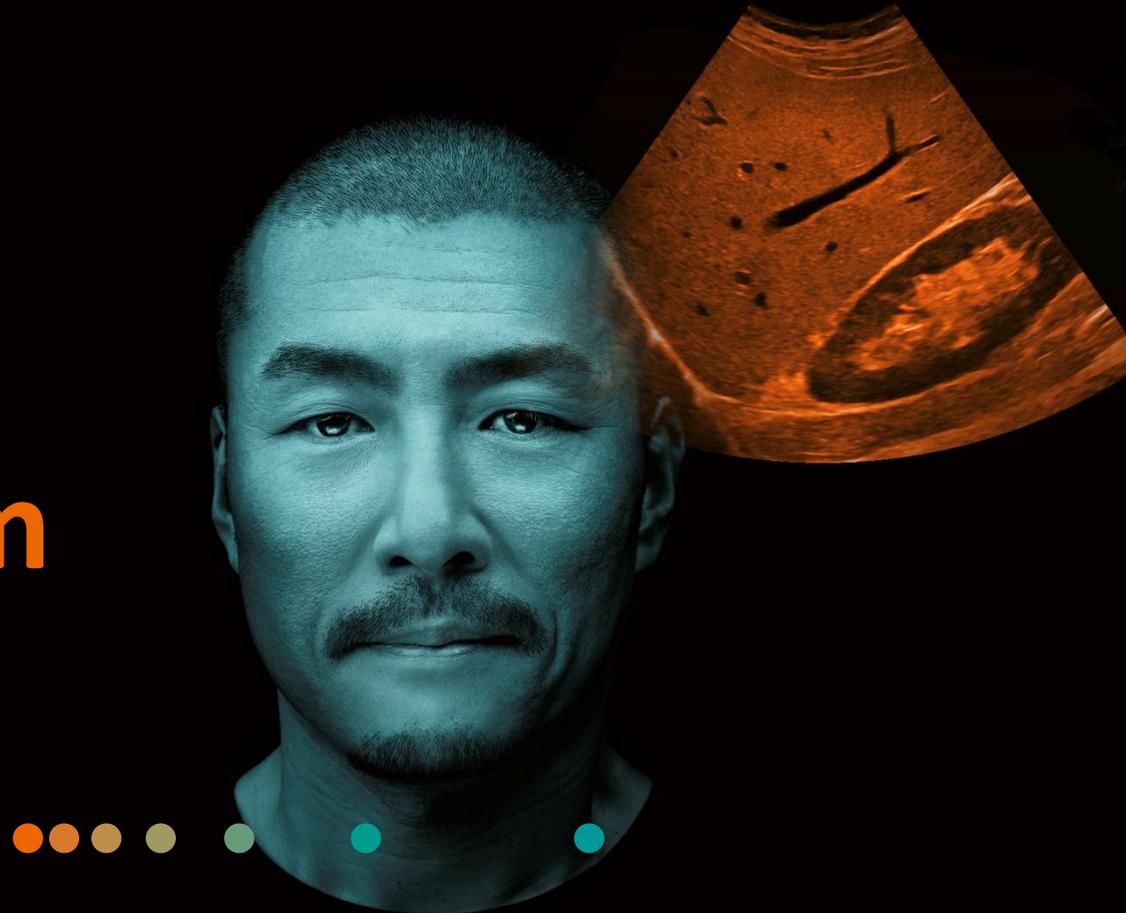# ACUSON Sequoia Ultrasound System
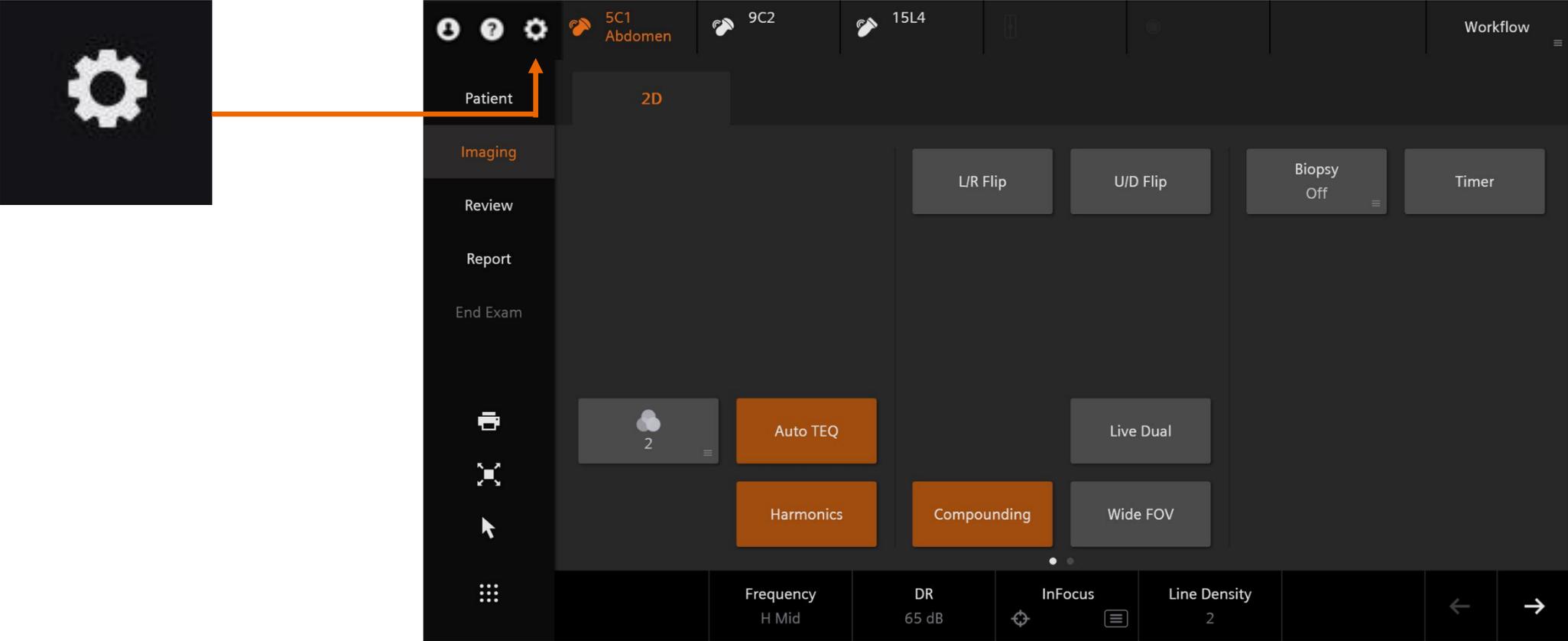
**Measurement Configuration
3.5 (VB30)**

Objectives

- **Identify access to system configuration**

- Outline the measurement subgroup

- Describe the Touch Screen configuration

- Explain custom measurement labels
  - Homepage layout
  - What is DICOM SR?
  - Steps to define a custom label
  - Create a new custom label

- Describe Custom Calculations

- Discuss the OB tables

- Review the report

Measurement configuration access

Measurement & Report configuration home page

Objectives

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Measurement subgroup General tab

System wide settings for:

- Dotted line between calipers
- Heart rate tool
- Show negative symbol
- Measurement Display Area (MDA) configuration
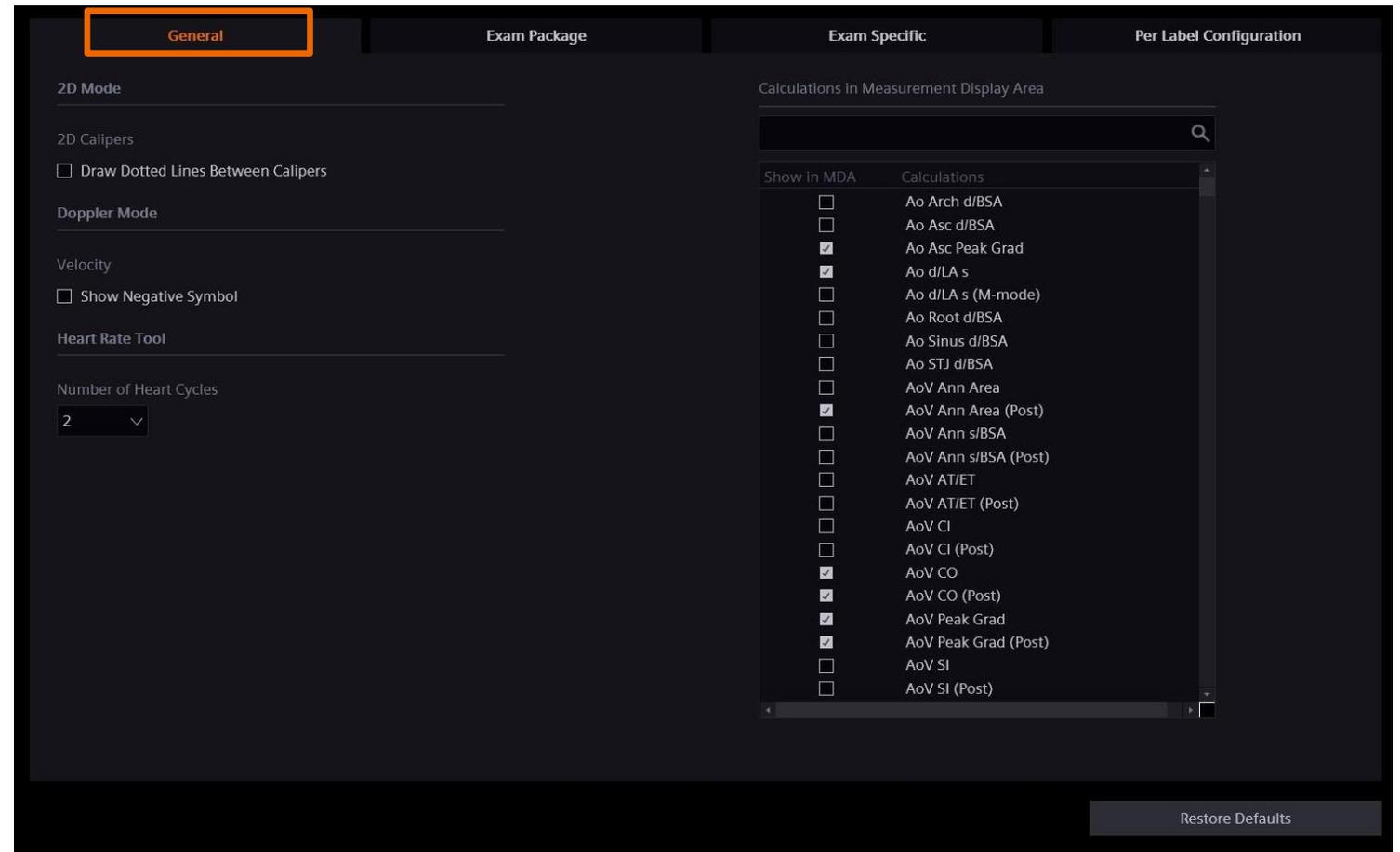
Measurement subgroup
Exam Package tab

Individual exam package settings for:

- Cine measurement behavior
- 2D measurement tool type
- Doppler default tool type
- Volume Flow Tool
- Individual label precision and unit

Measurement subgroup Exam Specific tab

OB exam options for:

- Date display types (screen)
- Standard deviation
- Ratio display types (report)
- Measurement tool types
- Auto OB

Prostate specific gravity options

- 1.0
- 1.05

Carotid Ratio default selections
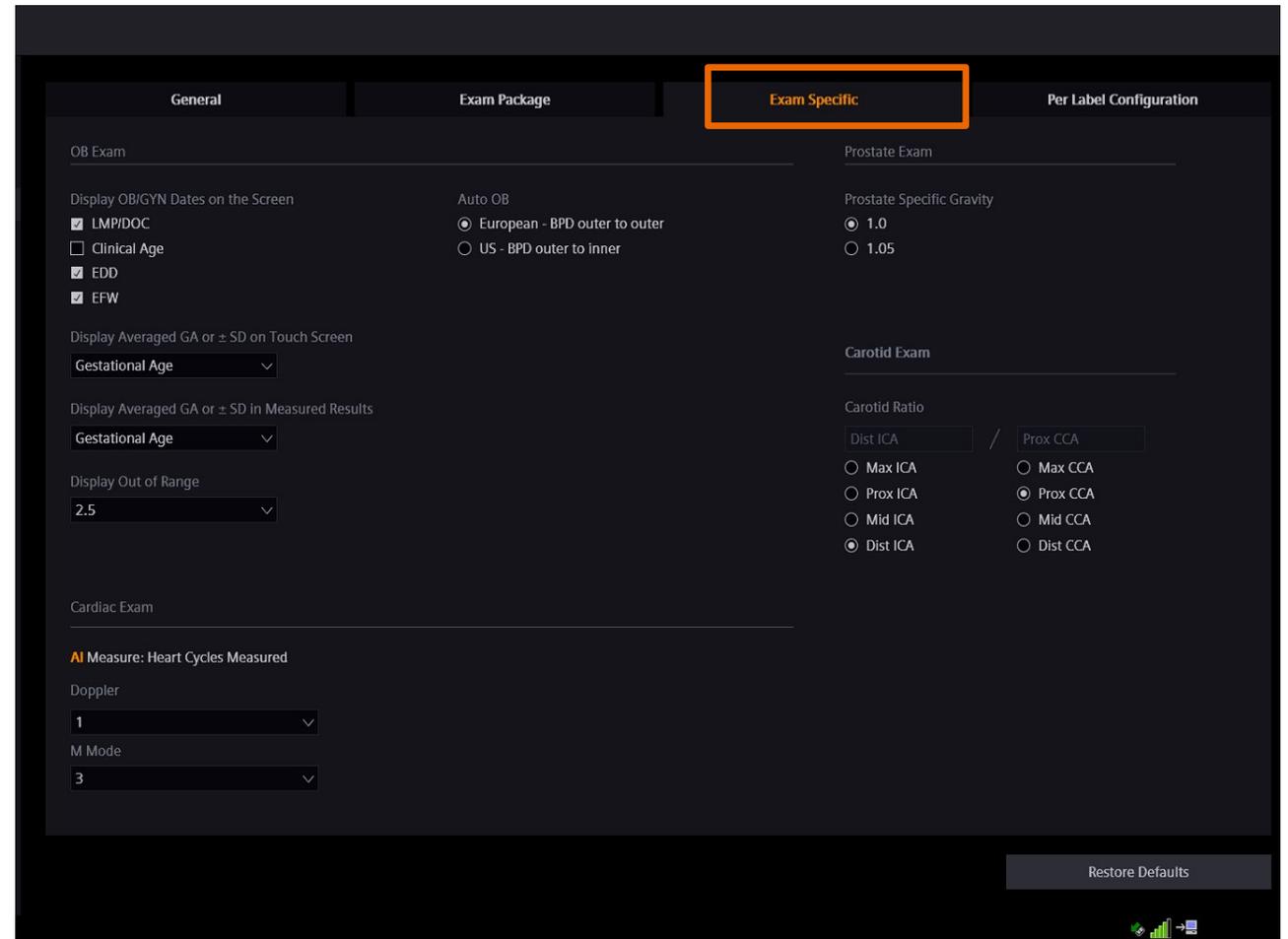
Measurement subgroup Per Label Configuration

Labels can be configured on an individual basis for

- Unit

- Precision

- Default tool type

- Method (Last, Max, Mean, Average)

- Show/Hide in MDA

Use Find Similar Labels option to change multiple labels to the same settings.
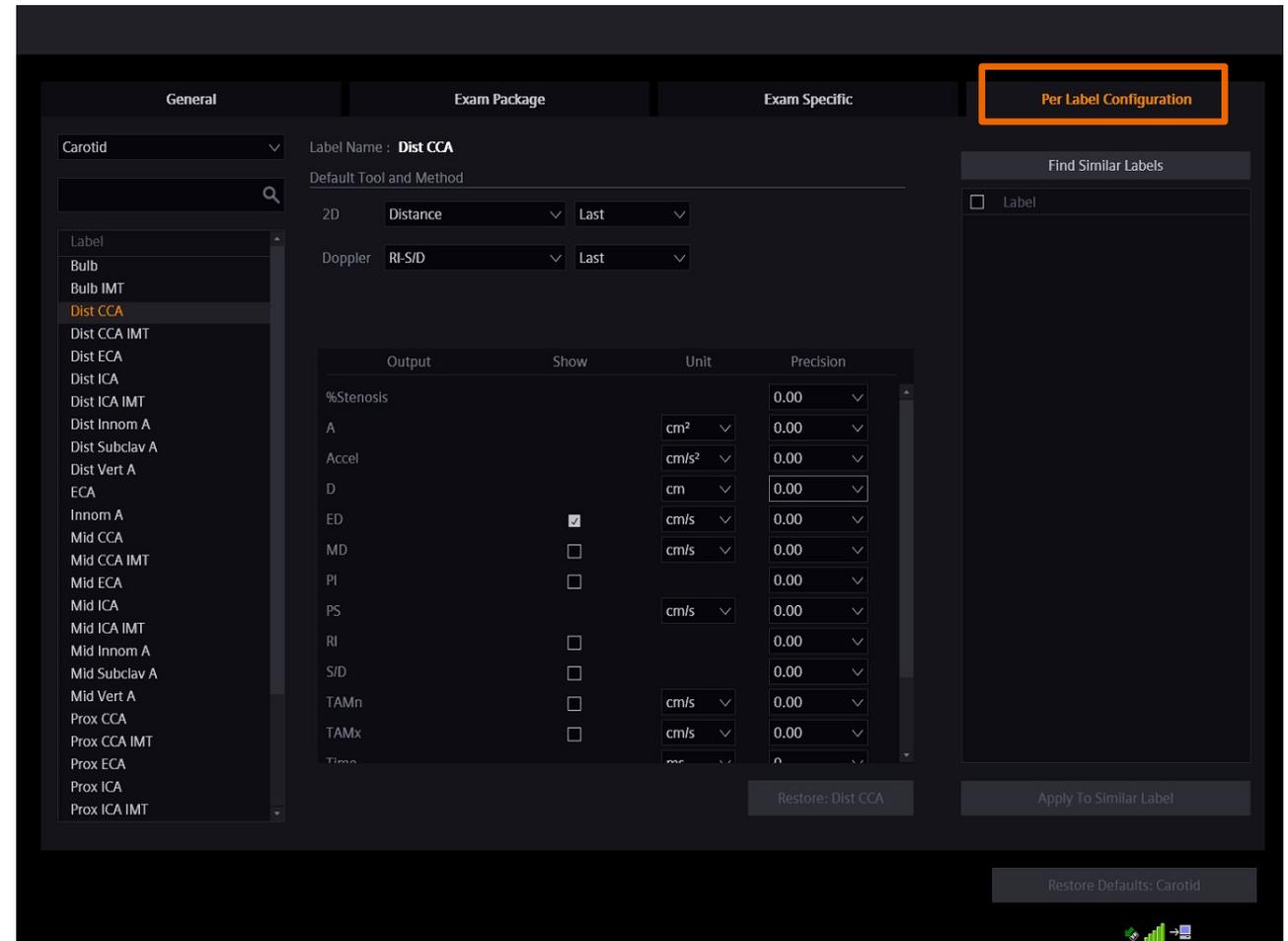
Objectives

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Touch Screen Measurement Config

Touch Screen Measurement Config
GI example

Touch Screen mode

Exam type

Label search field

Touch Screen layout grid

Master list of label options

Add new page

Specialized measurement groups
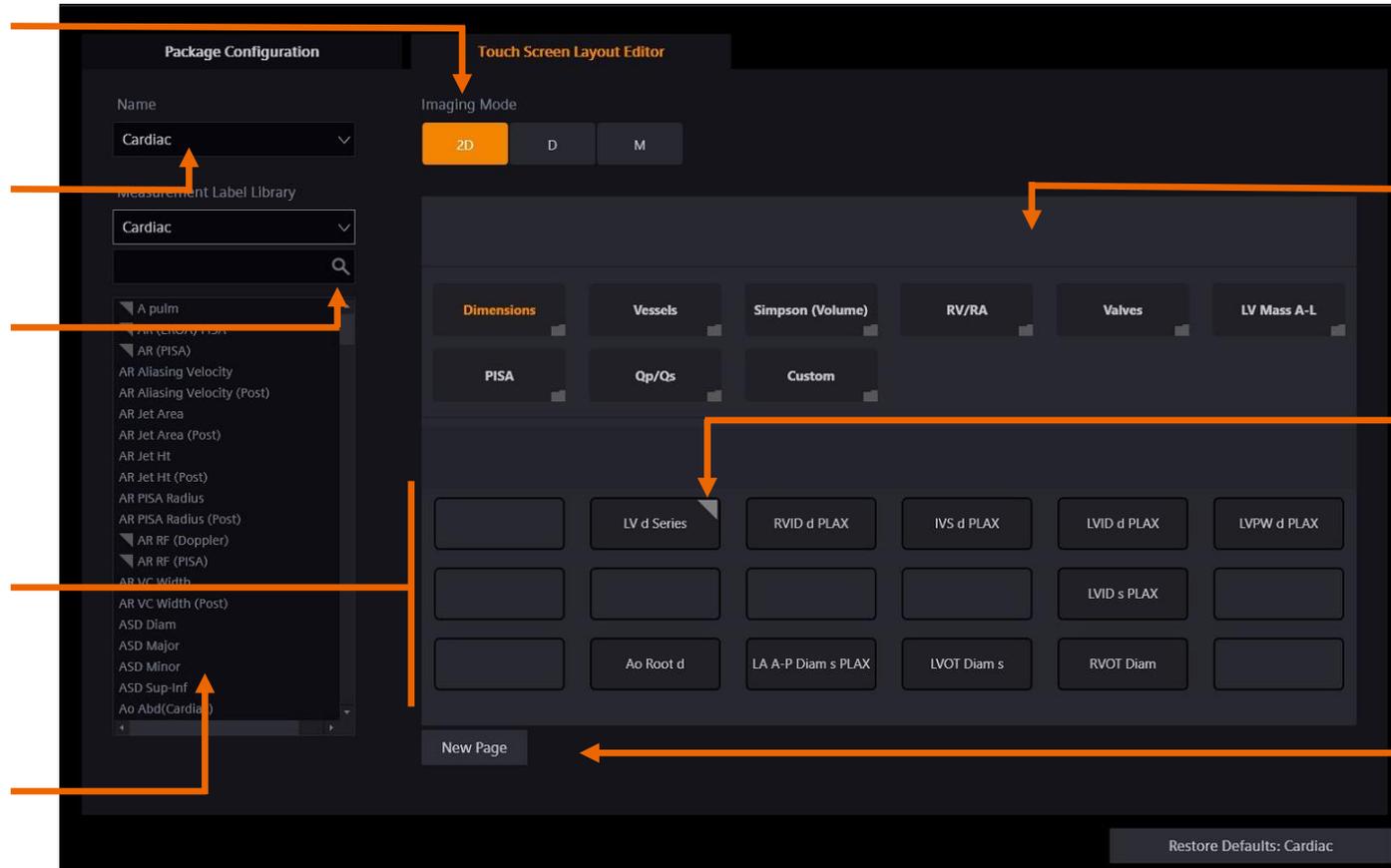
Sub-groups

Indicates a folder of measurements (i.e., volume)

Restore defaults

Package Configuration

Touch Screen Layout Editor

Name

Abdomen

Measurement Label Library

Abdomen

AAA
AAA
AAA (Post Repair)
AAA (Post Repair)
AAA AP Diam
AAA AP Diam (Post Repair)
AAA Sac Length
AAA Sac Length (Post Repair)
AAA Trans Diam
AAA Trans Diam (Post Repair)
AAA dist from SMA
ARA Origin
Ao Bif (Post Repair)
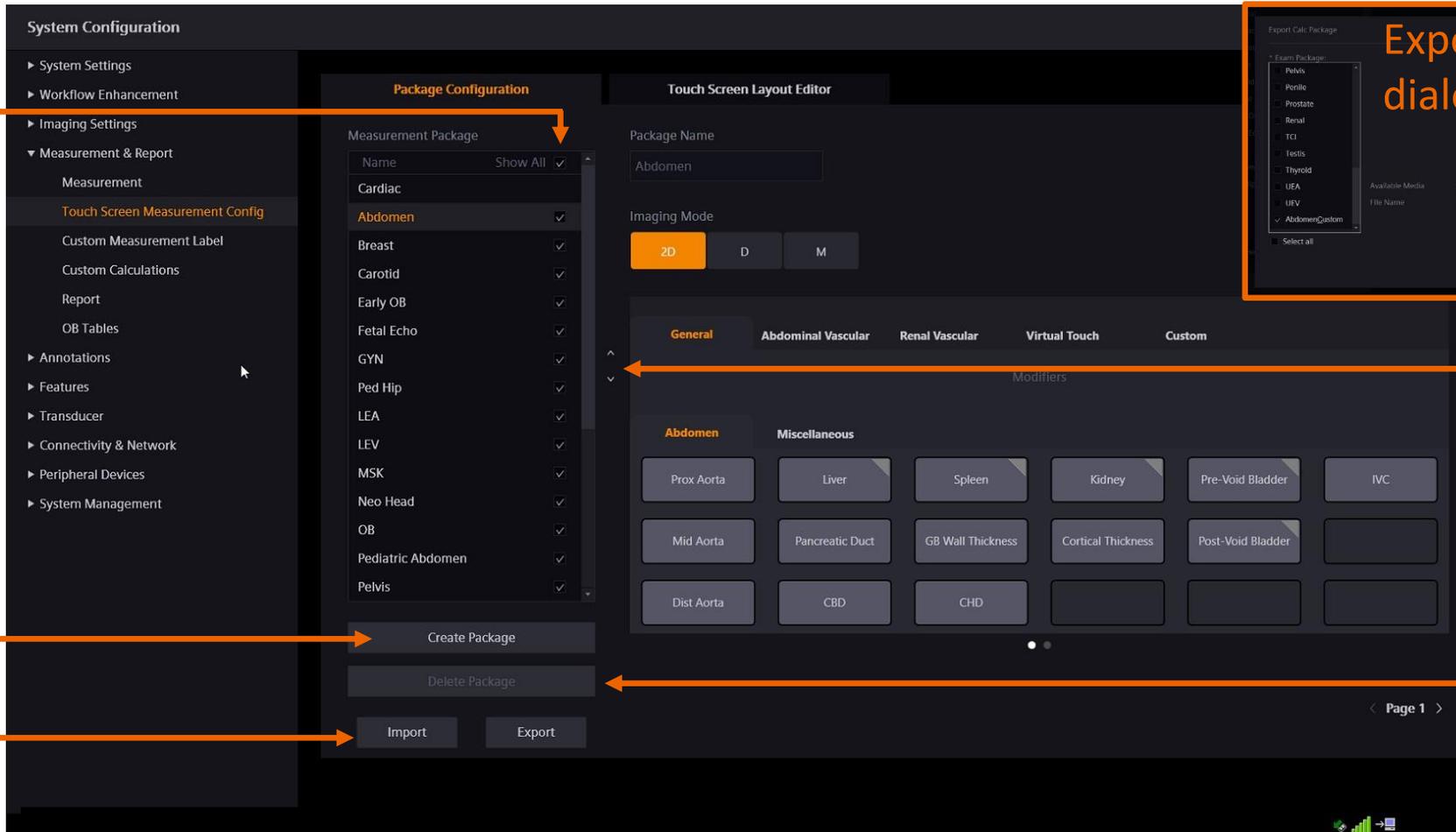Ao Bif AP Diam
Ao Bif AP Diam (Post Repair)
Ao Bif Trans Diam
Ao Bif Trans Diam (Post Repair)
Ao Bifurcation
Art Anast
CBD

Imaging Mode

| 2D | D | M |

| General | Abdominal Vascular | Renal Vascular | Virtual Touch | Custom |

Modifiers

| Abdomen | Miscellaneous |

Prox Aorta	Liver	Spleen	Kidney	Pre-Void Bladder	IVC
Mid Aorta	Pancreatic Duct	GB Wall Thickness	Cortical Thickness	Post-Void Bladder	
Dist Aorta	CBD	CHD			

New Page

Page 1

Restore Defaults: Abdomen

Touch Screen Measurement Config
Cardiac example

Touch Screen Measurement Config Moving labels

To move a label to different blank location on the Touch Screen:

- Use the **Pointer** and **Set** key to highlight and "pick up" the label

- Move the label to the new blank location

- Use the **Set** key to "drop" the label in the new location
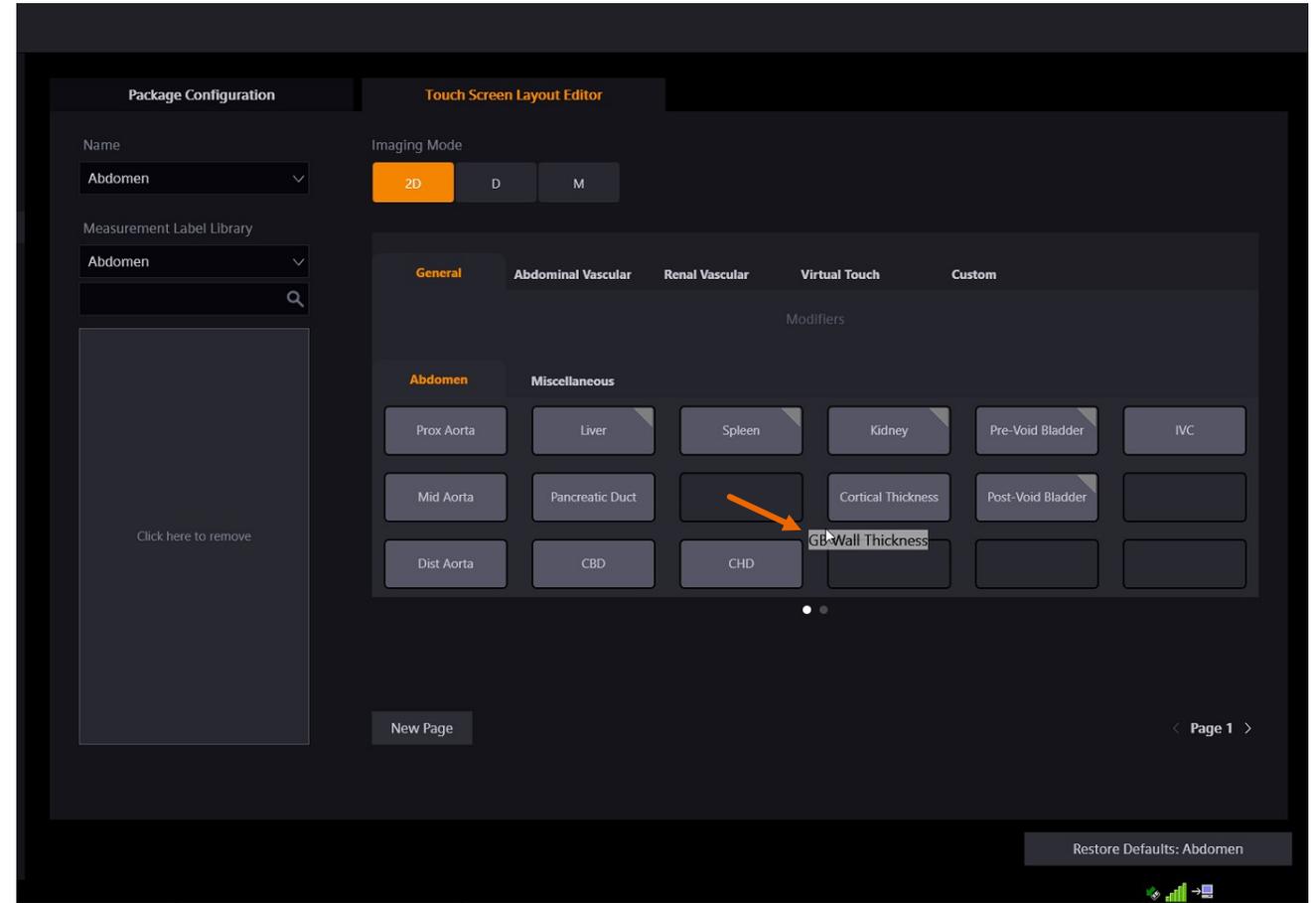
Touch Screen Measurement Config
Removing a label

Two options to remove a label:

- Pick up the label to be removed

- Drag label to master list and drop using the **Set** key, or "Double click" on the Touch Screen label
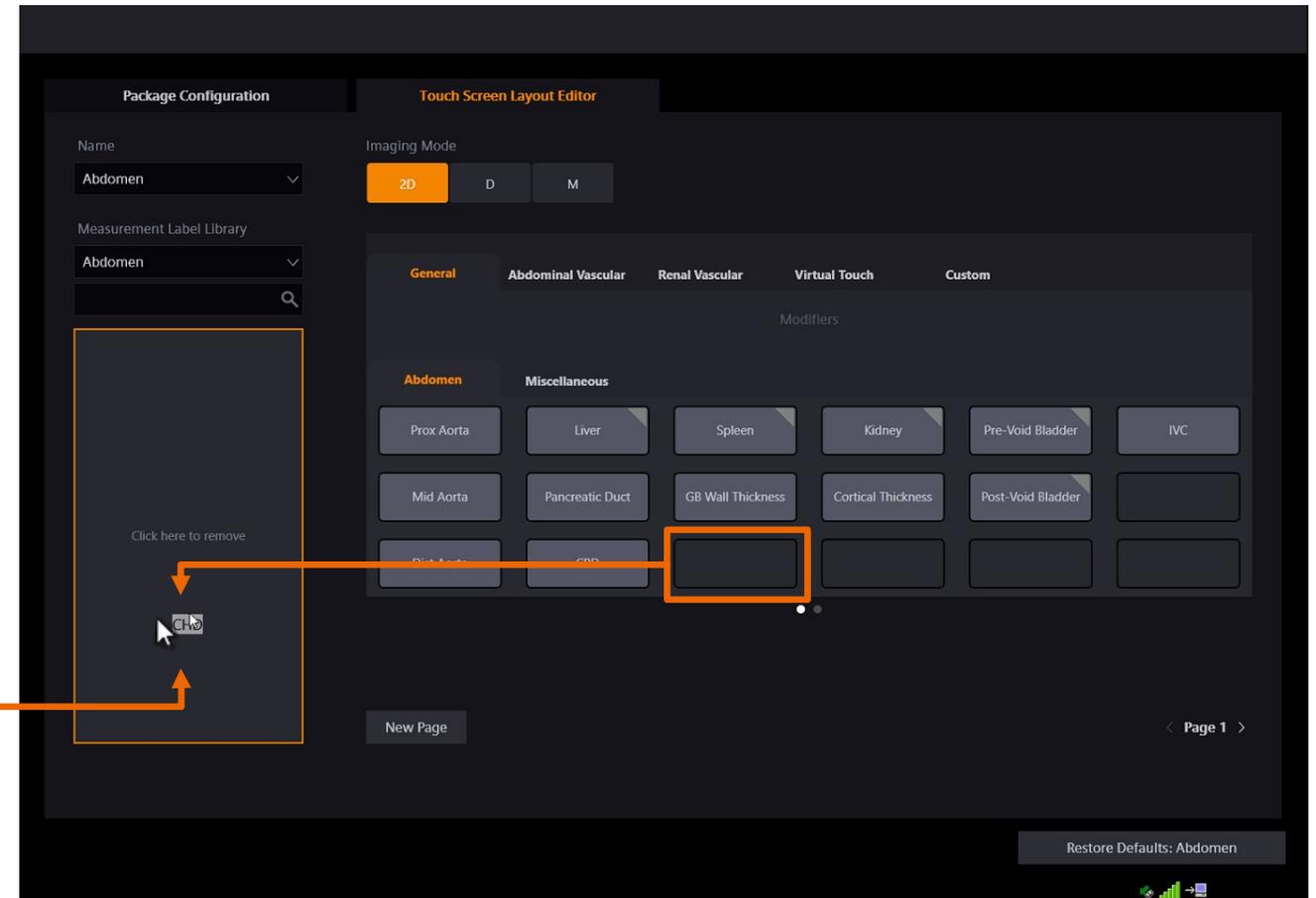
Touch Screen Measurement Config
Adding a label

Adding a label:

- Find the desired label in the master list

- Pick up the label using the **Pointer** and **Set** key

- Move to desired location and place the label

To quickly add a label, double-click on the label name in the master list – the label is added to the next available label spot.
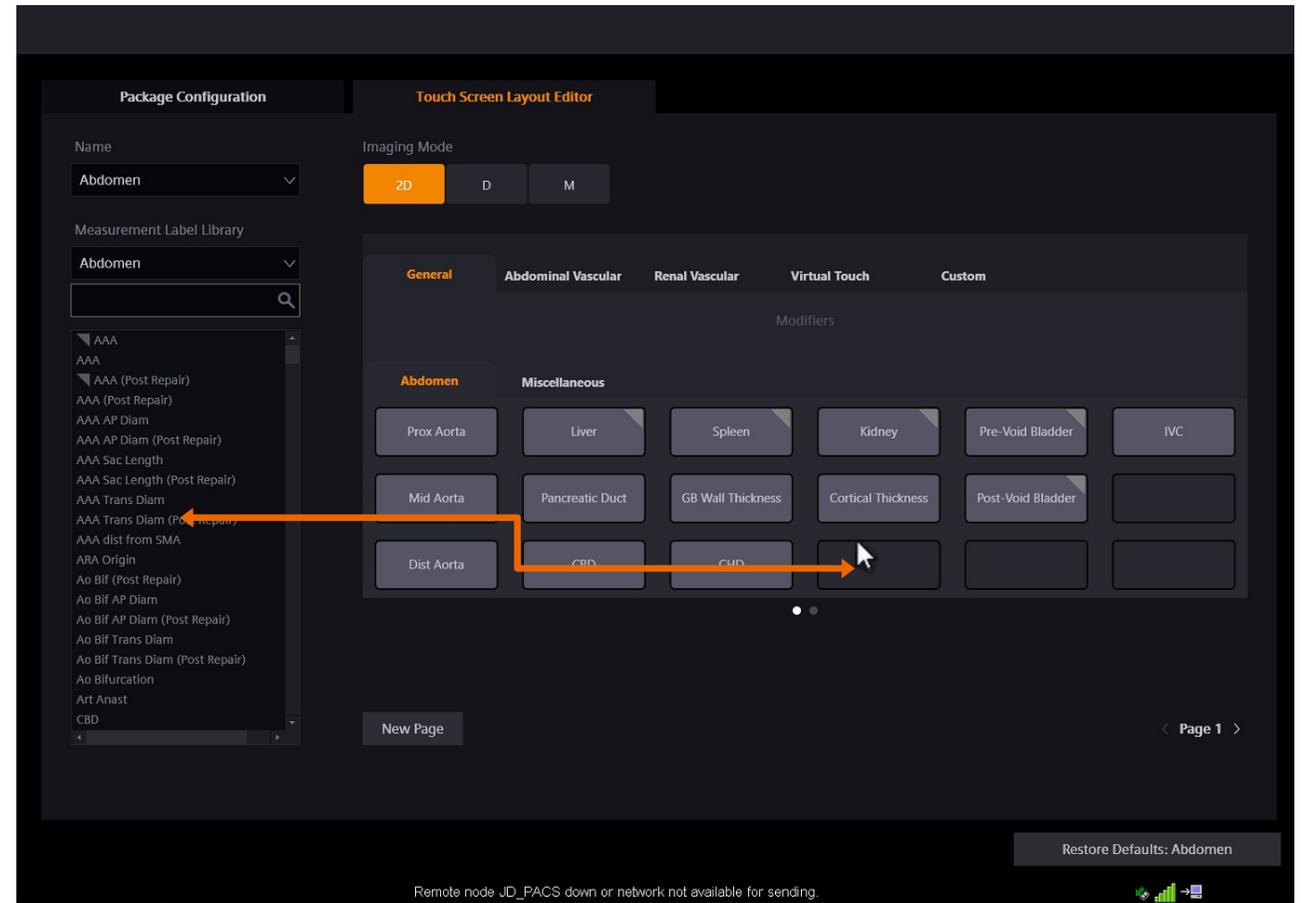
Touch Screen Measurement Config
"Blank" measurement Touch Screens

Not all exam packages have labels populated on the Touch Screen:

- MSK
- Neo Head
- TCI

Custom labels must be created for these exam packages.
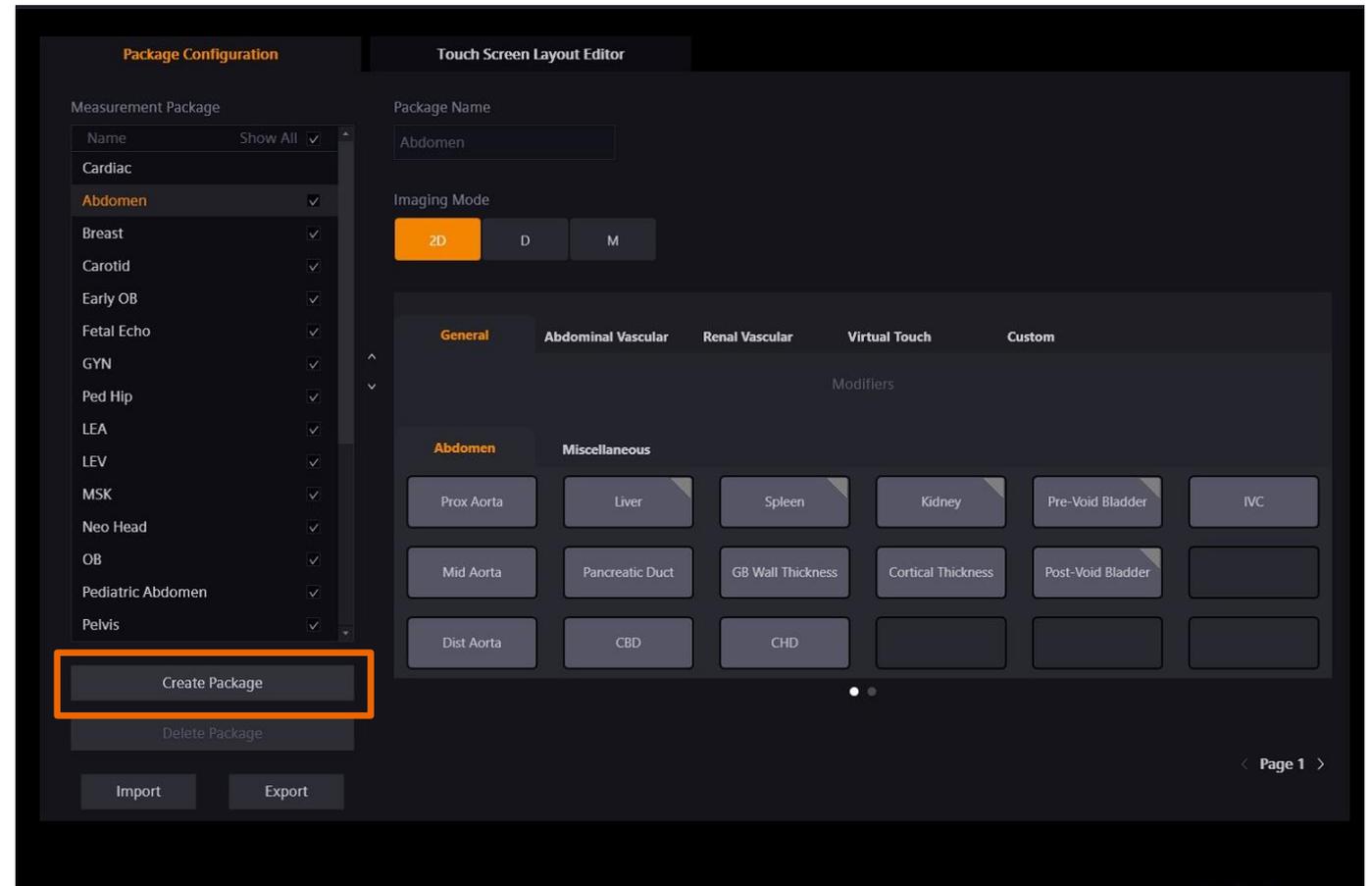
Objectives

- Identify access to system configuration

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- Describe the Touch Screen configuration

- **Explain custom measurement labels**
  - **Homepage layout**
  - What is DICOM SR?
  - Steps to define a custom label
  - Create a new custom label

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Custom measurement label subgroup Homepage layout
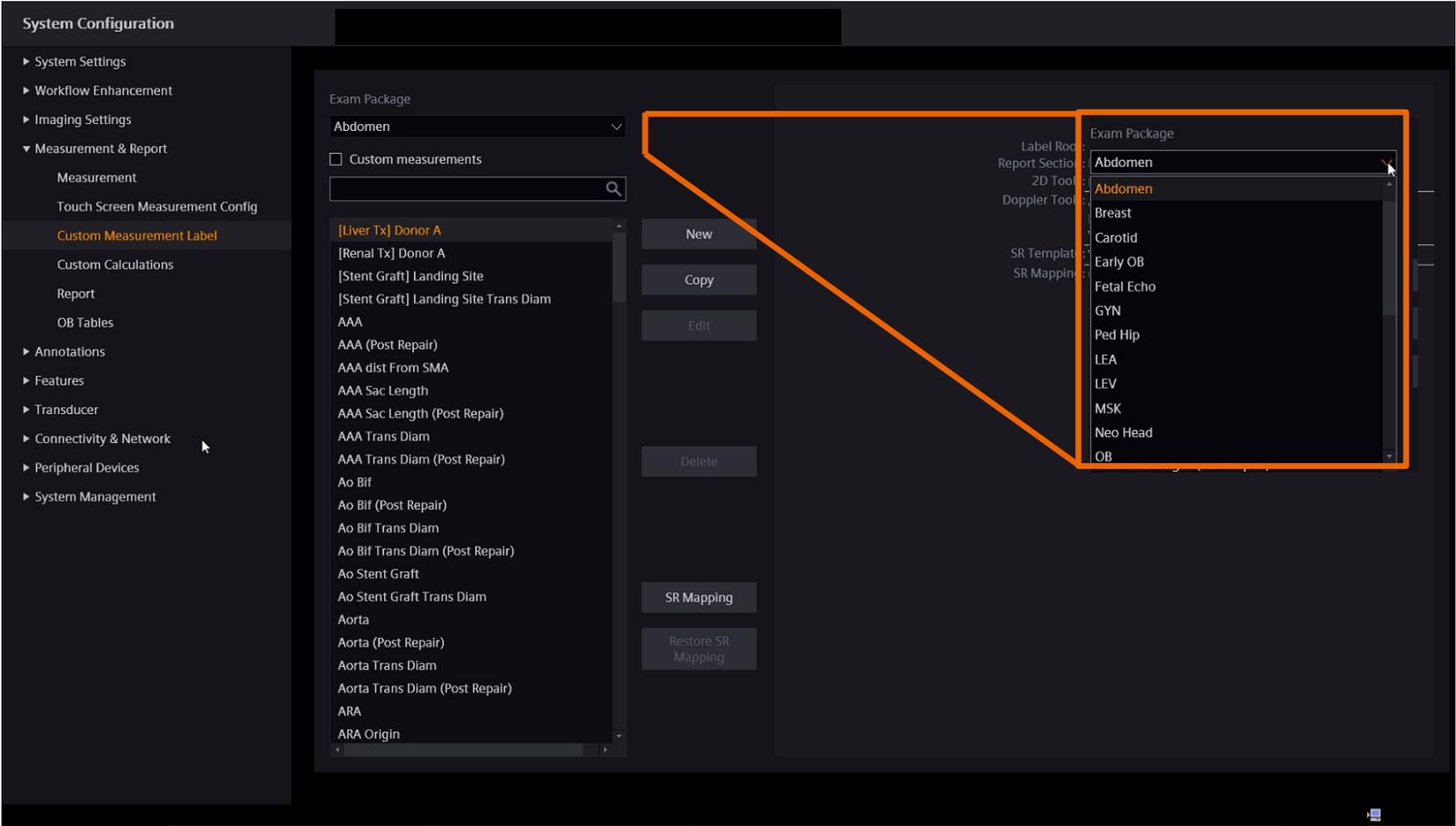
Custom measurement label subgroup
Homepage layout

1. Master list of all labels
2. Label management options
3. Display of label information/content
4. SR Mapping options

Custom measurement label subgroup
Measurement master list display options

1. Measurement list options display

    • All measurements*

    • Custom measurements

    • Exam type

2. Search box will match any part of the name

3. Measurement master list

    • Display is based on selected list (1)

    • Alphabetical, scroll bar to view list

    • Selected label is highlighted in orange
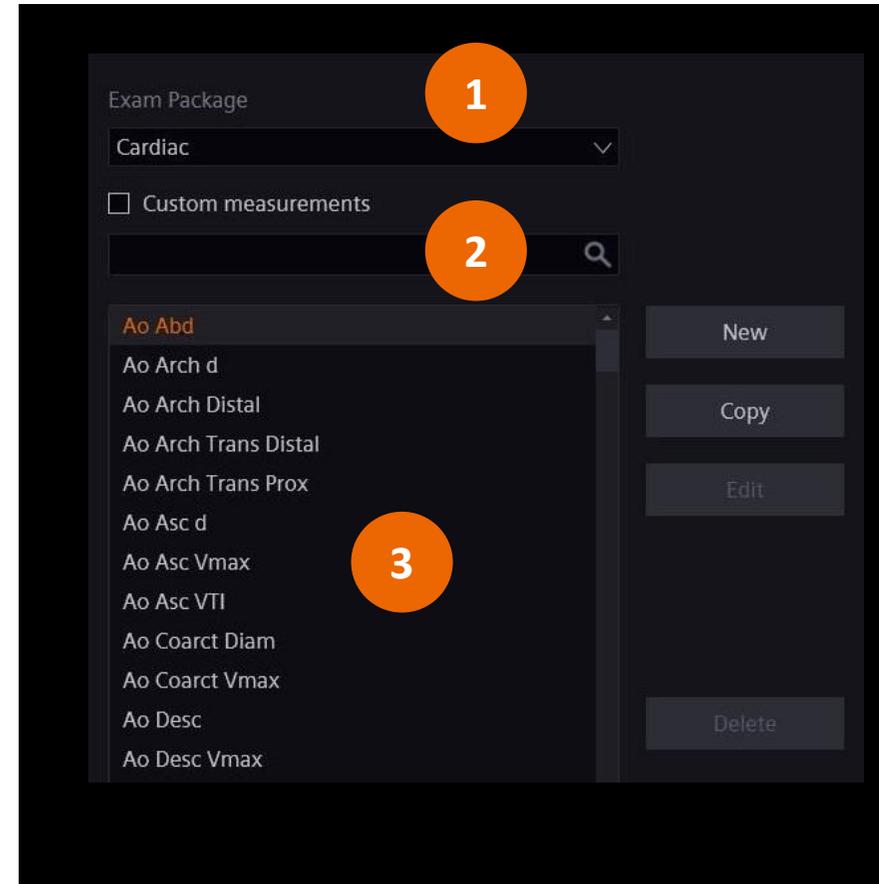
* Virtual Touch applications, Amniotic Fluid Index quadrants, Mean Sac Diameter, and
Volumes labels are currently unavailable for custom structured reporting.

Custom measurement label subgroup
Label management options

New

- Create a new custom measurement label

Edit

- Edit the selected custom label

Copy

- Copy a selected factory label

Delete

- Delete a custom label
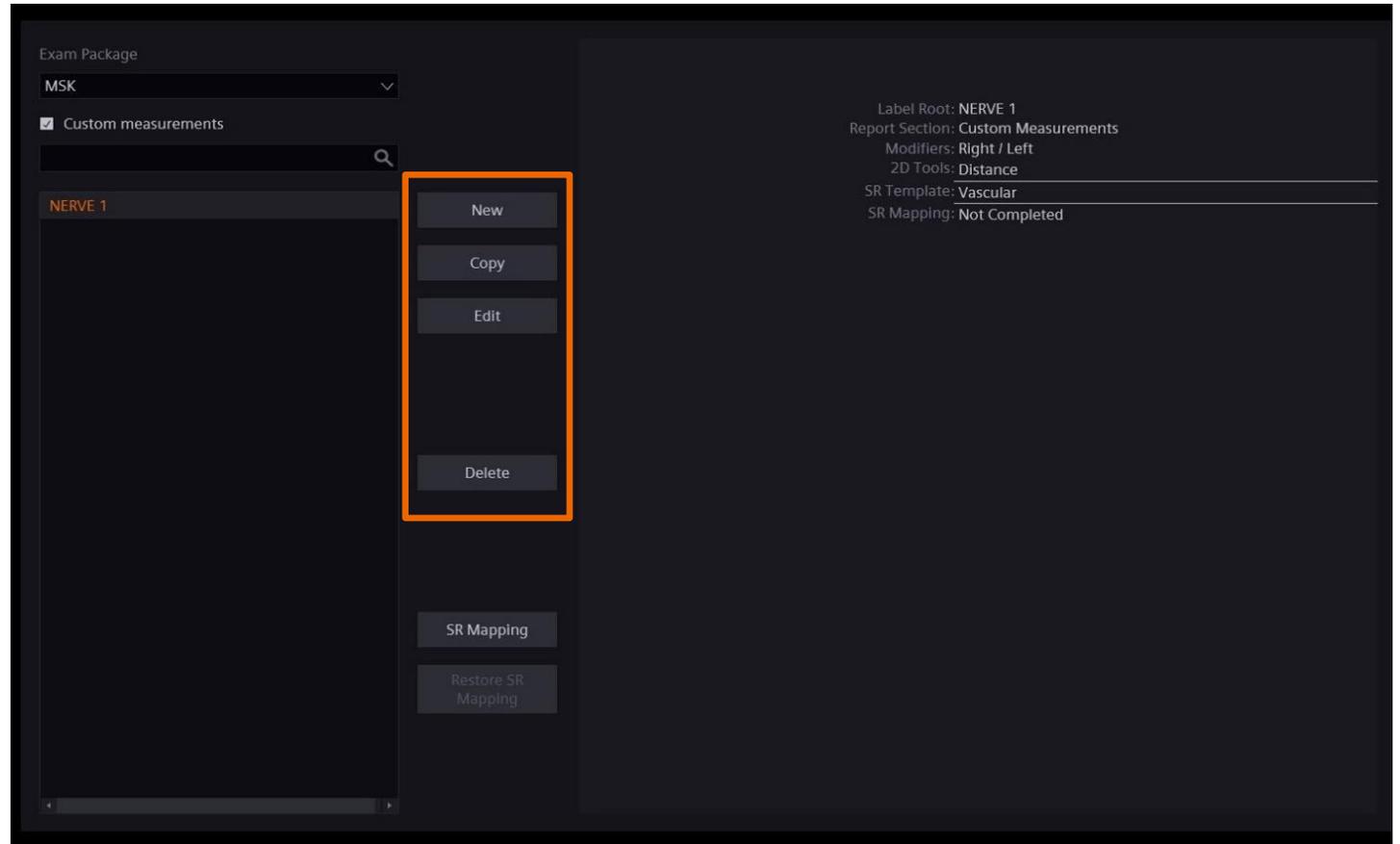
Custom measurement label subgroup
Label information

- Highlighting a label displays a summary of the measurement information

- Use as a quick reference for mode types, attached modifiers, tool types, or report section location

- Displays general SR mapping information

Custom measurement label subgroup
Other available functions

Other available functions include:

- SR Mapping "quick access" key

- Restore label defaults to any factory label that has been modified
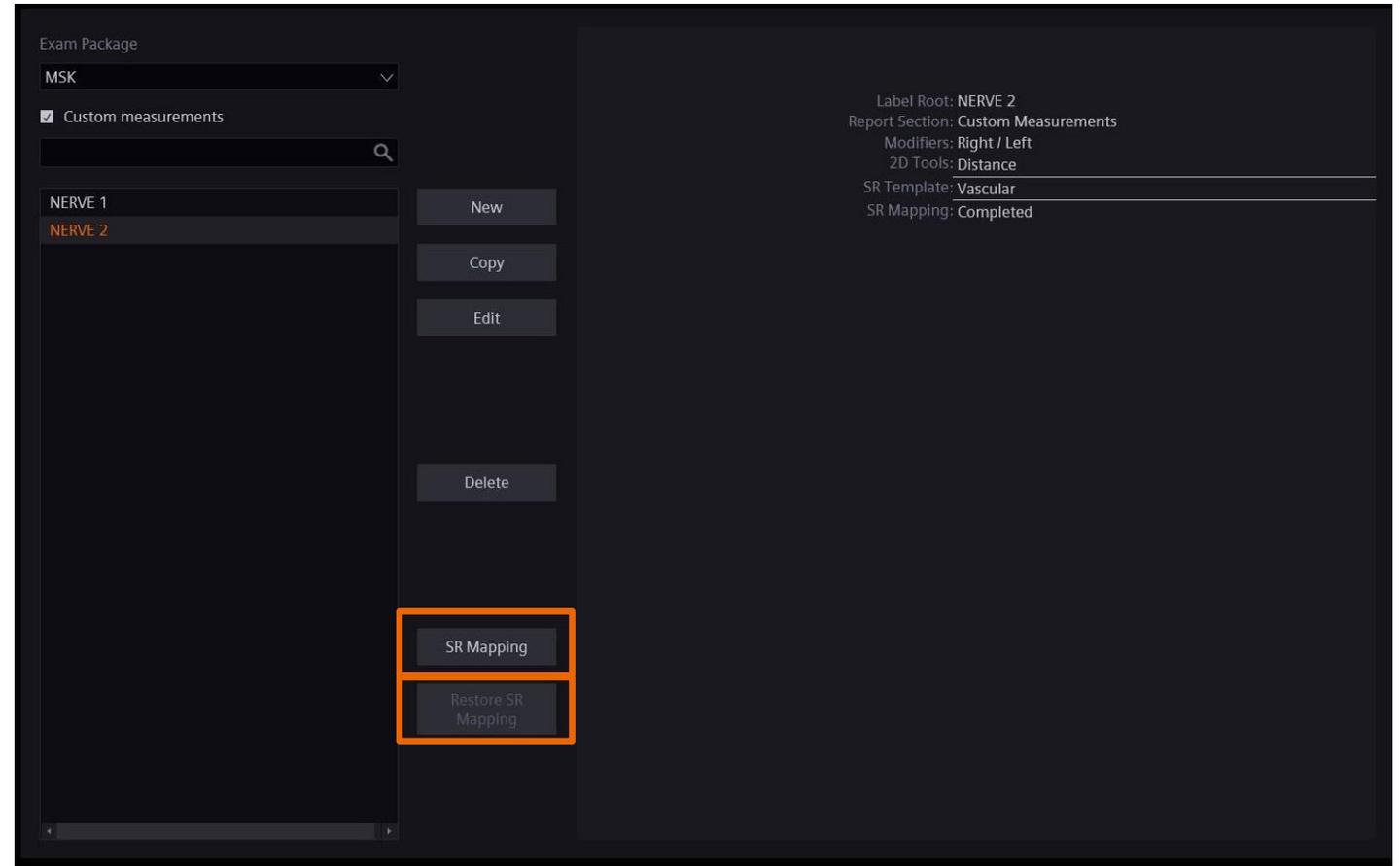
Objectives

- Identify access to system configuration

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What is DICOM and DICOM Structured Reporting (SR)?

DICOM is an acronym for *Digital Imaging and COmmunications in Medicine*

DICOM was the result of manufacturers and users of radiological imaging equipment attempting to standardize image exchange between different systems.

This included:

- Storage of the images and all relevant information
- A network transfer mechanism

These specifications became the DICOM Standard.

The development of DICOM Structured Reporting (SR) was an extension of the initial standard; it was created to help communicate non-imaging information, such as measurements or post-processing results, in a standardized way.

What is a DICOM Structured Report (SR)?

A DICOM SR is *not*:

- A report that can be printed "as is" on the ultrasound system or offline printer

- The customized reporting package

- An "off the shelf" (or predefined) product

A DICOM SR **is**

- A document consisting of structured or mapped data that defines the file content and organization for ultrasound procedure reports

This data is read by a PACS or offline workstation but requires additional software to translate the data into a format that can be printed as a tangible report.

Ultimately, a DICOM SR is a highly organized transfer mechanism between the ultrasound system and PACS or workstation.

DICOM SR and the ACUSON Sequoia Ultrasound System

Why is DICOM SR important to the ACUSON Sequoia ultrasound system?

In system configuration, the ACUSON Sequoia ultrasound system will allow the user to define custom measurements and associate a custom SR mapping to it.

This custom data can be transferred as a SR if it matches the mapping expected by the PACS/Offline reporting package.

Expected "mapping" behavior is only achieved if during the creation/mapping of a new measurement label the user follows the DICOM SR template structure.

If the template structure is not followed, the measurement data will not be displayed in an SR, as the PACS or offline workstation will not be able to "read" the data.

DICOM SR template data components

The DICOM SR template has a specific set of rules for "coding" data for a readable transfer.

The ultrasound data is constructed in sections (or "containers") based on anatomy, which are further separated into "concept names".
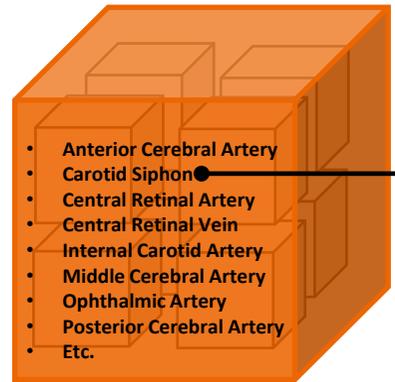
Each concept name is associated with a coded "result" which defines the specifics of that result – measurements and other data – within that concept name.

There are four templates supported by the DICOM standard for ultrasound. They are:

- OB/Gyn

- Vascular

- Adult Echocardiography

- Pediatric and Fetal Echocardiography

DICOM SR template data components

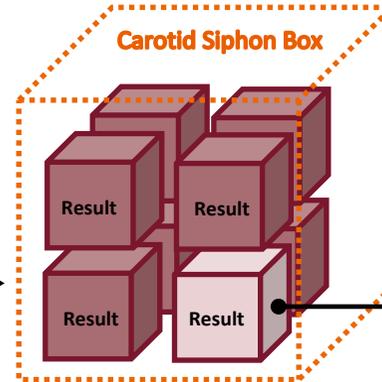| Template ID 5100 Vascular Ultrasound Procedure Report	Structured Reporting "coding" rules

- TID 5103: Blood Vessel of Head, Left
- TID 5103: Blood Vessel of Head, Right
- TID 5103: Blood Vessel of Head, Unilateral
- TID 5103: Artery of Neck, Left
- TID 5103: Artery of Neck, Right
- Etc.

Anterior Cerebral Artery
Carotid Siphon
Central Retinal Artery
Central Retinal Vein
Internal Carotid Artery
Middle Cerebral Artery
Ophthalmic Artery
Posterior Cerebral Artery
Etc.

Section or Container
TID 5103
Blood Vessel of Head, Left

Modifier

Carotid Siphon Box
Result | Result
Result | Result

Concept Names
Example results for
Carotid Siphon such as:
- Peak Systolic Velocity
- End Diastolic Velocity
- Diameter
- Etc.

Peak Systolic Velocity
Coded Entry "Result"
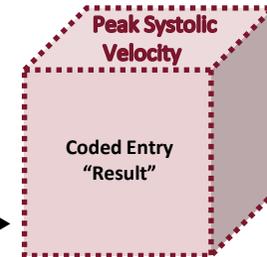
Context ID
Example:
(11726-7, LN, "Peak Systolic Velocity")

Code value   **Coding scheme designator**   **Code meaning**

Objectives

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Defining custom measurement labels
Creating a custom label

To create a custom label, begin by defining the label basics:

1. Label Root (name)

2. Choose exam package

3. Select modifiers (if applicable)

4. Measurement Type

5. Select segments (if applicable)

Defining custom measurement labels
Creating a custom label

Once the name and package basics have been defined, there are three tabs to complete the label parameters:

- Tools

- SR Template

- SR Mapping

Defining custom measurement labels
Creating a custom label – Tools tab

The **Tools** tab defines:

1. Imaging Mode

   • 2D

   • Doppler

   • M-Mode

2. Report Section

3. Measurement tools associated with the chosen imaging mode, i.e., Distance, Area, etc.

4. Label display name options

Use Save All & Close to complete the tool selections.
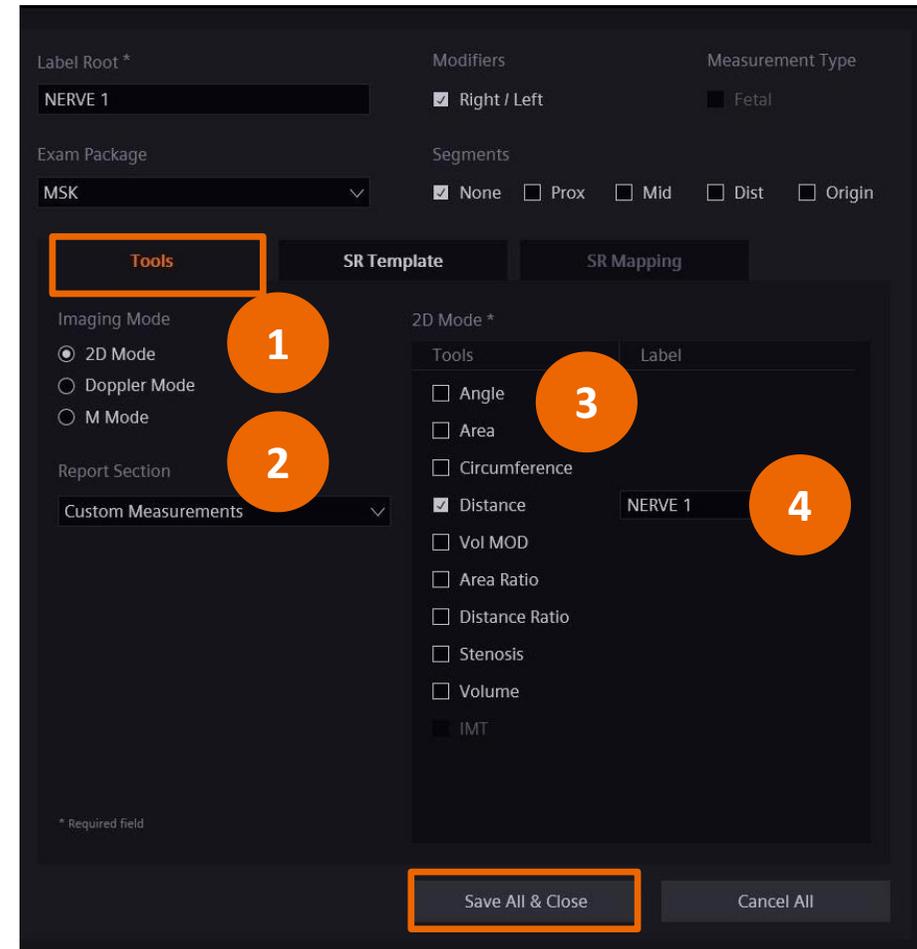
Defining custom measurement labels
Creating a custom label – SR Template tab

SR Template tab defines the:

1. SR Template

2. SR Template Section

3. Anatomy or Vessel

4. Coding Scheme Designator

5. Code Value

Use Save All & Close to complete the SR Template selections.

Defining custom measurement labels
Creating a custom label – SR Template options

Anatomy or Vessel

SR Template Section

Coding Scheme Designator

Code value linked
to Anatomy or
Vessel entry
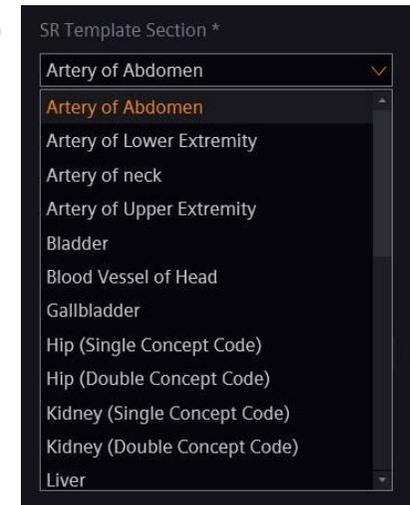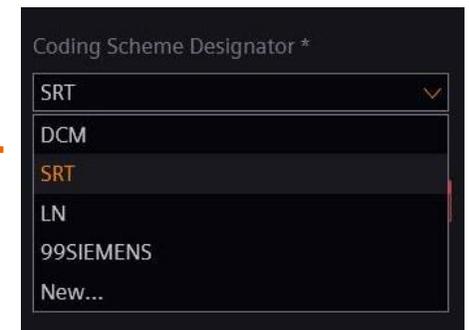
Defining custom measurement labels
Creating a custom label – SR Mapping tab

SR Mapping defines*

1. Tools & Output

2. Text String for SR

3. Concept Code Meaning

4. Coding Scheme Designator

5. Code Value

6. Measurement Orientation

7. Post prandial

Use Save All & Close to complete the SR Mapping selections.

*Options are for GI label coding – additional options for cardiac include Image View, Cardiac Cycle Point, Flow Direction, Finding Site, and Measurement Method
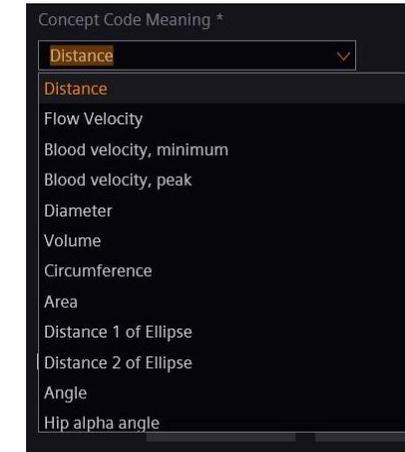
Defining custom measurement labels
Creating a custom label – SR Mapping options

Each tool output parameter must be defined
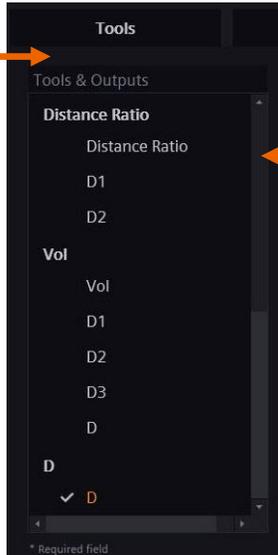
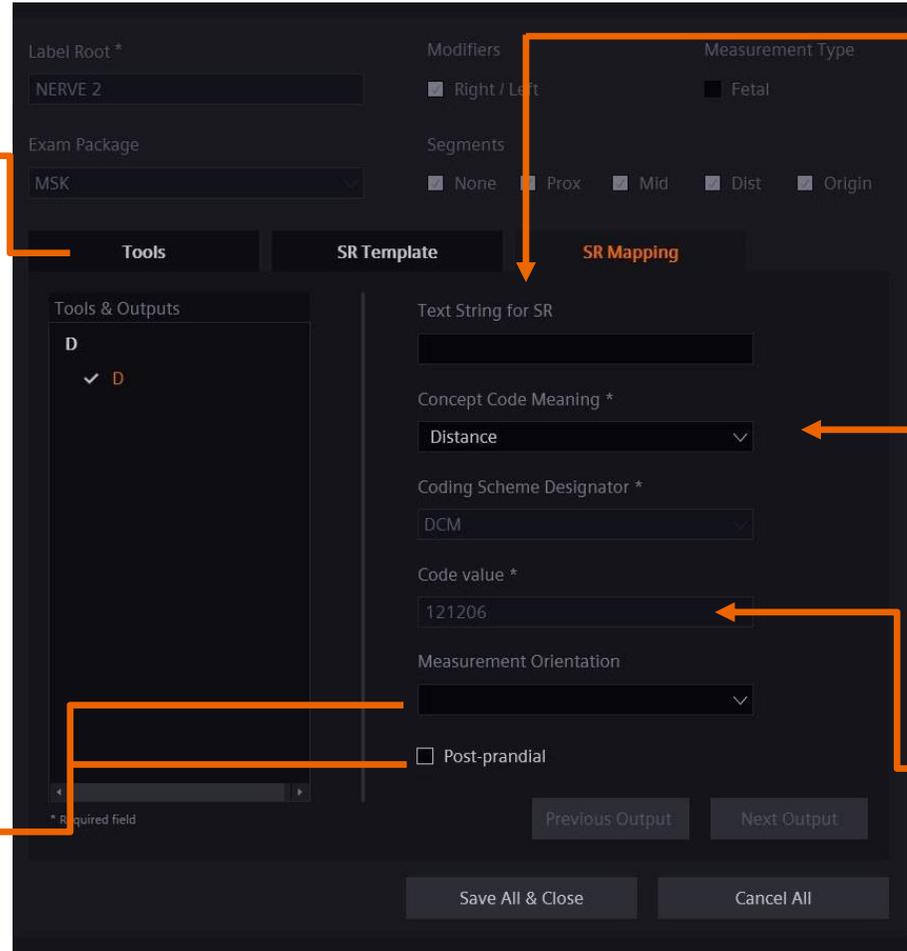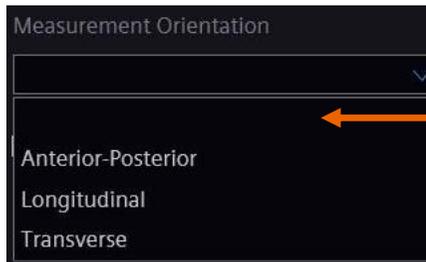Optional field for a text descriptor

Related to Tool

Optional fields

Concept code meaning choice auto populates the code value

Unrestricted © Siemens Healthineers 2024

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Creating a new label – GI example

- Select the **Exam Package** to add the label to

- Select the **New** option
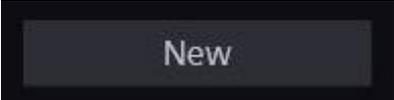
Creating a new label – GI example
Tools tab

- Enter the unique label name → NERVE 1

- Select the **Exam Package** from drop-down menu → MSK

- Select **Modifiers** → ☑ Right/Left

- Select **Segments** → ☑ None, ☑ Prox, etc.

- Select **Imaging Mode** → 2D Mode

- Select **Report Section** → MSK

- Select **Tool** → Distance

- Select **Save All & Close** if SR Mapping is not required, otherwise select SR Template tab

Creating a new label – GI example
SR Template tab

- Pre-selected SR Template → Vascular[*]

- Select the **SR Template Section** from drop-down menu → User Defined Results

- Select/input **Anatomy or Vessel** → Wrist

- Select or create new **Coding Scheme Designator** → 99 MAYO

- Enter the Code Value → 1234567890 [**]

- Selecting **Save All & Close** will stop the SR Mapping process [***]

* Will be automatically selected unless the label is created in OB/GYN or Fetal Echo
** The Code Value is linked to the Coding Scheme Designator
*** SR Mapping will be incomplete

Creating a new label – GI example
SR Mapping tab

- Tools & Outputs → ☑ beside all listed tools*

- Text String for SR → Optional field

- Select **Concept Code Meaning** → Distance

- Coding Scheme Designator → DCM

- Code Value → linked to Concept Code

- Optional fields → None selected

- Select **Save All & Close** to complete

* Each tool will need to be selected and confirmed with the steps listed above. Only then will the SR Mapping be completed for the custom label.
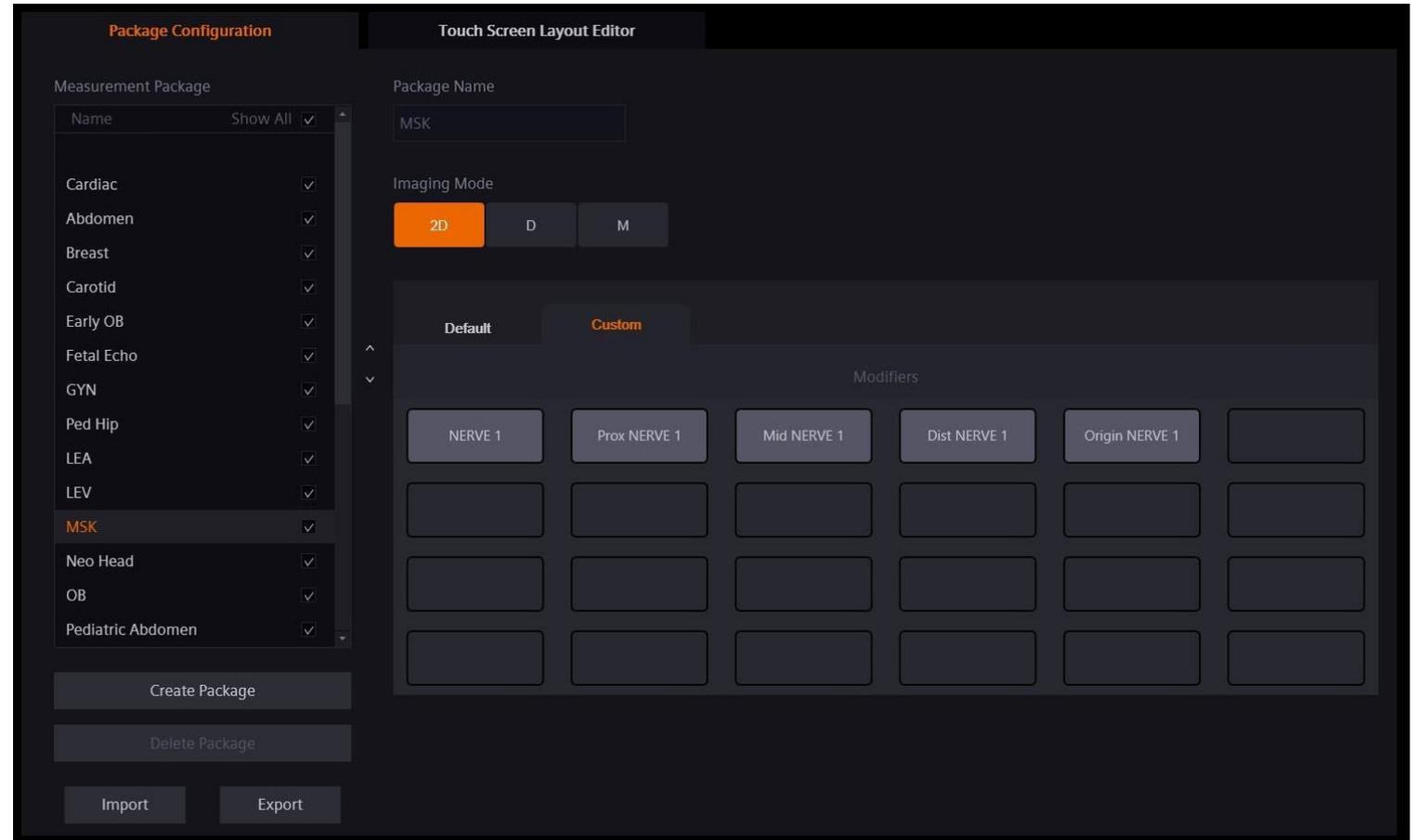
Creating a new label – GI example
Custom label summary

- Check listed label summary for accuracy

- Label will be listed in the master menu under exam

- Label will be automatically added to the Touch Screen upon completion

- Use the Per Label Configuration to alter units or precision

- Copy, Edit, Delete are all available
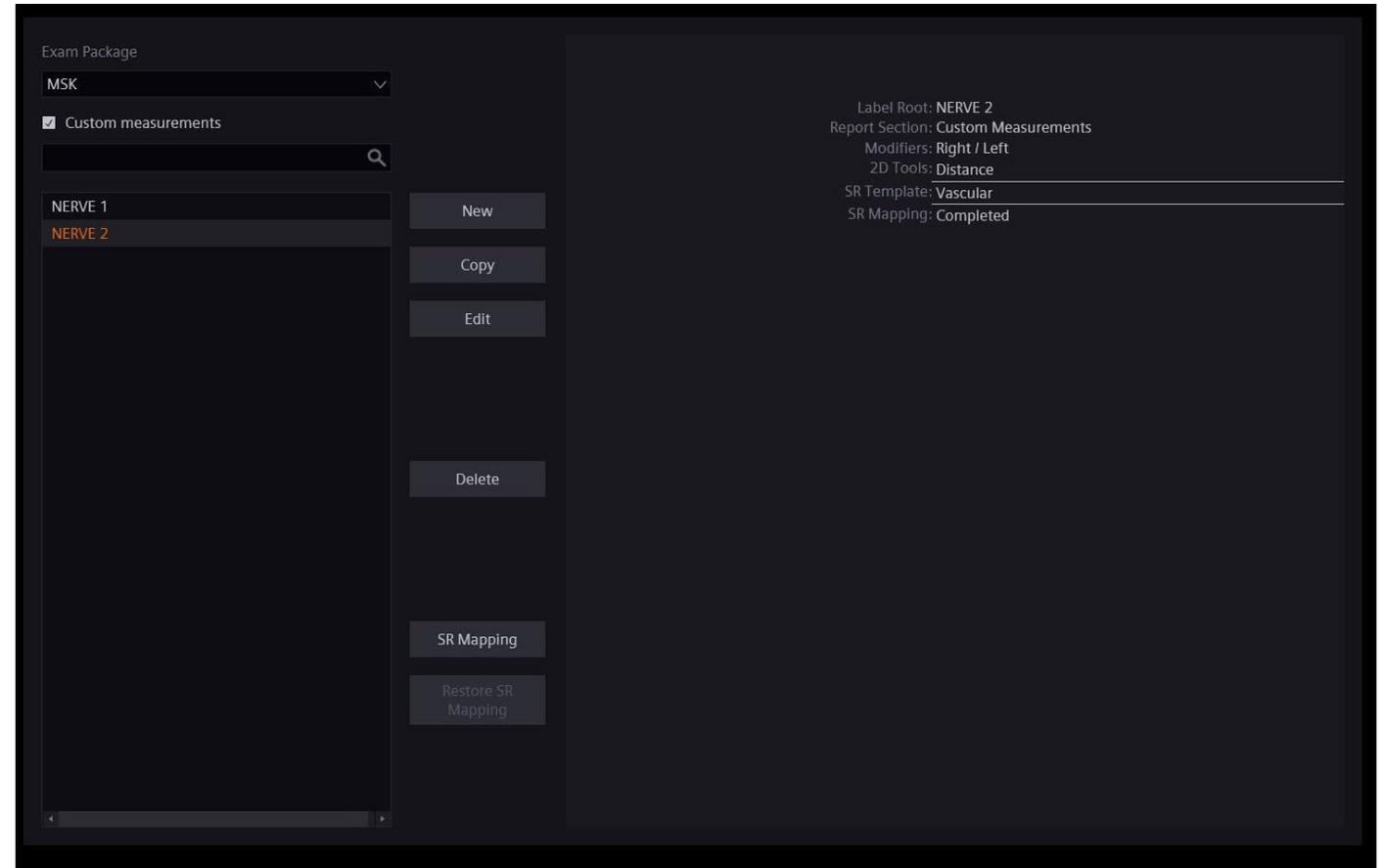
Creating a new label – GI example
Touch Screen

- Custom label will automatically be added to the Touch Screen

- Modifiers (if selected) are embedded in the custom label

- Access the Touch Screen Layout Editor touch tab to change label position if necessary

Creating a new custom label using the copy label feature - Cardiac example
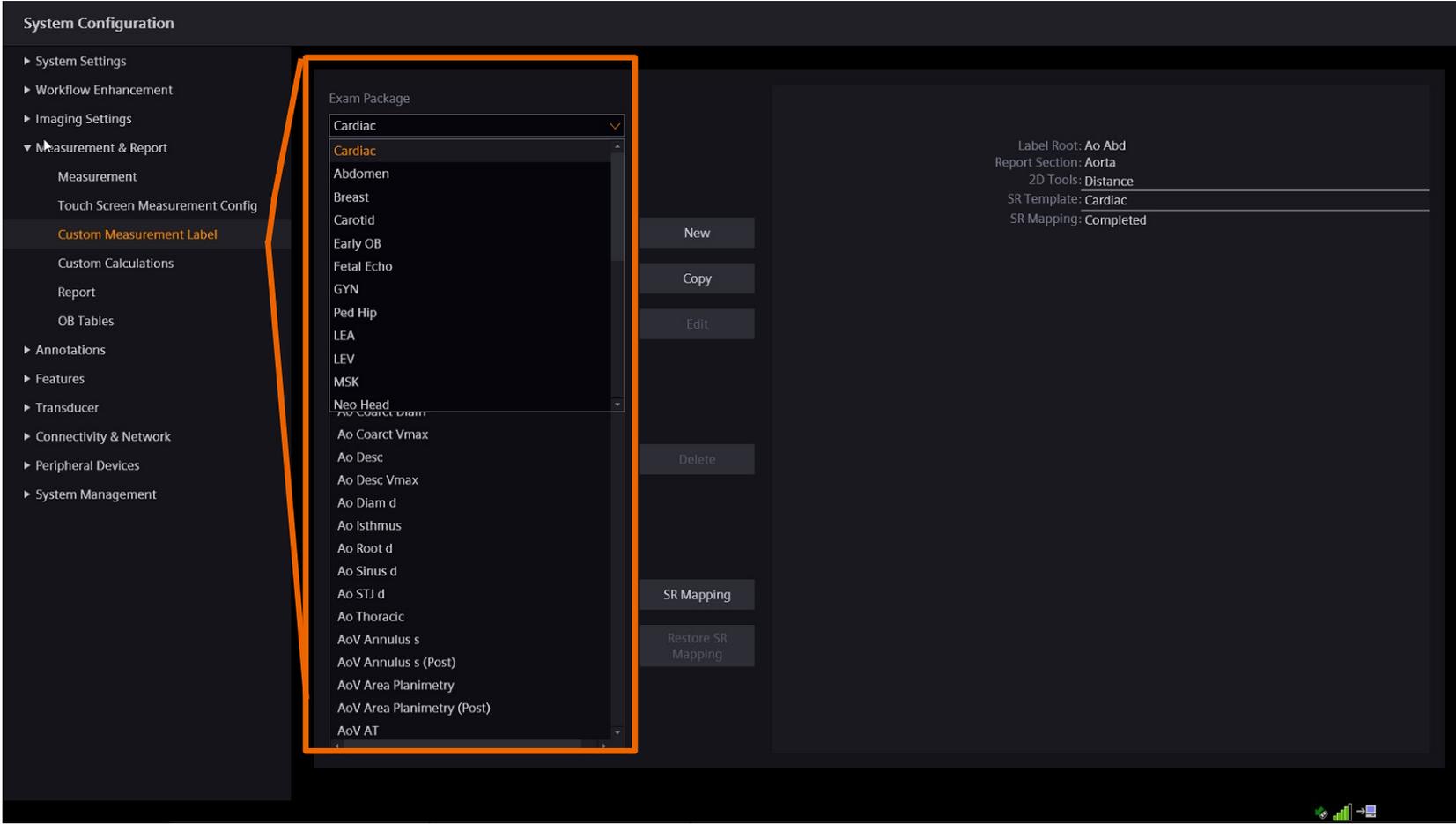
Copying a label – Cardiac example

1. Select the label you want to copy from the master list (selected label is back lit in orange)

2. Select **Copy** from the label management options

Summary of selected label parameters

Copying a label – Cardiac example
Defining label parameters

1. Define label root (name)

2. Select Exam Package from drop-down menu

3. Select Modifier   (if applicable)

4. Measurement Type

5. Select Segment   (if applicable)
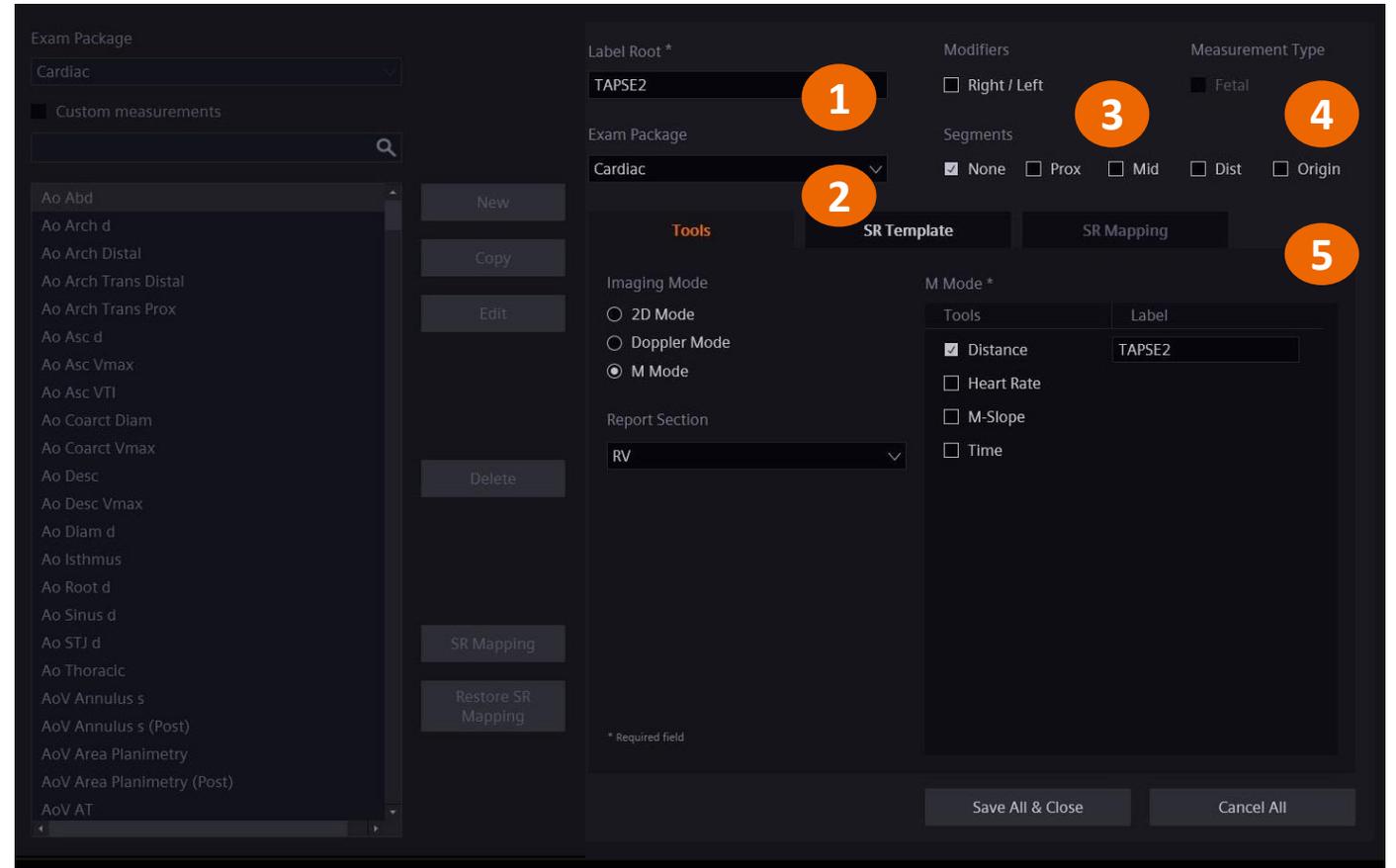
Copying a label – Cardiac example
Tools tab

The Tools tab defines the following label parameters:

1. Select the **Active Mode** for the label (2D, Doppler, etc.)

    → M Mode

2. Select the **Tool** type (distance, time, etc.)

    → Distance

3. Select **Report Section**

    → Right ventricle (RV)
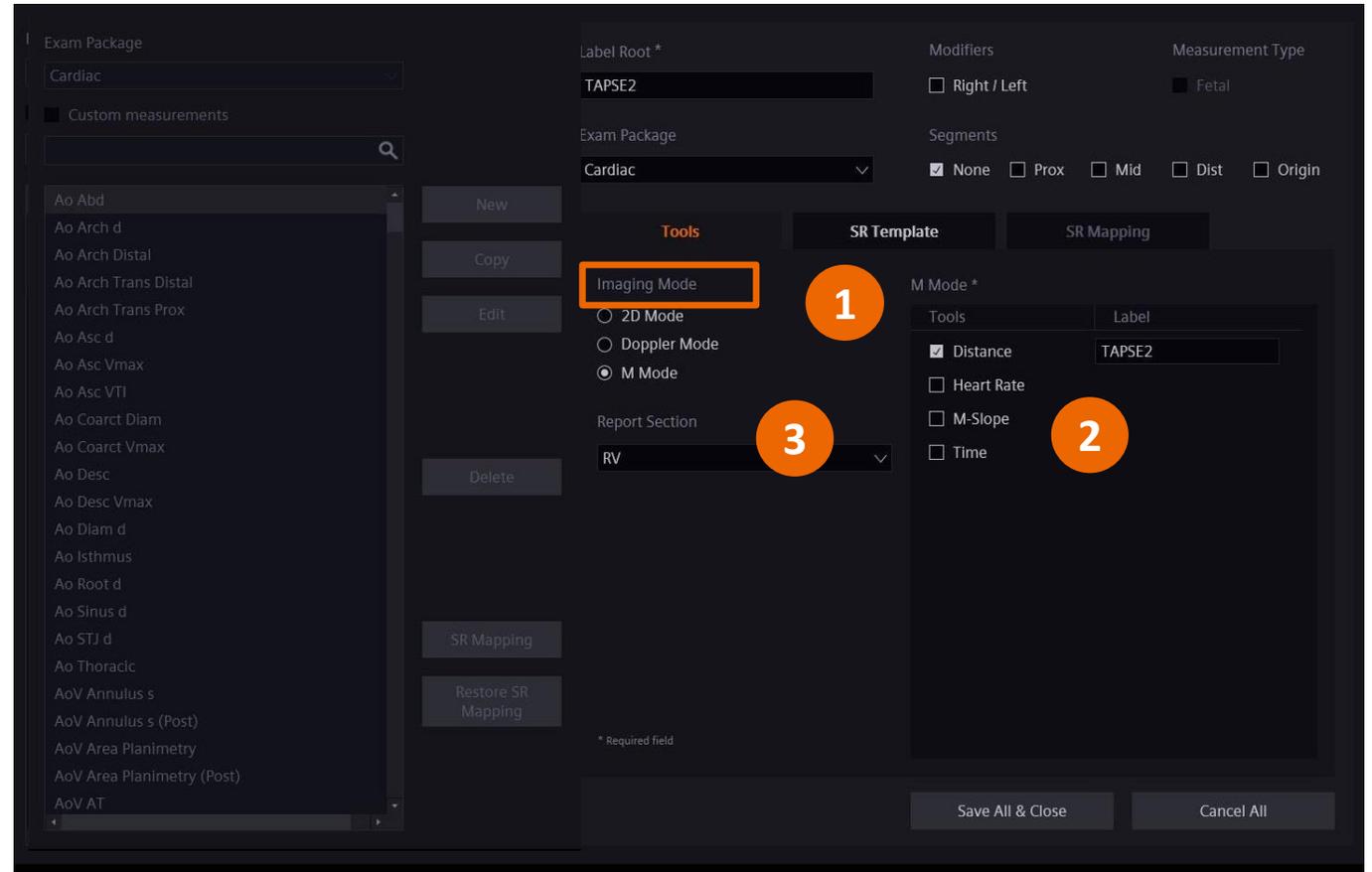
Copying a label – Cardiac example
SR Template tab

The SR Template tab allows the user to edit the copied labels data for the following:

1. SR Template type

    → Cardiac

2. SR Template section

    → Right ventricle
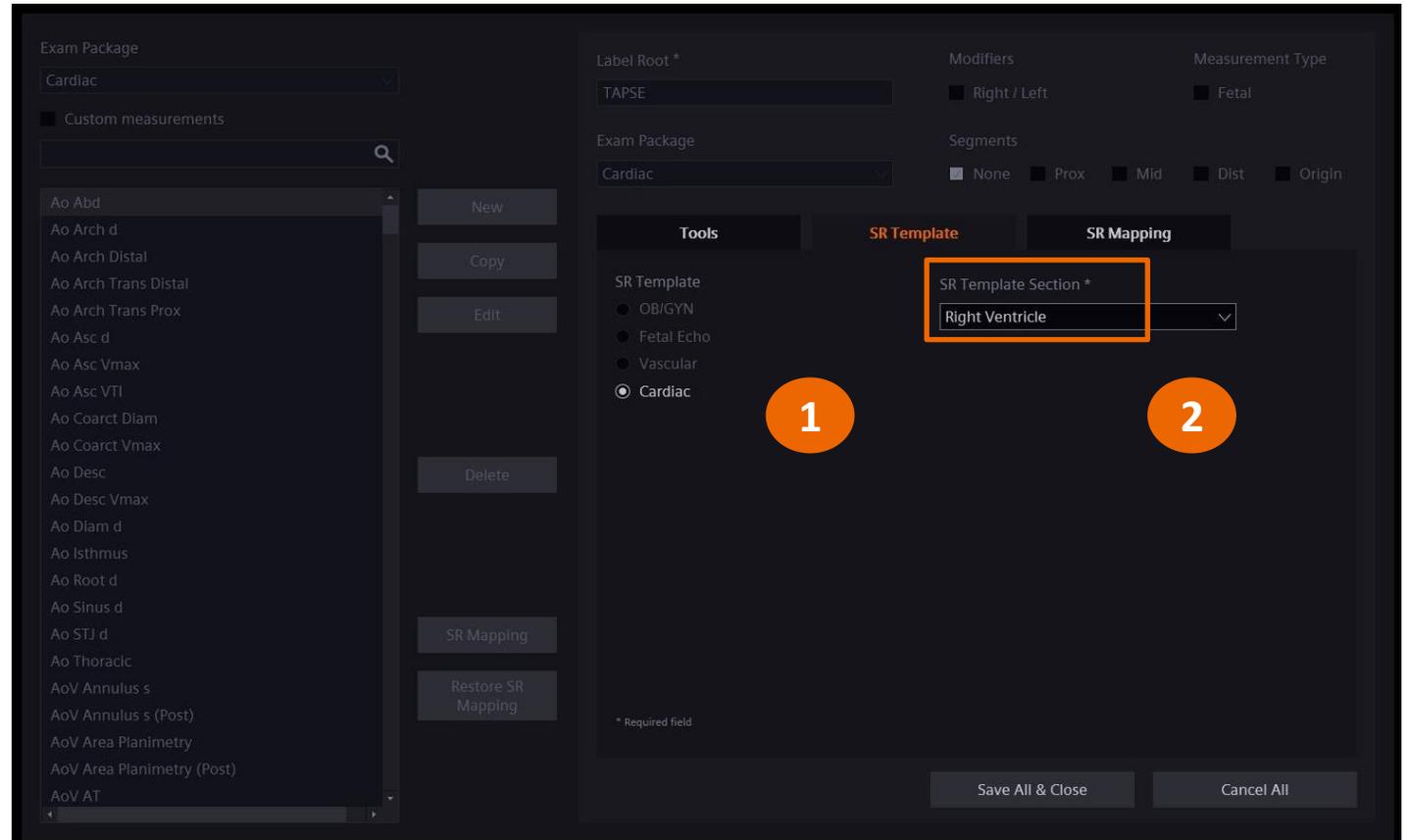
Copying a label – Cardiac example
SR Mapping tab

The SR Mapping tab contains the following:

1. Displays the measurement tool and output type

2. Allows edits to copied labels SR mapping parameters for:

   • Concept Code Meaning

   • Coding Scheme Designator

   • Code Value

   • Optional fields such as Text String or Measurement Method

3. Use Save All & Close to complete the SR Mapping selections
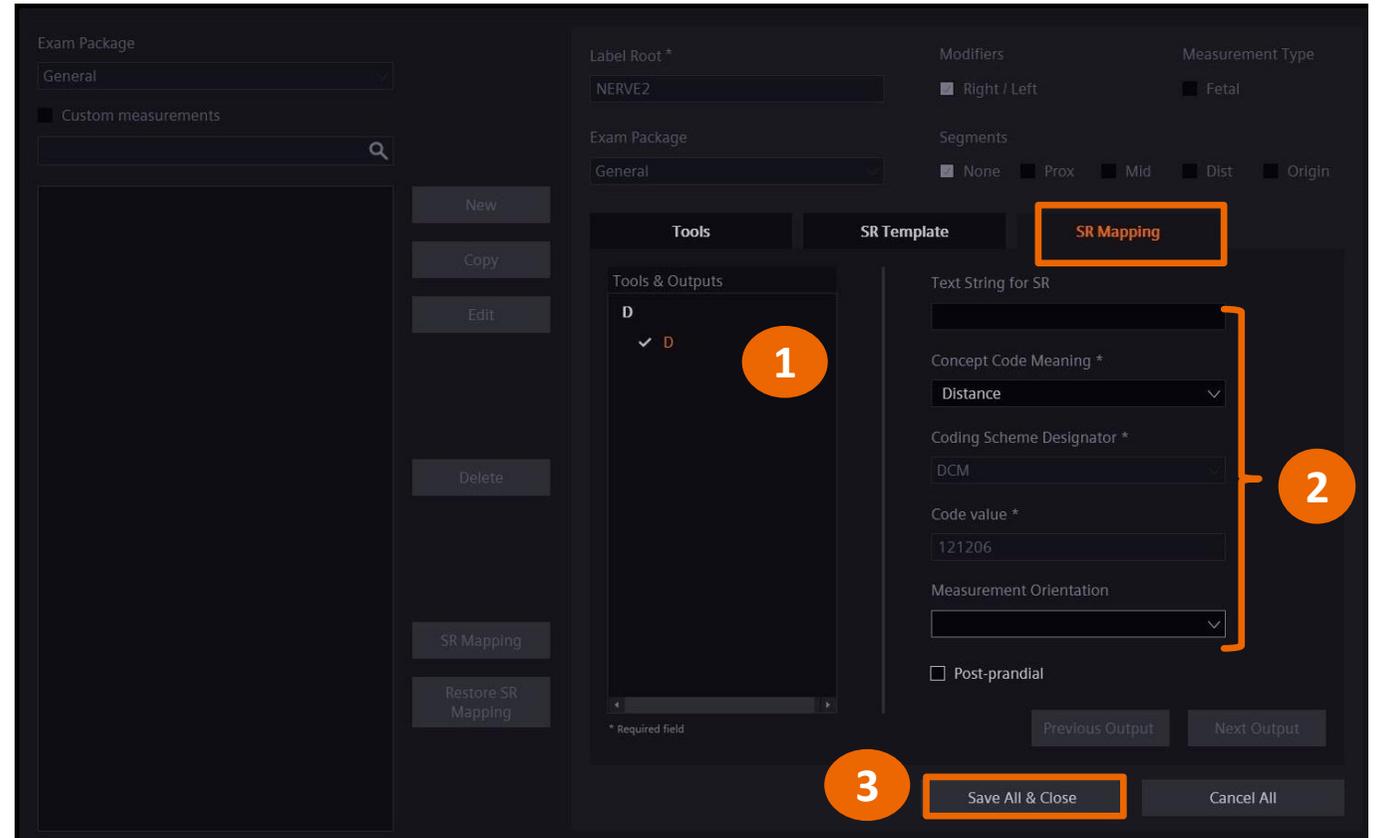
Create new custom calculation package

Custom calculation packages can be created for any exam:

- Select **Create Package**

- A dialogue box will appear
  - → Enter Package Name
  - → Select specific Root Package or None (empty)
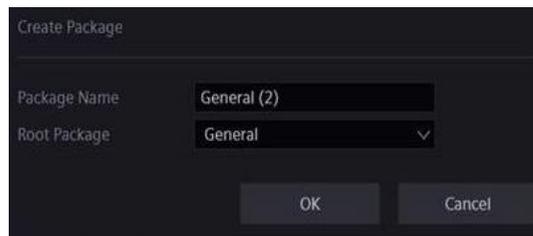
- Select **OK** to save
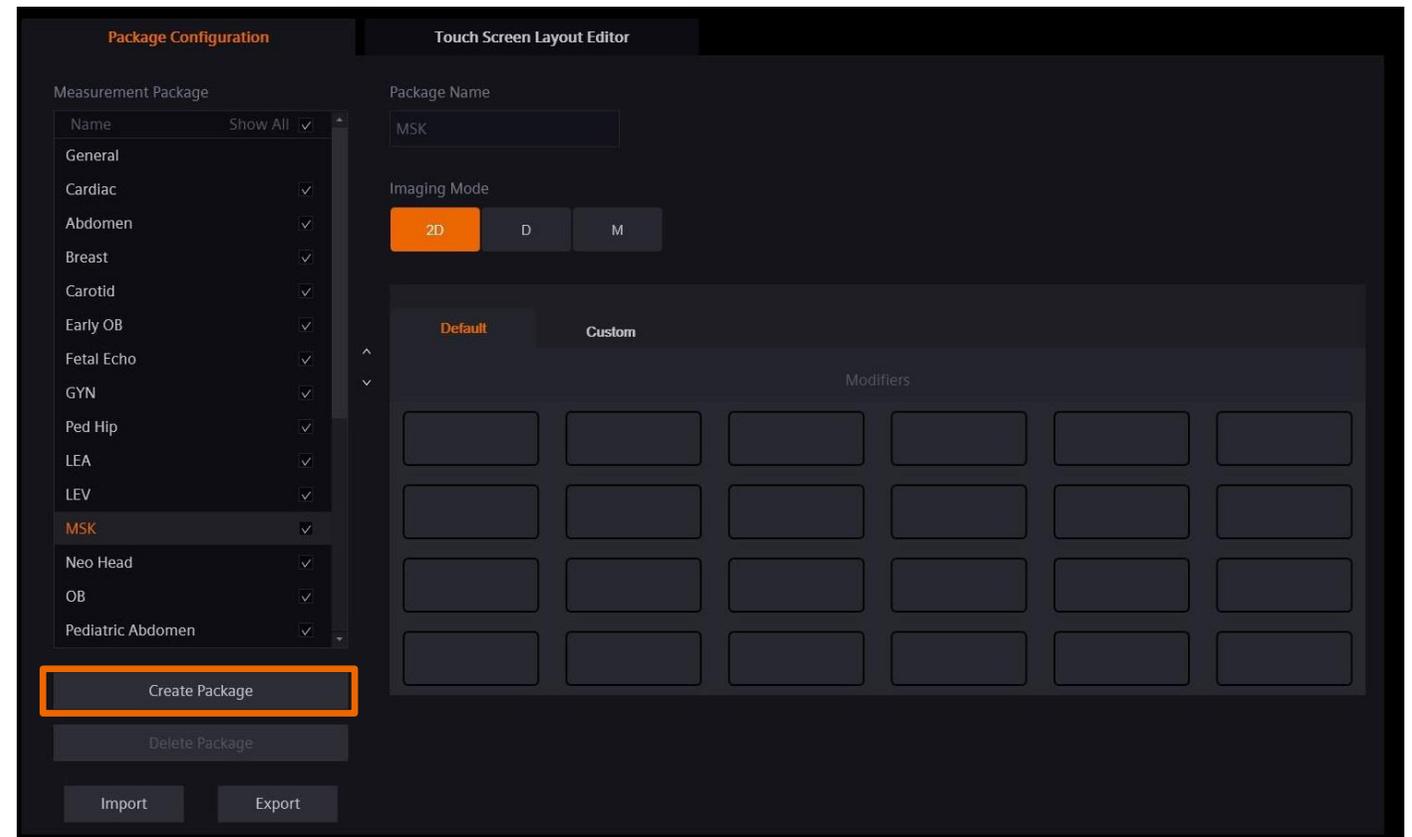
Calculation package visibility and order

All calculation packages are listed in the master list

- Change the visibility ("hide") of any package by unchecking the associated box ☑ → ☐

- Re-order packages within the list by using the up/down arrows

TIP
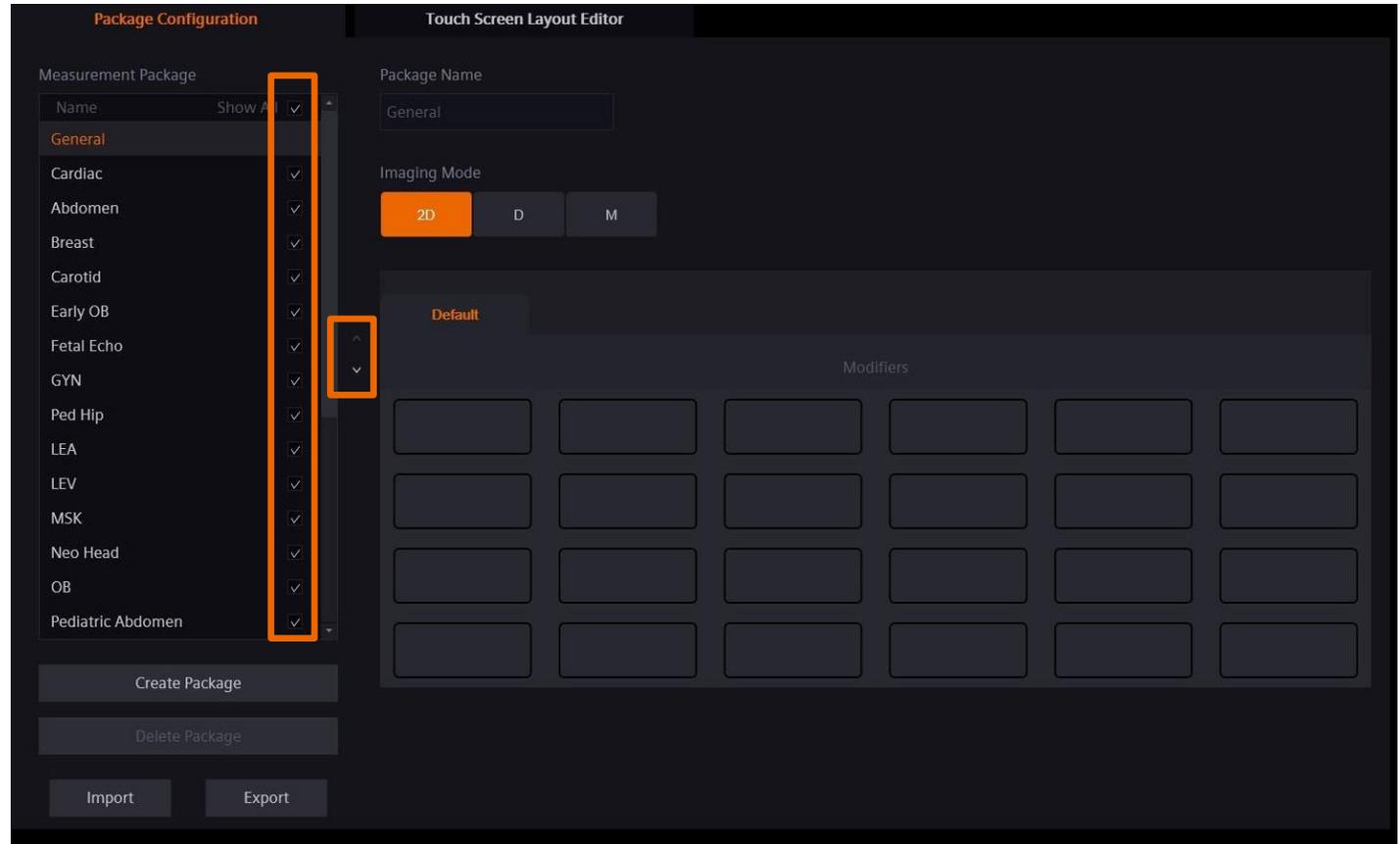
To display a calculation package, check this tab for visibility.

Objectives

- Identify access to system configuration

- Outline the measurement subgroup

- Describe the Touch Screen configuration

- Explain custom measurement labels
  - Homepage layout
  - What is DICOM SR?
  - Steps to define a custom label
  - Create a new custom label

- **Describe Custom Calculations**

- Discuss the OB tables

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Custom Calculations

Custom Calculations are clinical calculations that are specific to a user, department, institution, or region that are not available as factory calculations.

- **System Configuration > Measurement & Report > Custom Calculations**

- The tool will not let users save a mathematically incorrect formula

- Provides utility for a variety of equations from simple volumes to regression formula

- Full accessibility for General Imaging, Cardiac, and Shared Service

Custom Calculations

Custom Calculations

1. Name of equation (14-character limit)
2. Output units of equation
3. Decimal point precision
4. Report display area
5. Area of equation input
6. Display results in onscreen measurement display area or within Report
7. Exam package drop-down
8. Library of labels to create an equation
9. Result labels when type of measurement needs to be specific
10. Input units
11. Mathematical input area
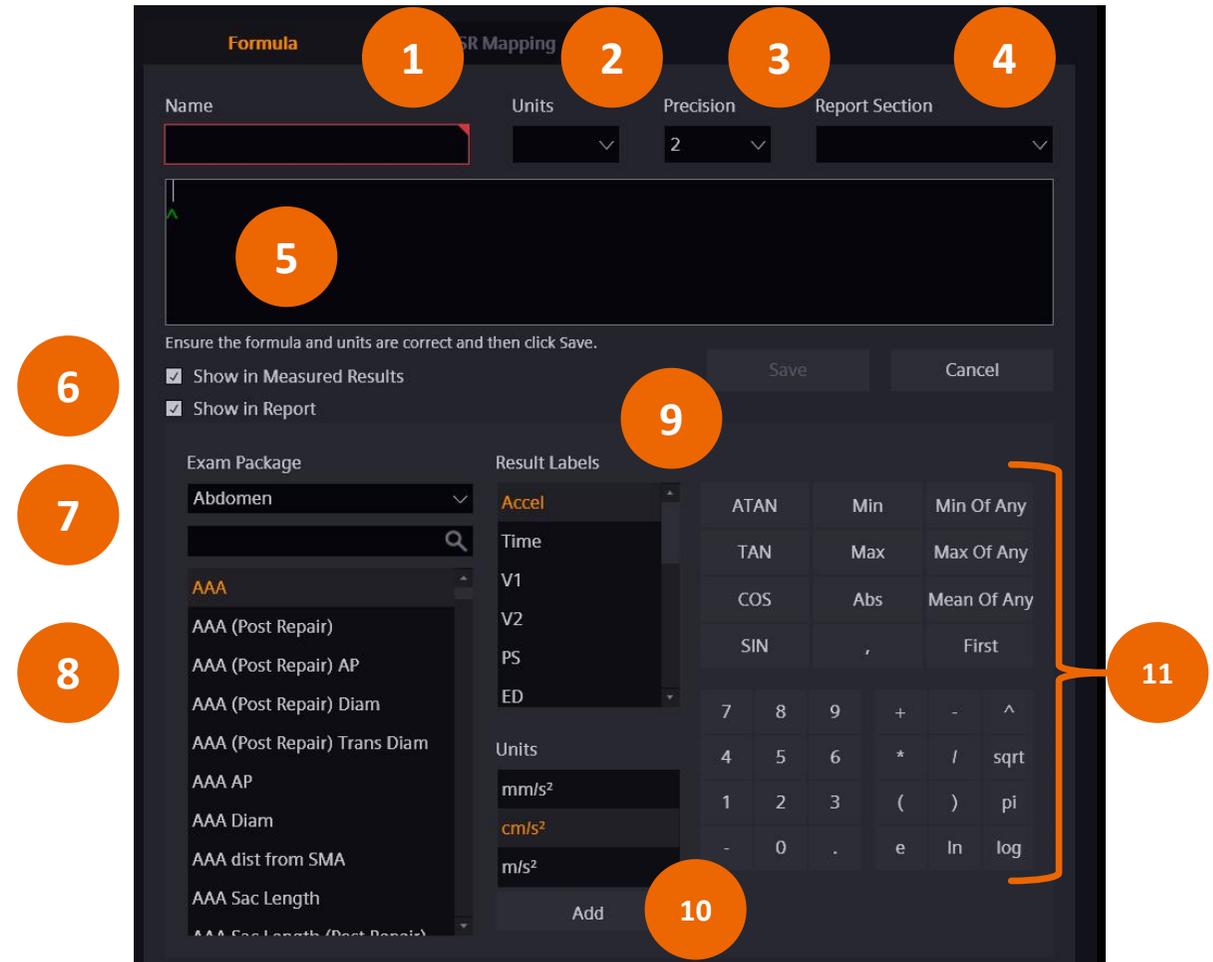
Custom Calculations – entry

Basic entry of a Custom Calculation:

1. Select **New**
2. Enter a unique formula name (14-character limit)
3. Select output **Units**
4. Select result **Precision**
5. Select appropriate **Exam Package**
6. Select a label from the exam package library and choose the input **Units** and results label for that measurement
7. Select **Add** to add measurement to equation area
8. Use calculator functions to enter mathematical equation

58
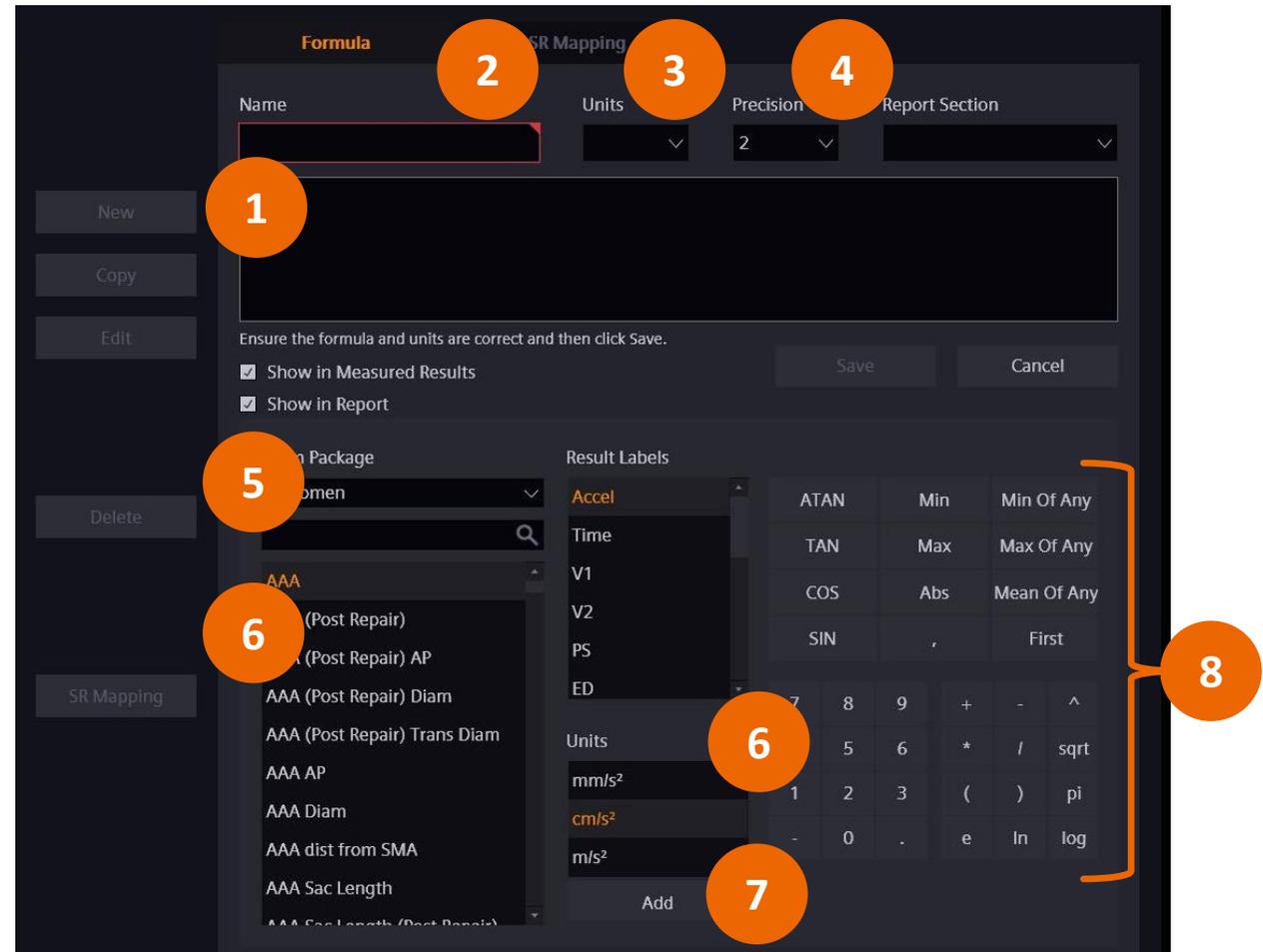
Custom Calculations – entry cont.

Basic entry of a Custom Calculation (cont.):

9. Select **Report Section** area for formula results to display
10. Check for accuracy and no red lines
11. Select **Show in Measured Results** to display results in MDA
12. Select **Show in Report** to display formula results in the report
13. Select **Save**
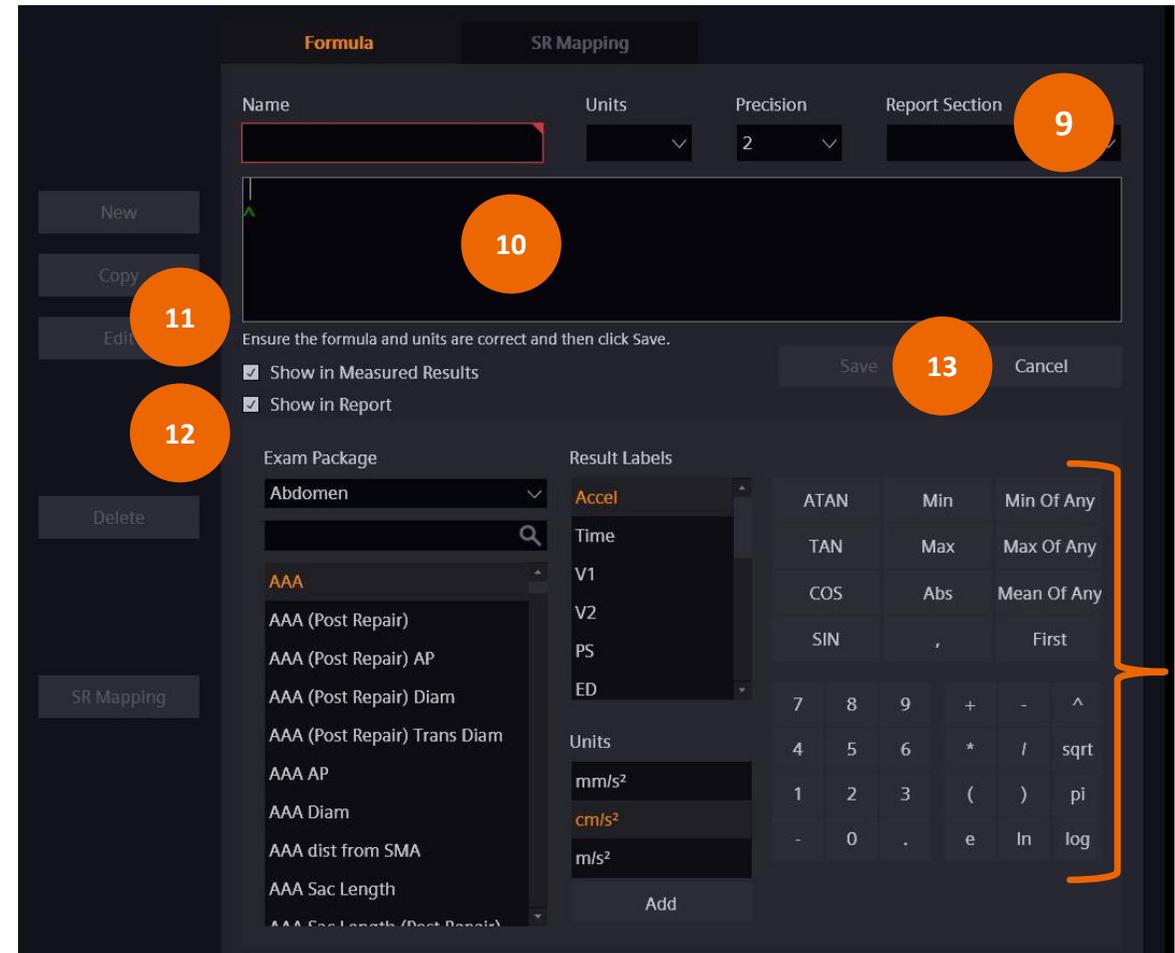
Custom Calculations

SR Mapping

1. Select **SR Mapping**
2. Select appropriate SR Template
3. Select SR Template section
4. Complete SR Mapping for given equation

Objectives

- Identify access to system configuration

- Outline the measurement subgroup

- Describe the Touch Screen configuration

- Explain custom measurement labels
  - Homepage layout
  - What is DICOM SR?
  - Steps to define a custom label
  - Create a new custom label

- Describe Custom Calculations

- **Discuss the OB tables**

- Review the report

OB Tables tab
Homepage layout

OB tables homepage configurable options:

- Default OB Author
- Custom GA Table
- Custom Growth Curves

OB Tables tab
Default OB Author

- Select default author from drop-down menu for each parameter

- Custom tables will have an asterisk (*) in the table name

- Factory tables will not have an asterisk (*) in table name

OB Tables tab
Custom GA Table

Two options to create a custom gestational age (GA) table:

1. Manually input a new table

2. Copy an existing table

OB Tables tab
Custom GA Table – copy existing table

- Highlight desired table

- Select **Copy**

- Change Author name or leave copied name with number

- Alter data (if required)

- Validate table
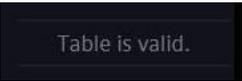
- If table is valid, select **Save**

OB Tables tab
Custom GA Table – create new

- Select **New**

- Name table and select units

- Input table data – use the "tab" key to advance

- Insert/delete rows as required

- Validate table

- Complete the SR Mapping process (if required)

- Select **Save** to complete table

OB Tables tab
Custom Growth Curves

- Steps to add custom growth curves are like custom GA tables using Copy or New

- Custom growth curves require a Low/High range selection – options are:
    - 5%/95%
    - 10%/90%
    - 3%/97%
    - +/- 1.5SD
    - +/- 2SD
    - +/- 1SE

- Maximum number of weeks that can be entered is 43

OB Tables tab
Custom Growth Curves

Flexibility with input

- Low/High percentile range options

- Custom defined Low/High percentile - 0.1–99.9%

- Auto calculation of Low/High percentile

Objectives

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- **Review the report**

# Report configuration tab Homepage layout

- Organ-based/anatomic reporting structure

- Homepage contains four configurable option areas:
  - Report Content
  - Assessments
  - Comments
  - Report Template
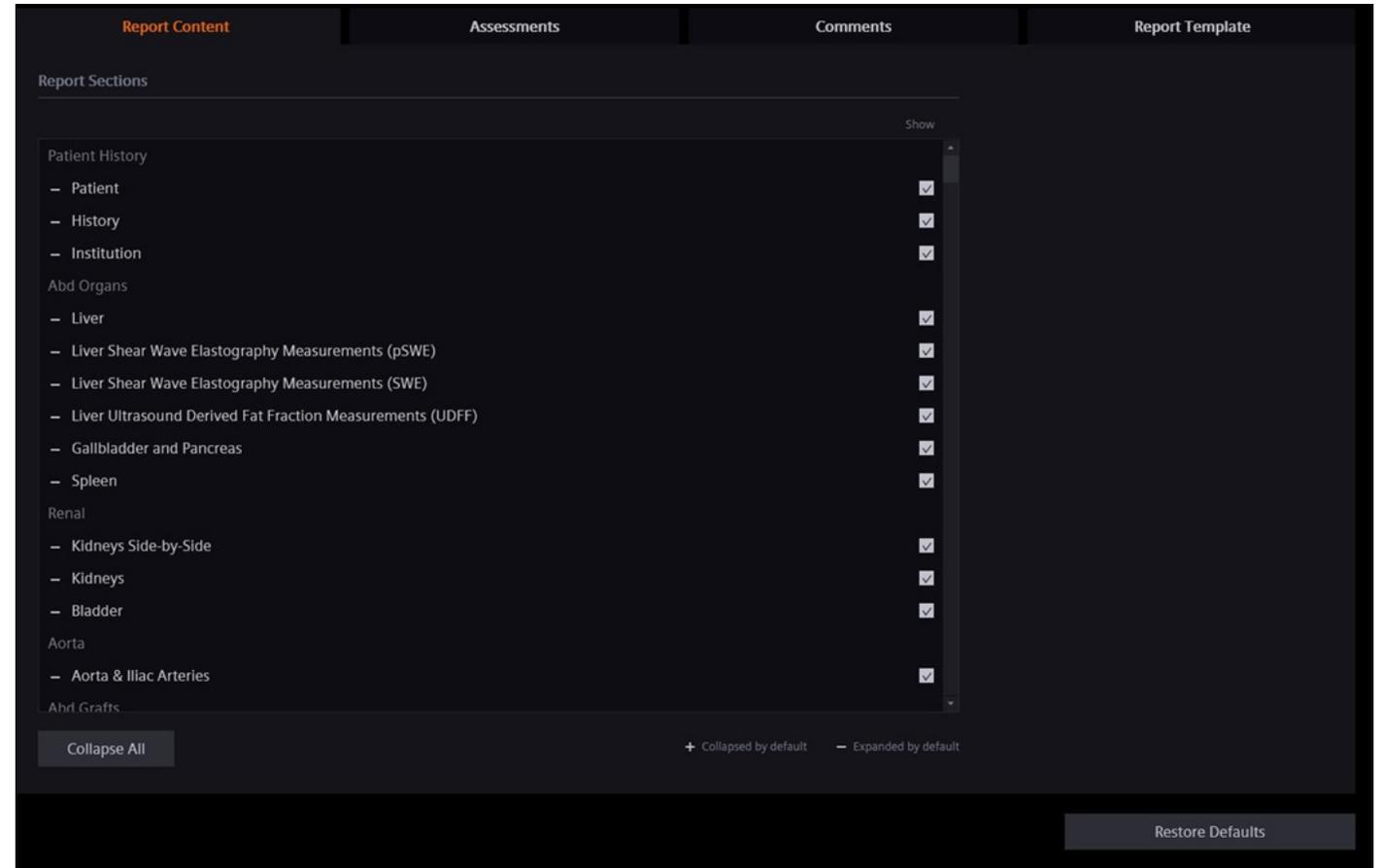
Report configuration tab
Report Content

1. Default option to expand or collapse all report content

2. Expand/collapse option for individual sections

3. Check ☑ option to show/hide report sections*
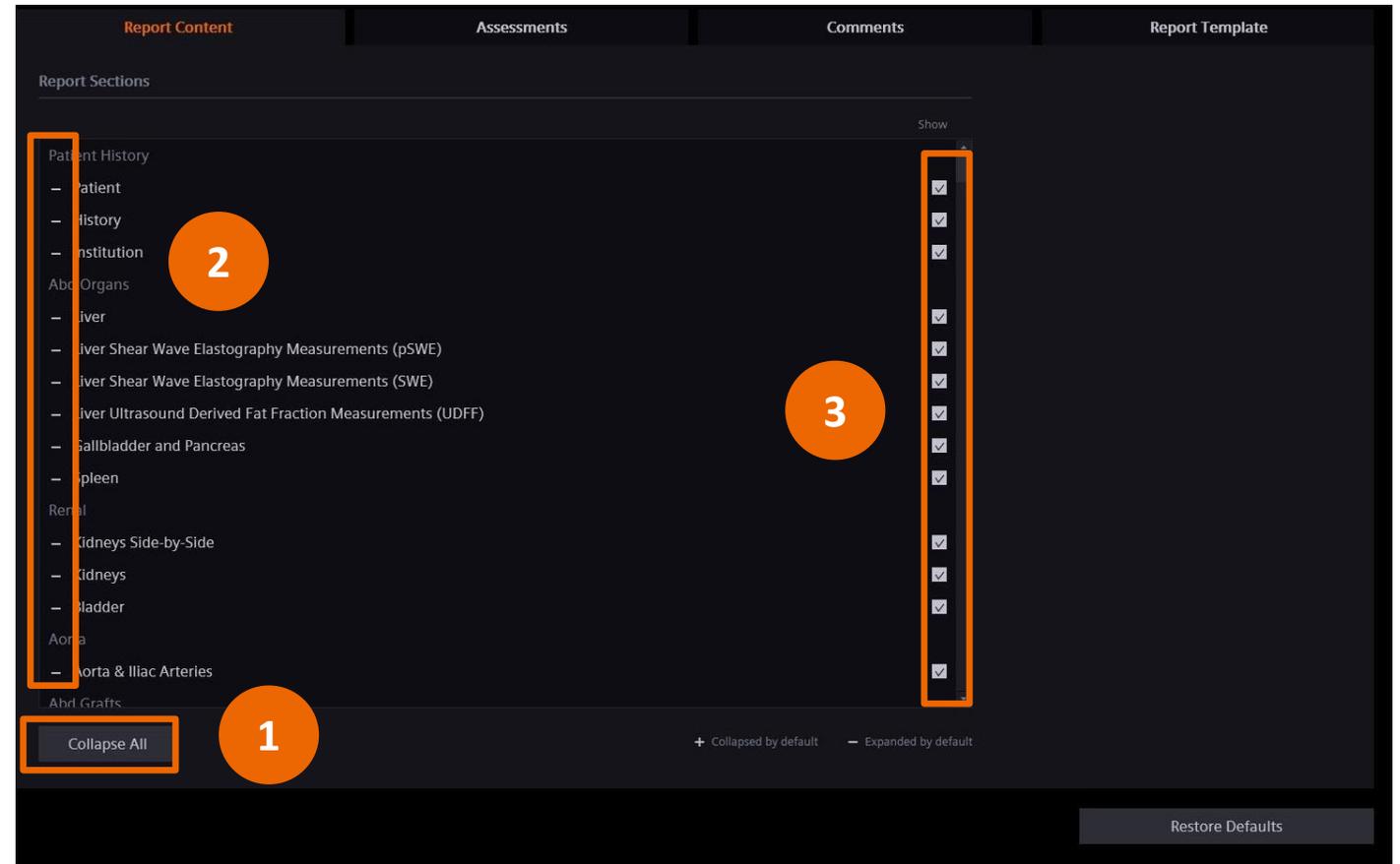
*Hidden sections will not show on a printed report even if a measurement is performed for that section.

Report configuration tab Assessments

Pre-loaded list of assessments from factory:

- Abdomen
- OB Fetal
- OB Maternal
- Early OB Fetal
- Early OB Maternal
- GYN
- Carotid
- Lt Hip Description
- Rt Hip Description
- Fetal Echo

Check ☑ option to show/hide assessment in report.

Report configuration tab
Add custom assessment item

Two types of custom assessment items can be added:

- Checklist

- Comment text box

To add a custom assessment:

1. Select assessment **Type**

2. Enter label in field

3. Select **Add**

Assessment label can only be moved around custom area of the report.

Report configuration tab
Delete custom assessment item

To delete a custom assessment item:

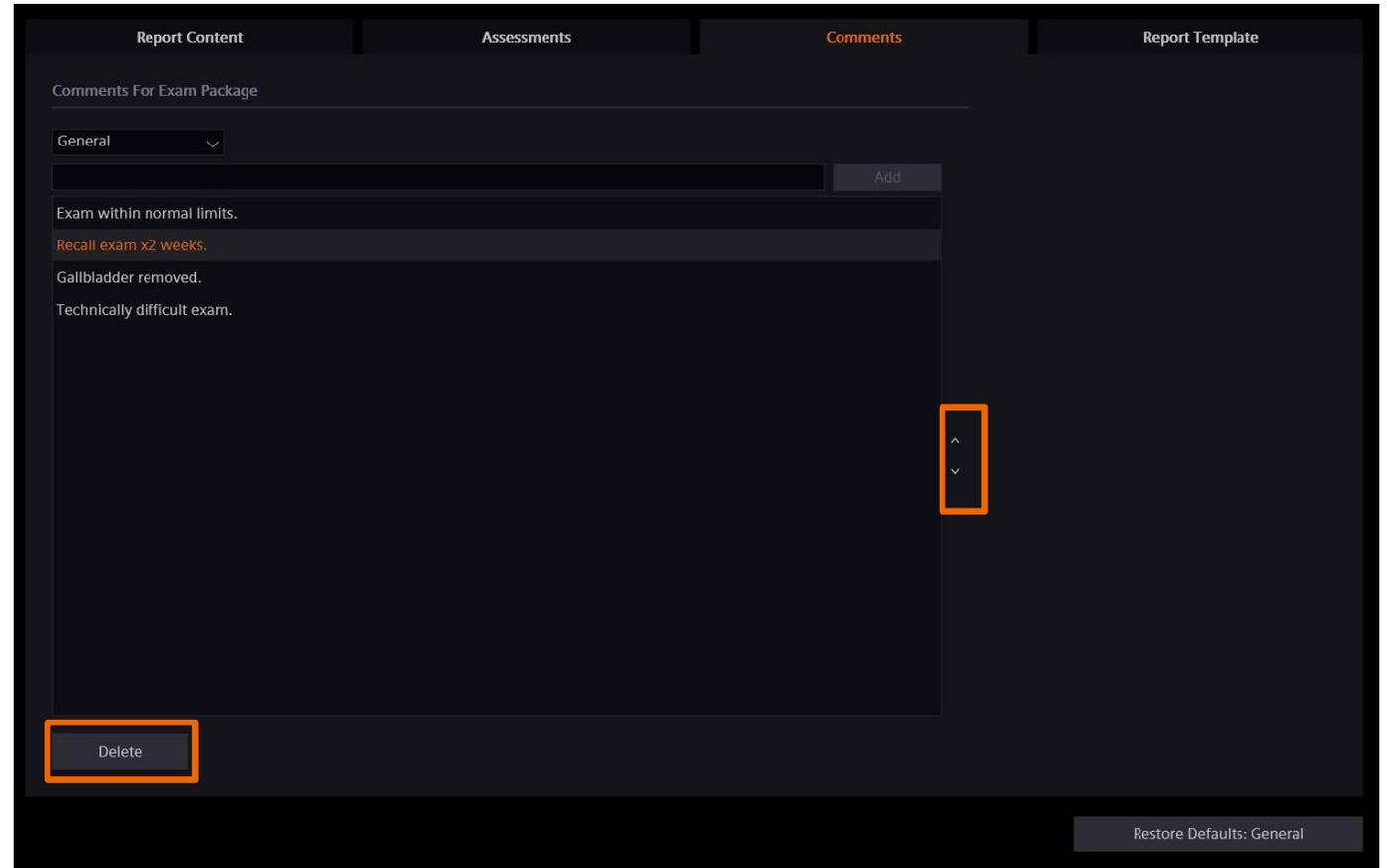- Highlight the desired label

- Select **Delete**

Report configuration tab Comments

Pre-defined comments can be added to the report

- Select the exam package

- Enter comment in the space provided

- Select **Add**

- Re-order (if required) with the directional arrows

To delete a comment

- Highlight comment

- Select **Delete**

Report configuration tab
Report Template

- Customized logo and text can be added to the report via USB

- Three layout options for logo and text

- Logo file must be JPEG or PNG

- Three lines of text can be added and customized for style and font

Summary

- **Identify access to system configuration**

- **Outline the measurement subgroup**

- **Describe the Touch Screen configuration**

- **Explain custom measurement labels**
    - **Homepage layout**
    - **What is DICOM SR?**
    - **Steps to define a custom label**
    - **Create a new custom label**

- **Describe Custom Calculations**

- **Discuss the OB tables**

- **Review the report**

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Questions?