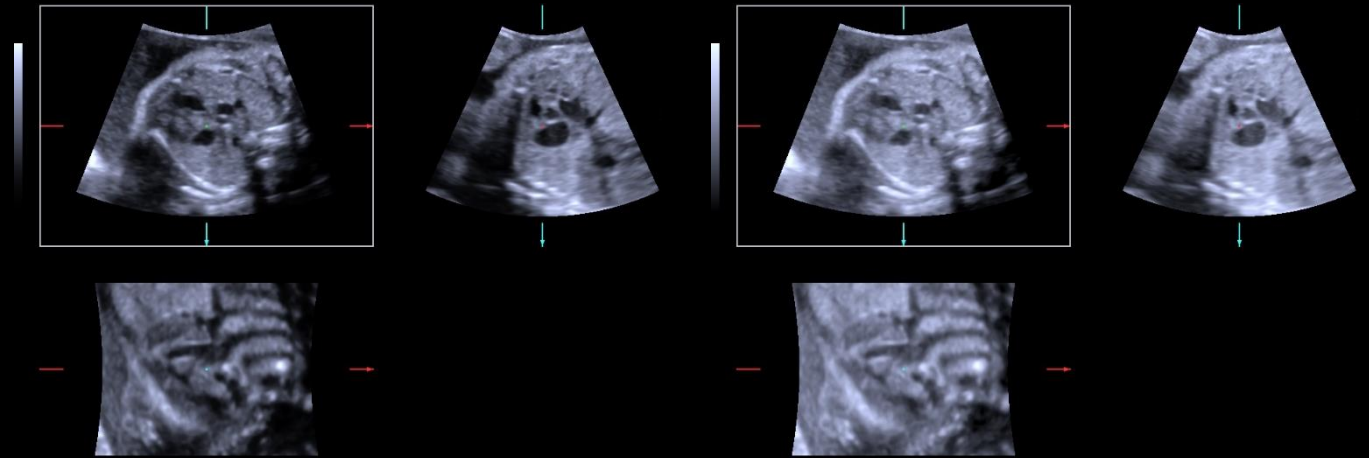
- Adjusts the number of gray shades displayed
- Increase for a softer image
- Decrease for more contrast
- Available in the MPR mode only



DR  
37

DR  
80

- Selects a processing curve that assigns echo amplitudes to gray levels
- Uses the same maps as 2D
- Available for MPR planes



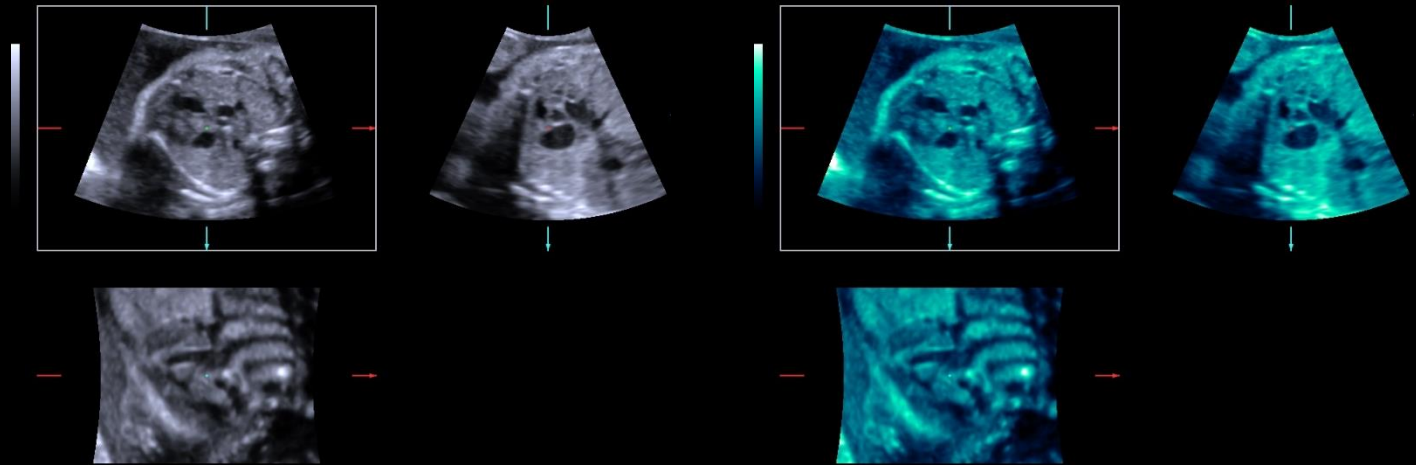
Map

D

Map

G

- Applies the selected Tint to the MPR images
- A separate tint control is available for the VR



Tint

4

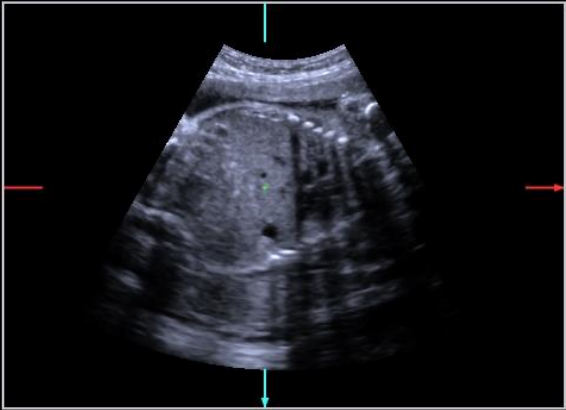
Tint


7

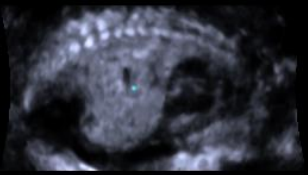
# Power Doppler

- Applies colors to vascular structures based on flow amplitude
- Activate prior to entering acquisition mode





1  7VC2  
OB  
TIB:0.38  
TIC:1.55  
TIS:0.38  
MI:1.22  
95%  
**3D**  
13dB/DR65  
Q Mid  
V 50°  
Th60  
Op72  
S2  
Br0  
Con60  
MPR:  
MapD/T5  
Vol:  
MapA



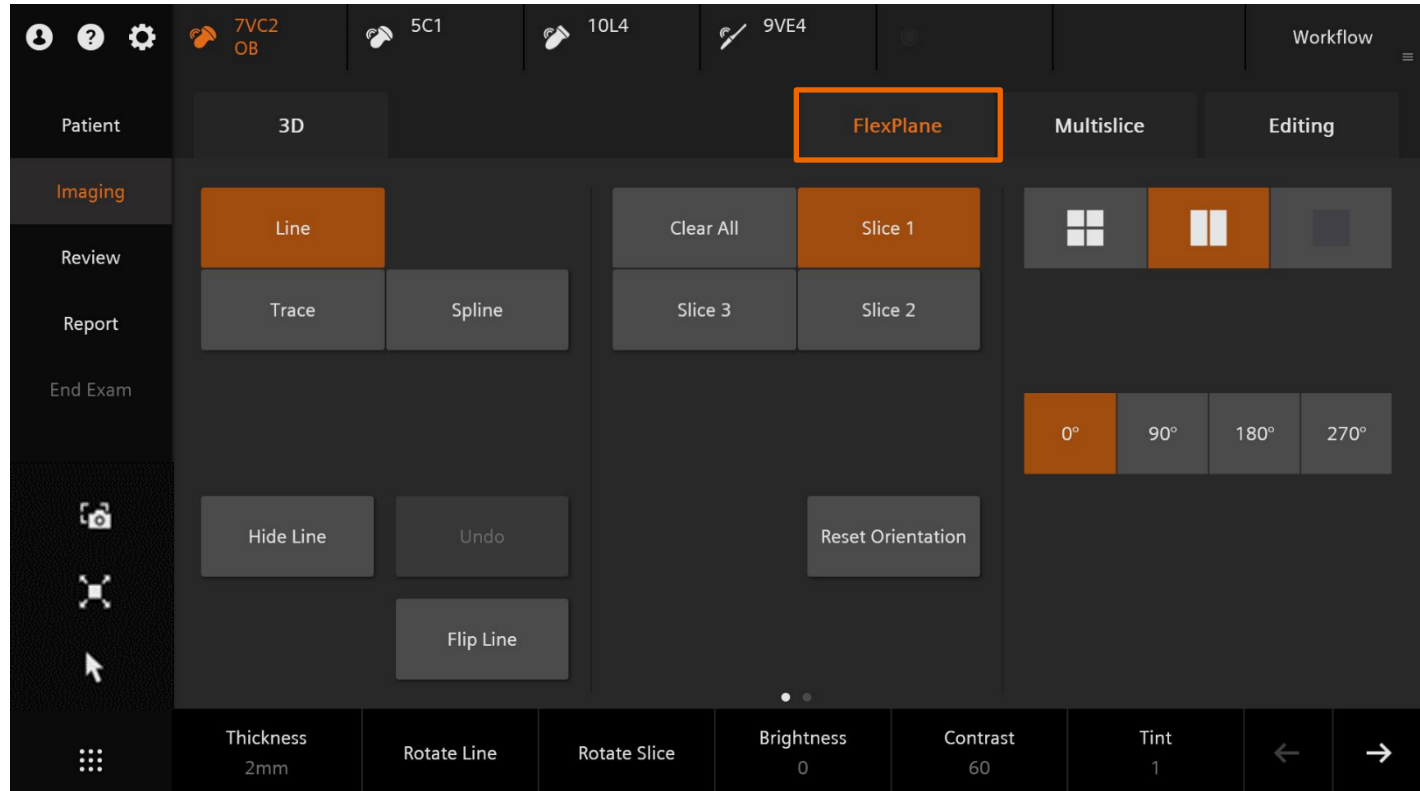
→ 1 AC=24.15 cm  
GA=28w 3d

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- Visualization of anatomy along any plane or shape
- Reduces planar manipulation (X-Y-Z)





27

7VC2

OB3

TIB:0.34

TIC:1.42

TIS:0.34

MI:1.05

90%

3D

26dB/DR65

Q Mid

V 50°

Th55

Op62

S0

Br2

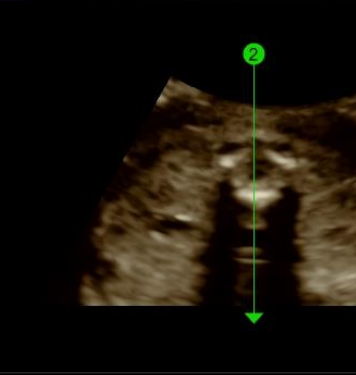
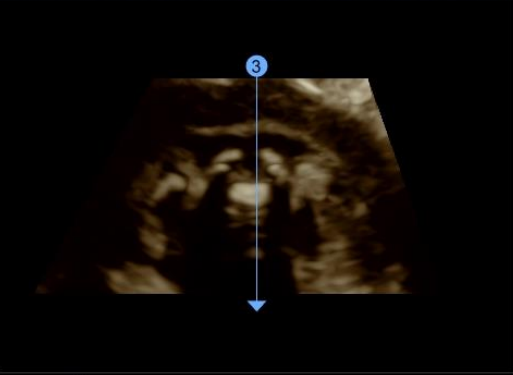
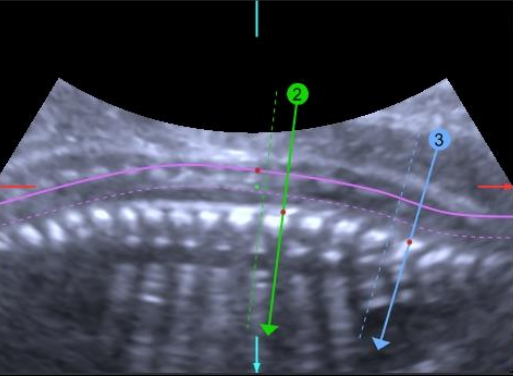
Con63

MPR:

MapD/T5

Vol:

T3



Z

7VC2

OB

TIB:0.38

TIC:1.55

TIS:0.38

MI:1.22

95%

3D

10dB/DR65

Q Mid

V 50°

Th60

Op72

S2

Br14

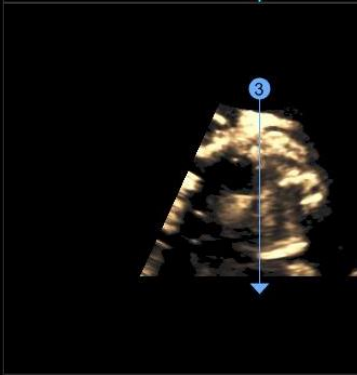
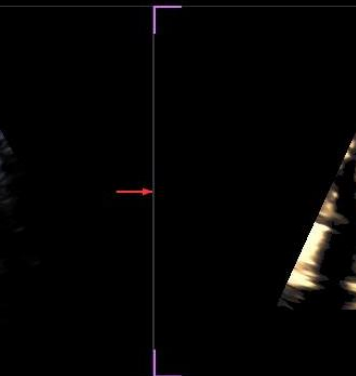
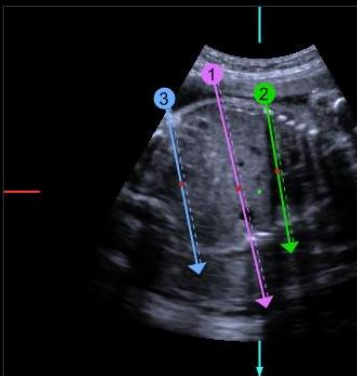
Con60

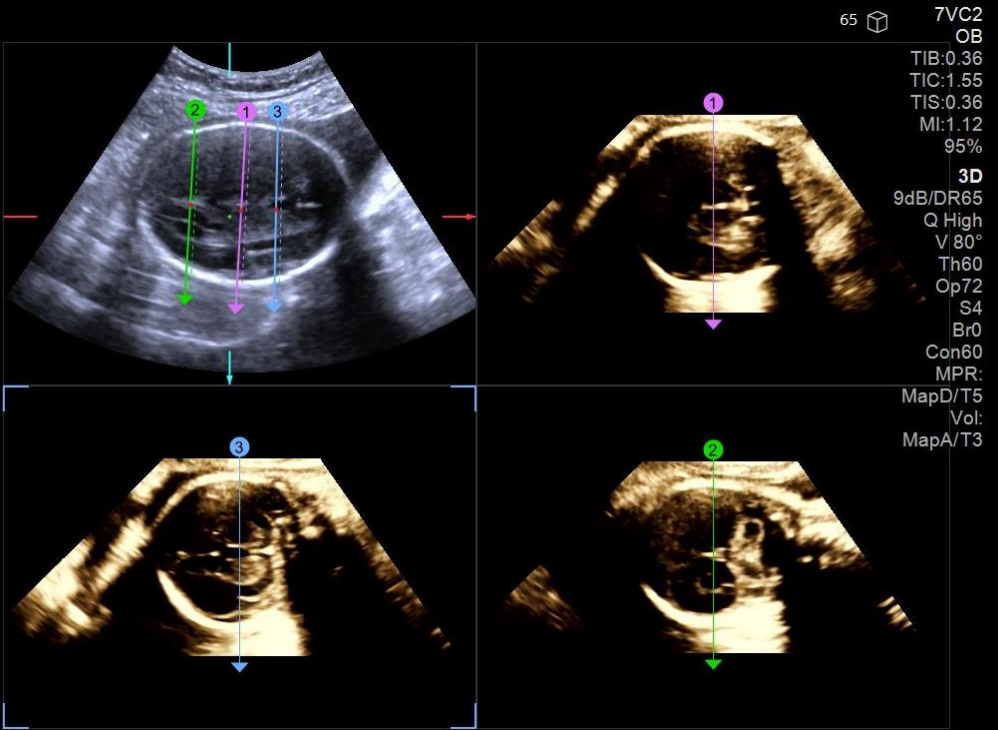
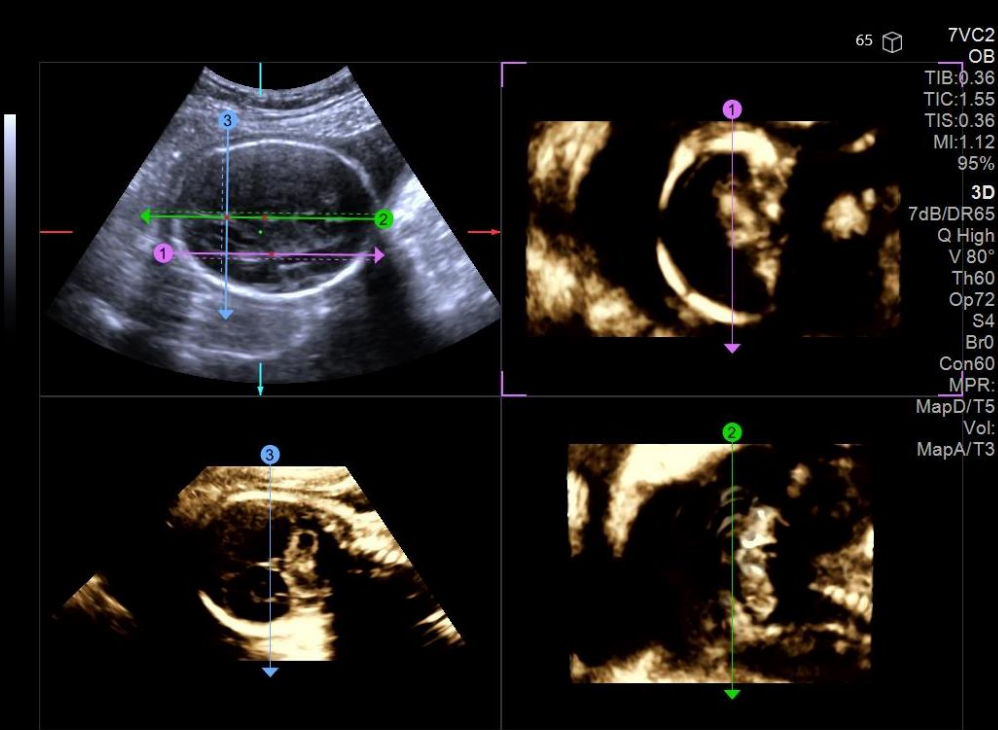
MPR:

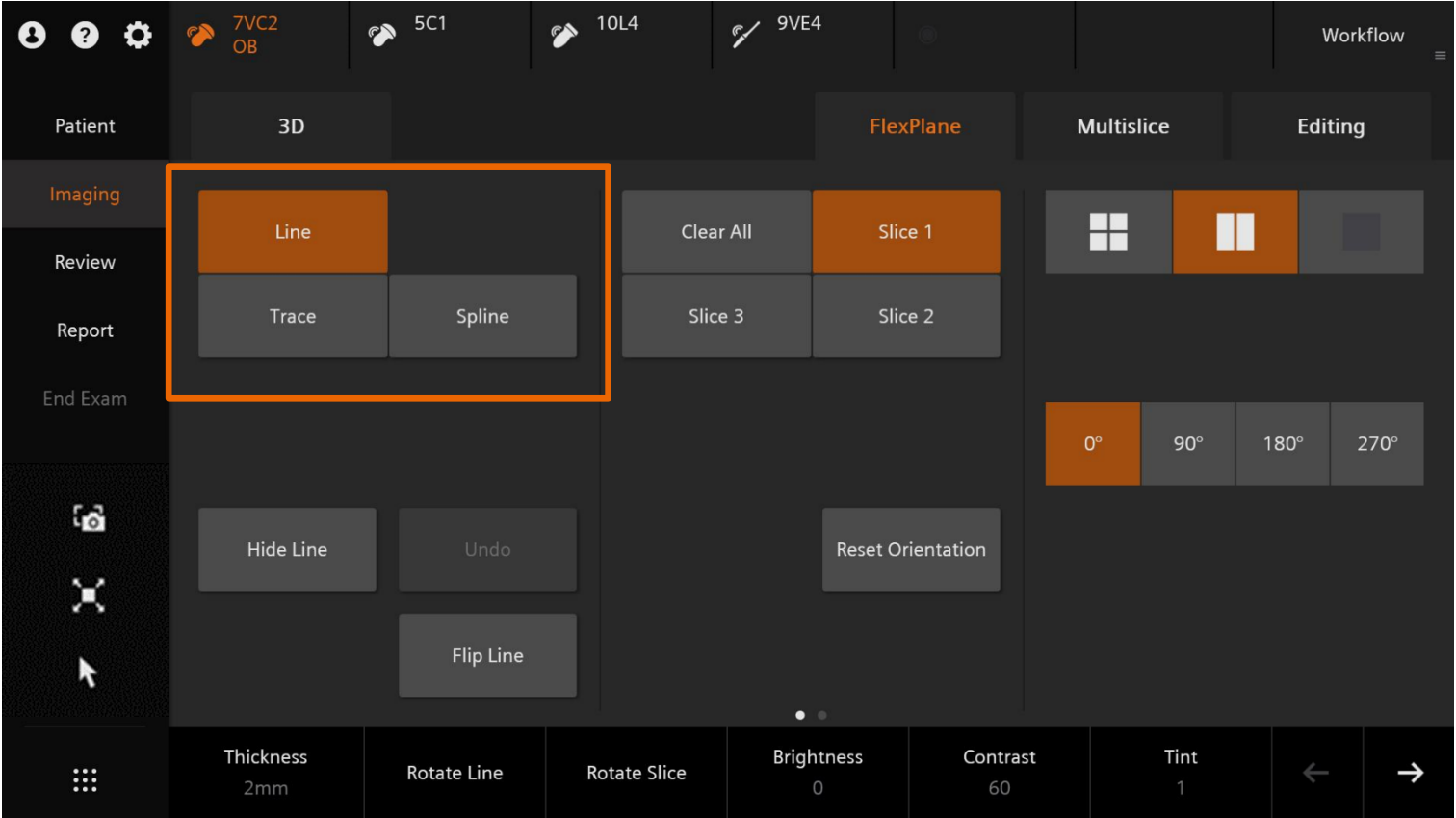
MapD/T5

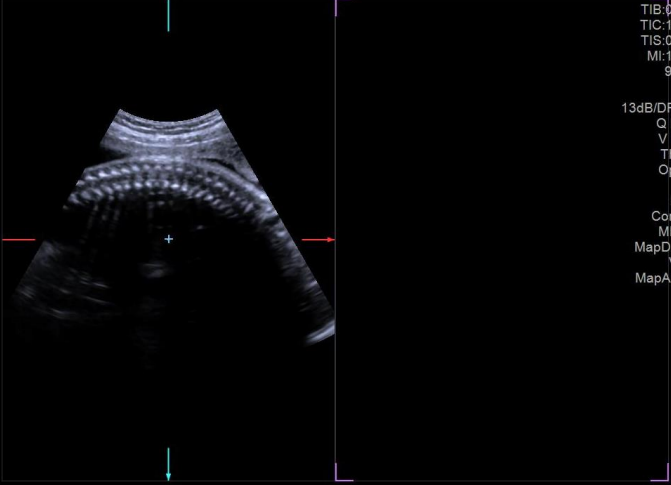
Vol:

MapA/T3










7VC2  
OB  
TIB:0.39  
TIC:1.57  
TIS:0.39  
MI:1.27  
95%  
3D  
13dB/DR65  
Q Mid  
V 70°  
Th60  
Op72  
S2  
Br0  
Con60  
MPR:  
MapD/T5  
Vol:  
MapA/T3

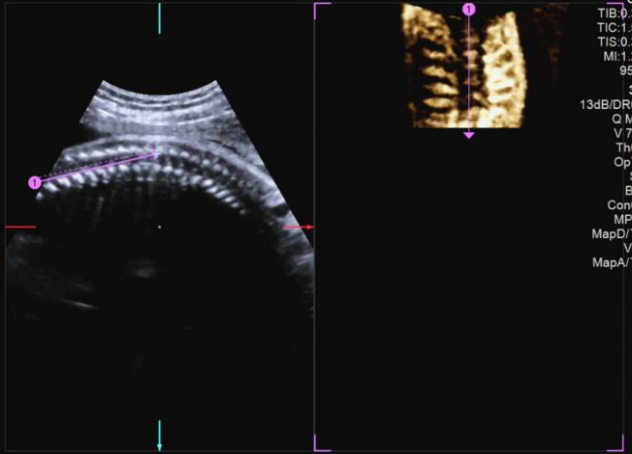
Start



Start


Draw

1



74 7VC2  
OB  
TIB:0.39  
TIC:1.57  
TIS:0.39  
MI:1.27  
95%  
3D  
13dB/DR65  
Q Mid  
V 70°  
Th60  
Op72  
S2  
Br0  
Con60  
MPR:  
MapD/T5  
Vol:  
MapA/T3

Set

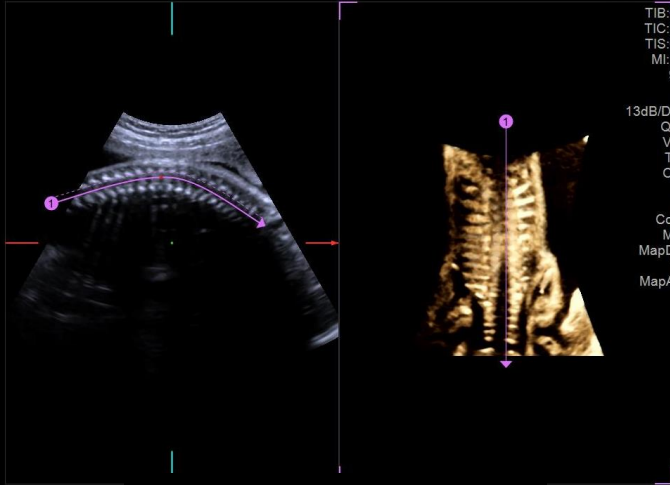


Set

Redraw


Draw

2



7VC2  
OB  
TIB:0.39  
TIC:1.57  
TIS:0.39  
MI:1.27  
95%  
3D  
13dB/DR65  
Q Mid  
V 70°  
Th60  
Op72  
S2  
Br0  
Con60  
MPR:  
MapD/T5  
Vol:  
MapA/T3

-

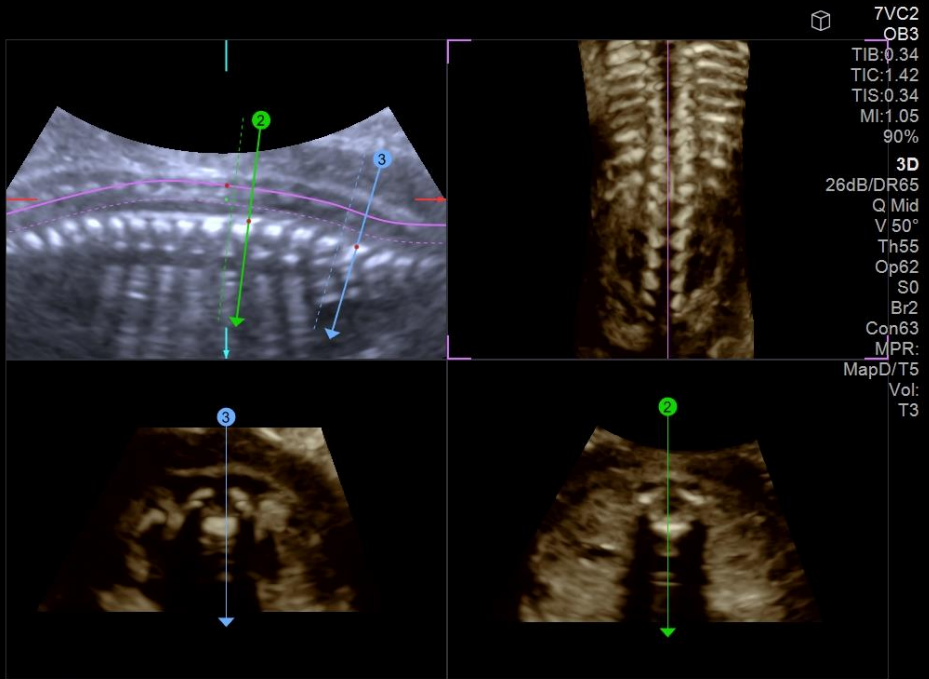
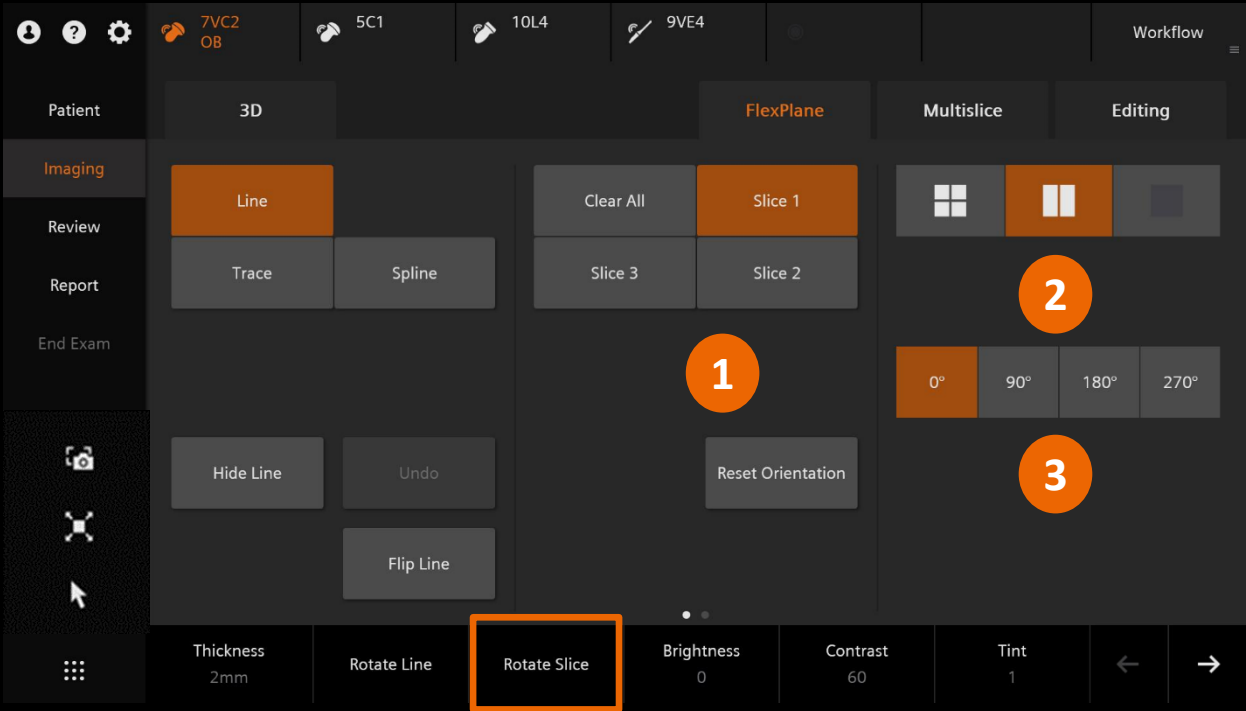


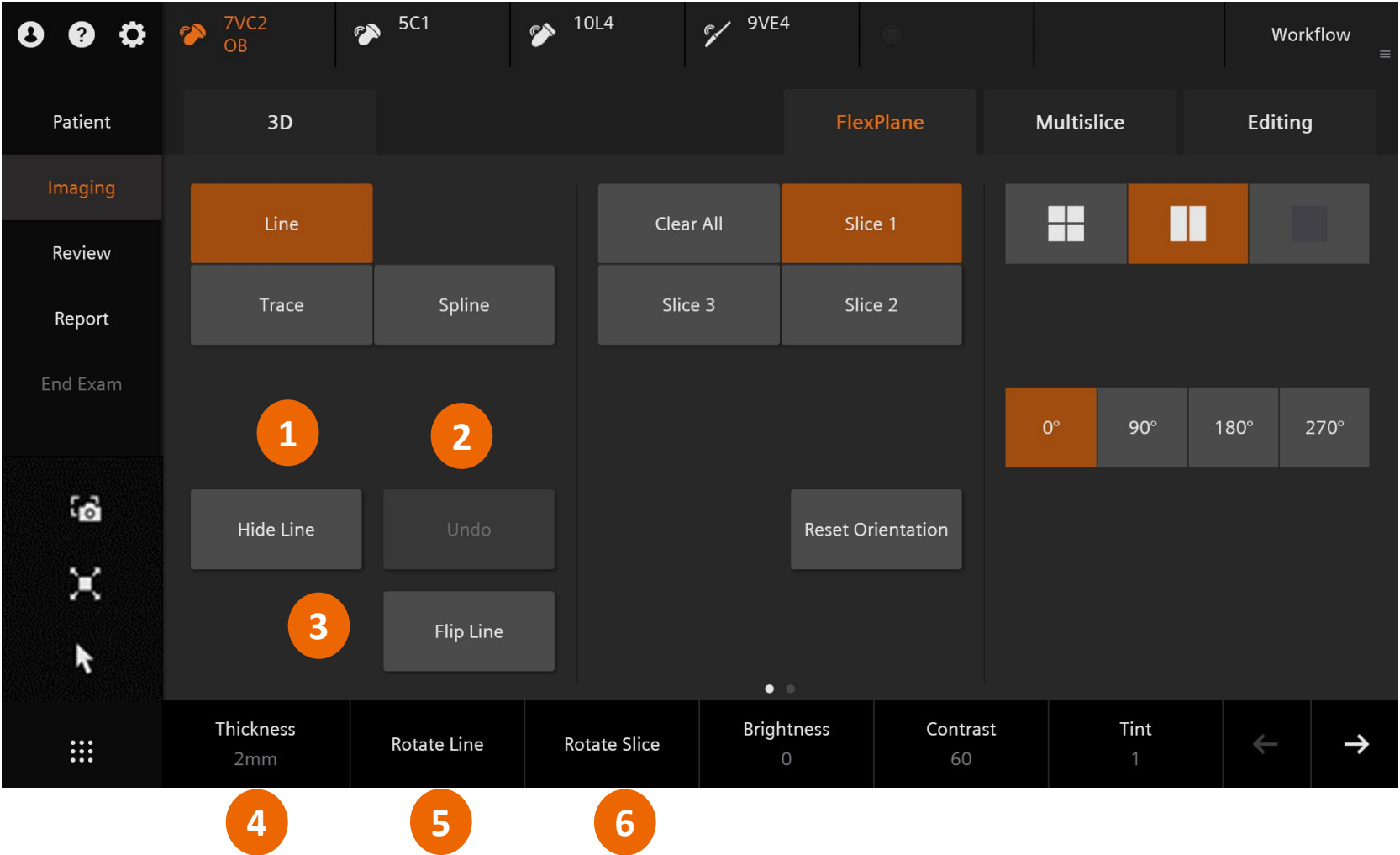
-

Redraw

Position

3





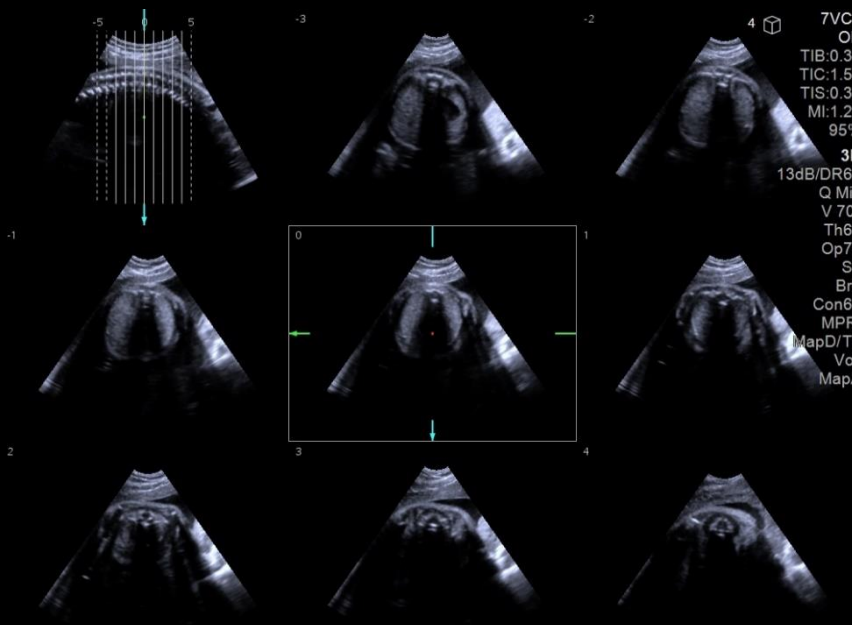
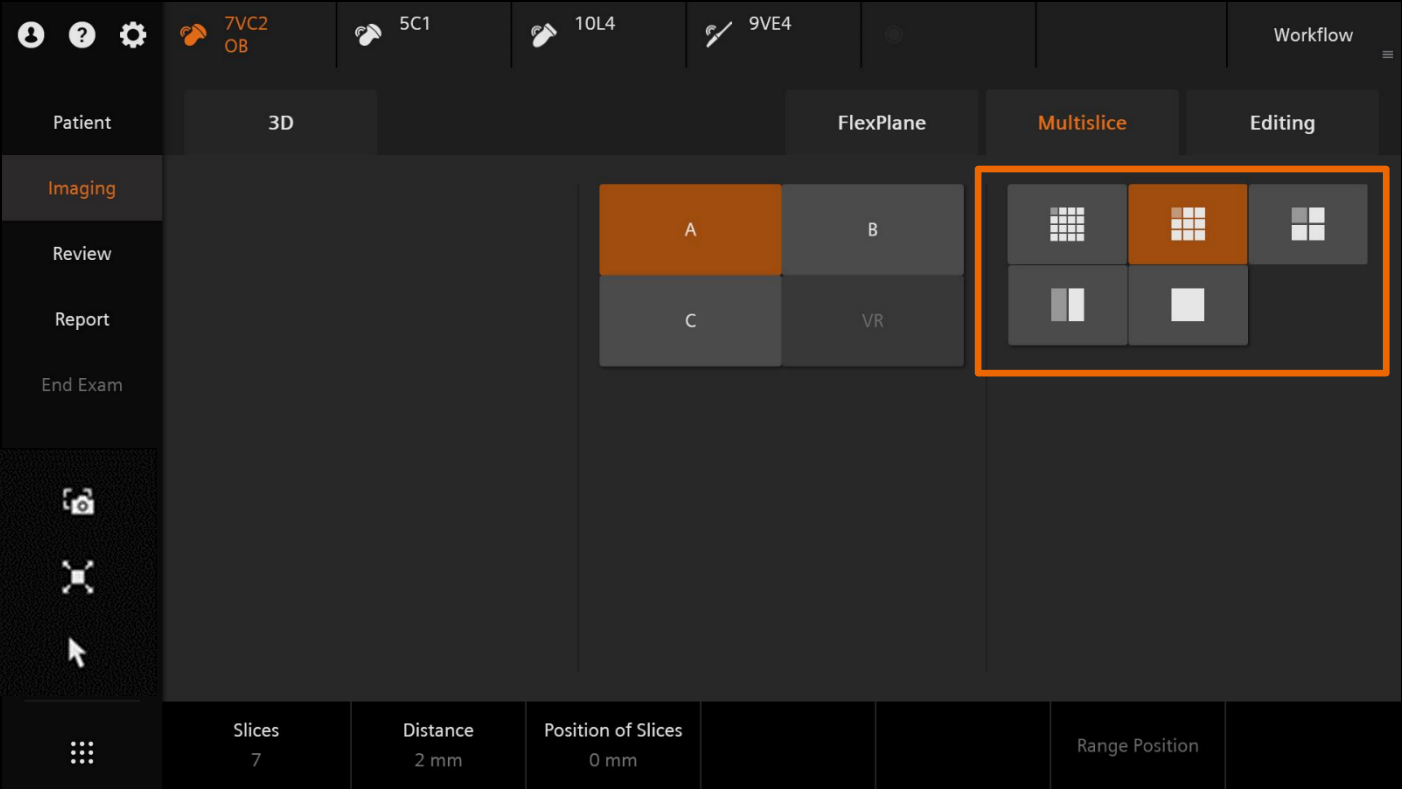
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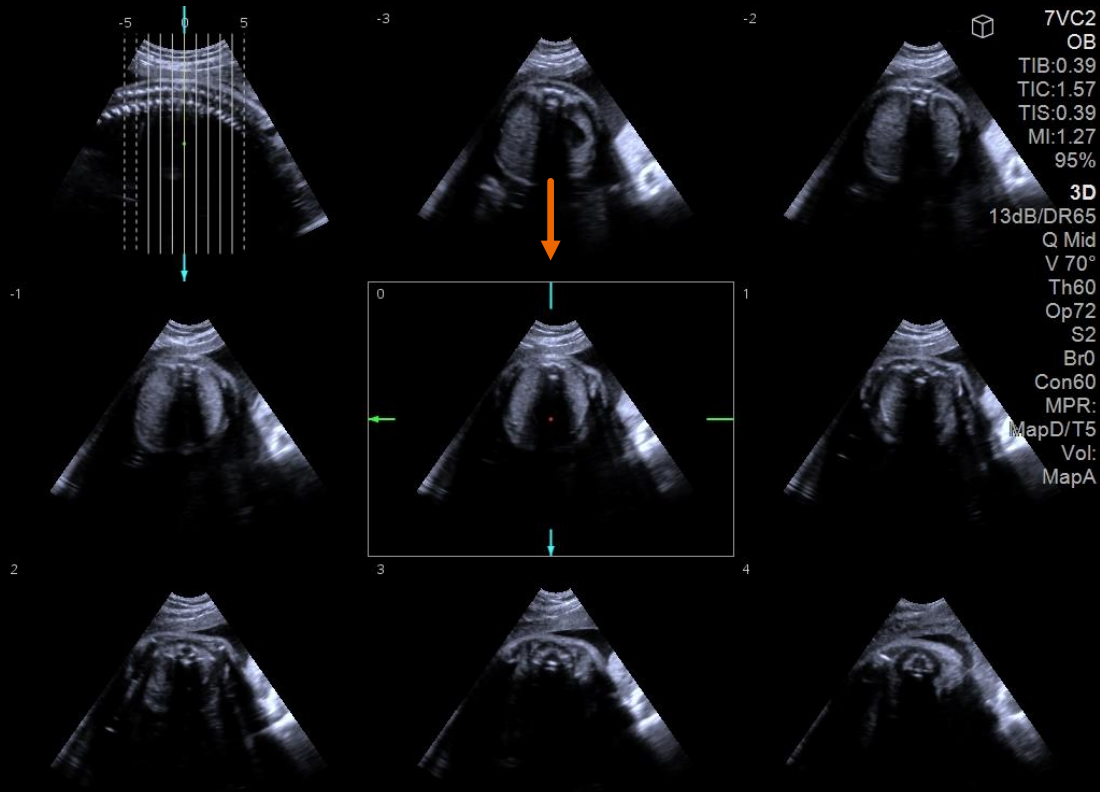
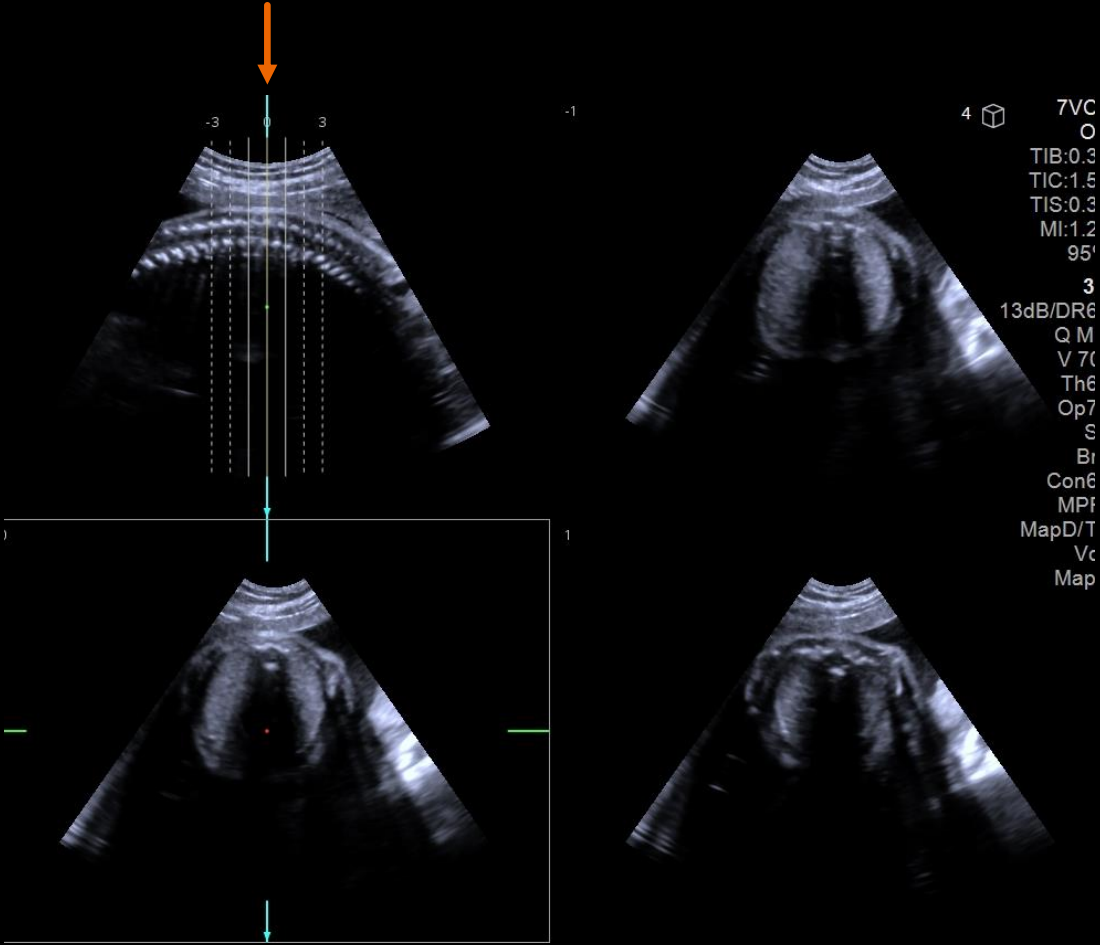




# Multislice display layout



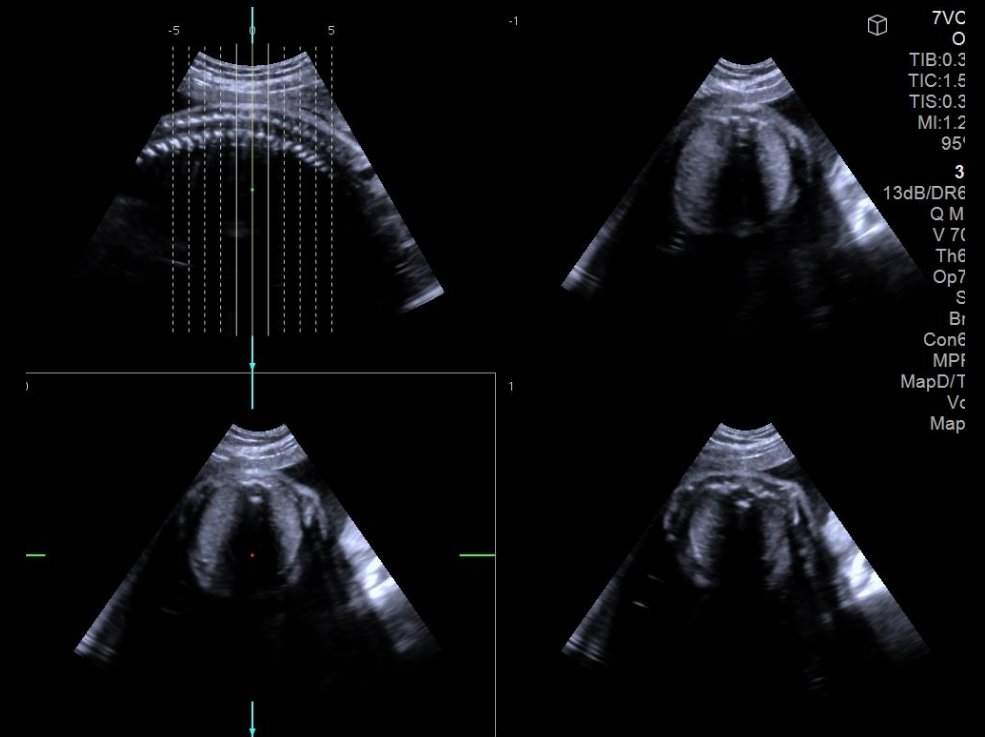
# Multislice display layout



# Multislice optimization

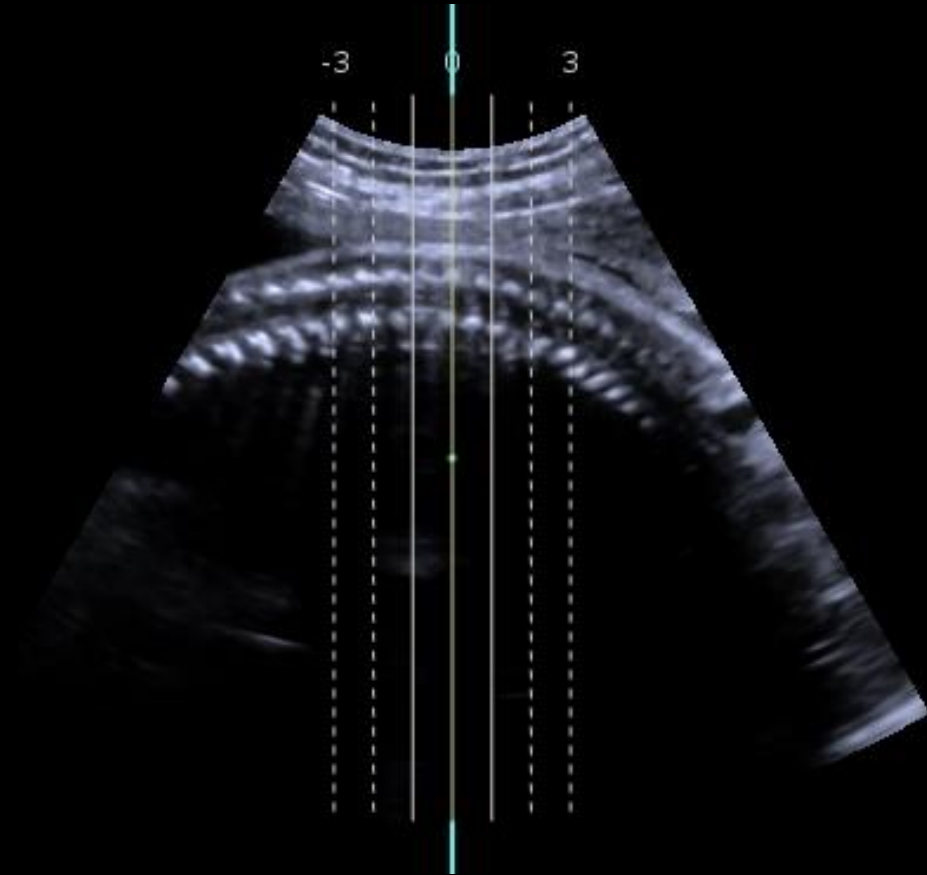
The screenshot displays the Philips IntelliSpace Portal software interface. The top navigation bar includes icons for Patient, Imaging, Review, Report, and End Exam. The main menu on the left lists Patient, Imaging (highlighted), Review, Report, and End Exam. The top right navigation bar shows icons for 7VC2 OB, 5C1, 10L4, 9VE4, and Workflow. The main workspace is divided into three sections: 3D, FlexPlane, and Multislice (highlighted). The Multislice section shows a grid of icons for different slice types, with the 'A' icon highlighted. Below the Multislice section, a table displays the following data:

Slices	Distance	Position of Slices			Range Position	
7	2 mm	0 mm				

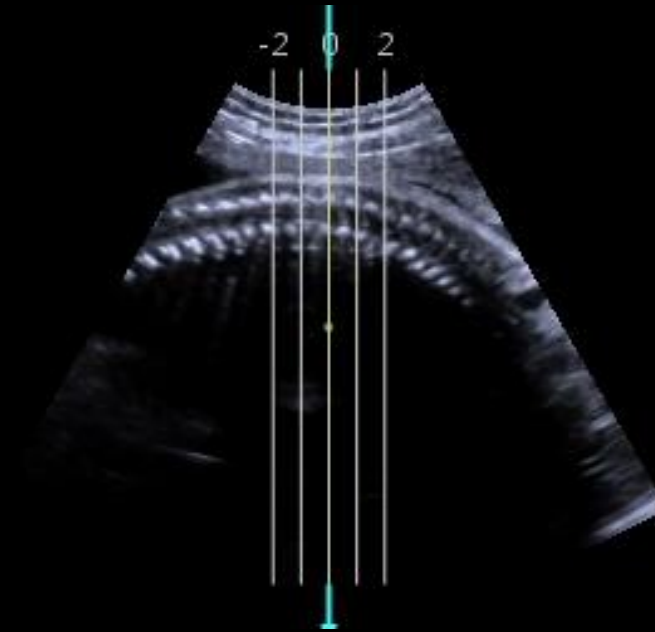


# Multislice graphic

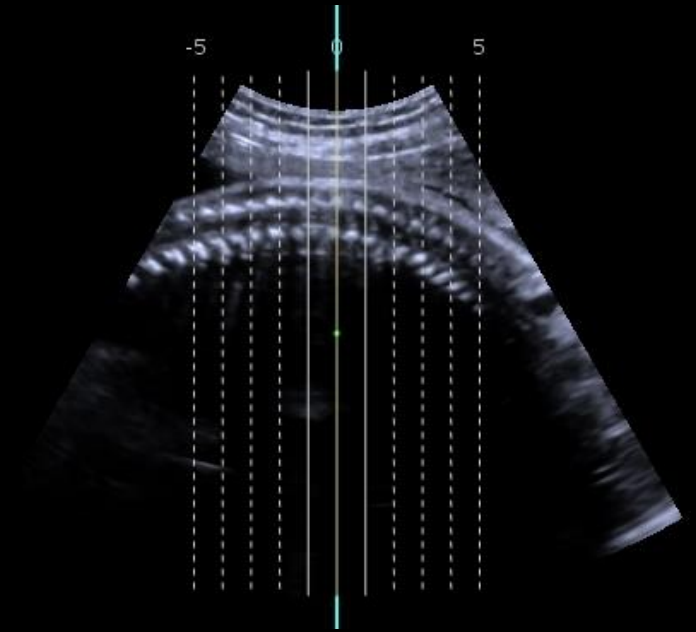
- Solid yellow line – Center slice displayed with white outline around corresponding slice
- Solid white line – Displayed slices
- Dashed white line – Available slices



- Defines the number of slices evaluated
- Options are 1 – 17
- May be adjusted further using additional optimization tools



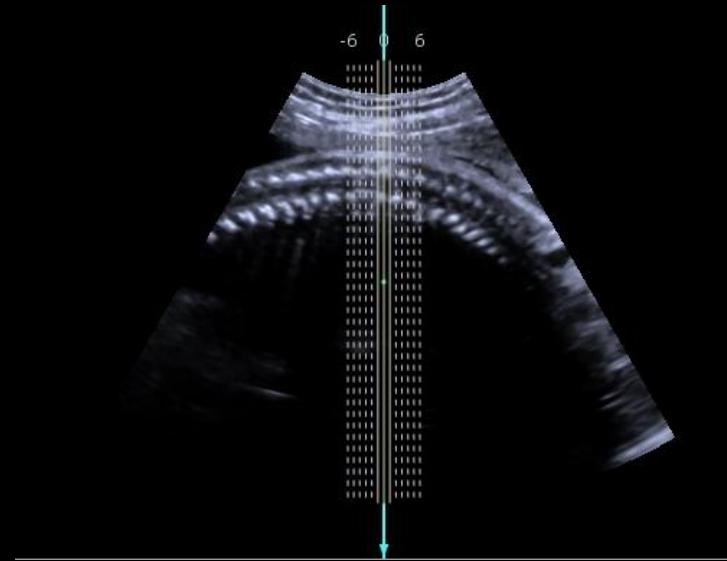
Less Slices



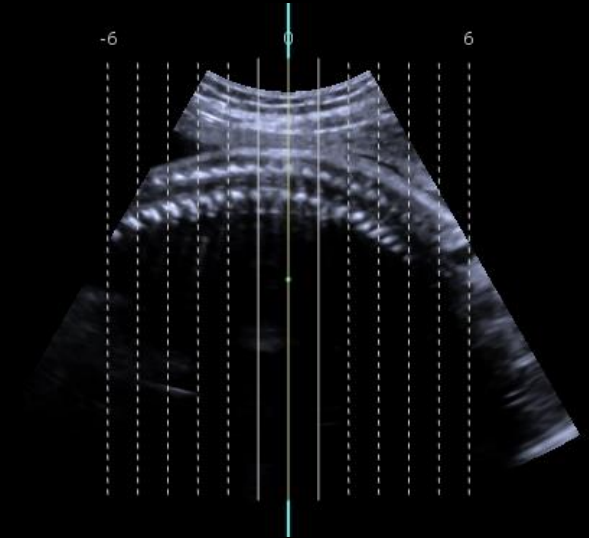
More Slices

# Distance

- Defines the distance between slices
- Options are 0.5 mm - 50 mm
- Slice graphic will reflect changes
- Increase for global view of region
- Decrease for greater detail



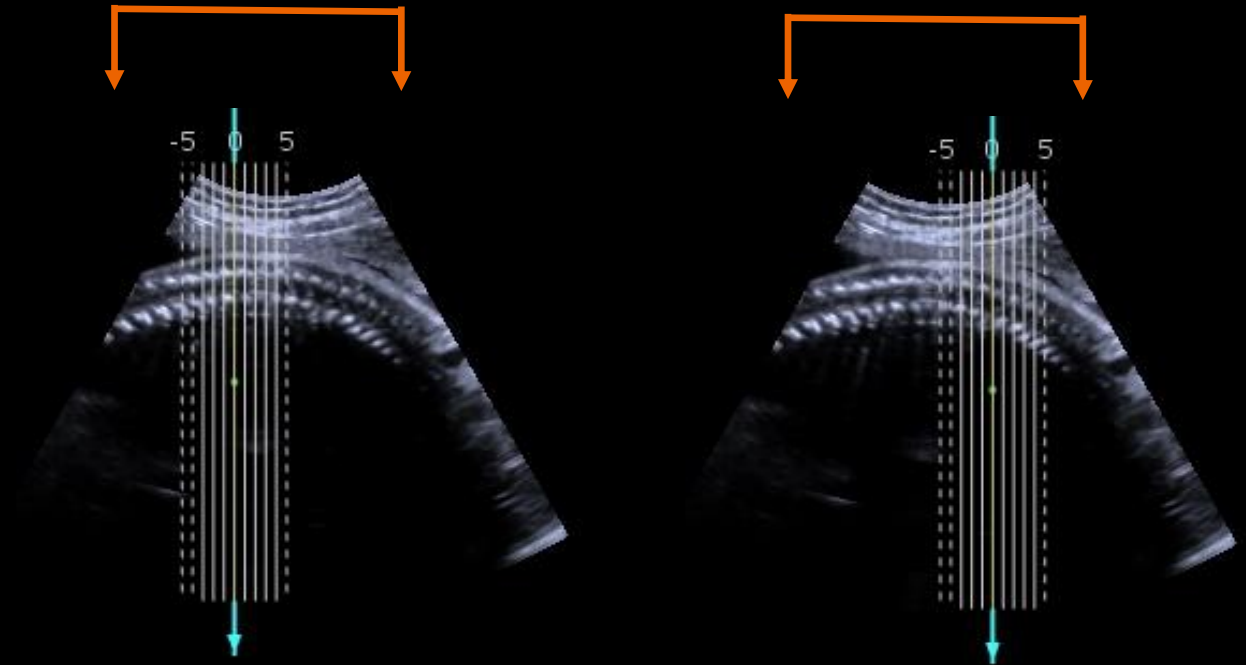
**Less Distance**



**More Distance**

# Position of Slices

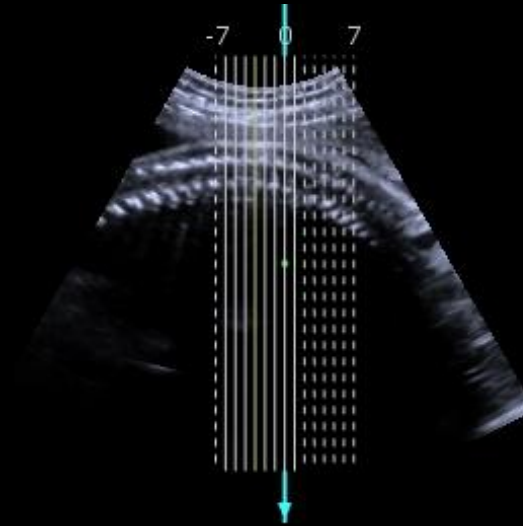
- Defines the area of interrogation
- The slice graphic will indicate the position of the slices
- Indicated by the slice graphic lines
- Anatomy outside of the slice graphic is not available for display



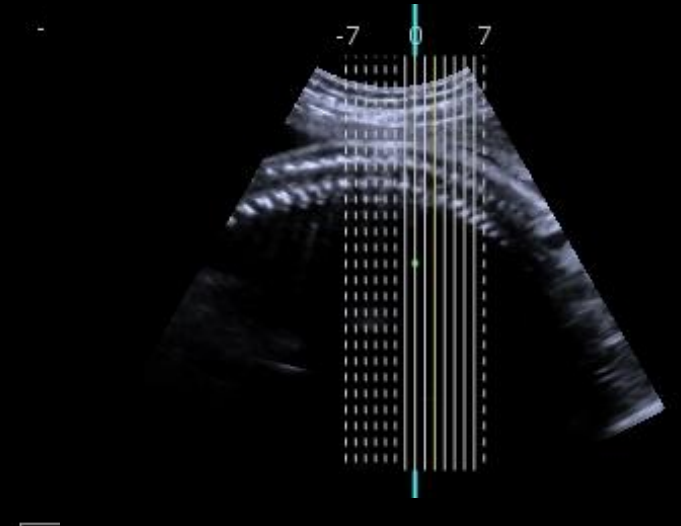


# Range Position

- Defines the slices displayed at any given time
- Rotate to scroll through the available slices previously selected
- Slice graphic reflects the area currently displayed
- Number of white solid lines on the graphic is dependent on the selected layout



Higher Range Position



Lower Range Position

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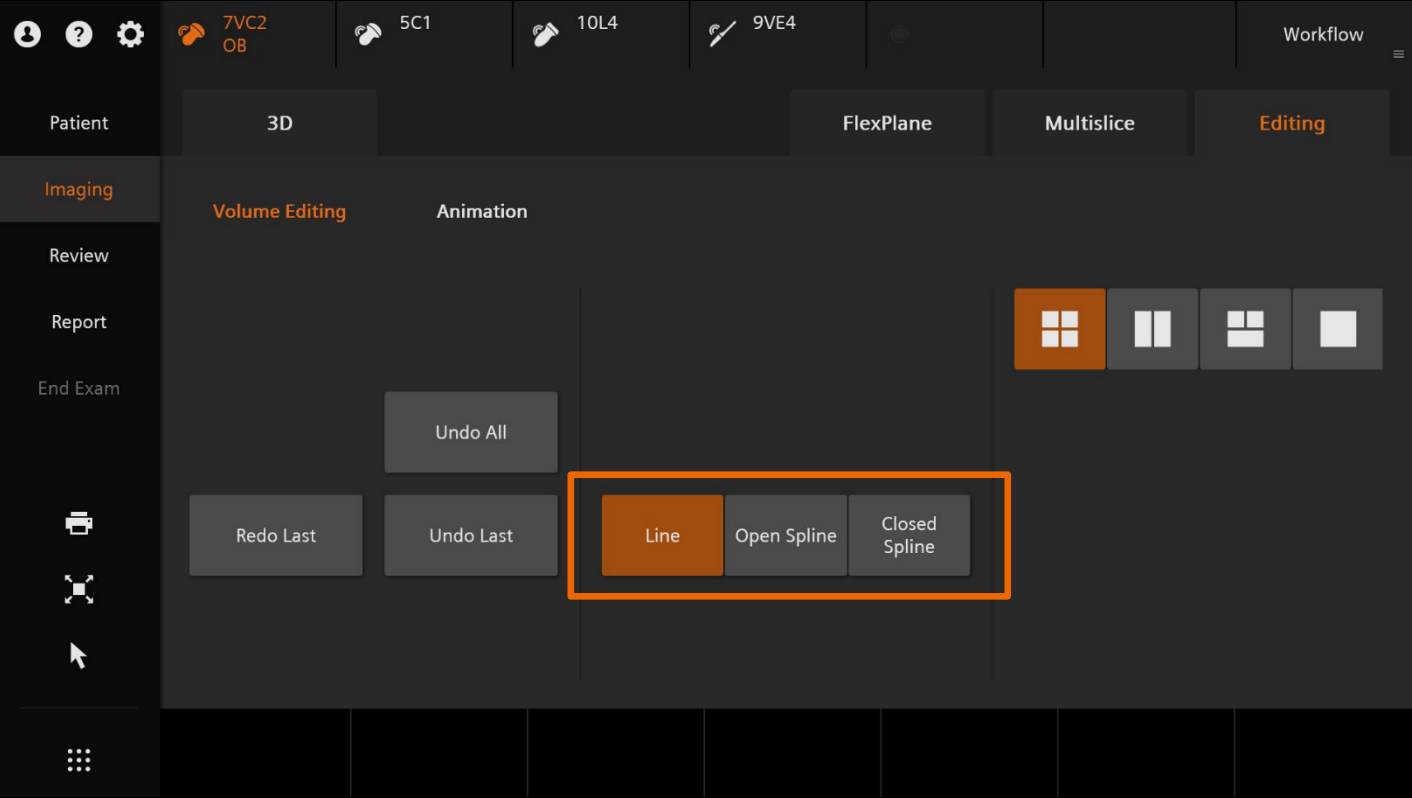
# Image and volume storage

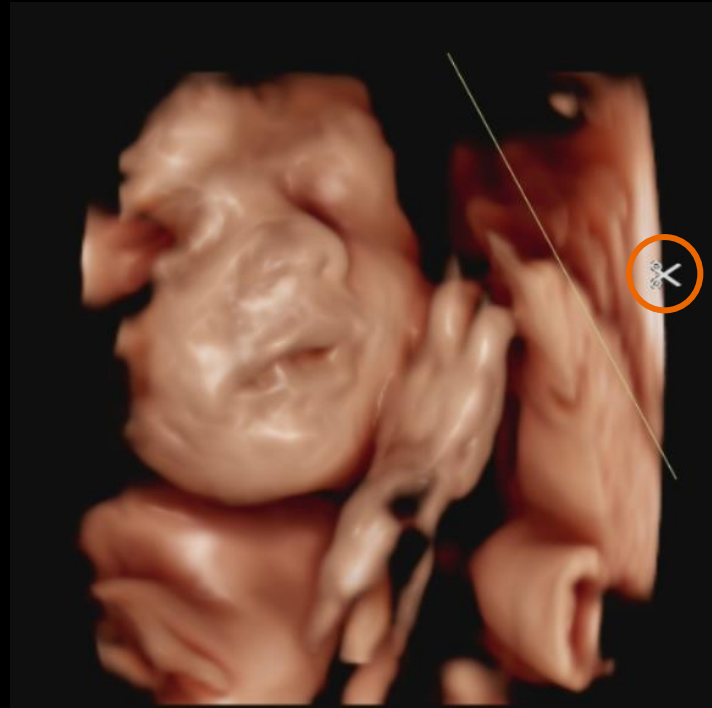


7VC2  
OB  
TIB:0.48  
TIC:1.27  
TIS:0.48  
MI:0.66  
4.5vps  
95%  
4D  
0dB/DR65  
Q Mid  
V 50°  
Th60  
Op72  
S3  
Br0  
Con60  
MPR:  
MapD/T5  
Vol:  
MapA

Clinical Data

# Additional controls





# Open Spline



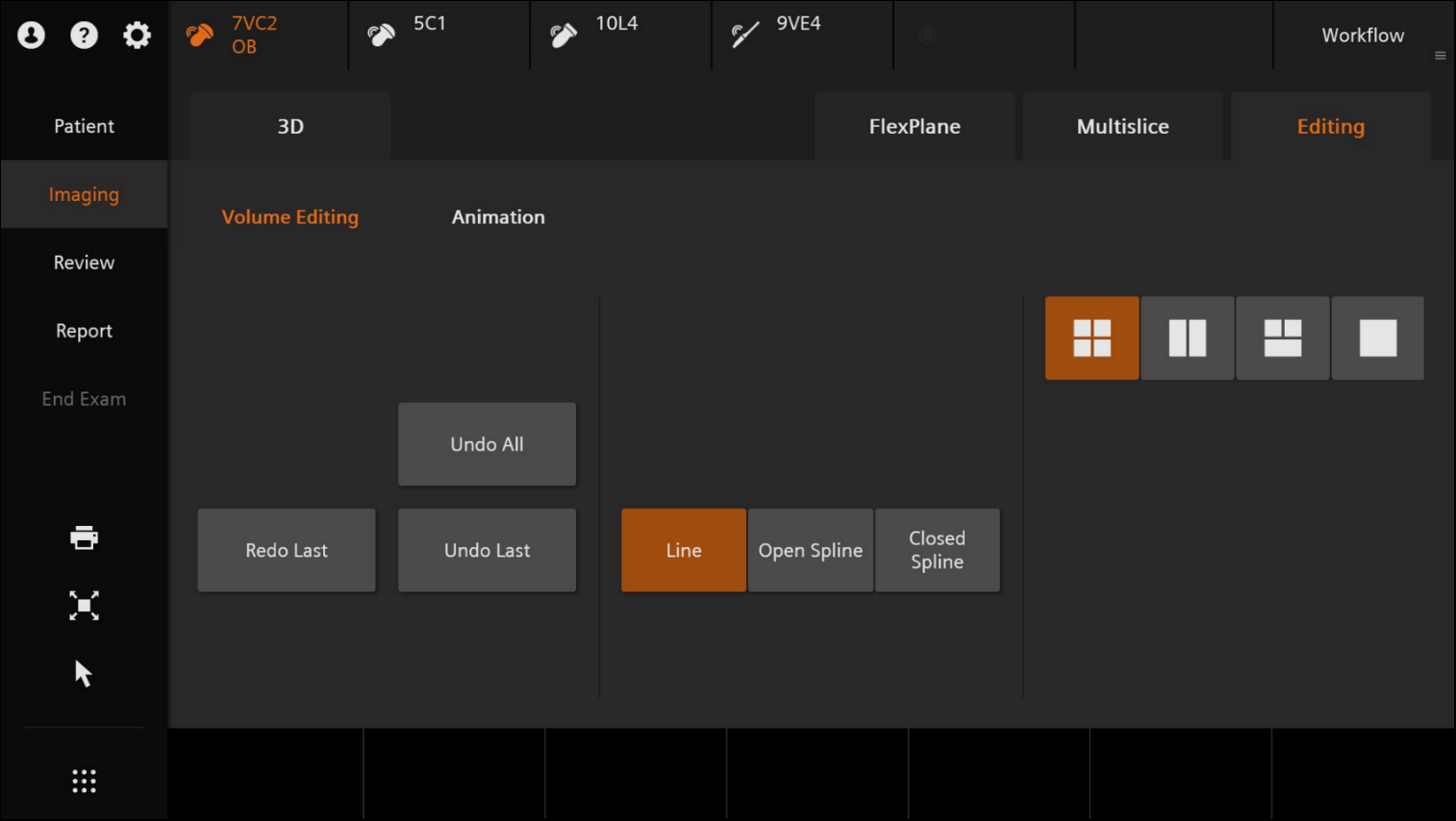


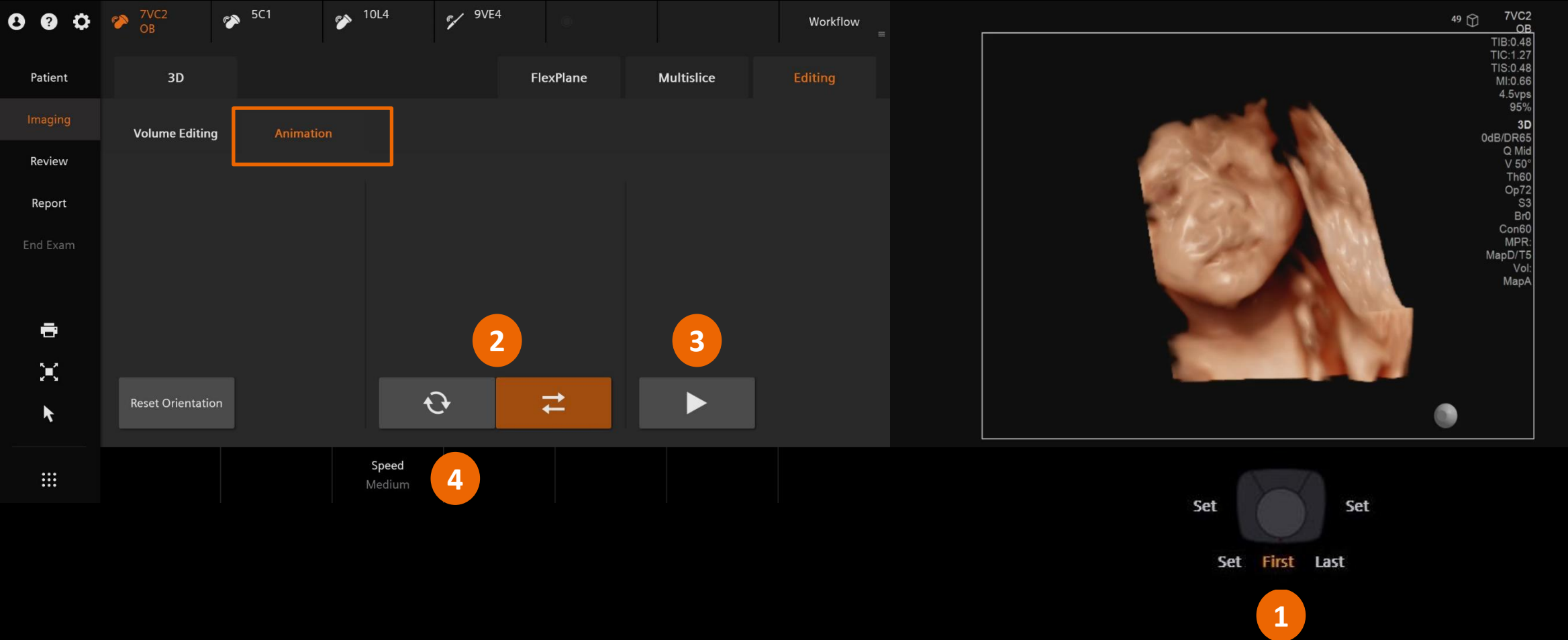
# Closed Spline





# Additional edit controls





# Objectives

- Outline activation and volume acquisition
- Describe volume manipulation
- Demonstrate optimization tools
- Explain FlexPlane Tool
- Explain Multislice feature
- Define volume store and editing
- **Describe reviewing stored volumes**



# 3D/4D review volume data

Patient

Imaging

Review

Report

End Exam

Review

FlexPlane

3D/4D

Review

Multislice

Editing

VR

MPR

A

B

C

VR

VOI

0°

90°

180°

270°

Reset All

Reset Curve

Reset Orientation

Flip

Sync

Light

Threshold

60

Opacity

72

Smooth

2

Brightness

0

Contrast

60

Tint

1

←

→

65  
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Thank you for your enthusiasm!

# Questions?