

# ACUSON Sequoia Ultrasound System

Major Modes  
Release 3.5 (VB30)



# Objectives

- **Review B-mode and M-mode controls**
- Describe B-mode and M-mode optimization features
- Explain display modes
- Review Doppler controls
- Describe Doppler optimization features



# Mode imaging parameters

Selection  
Screen

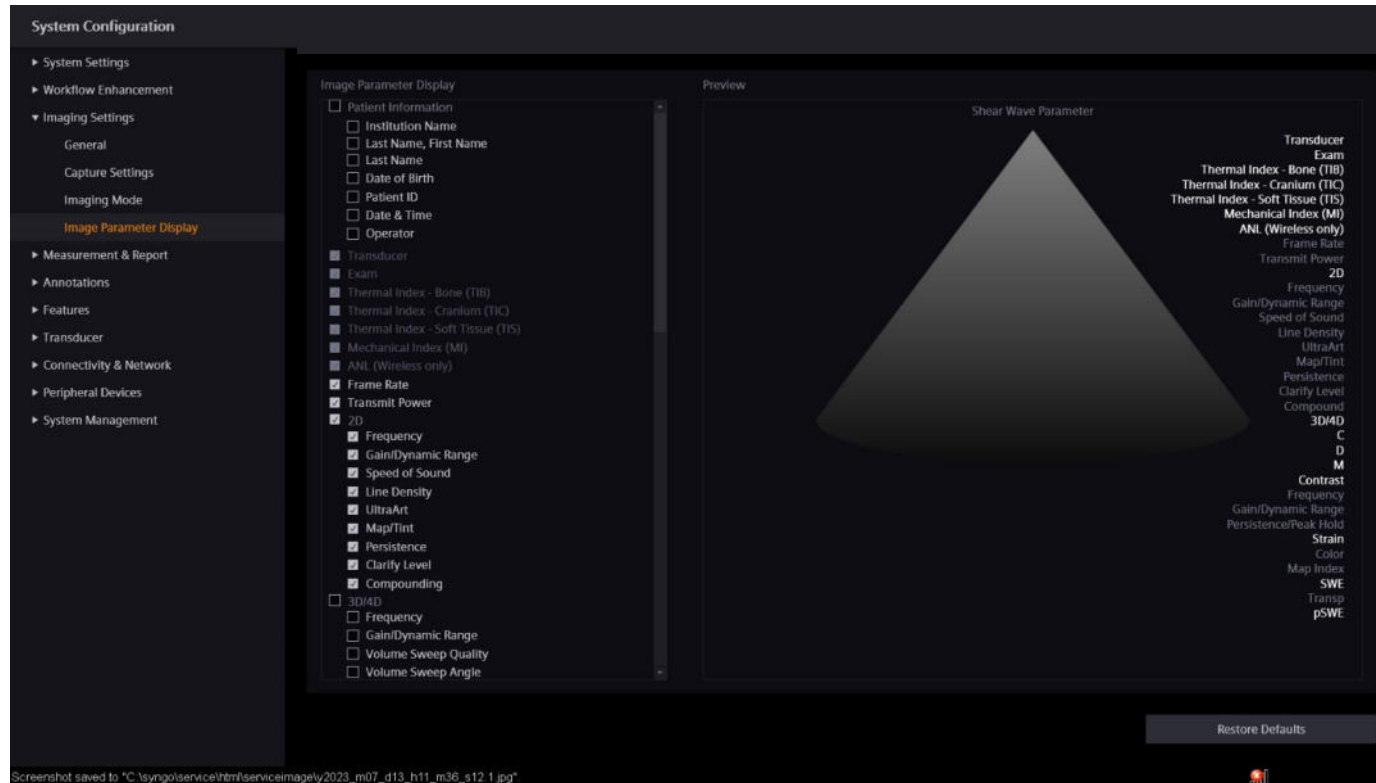
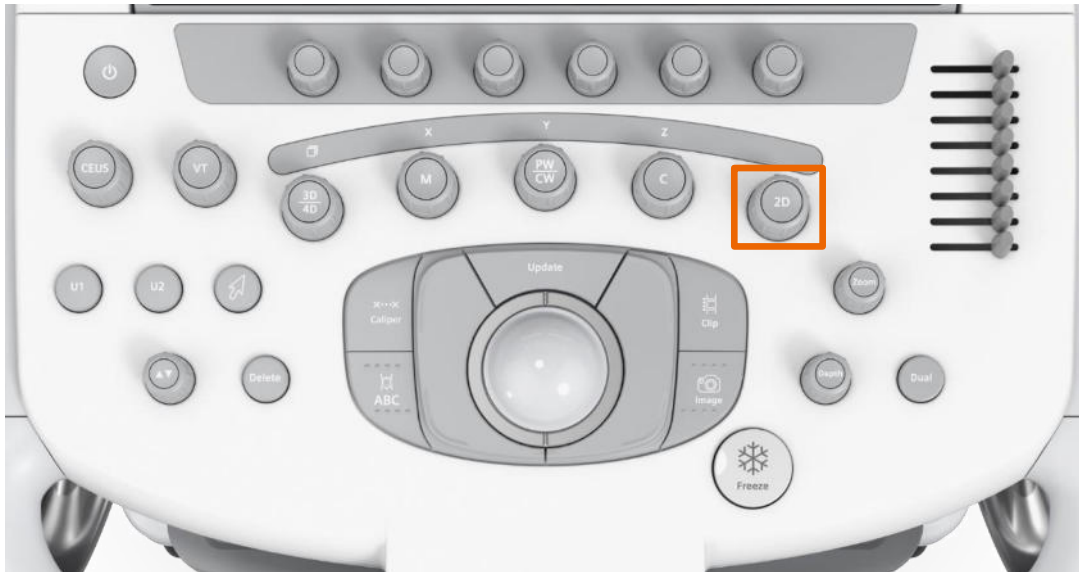
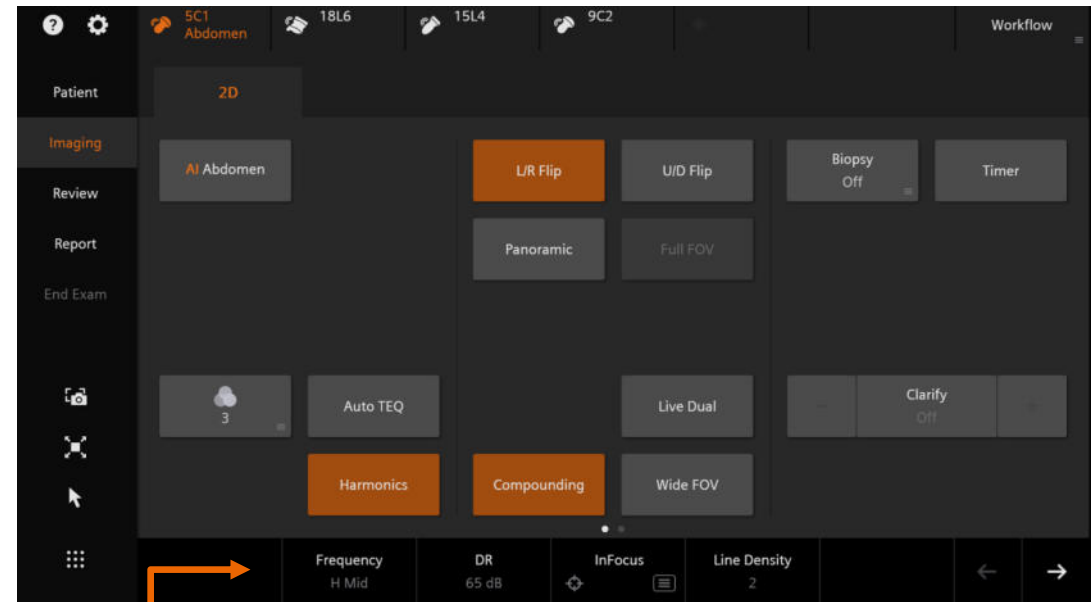


Image Screen  
Display

## Control Panel



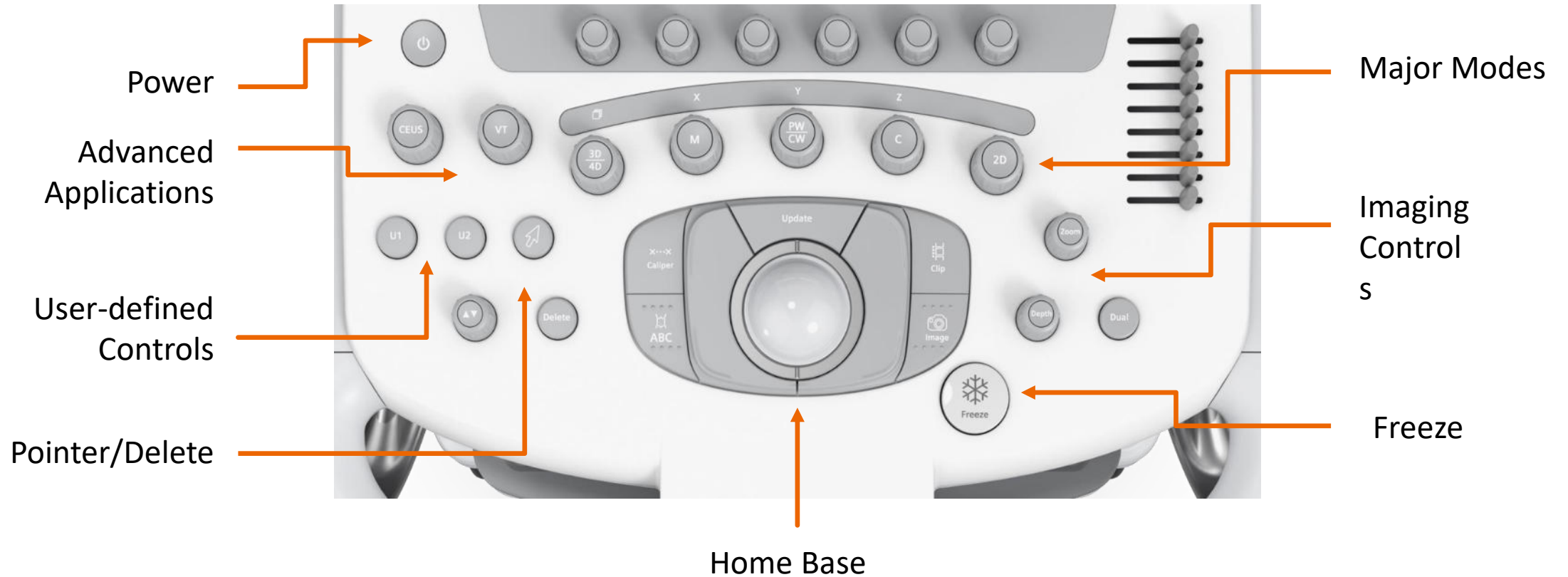
## Touch Screen



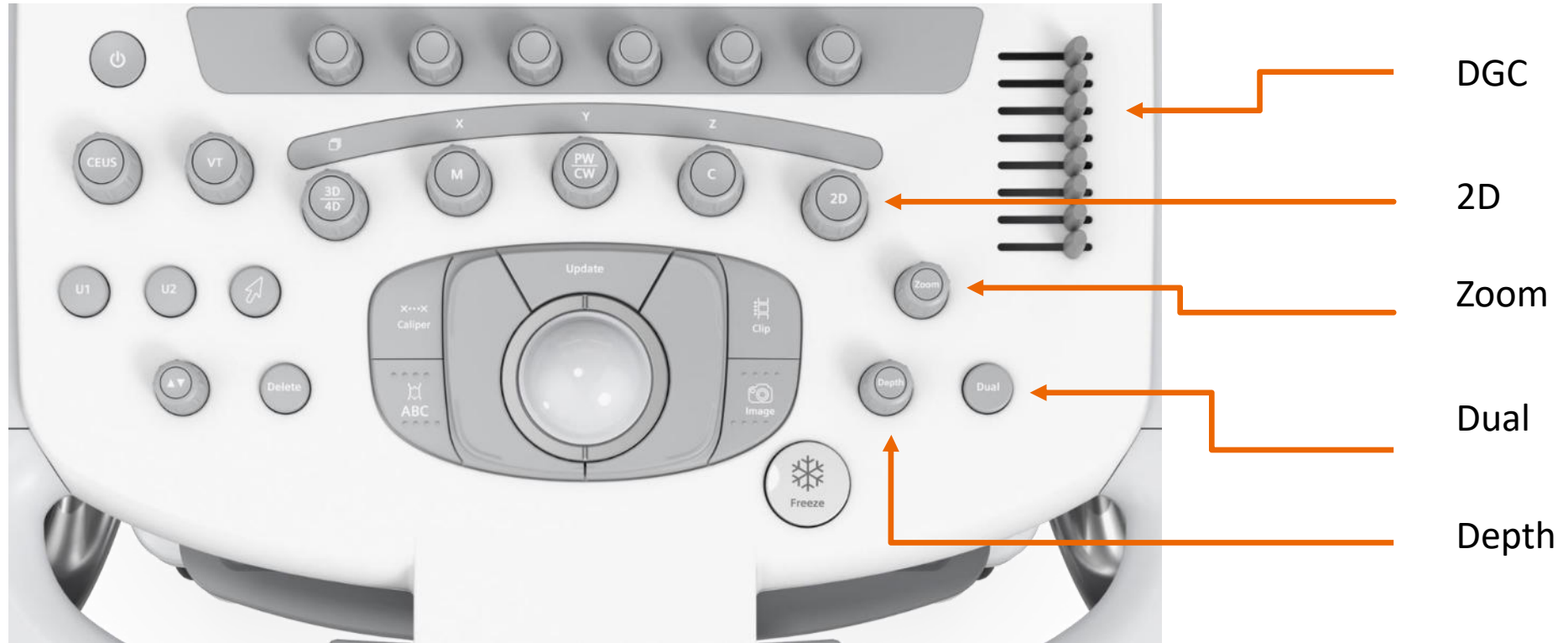
Soft Keys



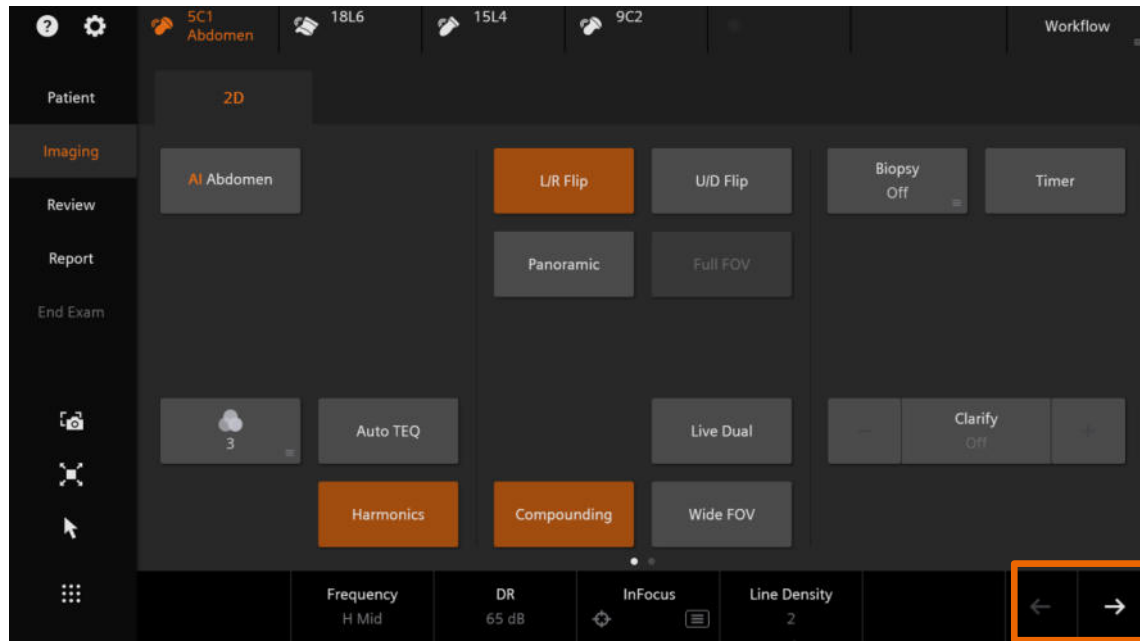
## Soft key rotary controls



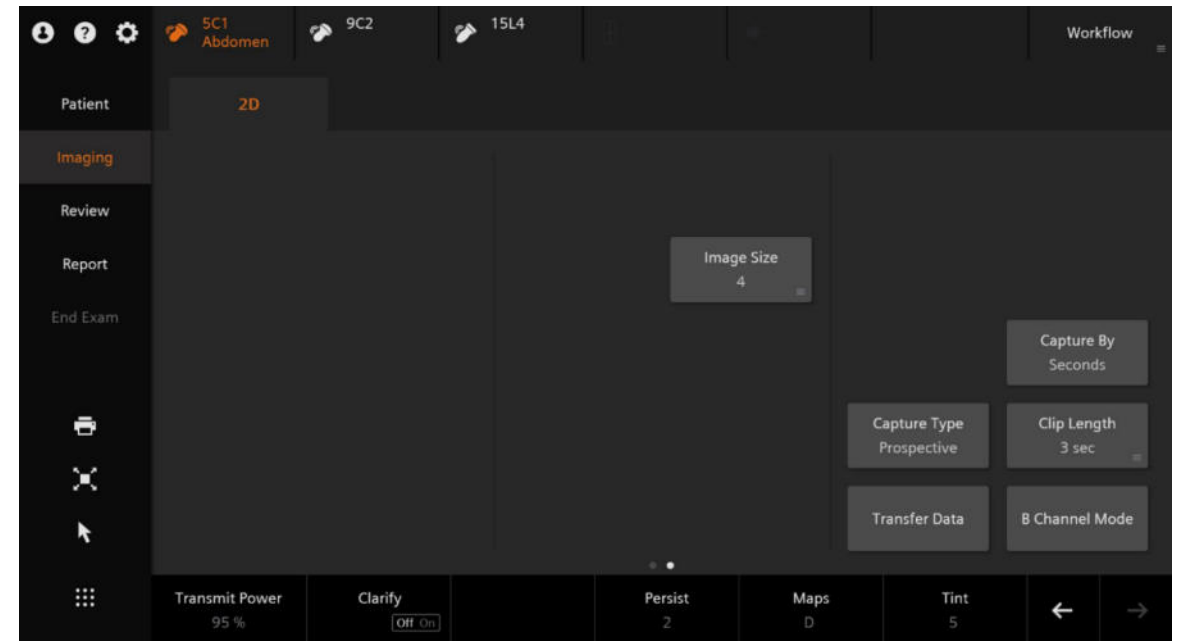
# B-mode controls on the Control Panel



# B-mode controls on the Touch Screen

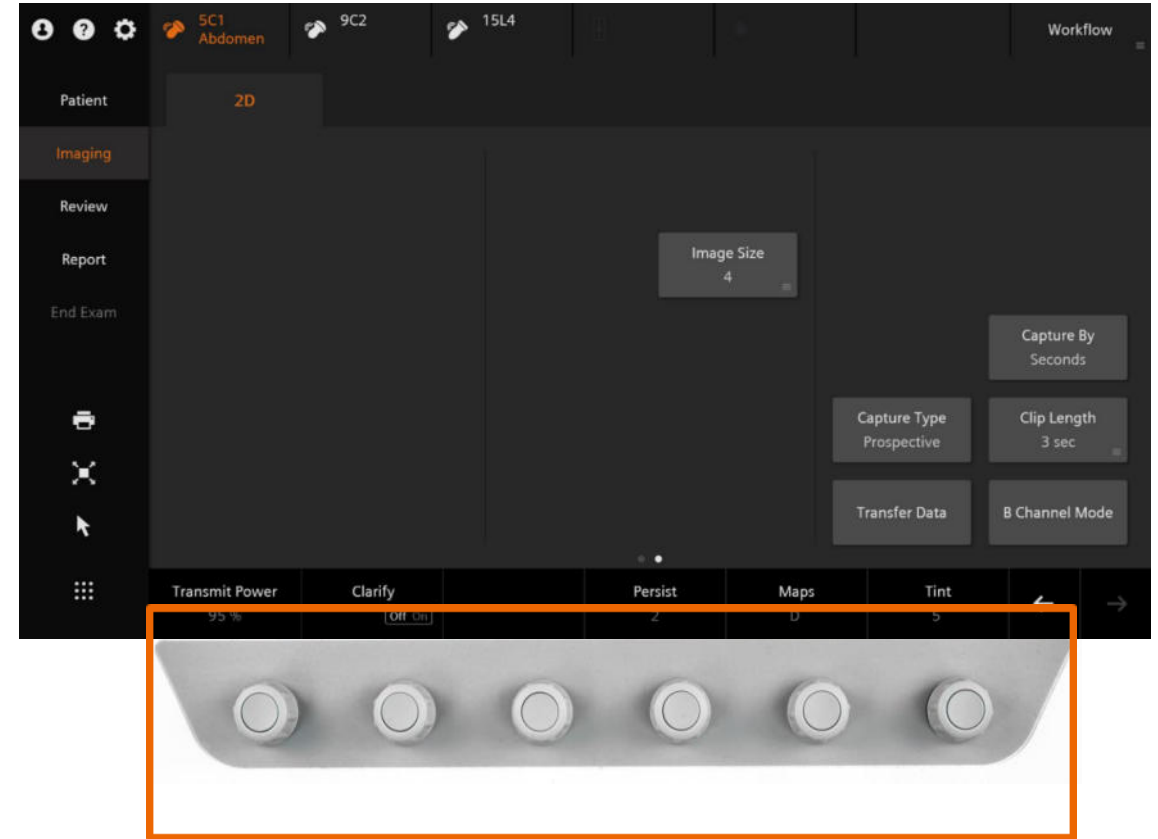
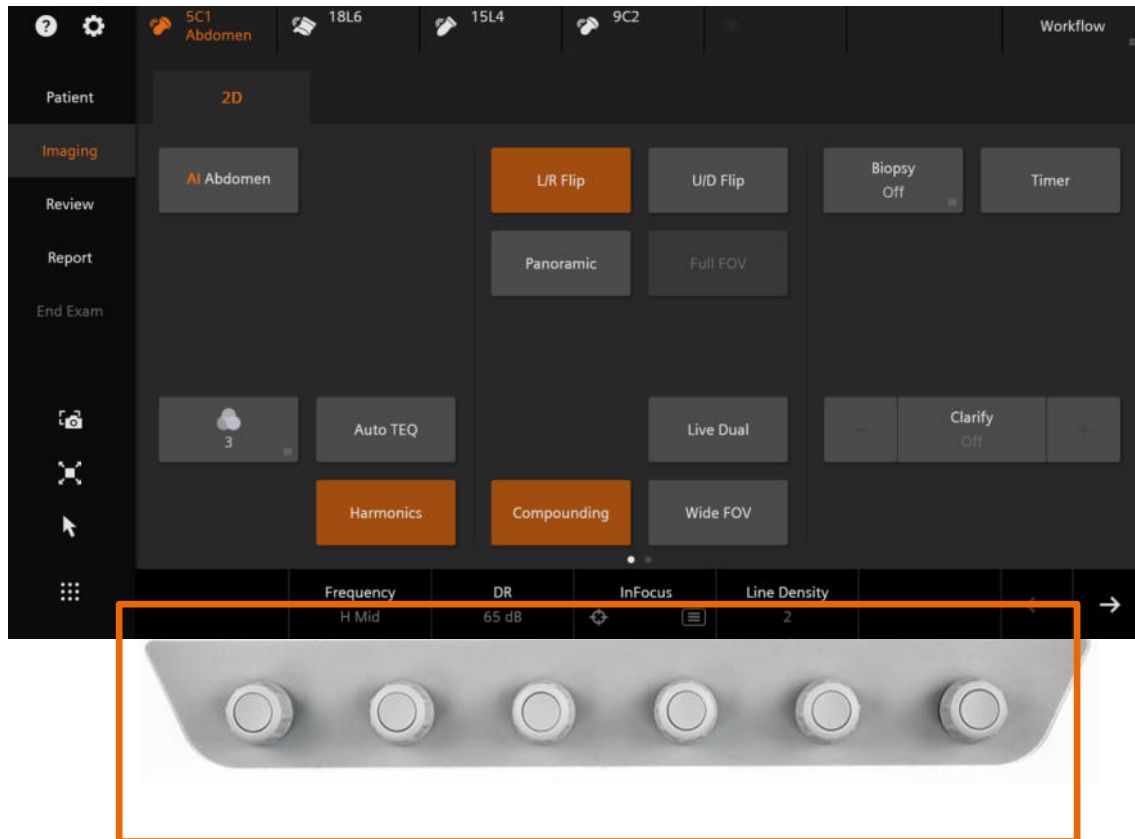


Page One

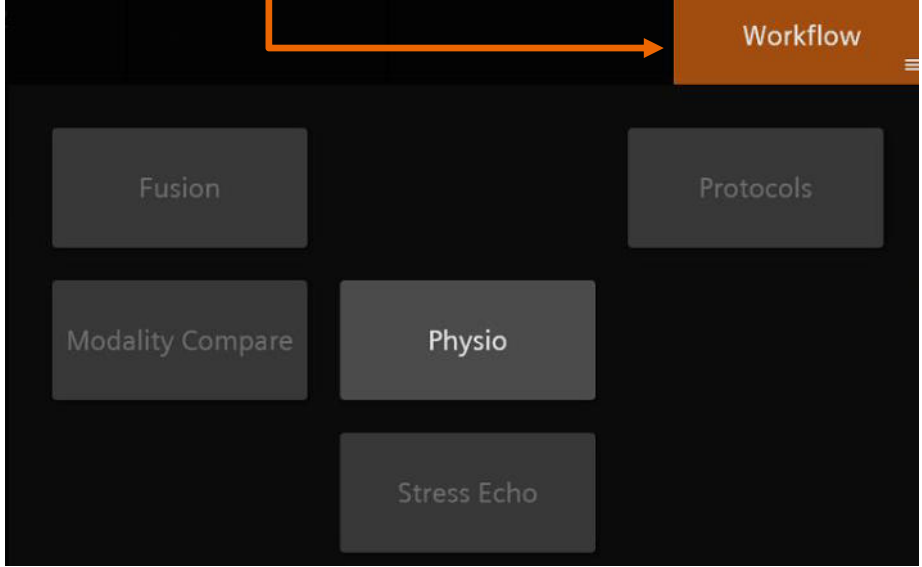
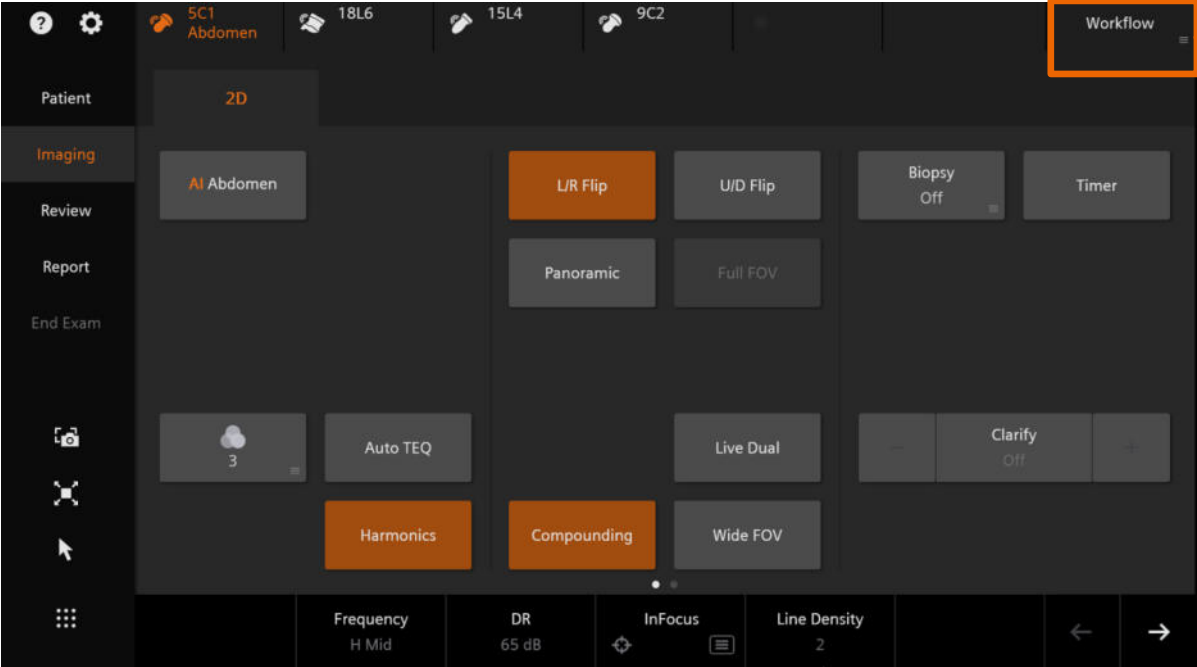


Page Two

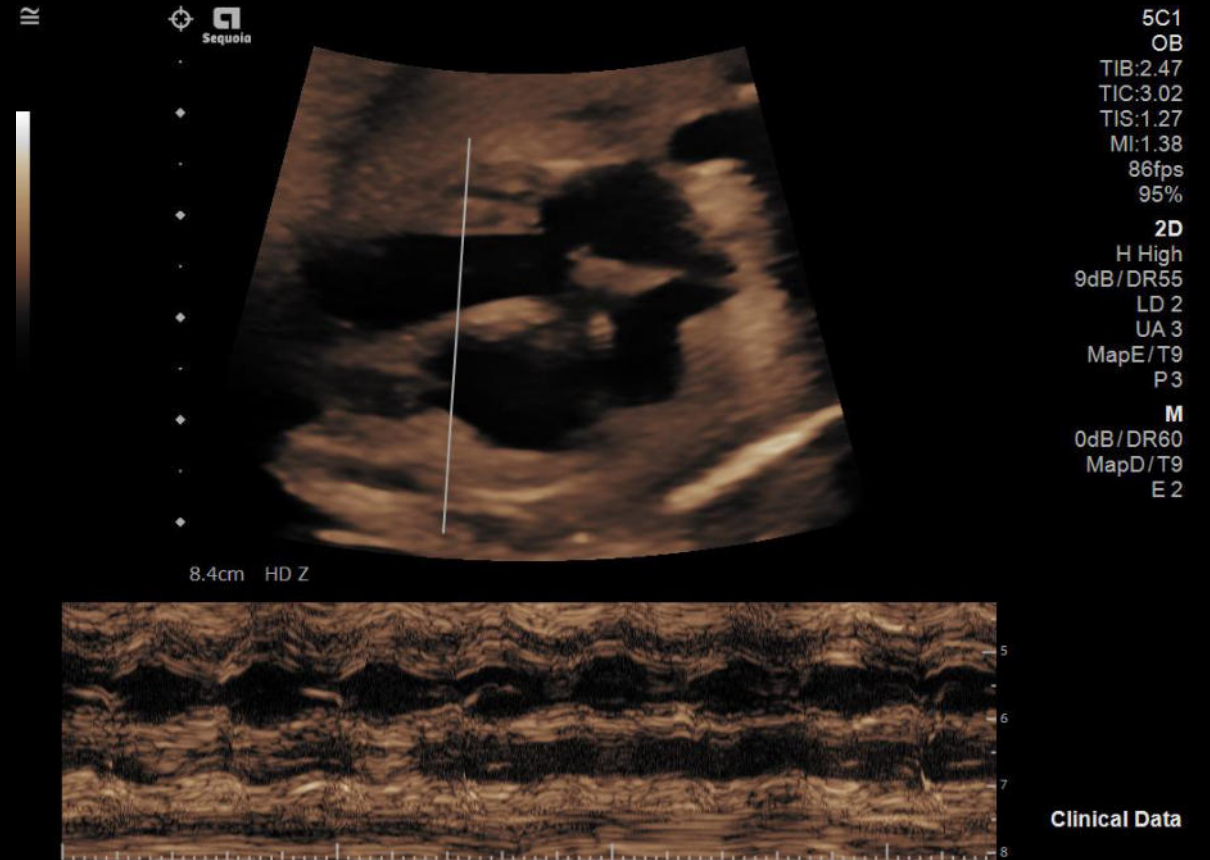
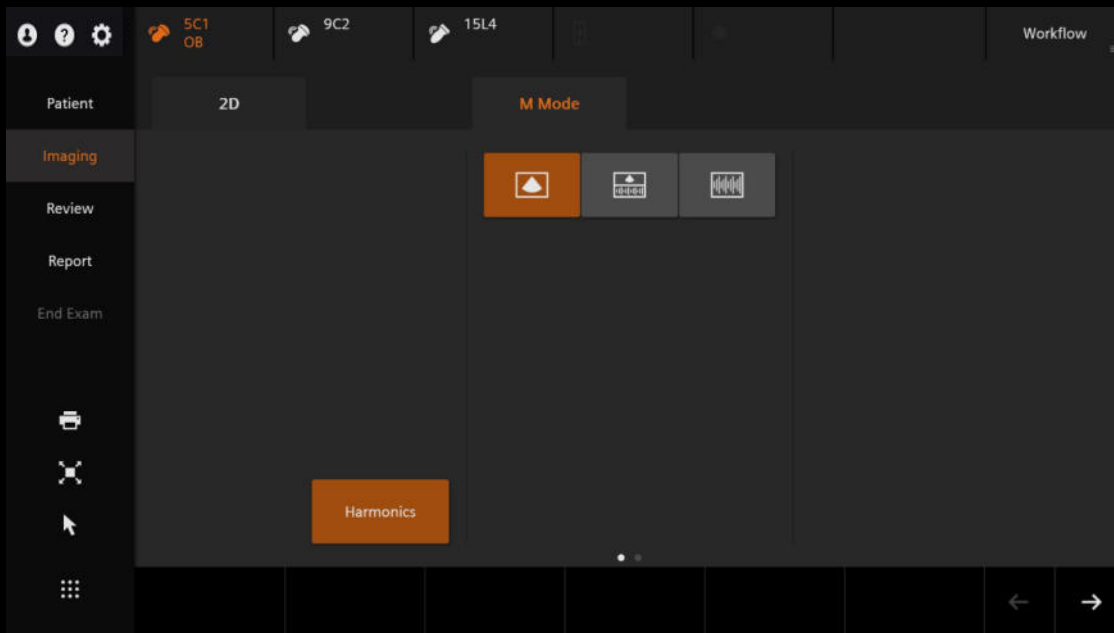
# B-mode controls on the soft keys



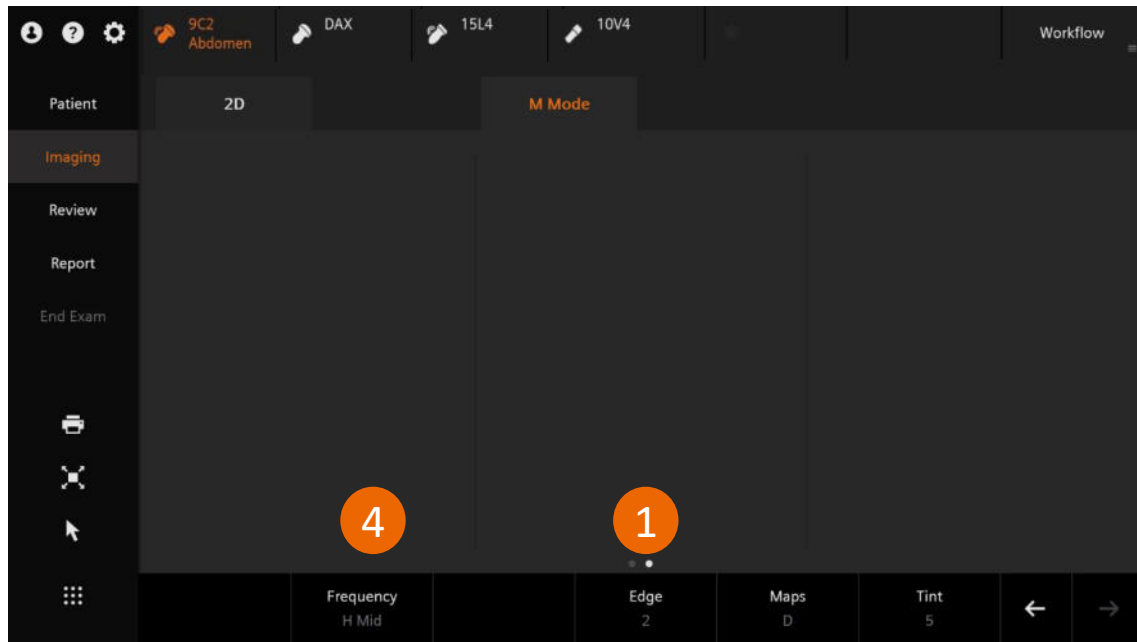
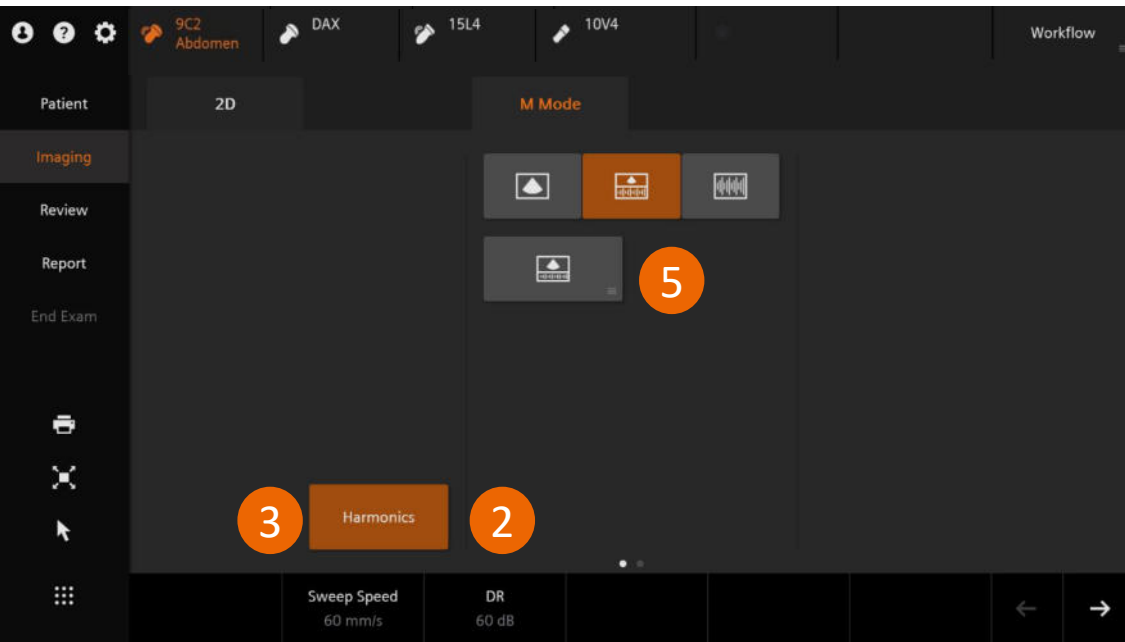
# Workflow control



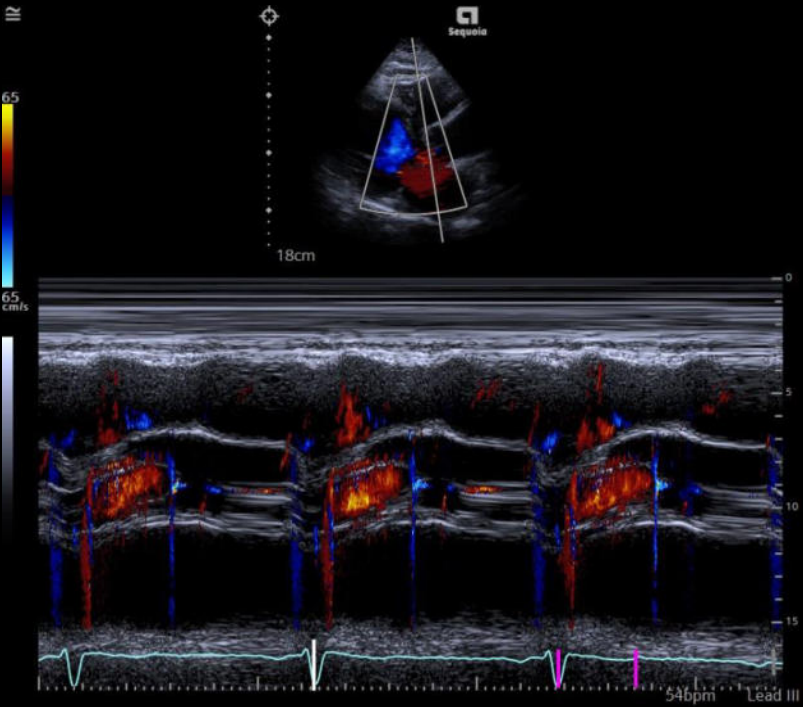
# M-mode controls



# M-mode Touch Screen controls

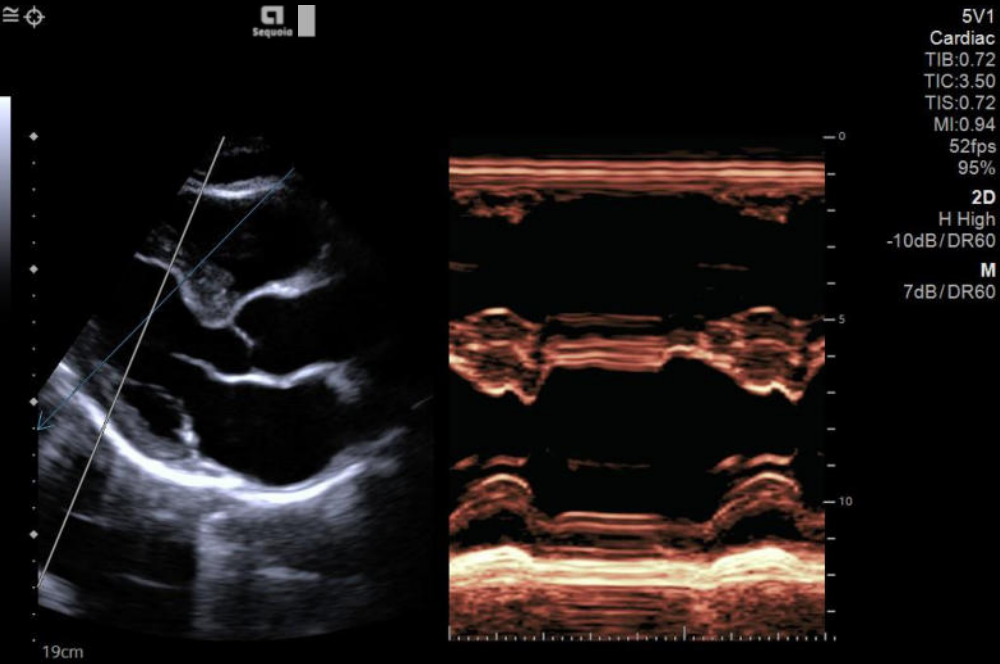


# Anatomic and color M-mode



Angle

Reset



# Objectives

- Review B-mode and M-mode controls
- **Describe B-mode and M-mode optimization features**
- Explain display modes
- Review Doppler controls
- Describe Doppler optimization features



# Auto TEQ image optimization

**Auto TEQ**

5C1 Abdomen | 18L6 | 15L4 | 9C2 | Workflow

Patient: 2D

Imaging: AI Abdomen | L/R Flip | U/D Flip | Biopsy Off | Timer

Review: Panoramic | Full FOV

Report: Auto TEQ | Live Dual | Clarify Off

End Exam: Harmonics | Compounding | Wide FOV

Frequency: H Mid | DR: 65 dB | InFocus: | Line Density: 2

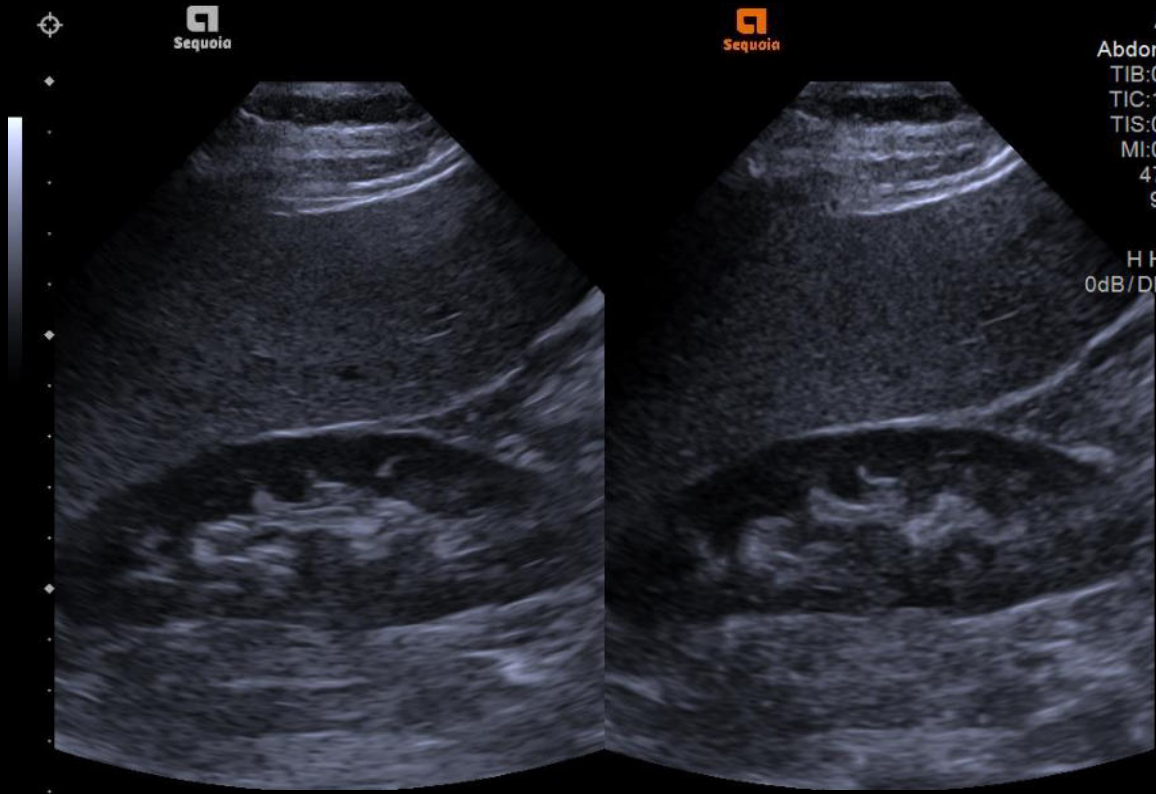
Sequoia

8cm

5C1  
Abdomen  
TIB:0.38  
TIC:1.55  
TIS:0.38  
MI:1.38  
31fps  
95%  
2D  
H High  
-1dB/DR65  
c=1540  
LD 2  
UA 3  
MapD/T5

# Harmonic imaging

Harmonics

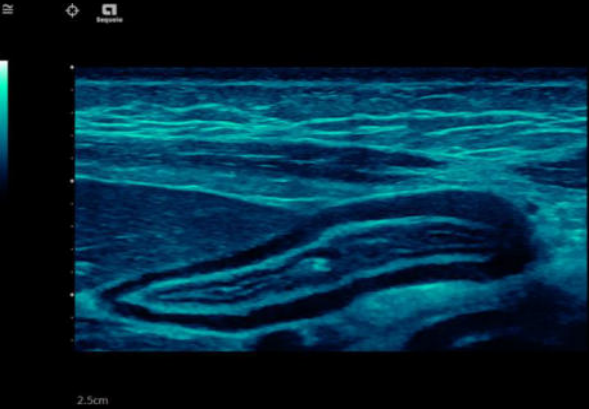
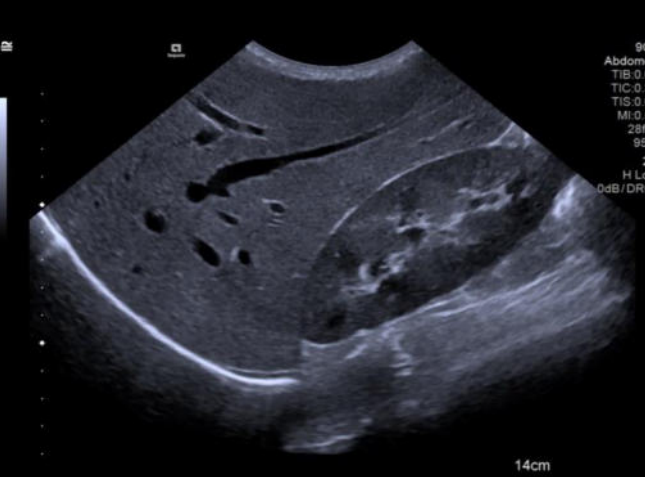


Fundamental

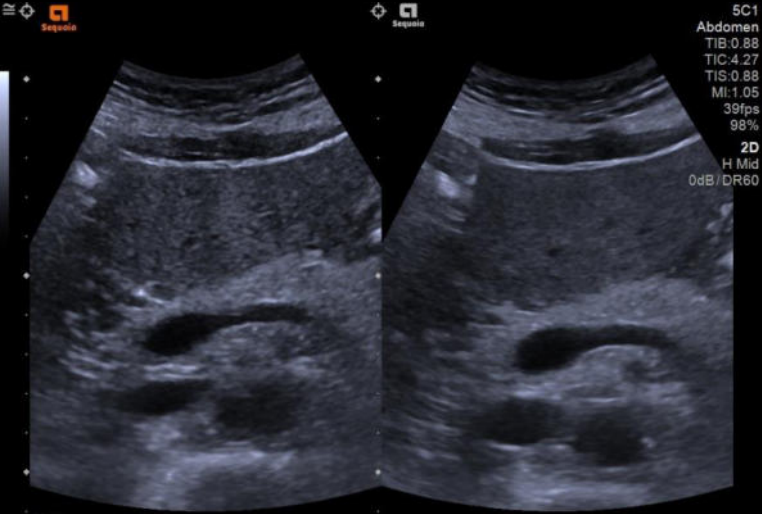
Harmonics

# Frequency imaging

Grid icon | **Frequency**  
H Mid | DR 65 dB | InFocus | Line Density 2 | ← | →



# Compounding



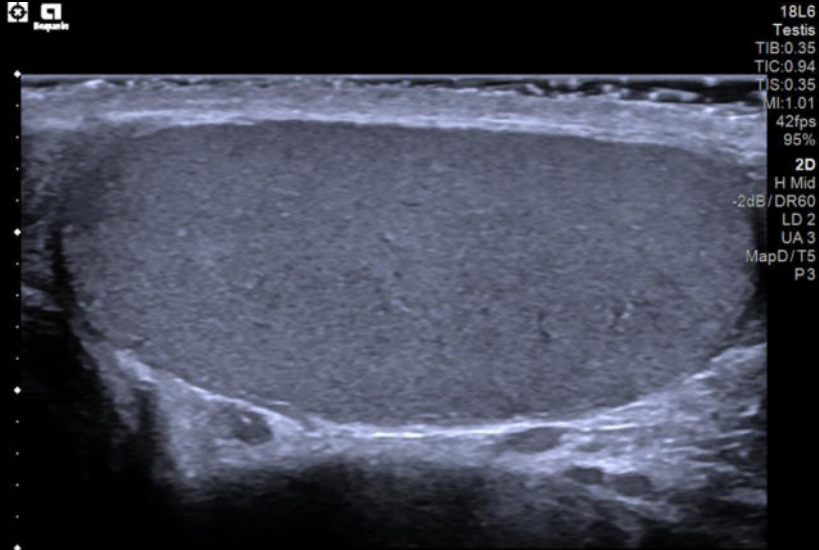
Off

On

Compounding



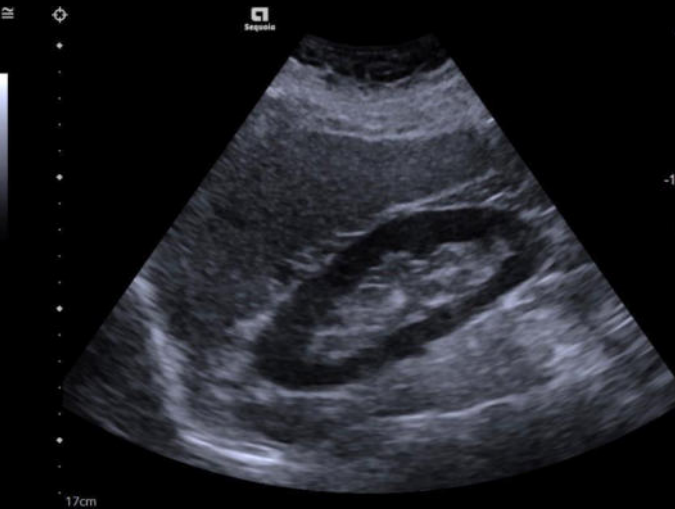
Line Density  
1



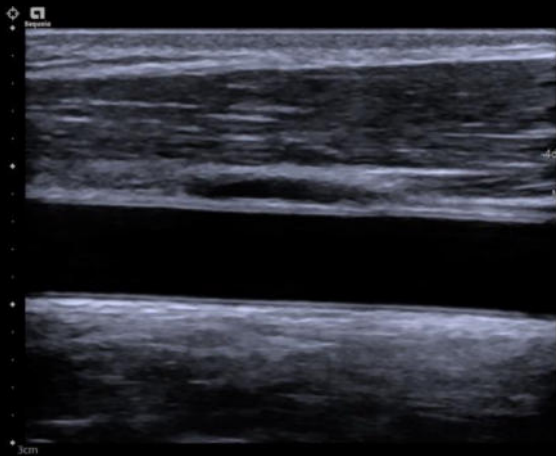
3cm

# Line Density

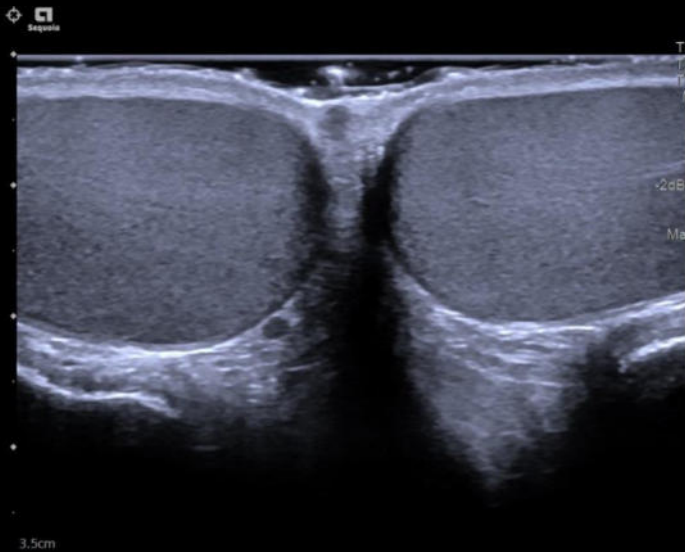
Grid icon | Frequency: H Mid | DR: 65 dB | InFocus: [Focus icon] [Menu icon] | **Line Density: 2** | Left Arrow | Right Arrow



DAX  
Abdomen  
TIB:0.37  
TIC:2.12  
TIS:0.37  
MI:1.01  
19fps  
95%  
**2D**  
H Pen  
-1dB/DR65  
LD 3  
UA 3  
MapC/T4  
P3

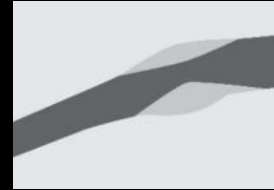
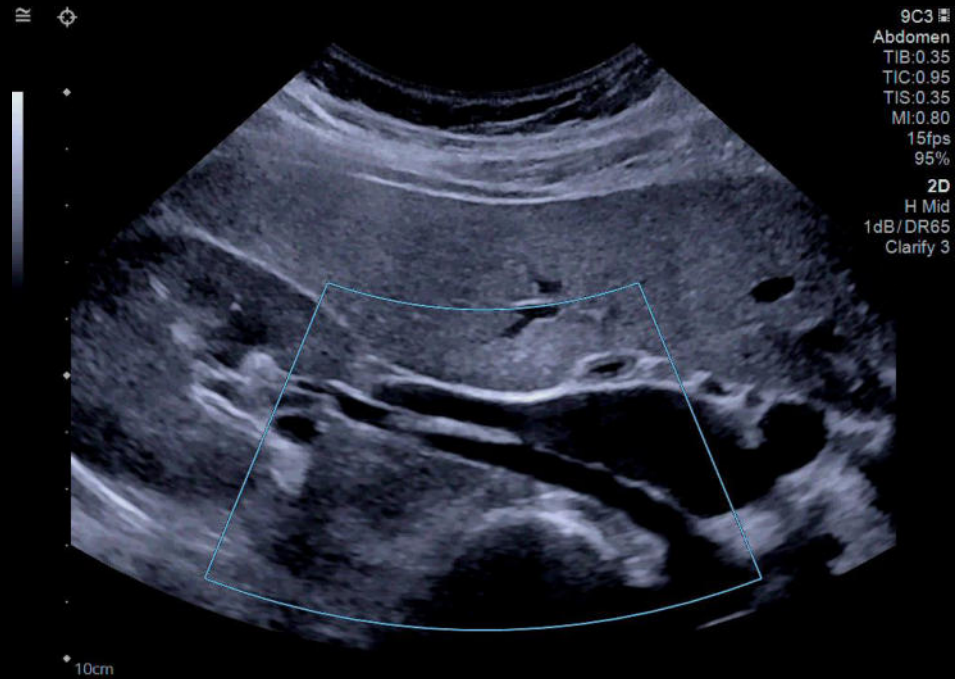


10L4  
Carotid  
TIB:0.25  
TIC:0.68  
TIS:0.25  
MI:1.15  
42fps  
95%  
**2D**  
H High  
-4dB/DR68  
LD 2  
UA 3  
MapF/T4  
P3

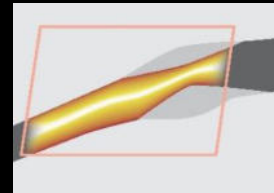


18L6  
Testis  
TIB:0.35  
TIC:0.96  
TIS:0.35  
MI:1.05  
36fps  
95%  
**2D**  
H Mid  
-2dB/DR60  
LD 2  
UA 3  
MapD/T5  
P3

# Clarify vascular enhancement (VE) technology



2D



Power



Clarify

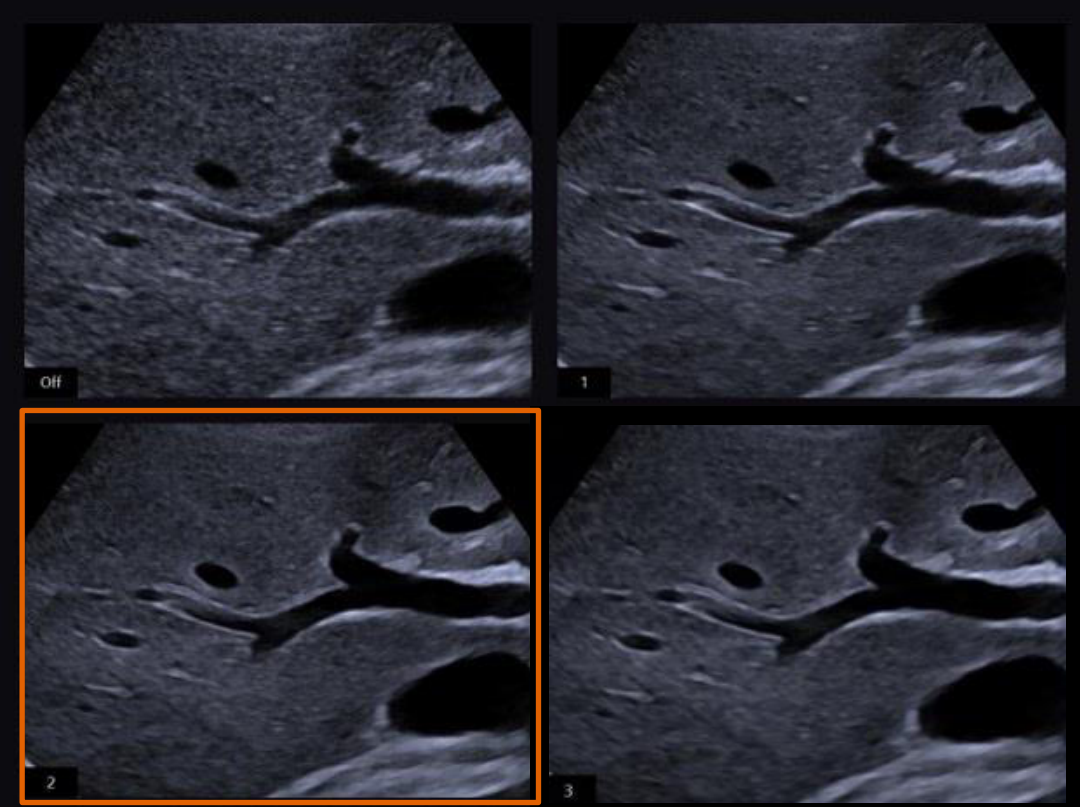
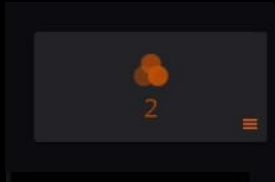
- Uses Power Doppler amplitude information to enhance B-mode imaging
- Reduces artifacts in vessels and improves vessel wall definition

# Clarify VE technology

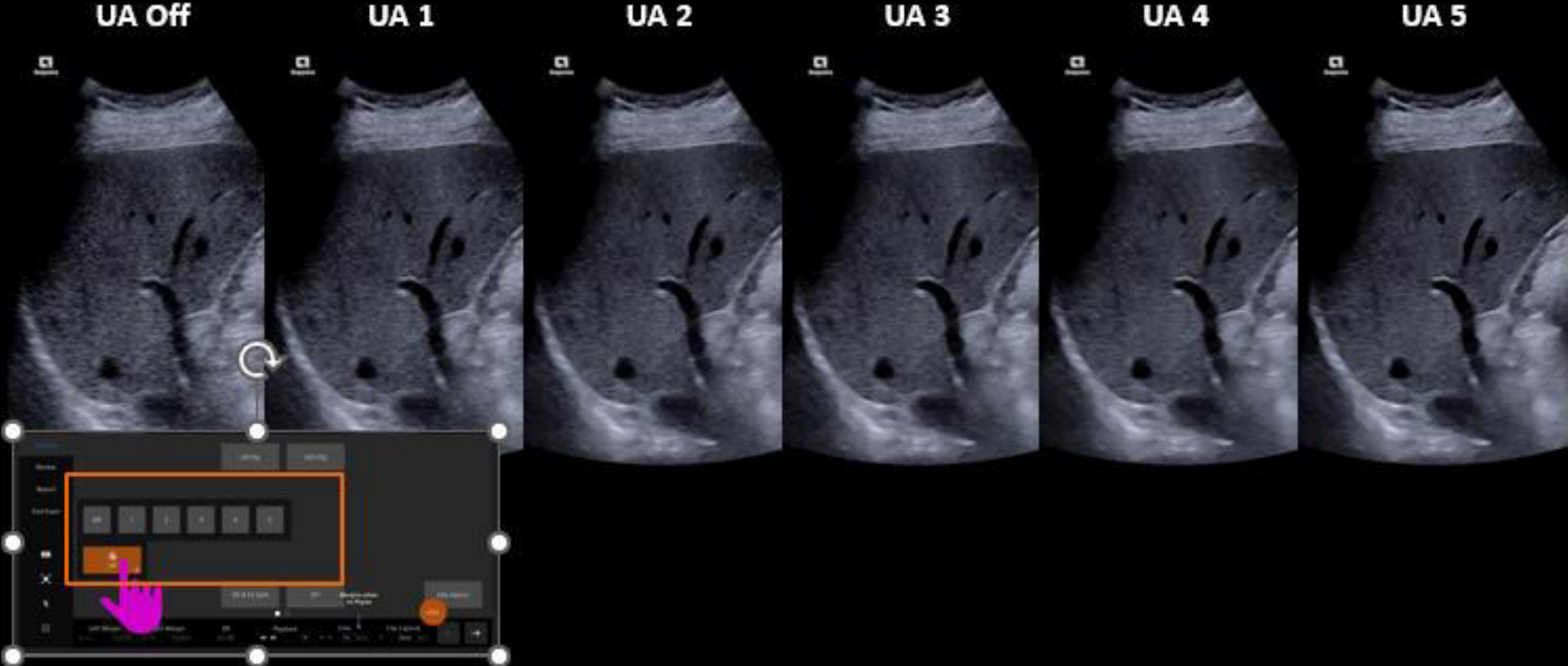


# UltraArt universal image processing

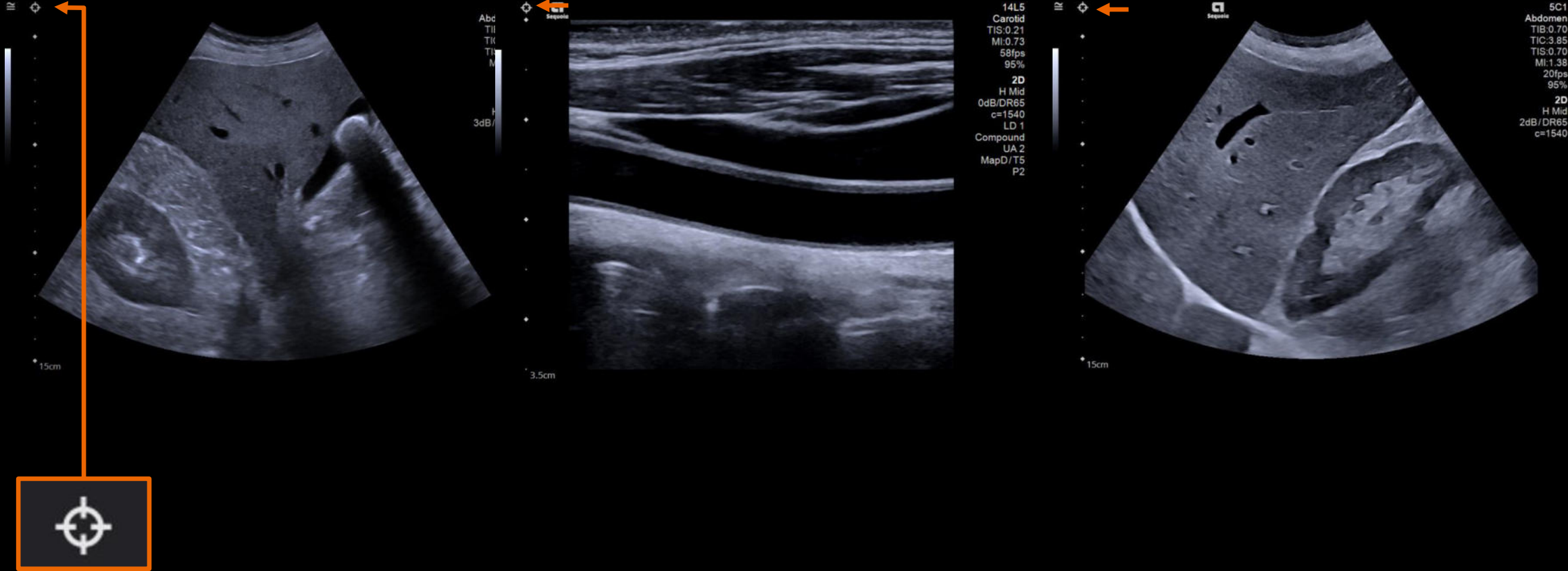
- Speckle Optimization
- Edge and Ridge Enhancement
- Contrast Enhancement
- Gain and Dynamic Range



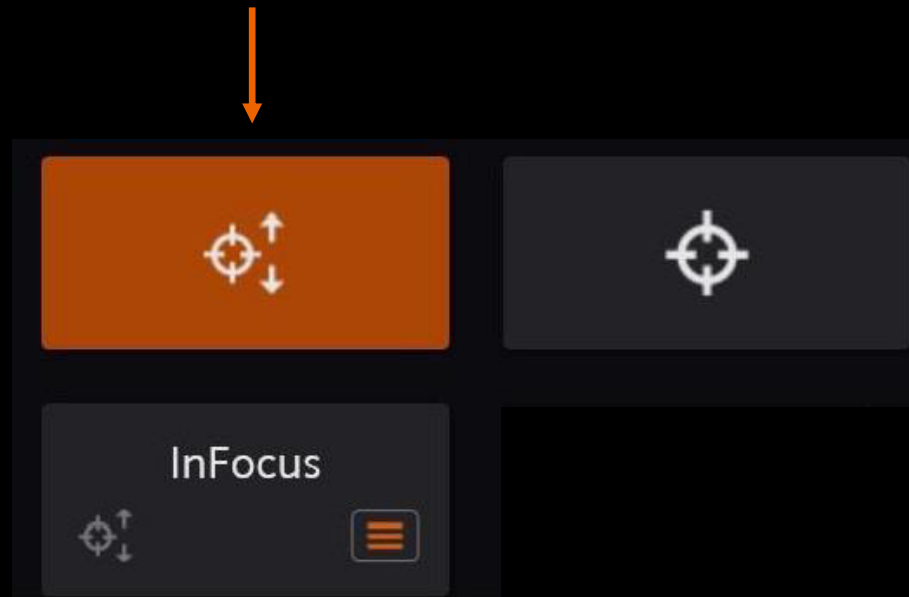
# UltraArt universal image processing



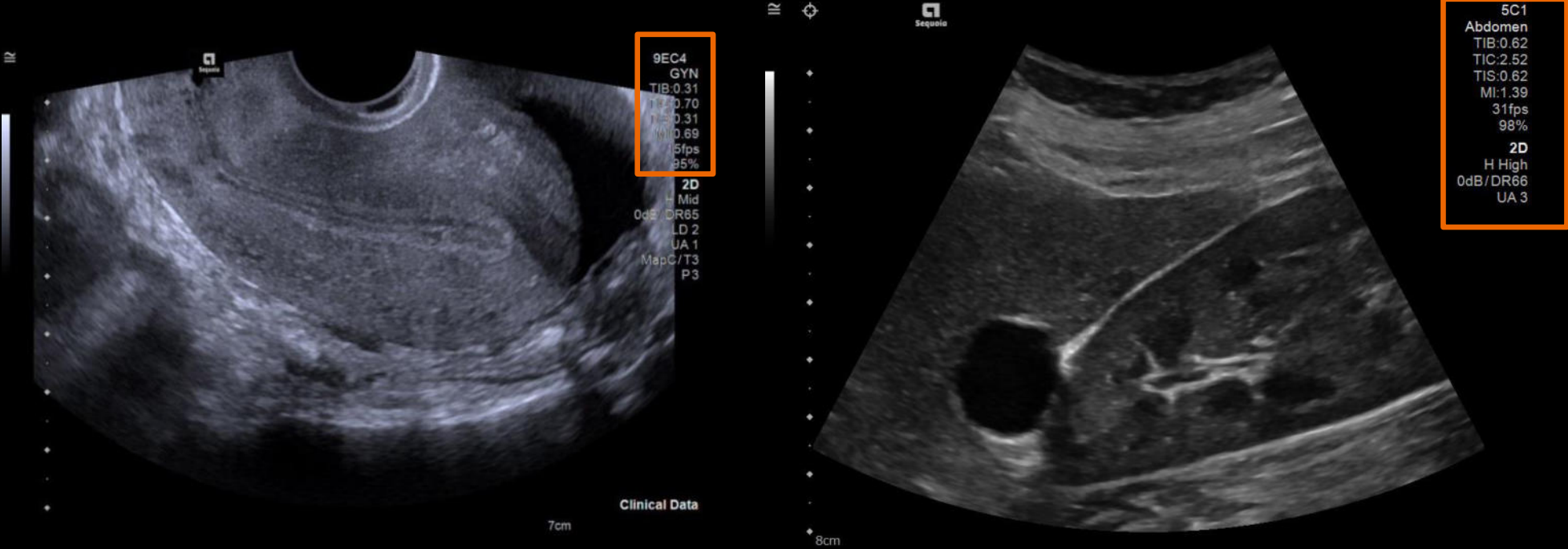
# InFocus coherent image formation



# InFocus coherent image formation – Selectable focus



# Transmit Power



Transmit Power 95 %

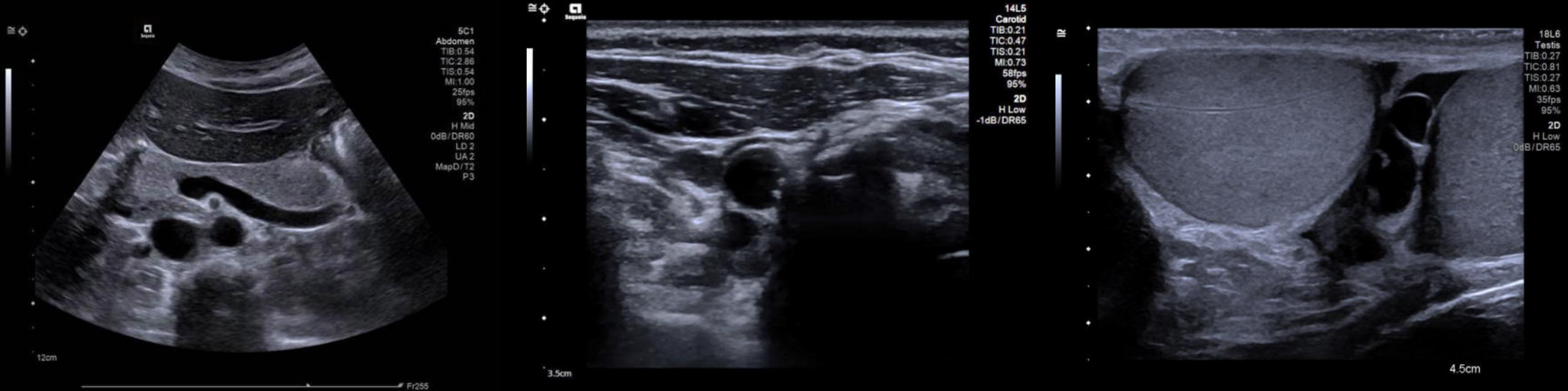
Persist 3

Maps D

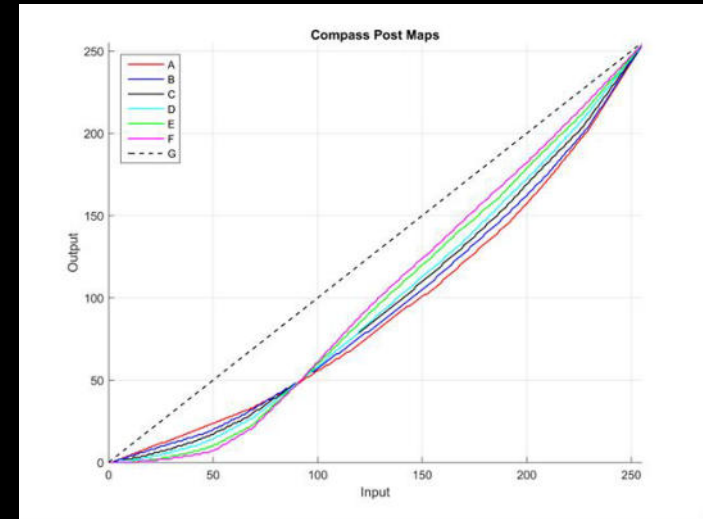
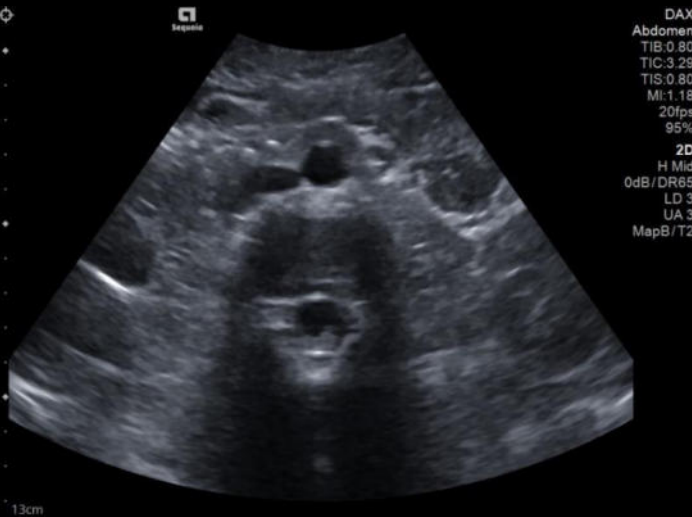
Tint 2

← →

# Dynamic Range



Grid icon | Frequency H Mid | **DR 65 dB** | InFocus | Line Density 2 | Left arrow | Right arrow



Transmit Power  
95 %

Clarify  
Off On

Persist  
2

Maps  
C

Tint  
5



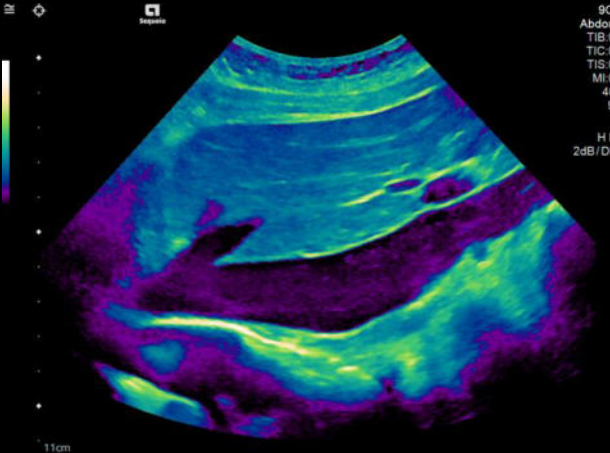
# Speed of Sound

The control panel features a row of four buttons with values 1540, 1480, 1460, and 1446. The 1446 button is highlighted in orange. Below this row, a 'Speed of Sound' menu is open, showing 'c=1446' with a hamburger menu icon. Other visible controls include 'Trapezoid', '0°', '90°', and 'Live Dual'.



18L6  
Breast  
TIB:0.13  
TIC:0.25  
TIS:0.13  
MI:0.72  
65fps  
95%  
2D  
Mid  
2dB/DR65  
→ c=1446

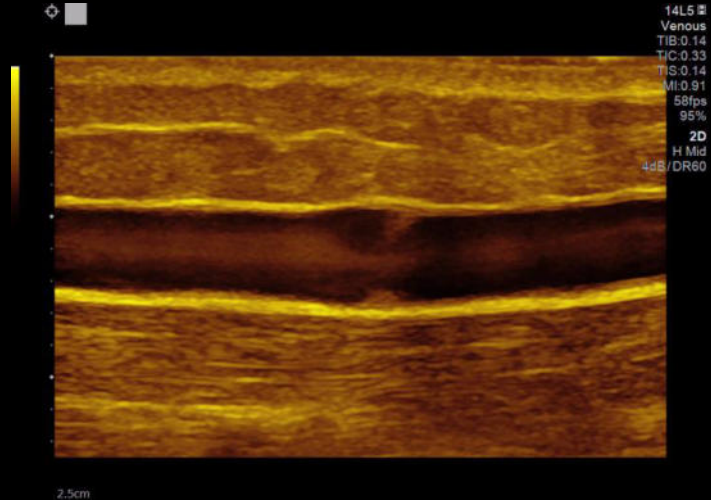
# Tints



Inverted Rainbow



Sepia



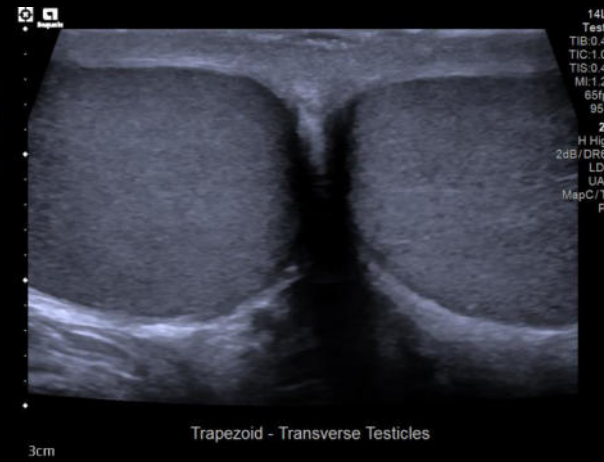
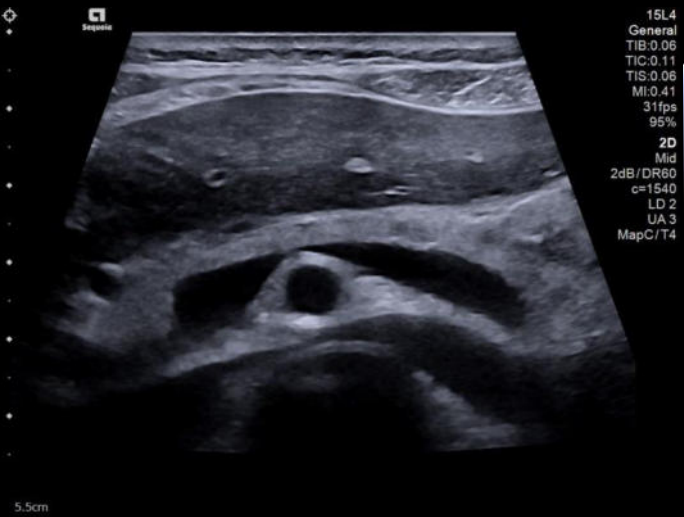
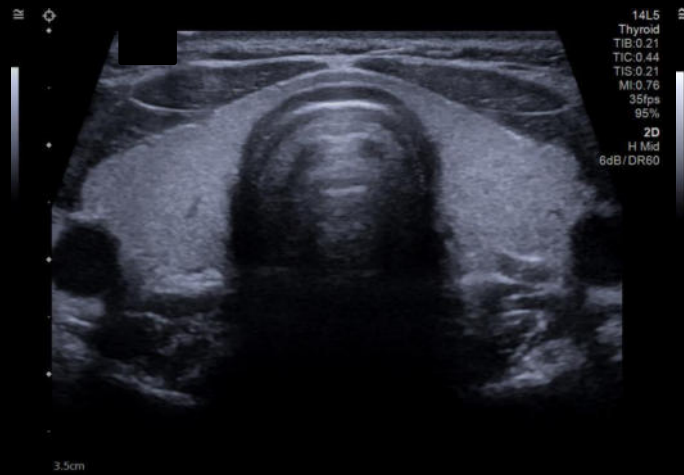
Gold

# Objectives

- Review B-mode and M-mode controls
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- **Explain display modes**
- Review Doppler controls
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# Trapezoid

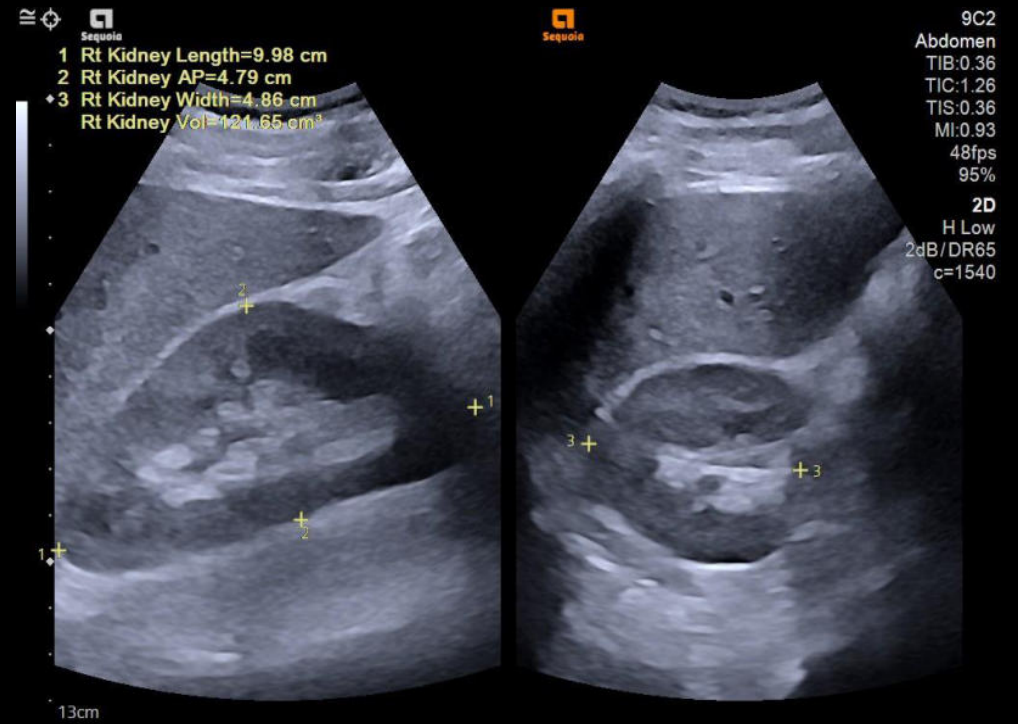
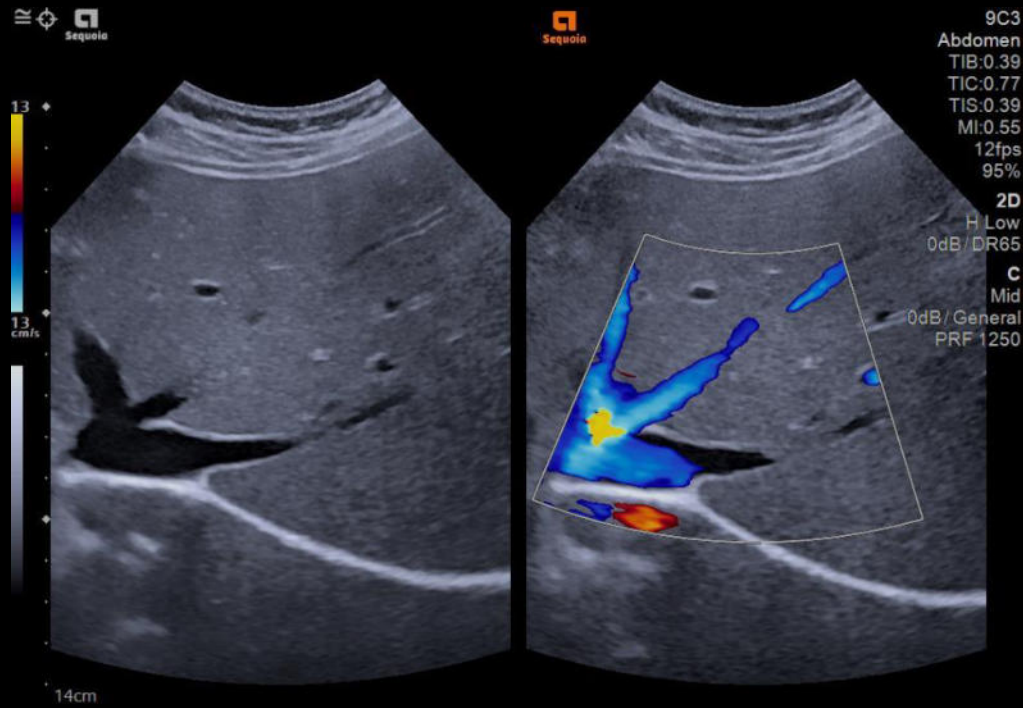


Trapezoid

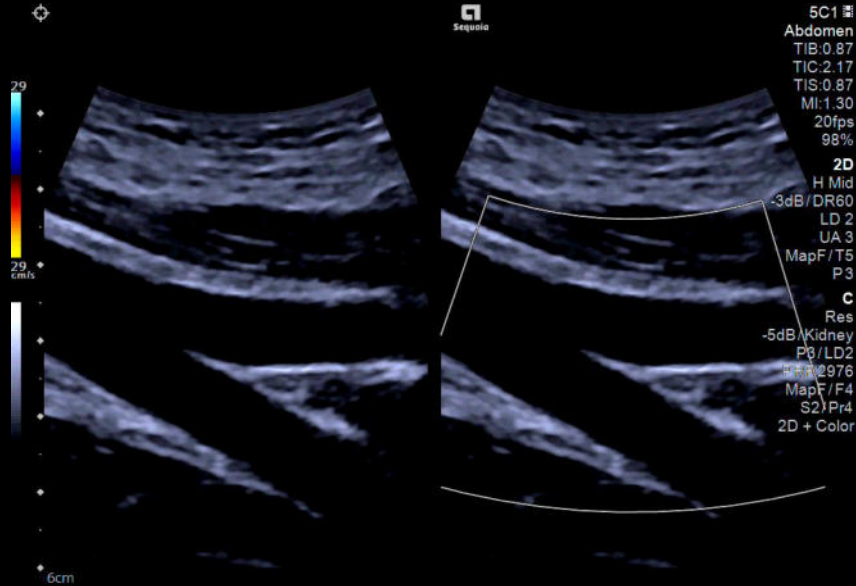
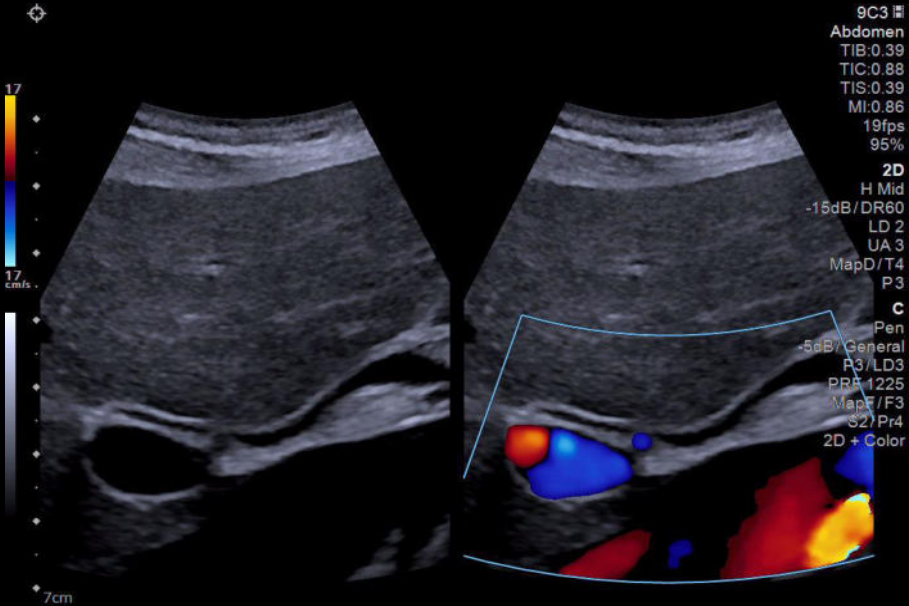
# Wide Field of View

The control panel features a top bar with icons for 5C1 Abdomen, 18L6, 15L4, 9C2, and Workflow. A left sidebar contains icons for Patient, Imaging, Review, Report, and End Exam. The main area includes buttons for AI Abdomen, L/R Flip, UID Flip, Biopsy Off, Timer, Panoramic, Full FOV, Auto TEQ, Live Dual, Clarify Off, Harmonics, Compounding, and Wide FOV (highlighted with an orange border). The bottom status bar shows Frequency H Mid, DR 65 dB, InFocus, and Line Density 2.





# Live Dual

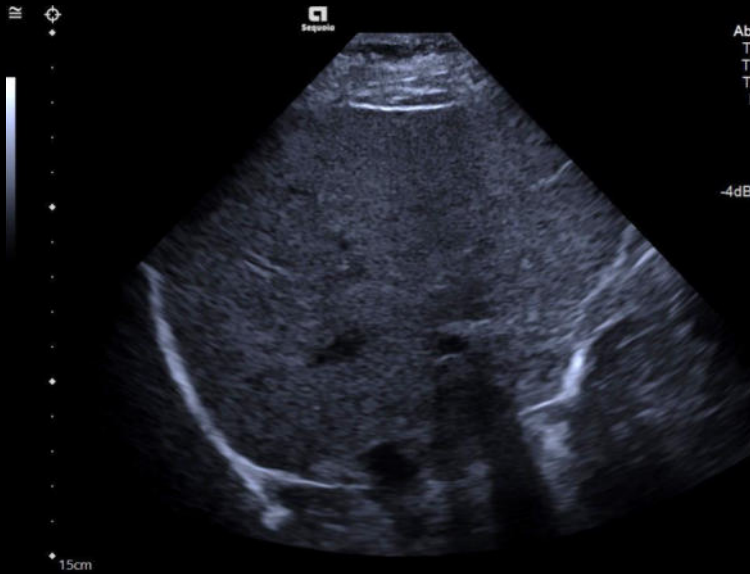


Live Dual

# Left/Right and Up/Down Flip

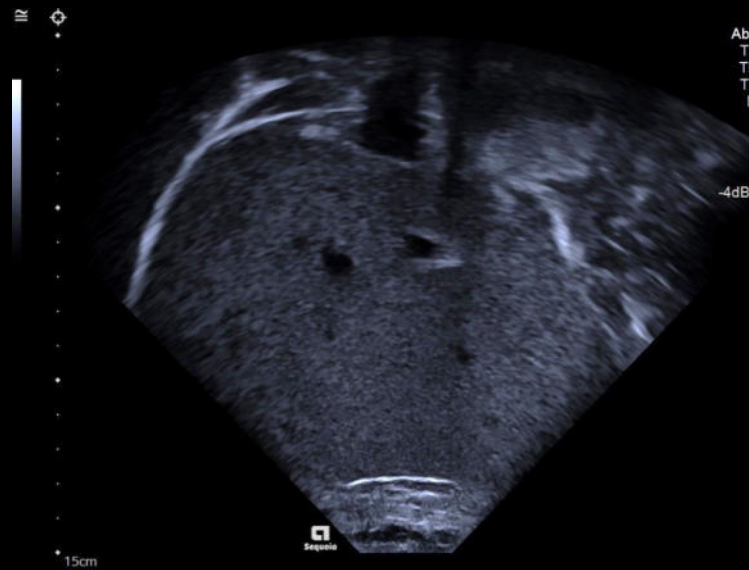
L/R Flip

U/D Flip



4V1  
Abdomen  
TIB:0.30  
TIC:1.18  
TIS:0.30  
MI:0.76  
43fps  
95%

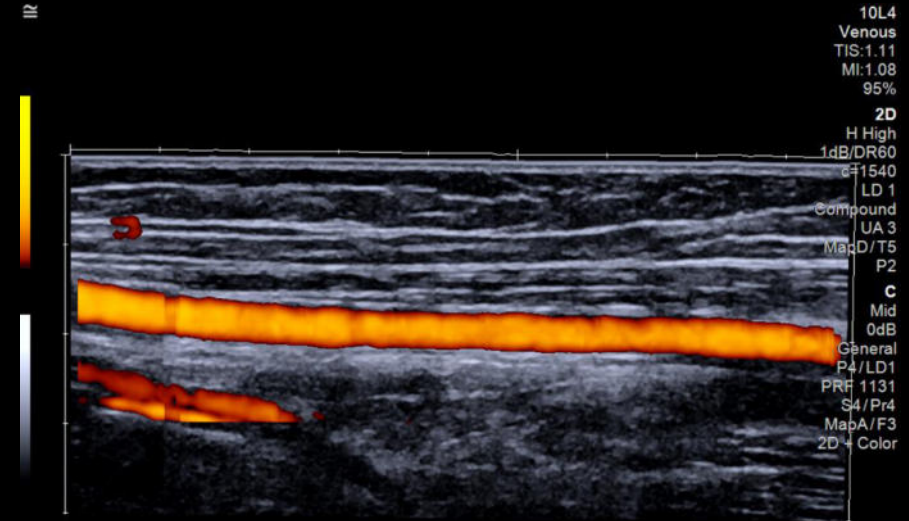
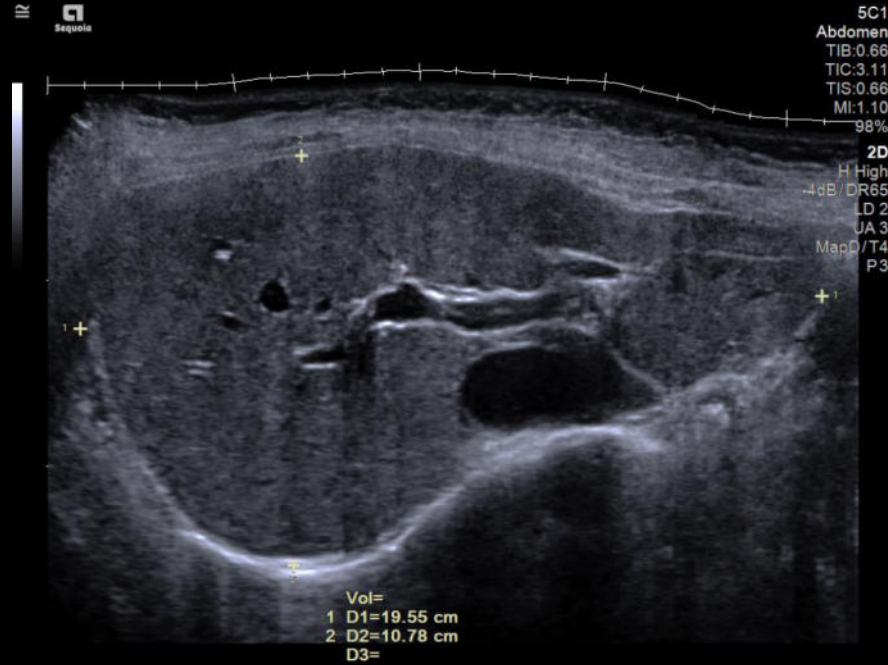
2D  
H Mid  
-4dB/DR66



4V1  
Abdomen  
TIB:0.30  
TIC:1.18  
TIS:0.30  
MI:0.76  
43fps  
95%

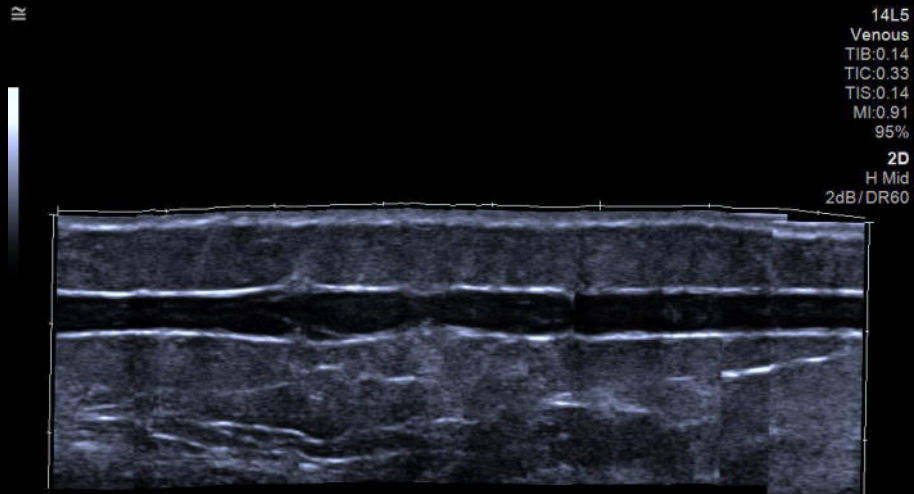
2D  
H Mid  
-4dB/DR66

# Panoramic imaging



Power Doppler - Panoramic Mode

# Panoramic imaging – B-mode



5C1 10L4 18L6 Breast 10V4

Patient 2D Panoramic

Imaging Flex Ruler Restore Redisplay Exit

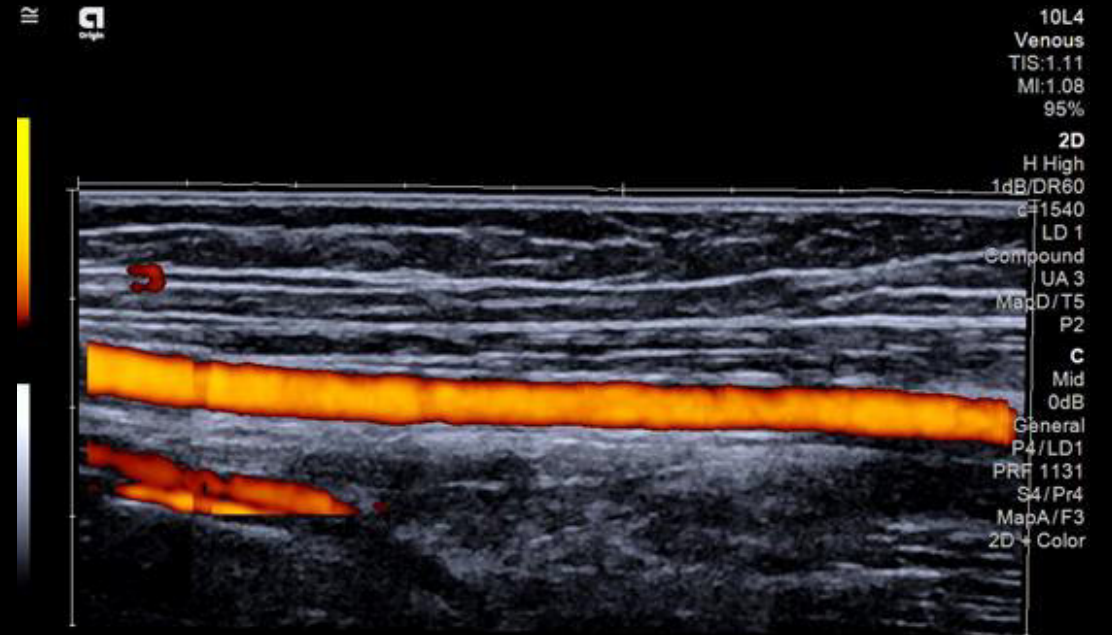
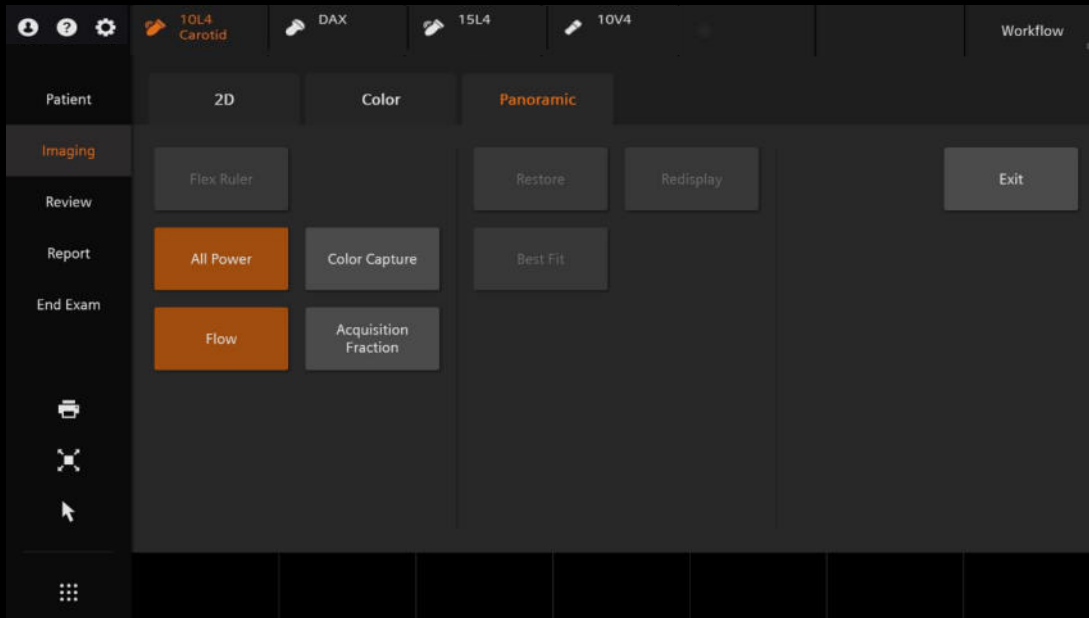
Review

Report Best Fit

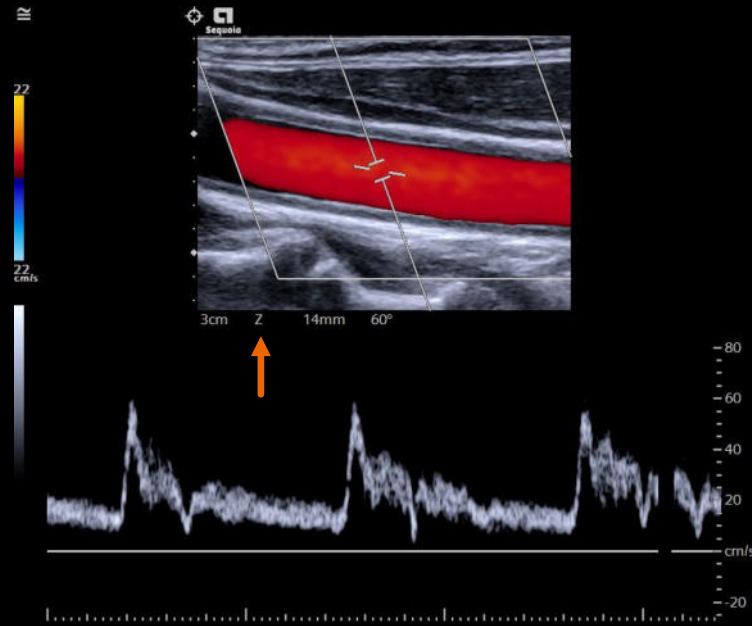
End Exam

Workflow

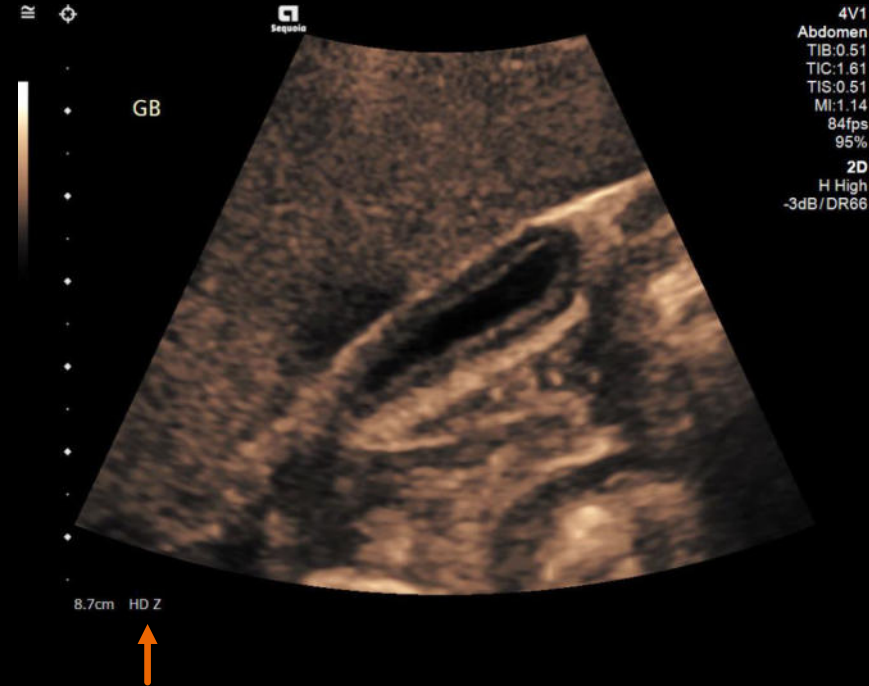
# Panoramic imaging – Power Doppler



# Zoom and HD Z



Zoom



HD Z

# Image Size

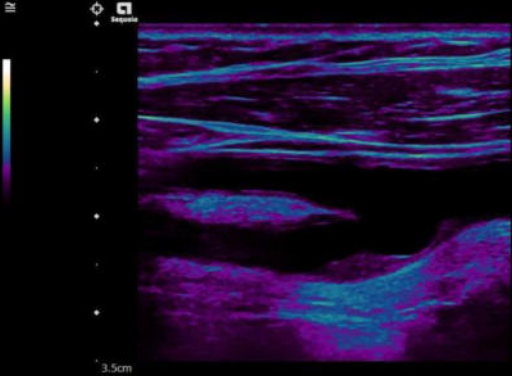


Image Size  
1

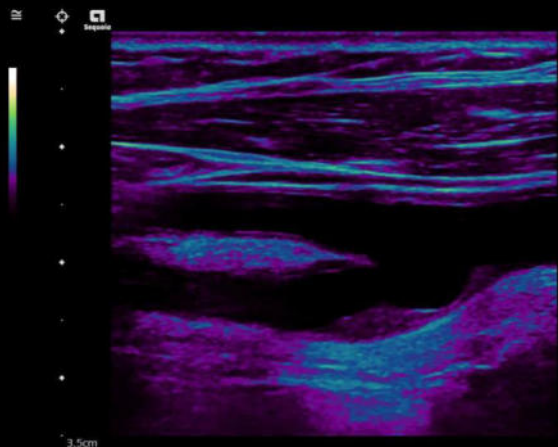


Image Size  
3

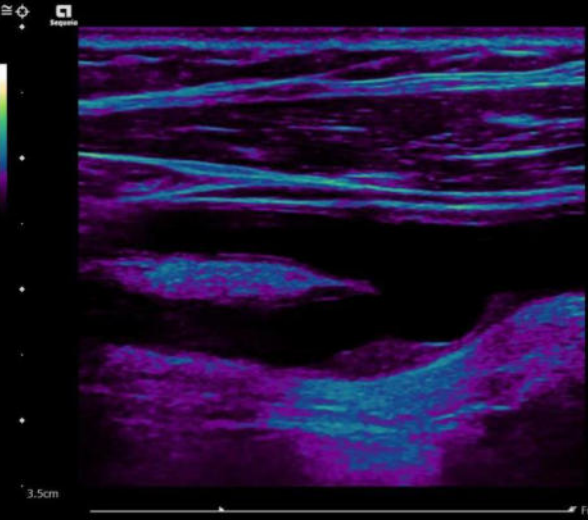
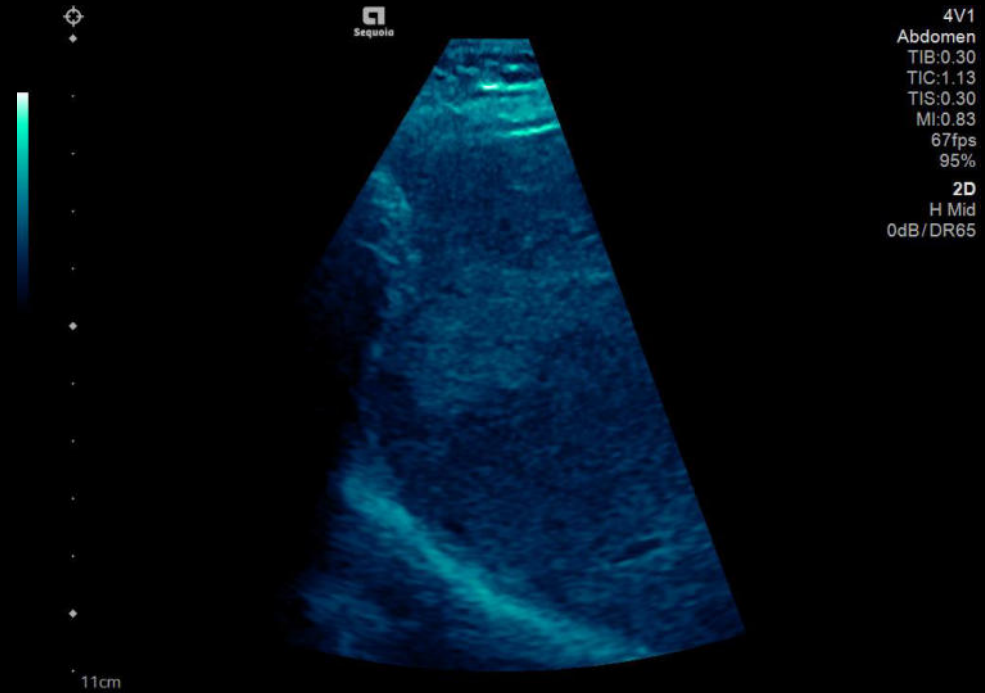
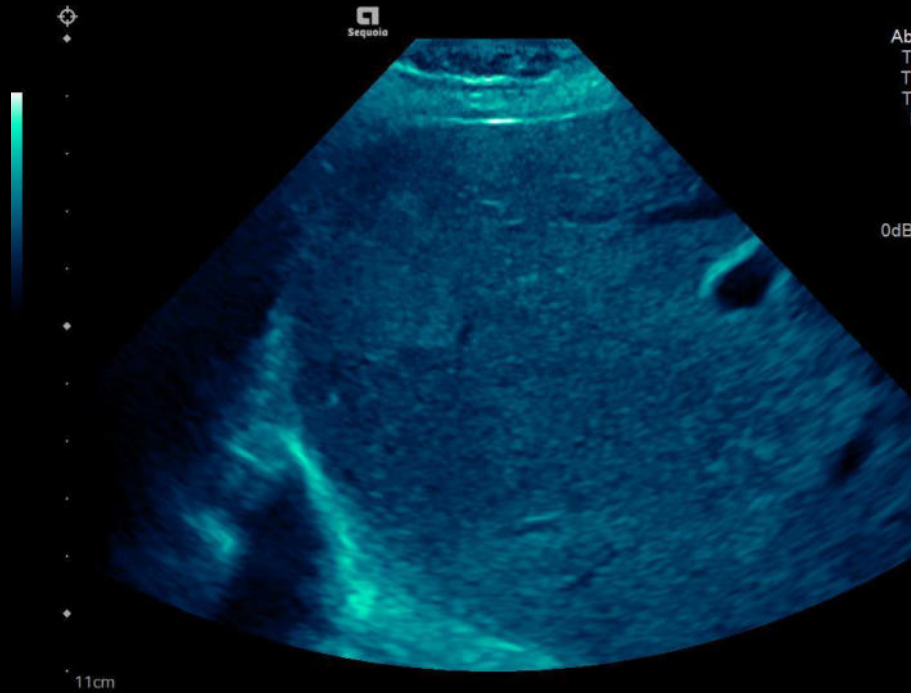


Image Size  
5

# Sector Size



# B-mode post-processing features



- DR
- Map
- Tint
- Image Size
- DGC
- Gain
- M-mode Gain
- UltraArt
- L/R Flip
- U/D Flip

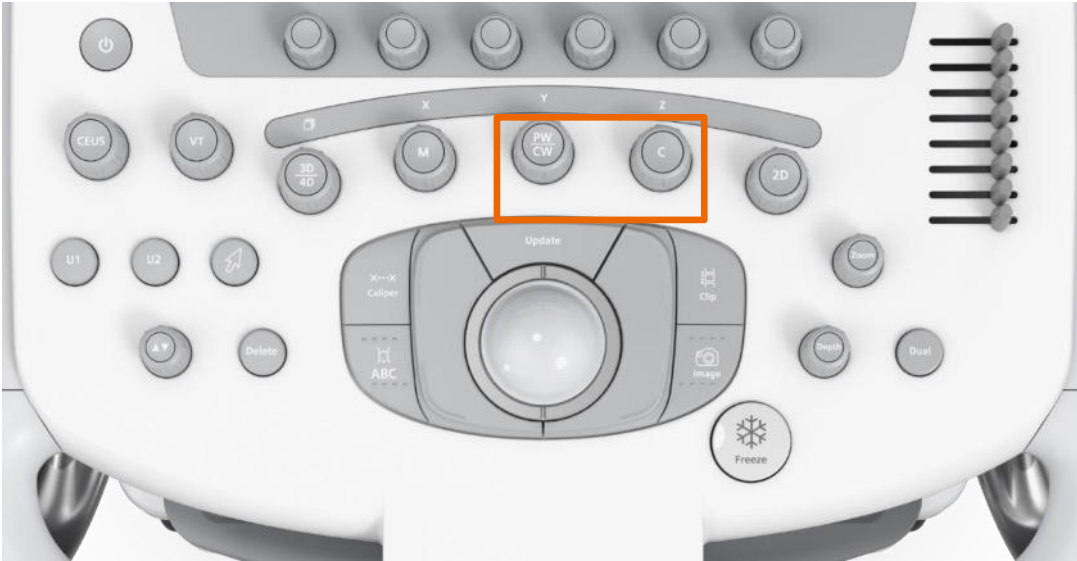
# Objectives

- Review B-mode and M-mode controls
- Describe B-mode and M-mode optimization features
- Explain display modes
- **Review Doppler controls**
- Describe Doppler optimization features

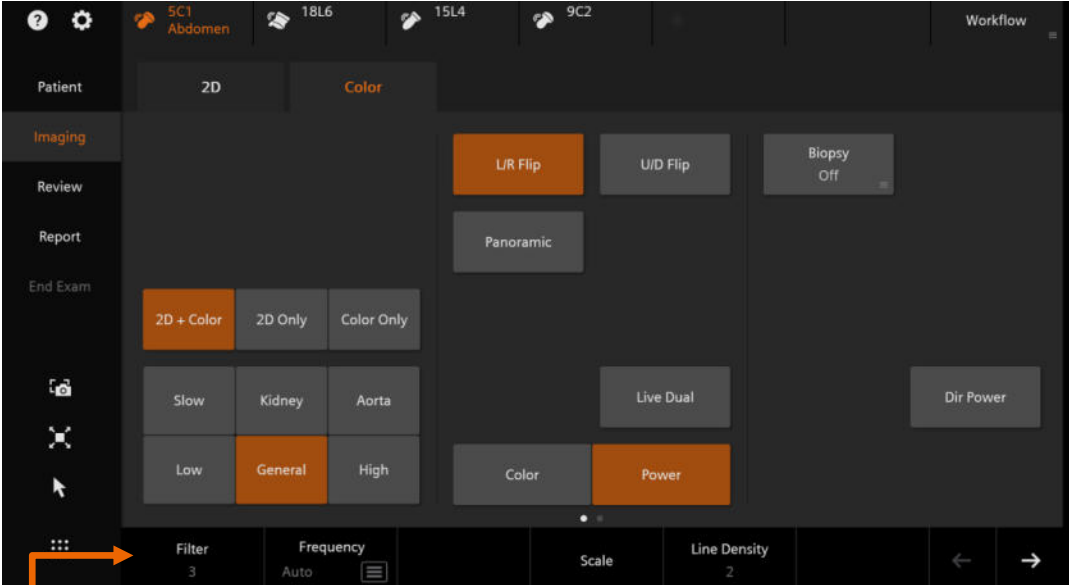


# Doppler controls

Control Panel



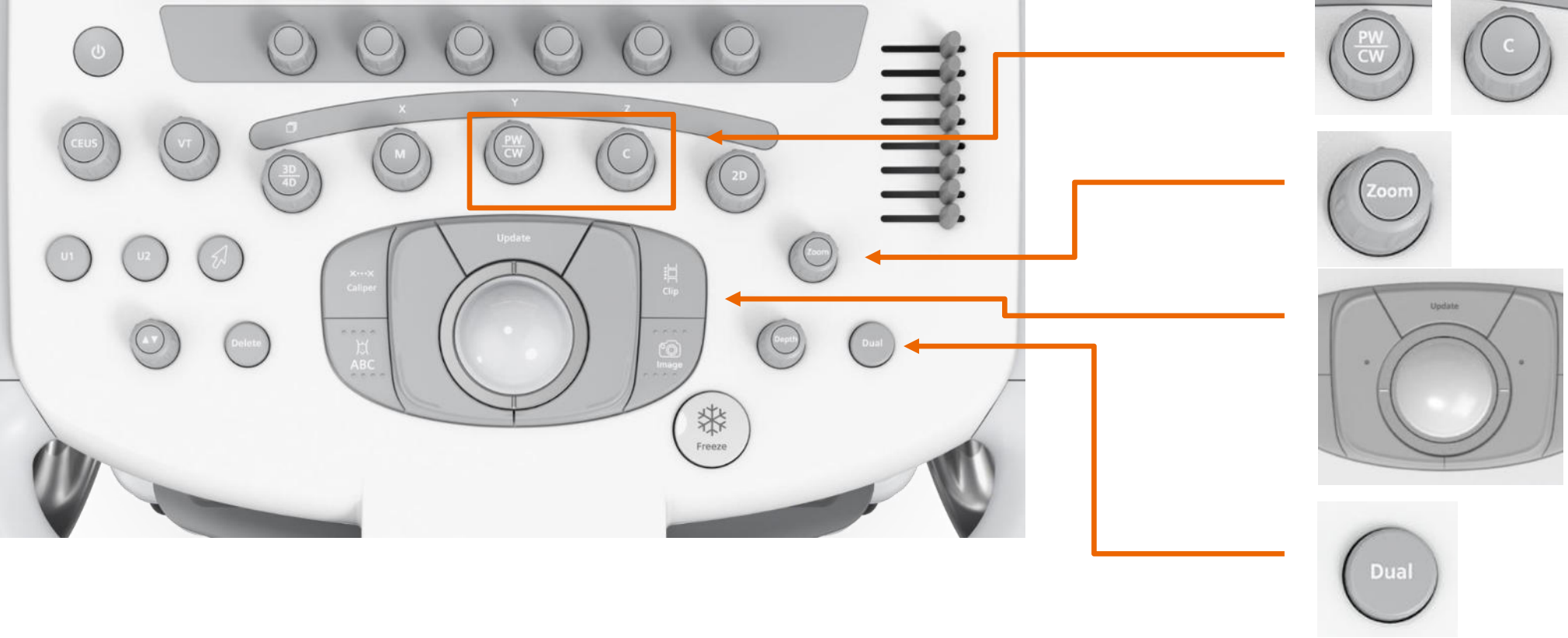
Touch Screen



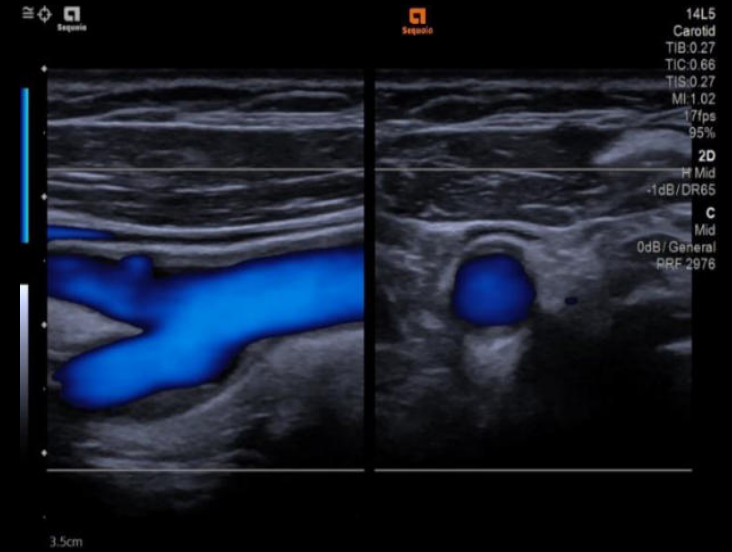
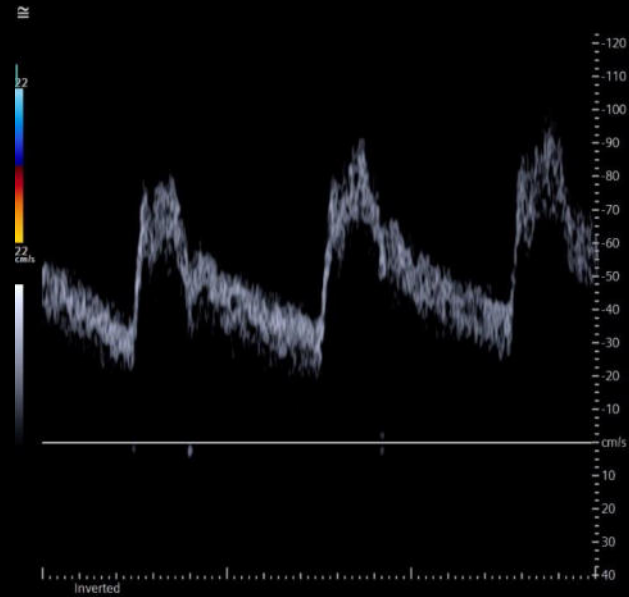
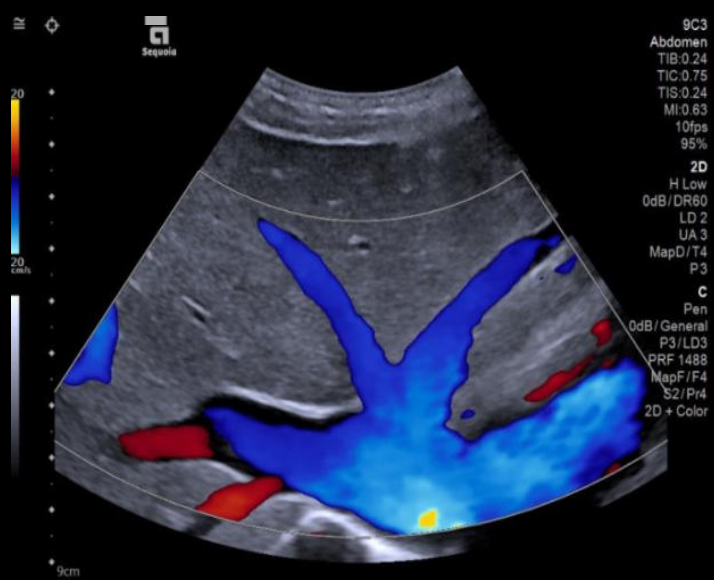
Soft keys



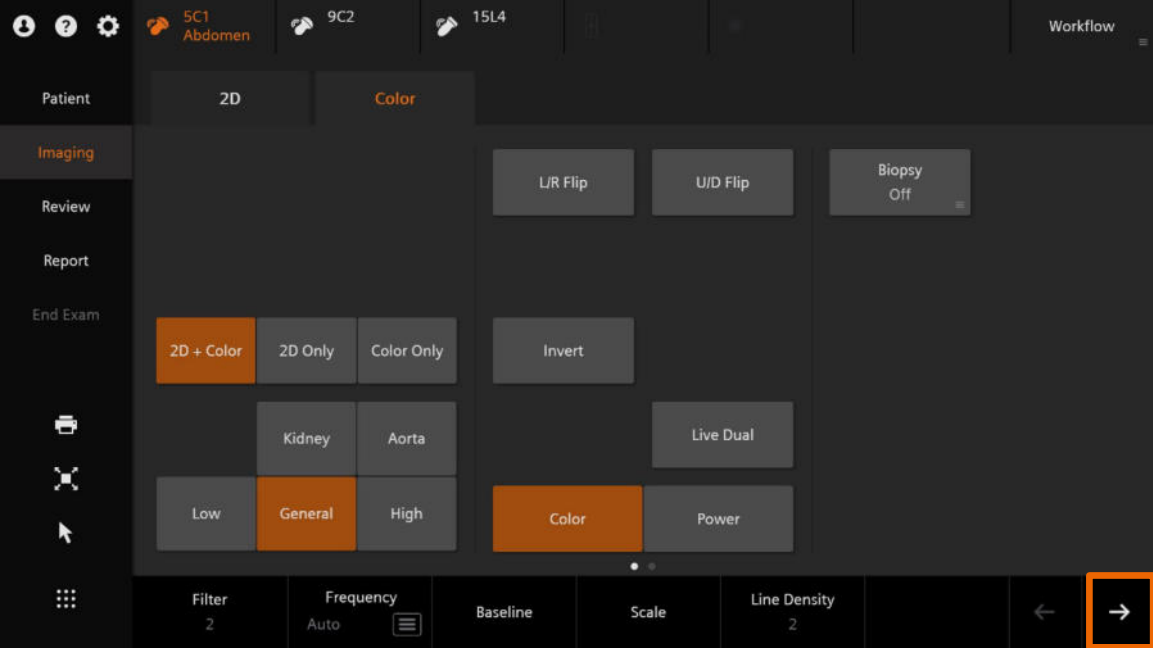
# Doppler controls on the Control Panel



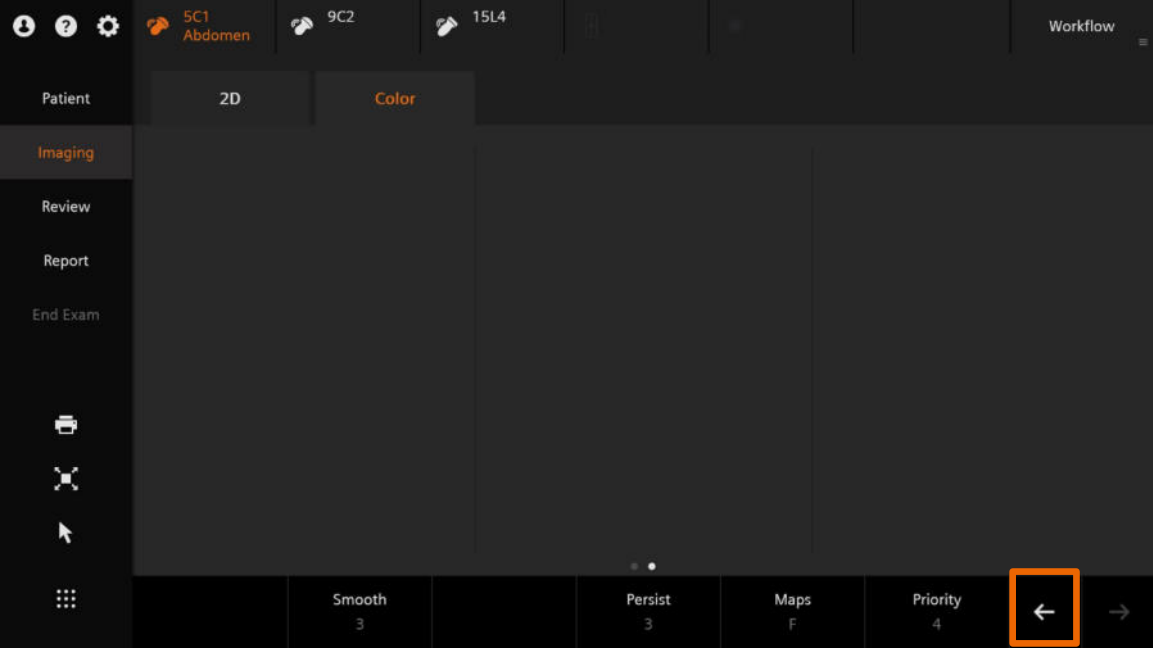
# Doppler modes



# Color controls on the Touch Screen

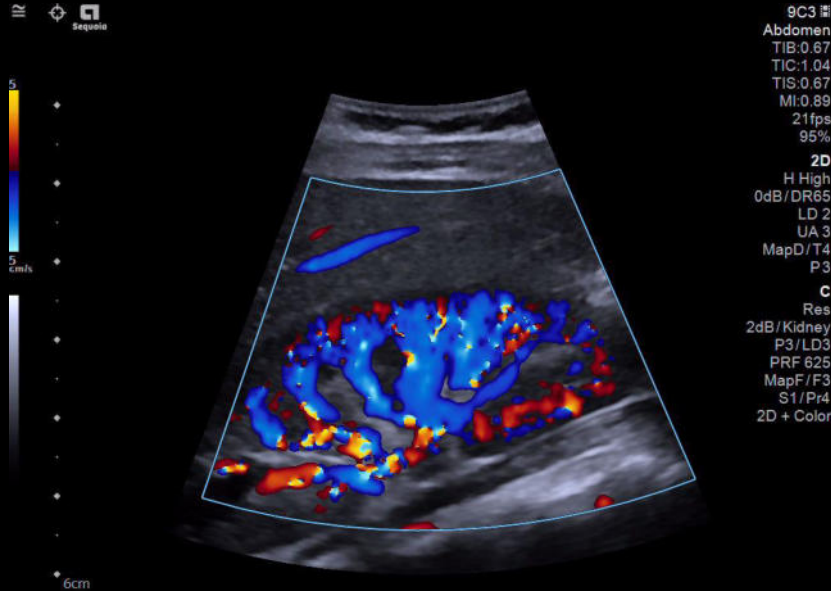
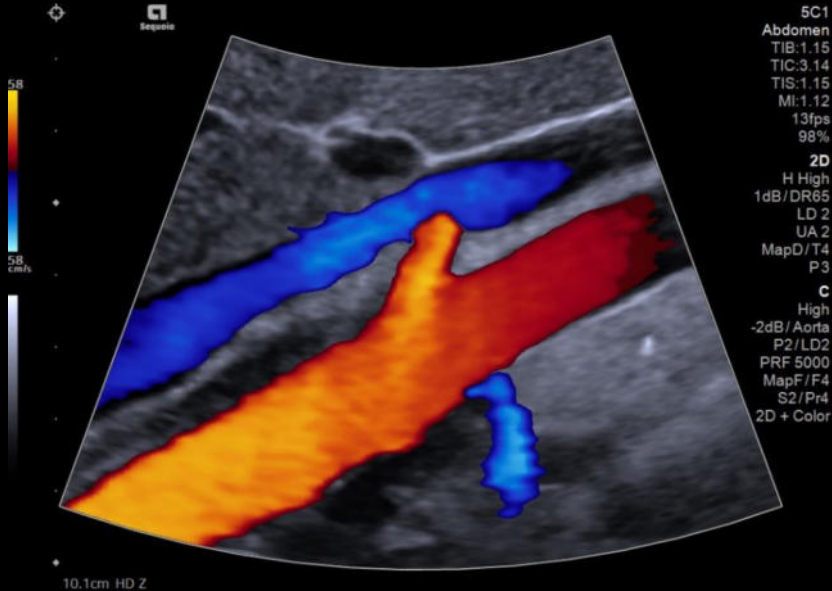


Page One



Page Two

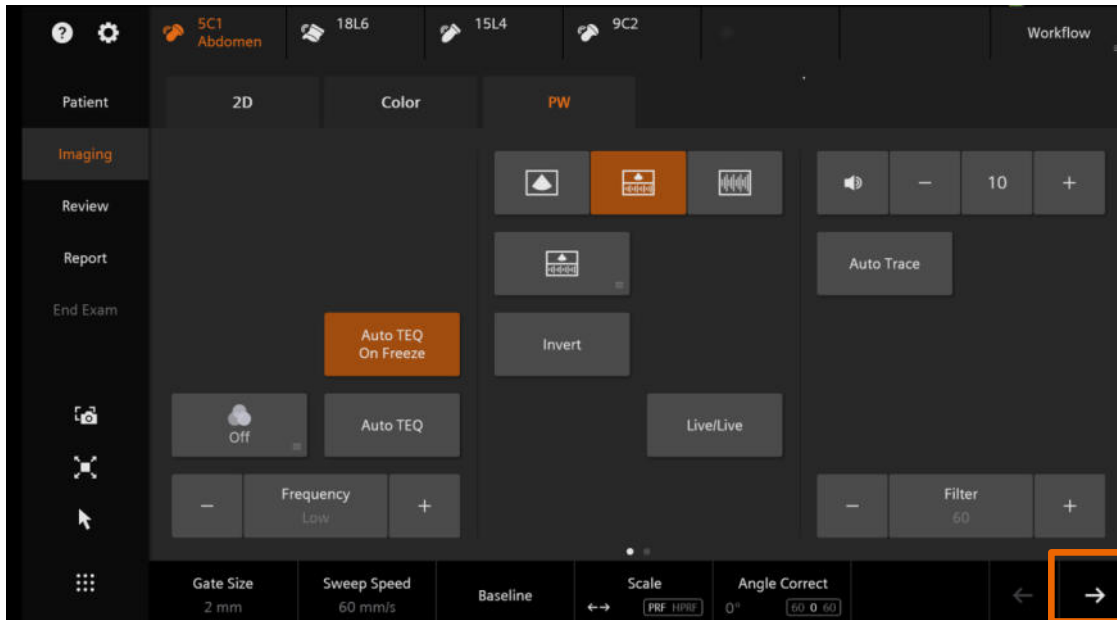
# Color Doppler controls on the soft keys



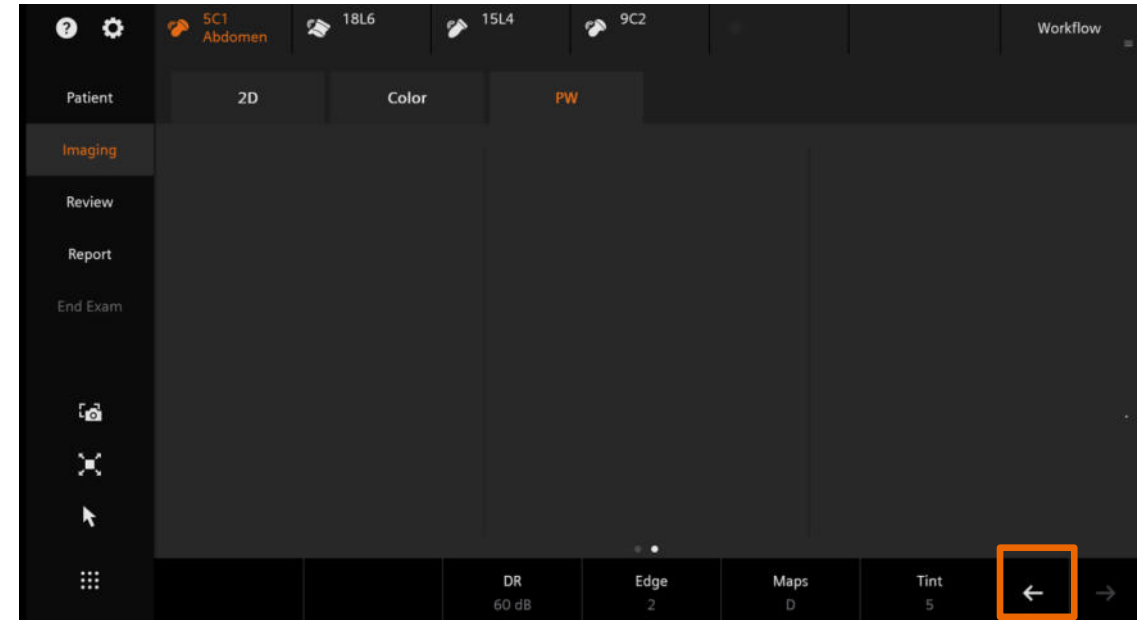
⋮	Filter 2	Frequency Auto	Baseline	Scale	Line Density 2
---	-------------	-------------------	----------	-------	-------------------

⋮	Smooth 3	Persist 3	Maps F	Priority 4
---	-------------	--------------	-----------	---------------

# PW controls on the Touch Screen

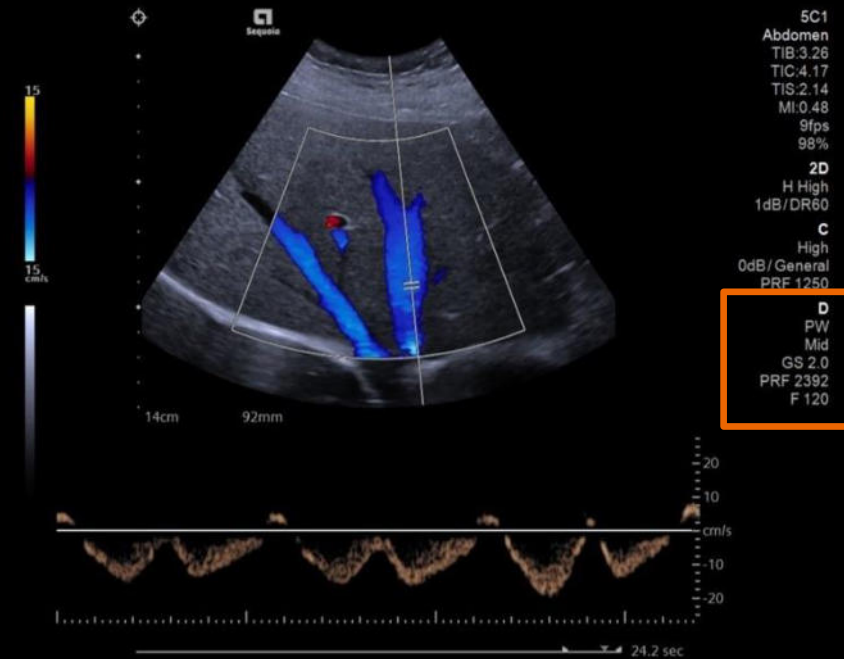
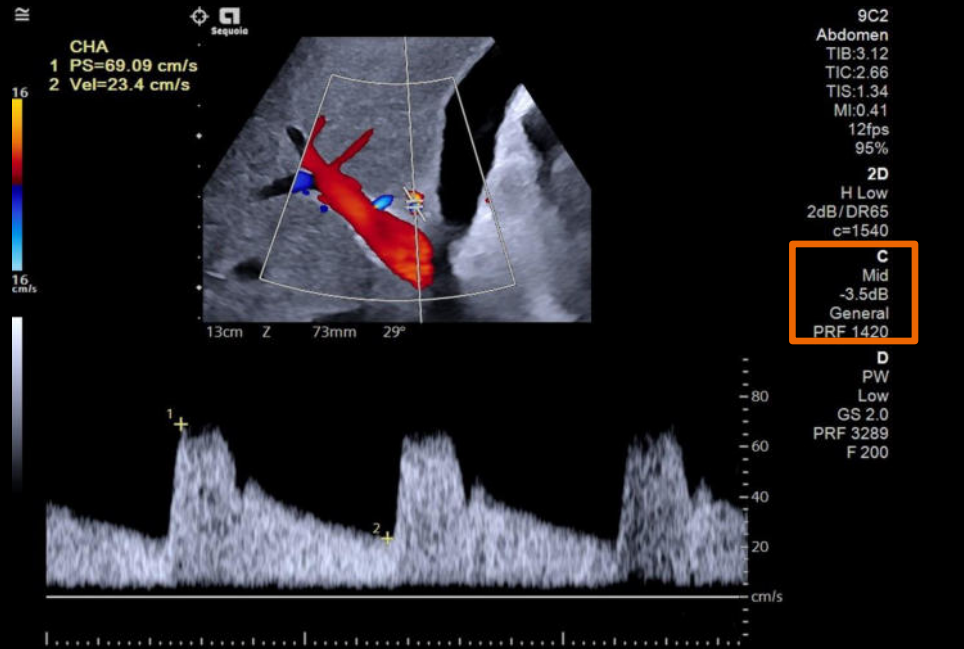


Page One



Page Two

# PW Doppler controls on the soft keys



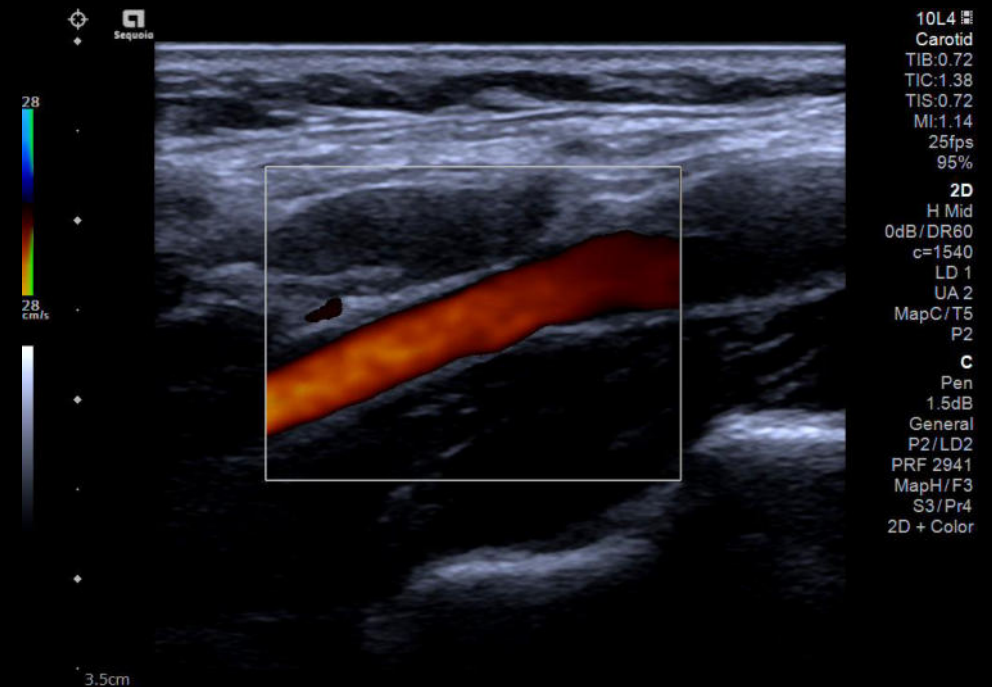
☰	Gate Size 2 mm	Sweep Speed 60 mm/s	Baseline	Scale ←→ PRF 1420	Angle Correct 0° (60.0 60)
---	-------------------	------------------------	----------	----------------------	-------------------------------

☰	DR 60 dB	Edge 2	Maps D	Tint 5
---	-------------	-----------	-----------	-----------

# Velocity variance map

Velocity variance map provides a variance in color flow display for differentiating complex flow patterns

- Available in Color Doppler velocity mode
  - Map H – General & Vascular
  - Map J – Cardiology
- Available on all transducers and presets



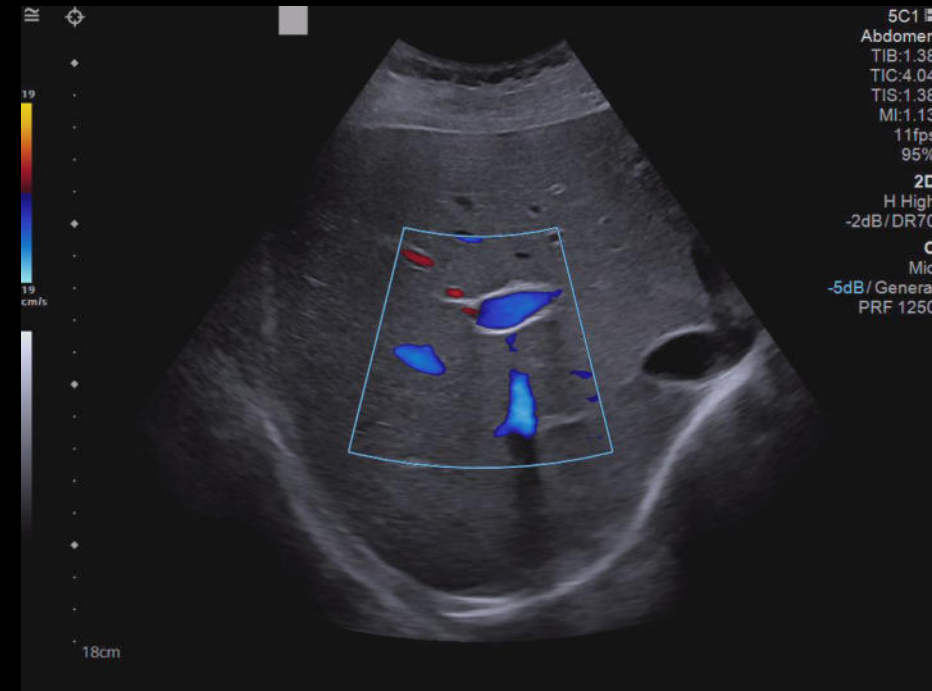
# Objectives

- Review B-mode and M-mode controls
- Describe B-mode and M-mode optimization features
- Explain display modes
- Review Doppler controls
- **Describe Doppler optimization features**



# Auto flash artifact suppression

Auto flash artifact suppression applies flash suppression relative to user motion



# Color Doppler

5C1 Abdomen 18L6 15L4 9C2 Workflow

Patient 2D Color

Imaging L/R Flip U/D Flip Biopsy Off

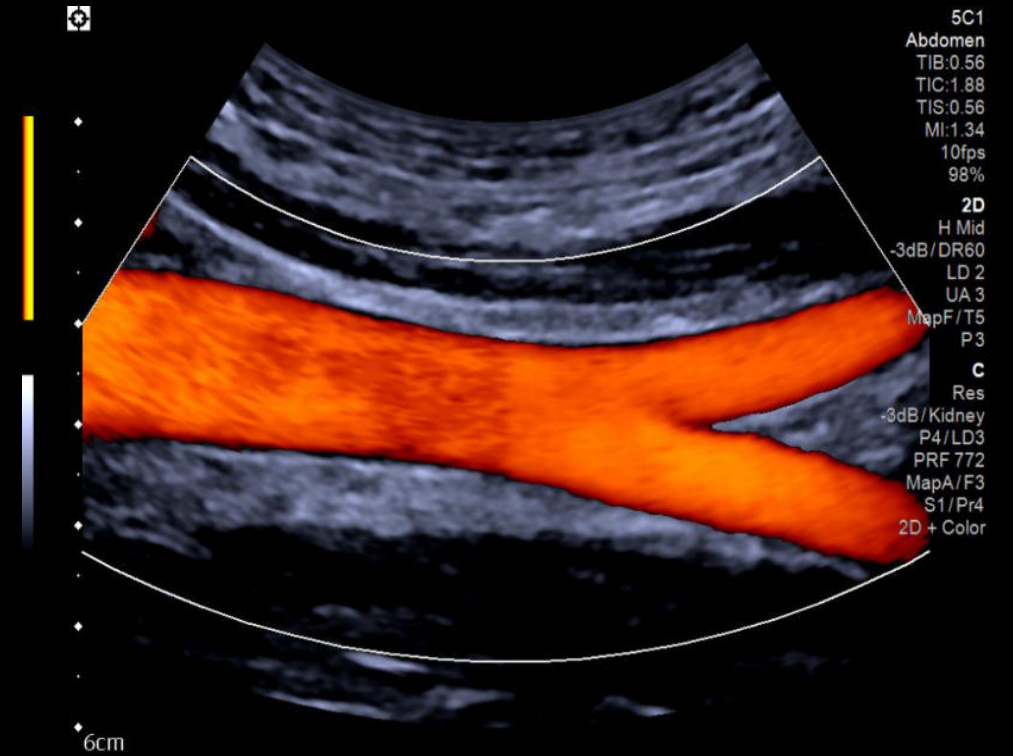
Review Panoramic

Report 2D + Color 2D Only Color Only Invert

End Exam Kidney Aorta Live Dual

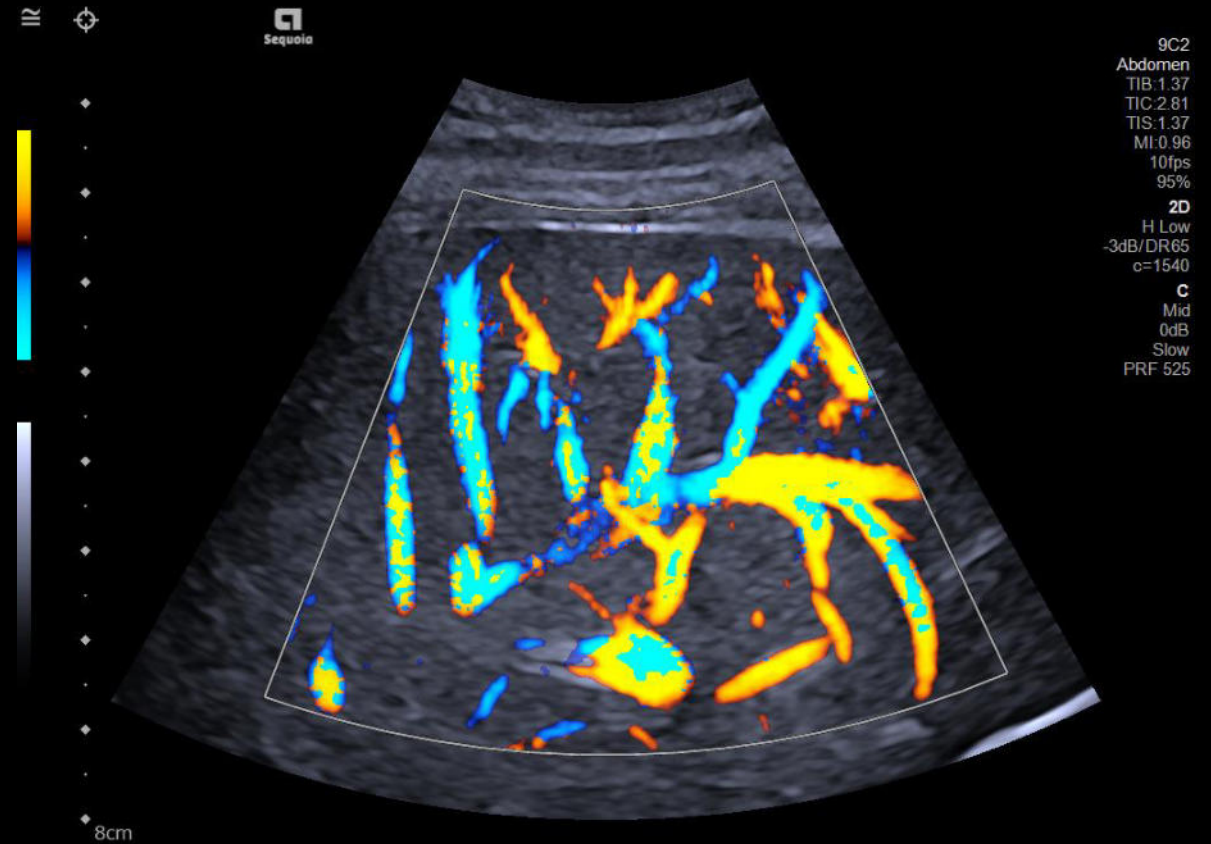
Low General High Color Power

Filter 2 Frequency Auto Baseline Scale Line Density 2



# Display modes

2D + Color	2D Only	Color Only
Slow	Kidney	Aorta
Low	General	High

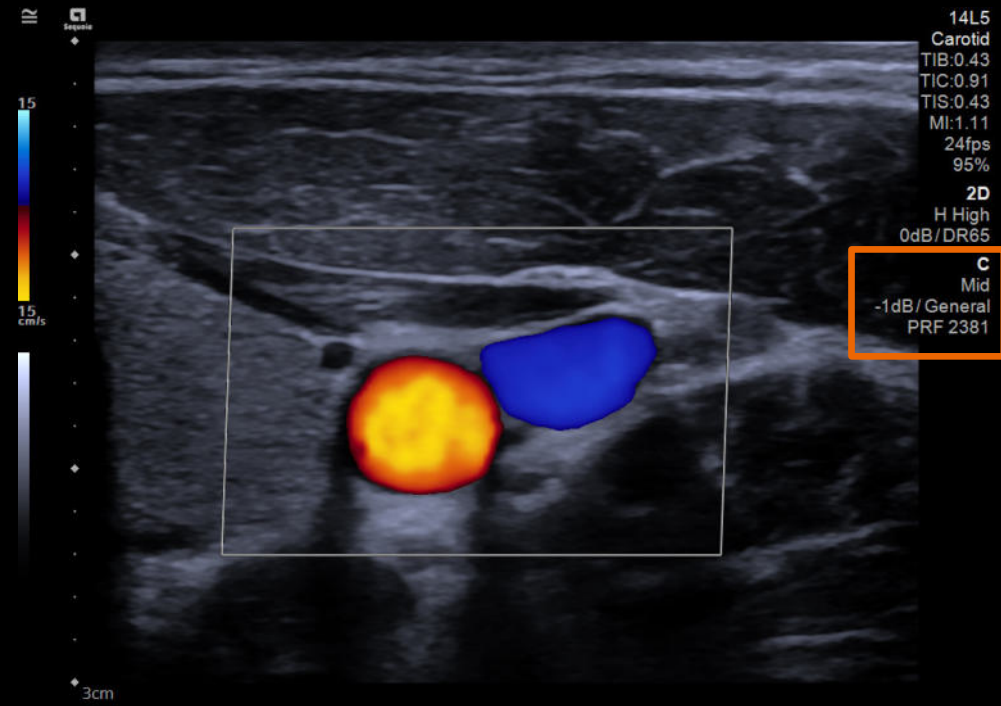
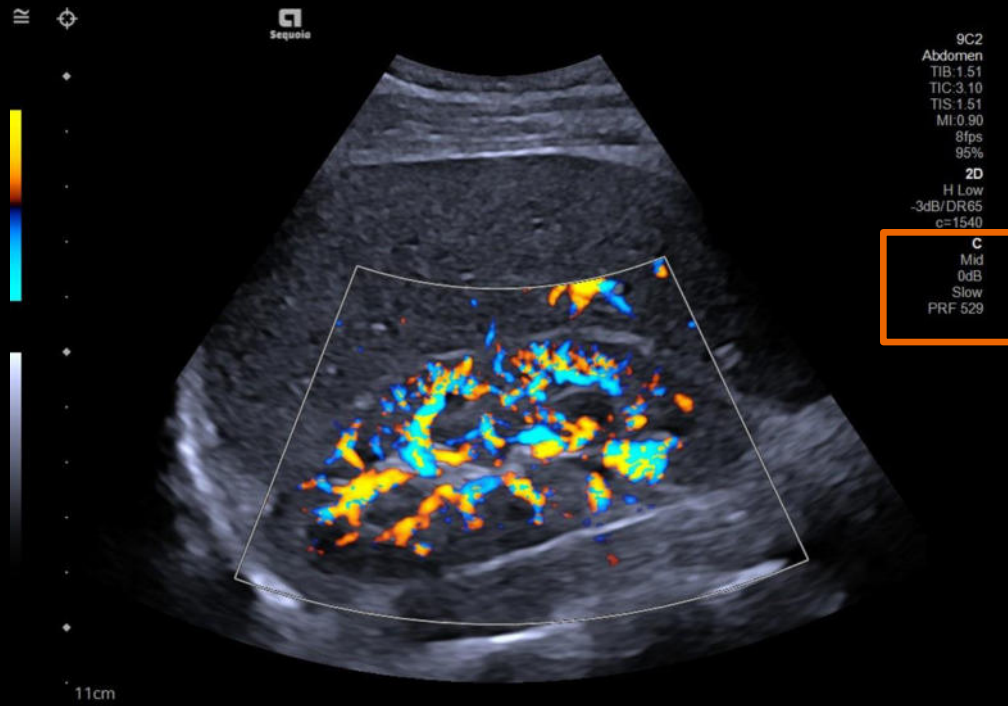


# Flow states

2D + Color	2D Only	Color Only
Slow	Kidney	Aorta
Low	General	High



# Flow state examples

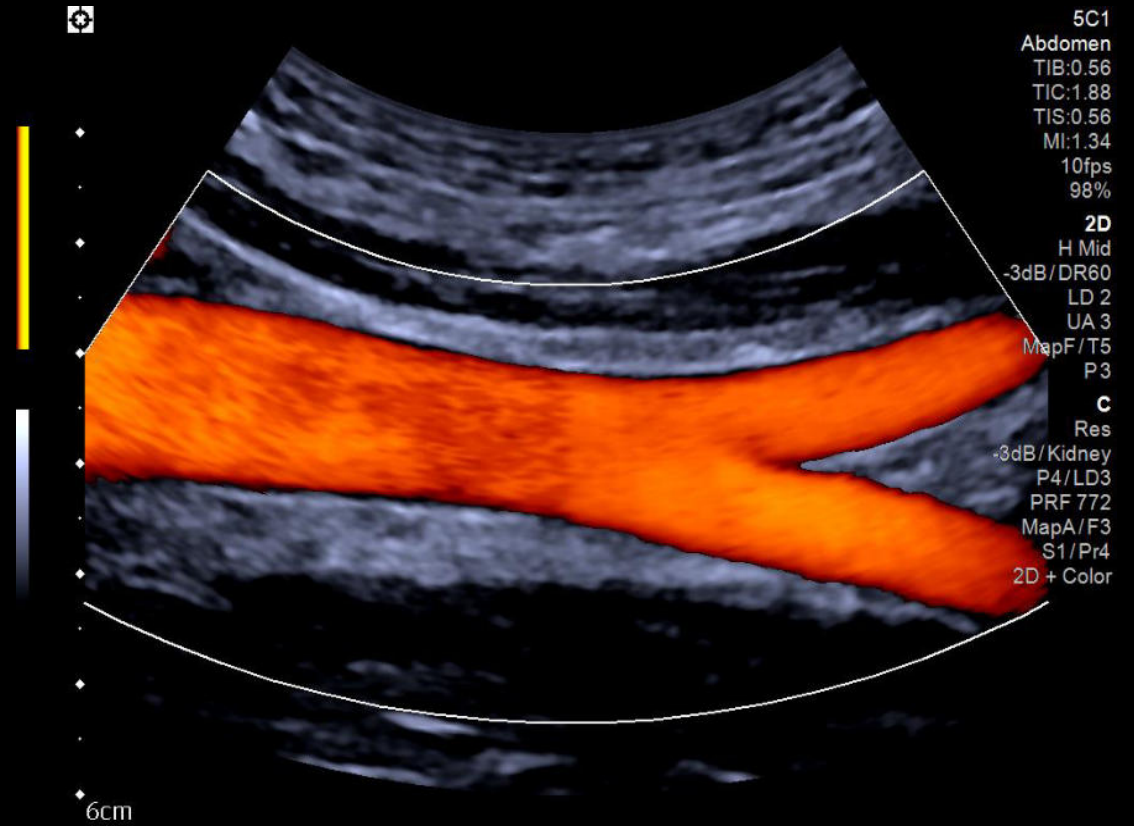


# Dynamic MultiHertz Technology

Auto Manual

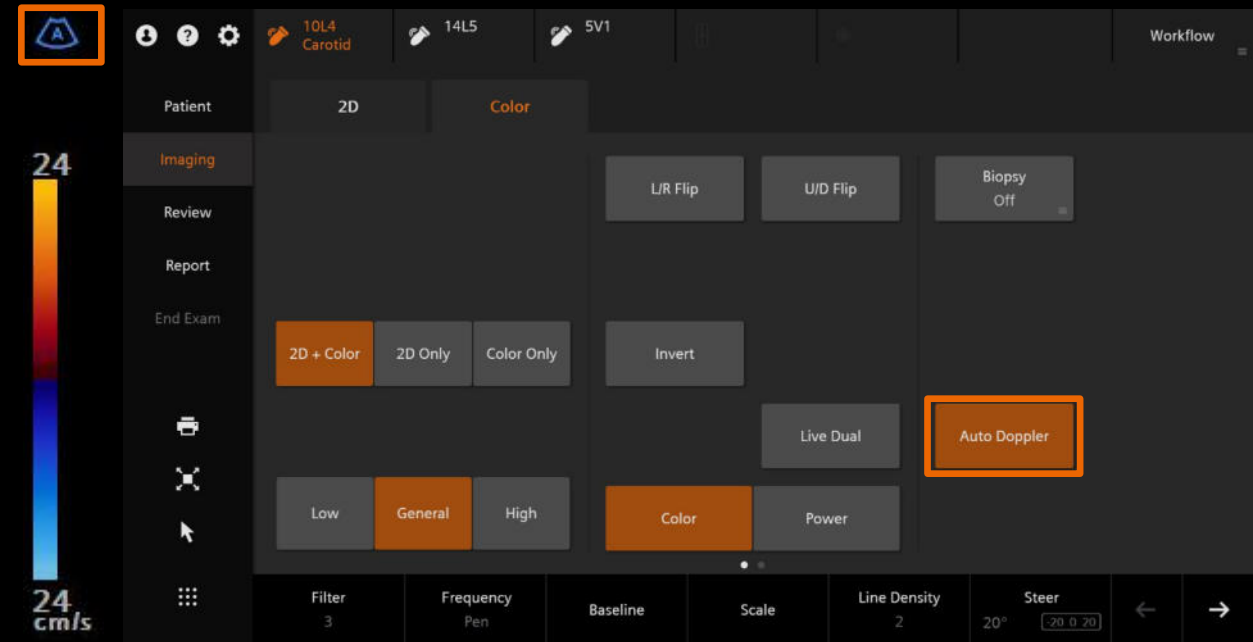
Frequency  
Auto

Line Density  
1



# Auto Doppler

- Available on Touch Screen when Color or PW Doppler activated
- Automated placement of Color ROI
- Automated placement of the sample gate and 60 ° angle correct for Pulsed-wave Doppler
- Available on 10L4 Transducer in the carotid and arterial preset
- **Icon located above color bar**



# Power Doppler

5C1 Abdomen 18L6 15L4 9C2 Workflow

Patient 2D Color

Imaging L/R Flip U/D Flip Biopsy Off

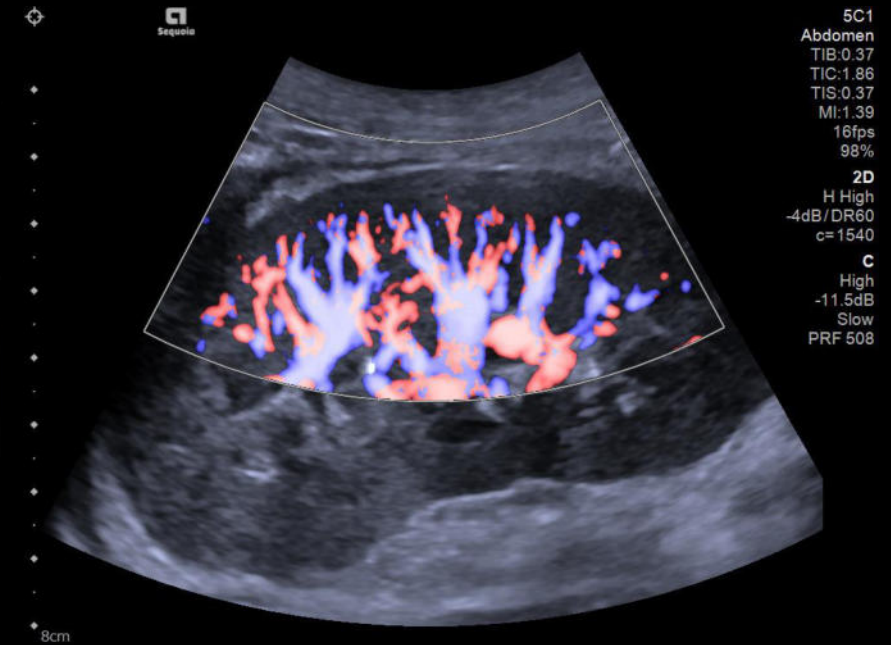
Review Panoramic

Report 2D + Color 2D Only Color Only

End Exam Slow Kidney Aorta Live Dual Dir Power

Low General High Color Power

Filter 3 Frequency Auto Scale Line Density 2



# Slow Flow

5C1 Abdomen 18L6 15L4 9C2 Workflow

Patient 2D Color

Imaging

Review

Report

End Exam

L/R Flip U/D Flip Biopsy Off

Panoramic

Invert

2D + Color 2D Only Color Only

Slow Kidney Aorta Live Dual Dir Power

Low General High Color Power

Filter 3 Frequency Auto Scale Line Density 2

5C1 Abdomen  
TIB:0.58  
TIC:2.07  
TIS:0.58  
MI:1.39  
16fps  
98%

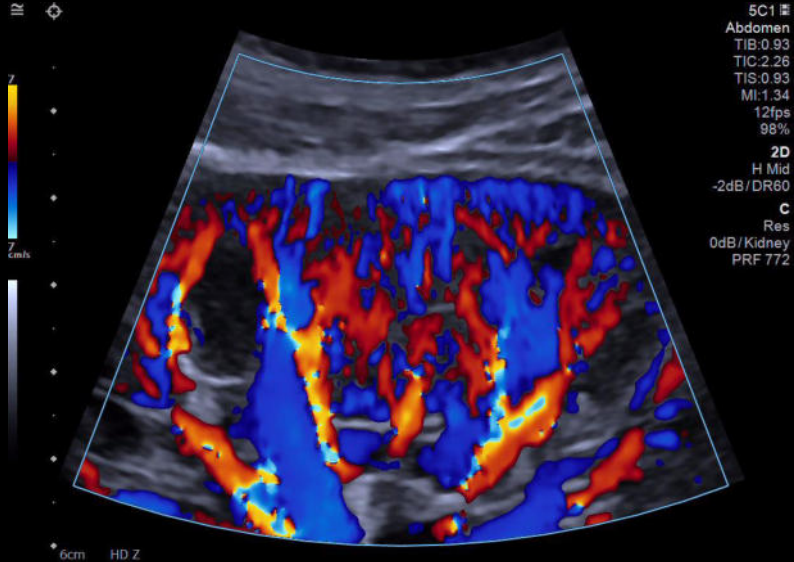
# Color Doppler – Soft keys

Filter 2	Frequency Auto	Baseline	Scale	Line Density 2
-------------	-------------------	----------	-------	-------------------

Page One

Smooth 3	Persist 3	Maps F	Priority 4
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Page Two



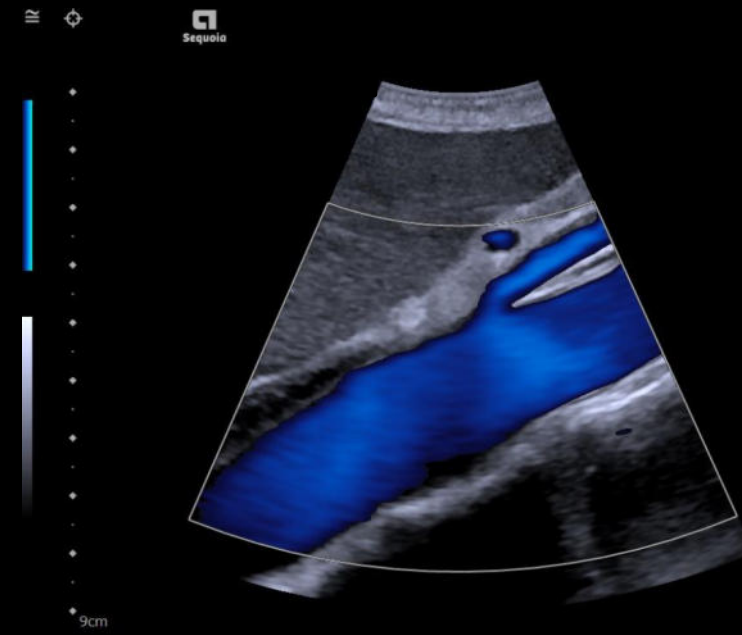
# Power Doppler – Soft keys

Filter 3 | Frequency Auto  | Scale | Line Density 2

Page One

Gate Size 2 mm | | | | Angle Correct 0°

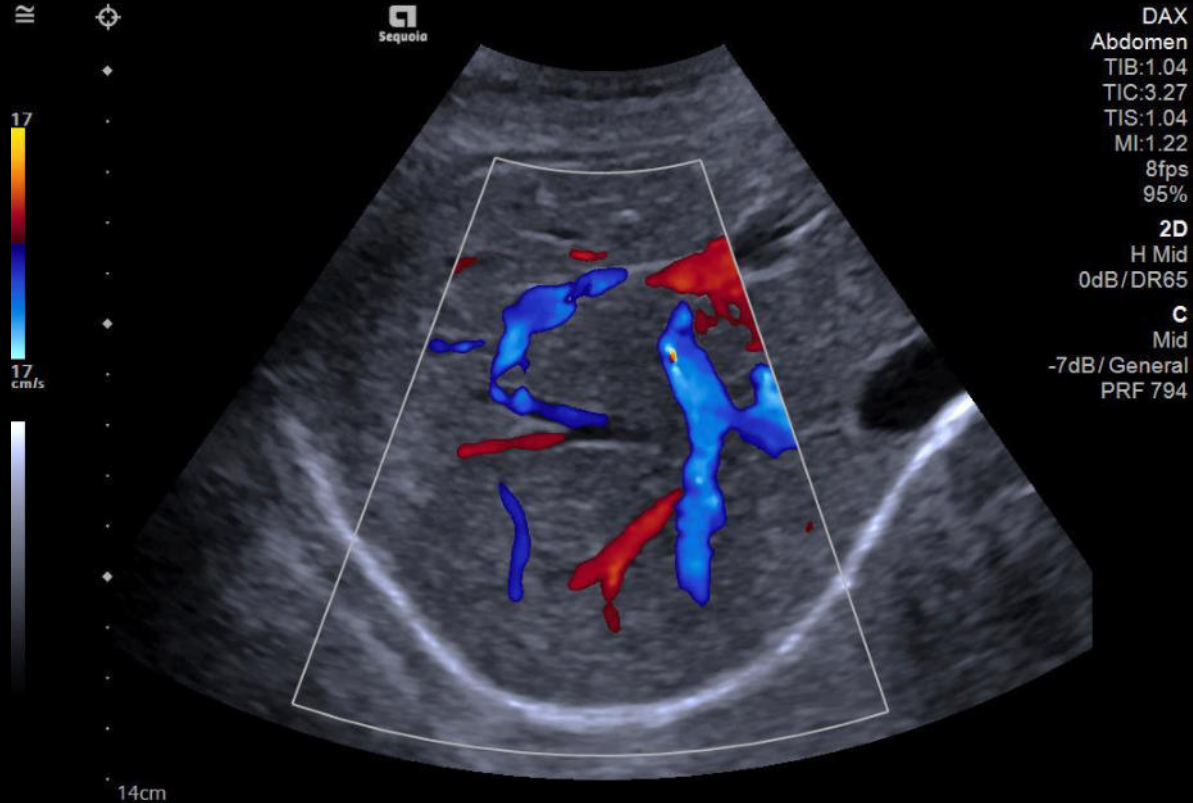
Page Two



9C3  
Abdomen  
TIB:0.40  
TIC:0.79  
TIS:0.40  
MI:0.57  
16fps  
95%  
**2D**  
H Low  
-5dB/DR60  
LD 2  
UA 3  
MapE/T4  
P3  
**C**  
Mid  
-6dB/Aorta  
P2/LD3  
PRF 992  
MapE/F3  
S3/Pr4  
2D + Color

# Color post-processing

- 2D Gain
- Baseline
- Map
- Priority
- Invert



# Pulsed wave (PW) Doppler



5C1 Abdomen 18L6 15L4 9C2 Workflow

Patient 2D Color PW

Imaging

Review

Report

End Exam

Auto TEQ On Freeze

Invert

Auto Trace

10

Off Auto TEQ

Frequency Low

Filter 60

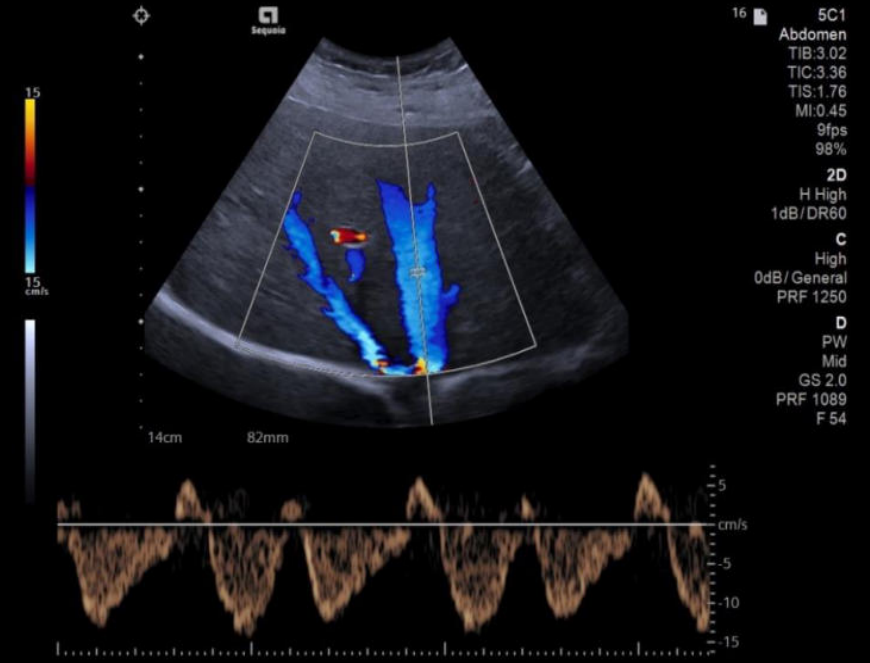
Gate Size 2 mm

Sweep Speed 60 mm/s

Baseline

Scale PRF HPRF

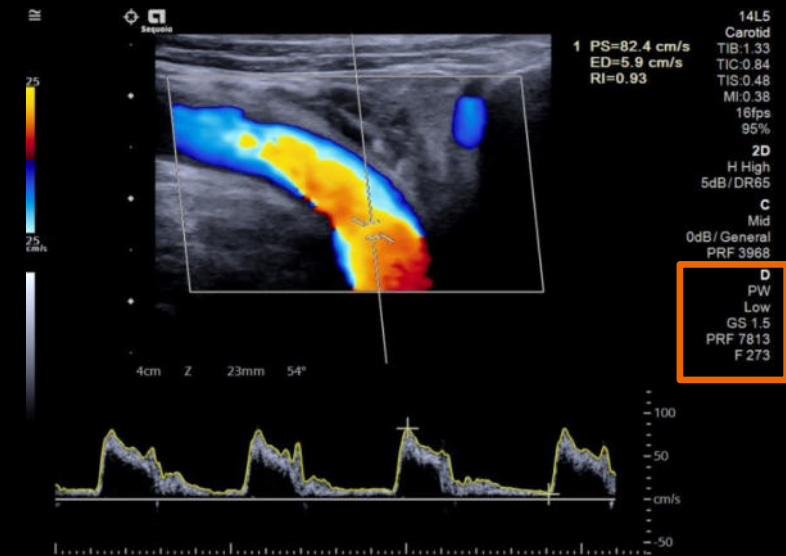
Angle Correct 0° 60 0 60



# Pulsed wave (PW) Doppler – soft keys

Gate Size 2 mm	Sweep Speed 60 mm/s	Baseline ←→	Scale PRF HPRF	Angle Correct 0° 60 0 60
-------------------	------------------------	----------------	-------------------	-----------------------------

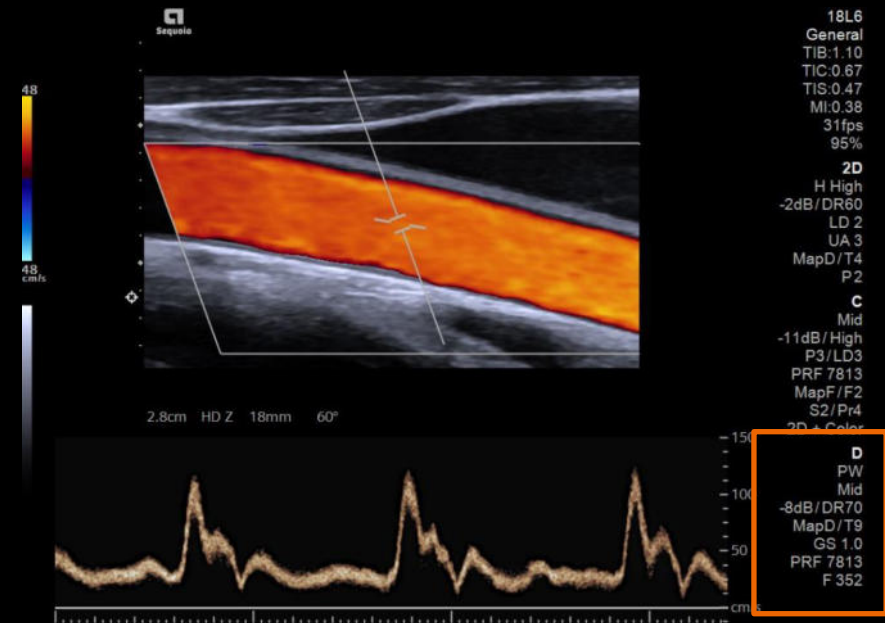
Page One

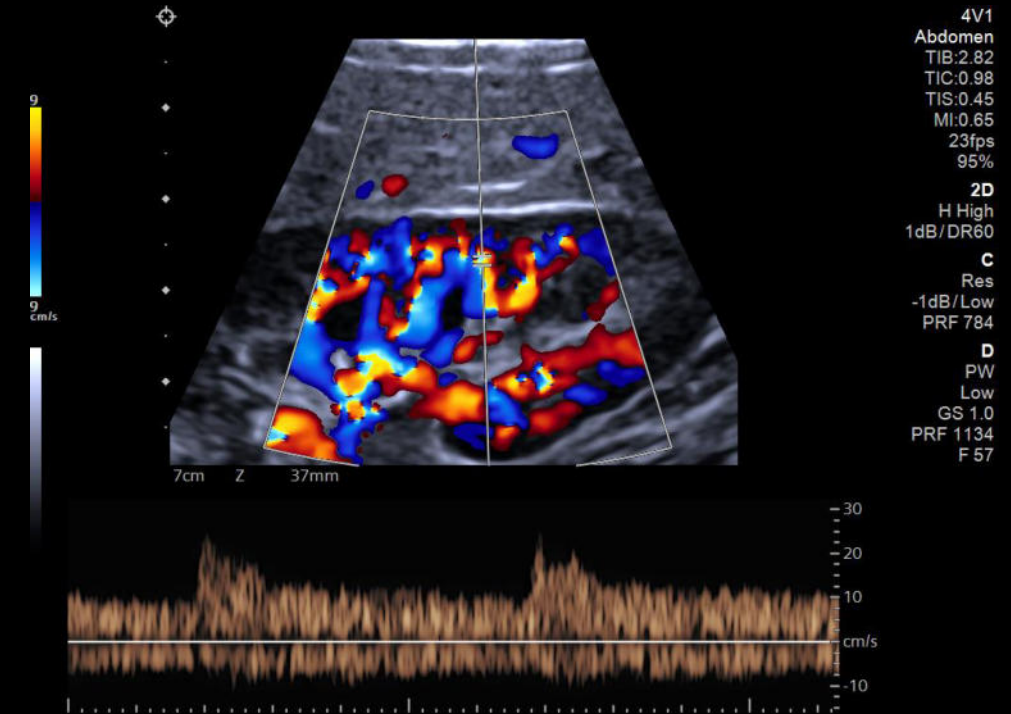
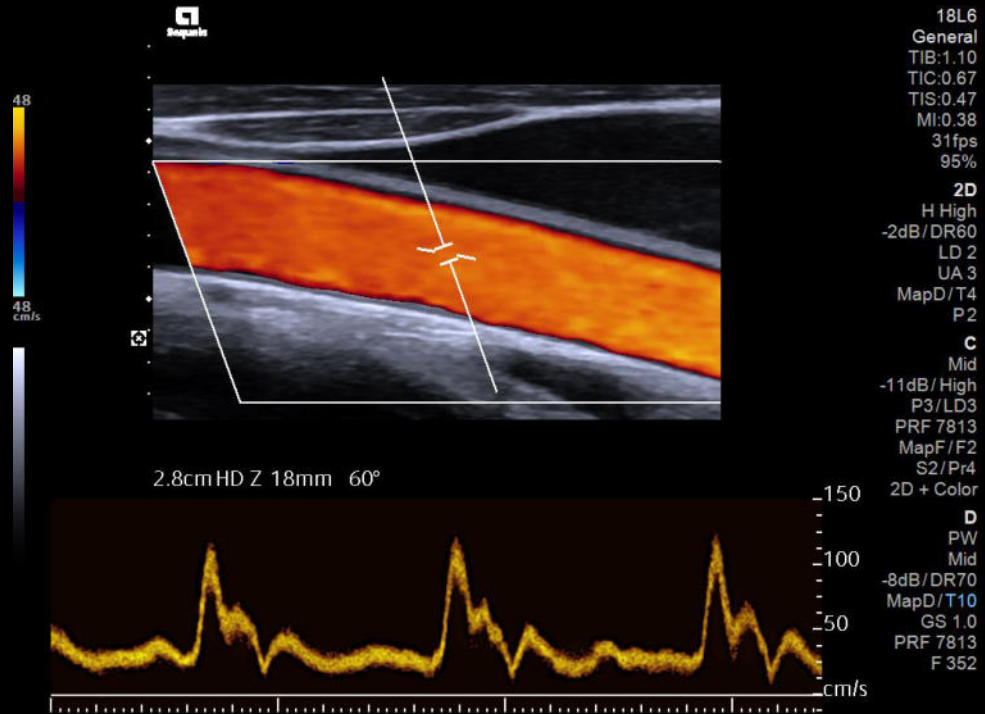


# Pulsed wave (PW) Doppler – soft keys

		DR 60 dB	Edge 2	Maps D	Tint 5
--	--	-------------	-----------	-----------	-----------

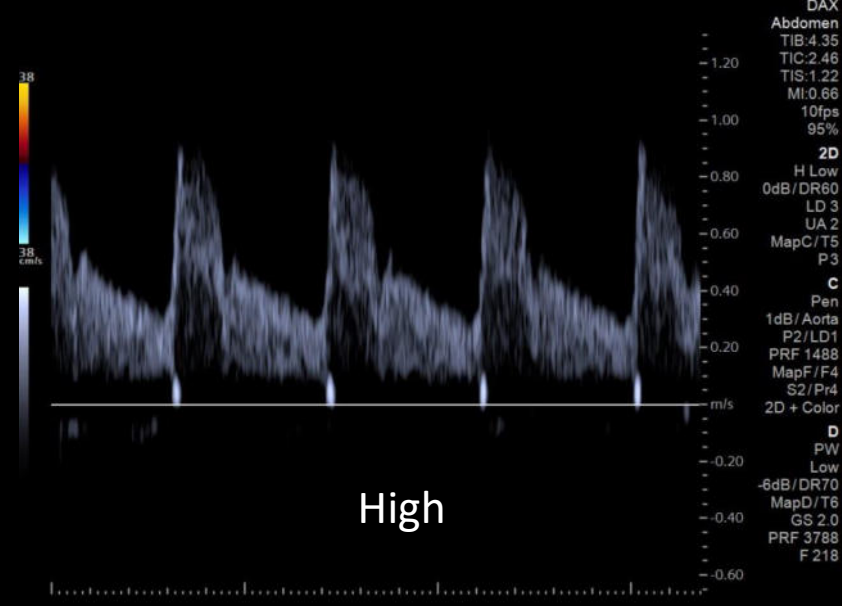
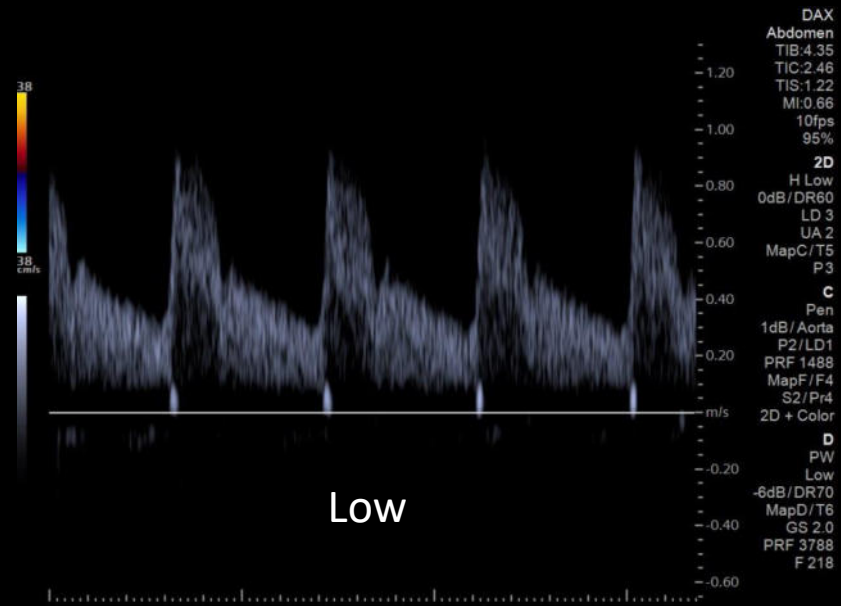
Page Two





Off Low **Mid** High

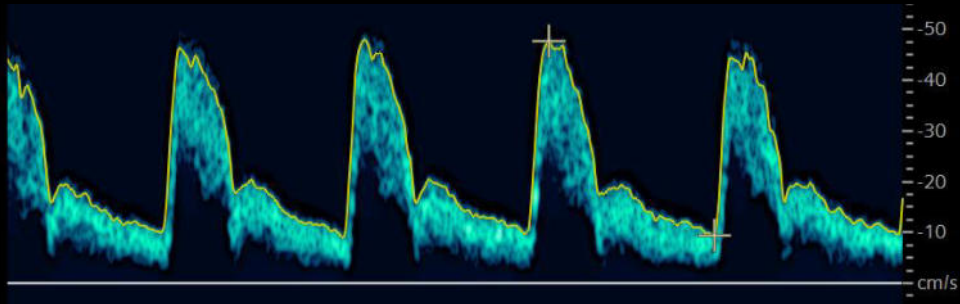
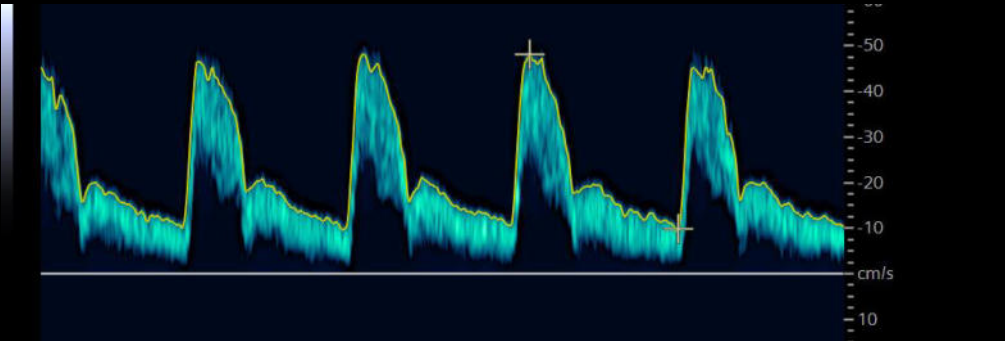
Mid Live/Live



# Edge in PW Doppler

1    2    3    4

Edge  
3



# Auto Trace Optimization & Sensitivity

7L2 5C1 Abdomen Workflow

Patient Imaging Review Report End Exam

2D Color PW

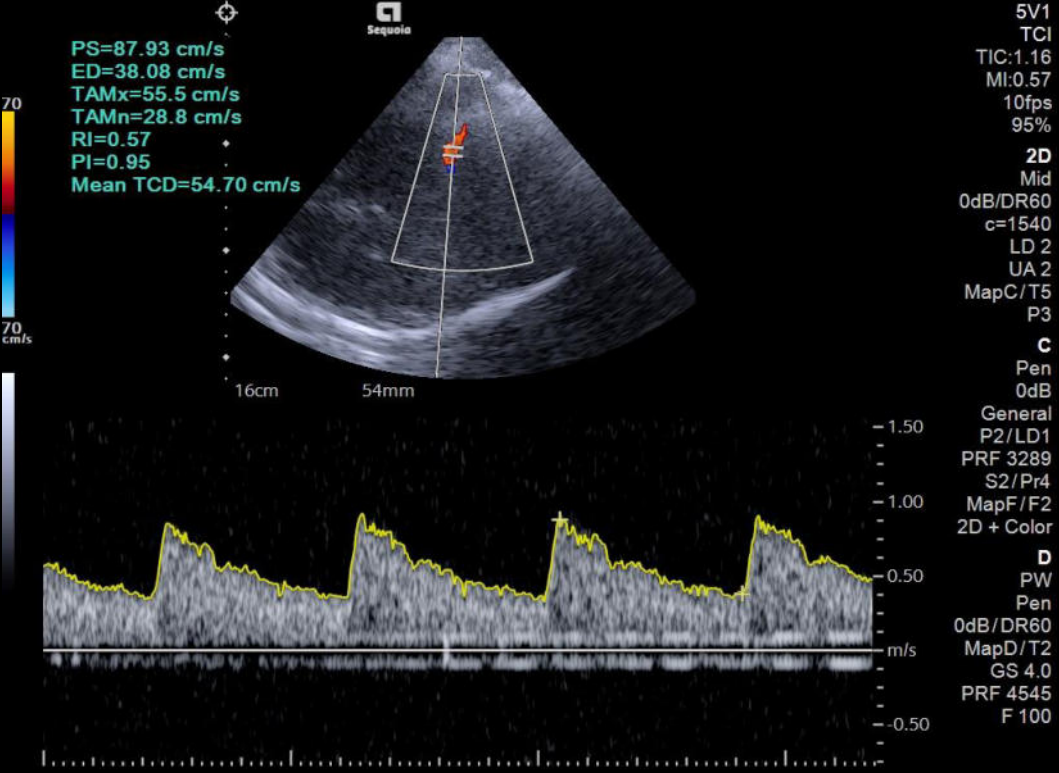
Auto TEQ On Freeze

Auto Trace Auto Trace Above Baseline

Sensitivity 10

Frequency Low Filter 60

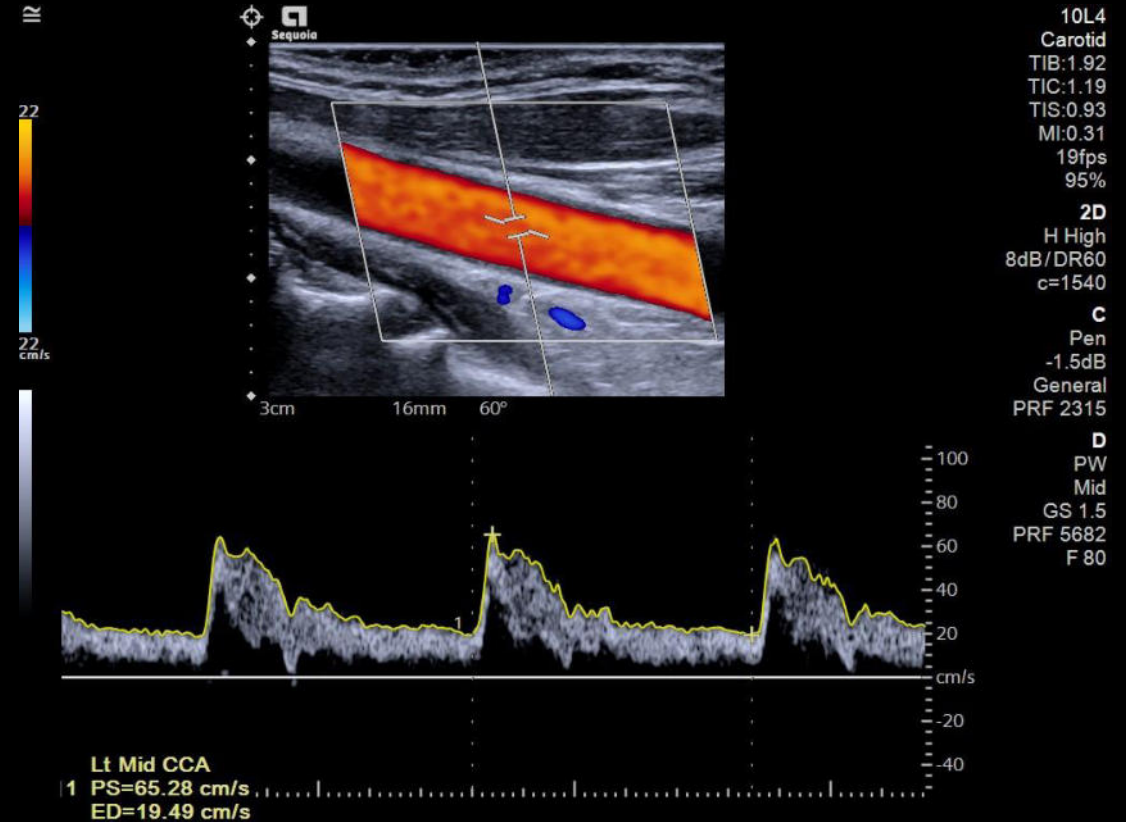
Gate Size 2 mm Sweep Speed 60 mm/s Baseline Scale PRF HPRF Angle Correct 0° 60 0 60



# Auto Trace

Control panel for Auto Trace settings:

- Above Baseline
- Below Baseline
- Above and Below
- Auto Trace
- Auto Trace Above Baseline
- Auto Trace
- Auto Trace Above Baseline



# Auto Trace configuration

System Configuration

- System Settings
- Workflow Enhancement
- Imaging Settings
- Measurement & Report
  - Measurement
    - Touch Screen Measurement Config
    - Custom Measurement Label
    - Custom Calculations
    - Report
    - OB Tables
  - Annotations
  - Features
  - Transducer
  - Connectivity & Network
  - Peripheral Devices
  - System Management

Exam Package: Cardiac

CINE Measurement Behavior

- Erase in CINE

2D Tools

- Volume Tool
- 1 Distances
- Area %Stenosis Tool
- Diagnose + Trace
- Generic Area Ratio Tool
- Trace

Doppler Tools

- Default Tool
- Velocity

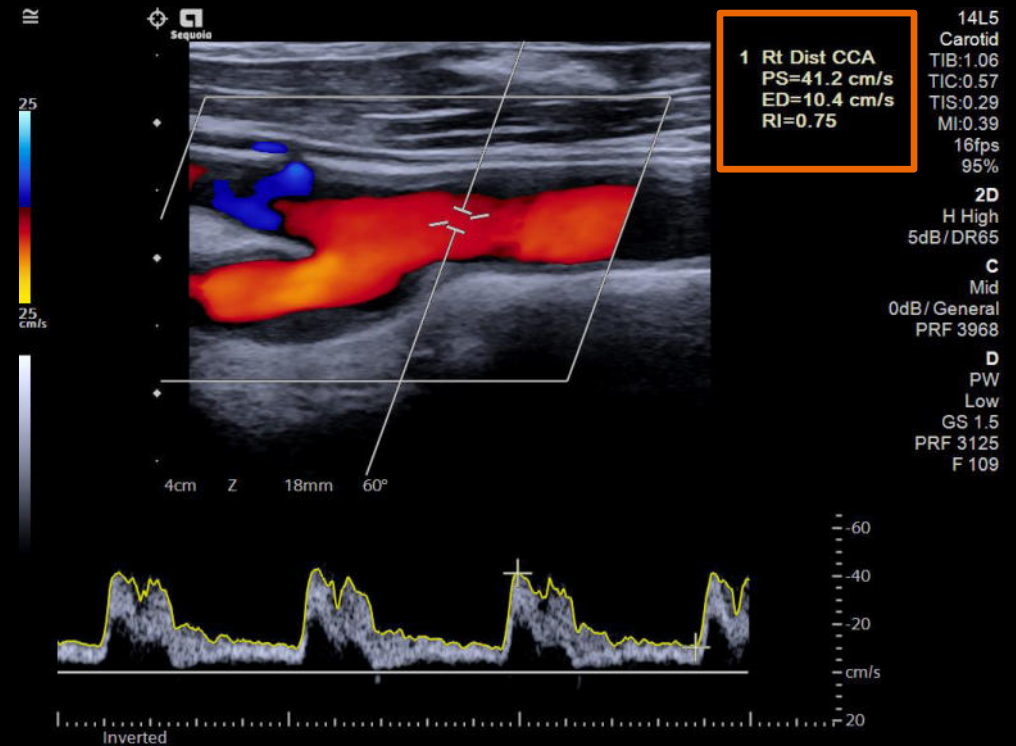
Volume Flow Tool

- Volume
- Distance
- Flow
- Heart Cycle

Result Format	Show	Unit	Precision
PS	<input type="checkbox"/>	cm	0.00
LVPW	<input type="checkbox"/>	cm	0.00
LVID	<input type="checkbox"/>	cm	0.00
%Stenosis	<input type="checkbox"/>	%	0
A	<input checked="" type="checkbox"/>	cm <sup>2</sup>	0.00
A (B)	<input type="checkbox"/>	cm <sup>2</sup>	0.00
A (E)	<input type="checkbox"/>	cm <sup>2</sup>	0.00
Accel	<input checked="" type="checkbox"/>	m/s <sup>2</sup>	0.00
Angle	<input type="checkbox"/>	°	0
Area Ratio	<input type="checkbox"/>		0.00
AT	<input type="checkbox"/>	ms	0
Average Distance	<input type="checkbox"/>	cm	0.00
C	<input type="checkbox"/>	cm	0.00
C10	<input checked="" type="checkbox"/>	mm	0.00
D	<input type="checkbox"/>	cm	0.00
D (B)	<input type="checkbox"/>	cm	0.00

Restore Defaults: Cardiac

TAMx	<input checked="" type="checkbox"/>	Show	cm/s	0.0
Time	<input type="checkbox"/>	Show	ms	0
Tr Semi Major Axis	<input type="checkbox"/>	Show	cm	0.00
Vel	<input type="checkbox"/>	Show	cm/s	0.0
Velocity Ratio	<input type="checkbox"/>	Show		0.00
Vmax	<input checked="" type="checkbox"/>	Show	cm/s	0.0
Vmean	<input type="checkbox"/>	Show	cm/s	0.00

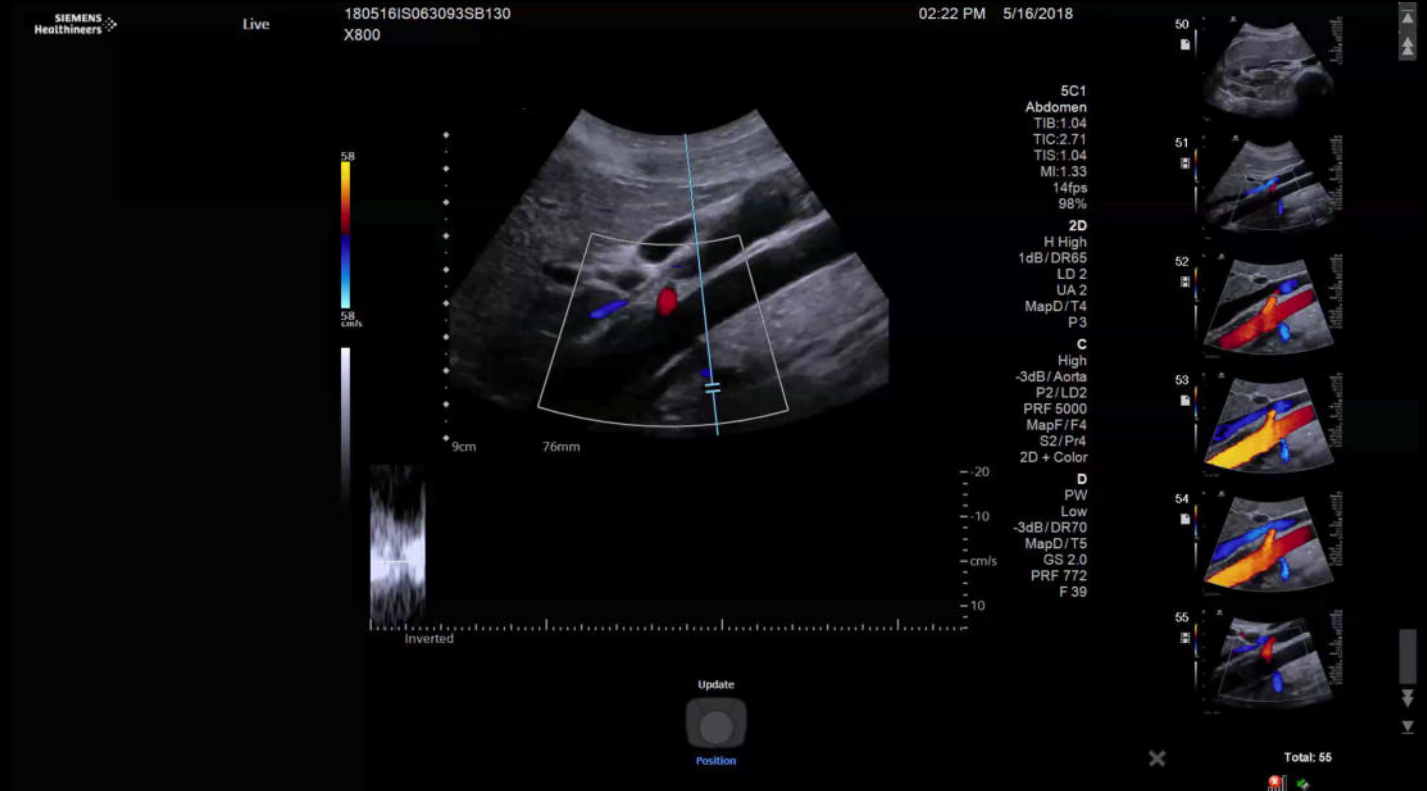
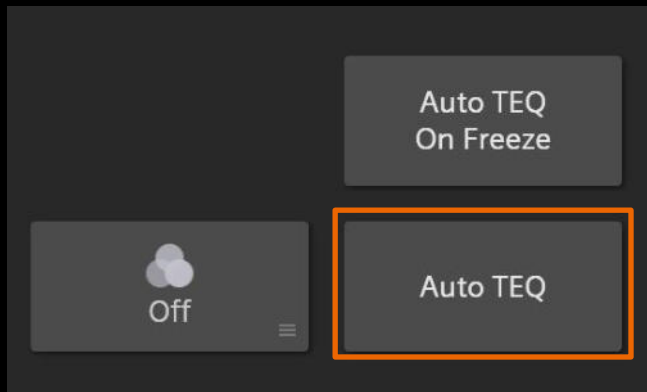


# Auto TEQ tissue equalization technology

## Doppler optimization

Automatic spectral Doppler optimization of:

- Gain
- Scale/Baseline
- Dynamic Range



# Auto TEQ tissue equalization technology Doppler optimization

**System Configuration**

- System Settings
- Workflow Enhancement
- Imaging Settings
  - General
  - Capture Settings
  - Imaging Mode**
  - Image Parameter Display
  - Measurement & Report
  - Annotations
  - Features
  - Transducers
  - Connectivity & Network
  - Peripheral Devices
  - System Management

Exam Presets: **Abdomen**

**Imaging Cursor Workflow**

- Enable Cursor Mode

**Doppler and M-Mode**

- Enable Automatic Color Invert

**Doppler Mode**

Display Format: **1/2 2D, 1/2 Trace**

**M Mode**

Display Format: **2/3 2D, 1/3 Trace**

**Freeze Behavior**

Default Menu on Touch Screen: **Mode Menu**

In Review: **Play/Pause CINE**

**Thermal Index Display**

- TIS
- TIB
- TIC

**Doppler Auto TEQ**

Parameters

- Gain
- Dynamic Range
- Scale/Baseline

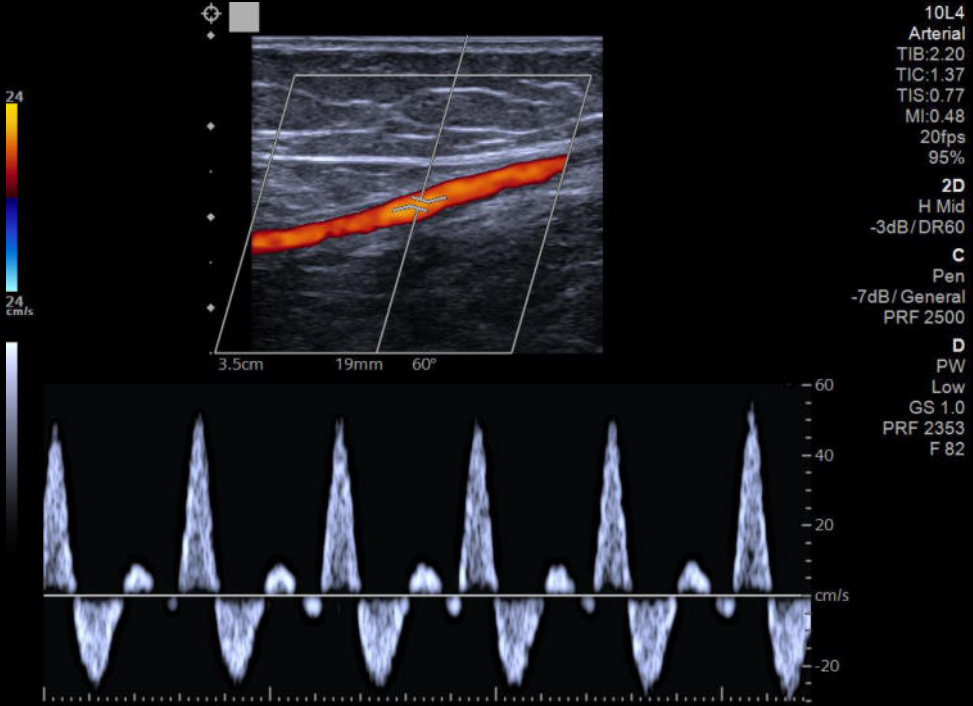
Doppler Auto TEQ on Freeze

- Off
- On

Doppler Auto TEQ Target Spectral Intensity

PW: **Low**

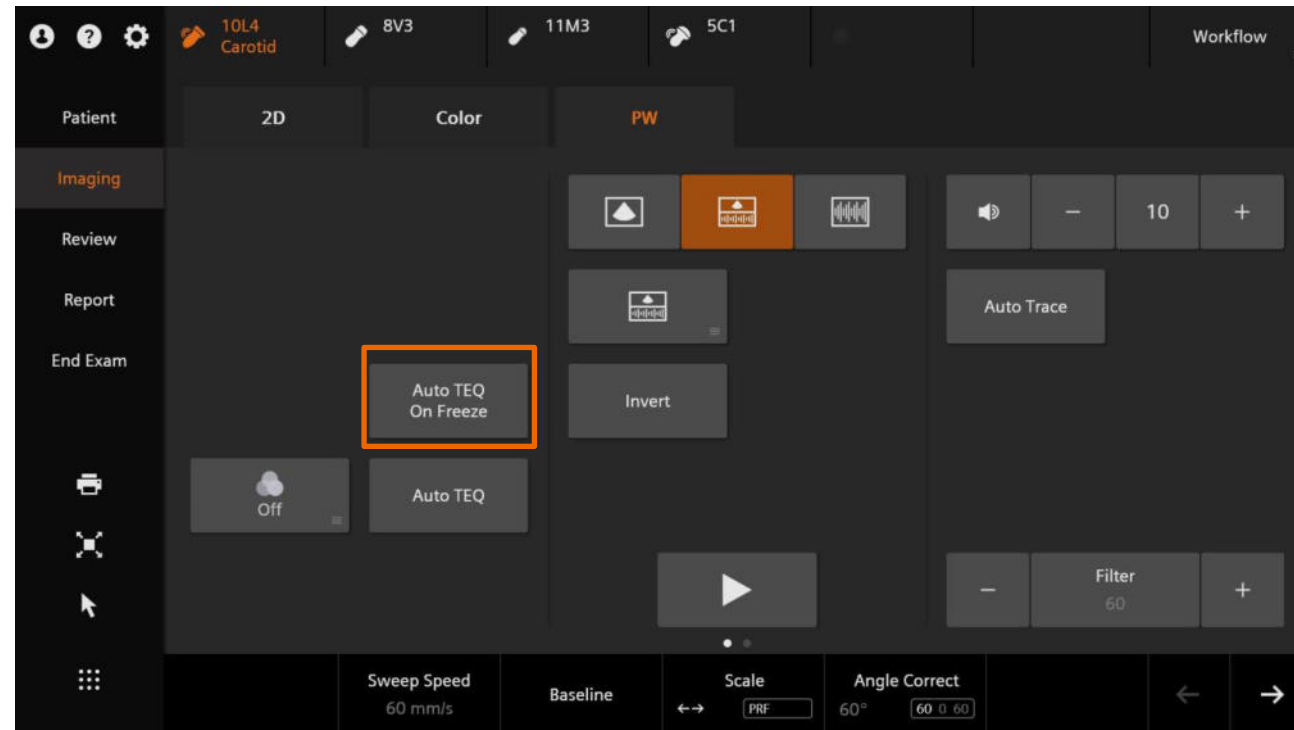
CW: **Medium**



# Auto TEQ on Freeze Touch Screen

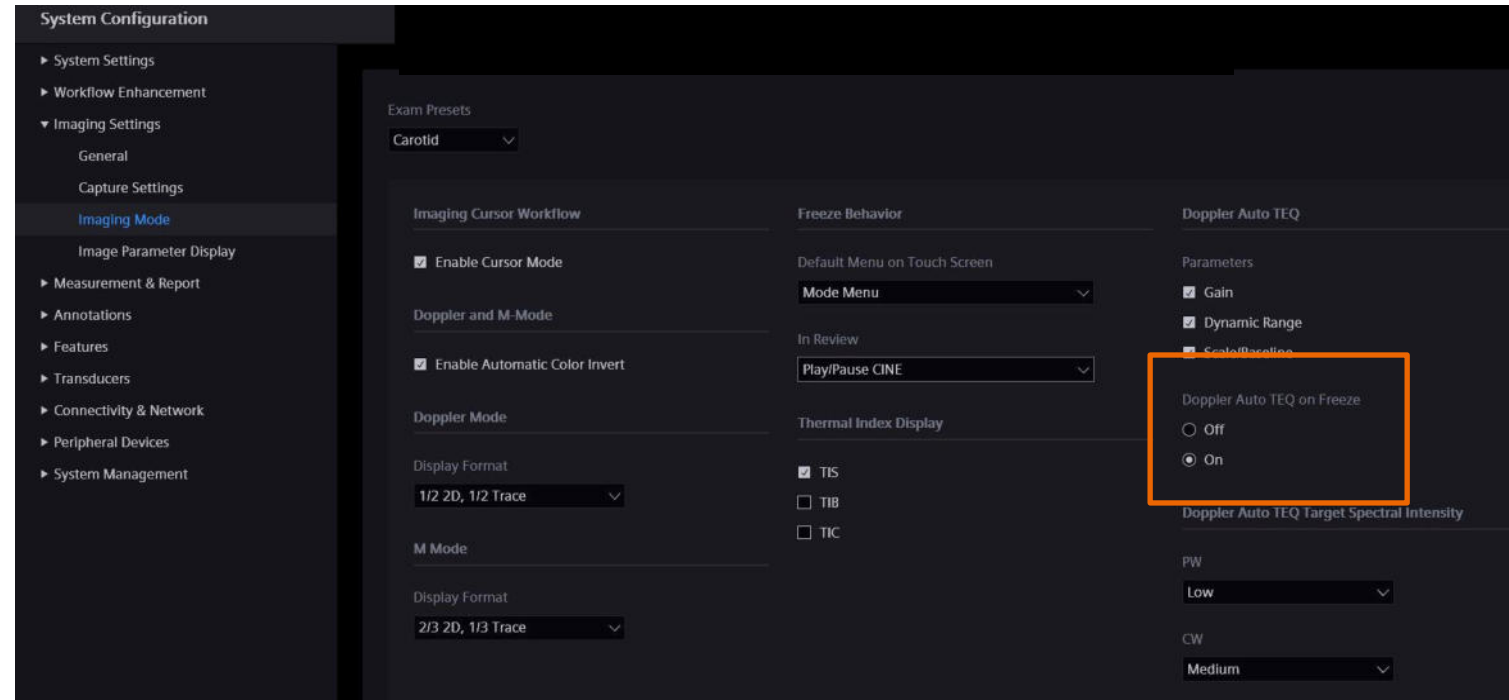
Touch Screen PW Mode  
Button will only appear  
when Doppler TEQ on  
freeze is *turned on*

- When feature is activated: scale and baseline will automatically optimize on freeze
- When the feature is not activated: scale and baseline is set by user and remain unchanged after freeze



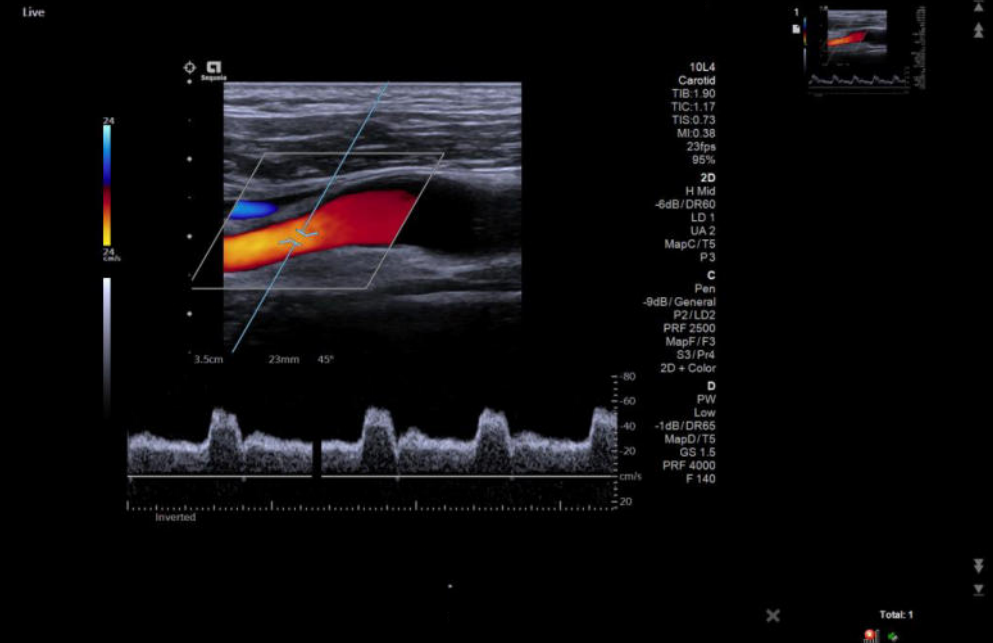
# Doppler Auto TEQ on Freeze

- There is the option to pause Auto TEQ on Freeze
- System Configuration > Imaging Settings > Imaging Mode > Imaging Settings > Imaging Mode > doppler Auto TEQ on Freeze

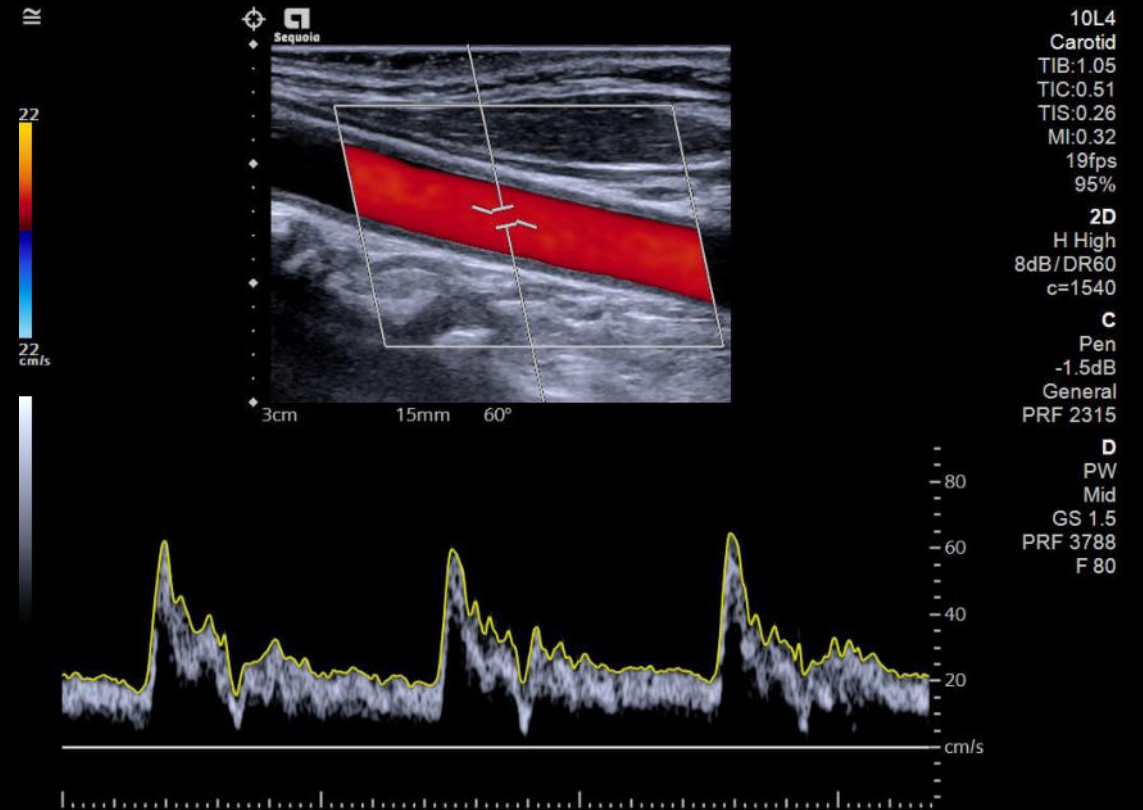
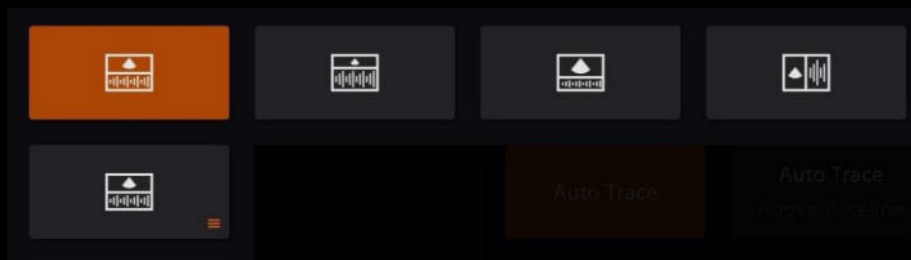
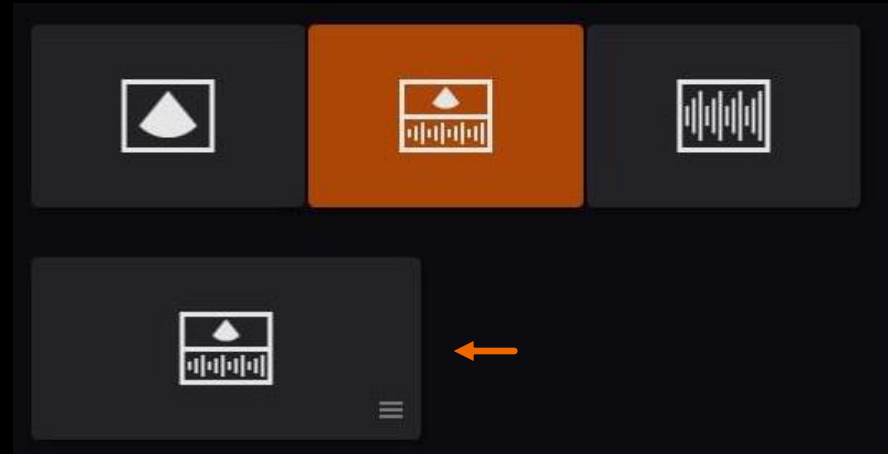


# Live/Live (triplex)

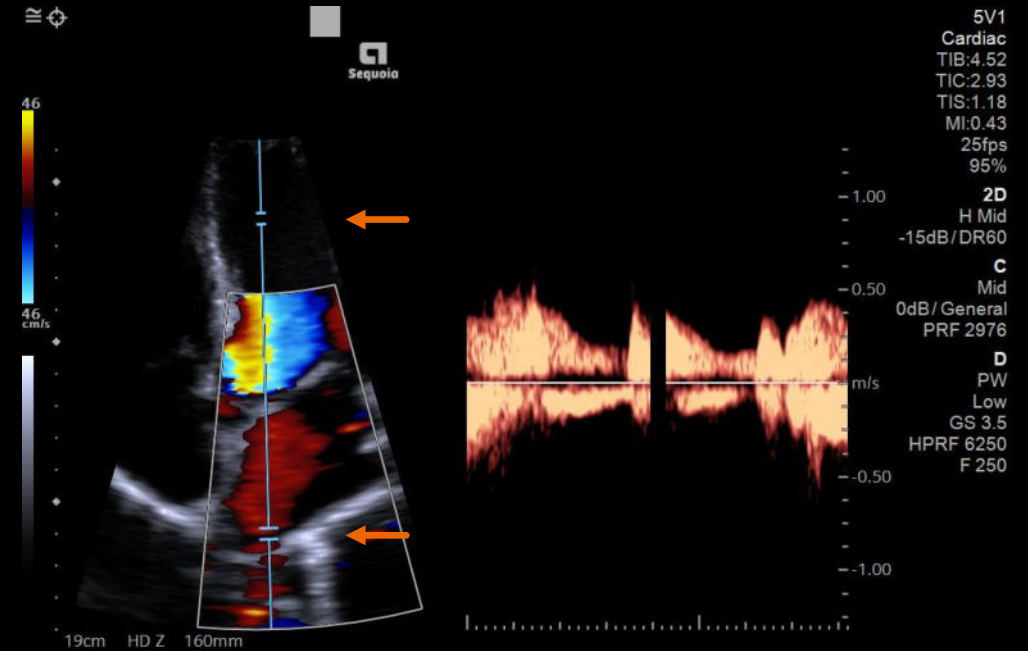
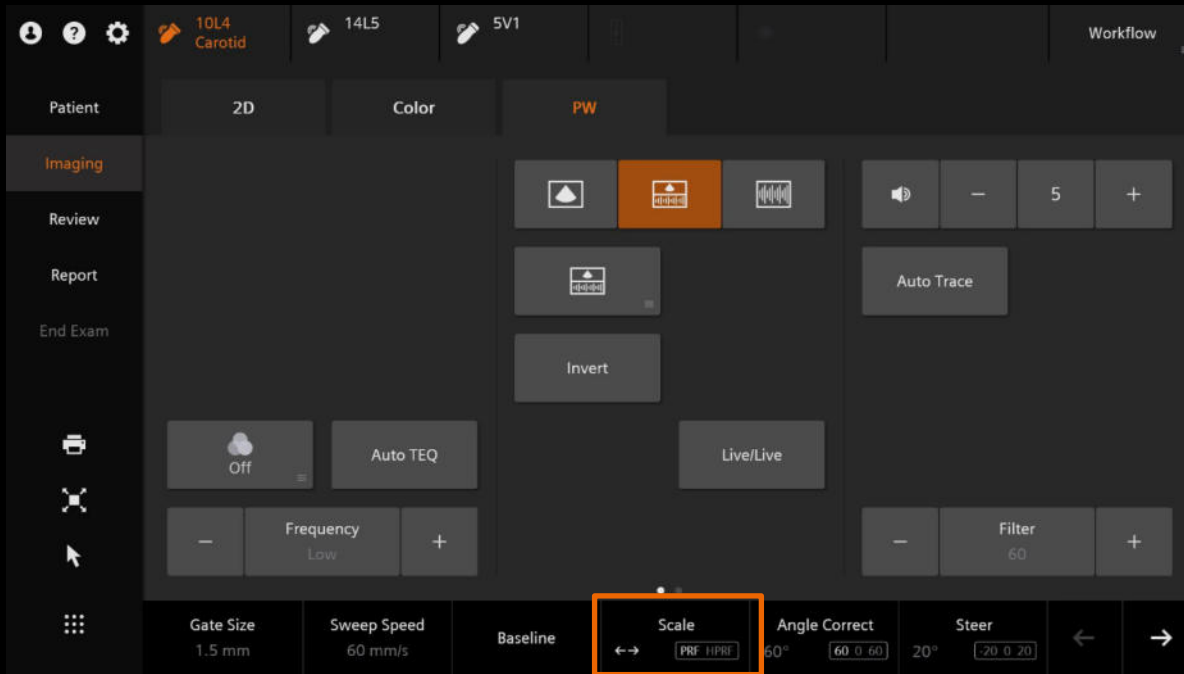
The image shows a Siemens ultrasound control panel. At the top, there are patient and exam identifiers: '5C1 Abdomen', '18L6', '15L4', and '9C2'. Below these are tabs for 'Patient', '2D', 'Color', and 'PW'. The 'PW' (Pulsed Wave) mode is currently selected. In the 'Imaging' section, the 'Live/Live' button is highlighted with an orange border. Other buttons include 'Auto TEQ On Freeze', 'Auto TEQ', 'Invert', 'Auto Trace', 'Frequency', and 'Filter'. At the bottom, there are settings for 'Gate Size' (2 mm), 'Sweep Speed' (60 mm/s), 'Baseline', 'Scale' (PRF: HPRF), and 'Angle Correct' (0°).



# Display modes

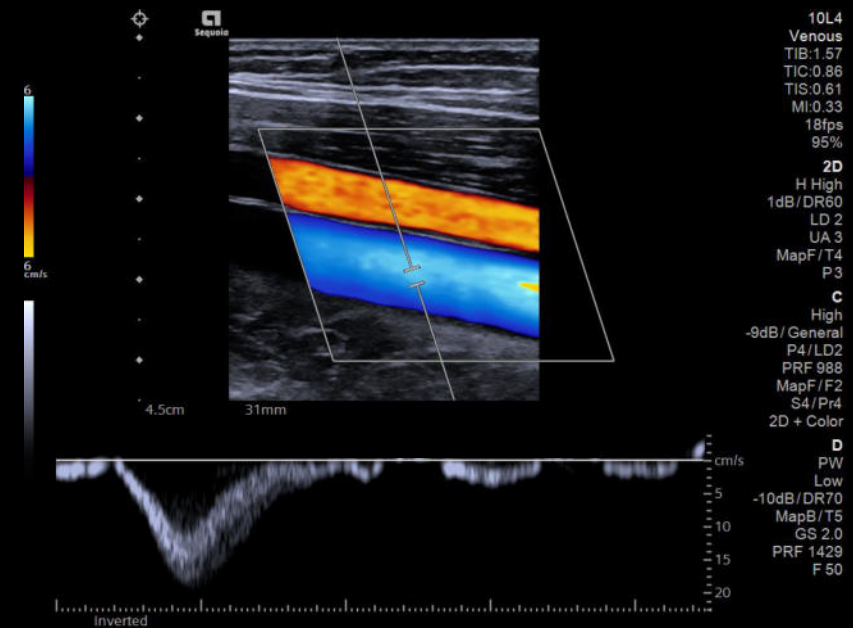


# HPRF – High pulse repetition frequency



# Doppler post-processing

- 2D/PW Gain
- Scale
- Baseline
- Invert
- Angle Correct
- Edge
- Auto Trace
- Ultra Art
- Sweep Speed
- Dynamic Range
- Maps
- Tints
- Format (1/3-2/3, side-by-side, 2/3-1/3, 1/2-1/2)



# Trademarks and disclaimers

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Thank you for your enthusiasm!

# Questions?