

# ACUSON Sequoia Ultrasound System

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



# Objectives

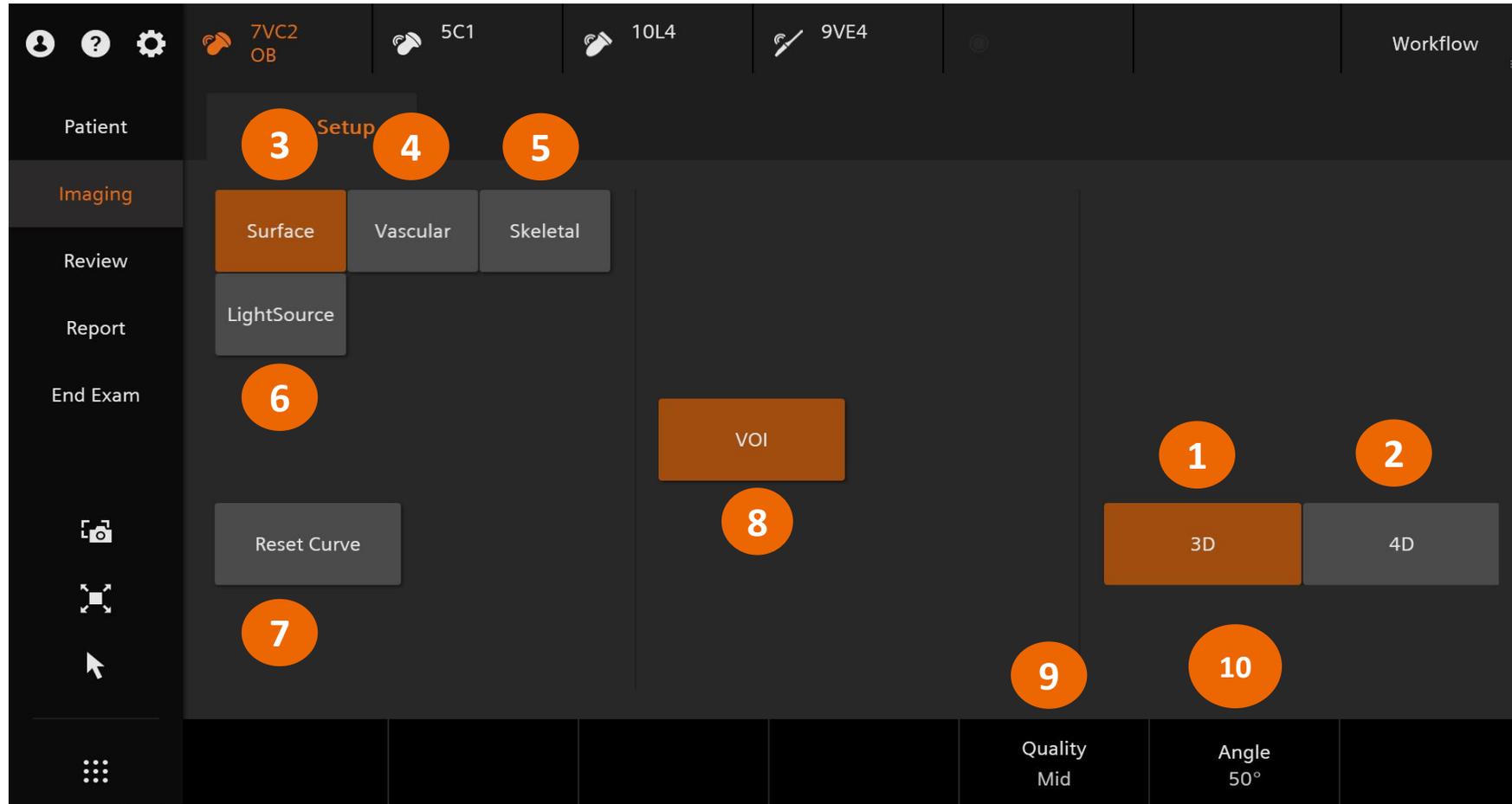
- **Outline activation and volume acquisition**
- Describe volume manipulation
- Demonstrate optimization tools
- Explain FlexPlane Tool
- Explain Multislice feature
- Define volume store and editing
- Describe reviewing stored volumes



# Activate 3D/4D



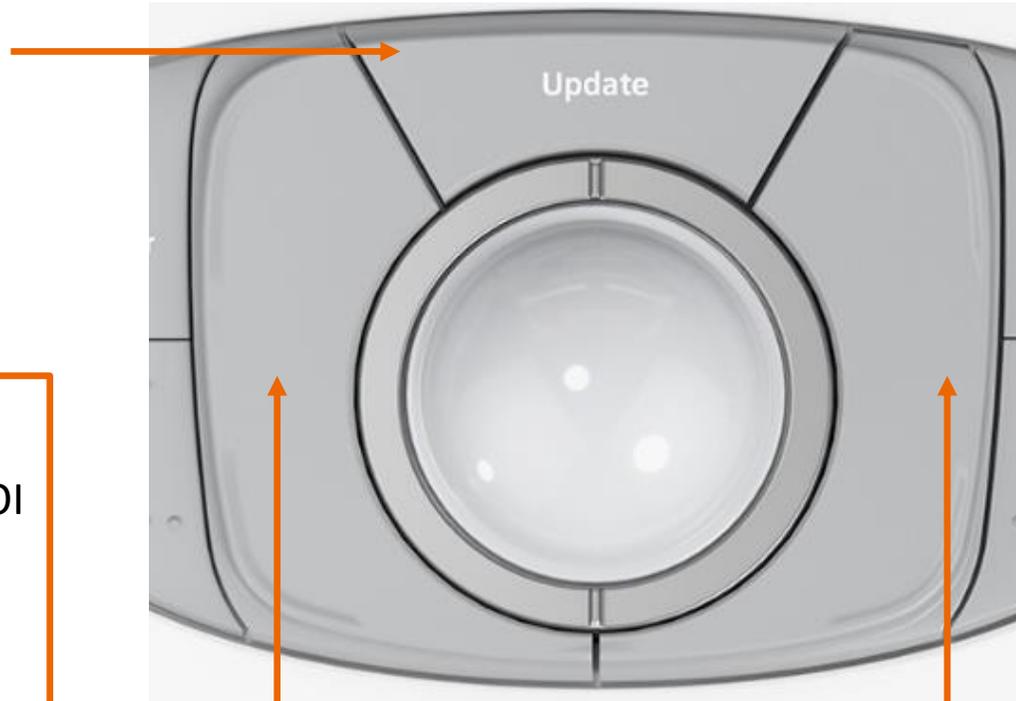
# Touch Screen



# 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



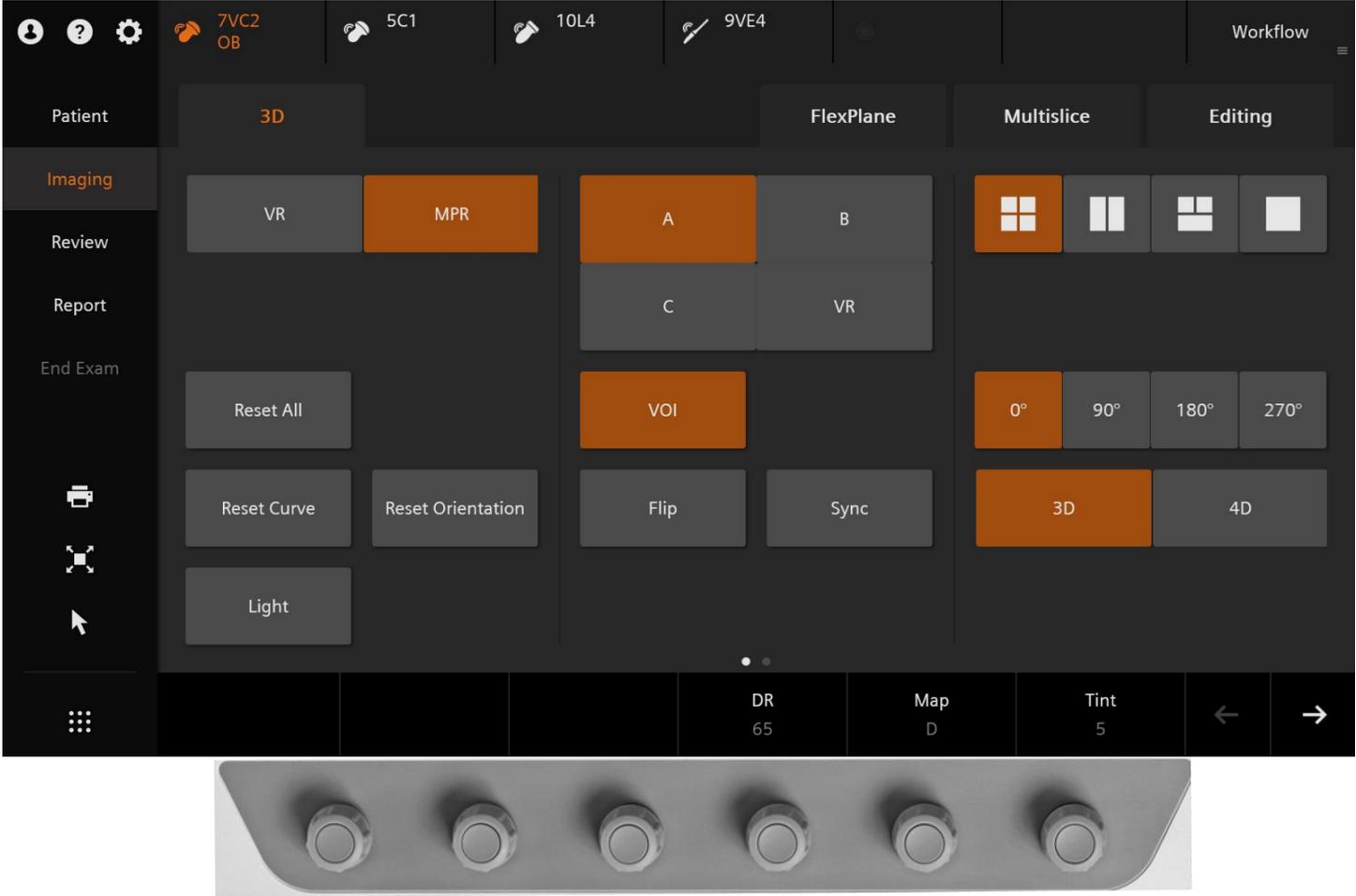
Home Base display

# 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

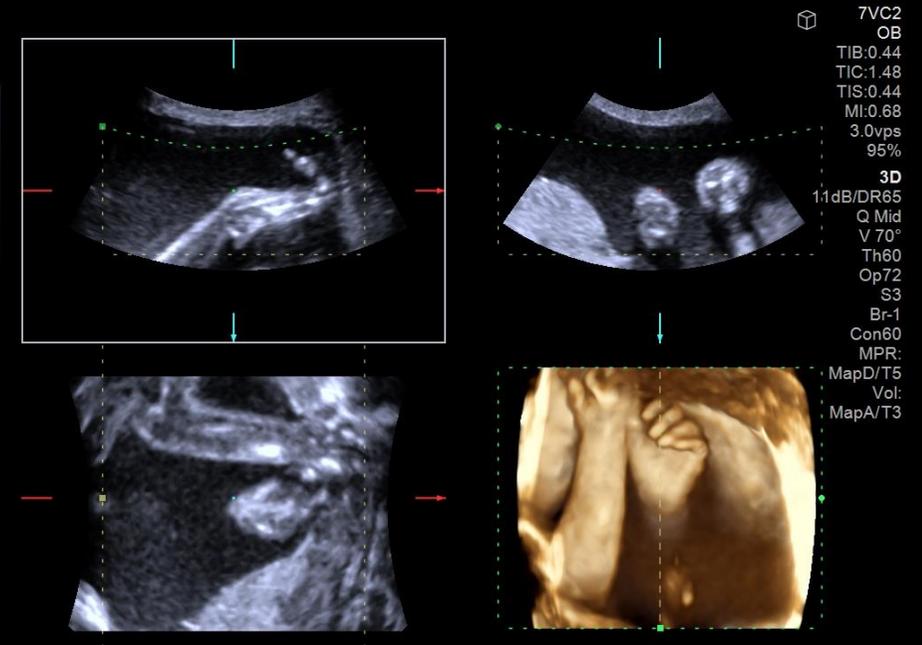


# Volume Touch Screen



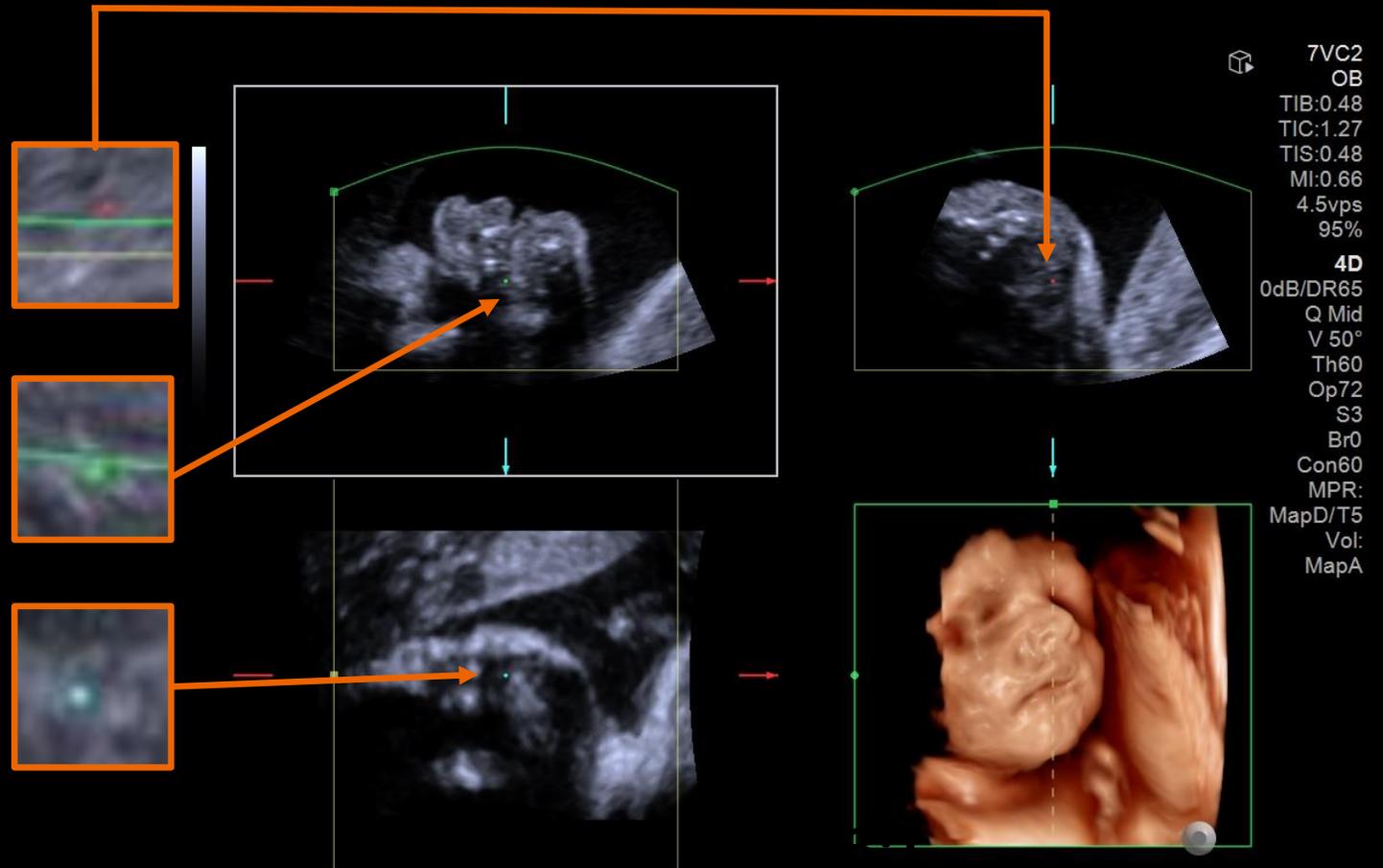
# Display format

The screenshot shows a software interface with a top navigation bar containing icons for Patient, Help, Settings, and Workflow. Below this is a menu with categories: Patient, Imaging, Review, Report, and End Exam. The main area is divided into sections: 3D, FlexPlane, Multislice, and Editing. The 3D section includes buttons for VR, MPR, A, B, C, and VR. The FlexPlane section includes buttons for A, B, C, and VR. The Multislice section includes buttons for 0°, 90°, 180°, and 270°. The Editing section includes buttons for 3D and 4D. At the bottom, there are controls for DR (65), Map (D), Tint (5), and navigation arrows.



# Reference point

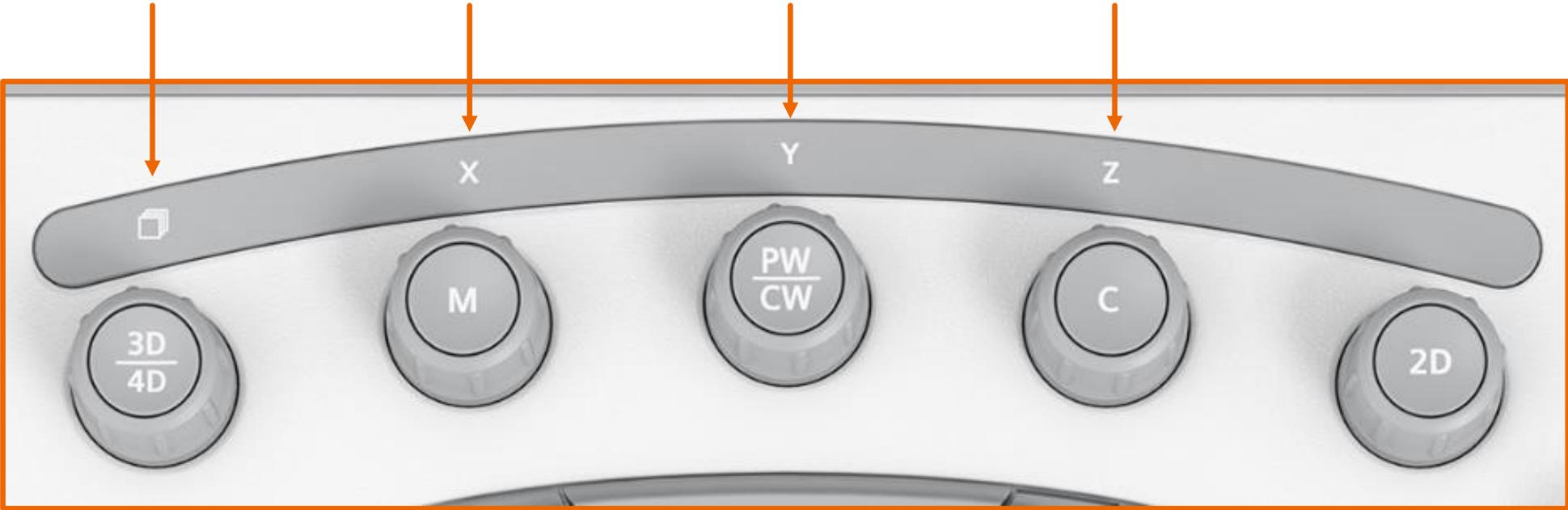
- The reference marker is the pivot point to manipulate the Multiplanar Reconstruction (MPR) planes
- It represents the point where the A, B, and C plane intersect
- Place the desired anatomy at the reference point to display in all three planes



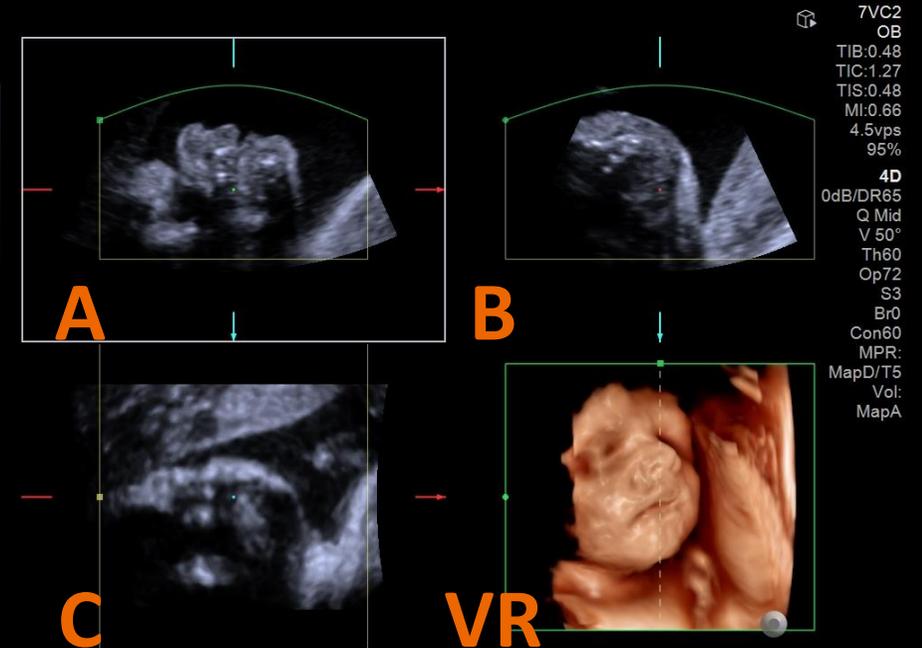
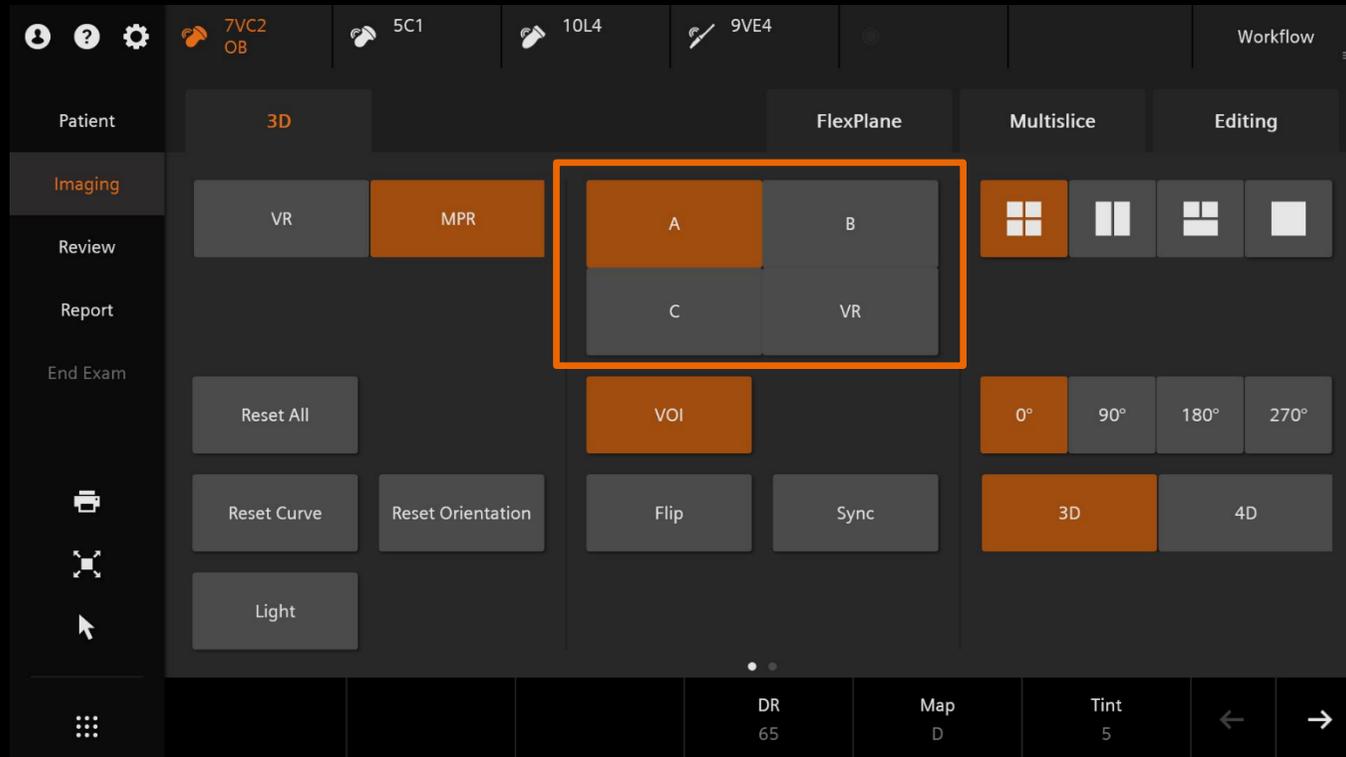
# VOI Size and curve



# Control Panel

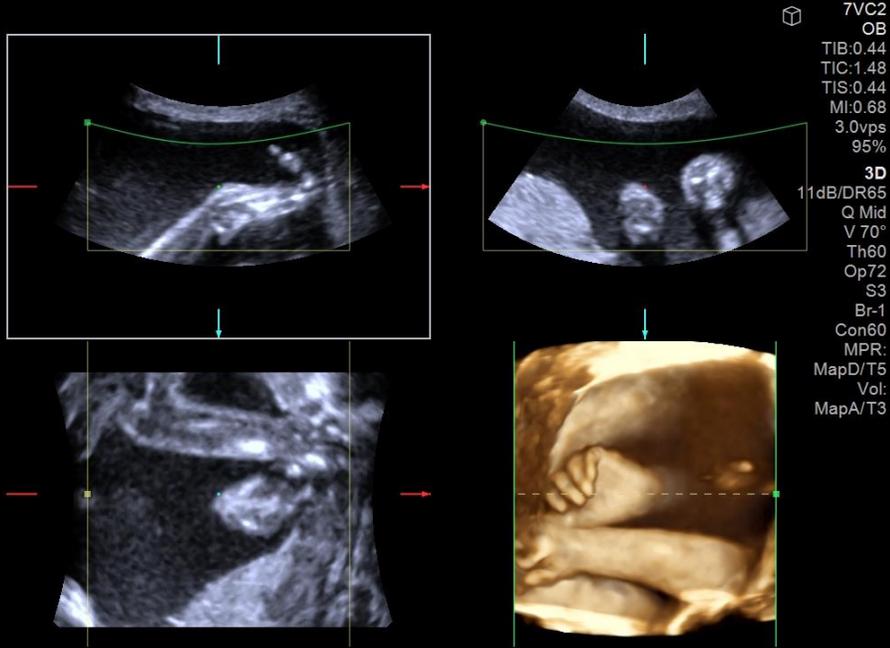


# Quadrant selection



# Volume rendering rotation

The screenshot shows the Siemens ultrasound software interface. At the top, there are patient and study identifiers: 7VC2 OB, 5C1, 10L4, and 9VE4. Below this is a navigation bar with 'Patient', 'Imaging', 'Review', 'Report', and 'End Exam' tabs. The 'Imaging' tab is active, showing a grid of options: '3D', 'FlexPlane', 'Multislice', and 'Editing'. Under '3D', 'VR' and 'MPR' are visible. Under 'FlexPlane', 'A', 'B', 'C', and 'VR' are visible. Under 'Multislice', there are icons for different slice views. Under 'Editing', there are options for '0°', '90°', '180°', and '270°', which are highlighted with an orange box. Other options include 'Reset All', 'Reset Curve', 'Reset Orientation', 'Light', 'VOI', 'Flip', 'Sync', '3D', and '4D'. At the bottom, there are controls for 'DR' (65), 'Map' (D), 'Tint' (5), and navigation arrows.



# Touch Screen keys

7VC2 OB 5C1 10L4 9VE4 Workflow

Patient 3D FlexPlane Multislice Editing

Imaging VR MPR A B

Review C VR

Report

End Exam

1 Reset All

2 Reset Curve Reset Orientation

3 Light

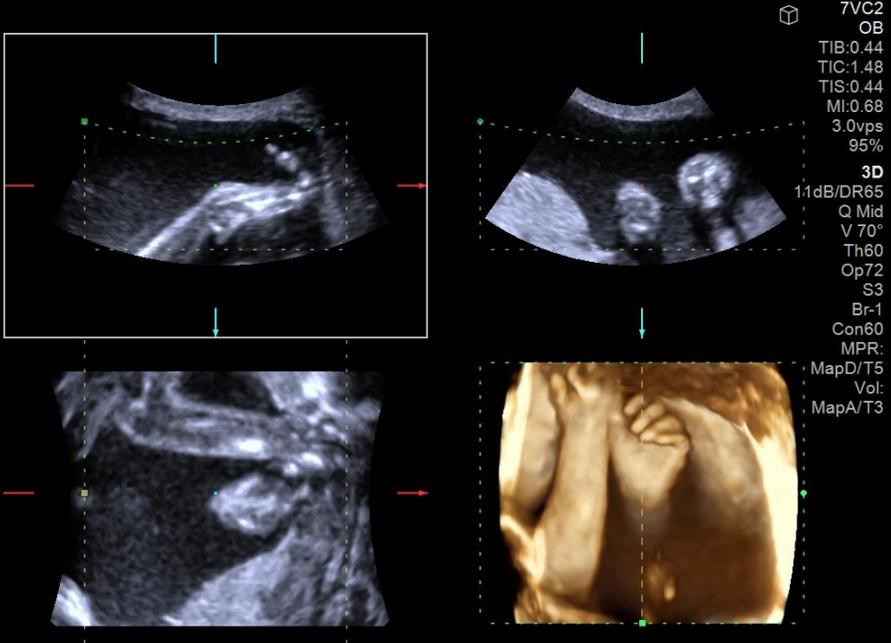
4 Flip

5 Sync

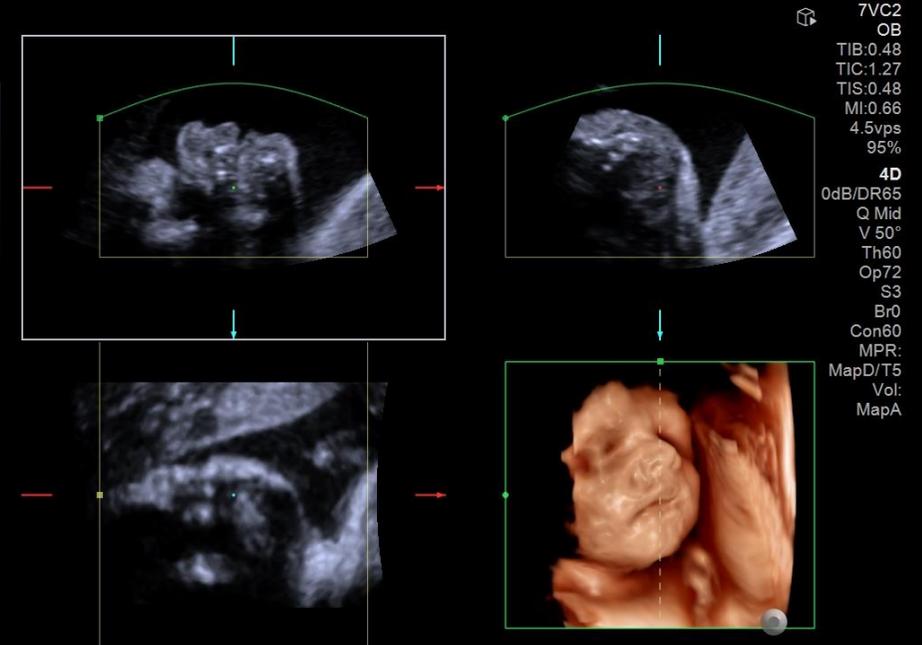
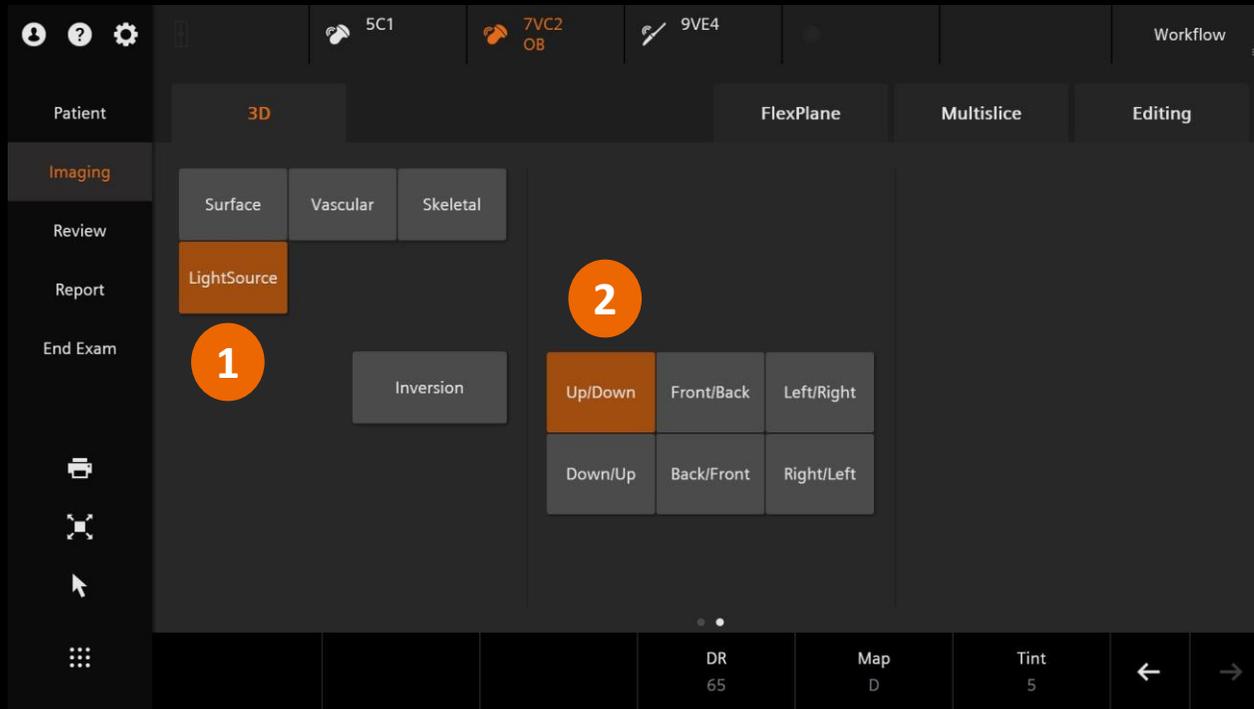
0° 90° 180° 270°

3D 4D

DR 65 Map D Tint 5



# Touch Screen keys

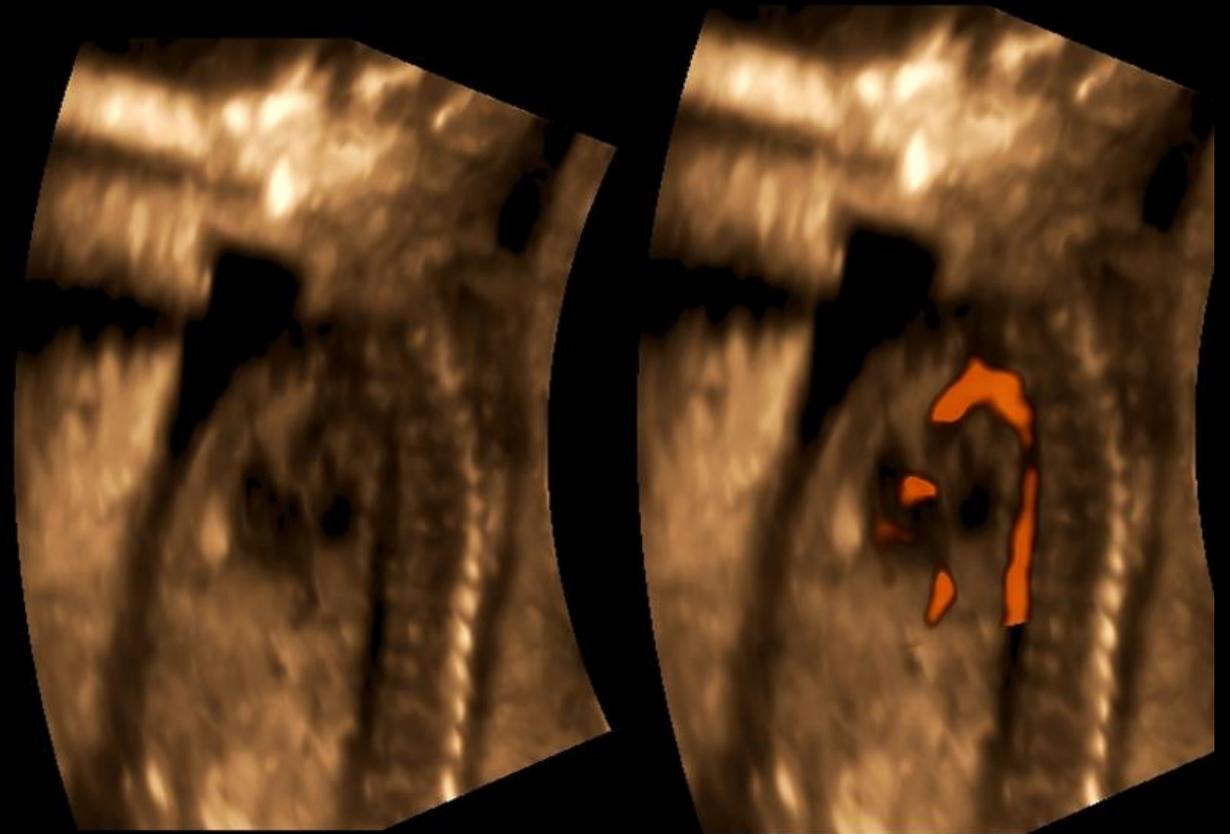


- Smooths the image contours
- Creates a soft sculptured appearance for highlighting surface features
- Uses the mode specific selections for opacity percentage and threshold
- Includes eight tint options



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

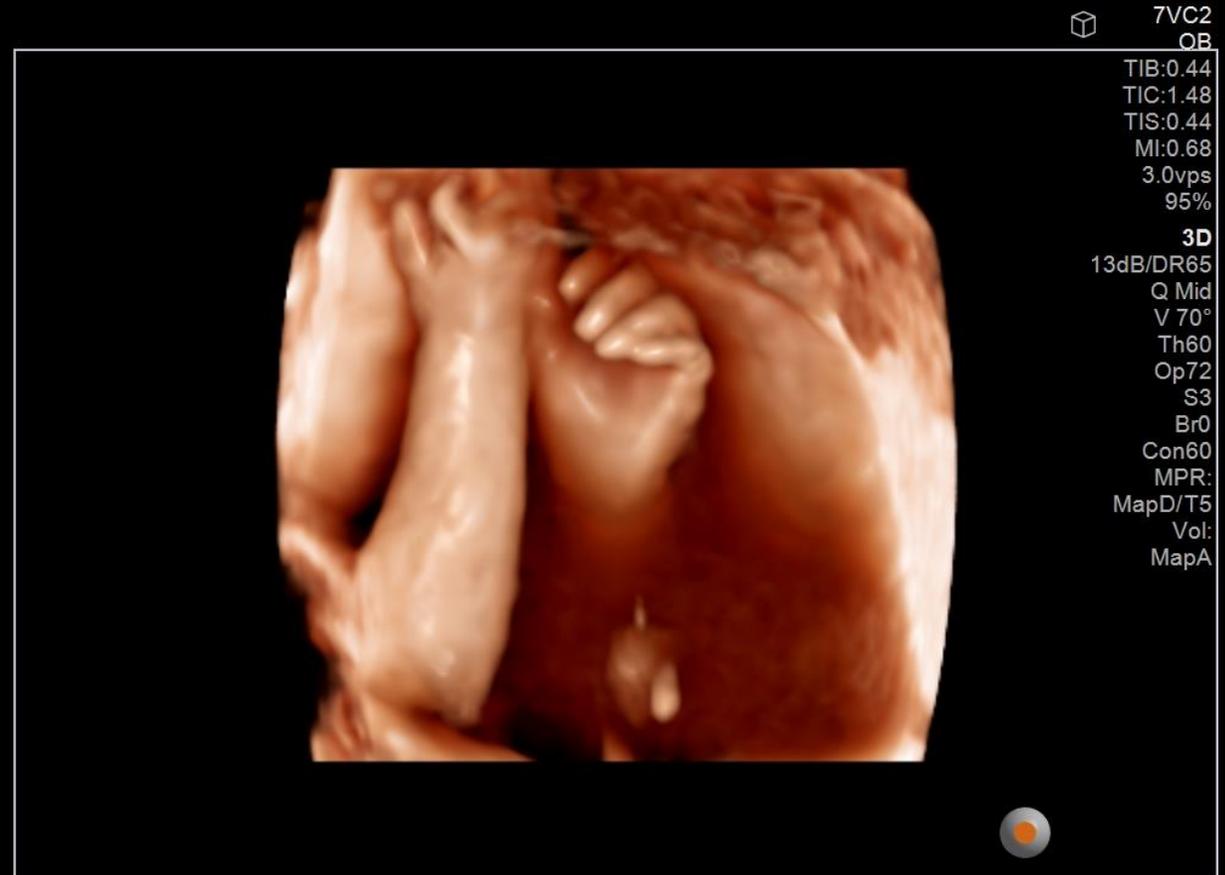


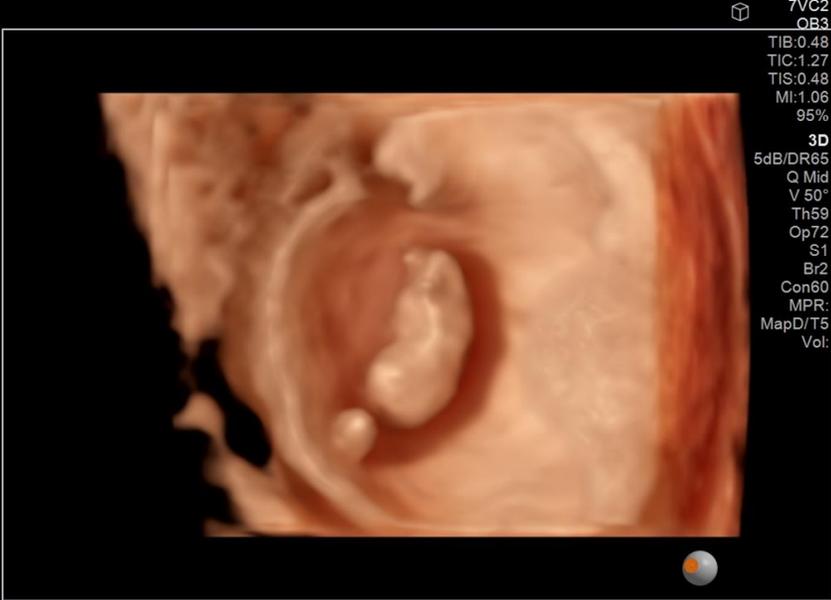
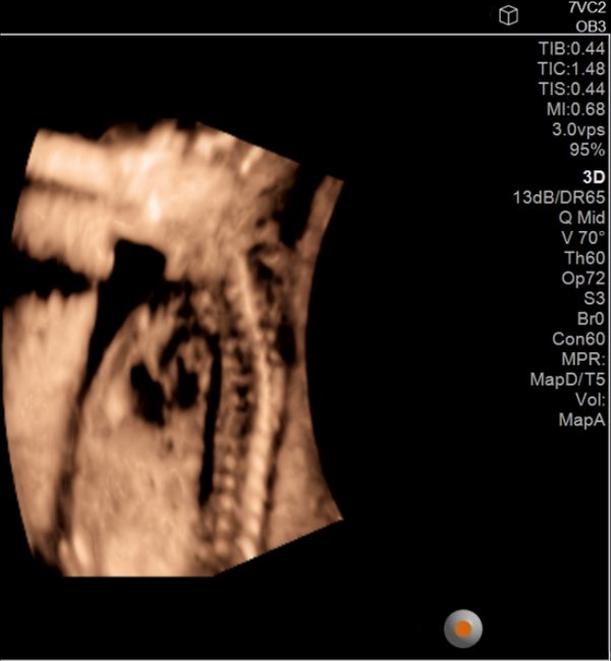
Limits the display to maximum-value pixels with the highest value along each projection of the volume to aid in visualizing hyper-echoic structures

- Fetal Spine
- Bony Structures
- Intrauterine devices



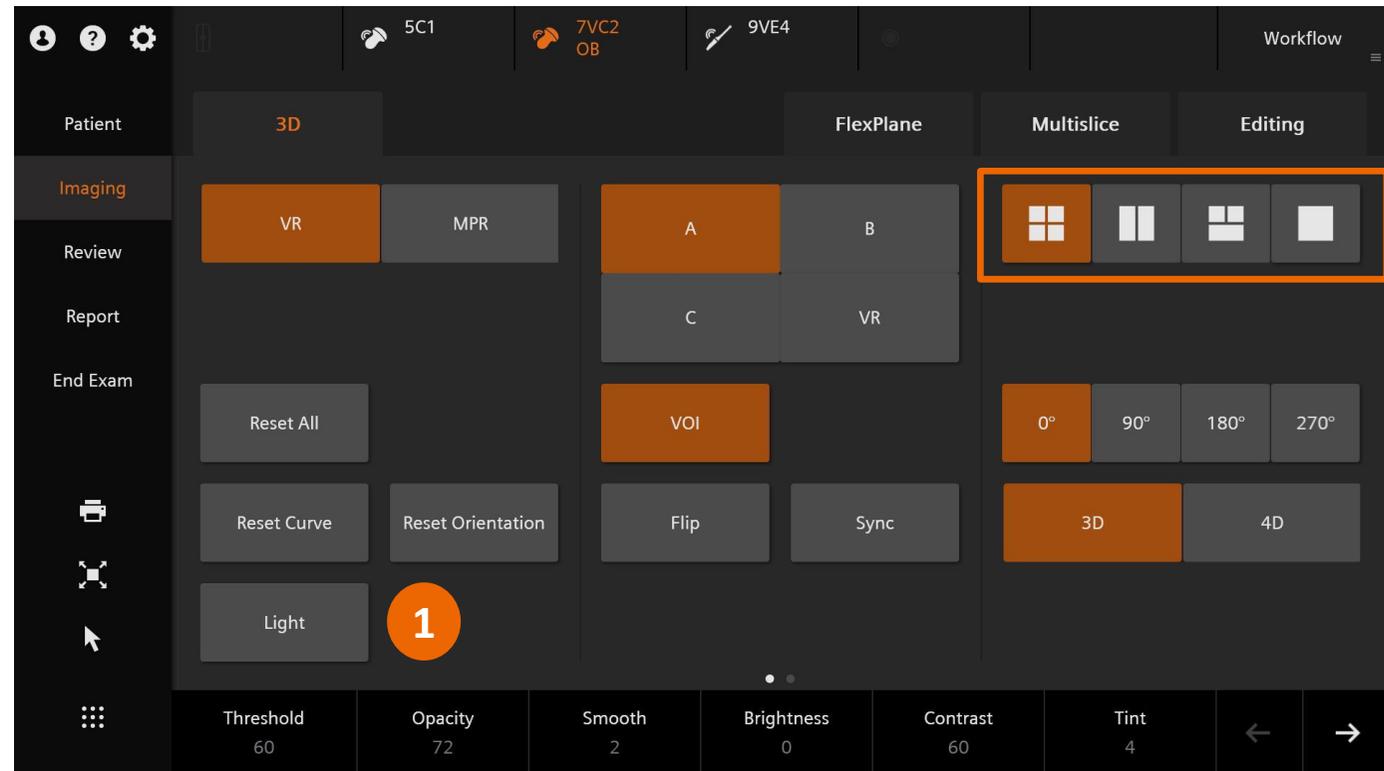
- Increase depth perception
- Reveal surface details
- Deeper understanding of relational anatomy





## 1. Select Light

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



# LightSource

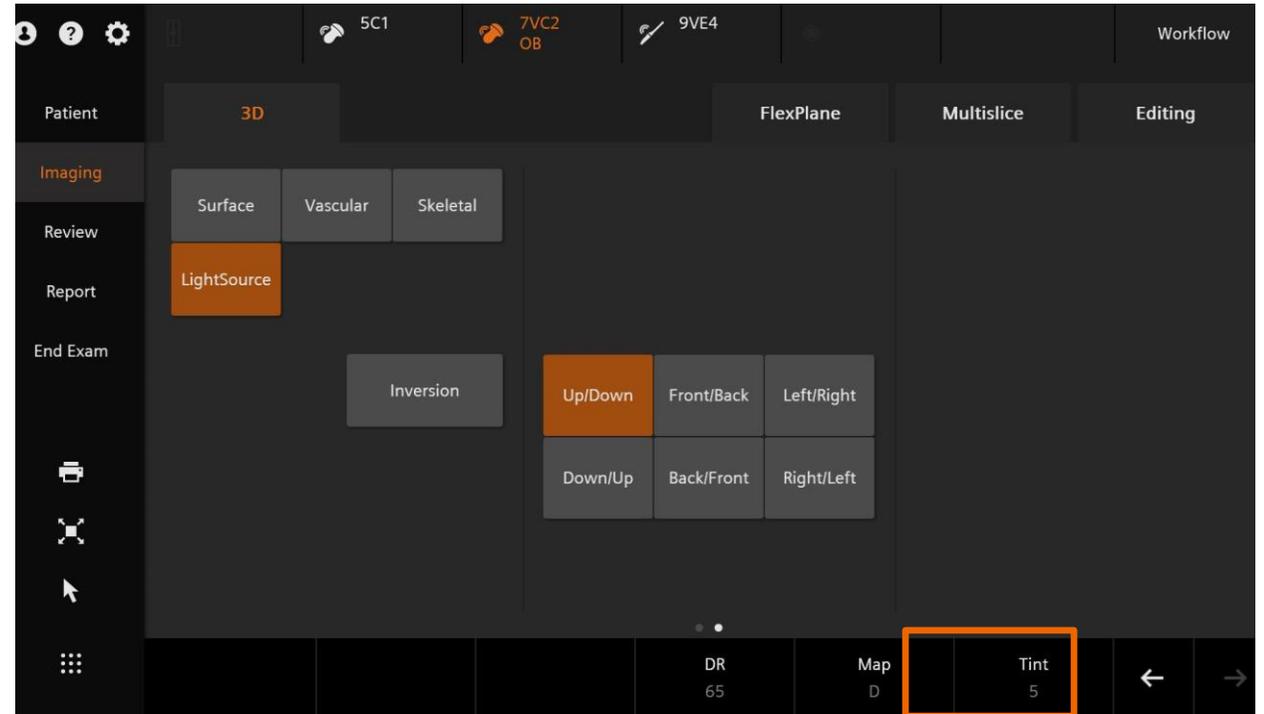
2. Use the trackball to adjust the point LightSource direction
3. The arrow on the point LightSource icon indicates the direction the light is shining



LightSource Tints provide

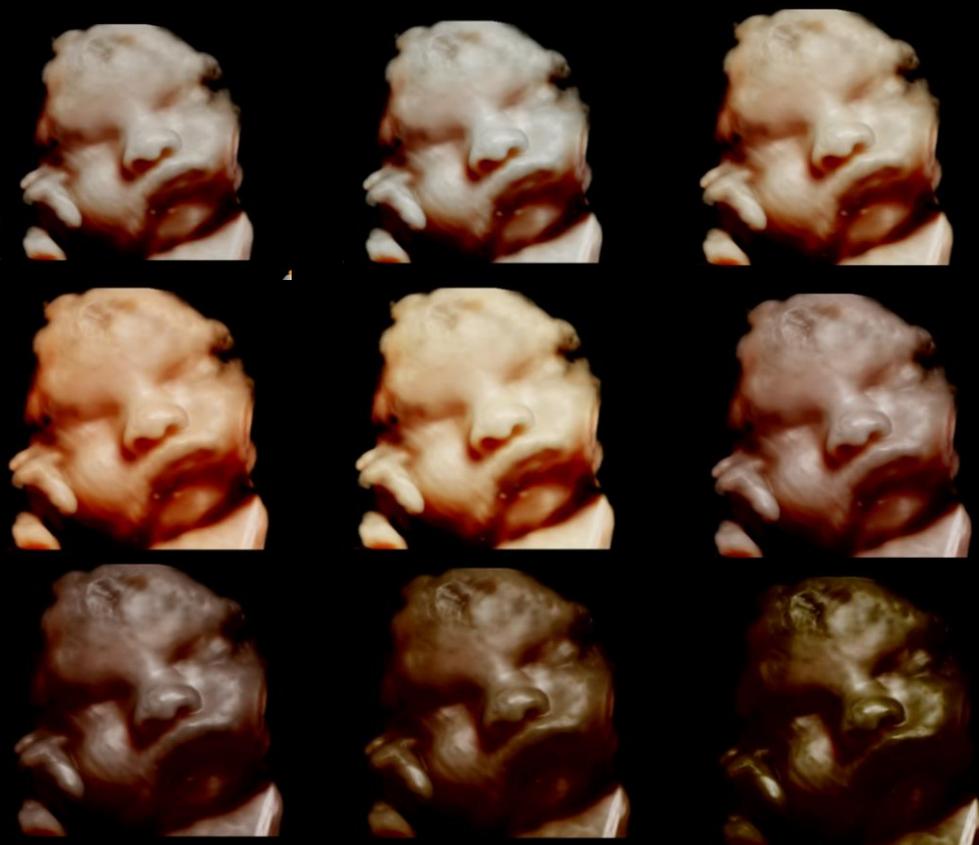
- Diversity in tints and skin tones
- A more even appearance to the surface render
- Enhance gynecological features

Available on the 7VC2 and the 9VE4



# VR- LightSource tints

7VC2



9VE4

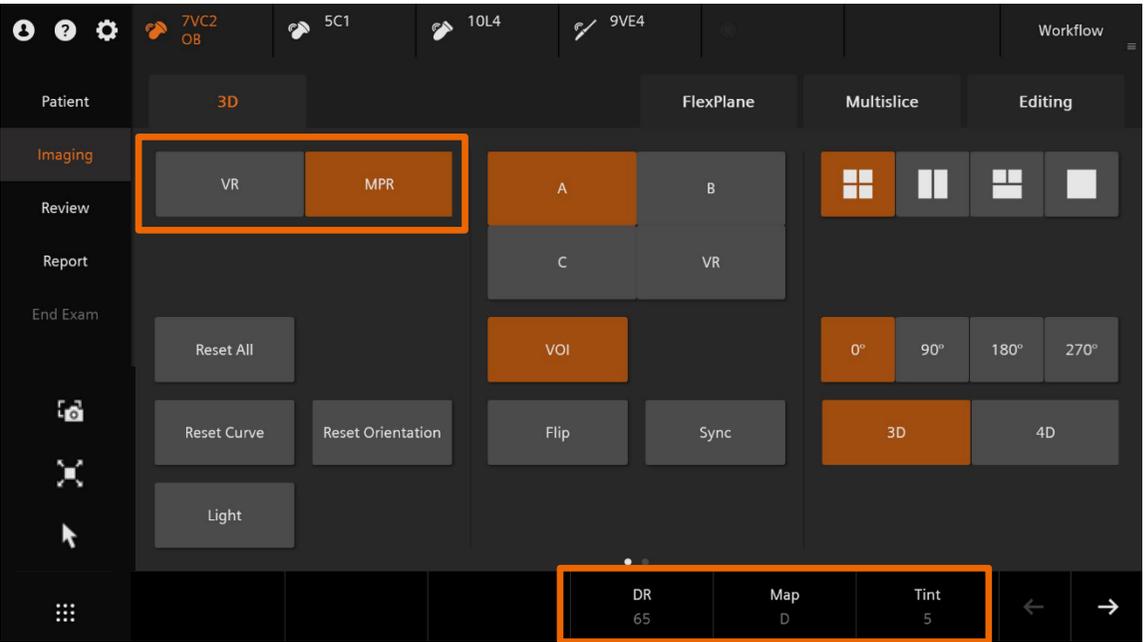
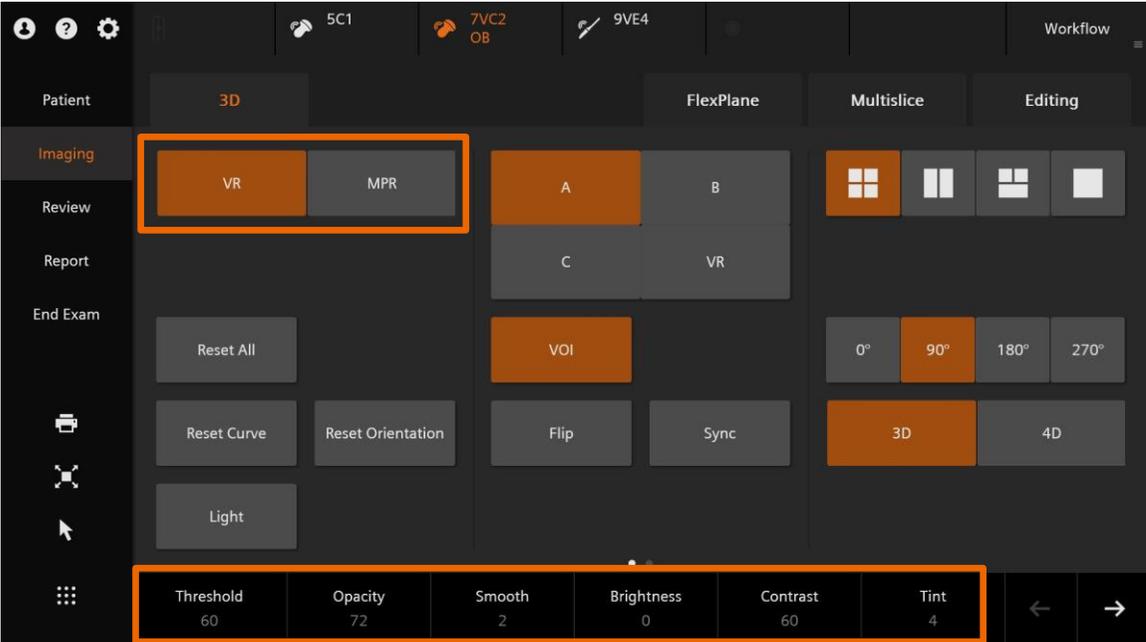


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# Optimization tools



# 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

# VR - Smooth

- 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

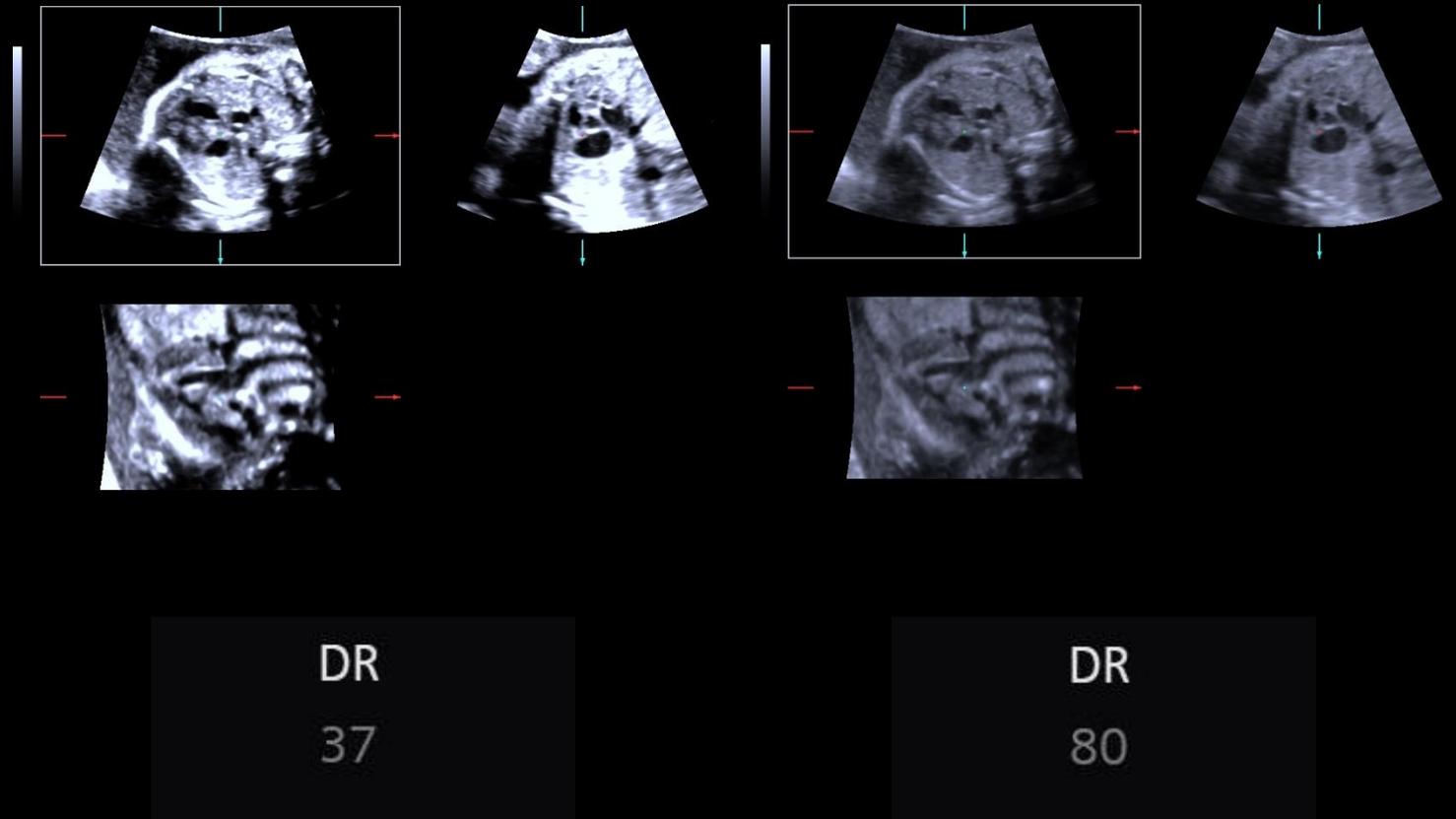
66

- 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



# MPR - Map

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



Map

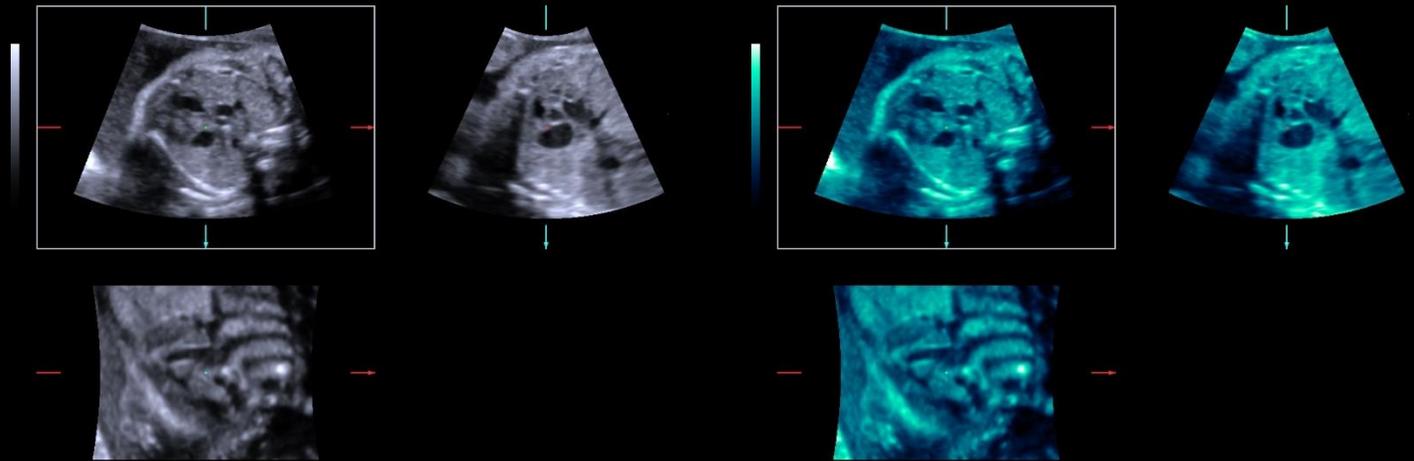
D

Map

G

# MPR - Tint

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



Tint

4

Tint

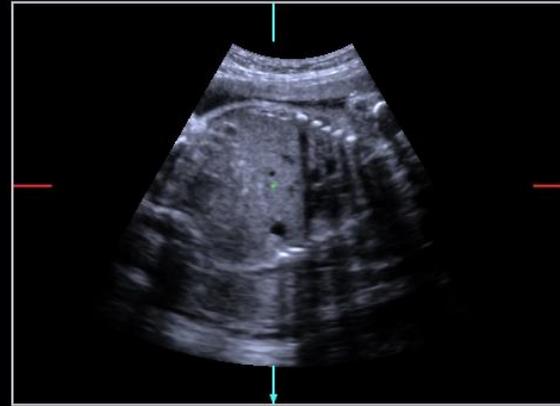
7

# Power Doppler

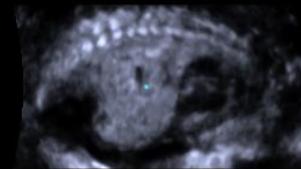
- Applies colors to vascular structures based on flow amplitude
- Activate prior to entering acquisition mode



# Measurements



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



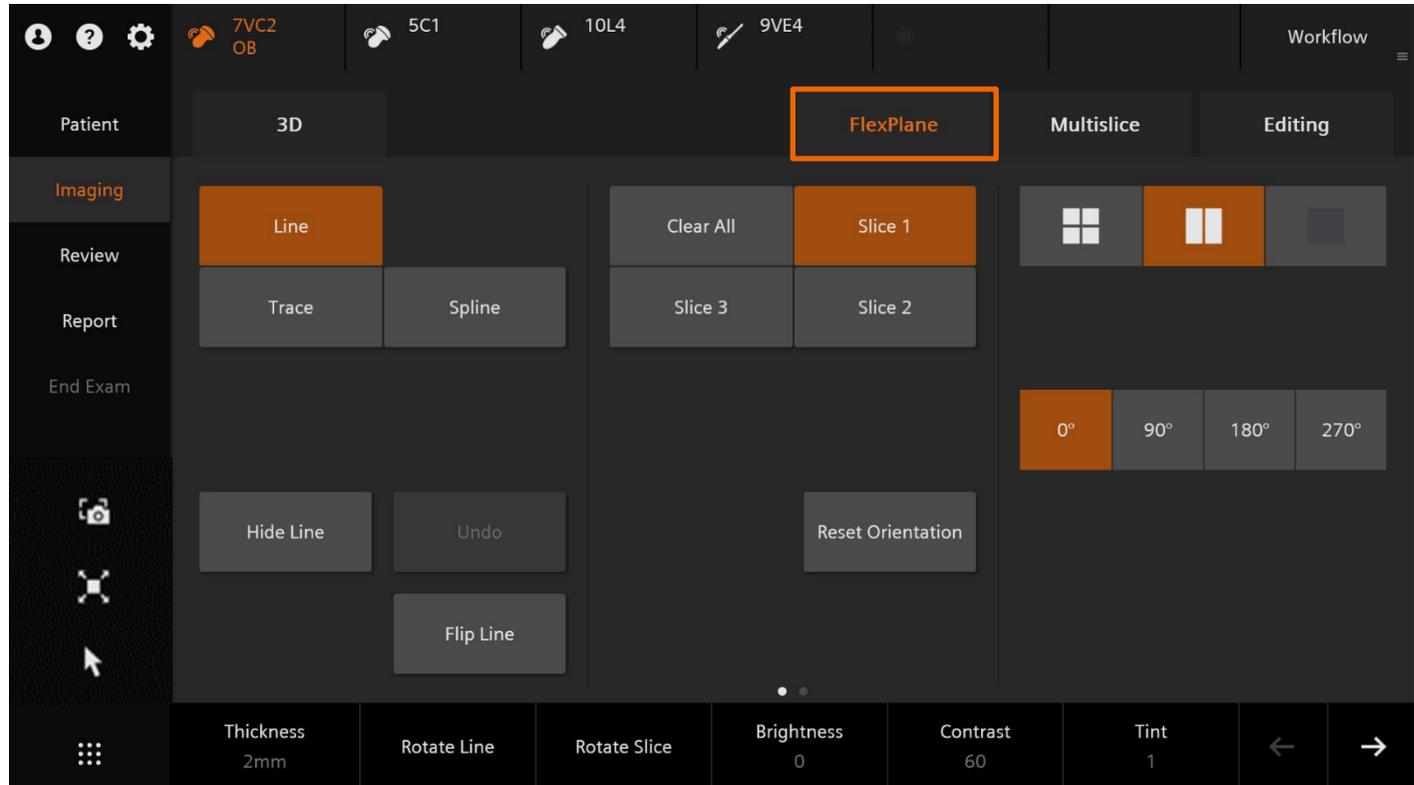
→ 1 AC=24.15 cm  
GA=28w 3d

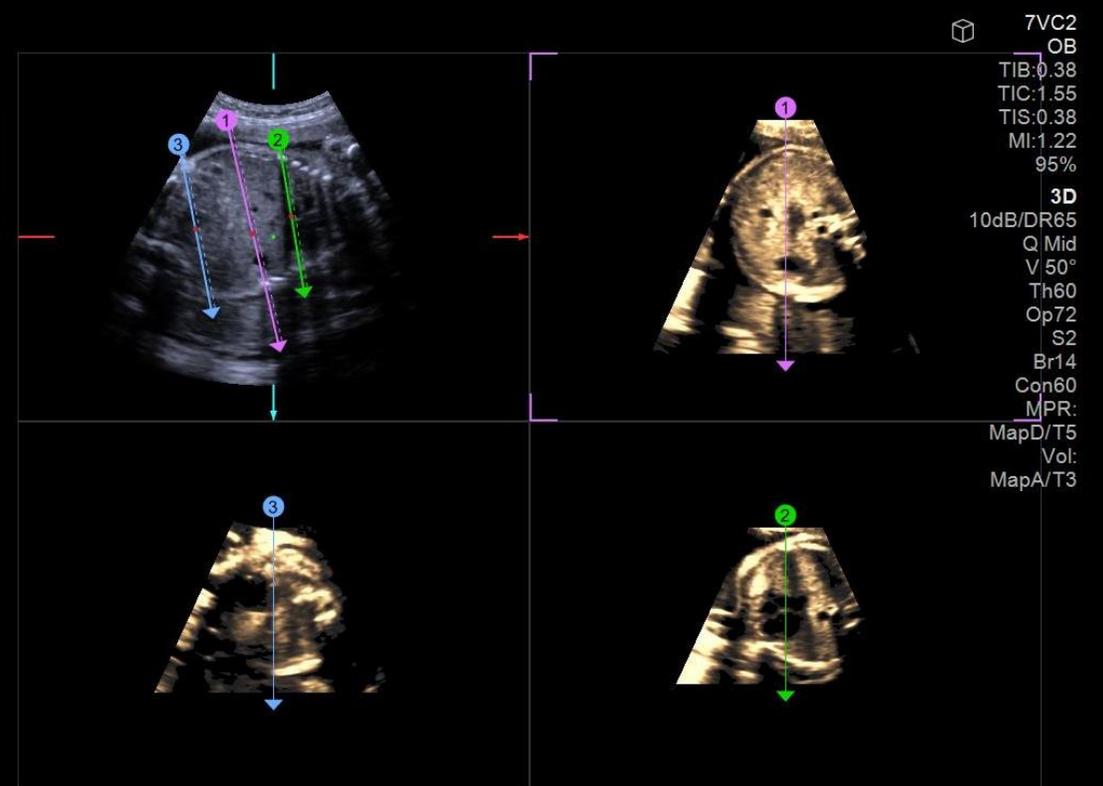
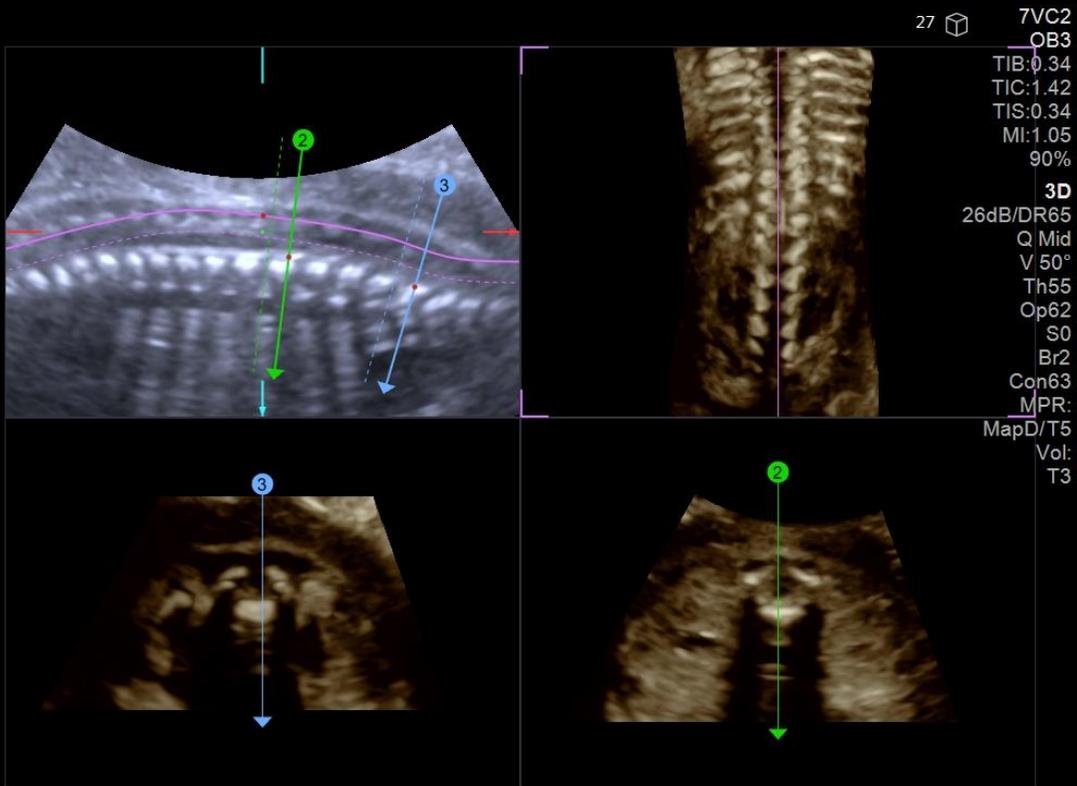
# Objectives

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- Explain Multislice feature
- Define volume store and editing
- Describe reviewing stored volumes

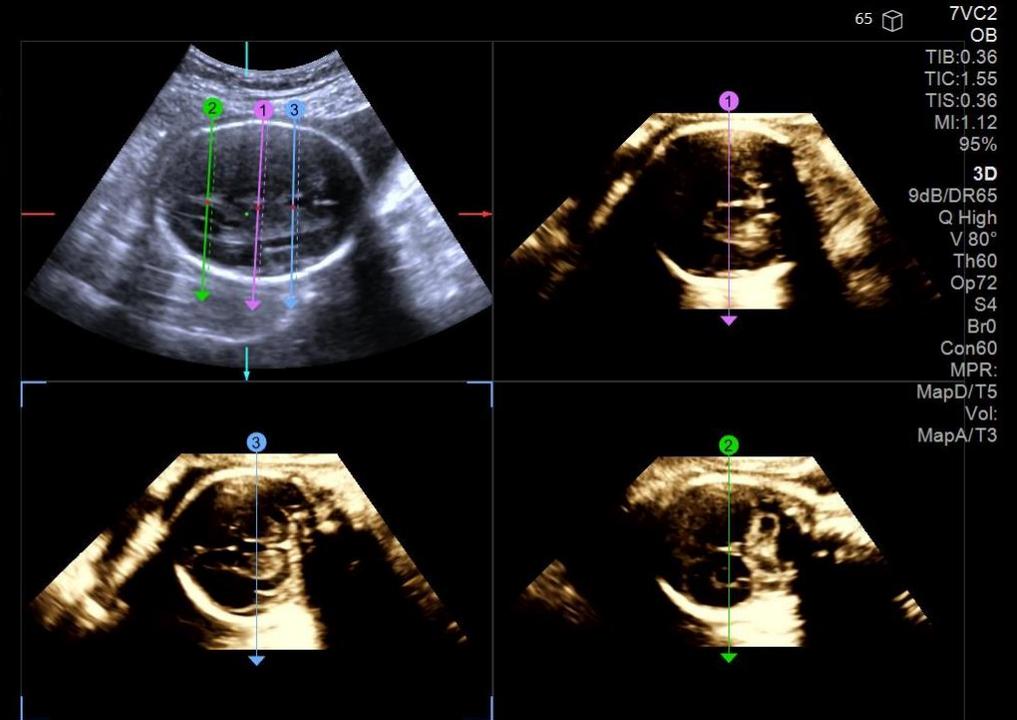
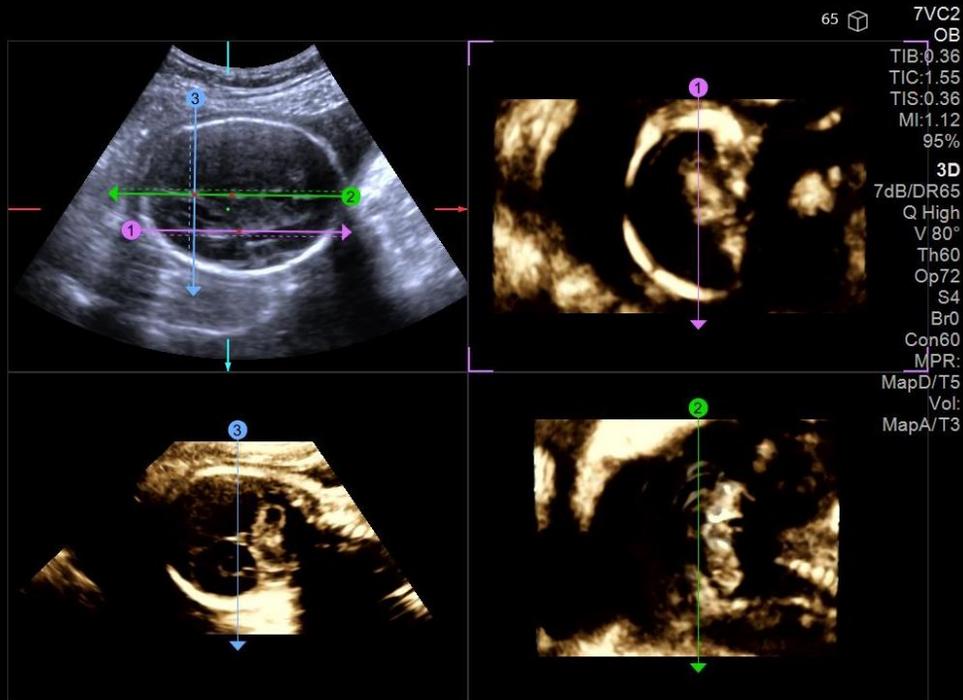


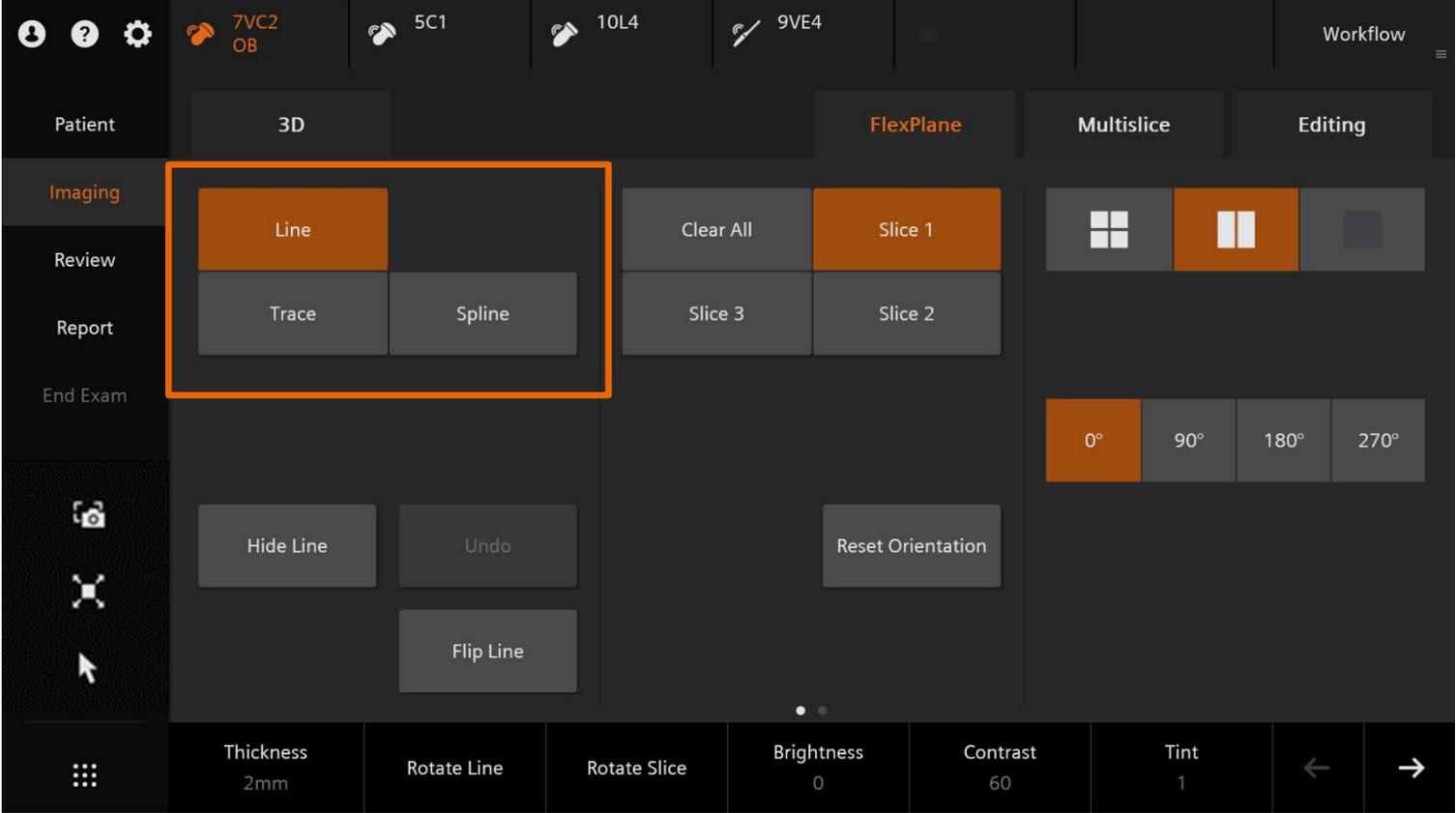
- Visualization of anatomy along any plane or shape
- Reduces planar manipulation (X-Y-Z)

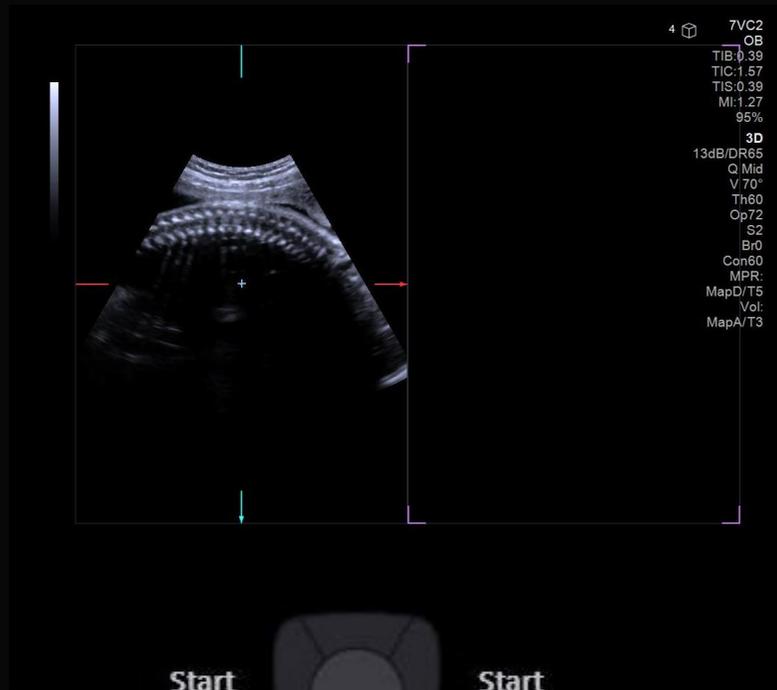




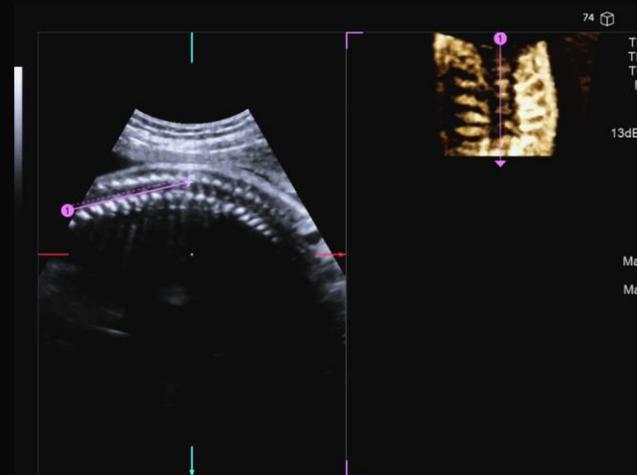
Z



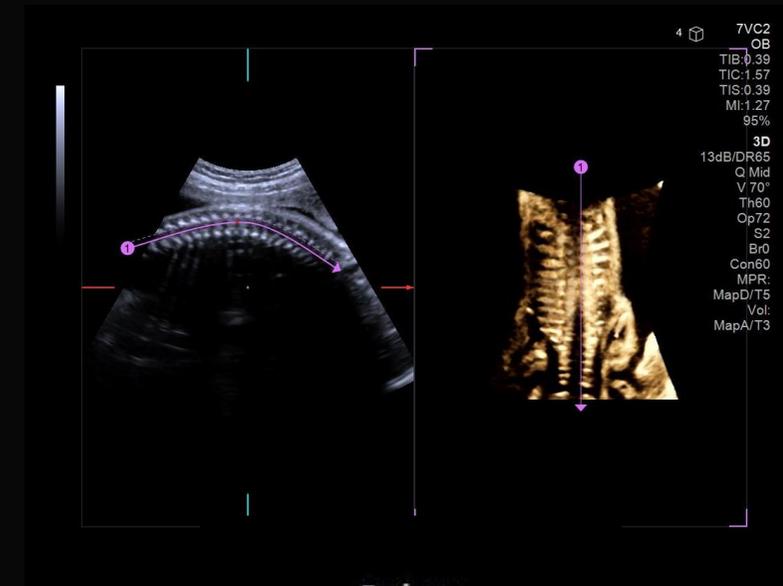




1



2



3

7VC2 OB  
5C1  
10L4  
9VE4  
Workflow

Patient  
3D  
FlexPlane  
Multislice  
Editing

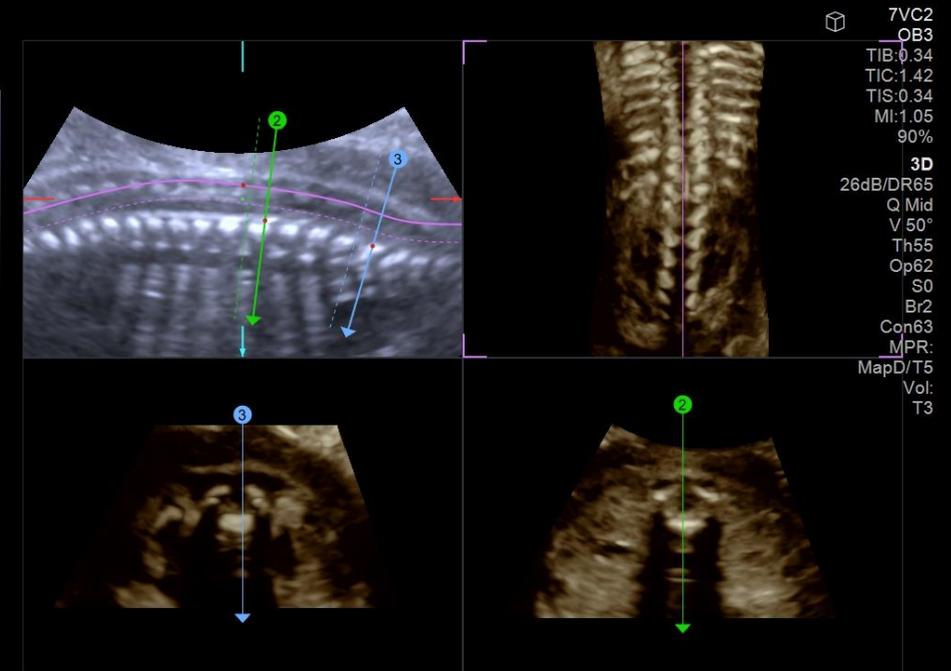
Imaging  
Line  
Trace  
Spline

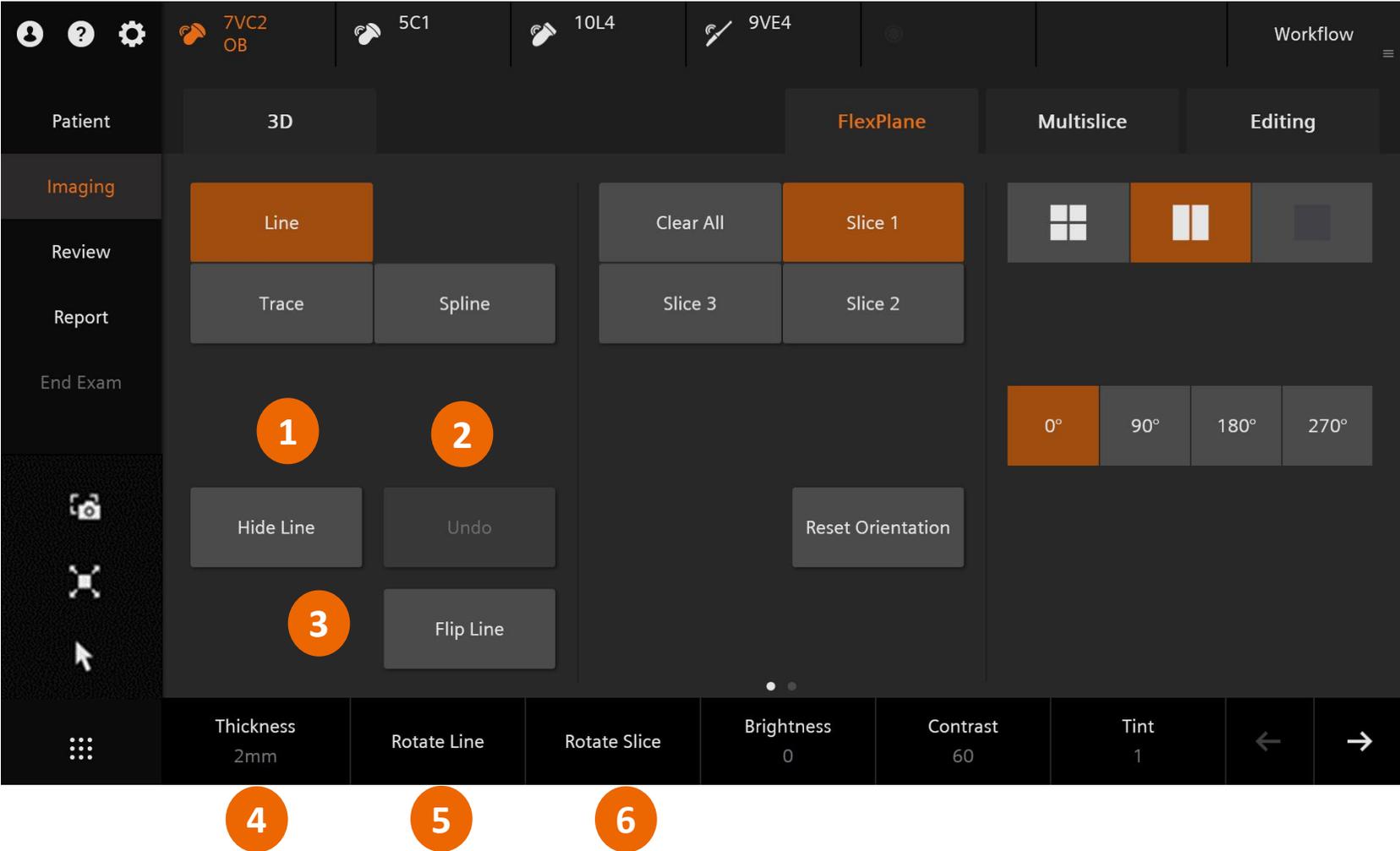
Clear All  
Slice 1  
Slice 3  
Slice 2

0° 90° 180° 270°

Hide Line  
Undo  
Reset Orientation  
Flip Line

Thickness 2mm  
Rotate Line  
Rotate Slice  
Brightness 0  
Contrast 60  
Tint 1





# 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



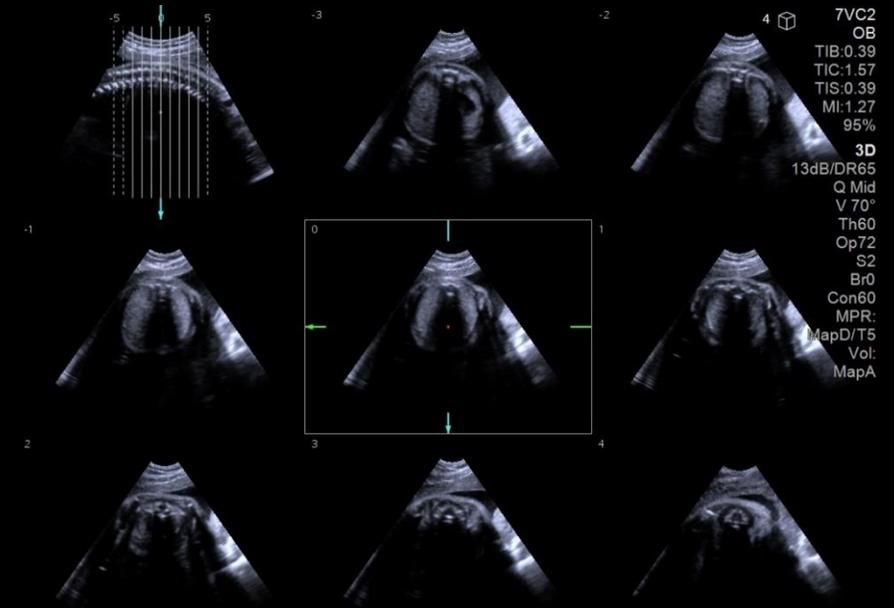
# Multislice display layout

The screenshot shows the Siemens Healthineers software interface for configuring a multislice display. The top bar includes patient information (7VC2 OB) and various tool icons (5C1, 10L4, 9VE4). The main menu has tabs for Patient, 3D, FlexPlane, Multislice, and Editing. The Multislice tab is active, showing a grid of icons for different slice configurations. The 'A' icon is highlighted in orange. Below the grid, there are settings for Slices (7), Distance (2 mm), Position of Slices (0 mm), and Range Position.

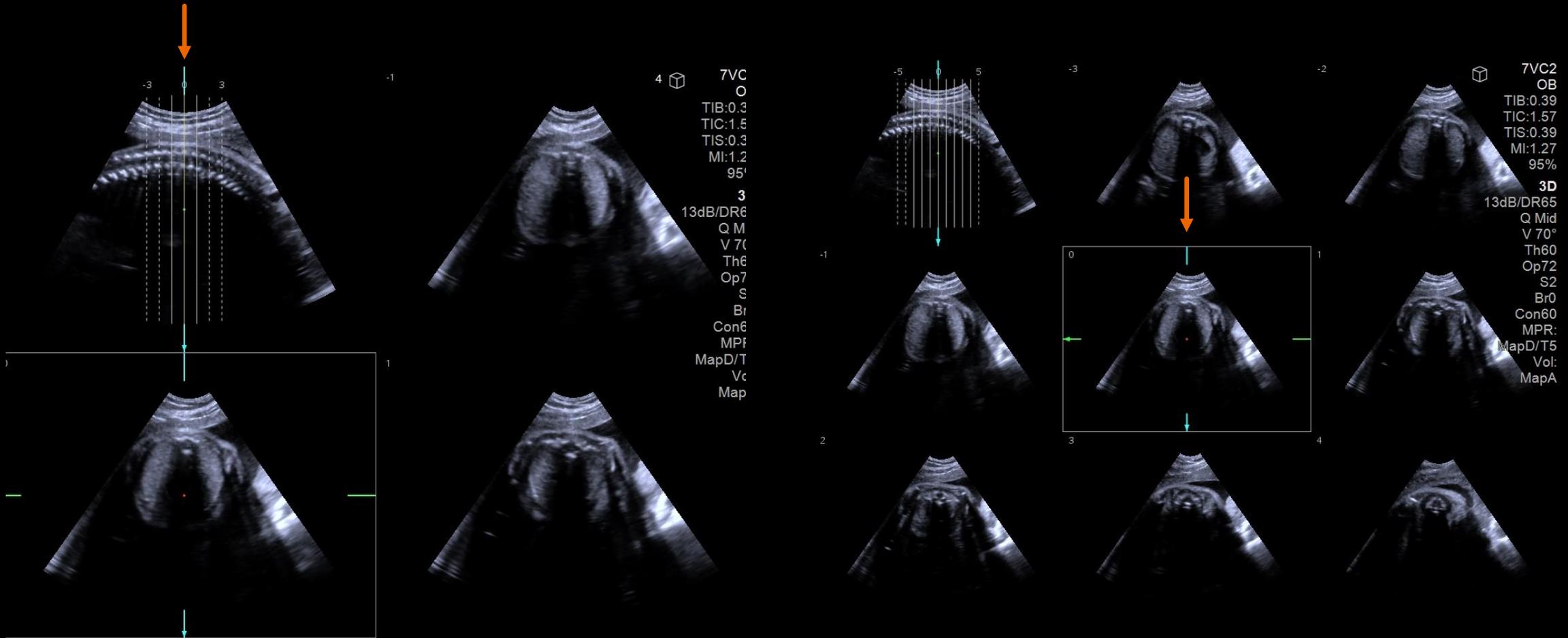
Icon	Label
7x7 grid	A
3x3 grid	B
2x2 grid	C
1x1 grid	VR

Settings:

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



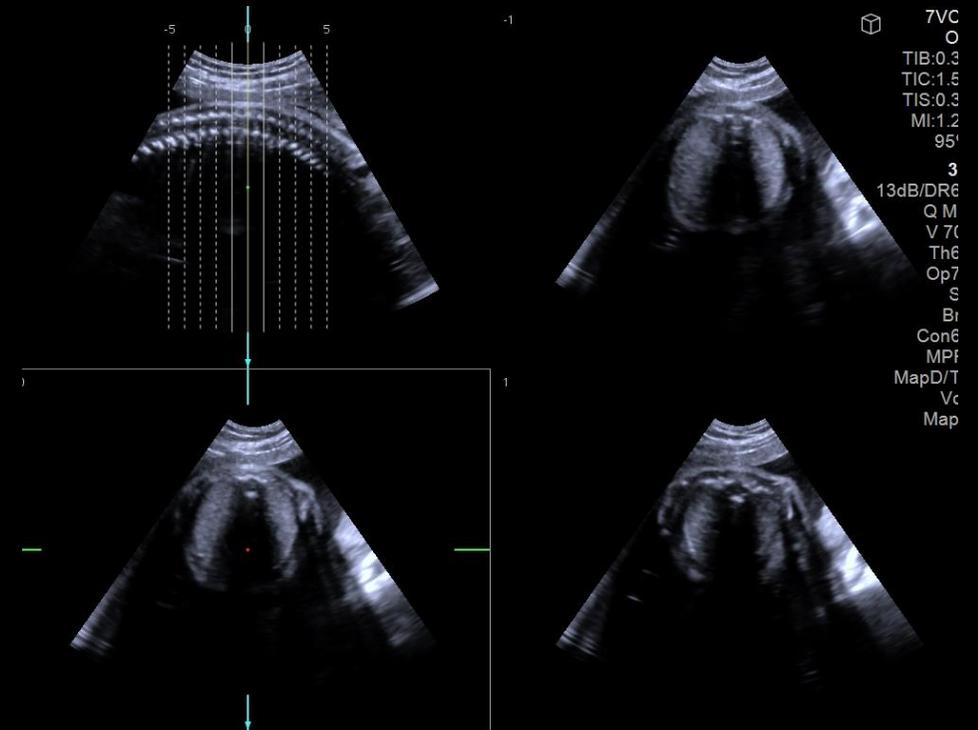
# Multislice display layout



# Multislice optimization

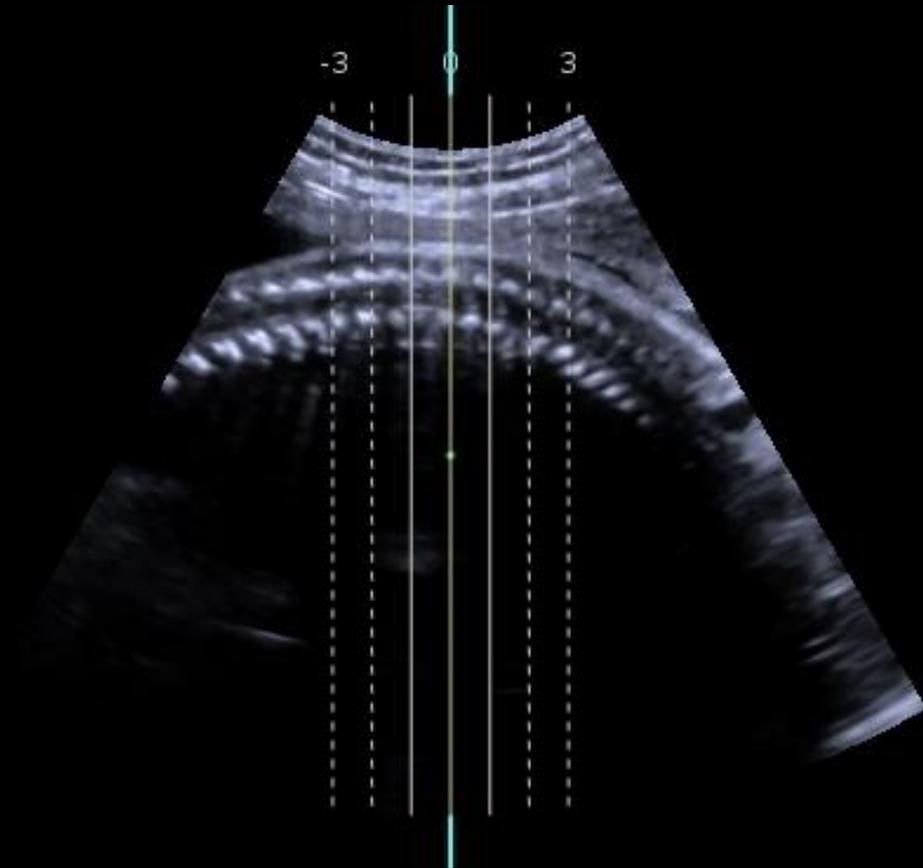
The screenshot shows the Siemens ultrasound software interface. The top bar contains patient information and various icons. The main menu includes Patient, 3D, FlexPlane, Multislice, and Editing. The Multislice section is active, showing a grid of icons for slice selection. A table at the bottom of the interface is highlighted with an orange border, displaying the following settings:

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

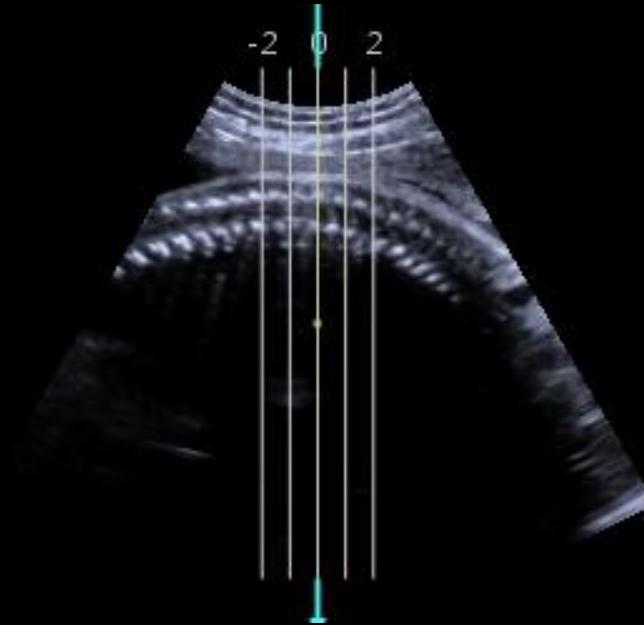


# Multislice graphic

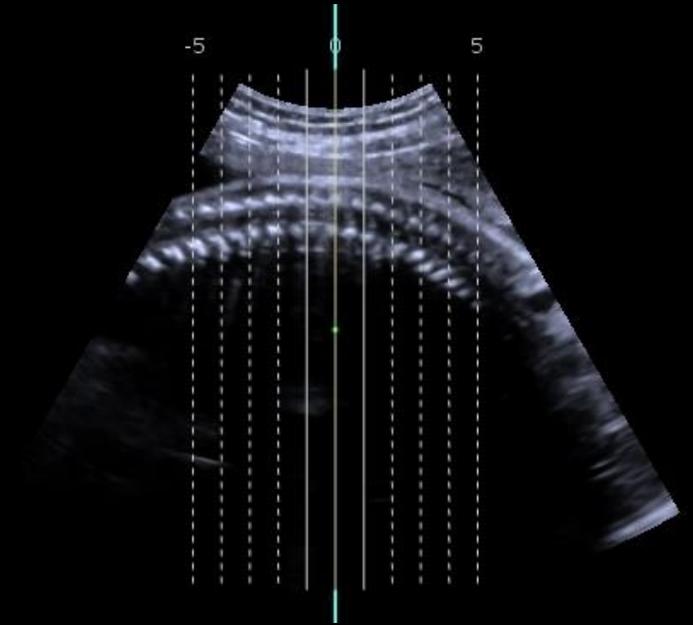
- Solid yellow line – Center slice displayed with white outline around corresponding slice
- Solid white line – Displayed slices
- Dashed white line – Available slices



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



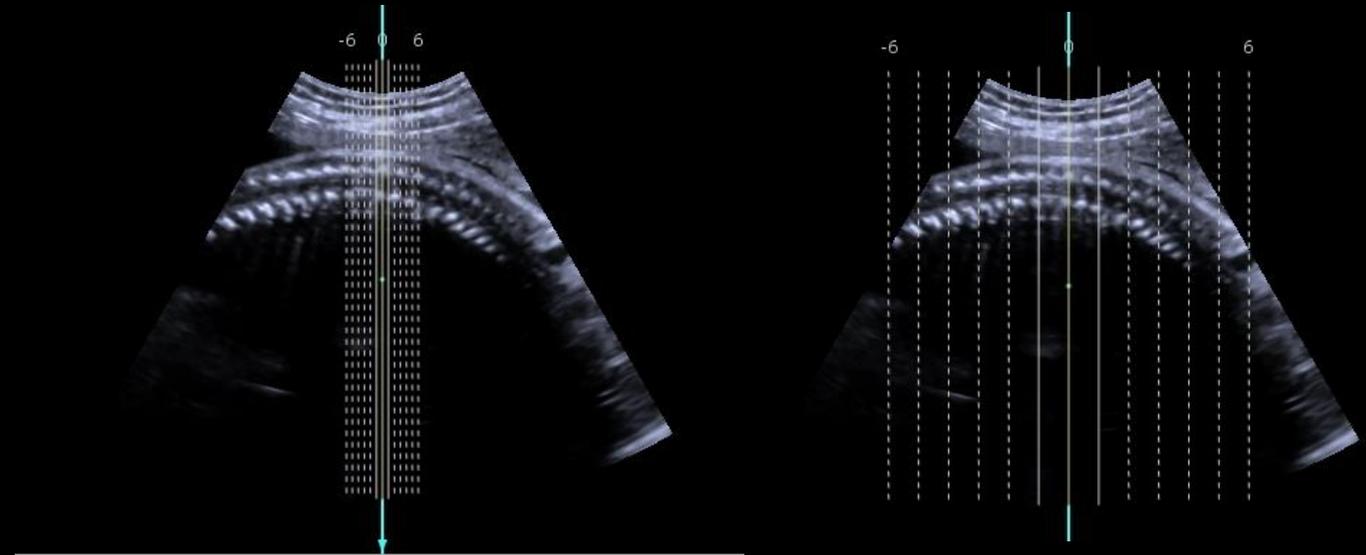
Less Slices



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

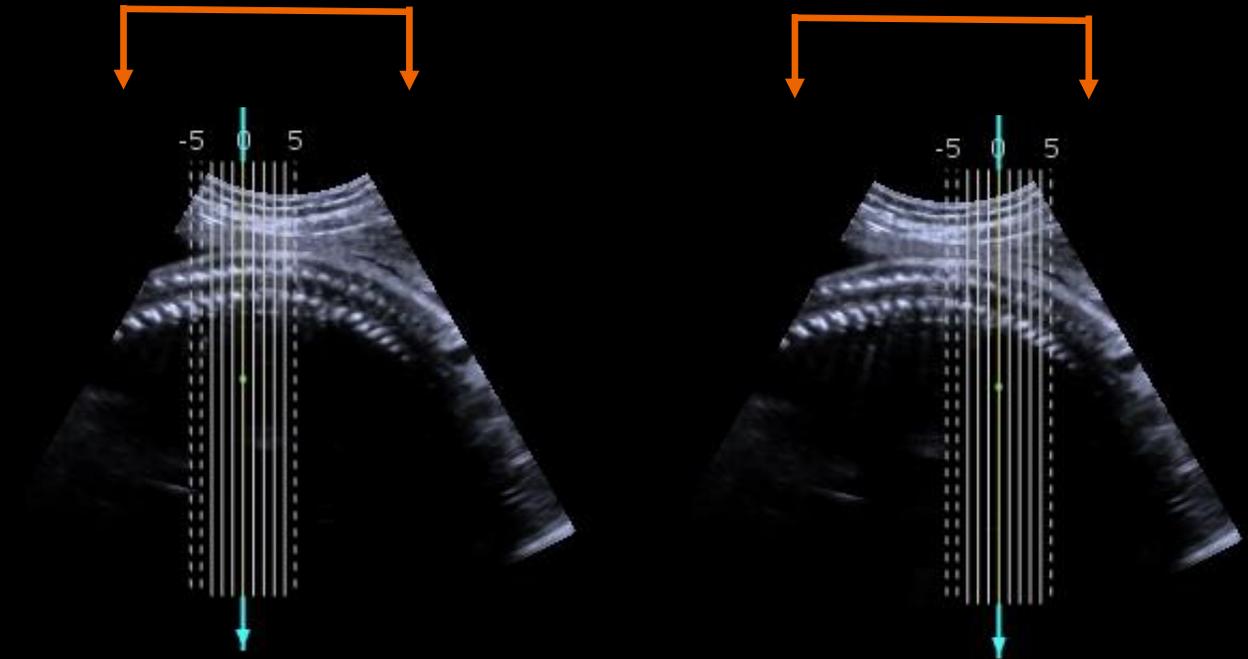


**Less Distance**

**More Distance**

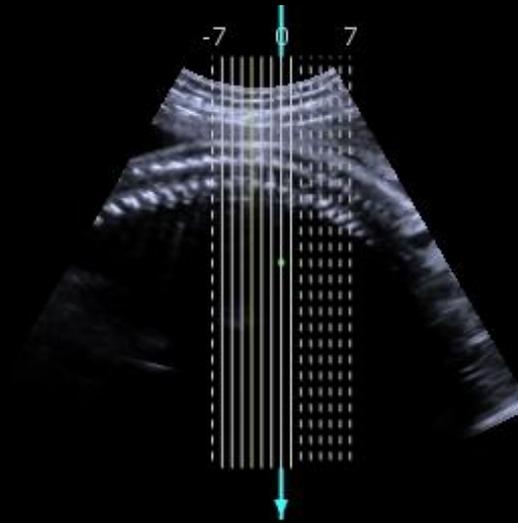
# Position of Slices

- 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

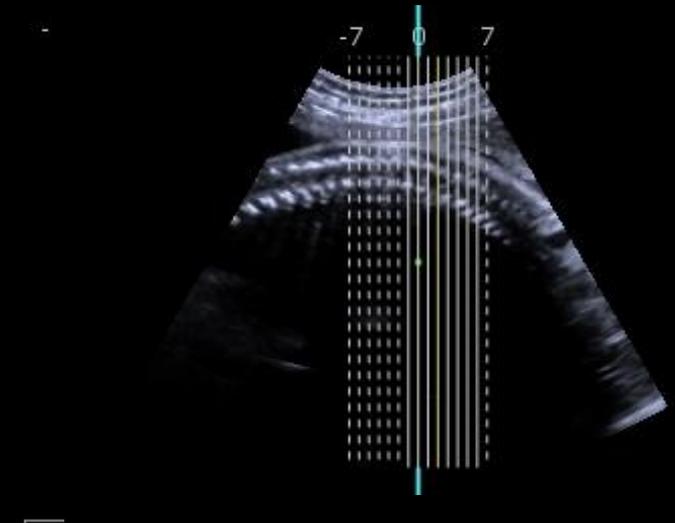


# Range Position

- 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**

# Objectives

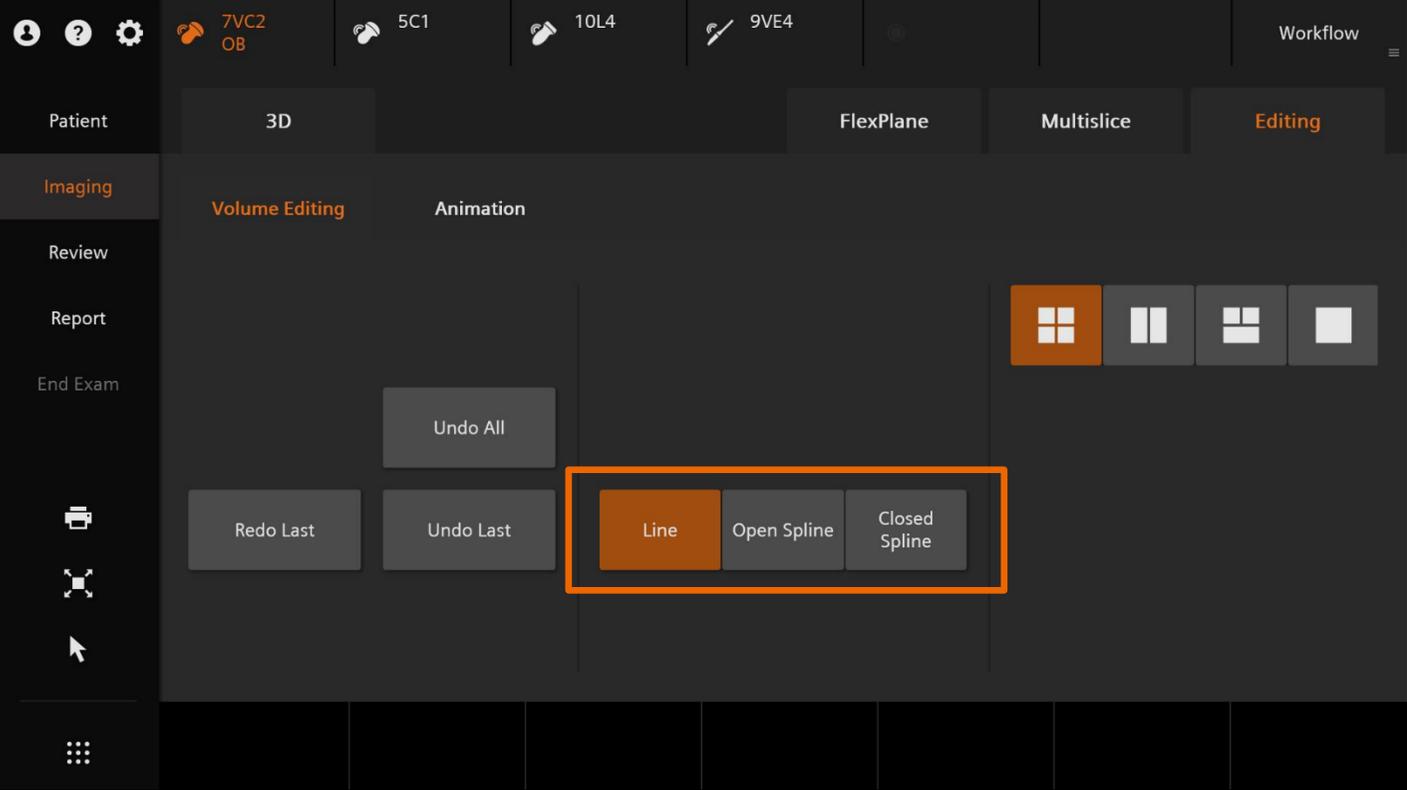
- Outline activation and volume acquisition
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- **Define volume store and editing**
- Describe reviewing stored volumes

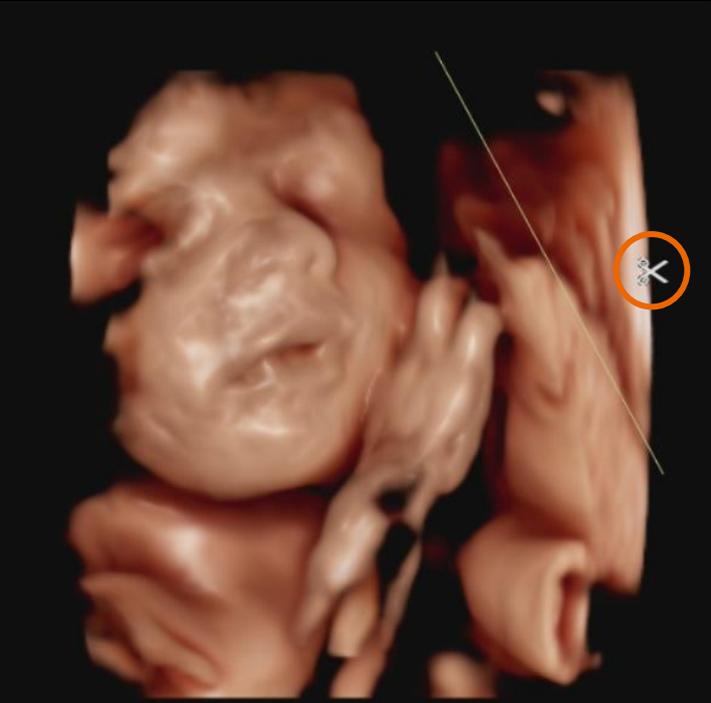


# Image and volume storage



# Additional controls

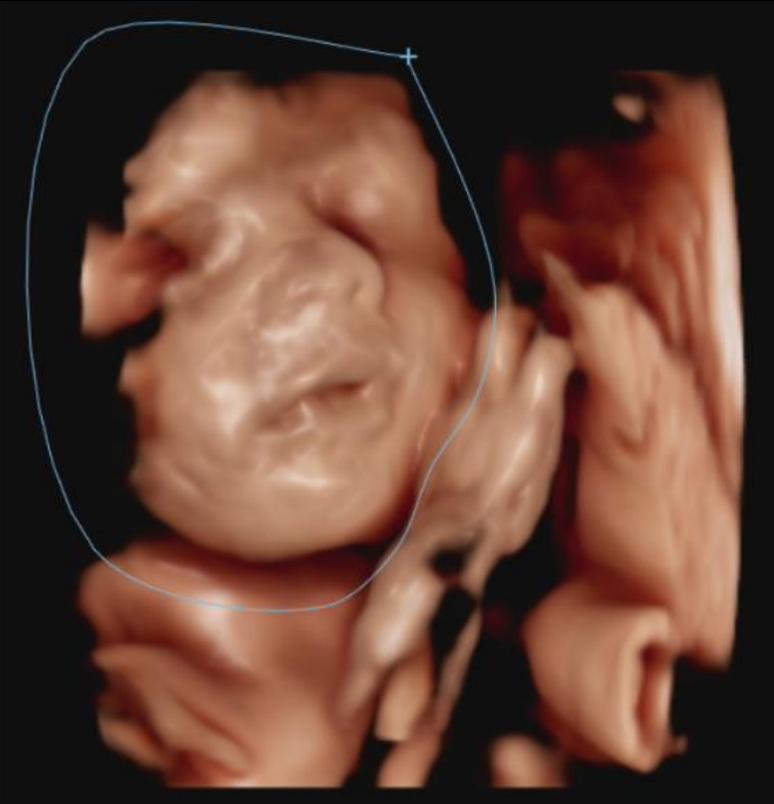




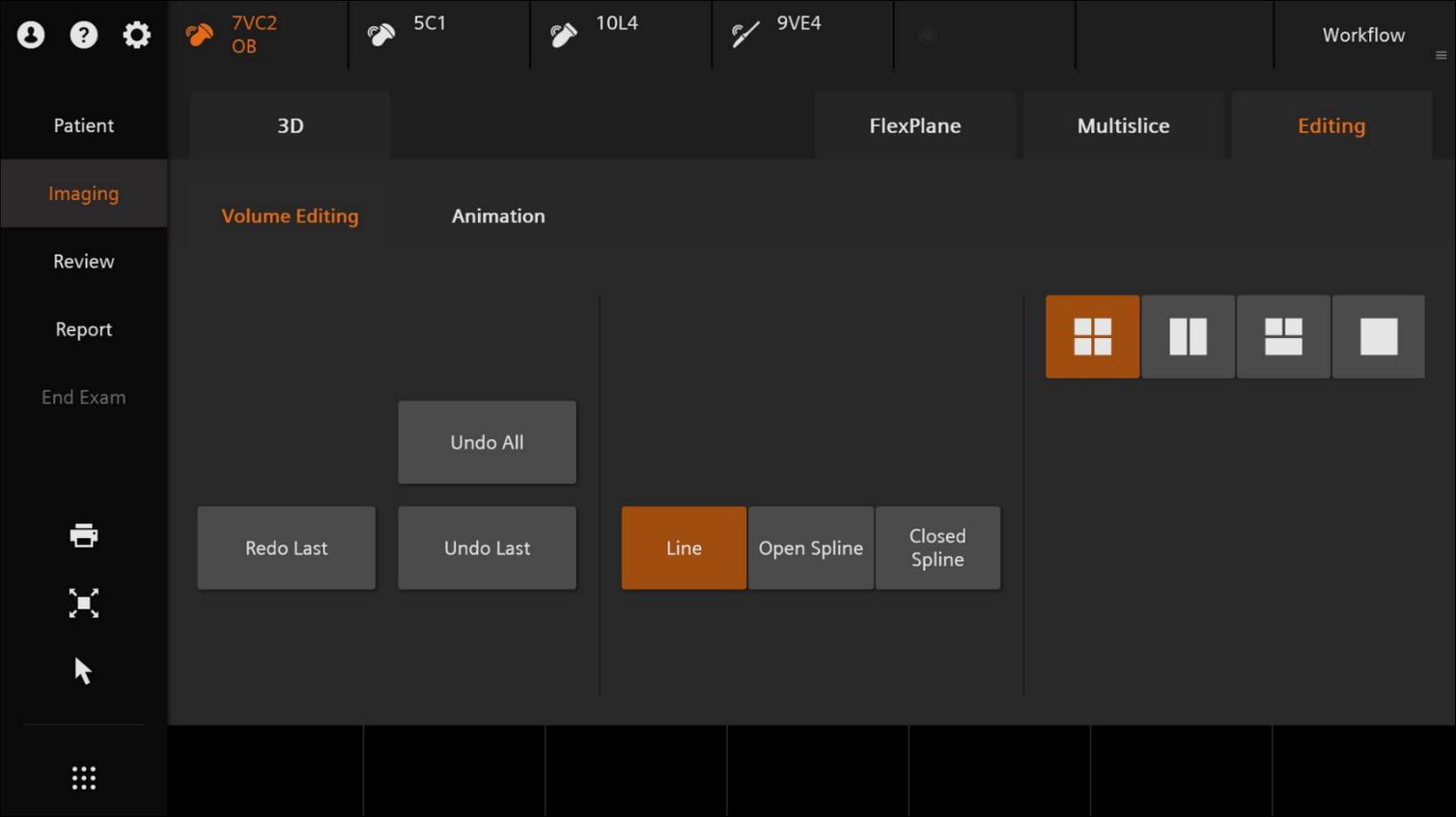
# Open Spline



# Closed Spline



# Additional edit controls



# Animation

The screenshot displays the Siemens Healthineers software interface for 3D animation. The top navigation bar includes icons for Patient, Imaging, Review, Report, and End Exam. The main workspace is divided into sections: 3D, FlexPlane, Multislice, and Editing. The 'Animation' tab is highlighted with an orange box. Below the 'Animation' tab, there are four numbered callouts: 1. A 'Set' button with a play icon, labeled 'Set First Last'. 2. A 'Reset Orientation' button with a circular arrow icon. 3. A 'Play' button with a right-pointing triangle icon. 4. A 'Speed Medium' slider with a play icon. The right side of the interface shows a 3D model of a head and neck, with a list of technical parameters on the right side of the model view.

49	7VC2
	OB
	TIB:0.48
	TIC:1.27
	TIS:0.48
	MI:0.66
	4.5vps
	95%
	<b>3D</b>
	0dB/DR65
	Q Mid
	V 50°
	Th60
	Op72
	S3
	Br0
	Con60
	MPR:
	MapD/T5
	Vol:
	MapA

# Objectives

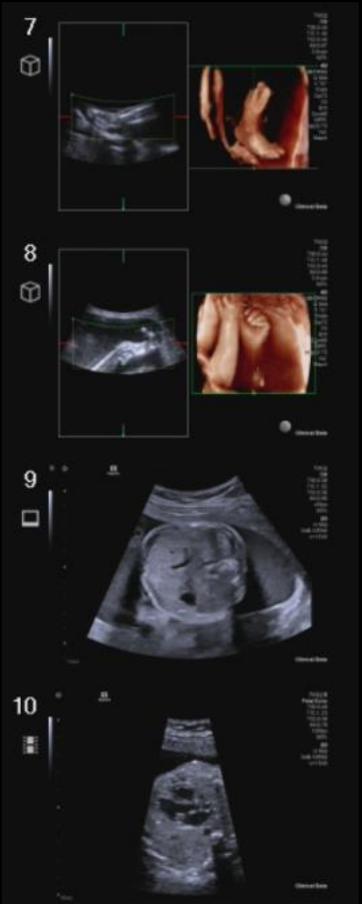
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# 3D/4D review volume data

Review

Patient	FlexPlane	3D/4D	Review	Multislice	Editing
Imaging	VR	A	B		
Review	MPR	C	VR		
Report					
End Exam	Reset All	VOI		0°	90°
	Reset Curve	Flip	Sync	180°	270°
	Reset Orientation				
	Light				
	Threshold 60	Opacity 72	Smooth 2	Brightness 0	Contrast 60
				Tint 1	



- **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**



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Thank you for your enthusiasm!

# Questions?