

3.5 (VB30)





Objectives

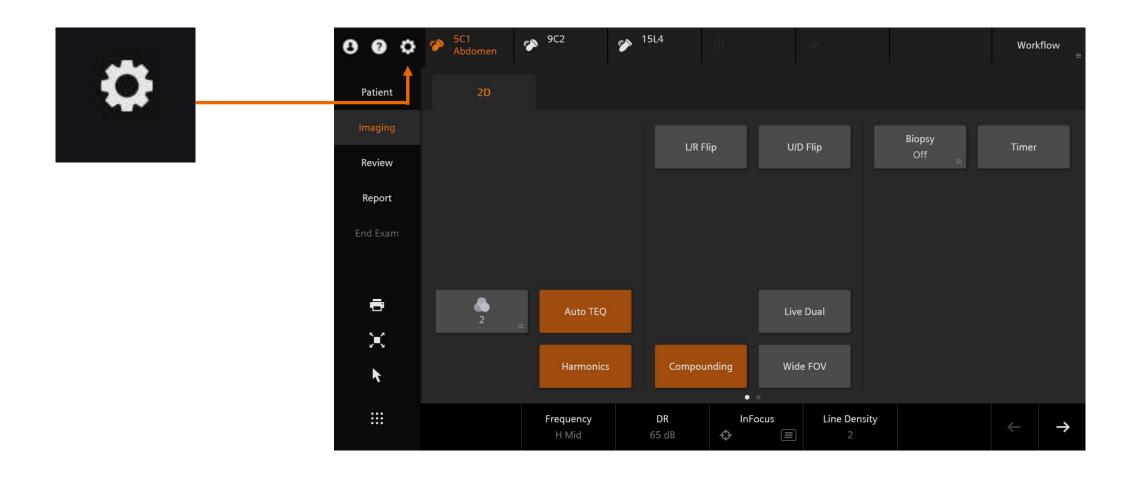


- Identify access to system configuration
- Outline the measurement subgroup
- Describe the Touch Screen configuration
- Explain custom measurement labels
 - Homepage layout
 - What is DICOM SR?
 - Steps to define a custom label
 - Create a new custom label
- Describe Custom Calculations
- Discuss the OB tables
- Review the report



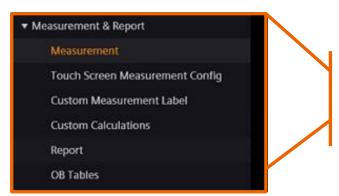
Measurement configuration access

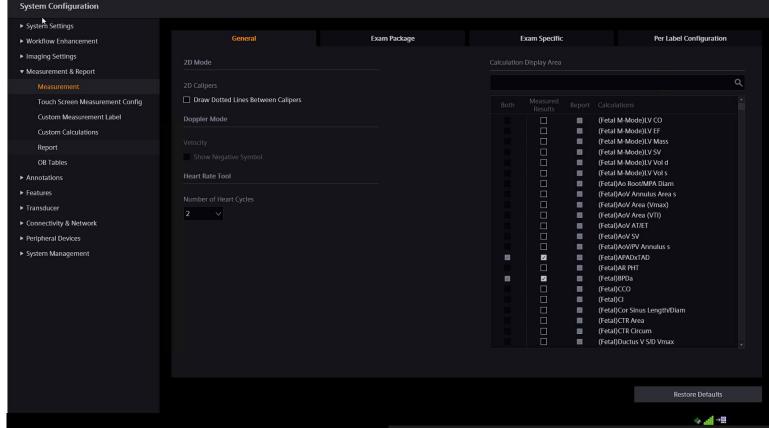




Measurement & Report configuration home page







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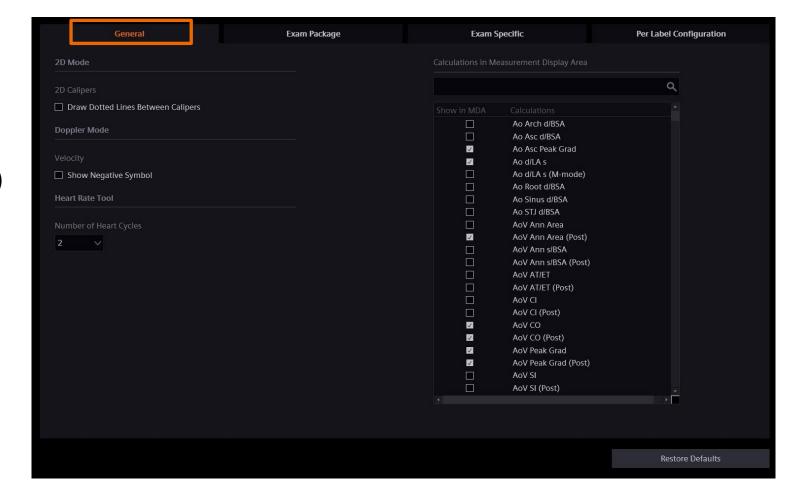


Measurement subgroup General tab



System wide settings for:

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

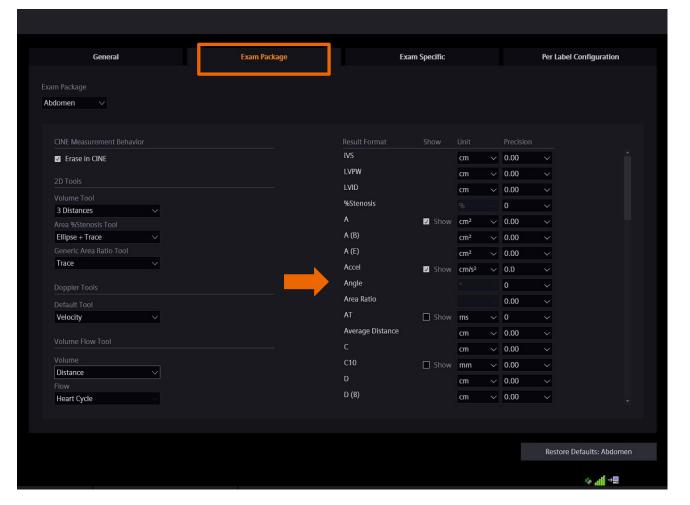


Measurement subgroup Exam Package tab



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



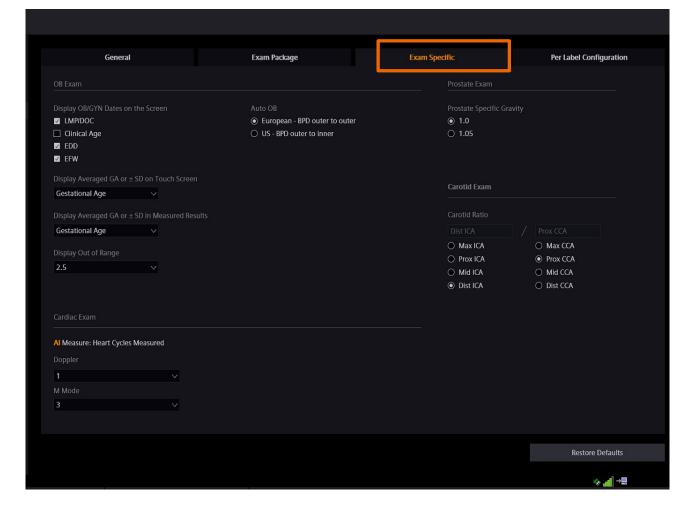
OB exam options for:

- 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



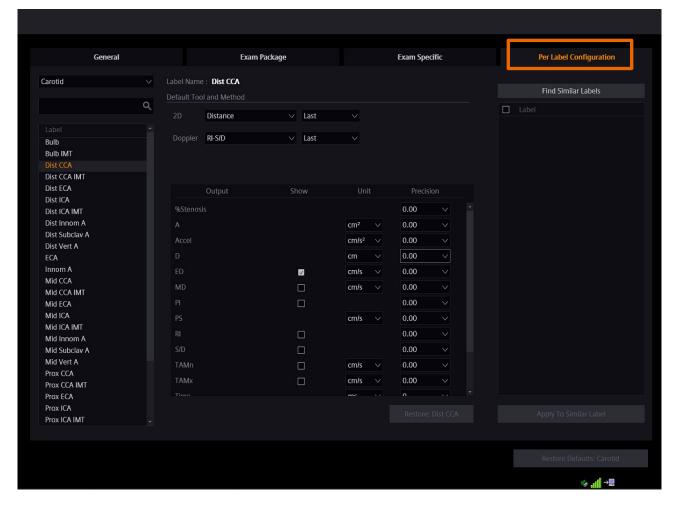
Measurement subgroup Per Label Configuration



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

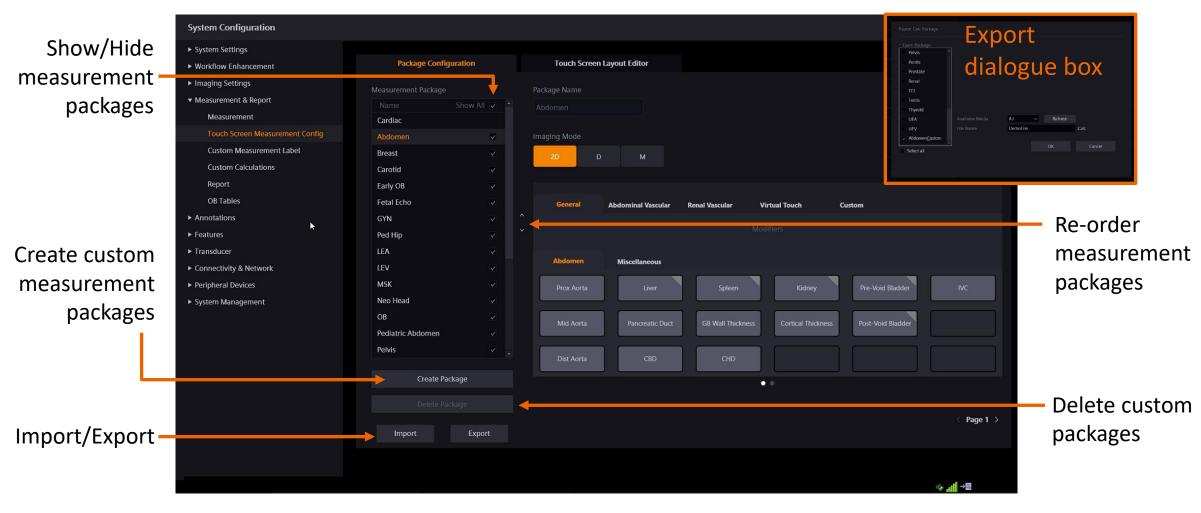


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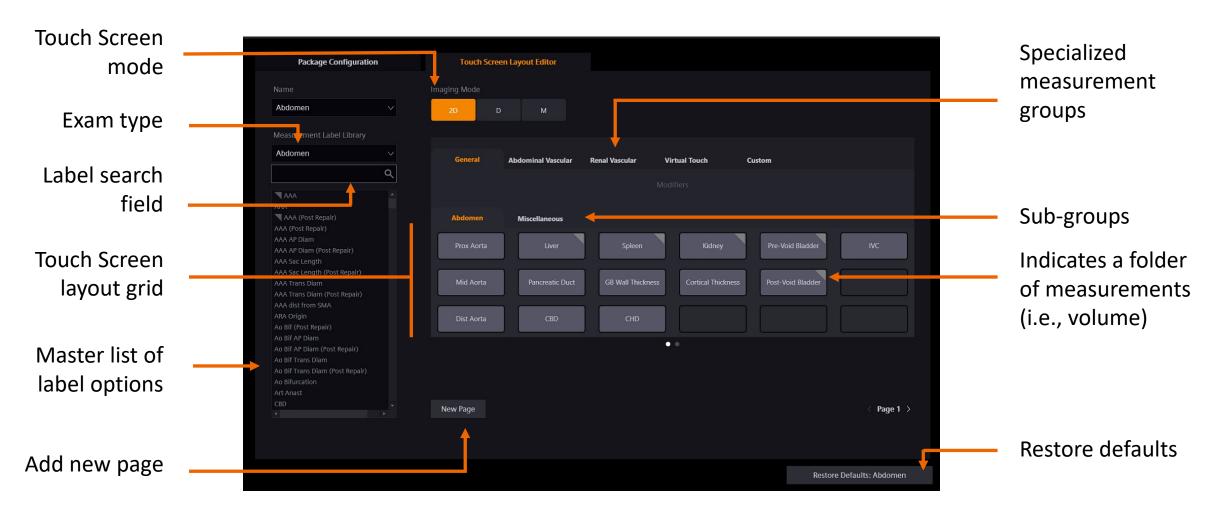
Touch Screen Measurement Config





Touch Screen Measurement Config GI example





Touch Screen Measurement Config Cardiac example



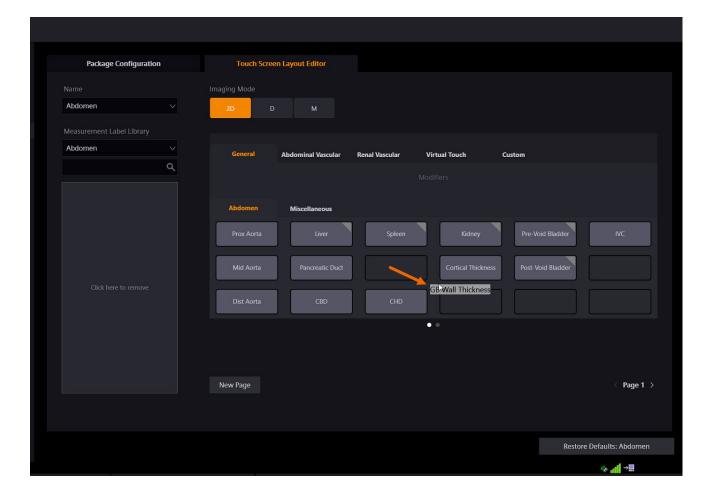


Touch Screen Measurement Config Moving labels



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

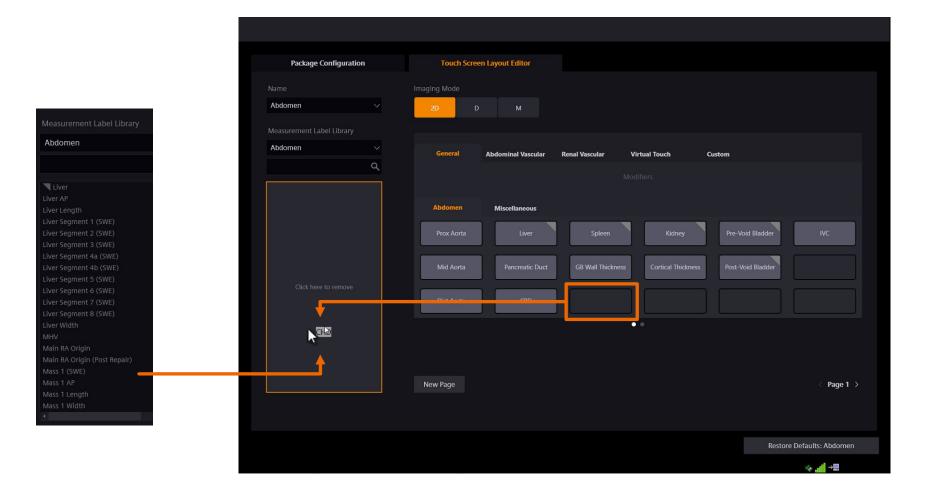


Touch Screen Measurement Config Removing a label



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

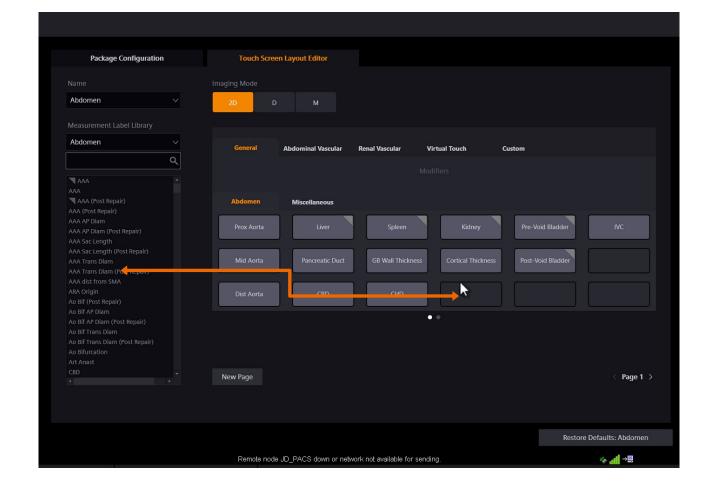


Adding a label:

- 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.



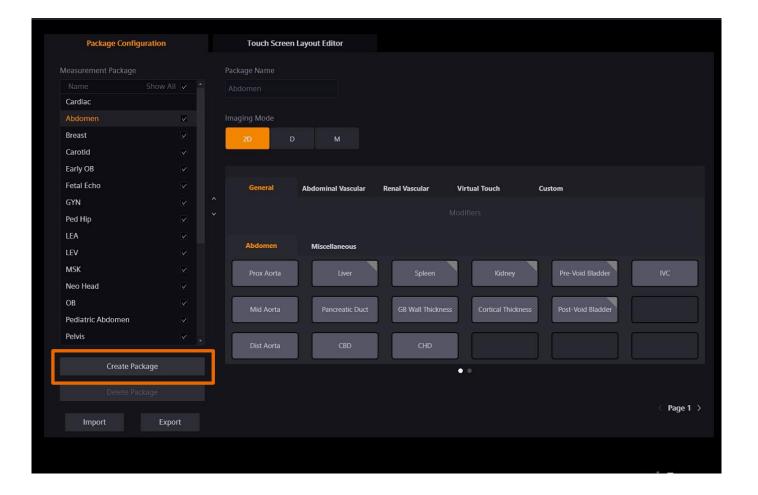
Touch Screen Measurement Config "Blank" measurement Touch Screens



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

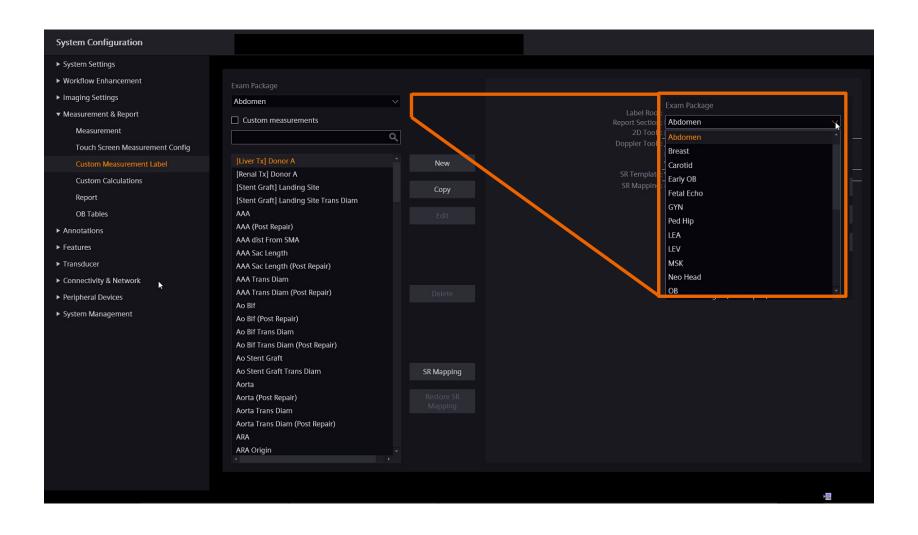


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Custom measurement label subgroup Homepage layout

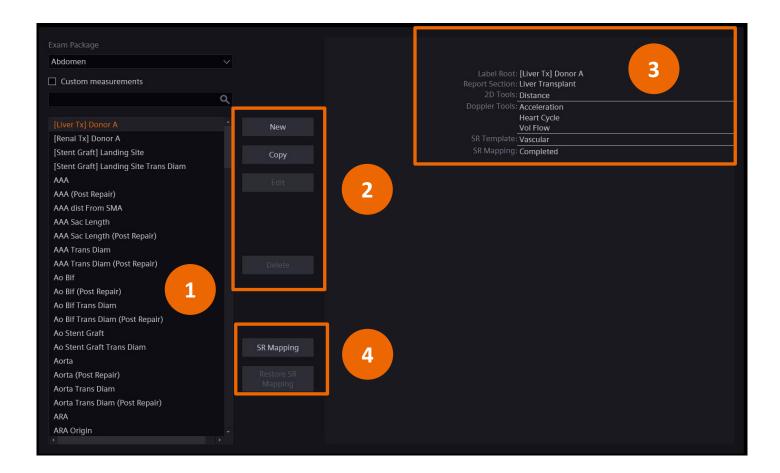




Custom measurement label subgroup Homepage layout



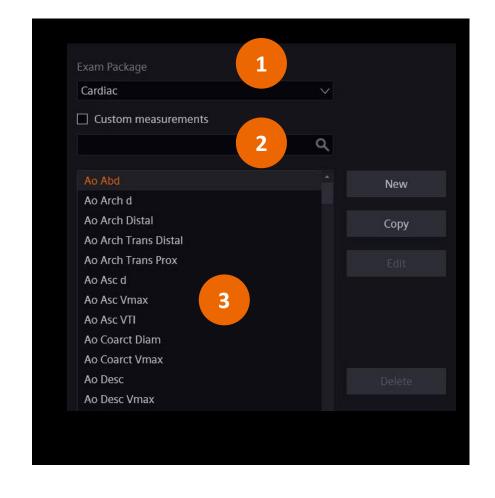
- Master list of all labels
- 2. Label management options
- 3. Display of label information/content
- 4. SR Mapping options



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



Custom measurement label subgroup Label management options



New

 Create a new custom measurement label

Edit

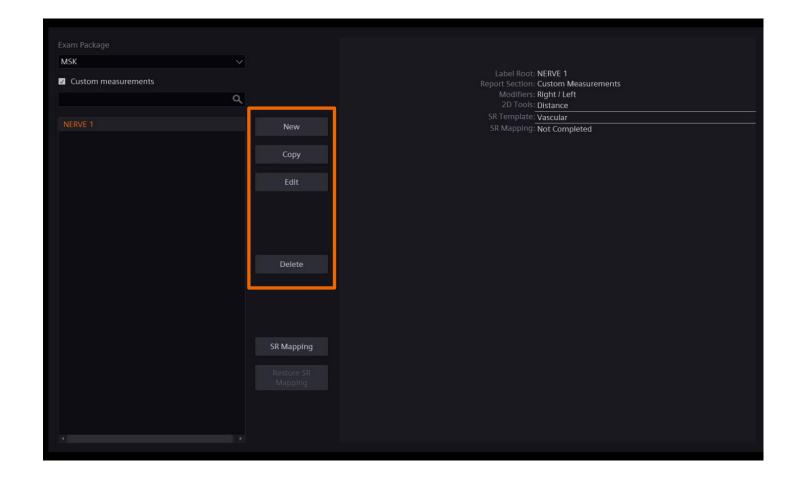
Edit the selected custom label

Copy

Copy a selected factory label

Delete

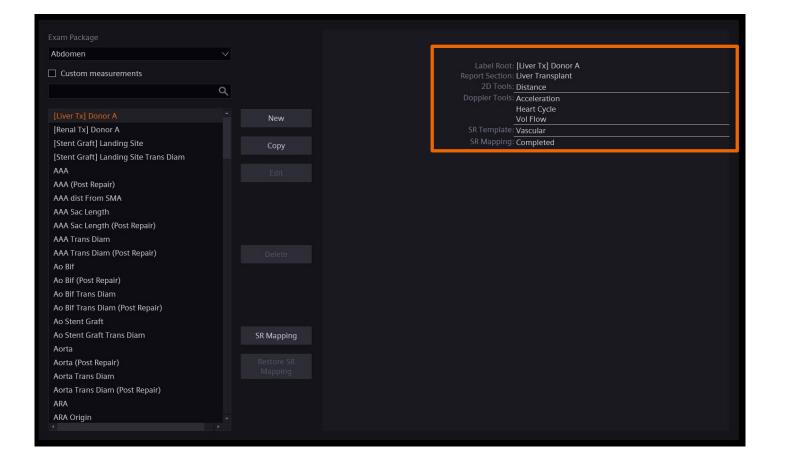
Delete a custom label



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

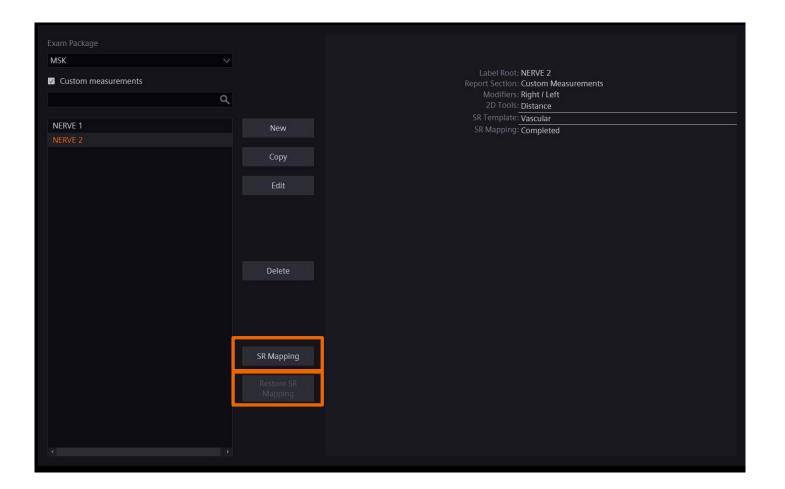


Custom measurement label subgroup Other available functions



Other available functions include:

- SR Mapping "quick access" key
- Restore label defaults to any factory label that has been modified



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What is DICOM and DICOM Structured Reporting (SR)?



DICOM is an acronym for <u>D</u>igital <u>I</u>maging and <u>CO</u>mmunications in <u>M</u>edicine

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

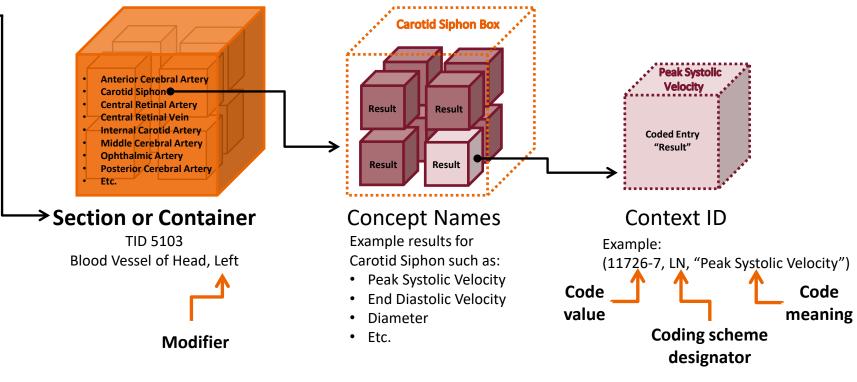
DICOM SR template data components



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.



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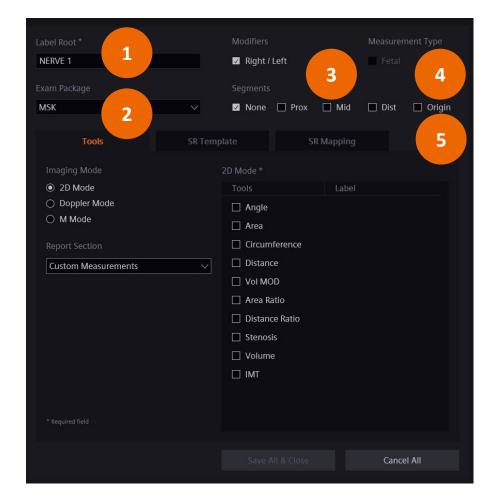


Defining custom measurement labels Creating a custom label



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)

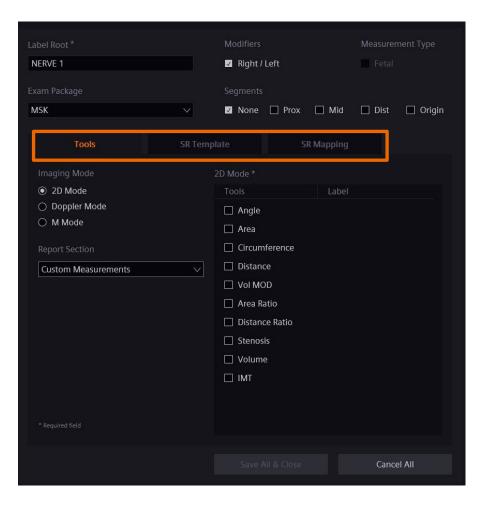


Defining custom measurement labels Creating a custom label



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

- Tools
- SR Template
- SR Mapping



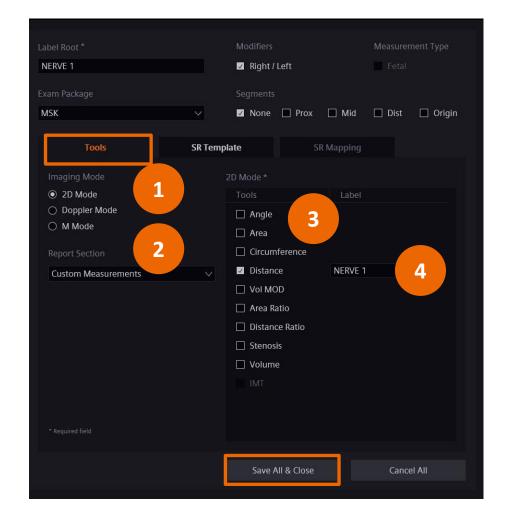
Defining custom measurement labels Creating a custom label – Tools tab



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.



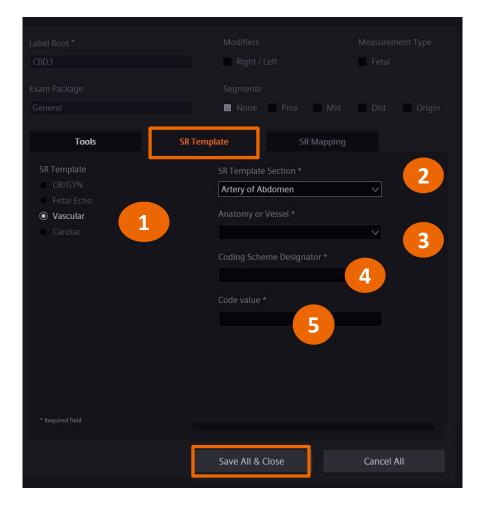
Defining custom measurement labels Creating a custom label – SR Template tab



SR Template tab defines the:

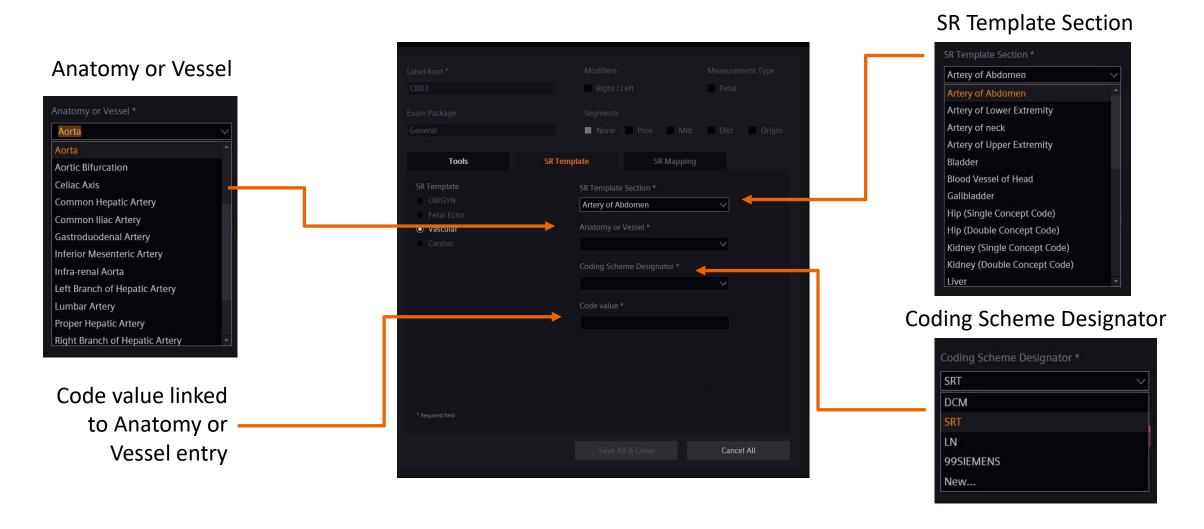
- 1. SR Template
- 2. SR Template Section
- Anatomy or Vessel
- 4. Coding Scheme Designator
- 5. Code Value

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



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





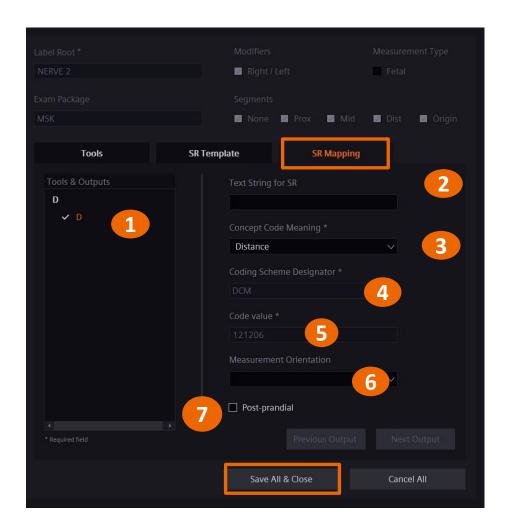
Defining custom measurement labels Creating a custom label – SR Mapping tab



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
- Post prandial

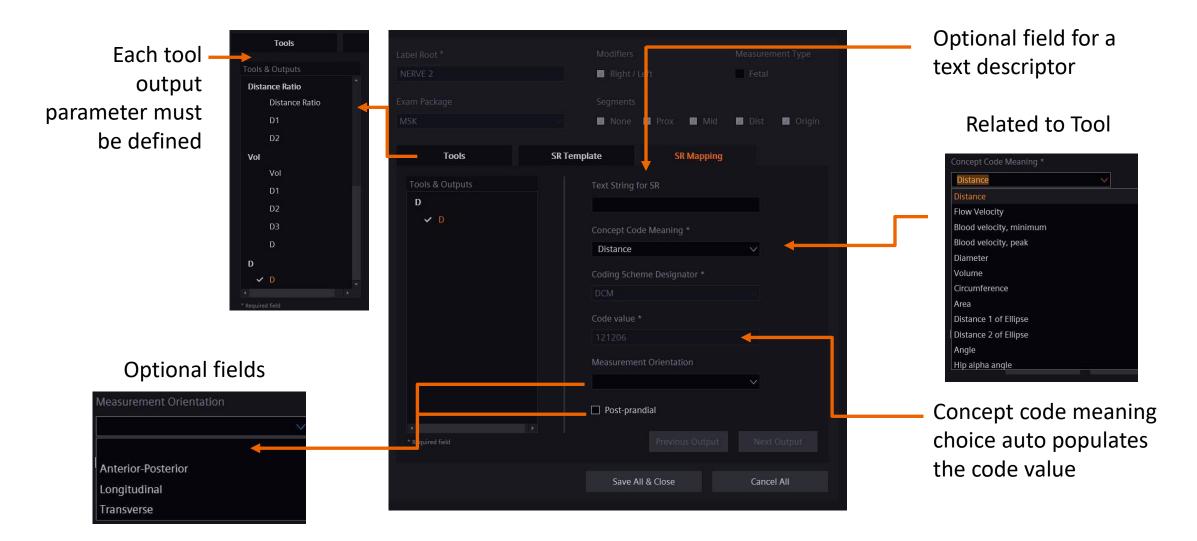
Use Save All & Close to complete the SR Mapping selections.



^{*}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





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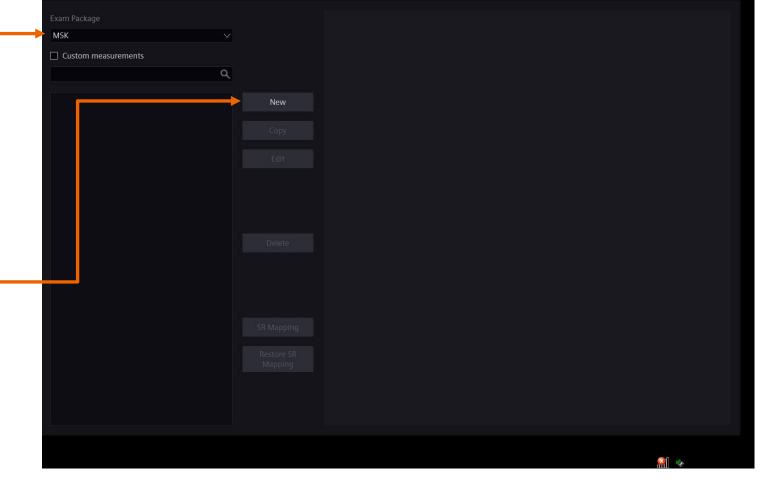


Creating a new label – GI example



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

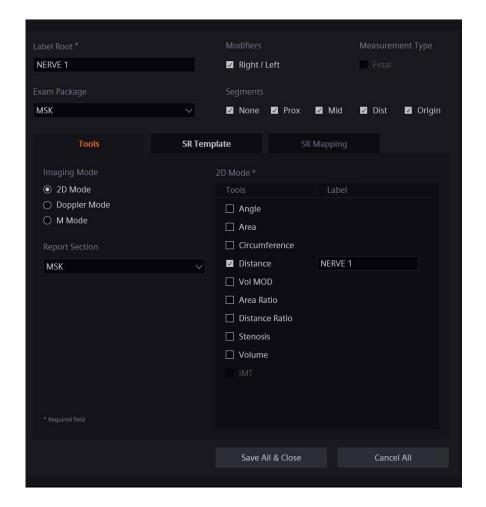
New



Creating a new label – GI example Tools tab



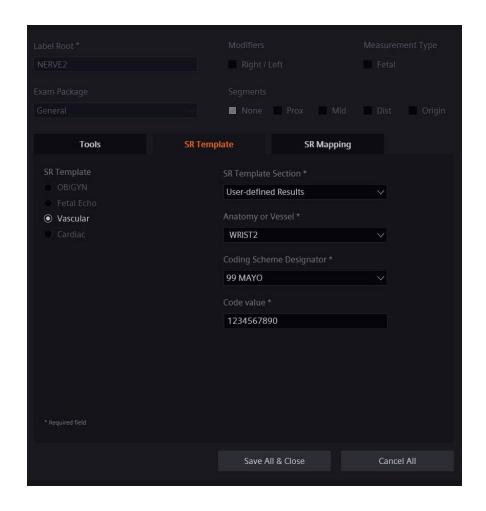
- Enter the unique label name → NERVE 1
- Select the **Exam Package** from drop-down menu → MSK
- Select **Modifiers** → **I** Right/Left
- Select Segments → ☑ None, ☑ Prox, etc.
- Select **Imaging Mode** → 2D Mode
- Select Report Section → MSK
- Select **Tool** → Distance
- Select Save All & Close if 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

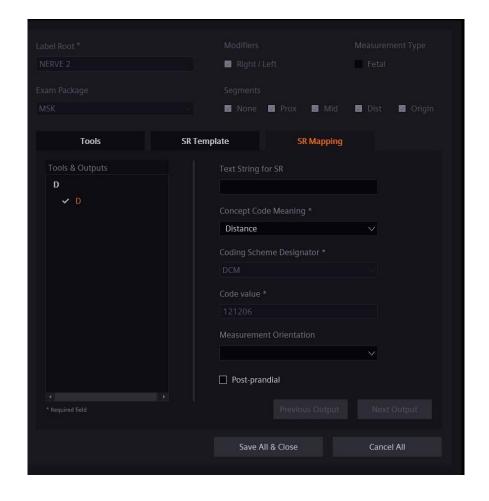
^{**} The Code Value is linked to the Coding Scheme Designator

^{***} SR Mapping will be incomplete

Creating a new label – GI example SR Mapping tab



- 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

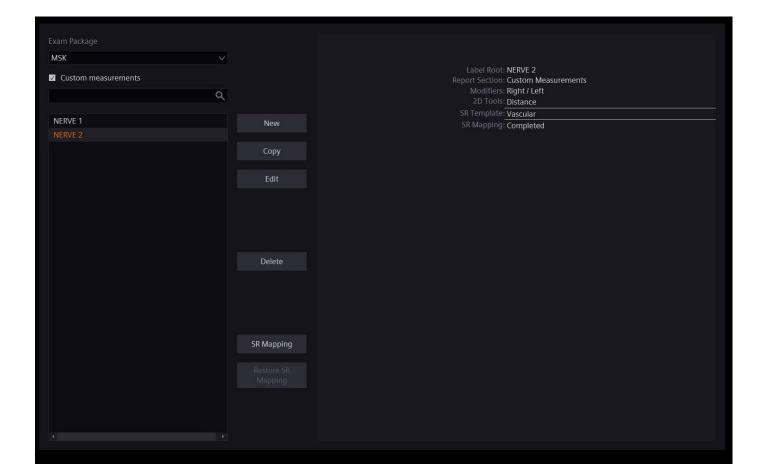


^{*} Each tool will need to be selected and confirmed with the steps listed above. Only then will the SR Mapping be completed for the custom label.

Creating a new label – GI example Custom label summary



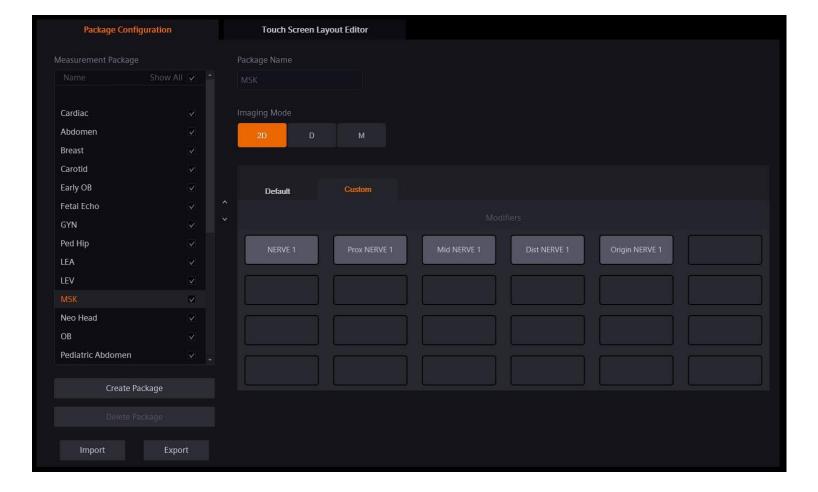
- Check listed label summary for accuracy
- Label will be listed in the master menu under exam
- Label will be automatically added to the Touch Screen upon completion
- Use the Per Label Configuration to alter units or precision
- Copy, Edit, Delete are all available



Creating a new label – GI example Touch Screen

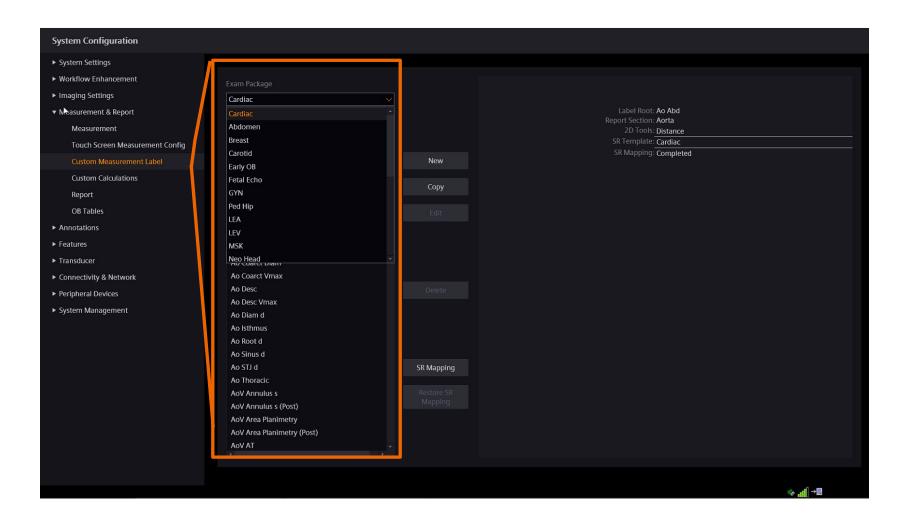


- Custom label will automatically be added to the Touch Screen
- Modifiers (if selected) are embedded in the custom label
- Access the Touch Screen Layout Editor touch tab to change label position if necessary



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





Copying a label – Cardiac example



- Select the label you want to copy from the master list (selected label is back lit in orange)
- Select Copy from the label management options

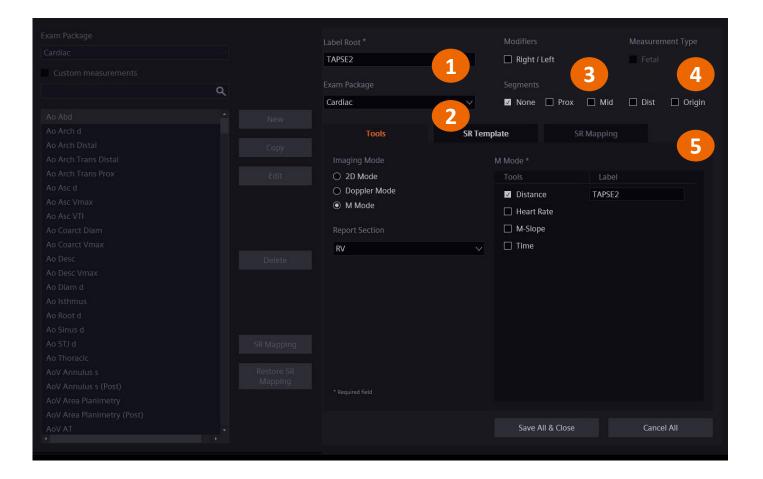
Cardiac Label Root: Ao Root d Custom measurements 2D Tools: Distance SR Template: Cardiac Ao Abd Ao Arch d Ao Arch Distal Ao Arch Trans Distal Ao Arch Trans Prox Ao Asc d Ao Asc Vmax Ao Asc VTI Ao Coarct Diam Ao Coarct Vmax Ao Desc Ao Desc Vmax Ao Diam d SR Mapping Ao Thoracic AoV Annulus s AoV Annulus s (Post) AoV Area Planimetry AoV Area Planimetry (Post)

Summary of selected label parameters

Copying a label – Cardiac example Defining label parameters



- 1. Define label root (name)
- Select Exam Package from drop-down menu
- Select Modifier (if applicable)
- 4. Measurement Type
- Select Segment (if applicable)

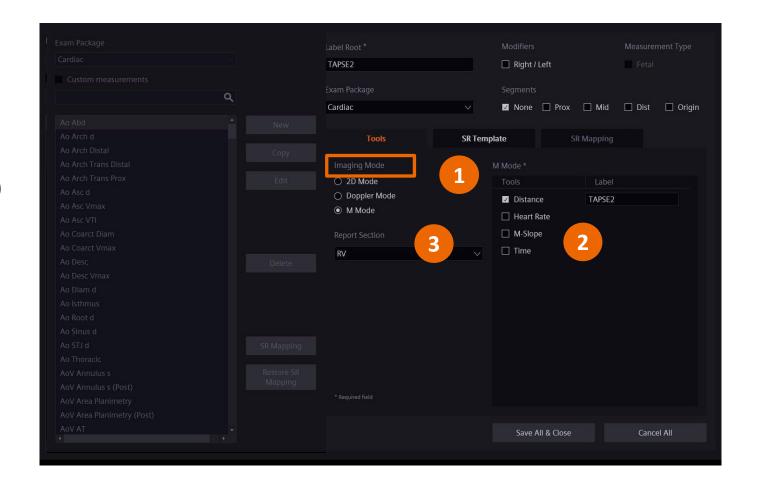


Copying a label – Cardiac example Tools tab



The Tools tab defines the following label parameters:

- 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)

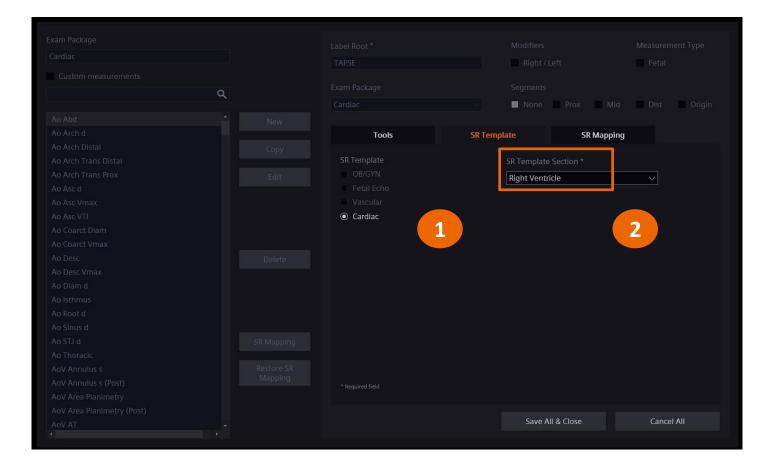


Copying a label – Cardiac example SR Template tab



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

- SR Template type
 - → Cardiac
- 2. SR Template section
 - → Right ventricle

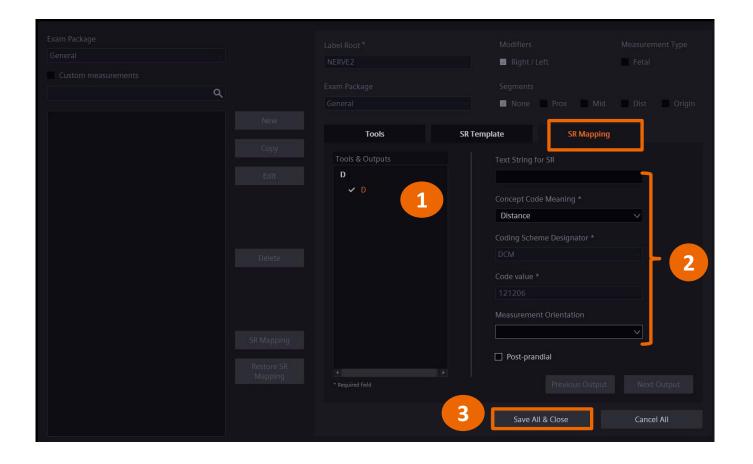


Copying a label – Cardiac example SR Mapping tab



The SR Mapping tab contains the following:

- 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

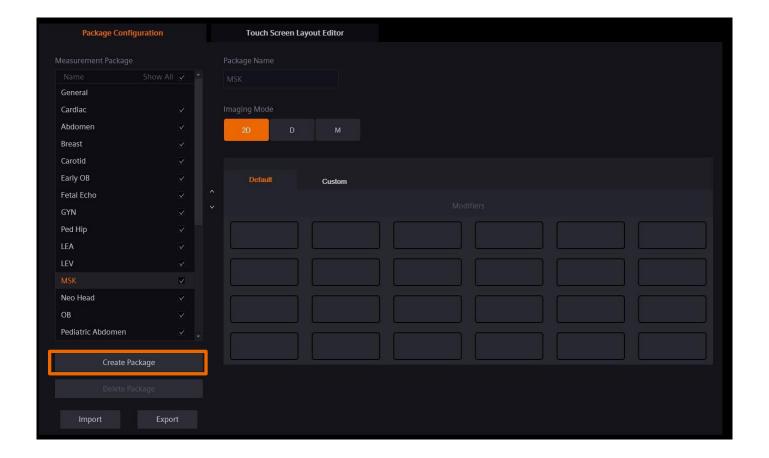


Custom calculation packages can be created for any exam:

- 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

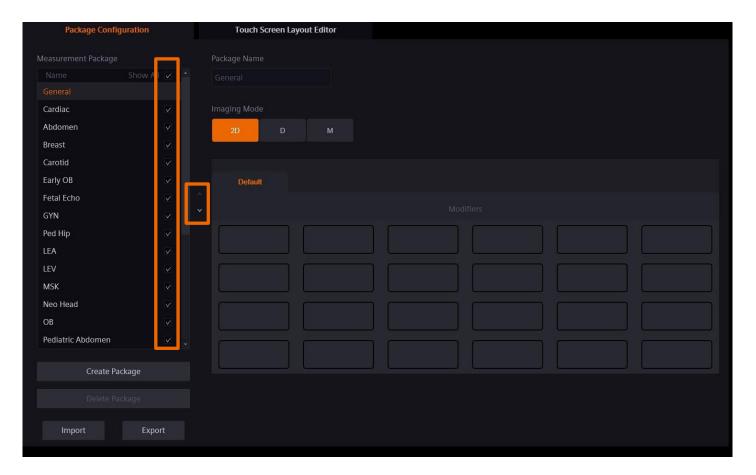


All calculation packages are listed in the master list

- Change the visibility ("hide") of any package by unchecking the associated box ☑ →□
- Re-order packages within the list by using the up/down arrows



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



Objectives



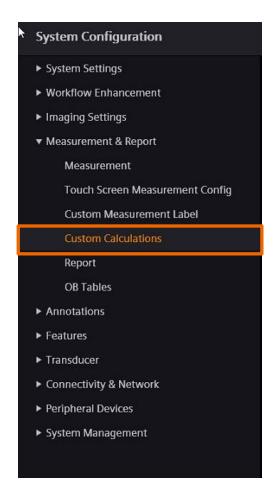
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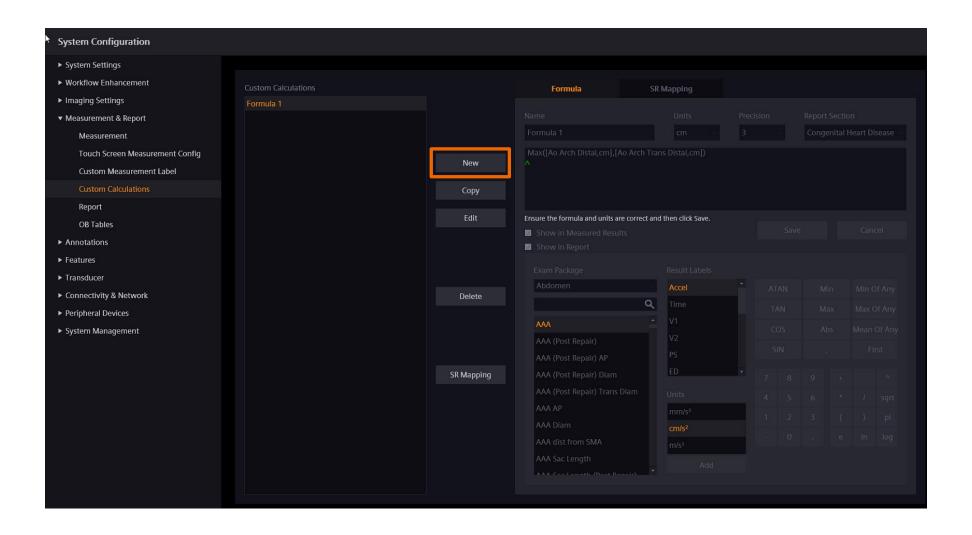


Custom Calculations are clinical calculations that are specific to a user, department, institution, or region that are not available as factory calculations.

- 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

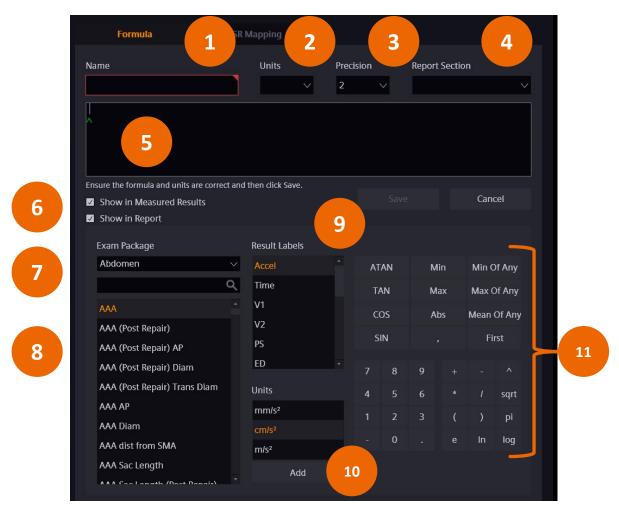








- 1. Name of equation (14-character limit)
- 2. Output units of equation
- 3. Decimal point precision
- 4. Report display area
- 5. Area of equation input
- Display results in onscreen measurement display area or within Report
- 7. Exam package drop-down
- 8. Library of labels to create an equation
-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

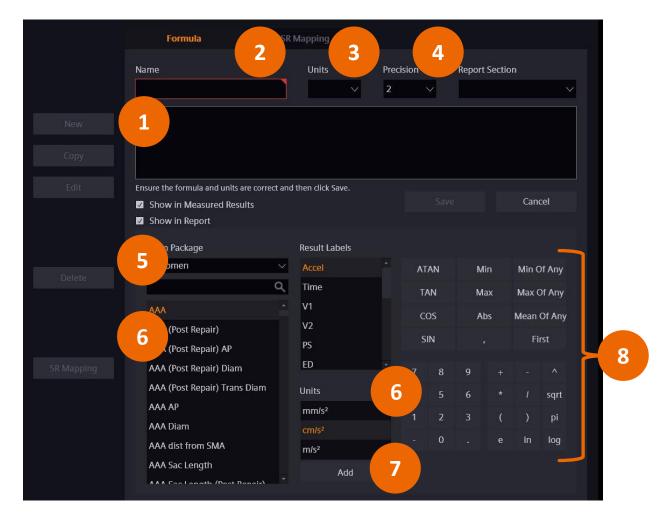


Custom Calculations – entry



Basic entry of a Custom Calculation:

- Select New
- Enter a unique formula name (14-character limit)
- 3. Select output **Units**
- Select result Precision
- 5. Select appropriate Exam Package
- 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

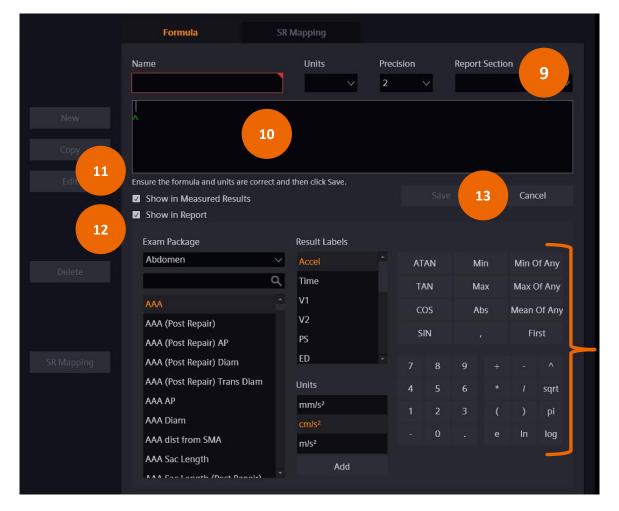


Custom Calculations – entry cont.



Basic entry of a Custom Calculation (cont.):

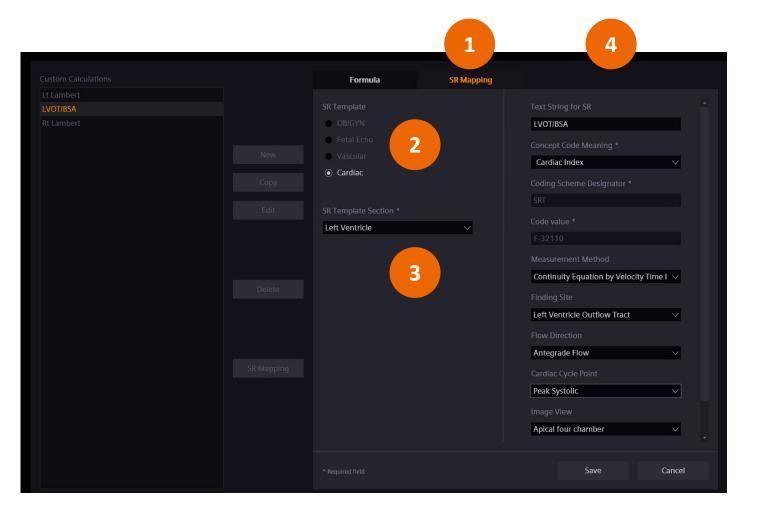
- 9. Select **Report Section** area for formula results to display
- 10. Check for accuracy and no red lines
- 11. Select **Show in Measured Results** to display results in MDA
- 12. Select **Show in Report** to display formula results in the report
- 13. Select Save





SR Mapping

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



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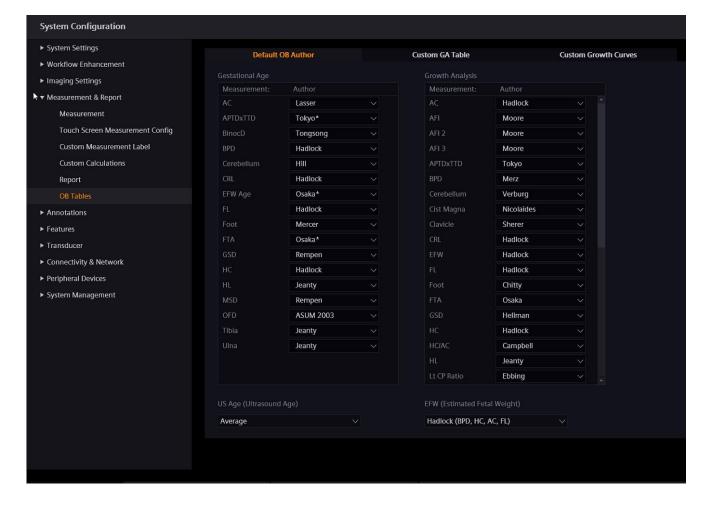


OB Tables tabHomepage layout



OB tables homepage configurable options:

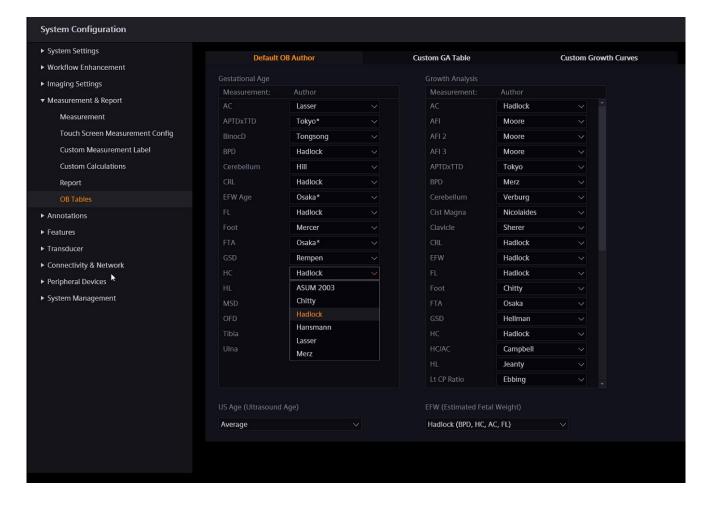
- Default OB Author
- Custom GA Table
- Custom Growth Curves



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

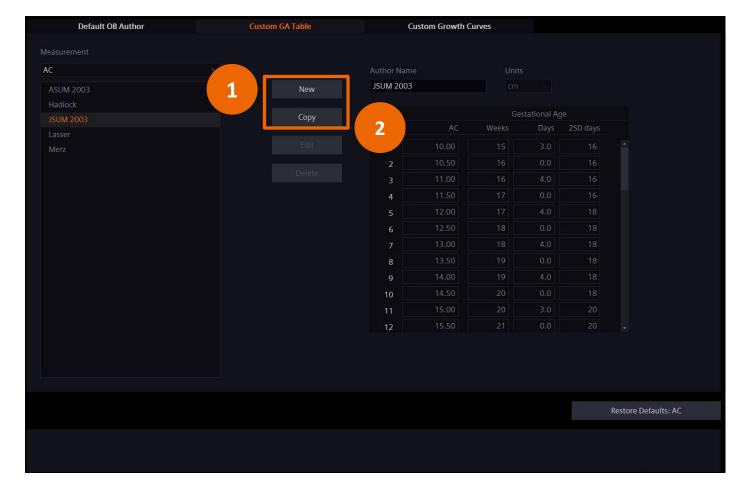


OB Tables tab Custom GA Table



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

- 1. Manually input a new table
- 2. Copy an existing table



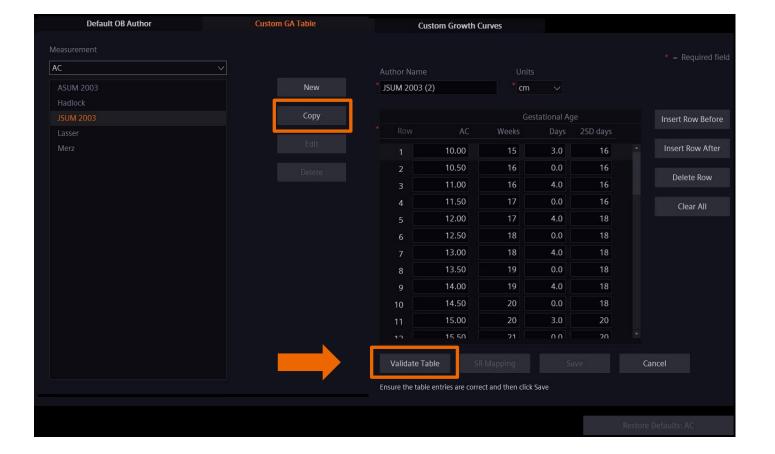
OB Tables tab Custom GA Table – copy existing table



- Highlight desired table
- Select Copy
- Change Author name or leave copied name with number
- Alter data (if required)
- Validate table

Table is valid.

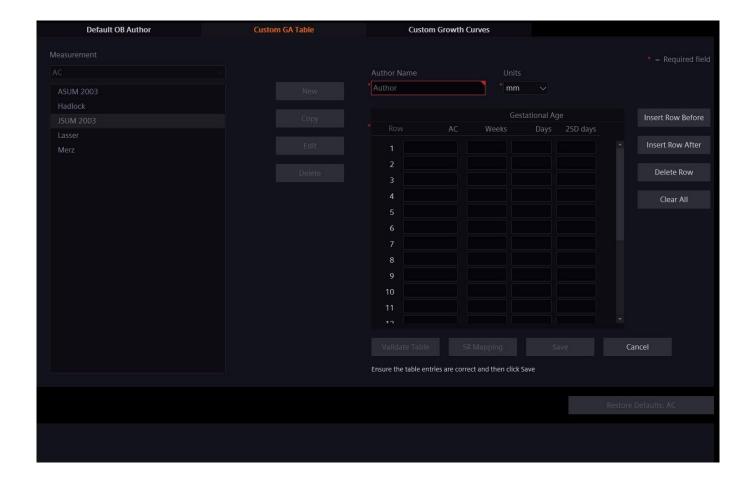
If table is valid, select Save



OB Tables tab Custom GA Table – create new



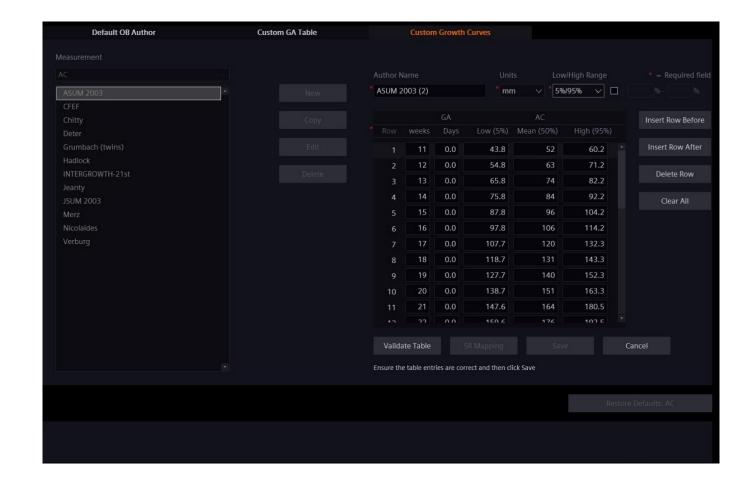
- Select New
- Name table and select units
- Input table data use the "tab" key to advance
- Insert/delete rows as required
- Validate table
- Complete the SR Mapping process (if required)
- Select **Save** to complete table



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

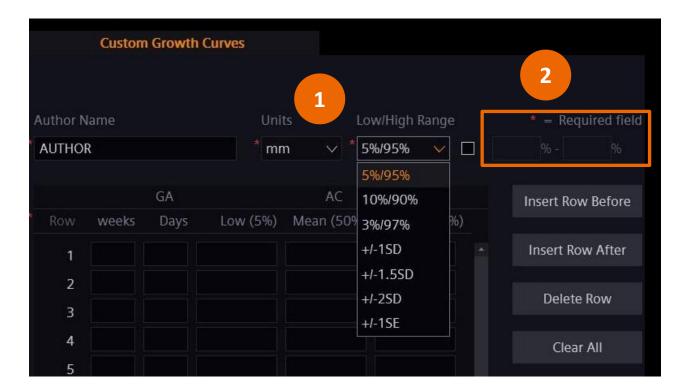


OB Tables tab Custom Growth Curves



Flexibility with input

- Low/High percentile range options
- Custom defined Low/High percentile -0.1–99.9%
- Auto calculation of Low/High percentile



Objectives



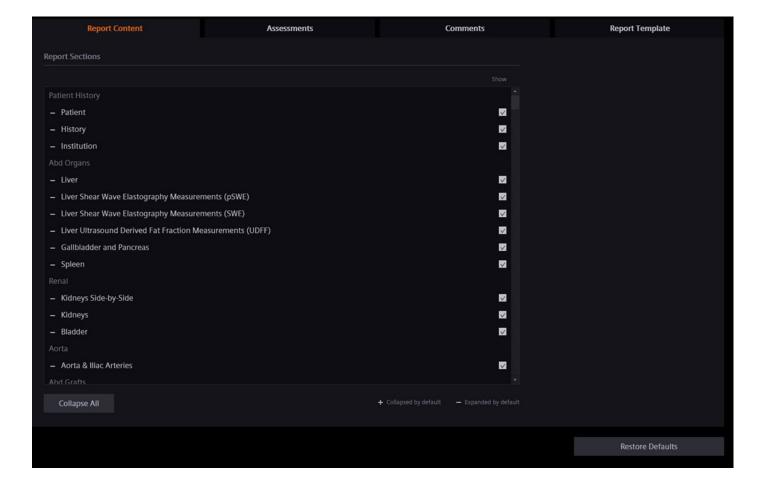
- Identify access to system configuration
- Outline the measurement subgroup
- Describe the Touch Screen configuration
- Explain custom measurement labels
 - Homepage layout
 - What is DICOM SR?
 - Steps to define a custom label
 - Create a new custom label
- Describe Custom Calculations
- Discuss the OB tables
- Review the report



Report configuration tab Homepage layout



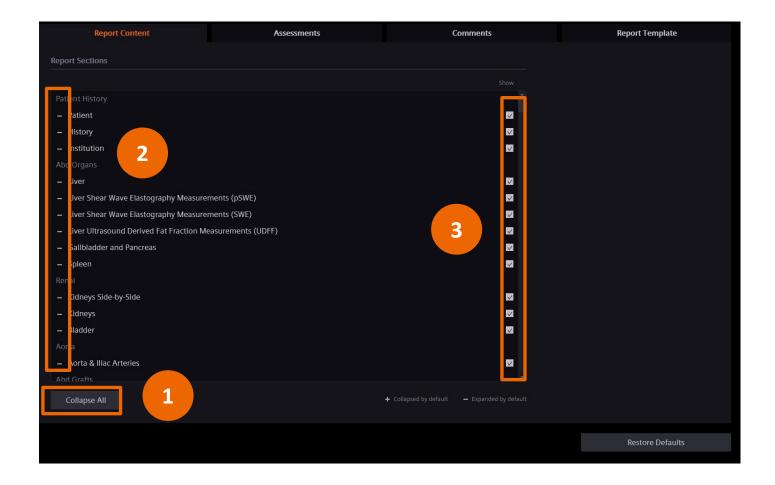
- Organ-based/anatomic reporting structure
- Homepage contains four configurable option areas:
 - Report Content
 - Assessments
 - Comments
 - Report Template



Report configuration tab Report Content



- Default option to expand or collapse all report content
- Expand/collapse option for individual sections



^{*}Hidden sections will not show on a printed report even if a measurement is performed for that section.

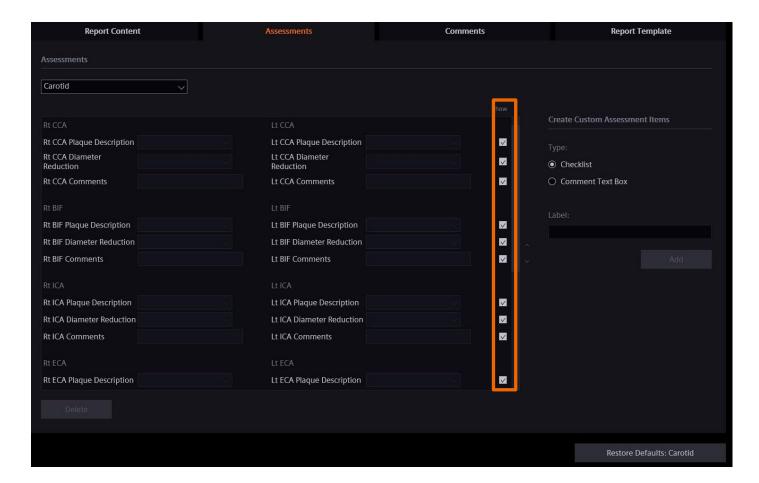
Report configuration tab Assessments



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



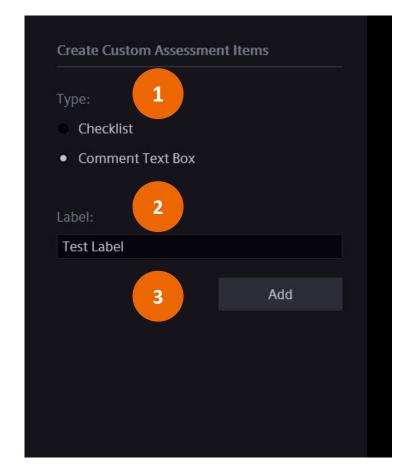
Two types of custom assessment items can be added:

- 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.

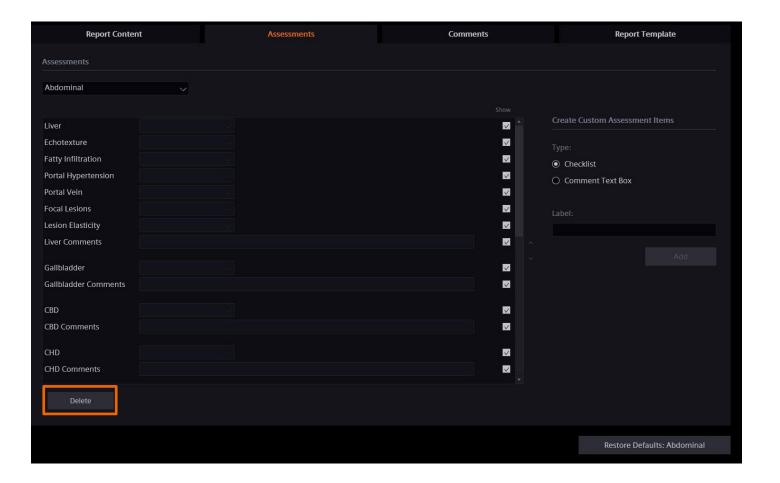


Report configuration tab Delete custom assessment item



To delete a custom assessment item:

- Highlight the desired label
- Select **Delete**



Report configuration tab Comments

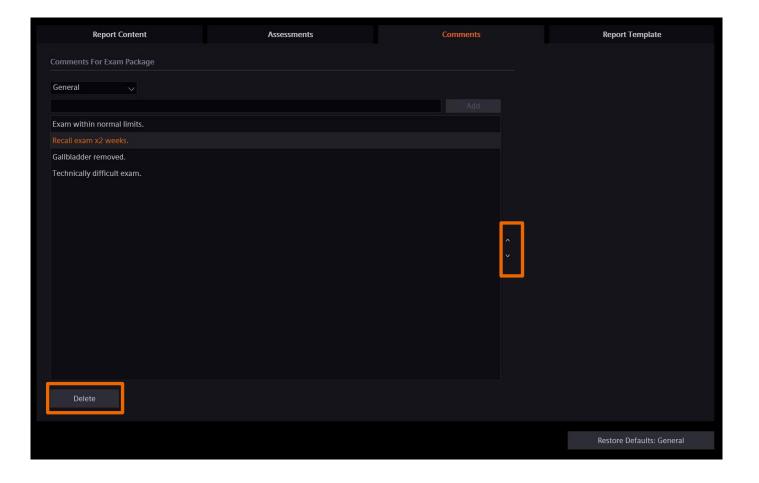


Pre-defined comments can be added to the report

- Select the exam package
- Enter comment in the space provided
- Select Add
- Re-order (if required) with the directional arrows

To delete a comment

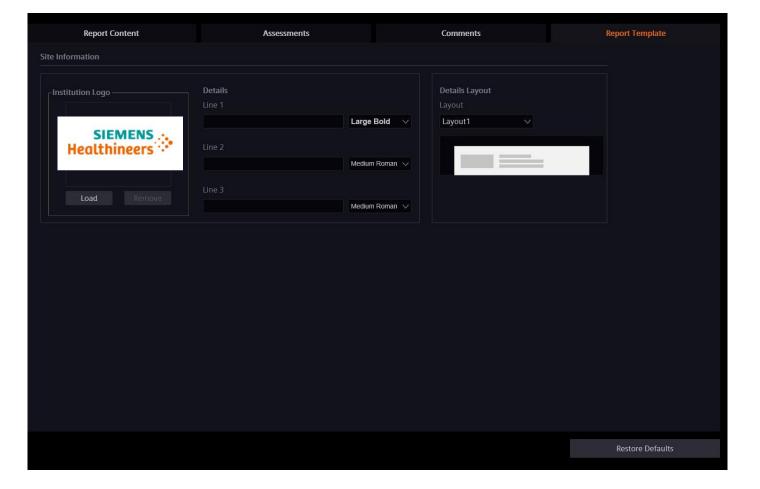
- Highlight comment
- Select Delete



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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Thank you for your enthusiasm!



Questions?