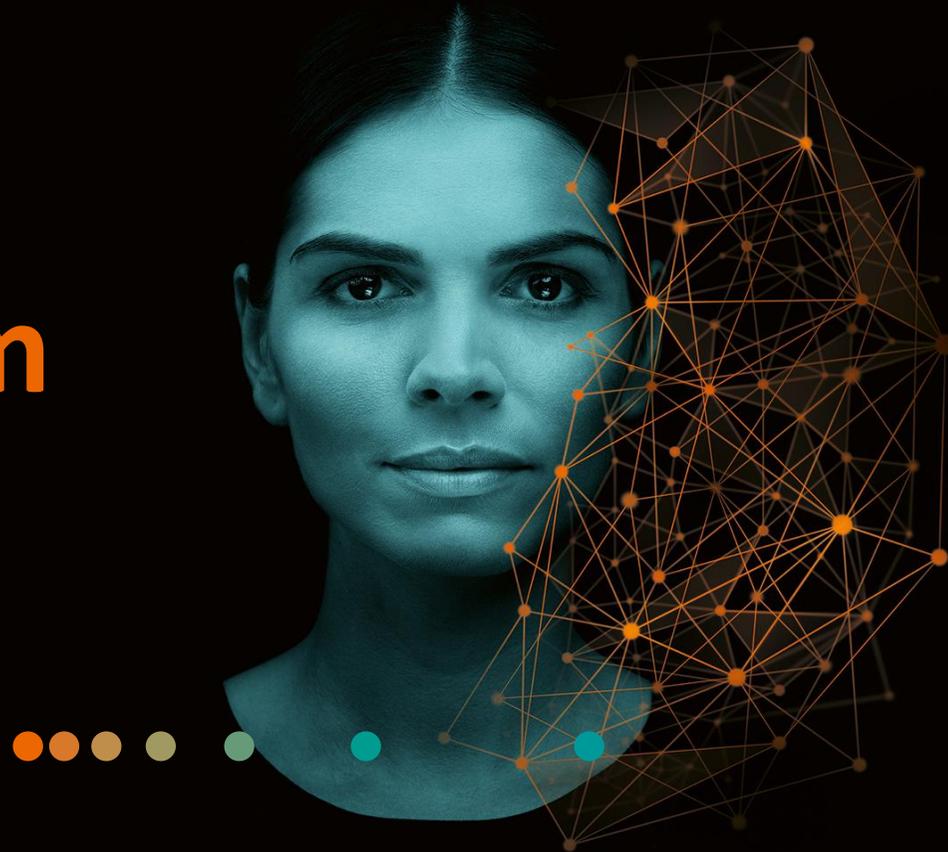


ACUSON Sequoia Ultrasound System

Measurements & Reports (Onscreen)
VA30 SW Release

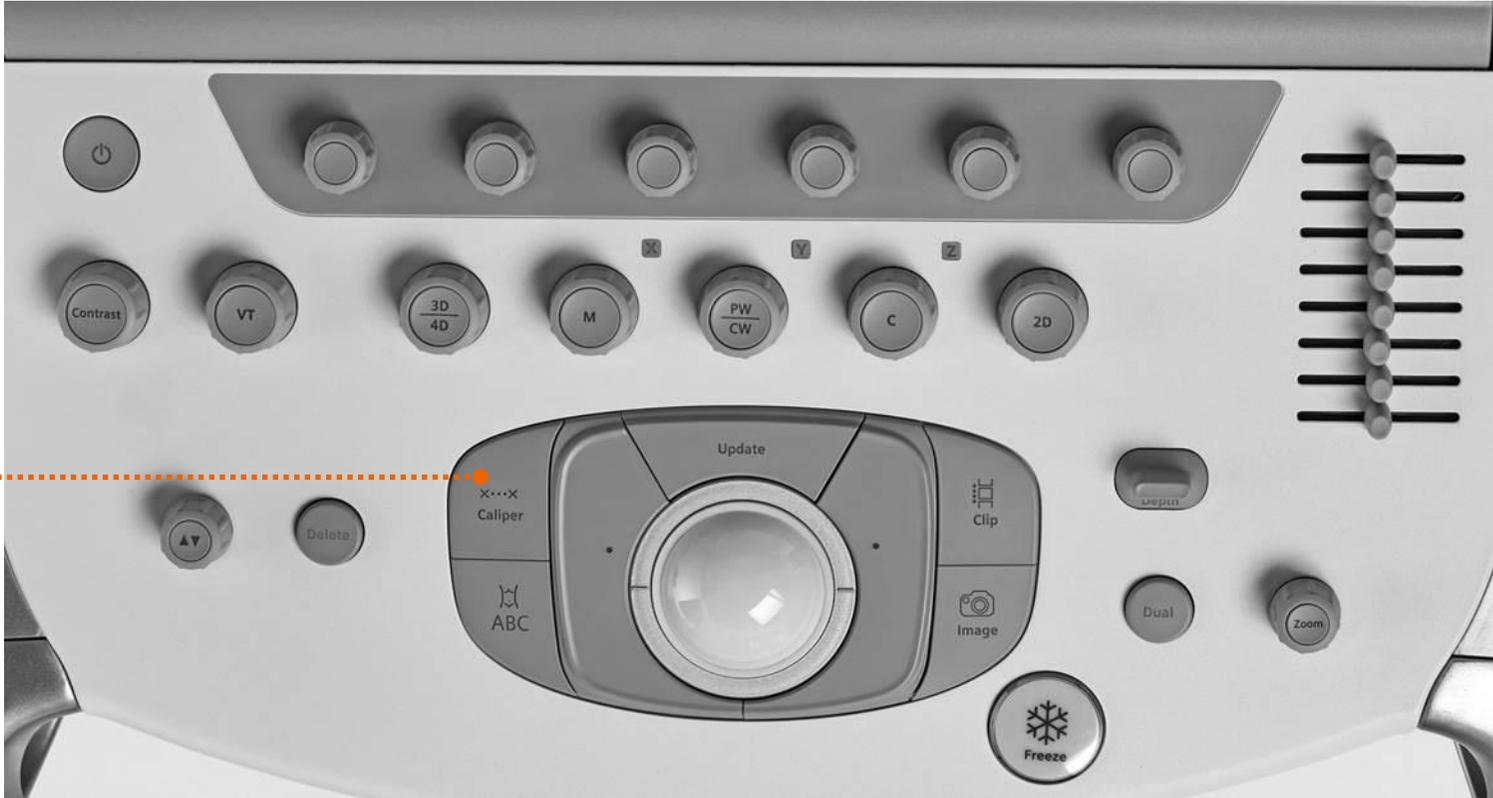


Objectives

- **Identify access to measurement feature and screen information**
- Explain editing and deleting measurements
- List exam specific measurement options
- Examine report access, layout and editing
- Outline printing options

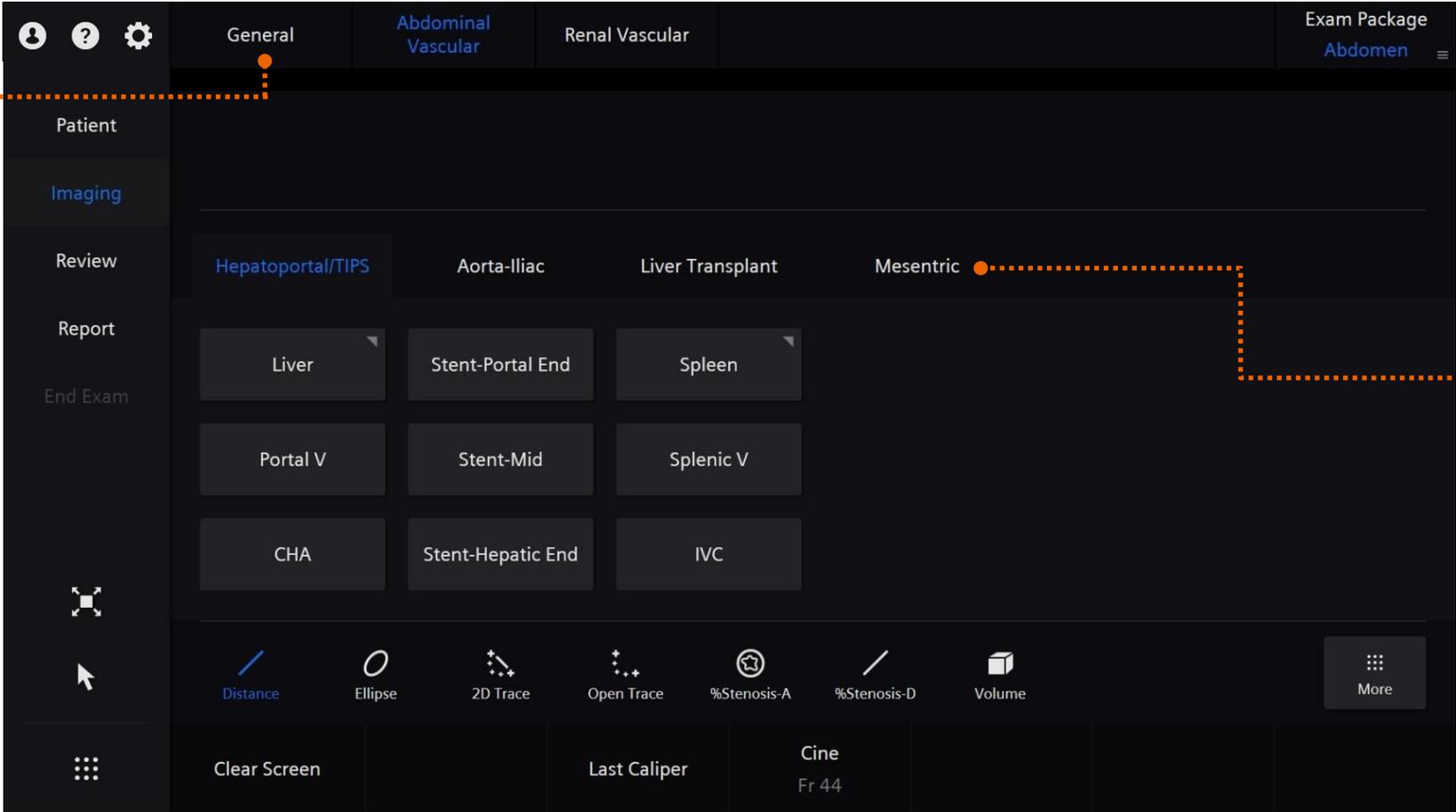


Accessing measurement feature



Touch screen display layout

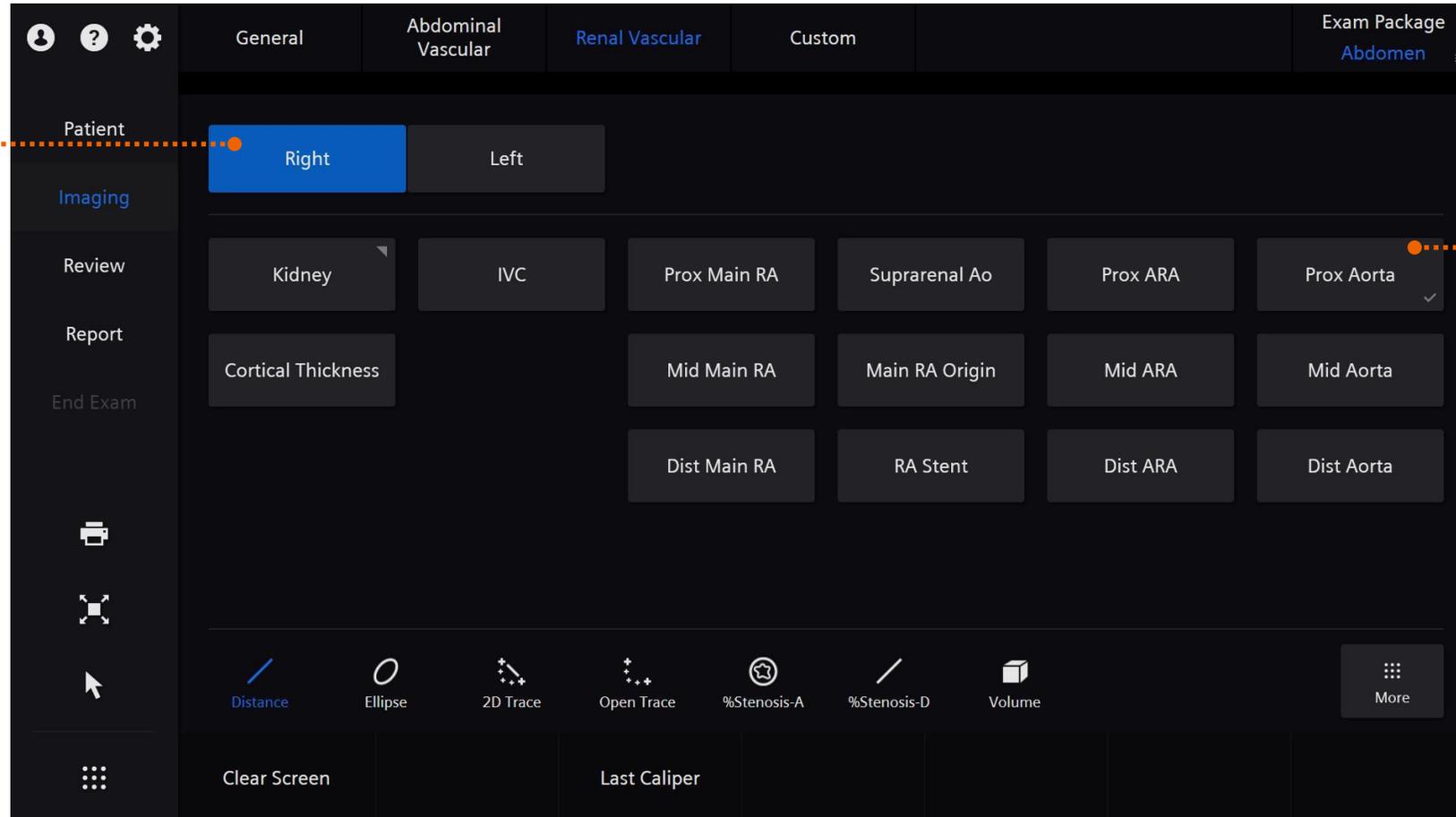
Main label Groups



Label sub-groups

Touch screen display layout

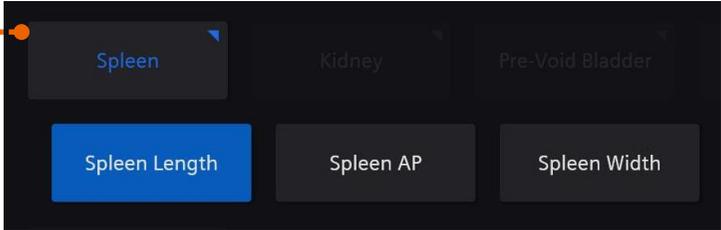
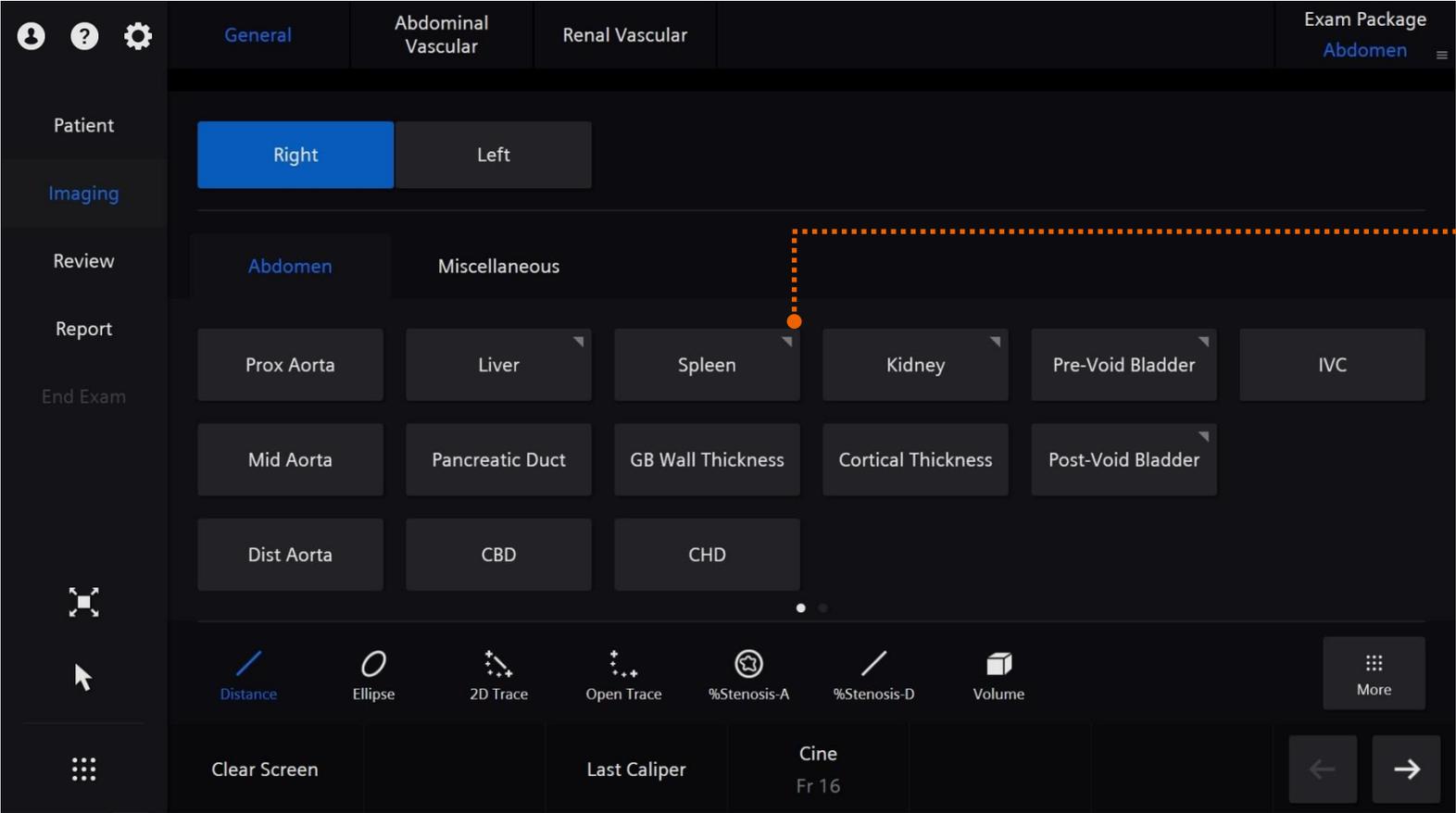
Right / Left options are displayed on every page



Modifiers are embedded within labels

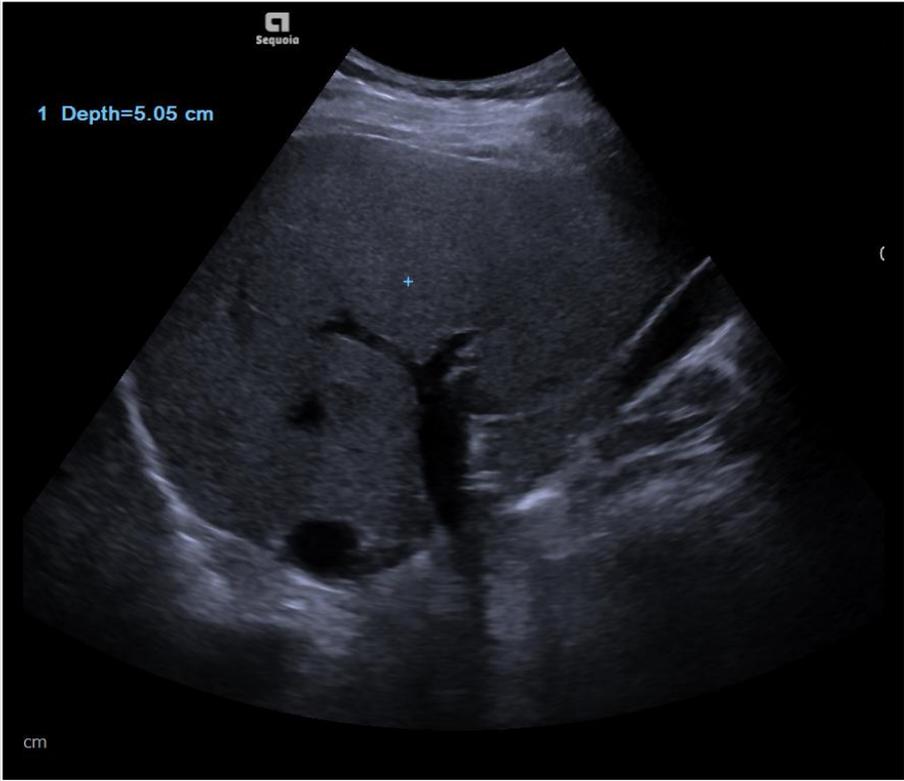
Touch screen display layout

Continuous measurement folders

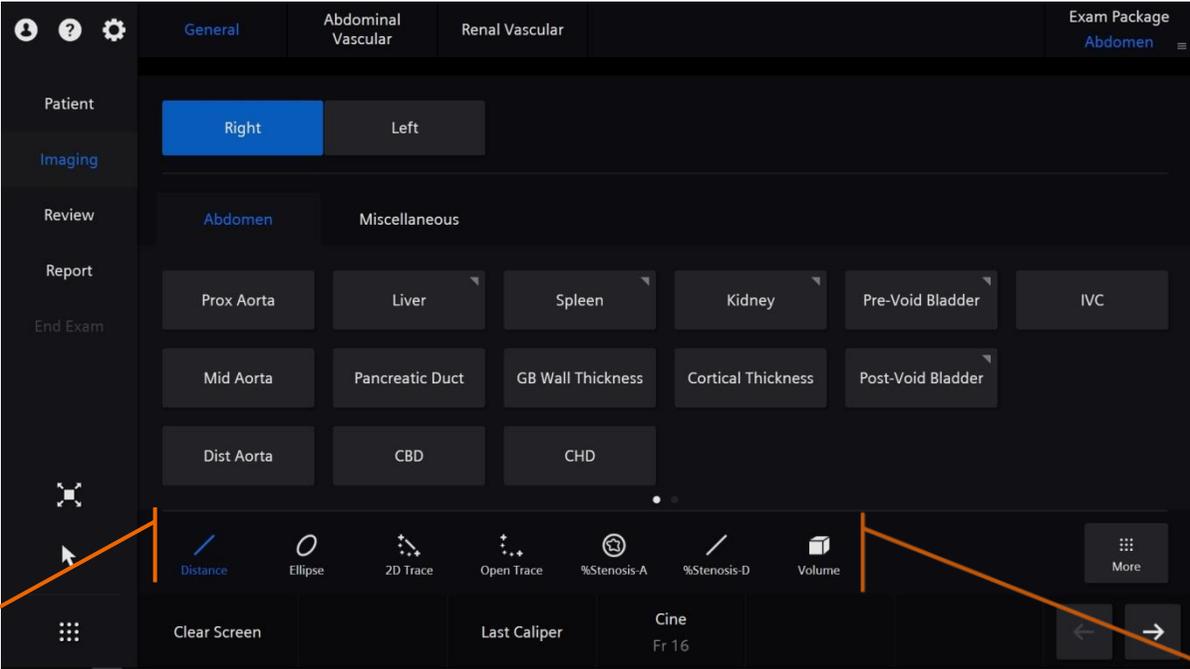


Touch screen display layout

The screenshot displays the Siemens Healthineers touch screen interface. At the top, there are navigation tabs: "General", "Abdominal Vascular", "Renal Vascular", "Custom", and "Exam Package" (with "Abdomen" selected). Below these are sub-tabs for "Right" and "Left", and "Abdomen" and "Miscellaneous". A grid of buttons lists various anatomical regions: "Prox Aorta", "Liver", "Spleen", "Kidney", "Pre-Void Bladder", "IVC", "Mid Aorta", "Pancreatic Duct", "GB Wall Thickness", "Cortical Thickness", "Post-Void Bladder", "Dist Aorta", "CBD", and "CHD". An orange arrow points to the "CHD" button. Below the grid is a row of measurement tools: "Distance", "Ellipse", "2D Trace", "Open Trace", "%Stenosis-A", "%Stenosis-D", "Volume", and "More". At the bottom, there are buttons for "Clear Screen", "Last Caliper", and navigation arrows. Another orange arrow points to the right navigation arrow.

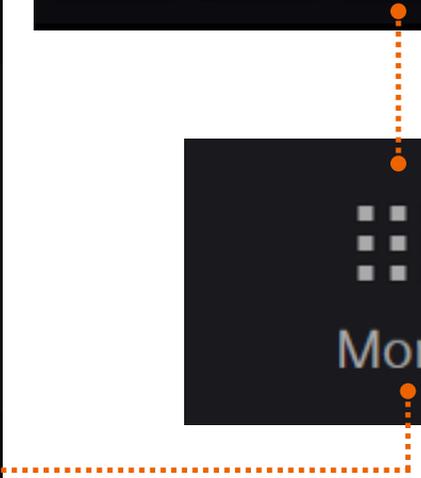
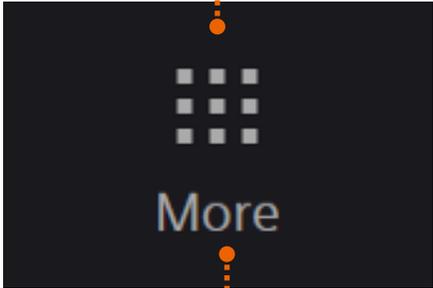
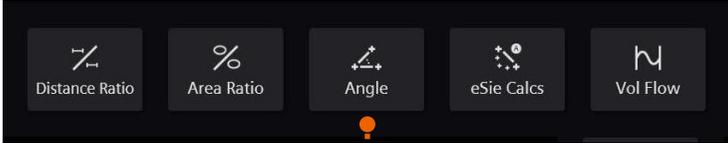
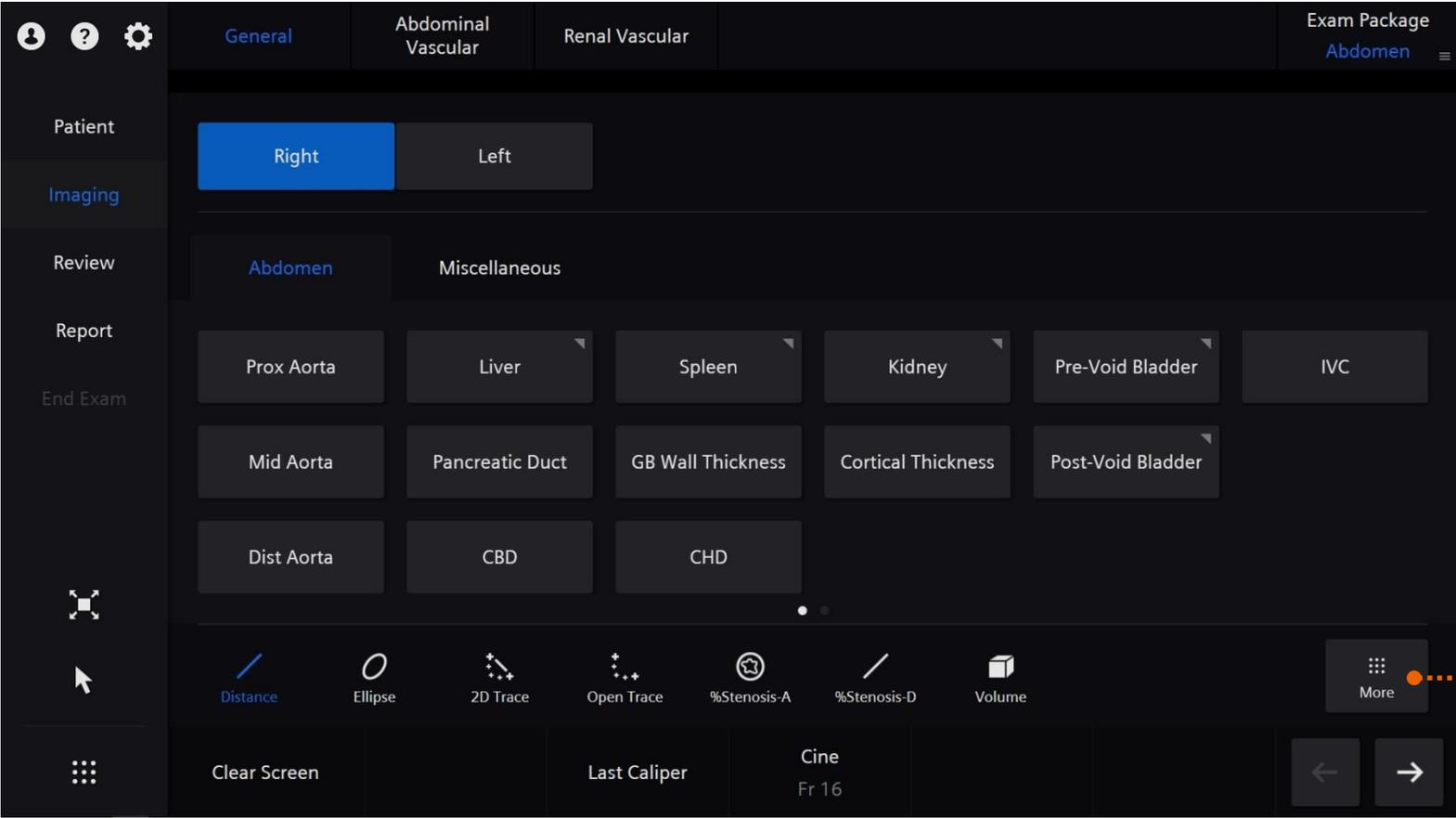


Generic measurements Tool bar



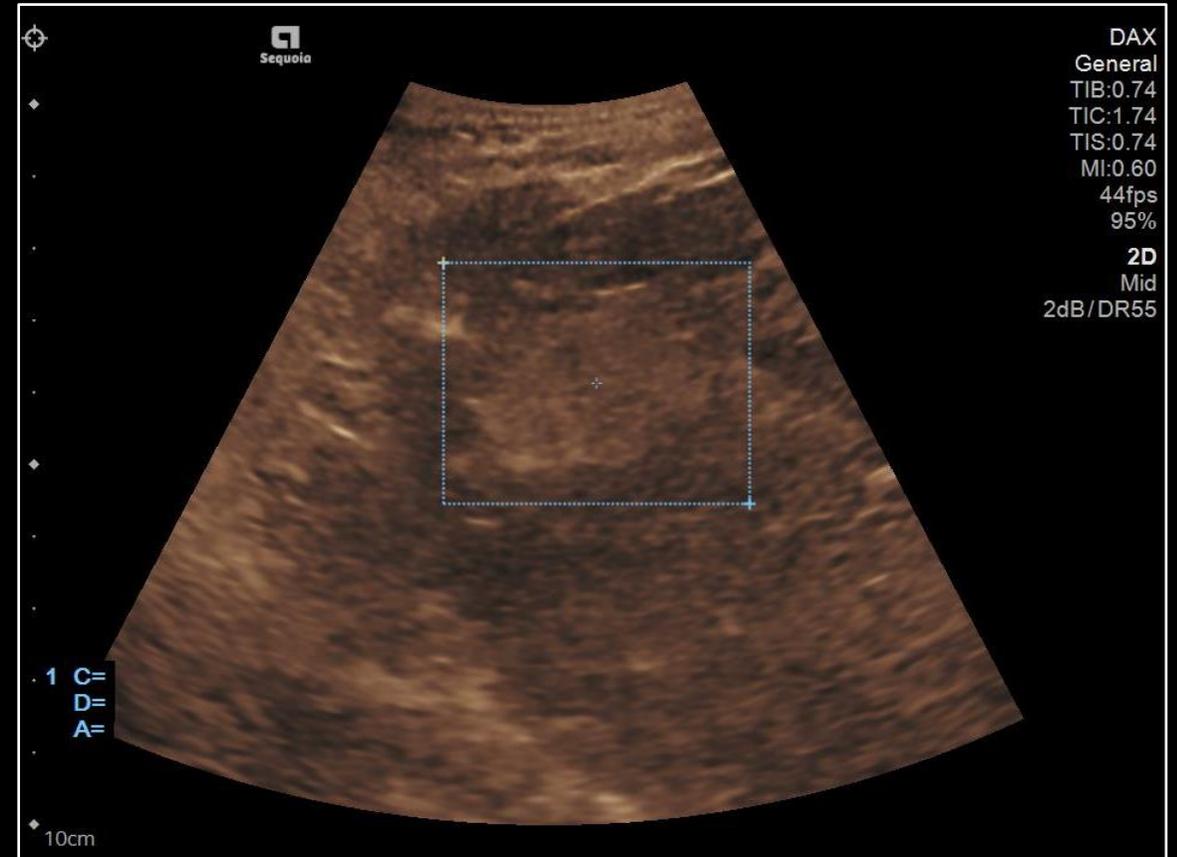
Generic measurements

“More”



“More” options eSieCalcs

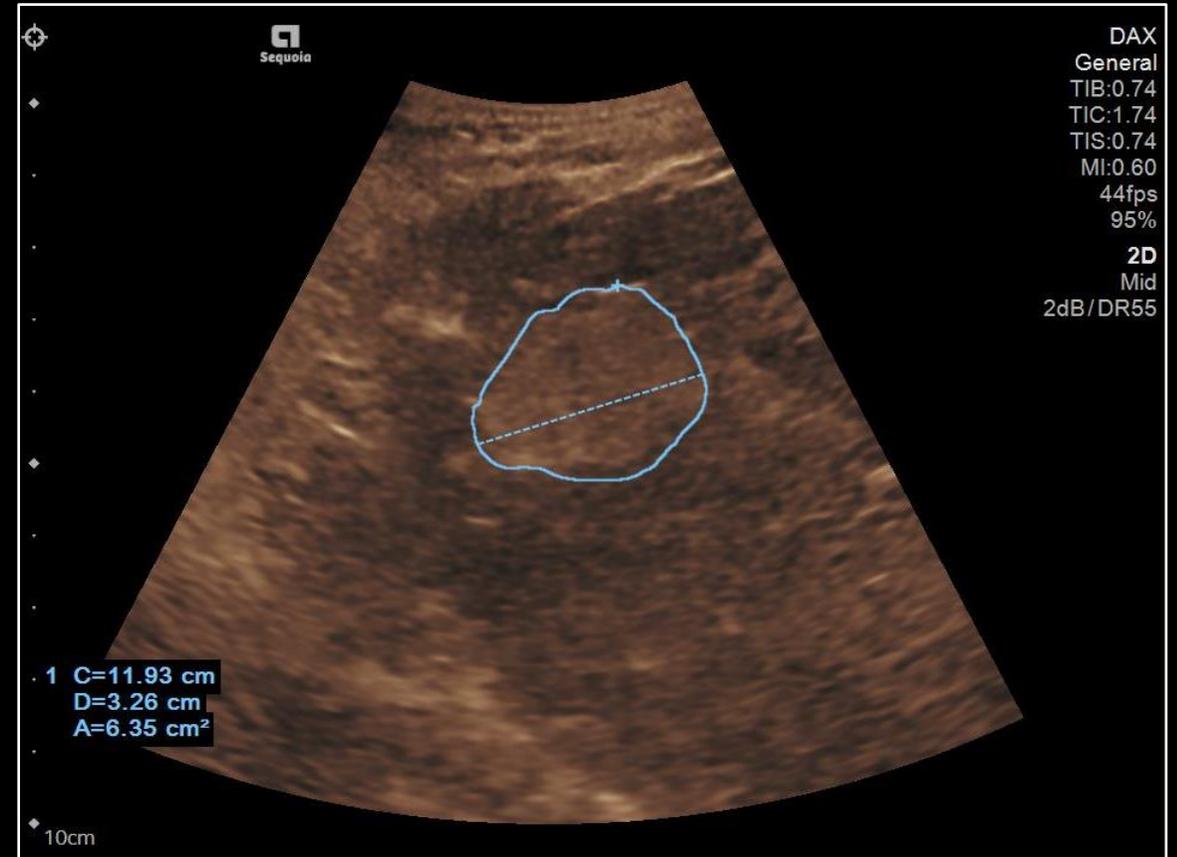
- Pattern recognition software that traces and measures the circumference, diameter, and area of a structure
- Select **eSieCalcs** 
- Position and anchor the first marker
- Roll the trackball to display a rectangle to encompass the structure of interest
- Press **Set** and the system will trace the structure – to accept and complete the measurement select **Set** again



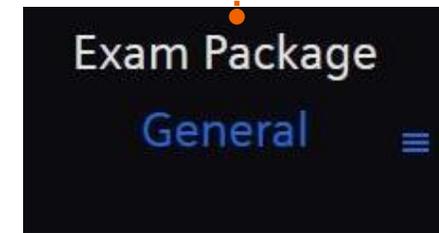
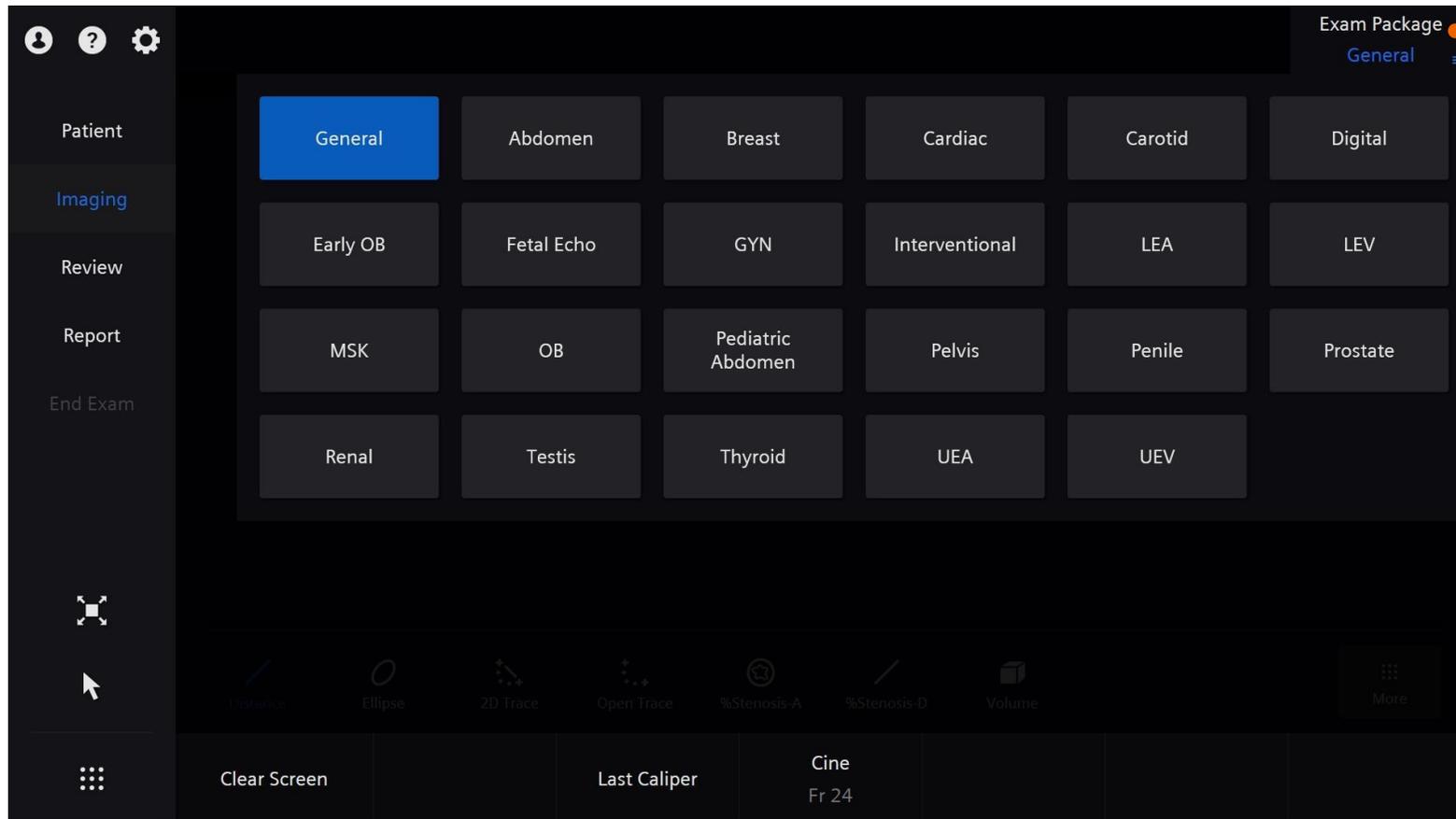
“More” options eSieCalcs - edit

Use the **Undo** key to edit the trace

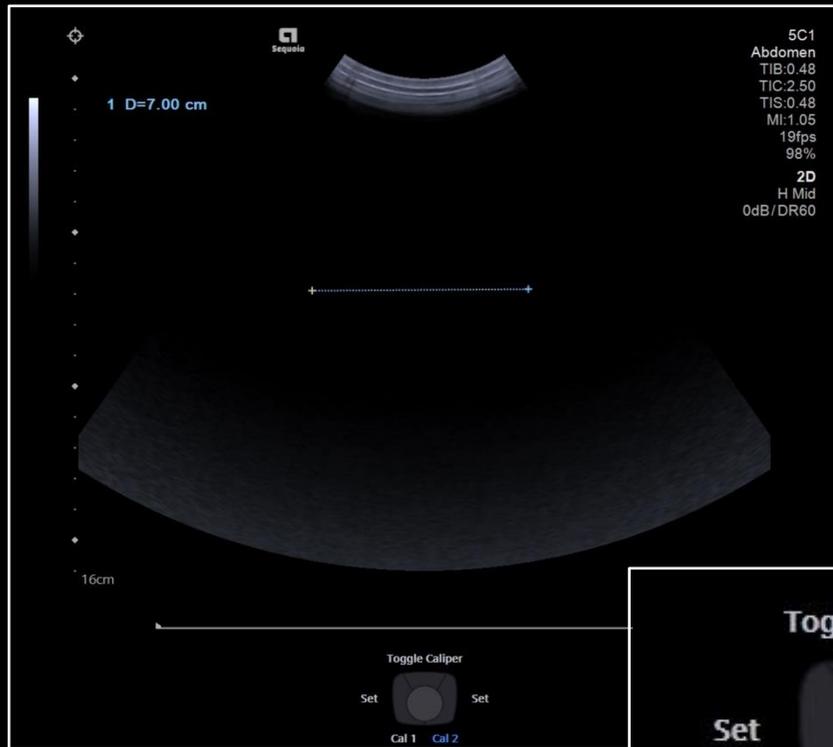
- Select **Last Caliper**
- Rotate or continuously press the **Undo** key until the segment is deleted
- Use the **Update (Toggle)** key to switch between the two caliper points and re-draw the trace
- Press **Set** to complete the new trace



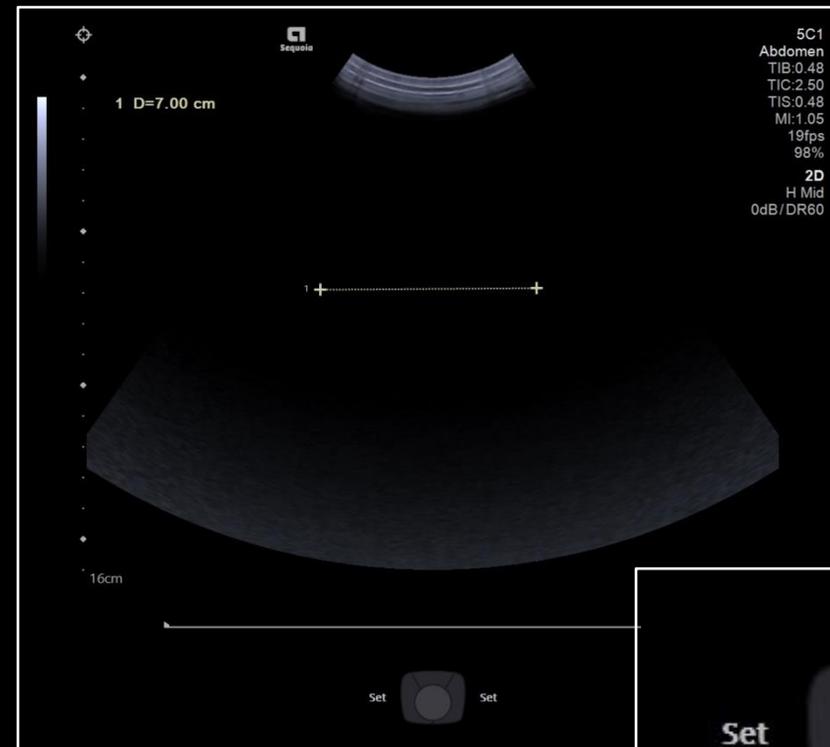
Accessing additional exam calculation packages



Active / locked caliper trackball options



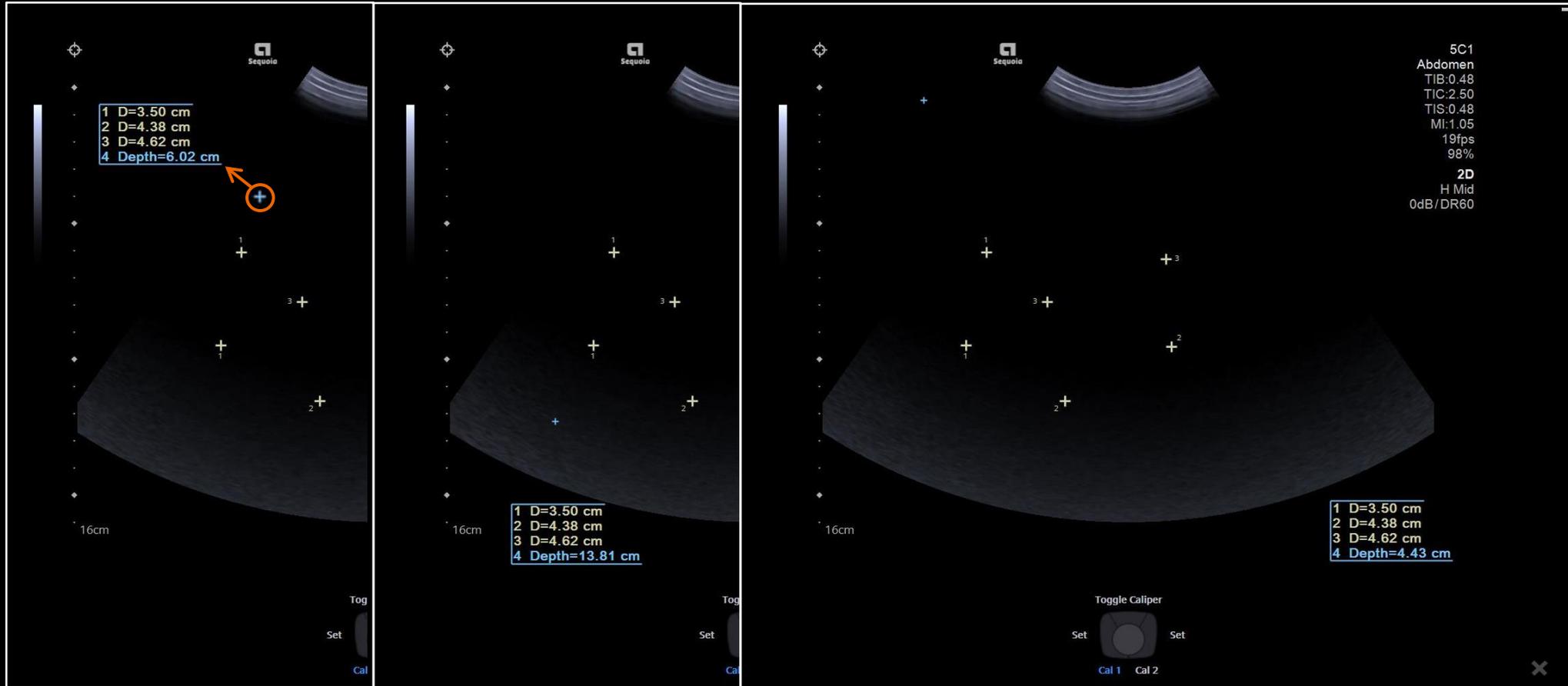
Active Caliper



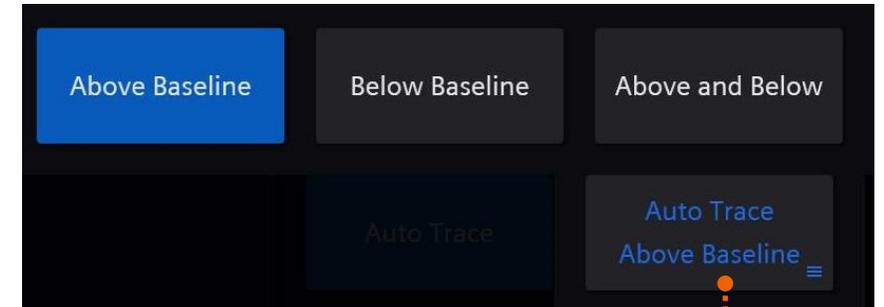
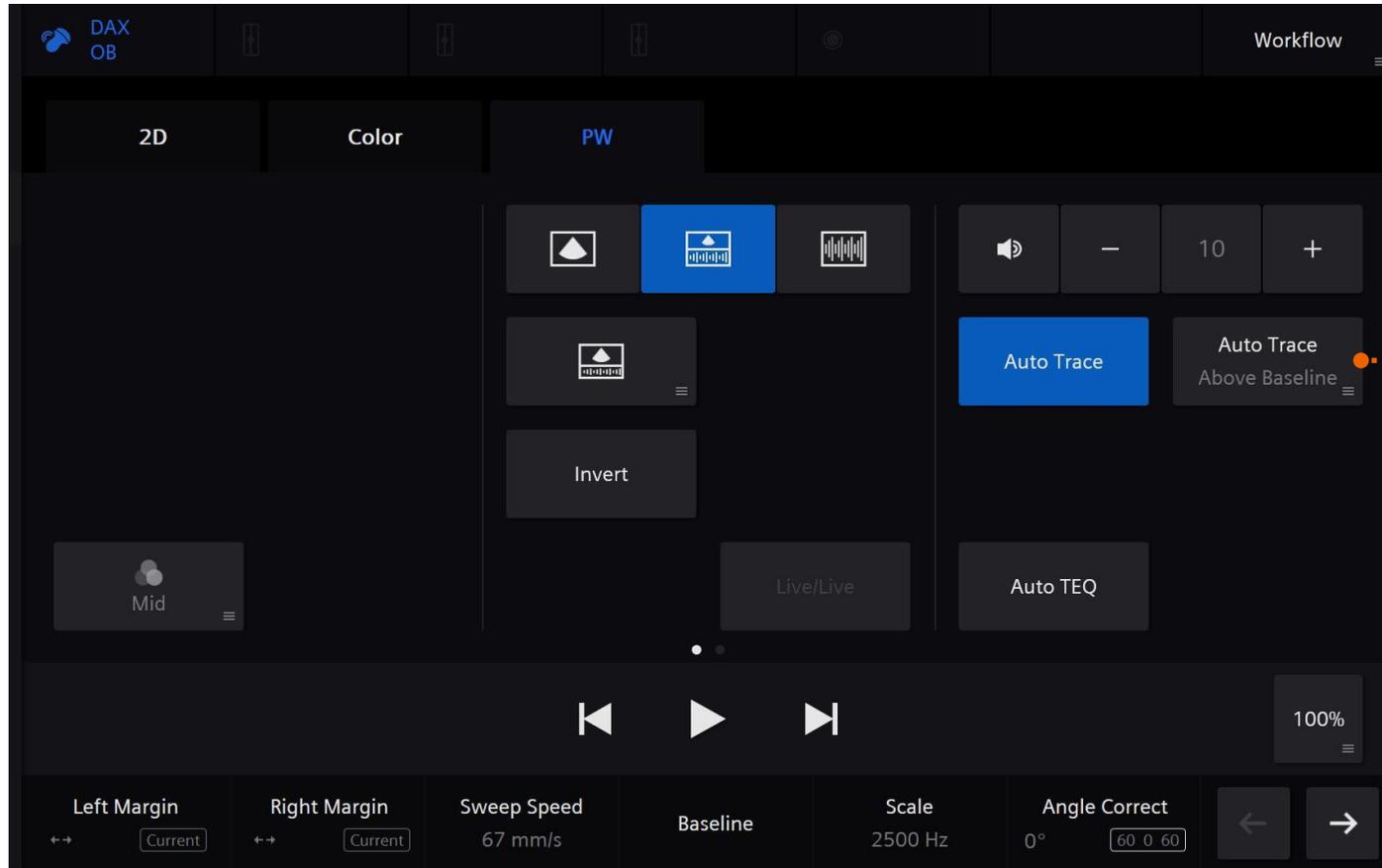
Locked Caliper



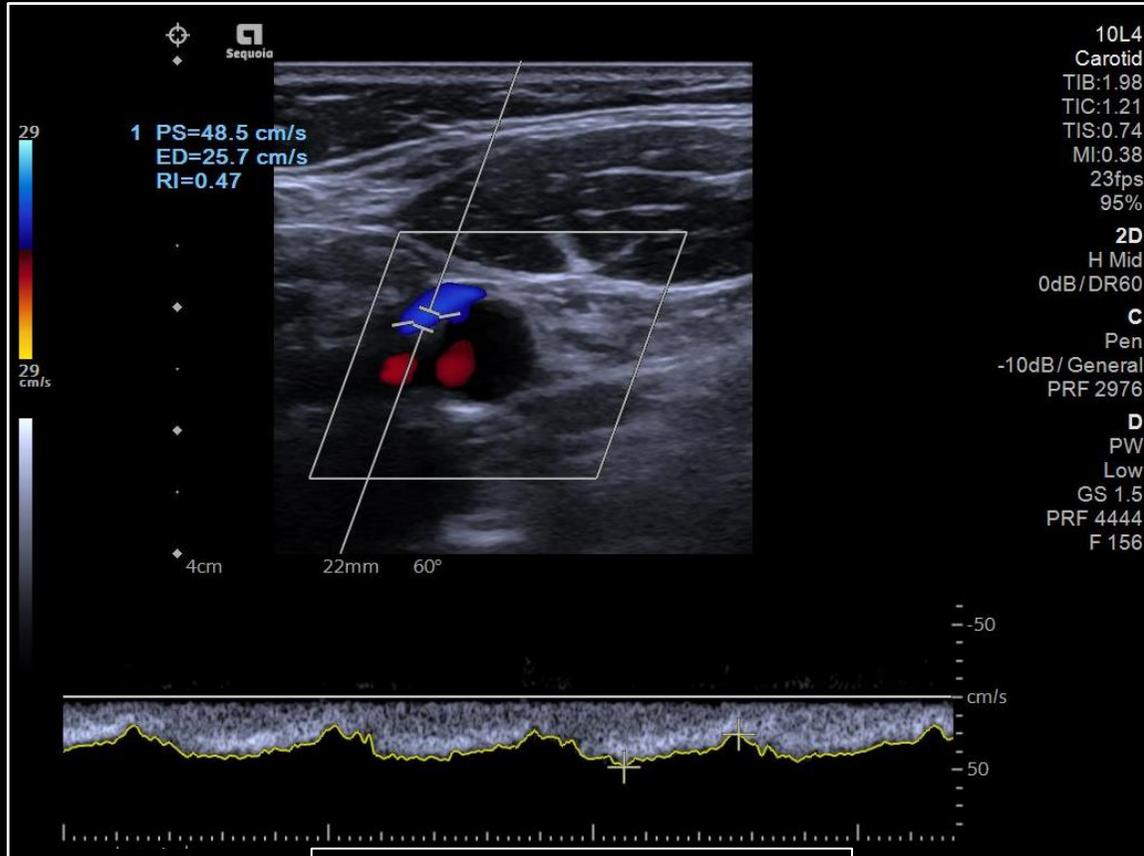
Reposition the measurement display area (MDA)



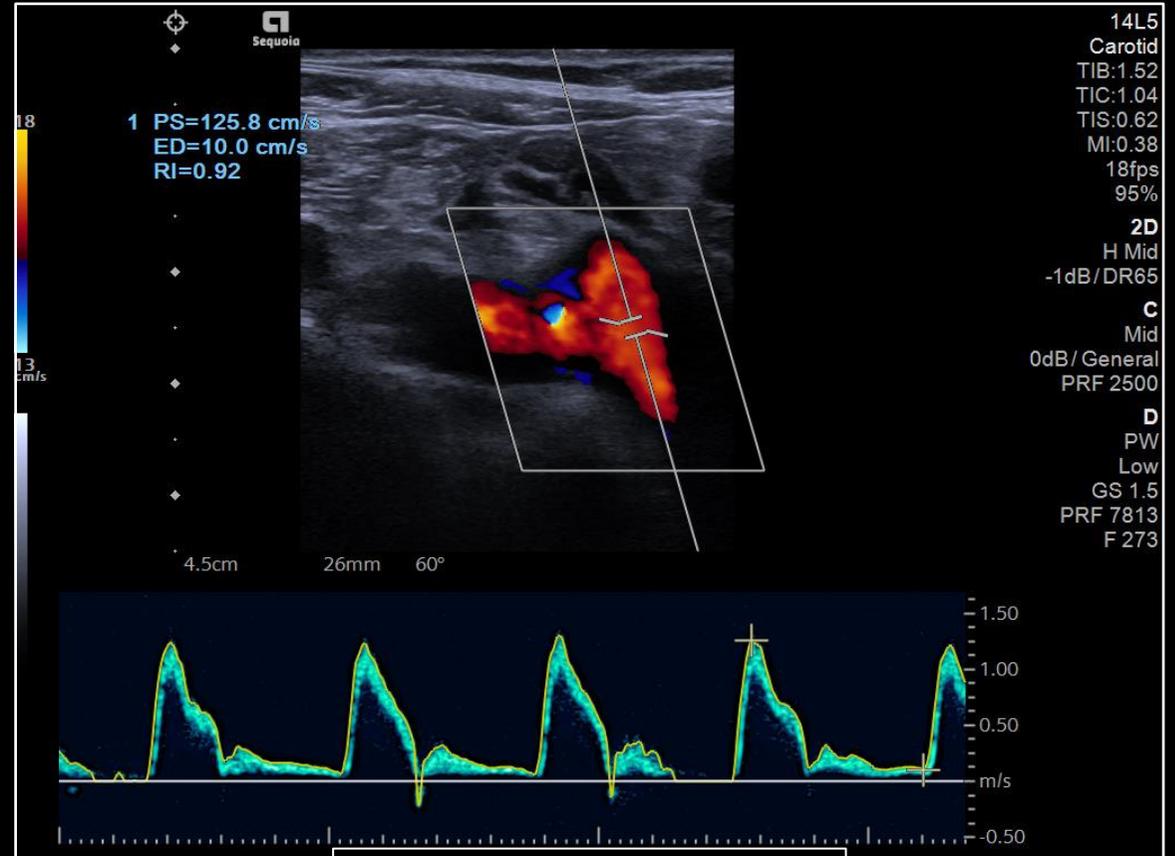
Auto trace



Auto trace Example



Below the baseline



Above the baseline

Objectives

- Identify access to measurement feature and screen information
- **Explain editing and deleting measurements**
- List exam specific measurement options
- Examine report access, layout and editing
- Outline printing options

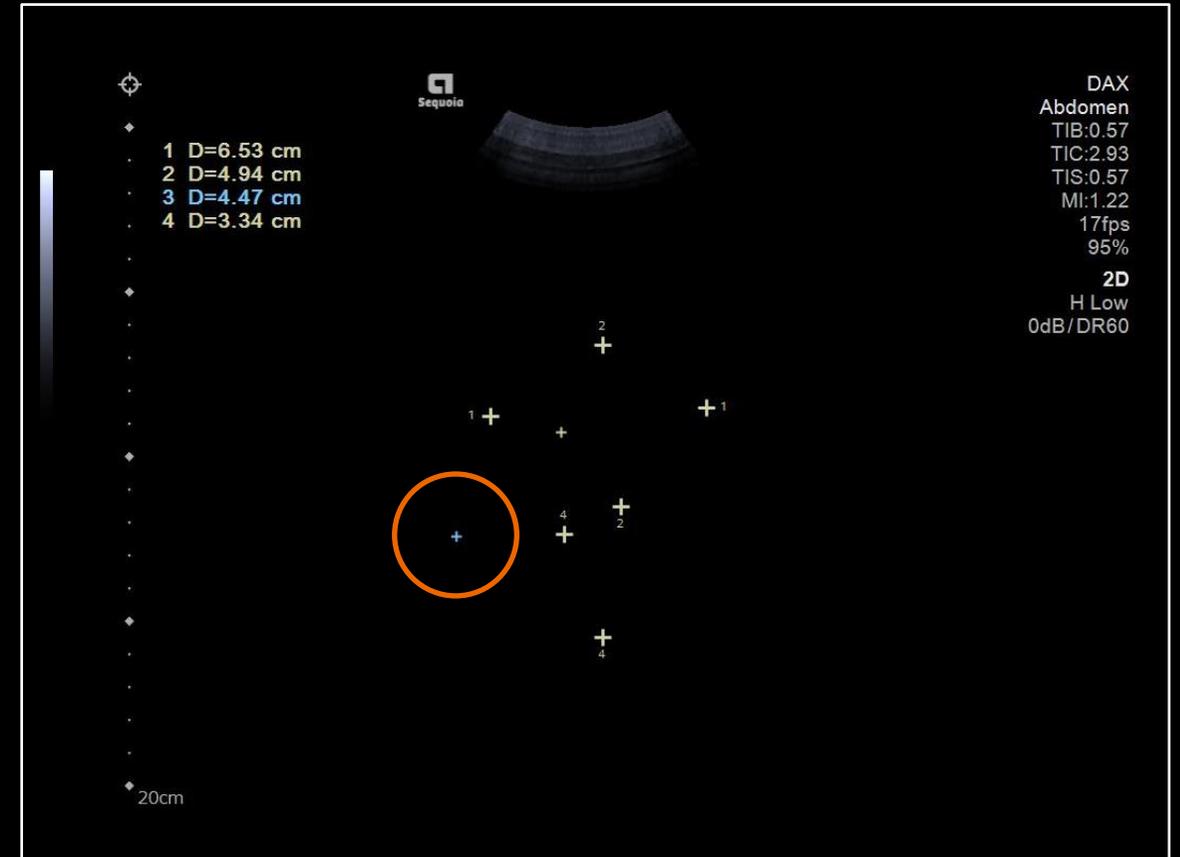


Editing / updating a completed measurement

- Press the **Last Caliper** soft key to activate caliper set



- Use the **Update** key to toggle and the **Set** to lock caliper



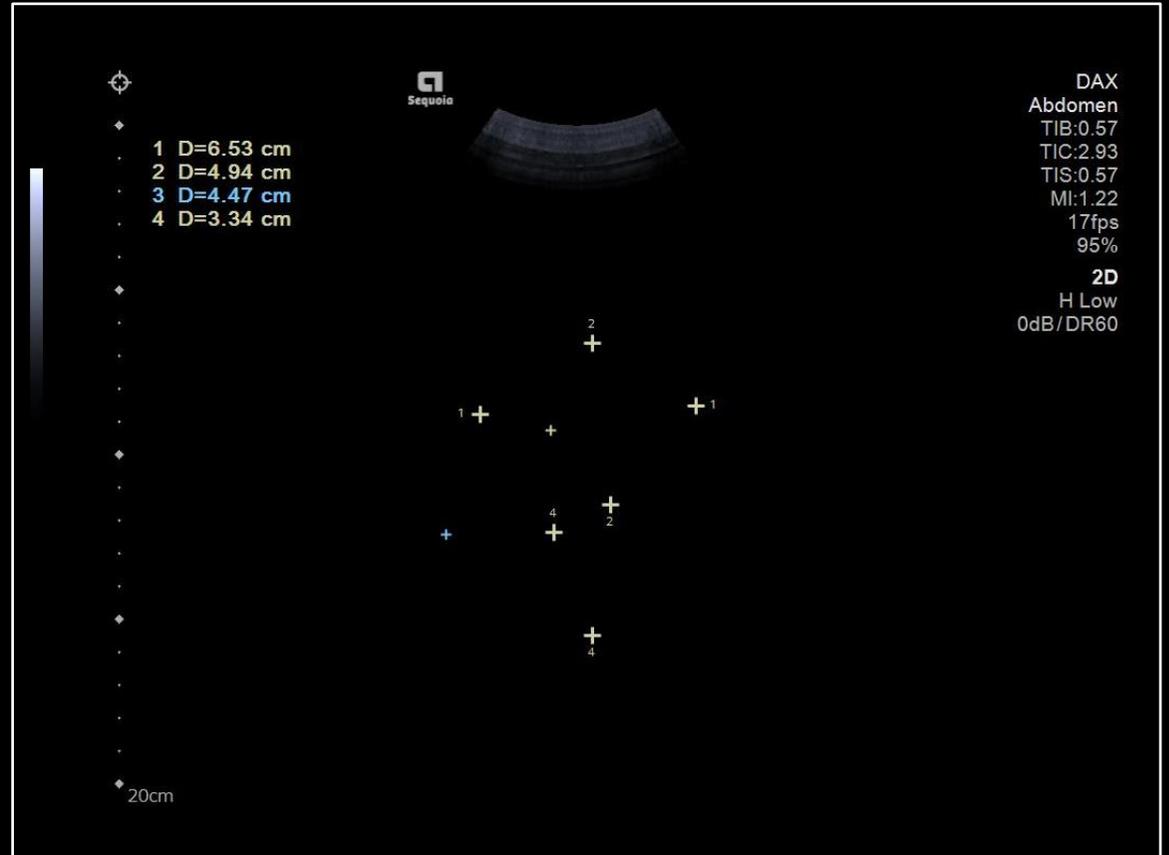
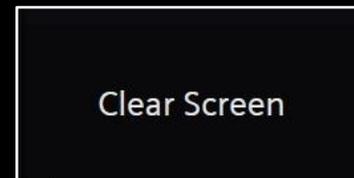
Deleting a caliper

With the measurement function active:

- select the **Delete** key on the control panel for single measurement deletion



- Select **Clear Screen** to delete all measurements



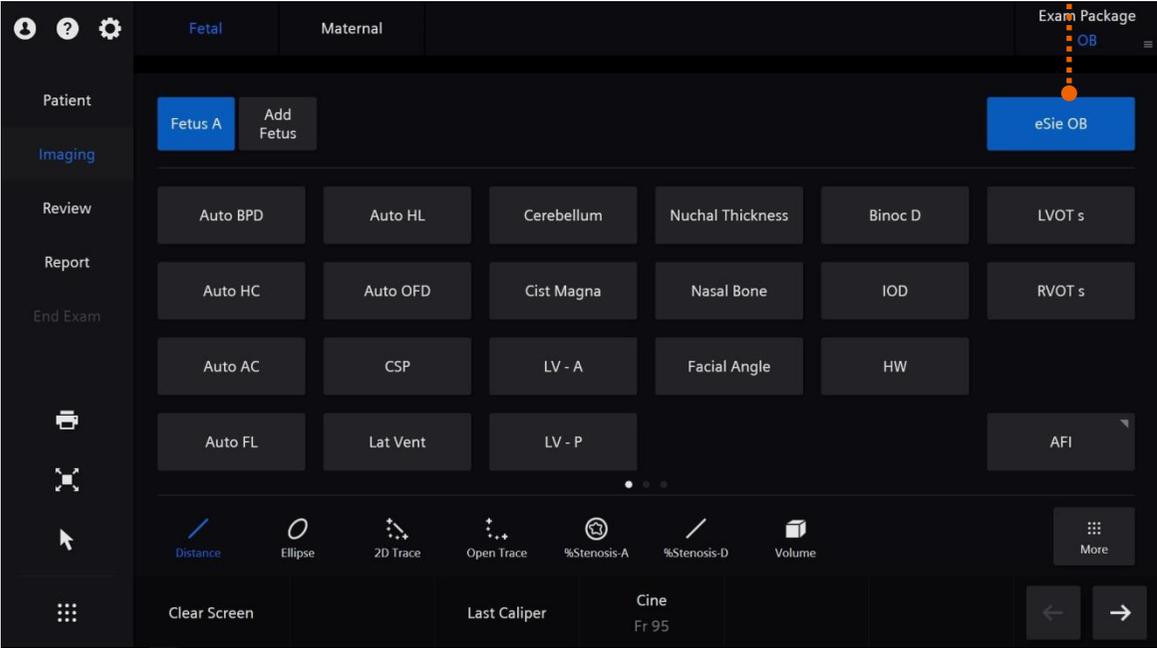
Objectives

- Identify access to measurement feature and screen information
- Explain editing and deleting measurements
- **List exam specific measurement options**
- Examine report access, layout and editing
- Outline printing options

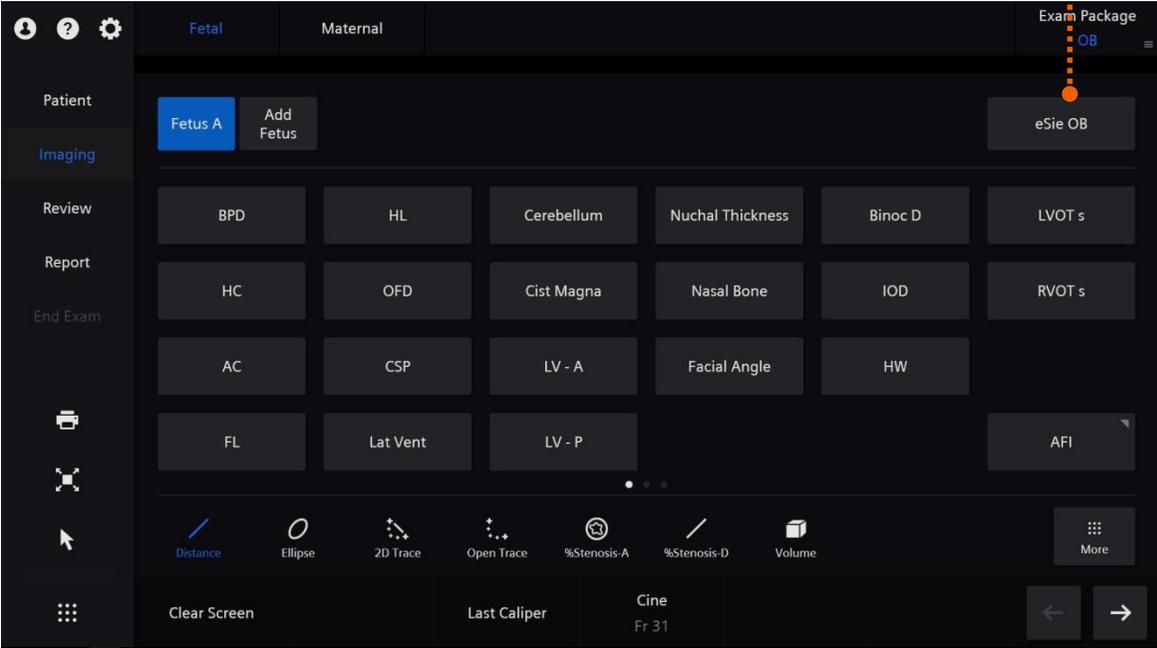


eSie OB on / off

eSie OB key is blue when ON



eSie OB key is grey when OFF



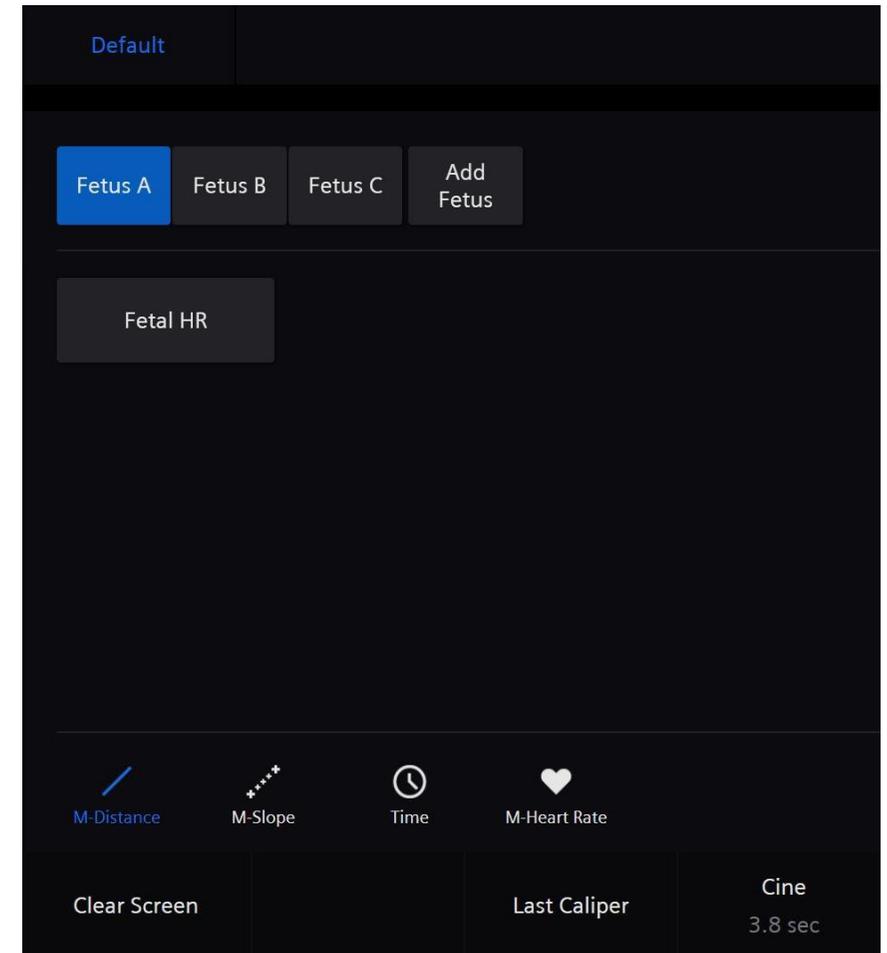
Fetal heart rate measurement

With the M-mode sweep completed:

- Activate the caliper function
- Default on touch screen is to Fetus A - manually select alternate fetus if multiple
- Select Fetal HR on touch screen and measure the appropriate beat(s)



- Number of beats for measurement is displayed in lower left corner of image screen
- Number of beats is specified in system configuration



Hip measurements

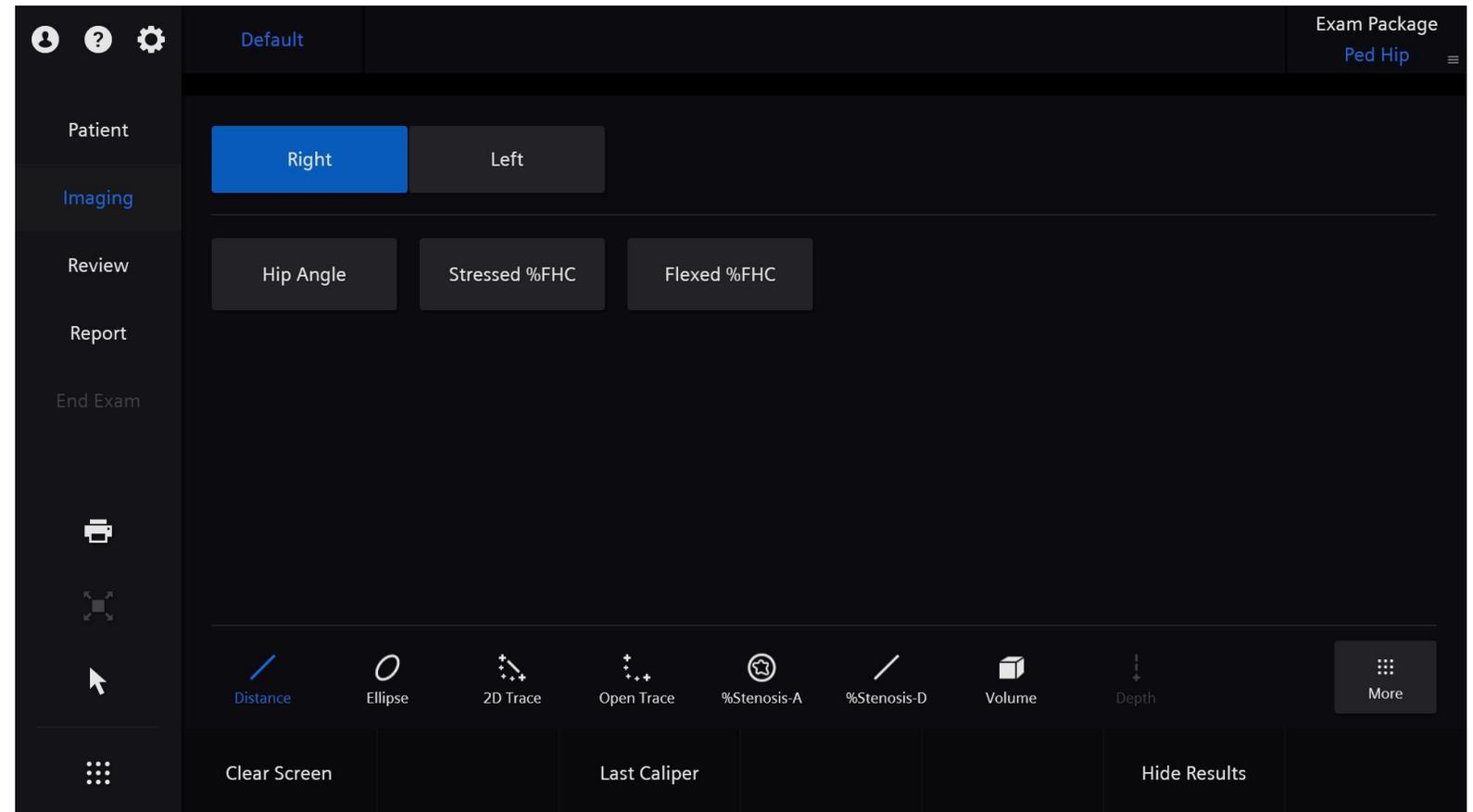
Available labels:

- Hip Angle
- Femoral head coverage (stressed and flexed)

Onscreen tool and method* options:

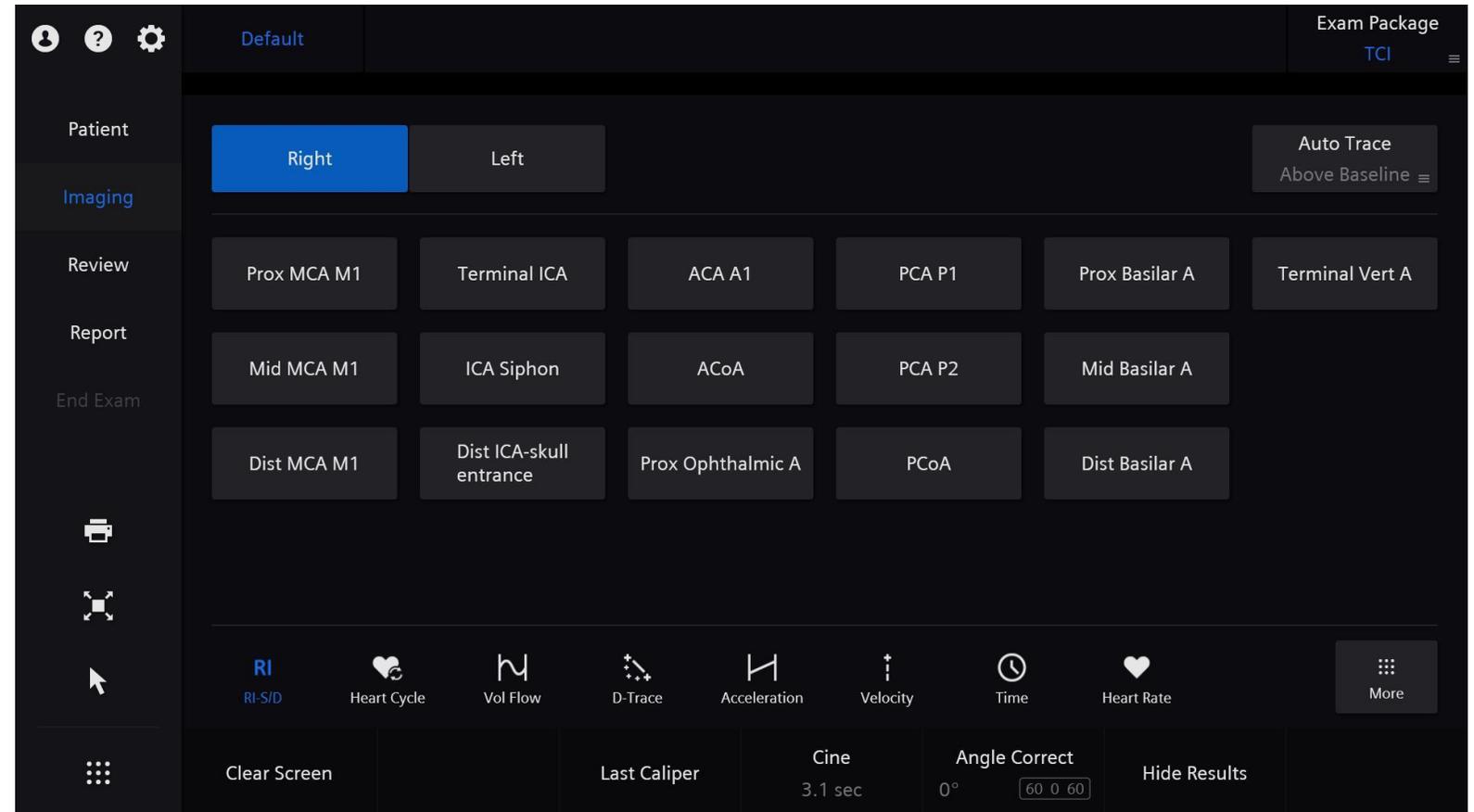
- Beta and Alpha
- Alpha only

Configuration: M & R >
Measurement > Per Label
Configuration > Ped Hip



*Options only for Hip Angle. MDA will only display the configured tool(s)

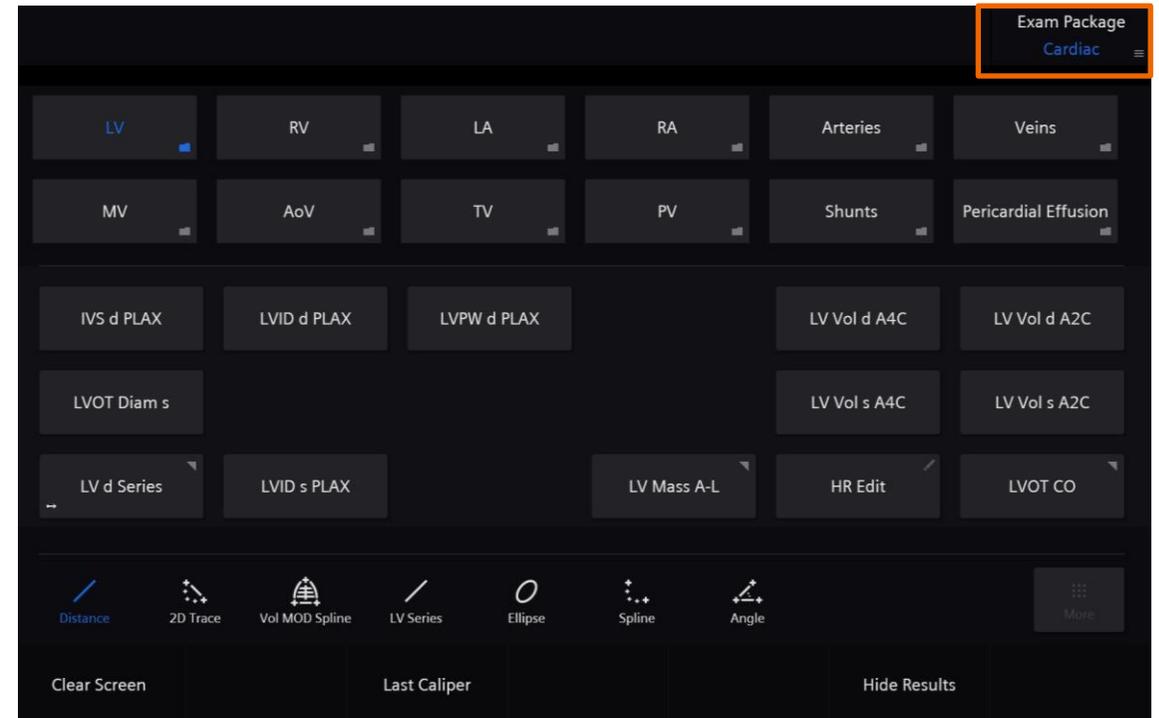
- Factory measurement labels displayed in Doppler mode
- Display is configurable in the Touch Screen Layout Editor
- Auto Trace available



Cardiac 2D measurement options

Touch screen

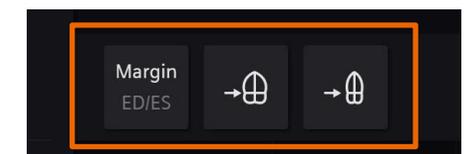
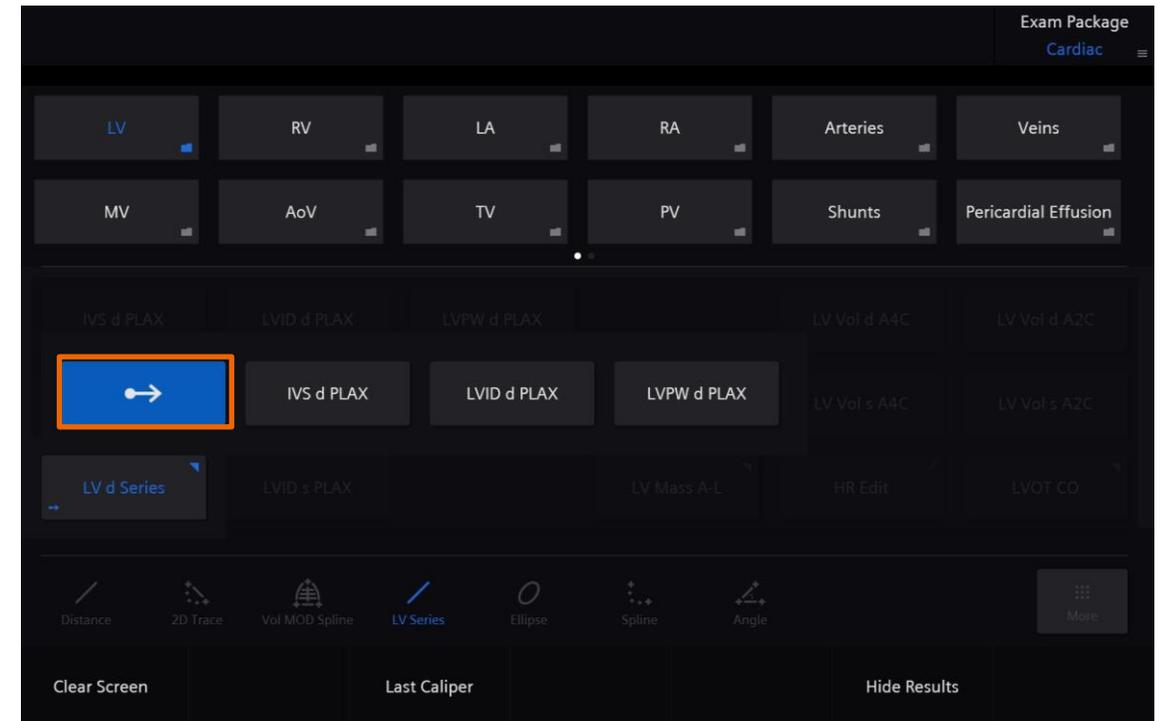
- There are two exams: Adult Cardiac and Fetal Cardiac Exam Packages
- Measurements are grouped into folders based on anatomy
- The folders are configurable in both content and layout
- Unlabeled / generic measurement options appear at the bottom of the screen



Cardiac 2D measurement options

Series measurements

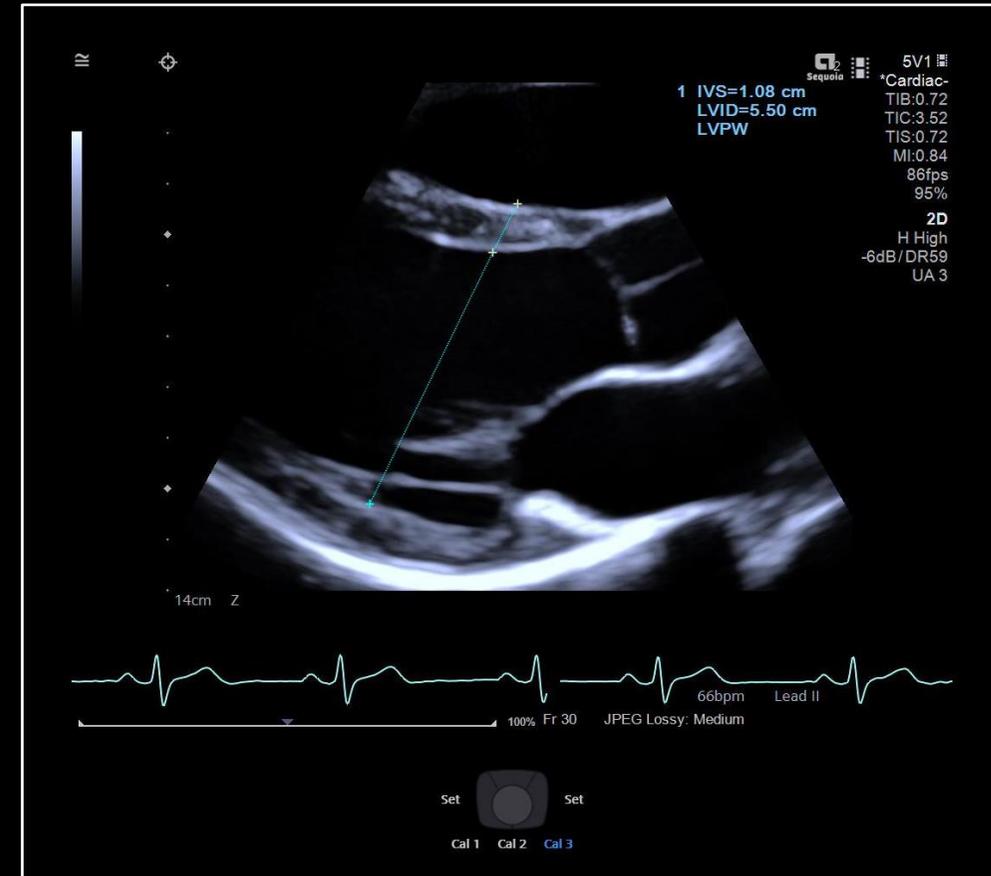
- Measurement series are indicated by an arrow on the touch screen
- Select arrow to utilize the measurement series or select each measurement individually
- A check mark (✓) will appear on the label once the measurement is completed / set
- **Go To ED** and **Go To ES** are available options on the soft key menu



Cardiac 2D measurement options

Series measurements

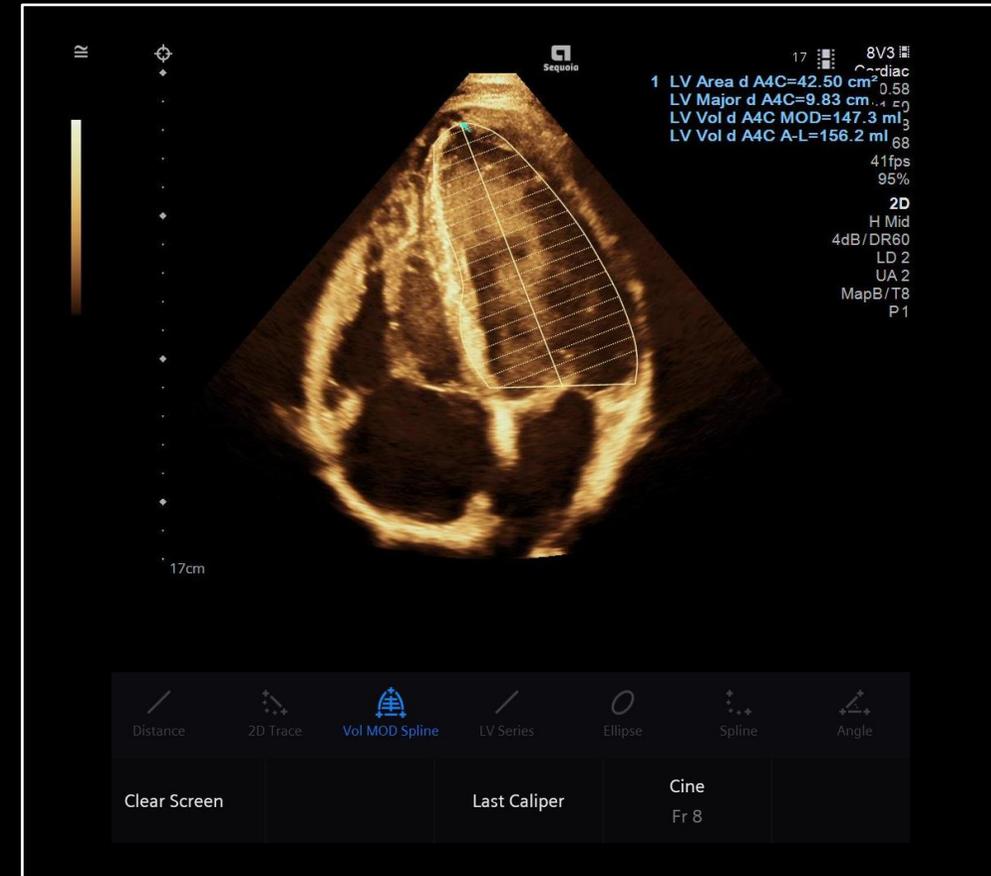
- In this **LV Series** example, once a measurement within a series is completed, the next measurement is automatically activated
- Press **Toggle Caliper (Update)** to toggle between the calipers to edit position and alignment
- To edit set calipers, select **Last Caliper** from soft key menu, then press **Toggle Caliper** to toggle and edit markers



Cardiac 2D measurement options

3 point method of discs

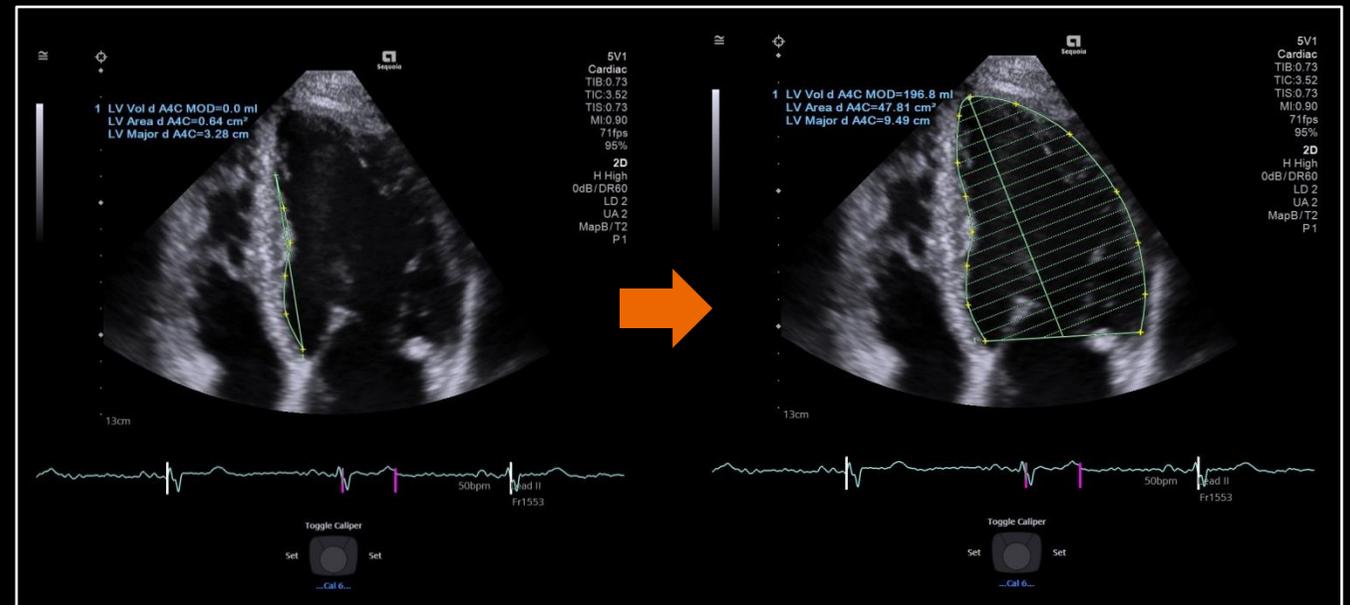
- **3 point trace** – LV & LA volume measurement method located in respective folders
- To use, select the volume measurement label, then place medial and lateral points
- Use the trackball to position third point and press the **Set** key
- Press **End** to complete trace



Cardiac 2D measurement options

Trace

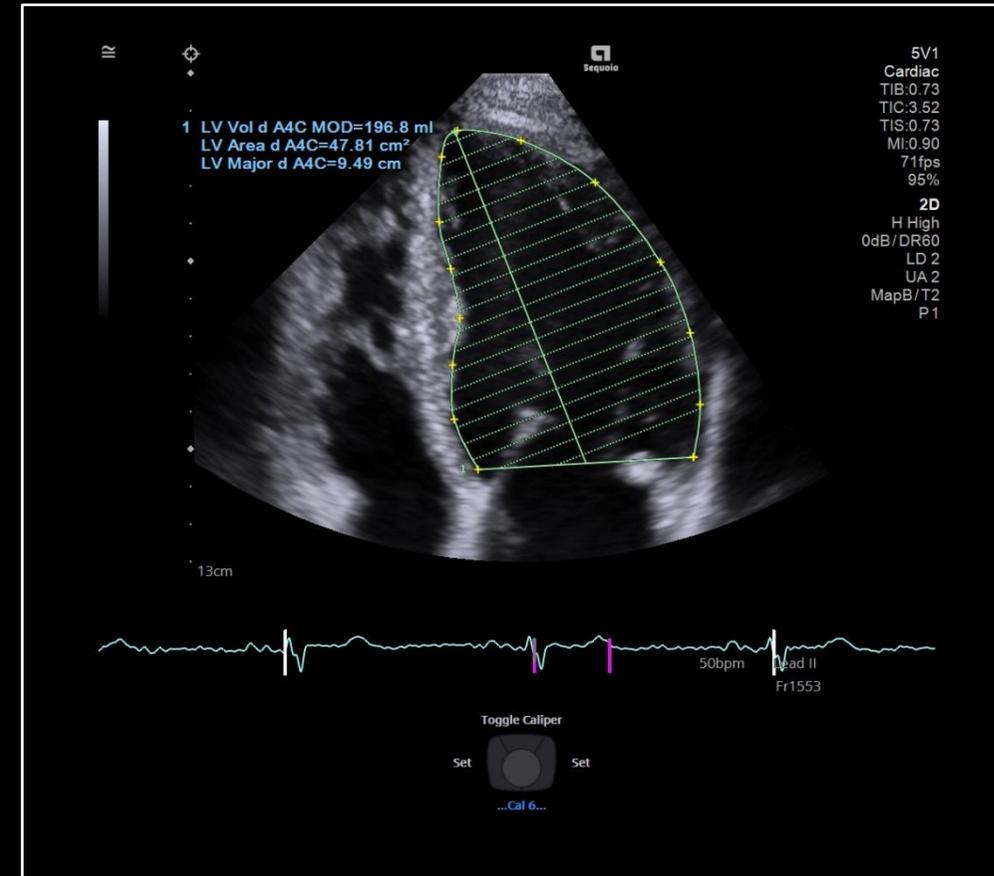
- The spline method is the configured tool for the trace measurement option
- Press a **Set** key to activate next caliper
- Double click a **Set** key to complete the trace
- Press **Set** once more to finalize the measurement and add it to the report



Cardiac 2D measurement options

Edit trace

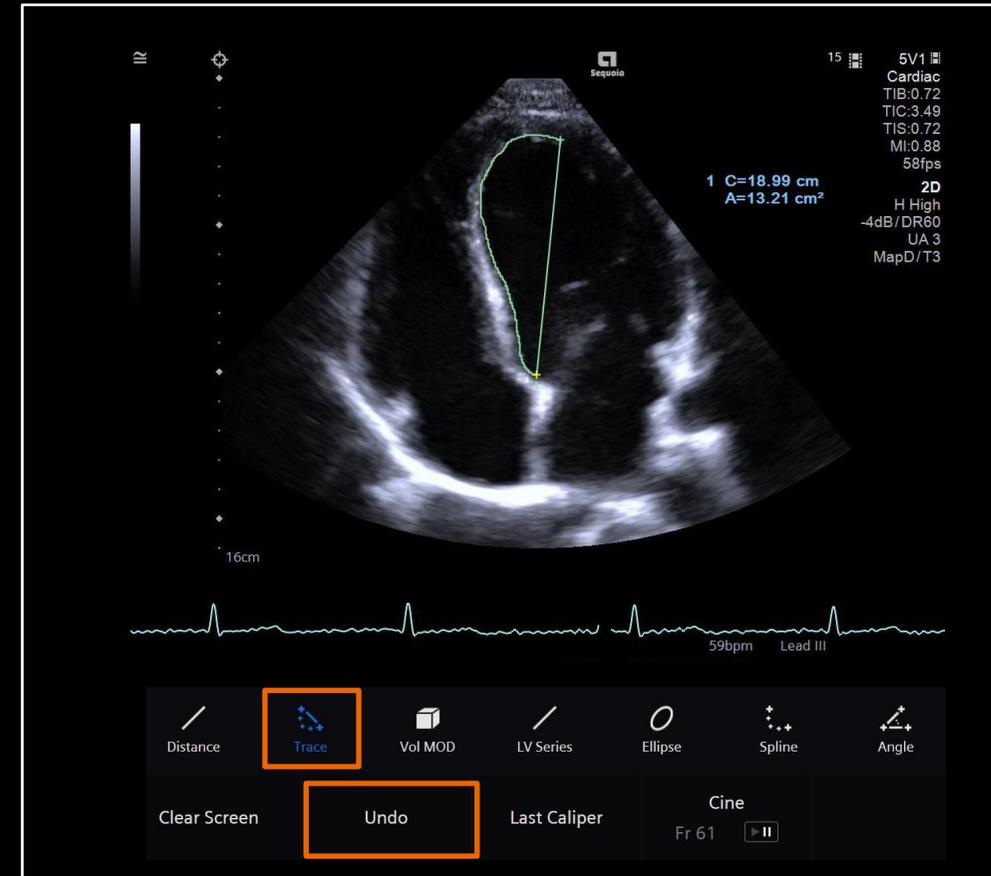
- To edit a trace, select **Last Caliper** from soft key menu and press **Toggle Caliper** key (**Update**) above trackball
- Use the trackball to move the caliper points and alter the LV contours
- The active caliper will appear green



Cardiac 2D measurement options

Unlabeled (generic) trace

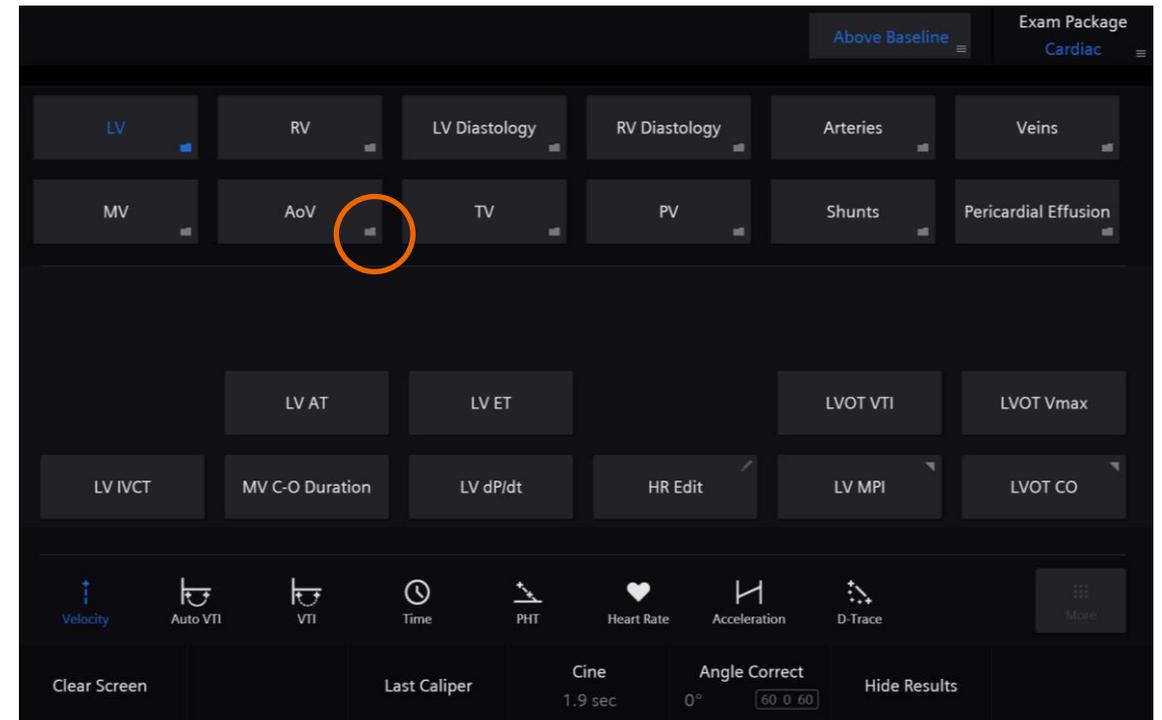
- The traditional trace method is available as a generic caliper measurement
- Select **Undo** or back up erase using the trackball to edit the trace
- A generic measurement will not populate into the patient report



Cardiac Doppler measurements

Touch screen

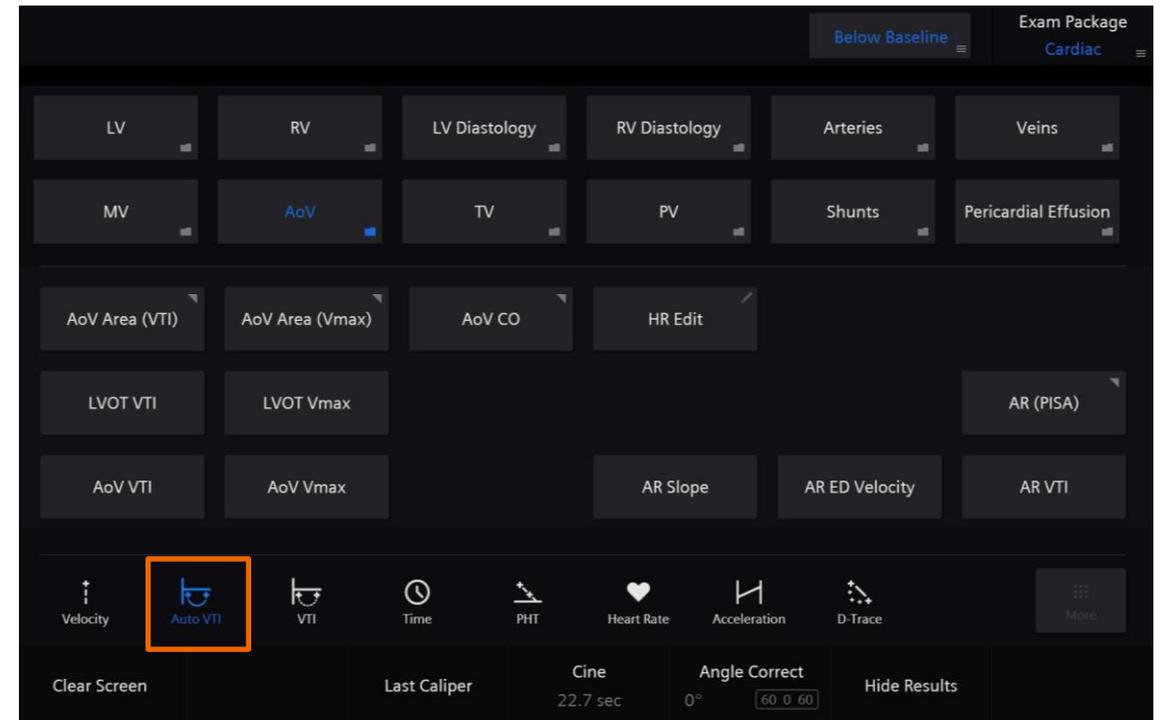
- Doppler measurement options are organized into folders in the same manner as the 2D measurements
- Folders are configurable in both content and layout



Cardiac Doppler measurements

Auto VTI

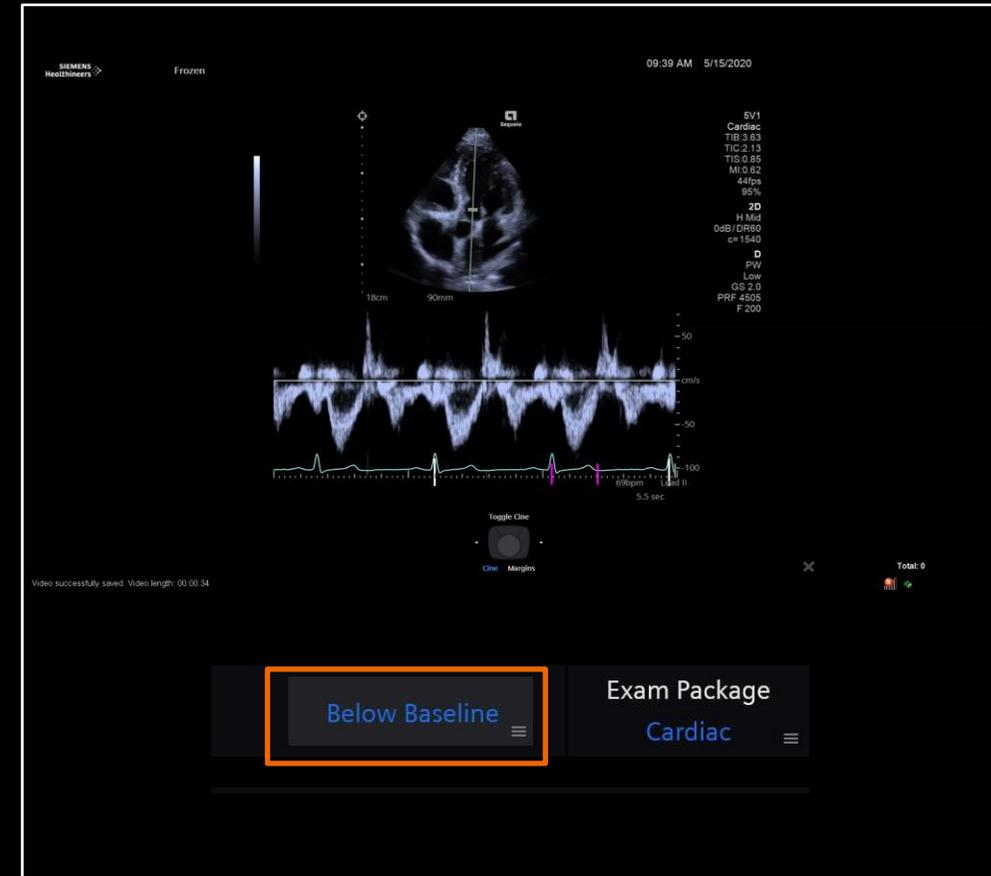
- Semi-automated tracing method for spectral Doppler
- Available during live imaging
- Can be configured to be associated with a specific VTI measurement label (i.e. LVOT VTI)
- Measurements associated with a measurement label will be entered into the Report



Cardiac Doppler measurements

Auto VTI

- Select **Auto VTI**
- Specify trace as **Above Baseline**, **Below Baseline**, or **Above and Below Baseline**
- Press **Set** key to place first caliper at the beginning of the spectral Doppler tracing, and place second caliper at the end of the spectral Doppler



Cardiac Doppler measurements

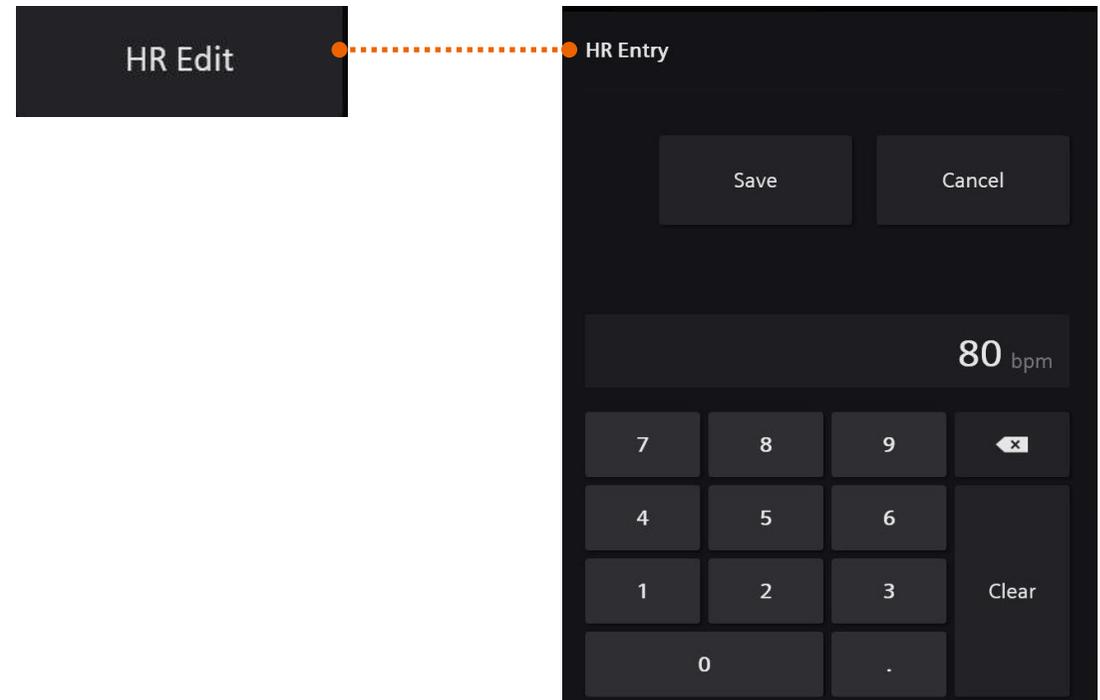
Trace

- The traditional trace method is available for spectral Doppler measurements
- Select **Undo** or back up erase using the trackball to edit the trace
- Once the measurement is set, select **Last Caliper** to edit



Edit heart rate (HR) for cardiac exams

- **HR Edit** allows manual entry of a heart rate
- For use in cases where an ECG is unavailable
- Select **HR Edit** and enter the heart rate using the touch screen number keys
- Select **Save**



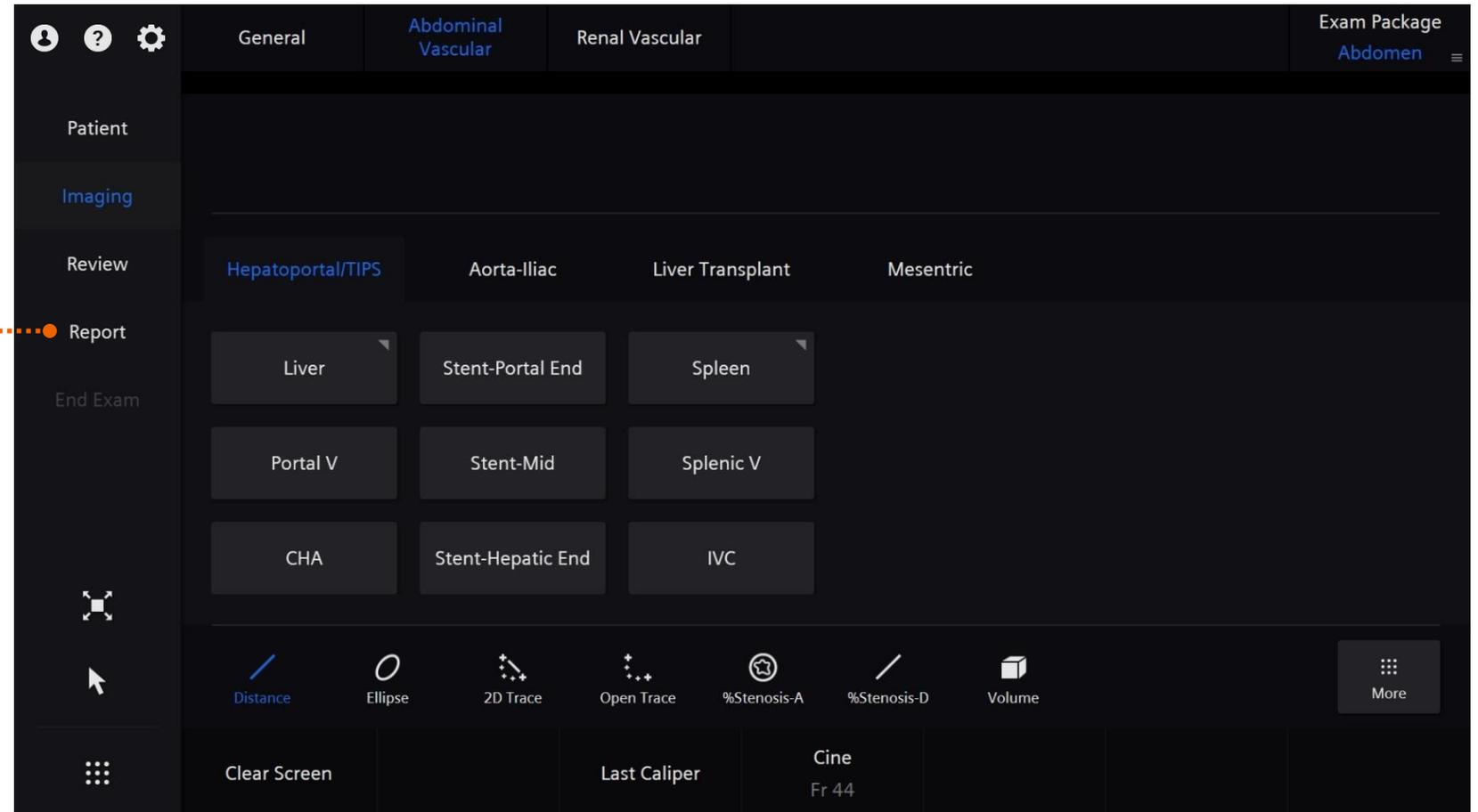
Objectives

- Identify access to measurement feature and screen information
- Explain editing and deleting measurements
- List exam specific measurement options
- **Examine report access, layout and editing**
- Outline printing options



Report access

Report access
from touch
screen



Report layout

Navigation pane

Expand or collapse all fields

Available functions

Section heading

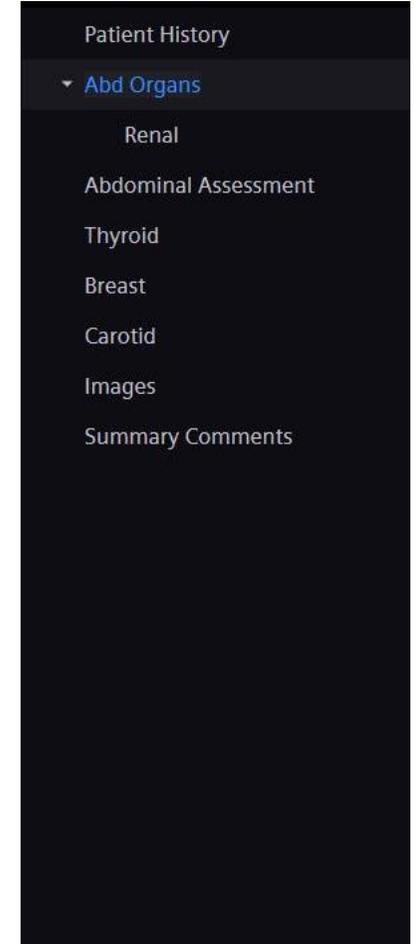
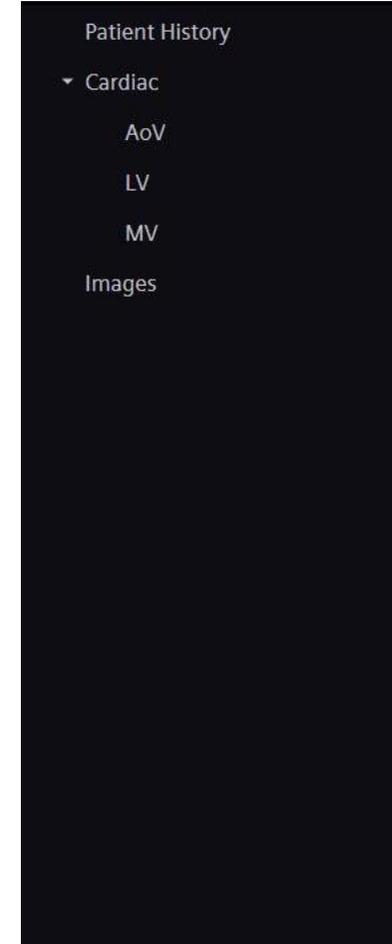
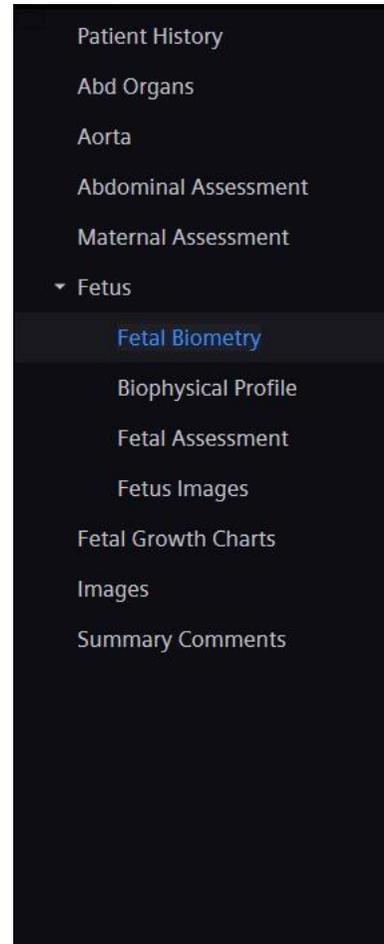
Scroll bar

Thumbnails

Measured results listed by exam

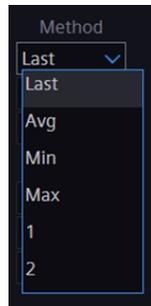
Navigation pane

- Navigation pane contains links to different report sections
- Sections are organized by anatomy
- An open / active section heading is highlighted in blue
- All reports / sections that have data are listed
- Any sections that have been “hidden” in system configuration will **not** be listed even if measurement data has been obtained



Report content structure

- Sections can be individually collapsed by selecting the “+” or “-” for that section
- Maximum of 5 labeled measurements will be displayed
- Display method options are determined by tool type and can be manually altered for all exams



- “Side-by-side” options available for anatomy with left / right options

	Value	Method	1	2	3	4	5
- Liver							
CBD	0.49 cm	Last	0.49				
- Spleen							
Spleen Length	11.24 cm	Last	11.24				
Spleen AP	7.10 cm	Last	7.10				
Spleen Width	13.97 cm	Last	13.97				
Spleen Vol	583.74 cm ³						
- Kidneys							
Rt Kidney Length	18.13 cm	Last	18.13				
Lt Kidney Length	20.31 cm	Last	20.31				
- Kidneys Side-by-Side							
Kidney Length	Right: 18.13 cm	Left: 20.31 cm					

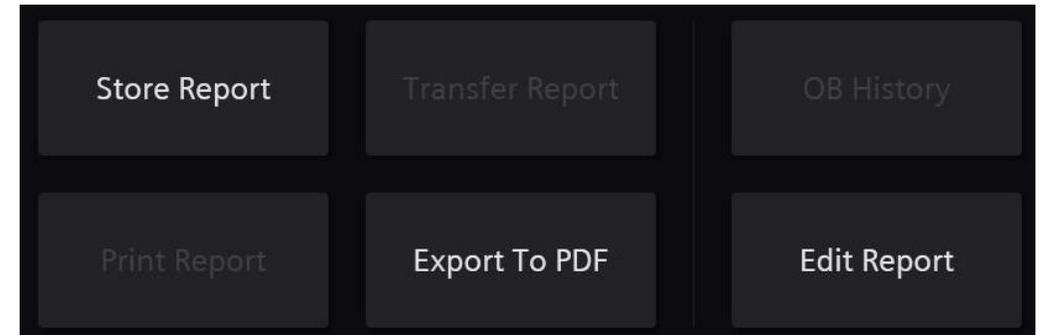
There are six function keys relating to the report

Keys are displayed on the touch screen and imaging screen

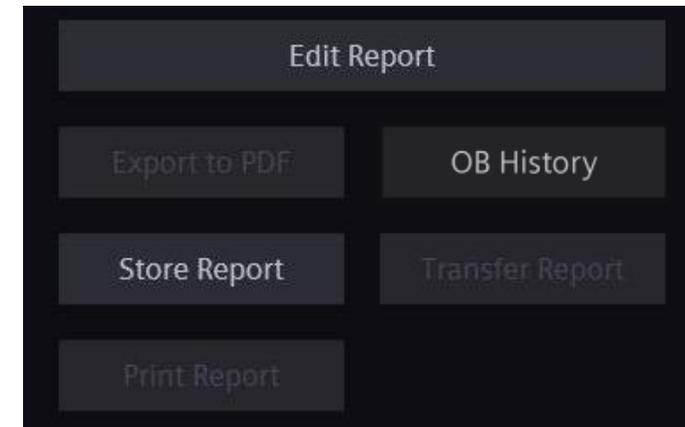
They are:

- Store Report
- Print Report
- Transfer Report
- Export to PDF
- OB History
- Edit Report

Touch screen display



Imaging screen display



- Obstetric history can be manually added to the report to compare growth parameters
- Use the **Pointer** to select the date the previous exam was performed on
- Enter data in the fields provided and select **OK** to add

Note: if the previous exam was performed on the same system, the data will be populated in the OB History

OB History

Fetus A

Trend	Exam Date	GSD (mm)	CRL (mm)	BPD (mm)	HC (mm)	AC (mm)	FL (mm)	HL (mm)	EFW (g)	Interval Growth
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>
<input type="checkbox"/>	M/D/YYYY									<input type="radio"/>

OK Cancel

Fetal growth charts

- Fetal growth charts can be displayed in the report
- User can change the measured parameter and chart author using the drop-down menus located on each chart
- Options for chart layout are found in the drop-down menu in the right upper corner – this is a 2 x 2 layout
- To collapse / hide charts click on the minus sign (-) in the section heading



- Cardiac reports are displayed in sections that contain headings and sub-headings to divide the results
- Display method options can be changed for individual measurements from those listed in the drop-down menu
- If changes are made, an additional function key to **Save as Cardiac Default** will store the current settings

The screenshot shows a software interface for LV (Left Ventricle) measurements. It features a table with columns for 'Value', 'Method', and five numbered columns (1-5). The 'Dimensions PLAX' section is highlighted with an orange box. Below the table, there is a 'Collapse All' button, a dropdown menu for 'Set all results for Cardiac to' (currently set to 'Default'), and a 'Save as Cardiac Default' button, which is also highlighted with an orange box.

	Value	Method	1	2	3	4	5
Dimensions PLAX							
IVS d PLAX	0.93 cm	Last ▾	0.89	0.93			
IVS s PLAX	1.44 cm	Last ▾	1.09	1.44			
LVID d PLAX	5.54 cm	Last ▾	5.63	5.54			
LVID s PLAX	3.78 cm	Last ▾	3.72	3.78			
LVPW d PLAX	0.91 cm	Last ▾	0.85	0.91			
LVPW s PLAX	1.53 cm	Last ▾	1.50	1.53			
IVS/LVPW	1.03						
IVS %Thick	54.7 %						
LVPW %Thick	69.4 %						
LV Relative Wall Thickness (LV RWT)	32.7 %						
A4C							
LV Major s A4C	5.96 cm	Last ▾	5.96				
LV Mass ASE							
IVS d PLAX	0.93 cm	Last ▾	0.89	0.93			
LVID d PLAX	5.54 cm	Last ▾	5.63	5.54			
LVPW d PLAX	0.91 cm	Last ▾	0.85	0.91			
LV Mass ASE	192.55 g						

Assessment sections are available for:

- Abdomen
- Gyn
- Early OB - fetal and maternal
- OB - fetal and maternal
- Fetal Echo
- Carotid
- Hip

Comment or drop-down menu formats available

Custom assessments can be added in system configuration

The screenshot shows the 'Fetal Assessment' section with the following fields:

- Placenta Location: Anterior, Posterior, Fundal, Mid, Right Lateral, Left Lateral, Low Lying, Partial Previa, Marginal Previa, Complete Previa
- Placenta Grade: [Drop-down menu]
- Placenta Cord Insertion: [Drop-down menu]
- Placenta Comments: [Text input field]
- Amniotic Fluid: [Drop-down menu]
- 3 Vessel Cord: [Drop-down menu]

The screenshot shows the 'Abdominal Assessment' section with the following fields:

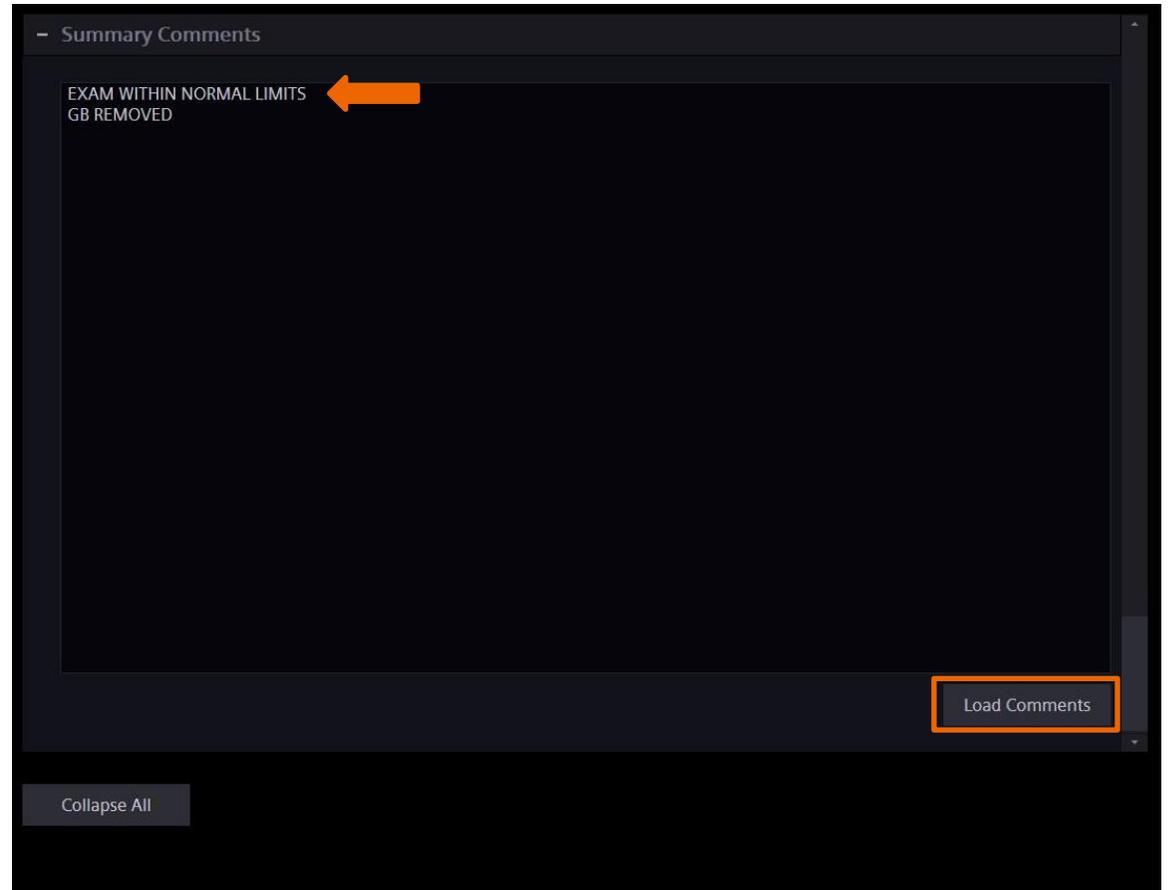
- Liver: [Drop-down menu]
- Echotexture: [Drop-down menu]
- Fatty Infiltration: [Drop-down menu]
- Portal Hypertension: [Drop-down menu]
- Portal Vein: [Drop-down menu]
- Focal Lesions: [Drop-down menu]

The screenshot shows the 'GYN Assessment' section with the following fields:

- Uterus: [Drop-down menu]
- Uterus Comments: [Text input field]
- Endometrium: [Drop-down menu]
- Endometrium Comments: [Text input field]

Summary comments

- A section for summary comments is available for each exam type
- Comments can be freeform and added by using the keyboard to enter the specific comment
- If pre-programmed comments are available, select the **Load Comments** key
- Custom comments can be added in system configuration

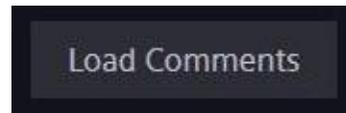


Summary comments

Add pre-programmed comments

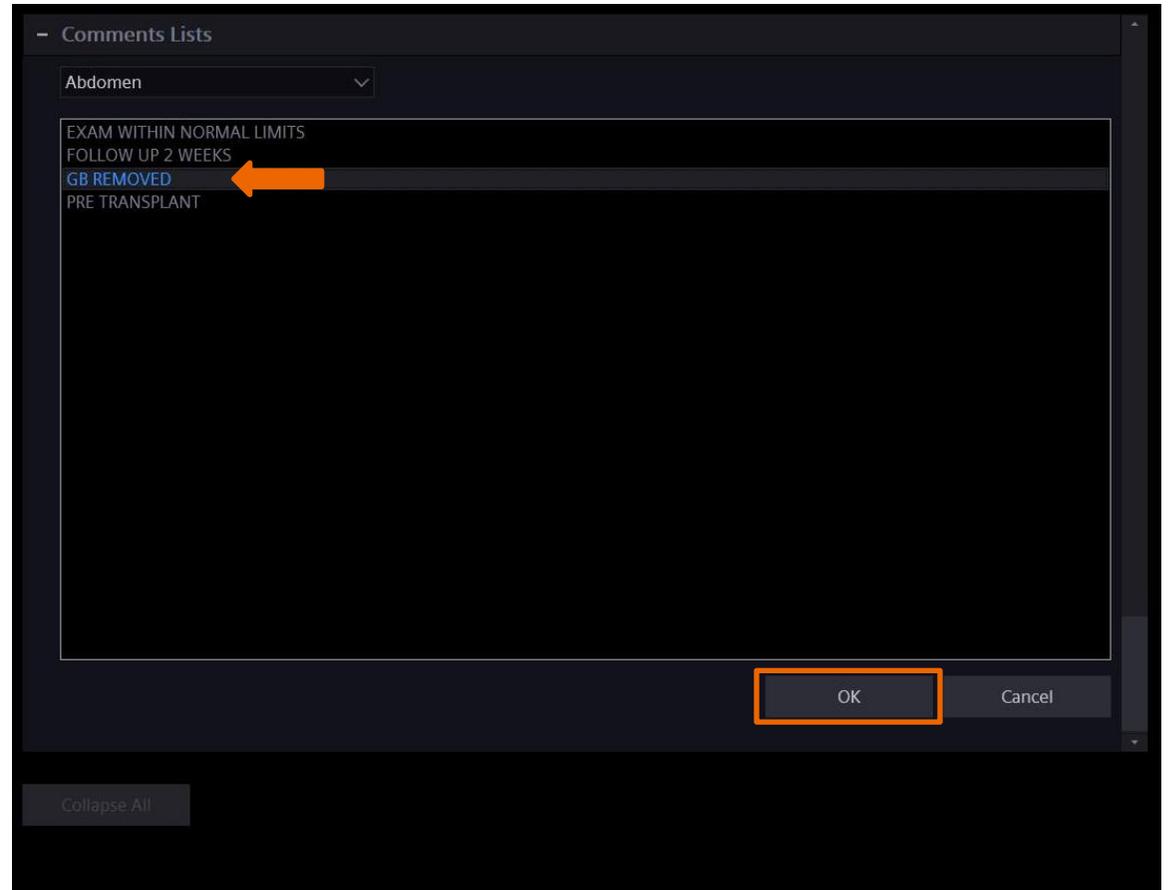
To add comments:

- Select **Load Comments**



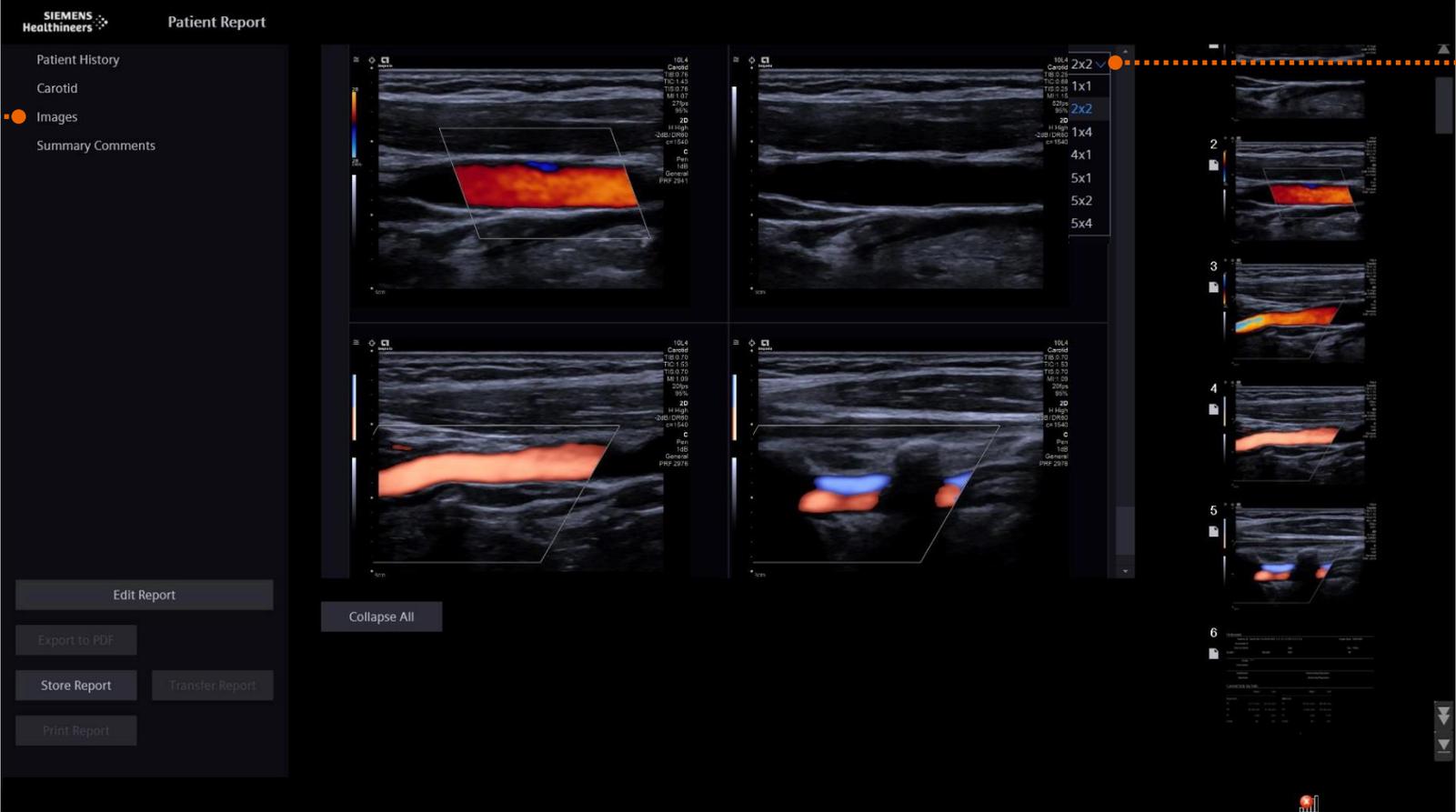
- Use the **Pointer** to highlight the chosen comment
- Select **OK**
- Comment will populate report

Multiple comments can be added to a single report one comment at a time



Add images to report

Quick navigation to images section

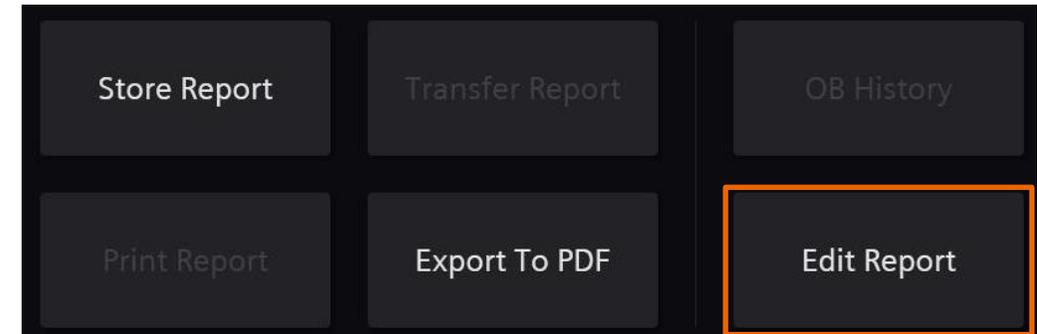


Drop-down for display layout

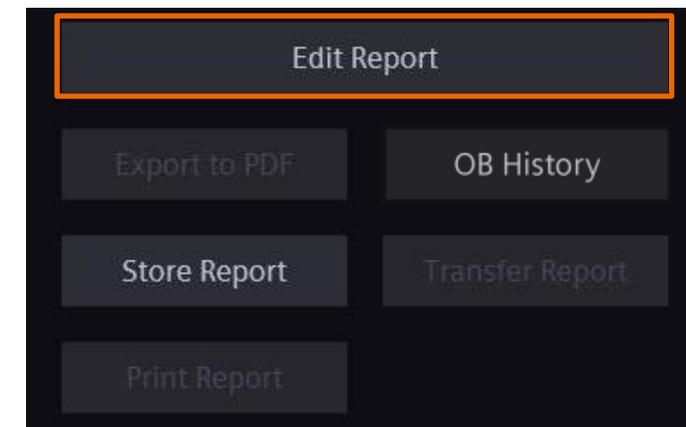
- Report data can be edited
- Function key to activate editing feature is available on both the touch screen and the imaging screen
- Select the **Edit Report** the use the Set key, trackball, and keyboard to input the new values

(continued next slide)

Touch screen display



Imaging screen display



Once the **Edit Report** function is selected:

- Use the **Pointer** and **Set** key to select / highlight the value to be edited
- Use the keyboard to enter the new value or use the **Delete** key on the touch screen to remove value entirely
- Move to another cell with the **Tab** key or trackball to complete change / deletion
- Edited values will be indicated by an asterisk (*) in the data cell and noted at the bottom of the report

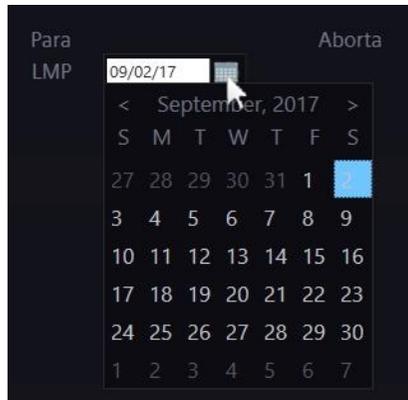
Rt Dist CCA			
PS	41.2	cm/s	Last
ED	10.4	cm/s	
RI	0.75		
Angle	60	°	
Rt Bulb			
PS	49.3	cm/s	Last
ED	12.0	cm/s	
RI	0.76		
Angle	60	°	
Rt Prox ECA			
PS	41.0	cm/s	Last
ED	0.5	cm/s	
RI	1.01		
Angle	60	°	
Rt Mid ECA			
PS	70.0*	cm/s	Last
ED	5.1	cm/s	
RI	0.93		
Angle	60	°	

Collapse All

Edited Value *

Editing OB dating data

- OB dating data can be edited on the report
- Use the **Pointer** to select the calendar drop-down and desired date



- Date can be altered manually by highlighting the field entering the date using the keyboard

Serial number: 899416 System date/time: Tuesday, April 24, 2018 07:37 PM

- Patient

Last Name Middle Name Study Date
First Name Accession #
Patient ID
Date of Birth Age Sex Other
Height Weight BSA
BP

- History

Study ***
Comments
Gravida
Num of Fetuses 1

Para Aborta Ectopics
LMP M/D/YYYY
DOC M/D/YYYY
Clinical Age w d

- Institution

Institution
Performing Physician
Referring Physician
Operator

Collapse All

Due to a missing clinical age, the growth charts cannot be saved. Edited Value *

Data type available / entered	Report behavior	Patient registration
1. Last Menstrual Period (LMP)	<ul style="list-style-type: none"> LMP is displayed and is editable EDD and Clinical age are calculated from LMP LMP does not change if Clinical Age is changed 	<ul style="list-style-type: none"> If LMP is edited from the report page, all values (LMP, EDD, and Clinical Age) are updated on the patient registration page
2. Expected Date of Delivery (EDD)	<ul style="list-style-type: none"> EDD is displayed and is editable EDD will be re-calculated on report if Clinical Age is edited LMP will be blank (not calculated from EDD if a value was not entered originally) 	<ul style="list-style-type: none"> If EDD is edited from the report page, Clinical Age is re-calculated and both values are updated in the patient registration page LMP remains blank if not entered
2. Clinical Age	<ul style="list-style-type: none"> Clinical Age is displayed and is editable If Clinical Age is edited, EDD will be re-calculated on the report LMP will be blank (not calculated from Clinical Age if a value was not entered originally) 	<ul style="list-style-type: none"> If Clinical Age is edited from the report page, EDD is re-calculated and both values are updated in the patient registration page LMP remains blank if not entered

- Shear Wave values cannot be edited in the report, only deleted
- Select **Edit Report** to activate the editing function
- Values cannot be retrieved once they are deleted
- All values – Mean, Std Dev, Median, IQR, and IQR/Median listed in the results will be re-calculated

	Liver Site 1		Depth
	Vs	E	cm
	m/s	kPa	
1	1.30	5.0	4.7
2	1.26	4.8	4.7
3	1.52	6.9	4.7
4	1.36	5.6	4.7
5	1.28	4.9	4.7
6	1.37	5.7	4.7
7	1.34	5.3	4.7
8	1.37	5.6	4.7
9	1.24	4.6	4.7
10	1.81	9.9	4.7
Mean	1.39	5.8	
Std Dev	0.17	1.6	
Median	1.35	5.4	
IQR	0.09	0.8	
IQR/Median	0.07	0.1	

Overall Statistics
Mean 1.39 m/s Std Dev 0.17 m/s Median 1.35 m/s IQR 0.09 m/s IQR/Median 0.07
Mean 5.8 kPa Std Dev 1.6 kPa Median 5.4 kPa IQR 0.8 kPa IQR/Median 0.1

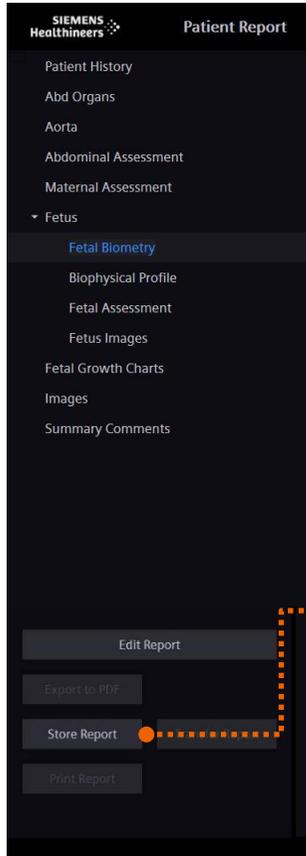
Note: Shear Wave Speed and Elasticity values may vary among manufacturers!

Objectives

- Identify access to measurement feature and screen information
- Explain editing and deleting measurements
- List exam specific measurement options
- Examine report access, layout and editing
- **Outline printing options**

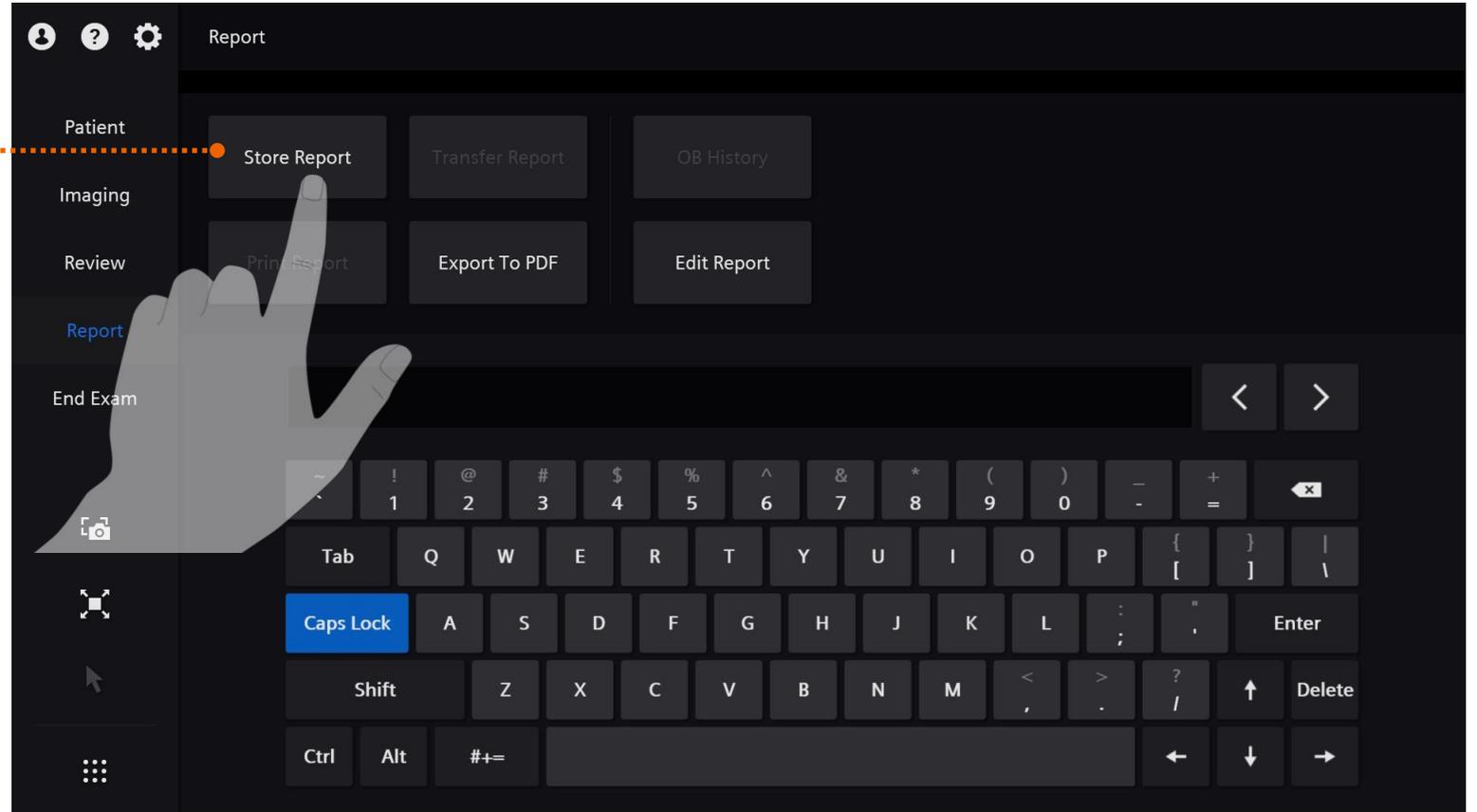


Print / store report



Touch screen
store report
option

Imaging screen
store report
option



Store report command

Patient

Last Name
First Name
Patient ID
Date of Birth
Height
BP

History

Study ***
Comments

Institution

Institution
Performing Physician
Referring Physician
Operator

Liver

Spleen

Spleen Length 12.91 cm

Kidneys

Rt Kidney Length 10.80 cm
Lt Kidney Length 11.25 cm

Kidneys Side-by-Side

Kidney Length

Thyroid

Rt Thyroid Length 0.87 cm

Carotid

Rt Prox CCA Diam 6.24 cm
Rt Prox CCA PS 83.9 cr
ED 35.7 cr
RI 0.57
S/D 2.35
Angle 0°
Lt Prox ECA PS 60.1 cr
ED 13.2 cr
RI 0.78
S/D 4.55
Angle 0°
Lt Prox ICA PS 86.5 cr
ED 42.9 cr
RI 0.50
S/D 2.02
Angle 0°

Carotid Side-by-Side

Rt Prox CCA PS 64.7 cr

Carotid Ratios

Rt Prox ICA(83.9)
Lt Prox ICA(86.5)

Fetus Information

Clinical Age / GA
US Age 24
EFW 79
EFW Age 24
EFW%
Fetal HR

Fetal Biometry

BPD Value / Method 5.39 cm
Last 21.75 cm
HC Last 22.41 cm
FL Last 4.32 cm
EFW Last 796 g

Fetal Ratios

Label	Ratio	Range Low	Range High	Growth	Author
HC/AC	0.97				
FL/BPD	80.15				
FL/HC	19.86				
FL/AC	19.28				
CI	67.52				

Thyroid

	Value	Method	1	2	3	4	5
Lt Thyroid Length	4.08 cm	Last	4.08				
Lt Thyroid AP	12.46 cm	Last	12.46				
Lt Thyroid Width	2.46 cm	Last	2.46				
Lt Thyroid Vol	59.90 cm³						

Thyroid Side-by-Side

	Right	Left
Thyroid Length		4.08 cm
Thyroid AP		12.46 cm
Thyroid Width		2.46 cm
Thyroid Vol		59.90 cm³

Edited Value *

Summary

- Identify access to measurement feature and screen information
- Explain editing and deleting measurements
- List exam specific measurement options
- Examine report access, layout and editing
- Outline printing options



Thank you for your enthusiasm!

Questions?