VIEWORKS Imaging Expert

QXLink 3 User Manual

CE 0434

Contents

1. Instruction

This chapter gives basic information of this manual and the intended use of program.

Document Guide

Intended Use

1.1 Document Guide

This user manual explains about the **QXLink 3 Viewer** program, which performs tranferring and adjusting the medical images.

Target

This document is intended for the users who use **QXLink 3 Viewer**. With this user manual, you can fully understand about the composition of **QXLink 3 Viewer** and its various functions.

Contact Department

For any comments or inquiries regarding this document, contact via email below.

Item	Contents
Department	Customer Support Team in Vieworks
E-mail	CustomerSupport@vieworks.com

1.1.1 Symbols

This product should be operated under the safety instructions with the warning or caution symbol in this manual. It is important for you to read and understand the contents to operate the products safely.

Caution

- This symbol is used to indicate a potentially hazardous situation that may cause death, personal injury or substantial property damage if the instructions are ignored. Users should be well acquainted with this symbol and the related contents.

Information

- This symbol is used for indicating product related references and supplementary information. Users are recommended to read the sentences with this notice carefully.

1.1.2 Notations

Bold Types

Words in bold indicate products terms, or the sentences which are needed to transmit clear meaning to the customers.

1.2 Intended Use

QXLink is a device that provides functions relating to the acceptance, transfer, display, storage, and digital processing of medical images. You can manipulate or enhance images by using the software components. The medical images are acquired from the following medical devices.

Modality	Description
CR	Computed Radiography
MR	Magnetic Resonance
US	Ultrasound
BI	Biomagnetic imaging
ES	Endoscopy
PT	Positron emission tomography (PET)
XA	X-ray Angiography
RTIMAGE	Radiotherapy Image
DX	Digital Radiography
IO	Intra-oral Radiography
GM	General Microscopy
XC	External-camera Photography
OP	Ophthalmic Photography
CT	Computed Tomography
NM	Nuclear Medicine
OT	Other
DG	Diaphanography
RG	Radiographic Imaging (Conventional film / Screen)
TG	Thermography
RF	Radio Fluoroscopy
PX	Panoramic X-ray
IVUS	Intravascular Ultrasound
BMD	Bone Densitometry (X-ray)

1.2.1 The Limits of Image Measurement Function

The image measurement function of **QXLink** is limited to the ancillary annotation.

- The accuracy of measurement functions for clinical and medical use can be affected by followings;
  - The quality of an image to be measured.
  - User's acquisition skill and comprehension of the tool.
- Therefore, it is recommended to use only the images of diagnosable quality. Also, a thorough understanding of the tool through provided user manual and guide function is highly recommended.
- Operation of the tool when lacking the comprehension of these information can lead to malfunctioning or unexpected accidents from misuse.

2. Getting Started

This chapter explains about the composition and operation way of the program.

Executing the Program

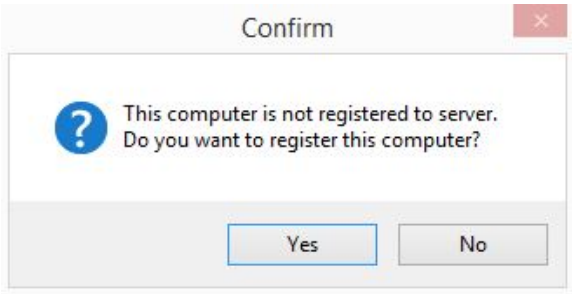
2.1 Executing the Program

Icon	Location
	On the wallpaper of PC or the starting program.

2.1.1 Login

1 Select **QXLink 3 Server** to log in and input the registered used ID and password.

2 If the following message is displayed, click **Yes** button.



- **QXLink Server 3** checks whether your PC is registered or not by using the MAC address of the PC where **QXLink 3 Viewer** is installed in. If the PC is not registered to **QXLink 3 Server**, a message displays when you log on to **QXLink Viewer**. Click **Yes** to register the PC information to **QXLink 3 Server** automatically.

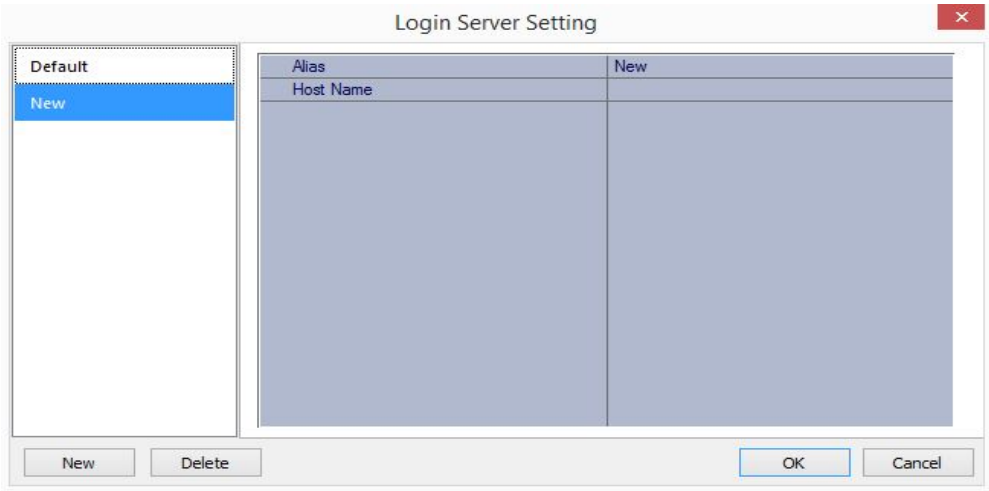
- The resistered user of **QXLink 3 Server** can log on to **QXLink 3 Viewer** only.
- You cannot log on to **QXLink 3 Viewer** if the number of registering PC allowed by **QXLink 3 Server** exceeds. In this case, contact the engineer to solve the problem.

2.1.2 Setting Login Server

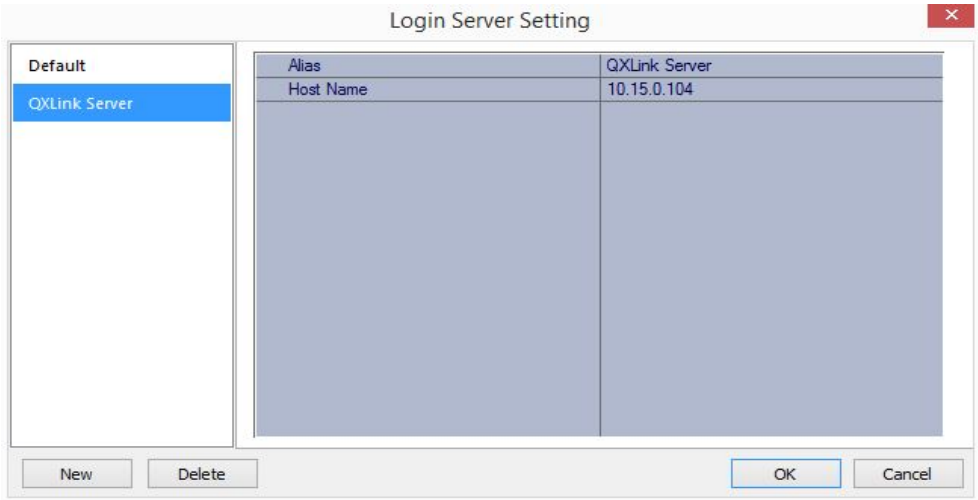
You can configure and add a new server when accessing to **QXLink 3** with another server.

1 Choose **Edit** from the **Login Server** options.

2 Click **New** button at the left bottom to make a new Alias and click the **New** tab (marked below) to change its name. (e.g: **QXLink Server**)

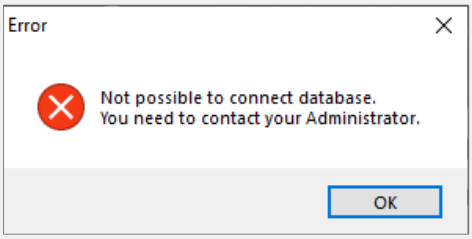


3 Input the Host Name (IP address of your PC installed **QXLink Viewer**) and click **OK** button.



4 Choose the new option and click on the **Login** button after entering passwords.

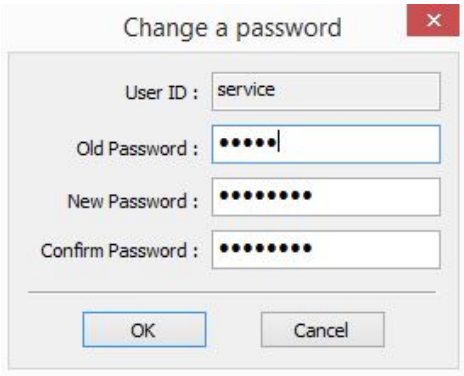
- If the following message appears on the server added by inputting the IP Address, check the server setting referring to Section 4.7 'Error connecting to IP address' in QXLink 3 Service Manual.



2.1.3 Change a Password

1 Input the user ID.

2 Click on the **Change a password** button and input the old password and the new password to each field.



3 Enter the new password again in the **Confirm Password** field and click **OK** button.

2.1.4 Switching to Viewer Window

Click  button on the toolbar to move to the Viewer window from the study list window.

Press F2 key to switch between the Viewer and Study List windows.

2.1.5 Close

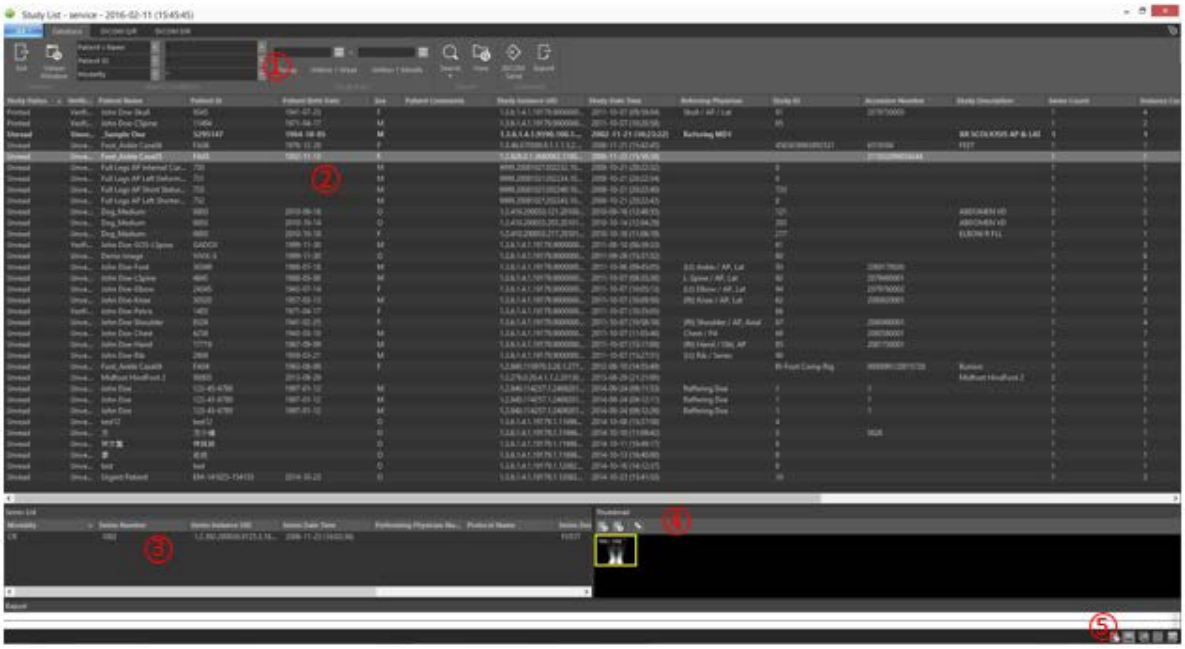
Click  button on the toolbar or  button at the right top of the Viewer window to close **QXLink Viewer**.

3. Study List

This chapter explains about the composition of Study List window in QXLink 3 Viewer.

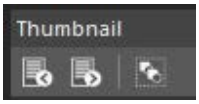
3.1 Composition of Study List

3.1.1 Database



	Item	Description
1	**Database Ribbon Toolbar**	Displays a toolbar available in the Database tab of the Study List window.
2	**Study List**	Displays a study list searched from the database tab.
3	**Series List**	Displays image information of the selected study.
4	**Thumbnail List**	Displays thumbnails of the selected study.
5	**Status Bar**	Displays functions and their status used from the Database tab.

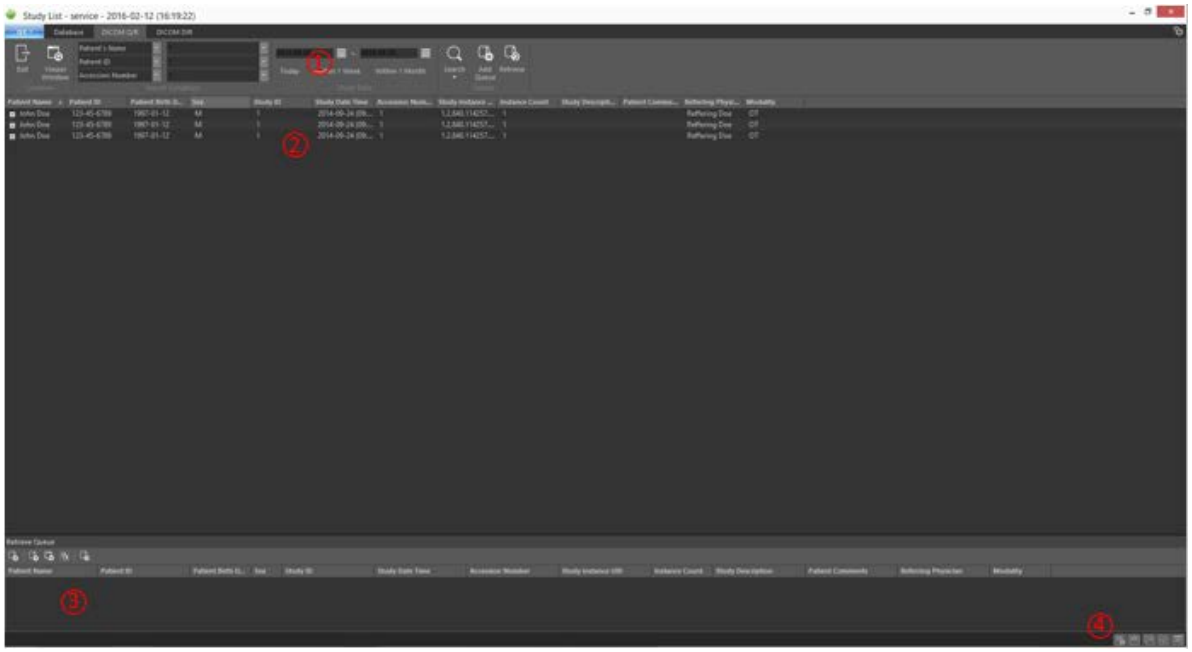
3.1.2 Thumbnail List

Image	Description (from left)
	• Previous page • Next page • Show all thumbnails of the selected study

3.1.3 Status Bar

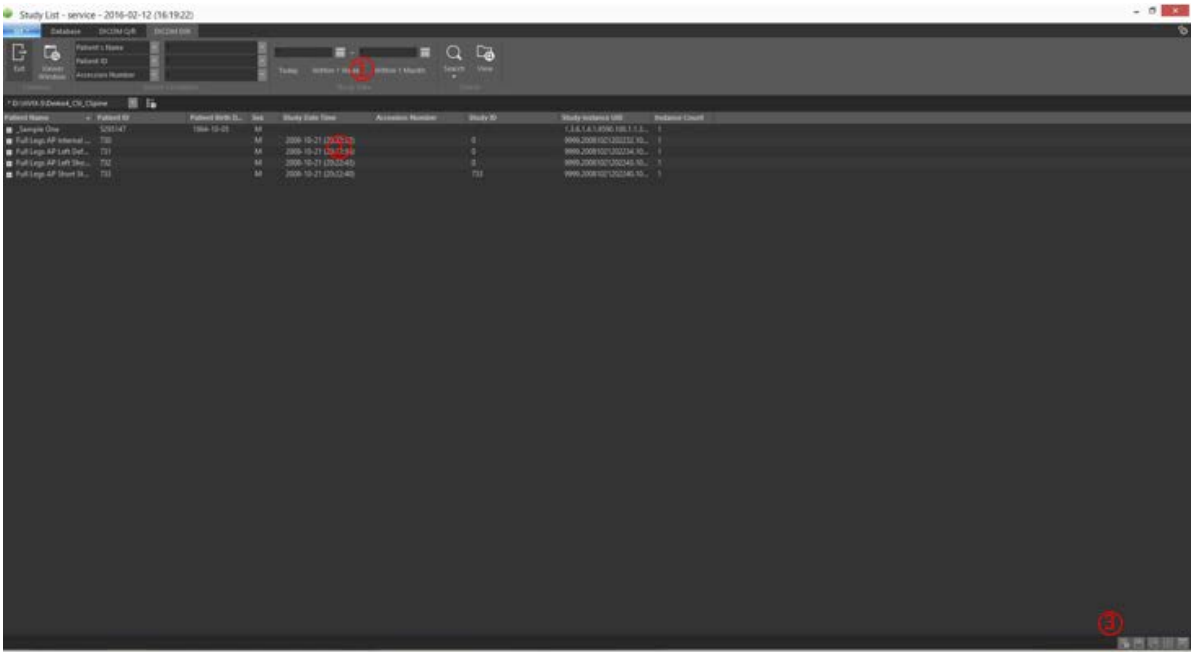
Image	Description (From left)
	• Text Mode • Preview Mode • Show or Hide Series List • Show or Hide Thumbnail • Show or Hide Report

3.1.4 DICOM Q/R



	Item	Description
1	**DICOM Q/R Ribbon Toolbar**	Displays a toolbar available in the DICOM Q/R tab of the study list window.
2	**Query List**	Displays a study list queried from the DICOM Q/R tab.
3	**Retrieve Queue List**	Displays a Retrieve Queue list.
4	**Status Bar**	Displays functions and their status used from the DICOM Q/R tab.

3.1.5 DICOM DIR



	Item	Description
1	**DICOM DIR Ribbon Toolbar**	Displays a toolbar available in the DICOM DIR tab of the Study List window.
2	**Search Results**	Displays search results from the DICOM DIR tab.
3	**Status Bar**	Displays functions and their status used from the DICOM DIR tab.

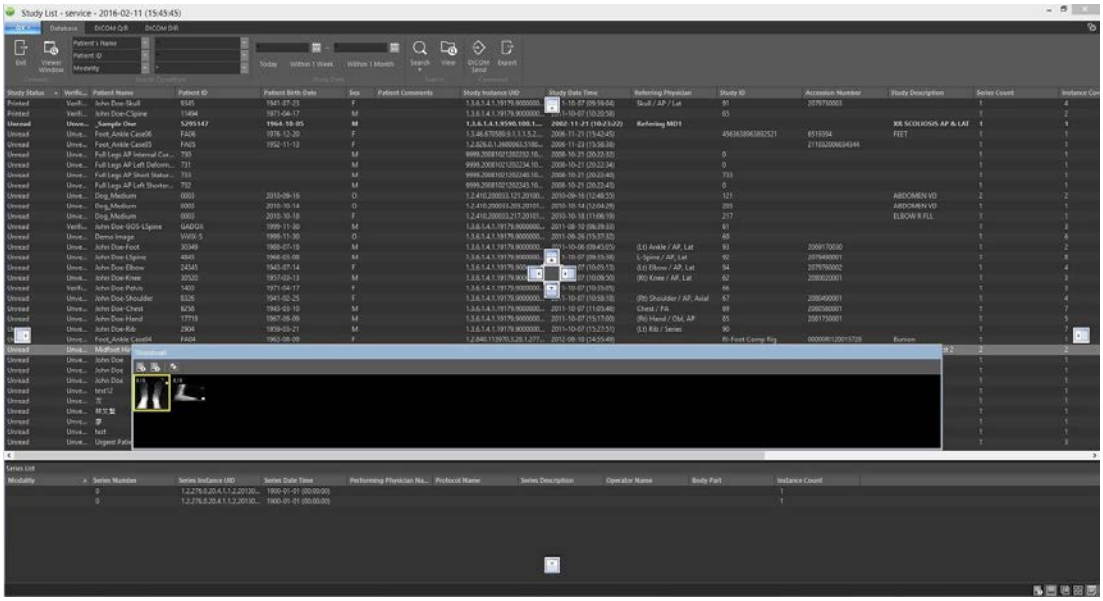
3.1.6 Changing the Size and Location of Window

You can adjust the size and location of windows composed the **Study List** window. The adjustable windows are as follows.

- **Series List, Thumbnail, Report, Queue List**

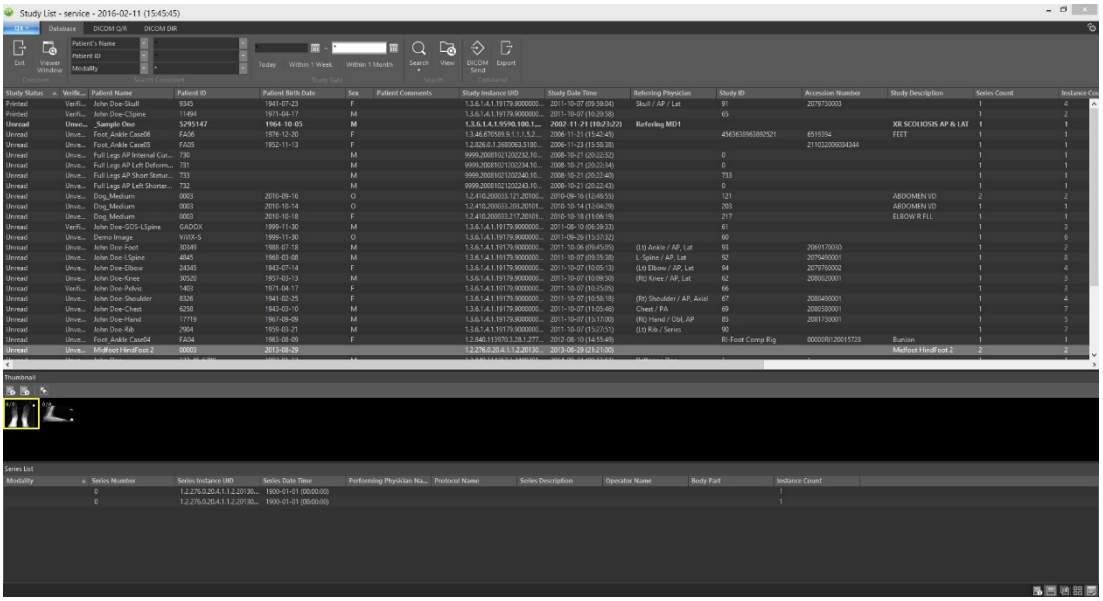
Change location of window

1 Press and hold the left mouse button on the title of window and drag it, then a placeholder which indicates location displays.



2 Press and hold the left mouse button and drag the pointer to the placeholder to relocate it in the desired place.

3 The window will be placed on the location after releasing the mouse left button.



4 Resize the window size properly. The resized window and its location will be saved even though you restart the program.

3.2 Search Condition

3.2.1 Search Conditions of Database

You can search the stored studies flexibly by combining the search conditions. The supported conditions are as follows.

Image	Search Conditions
	• **Study Status** • **Verification** • **Patient's Name, Patient ID** • **Patient Birth Date, Patient Sex, Patient Comments** • **Reffering Physician** • **Study ID, Accession Number, Study Description** • **Modality** • **Body Parts** • **Operators** • **Institution** • **Source AE Title**

Study Status

The studies are classified into the following status.

Name	Status
Unread	When no report exists.
Read	When one report exists.
Read(*)	When more than one report exists, or a report is modified.
Printed	When a report is printed out.

Verification

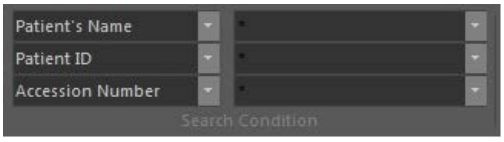
This item indicates the verification status of each study. The status of study is changed when you click on the **Save** button to save the status of image after you diagnosed it.

Name	Status
Unverified	When verification is not completed.
Verified	When verification is completed.

3.2.2 Search Conditions of DICOM Q/R

Image	Search Condition
	• Patient's Name, Patient ID • Patient Birth Date, Patient Sex • Study ID, Accession Number, Study Description • Patient Comments, Reffering Physician, Modality

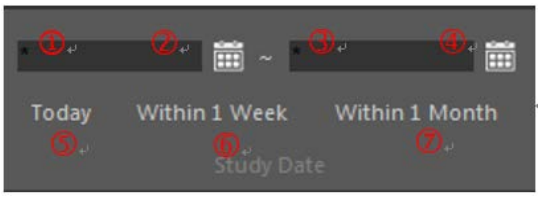
3.2.3 Search Conditions of DICOM Directory

Image	Search Condition
	• **Patient's Name, Patient ID, Patient Sex** • **Study ID, Accession Number**

- You cannot select duplicated search conditions.
- The selected search conditions are maintained, even after you restart the program.
- The entered search values are recorded every time when you search the conditions. Fifteen (15) values are stored for each study temporarily.

3.2.4 Setting Search Period

You can configure a period of date for searching study records.



No.	Name	Description
1	**Start date of search period**	Input a start date manually.
2	**Start date input calendar**	Select a start date using a date picker calendar.
3	**End date of search period**	Enter an end date manually.
4	**End date input calendar**	Select an end date using a date picker calendar.
5	**Studies within today**	Search all studies performed today.
6	**Studies within a week**	Search all studies performed within a week including today.
7	**Studies within a month**	Search all studies performed within a month including today.

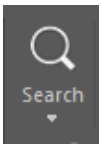
- Click on **Today**, **Within 1 Week**, or **Within 1 Month** to search each item without clicking on the **Search** button.

3.2.5 Initializing Search Condition

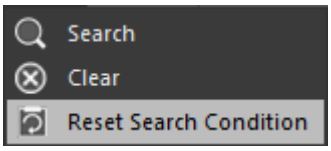
Reset all search conditions including the changed condition or entered condition values.

How to reset search condition

1 Click on the bottom part of **Search** button.



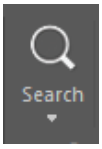
2 Click on the **Reset Search Condition** button.



3.2.6 Clearing Search Result

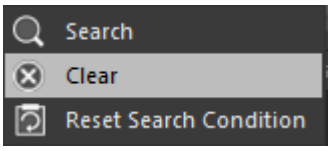
How to clear search result

1 Click on the bottom part of **Search** button.



2 Click on the **Clear** button.

▫ The serach conditions are also initialized at the same time.



- The following lists become initialized on the **Database** window.
  - Study List
  - Series List
  - Thumbnail List

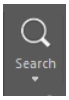
- The following lists become initialized on the **DICOM Q/R** window.
  - Retrieve List
  - Queue List

- The following list becomes initialized on the **DICOM DIR** window.
  - Search result

3.3 Database Tab

3.3.1 Search

You can search studies stored in the database.

1 Select search conditions and input search values.
2 Set the search periods.
3 Click on the **Search** 

button.

- Search conditions are case-insensitive.
- Wild-card characters (*) are available. The entered search values are recorded every time when you search the conditions. Fifteen (15) values are stored for each study temporarily.

- Click on **Today**, **Within 1 Week**, or **Within 1 Month** to search each item without clicking on the **Search** button.

3.3.2 Thumbnail View

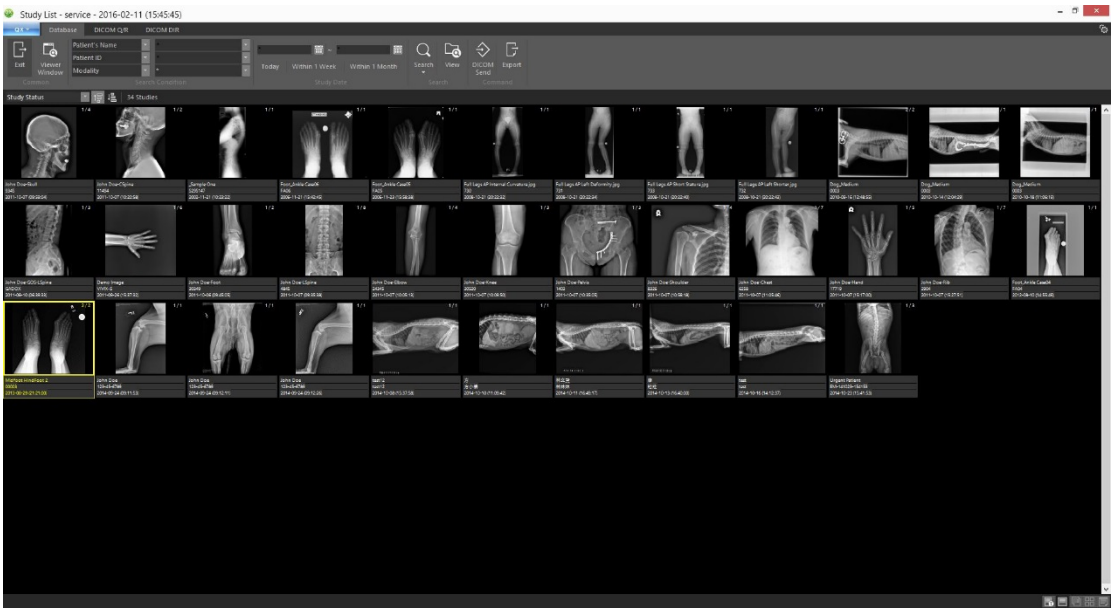
The thumbnail window displays thumbnails included in the searched studies from database. The thumbnail is showed by selecting the searched study. If you select a series from the study consisted of multiple series, all thumbnails in the series display.

Toolbar

Icon	Description
	Moves to the previous page.
	Moves to the next page.
	Displays all thumbnails of the selected study.

3.3.3 Preview Mode

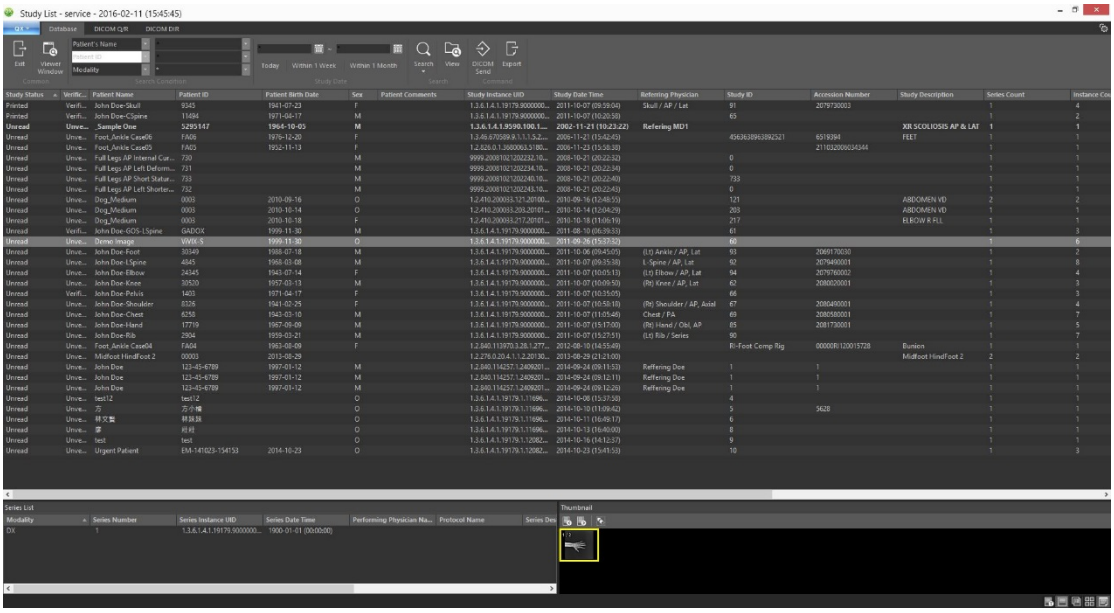
Click the **Preview Mode** icon on the status bar to display representative images of searched studies in the preview mode. This function is useful when you check images of study in advance. (Refer to <3.1.3 Status Bar>.)



- Click on the **Text Mode** icon on the status bar to switch the mode from **Preview Mode**.
- The information indicated each study is as follows.
  - Patient's Name, Patient ID, Study Date Time
- The first image in the thumbnail is indicated as a representative one based on the series and instance numbers.

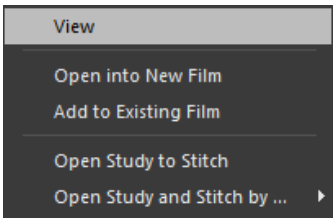
3.3.4 Searching Images in Study Unit

1 Select studies from the searched study list.



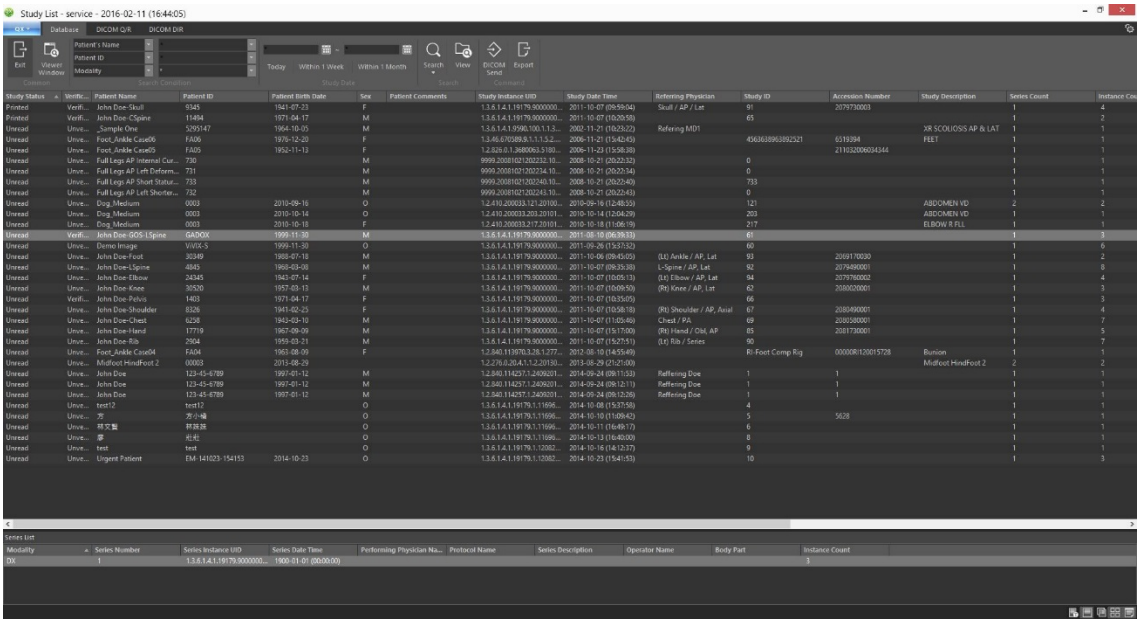
2 Click on the **View** button on the toolbar.

3 Or, double click the selected item or choose the **View** button in the popup menu after clicking the right mouse button.

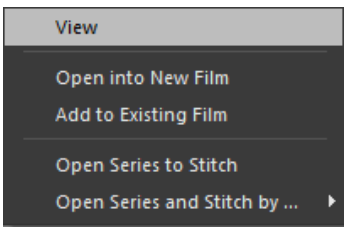


3.3.5 Searching Images in Series Unit

1 Select series from **Series List**.

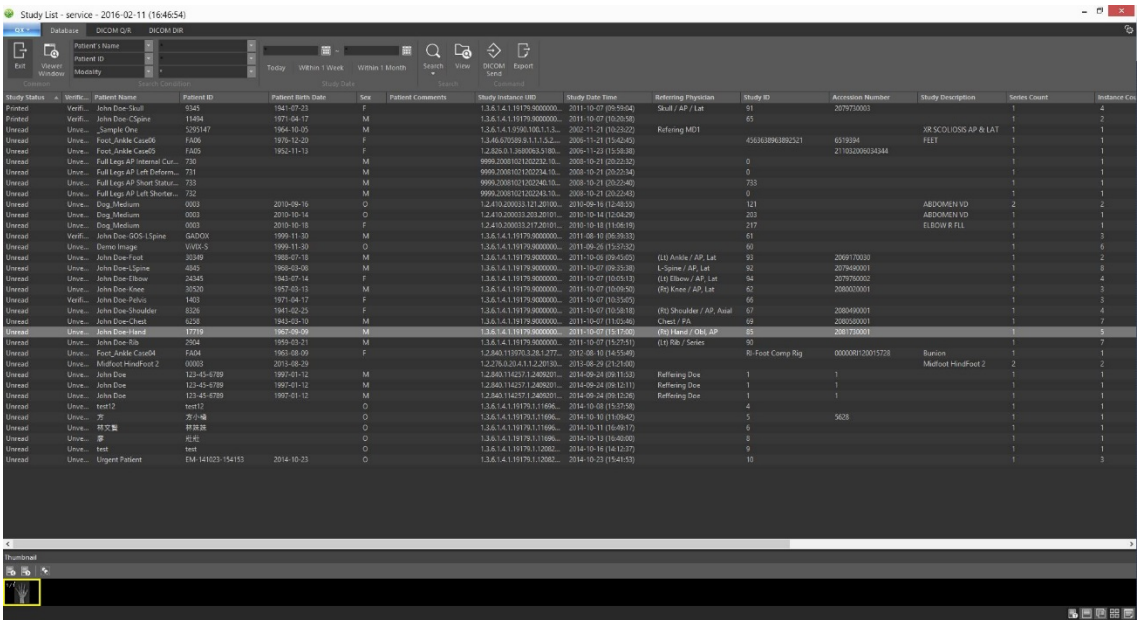


2 Double click the selected item or choose the **View** button in the popup menu after clicking the right mouse button.

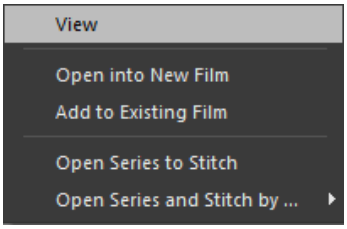


3.3.6 Searching Specific Images

1 Select the desired image in the **Thumbnail** window.



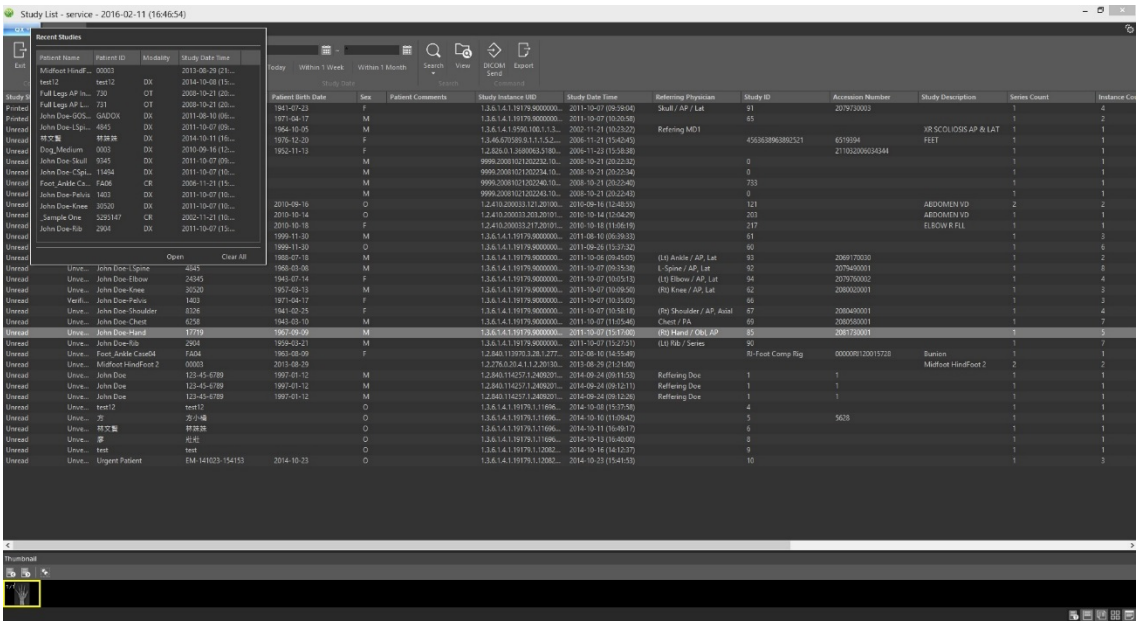
2 Double click the selected image, or choose the **View** button in the popup menu after clicking the right mouse button.



- To retrieve all images in the series, select the representative image of the series.

3.3.7 Searching the Recently Searched Images

1 Click the arrow of **QX** menu on the left top.



2 You can view the recently searched study list from the pop-up window of **Recent Studies**.

- Select a desired study and click on the **Open** button to display the selected study on the viewer screen.
- All searched lists of study are deleted by clicking on the **Clear All** button.

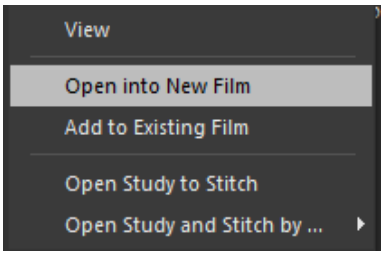
- The series list or images searched from the thumbnail window is not indicated on the image list searched recently.

3.3.8 Opening from the Print Mode Directly

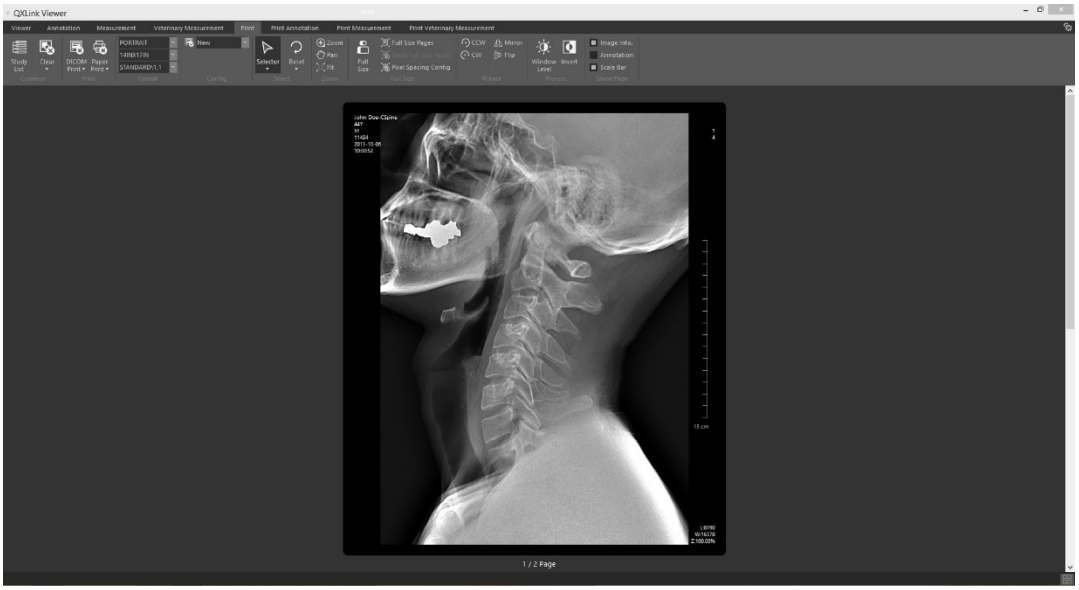
Open the selected studies, series or images from the **Print** mode directly to print it. You can save more memory if you open the items from the **Print** mode without passing the **Viewer** window. You can also use the system more efficiently by skipping several procedures.

1 Select an image from the study, series or thumbnail list.

2 Click the right mouse button to display the popup menus.



3 Click the **Open into new Film** or **Add to Existing Film** menu.

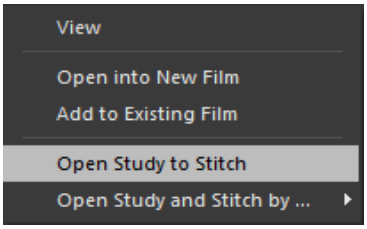


3.3.9 Opening from the Stitch Mode Directly

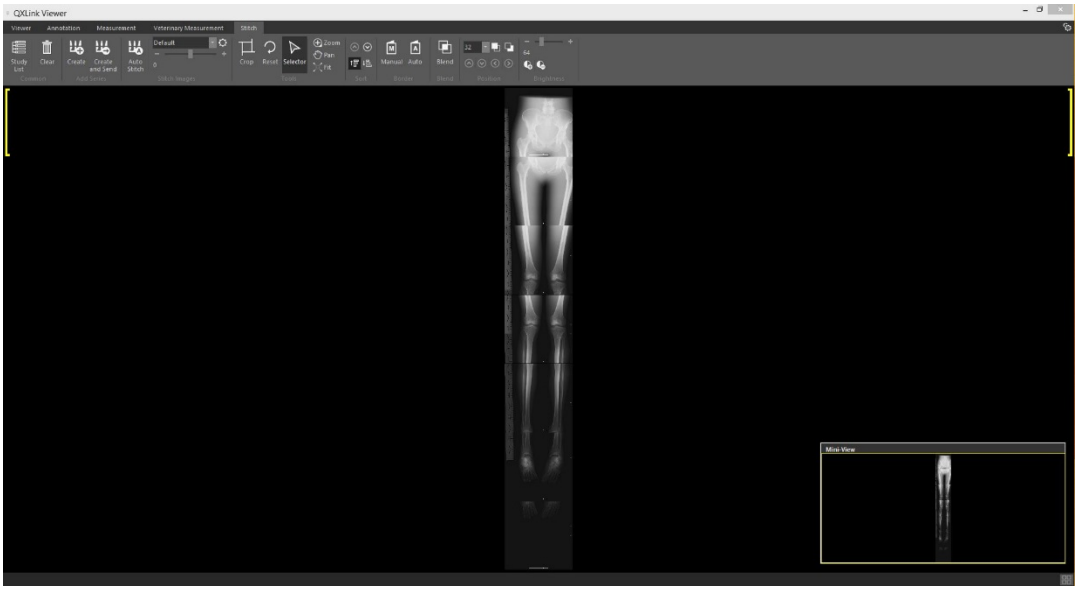
Open the selected studies, series or images from the **Stitch** mode directly to stitch it. You can also save more memory if you open the items from the **Stitch** mode without passing the **Viewer** window.

1 Select images from the study, series or thumbnail list.

2 Click the right mouse button to display pop-up menus.



3 Click the **Open Study to Stitch** menu to process stitching images**.**

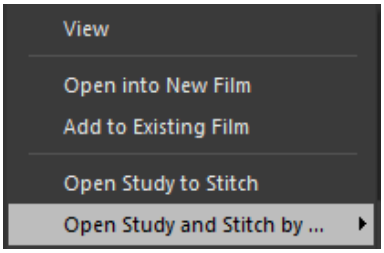


3.3.10 Processing Auto Stitch

Open the selected studies, series or images from the **Stitch** mode directly, and then perform auto-stitch with the specified parameters.

1 Select images from the study, series or thumbnail list.

2 Click the right mouse button to display pop-up menus.



3 Click a submenu (specified parameter) of the **Open Study and Stitch by** menu.

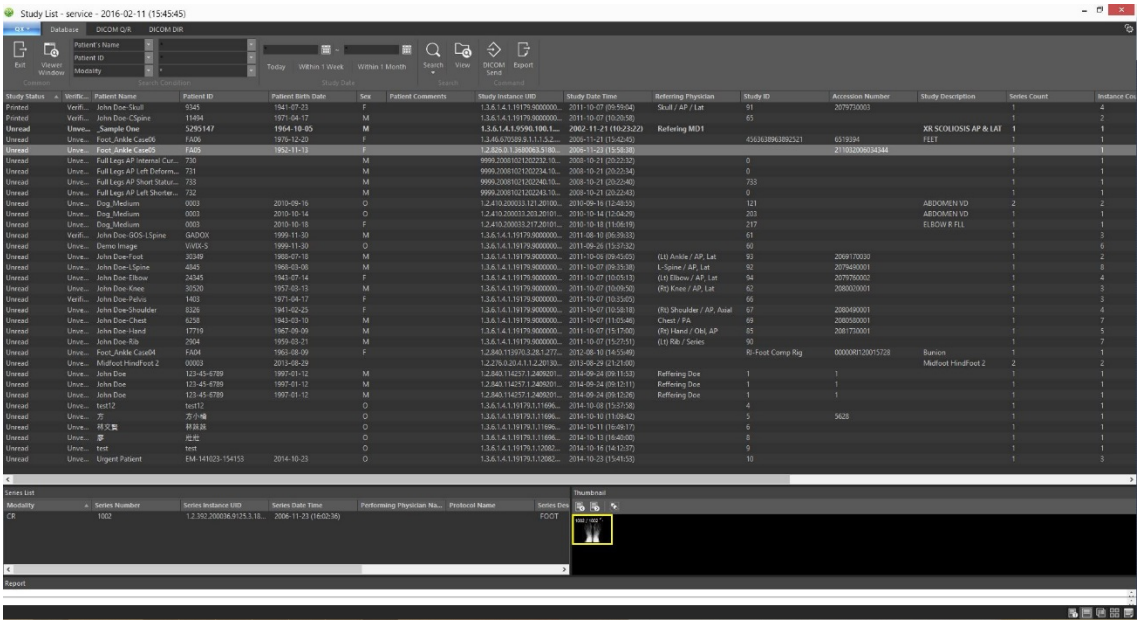
3.3.11 Sending a Study

Send the selected studies or series to the other DICOM applications. You can apply annotations stored in the image or change window level when sending study or series.

How to send study

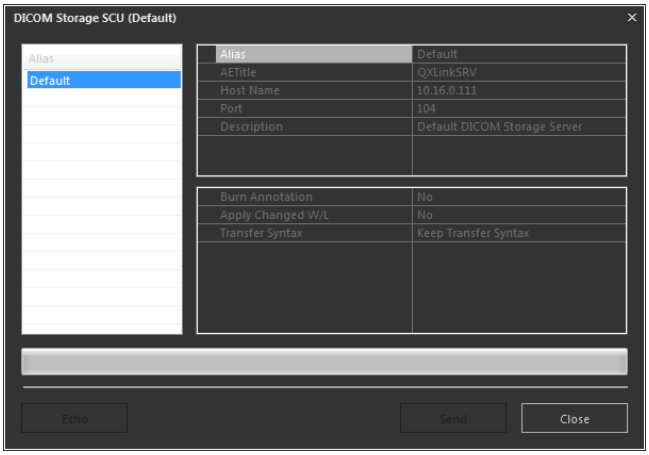
1 Retrieve studies with the selected search conditions.

2 Select studies or series to send.



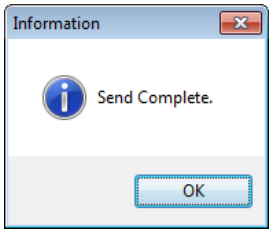
3 Click on the **DICOM Send** button on the toolbar.

4 Select **Alias** of the application to send studies or series.



5 Change the sending option and click on the **Send** button.

6 Check the completed or error message as below.



Sending options

- **Burn Annotation**: Sends a study by applying annotation and shutter information into pixels.
- **Apply Changed W/L**: Applies the changing window level to the study.
- **Transfer Syntax**: Sends a study by changing compression (transfer syntax).

Transfer Syntax	Description
Keep Transfer Syntax	Uses existing transfer syntax.
Uncompress	Decompresses the compressed image.
DICOM JPEG 2000 Lossless	Uses JPEG 2000 lossless compression.
DICOM JPEG 2000 Lossy (Maximum)	Lossy compression. (Maximum)
DICOM JPEG 2000 Lossy (High)	Lossy compression. (High)
DICOM JPEG 2000 Lossy (Medium)	Lossy compression. (Medium)
DICOM JPEG Lossless	Uses JPEG lossless compression.
DICOM JPEG Lossy (Maximum)	Lossy compression. (Maximum)
DICOM JPEG Lossy (High)	Lossy compression. (High)
DICOM JPEG Lossy (Medium)	Lossy compression. (Medium)

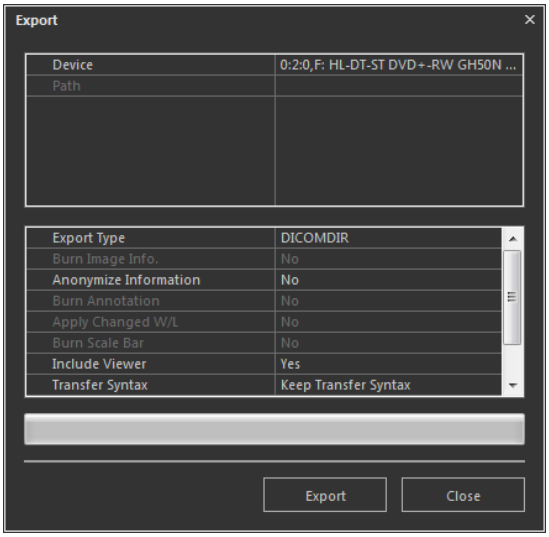
- The **Default** item set in the server as a default value cannot be modified.
- You cannot send studies searched from database to the **Default** server.

3.3.12 Exporting Study

Export

1 Select search conditions, and search studies you want.

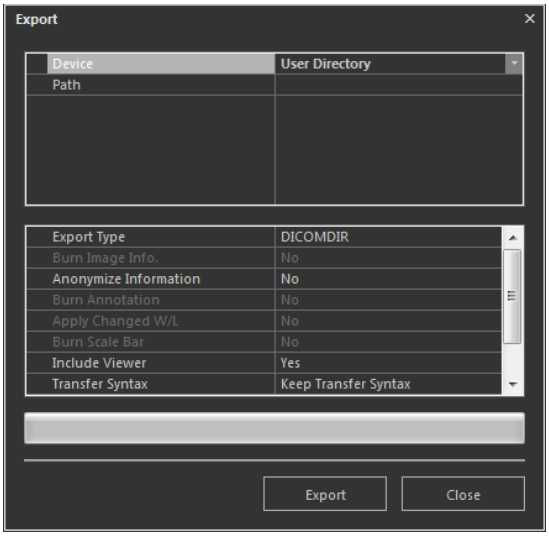
2 Click on the **Export** button and choose the studies to export.



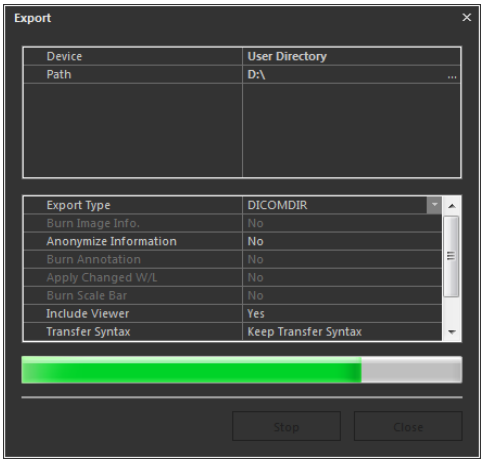
3 Click on the **Export** button on the toolbar.

4 Insert CD/DVD or a USB drive.

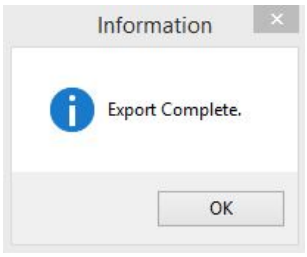
5 Click **Device** menu to select a desired option. The **Path** menu becomes activated when you select the **User Directory** option, and you can specify a folder to export images.



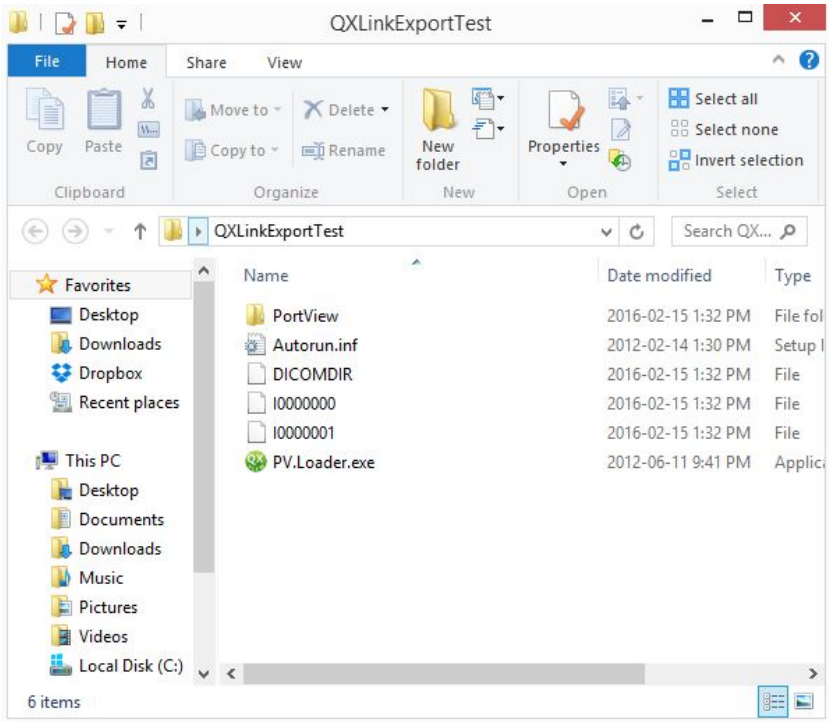
6 Click **Export Type** to select options and click on the **Export** button.



7 Check the completed or error message as below.



8 If you specify the path for exporting files, the portable viewer is created. With this portable viewer, you can check the exported images without logging on to **QXLink Viewer**.

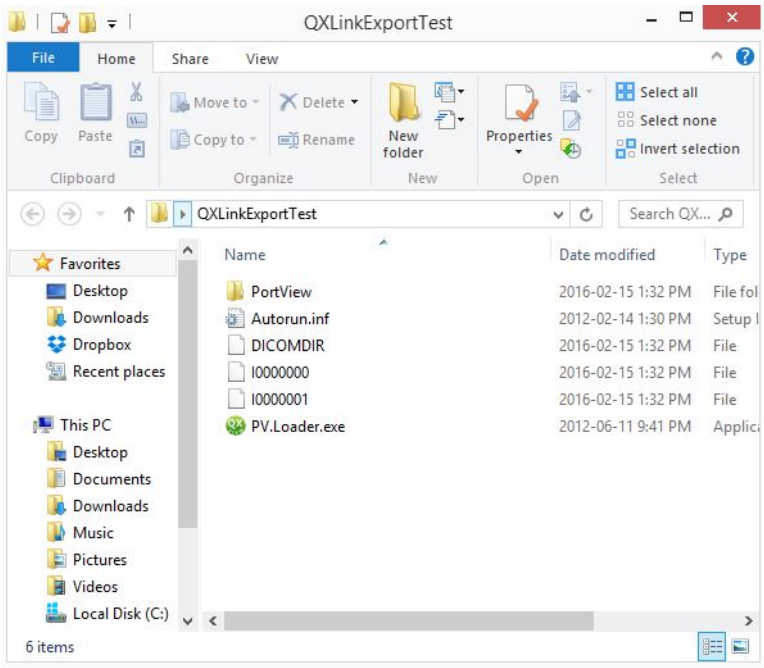


- If you select **No** from the options in **Include Viewer** menu, the portable viewer cannot be created.

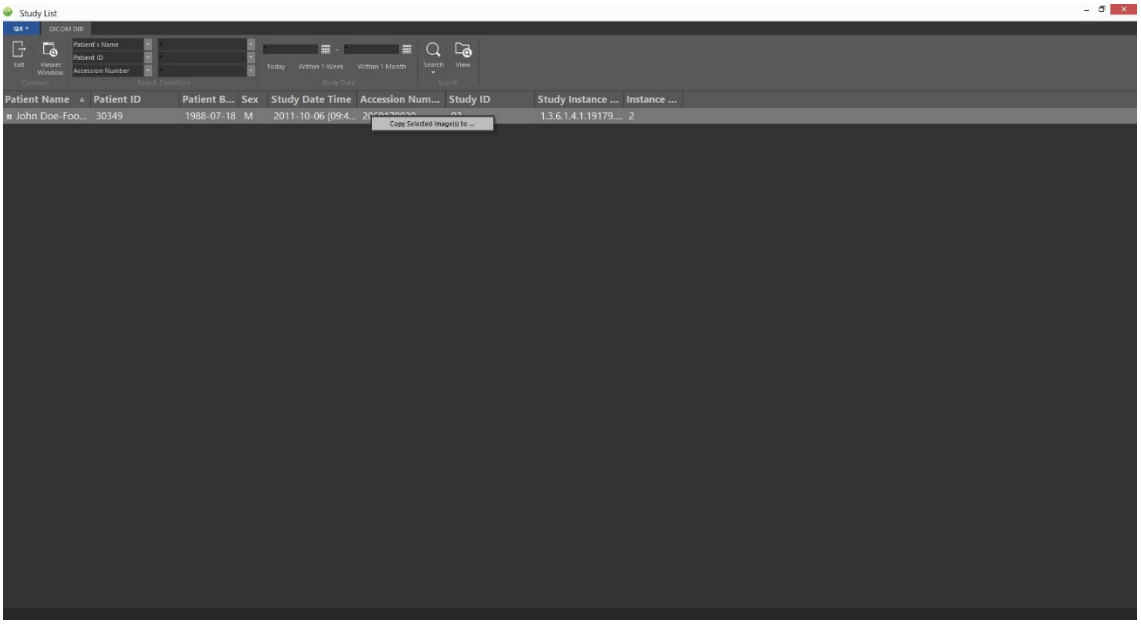
3.3.13 Portable Viewer

You can copy the desired study, series or images from the **Portable Viewer** study list to the specified folder.

1 Run **Portable Viewer** after exporting images.



2 Choose a desired study and click the right mouse button. After that, select **Copy Selected Image(s) to**.



3 Specify the path and copy the selected images to the folder.

Export Options

Item	Description
Export Type	• **DICOMDIR** • **BMP** • **JPEG** • **TIF**
Burn Image Info	• Applies the patient or study information into pixels. • This option is not applicable for DICOMDIR method.
Anonymize Information	• Anonymized patient information.
Burn Annotation	• Applies the annotation and shutter information to pixels.
Apply Changed W/L	• Applies the changing window level to pixels. • The changed W/L value must be stored in the database.
Burn Scale Bar	• Applies the scale bar to pixels. • This option is not applicable for DICOMDIR method.
Include Viewer	• Includes a viewer to display the exported DICOM file.
Transfer Syntax	• Same as the transfer syntax used for sending study.

• Click on the **Stop** button to stop studies from being exported.

3.4 DICOM Q/R Tab

Click on the **Search** button  in the **DICOM Q/R** tab to query or retrieve studies in the DICOM server which supports DICOM Q/R service.

- The **DICOM Q/R** tab follows the standard of DICOM Q/R SCU Service. From this dialog, you can query studies or retrieve images by accessing to the server which supports DICOM Q/R SCP Service.

- From the **DICOM Q/R** tab, you can query or retrieve studies in **QXLink 3 Server** by using the standard way of **DICOM Q/R** service. However, this way is slower than the way of direct access from the database tab in **QXLink 3 Viewer** to the database in **QXLink 3 Server**. Therefore, it is recommended to use the database tab when you query or retrieve studies. (This way is called as a non-standard way or a direct way.)

3.4.1 Search

1 Select search conditions and enter the search values.

2 Configure the search period.

3 Click on the **Search**  button.

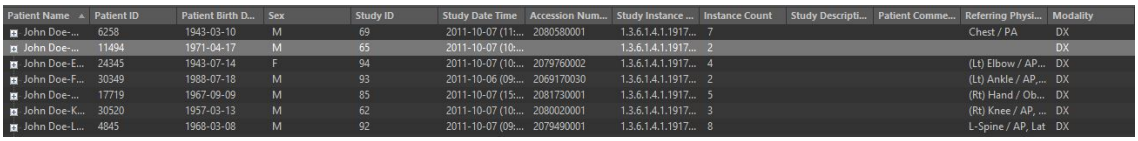
- The case-sensitive matching of search conditions may vary depending on the DICOM Server.

3.4.2 Queue List Toolbar

Icon	Name	Description
	**Add Queue**	Add the selected study to queue.
	**Clear**	Delete selected items from the queue list.
	**Clear All**	Delete all items in the queue list.
	**Select All**	Select all items in the queue list.
	**Retrieve**	Retrieve selected studies from the queue list.

3.4.3 Searching Images in Study Unit

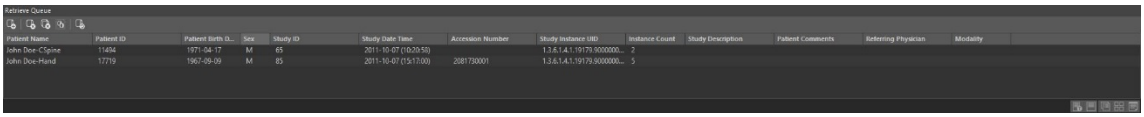
1 Select studies from the Query list.



Patient Name	Patient ID	Patient Birth D...	Sex	Study ID	Study Date Time	Accession Num...	Study Instance ...	Instance Count	Study Descripti...	Patient Comme...	Referring Physi...	Modality
John Doe-...	6258	1943-03-10	M	69	2011-10-07 (11:...	2080580001	1.3.6.1.4.1.1917...	7			Chest / PA	DX
John Doe-...	11494	1971-04-17	M	65	2011-10-07 (10:...		1.3.6.1.4.1.1917...	2				DX
John Doe-E...	24345	1943-07-14	F	94	2011-10-07 (10:...	2079760002	1.3.6.1.4.1.1917...	4			(Lt) Elbow / AP...	DX
John Doe-F...	30349	1988-07-18	M	93	2011-10-06 (09:...	2069170030	1.3.6.1.4.1.1917...	2			(Lt) Ankle / AP,...	DX
John Doe-...	17719	1967-09-09	M	85	2011-10-07 (15:...	2081730001	1.3.6.1.4.1.1917...	5			(Rt) Hand / Ob...	DX
John Doe-K...	30520	1957-03-13	M	62	2011-10-07 (10:...	2080020001	1.3.6.1.4.1.1917...	3			(Rt) Knee / AP, ...	DX
John Doe-L...	4845	1968-03-08	M	92	2011-10-07 (09:...	2079490001	1.3.6.1.4.1.1917...	8			L-Spine / AP, Lat	DX

2 Click on the **Add Queue** button.

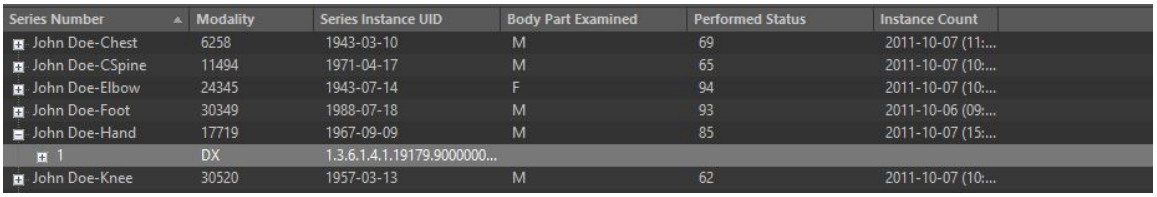
3 Select added items in the **Queue** list.



4 Click on the **Retrieve** button from the Queue list toolbar.

3.4.4 Opening Images in Series Unit

1 Select the desired study series from the study list.



Series Number	Modality	Series Instance UID	Body Part Examined	Performed Status	Instance Count
John Doe-Chest	6258	1943-03-10	M	69	2011-10-07 (11:...
John Doe-CSpine	11494	1971-04-17	M	65	2011-10-07 (10:...
John Doe-Elbow	24345	1943-07-14	F	94	2011-10-07 (10:...
John Doe-Foot	30349	1988-07-18	M	93	2011-10-06 (09:...
John Doe-Hand	17719	1967-09-09	M	85	2011-10-07 (15:...
1	DX	1.3.6.1.4.1.19179.9000000...			
John Doe-Knee	30520	1957-03-13	M	62	2011-10-07 (10:...

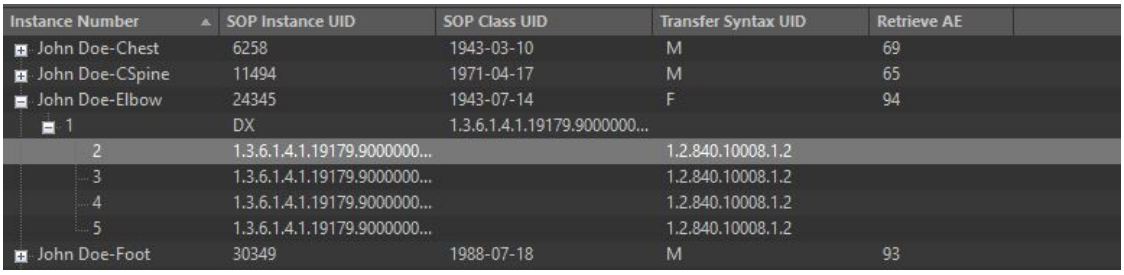
2 Click on the **Add Queue** button.

3 Click on the **Retrieve** button from the **Queue** list toolbar.

3.4.5 Opening by Instance

How to retrieve in image unit

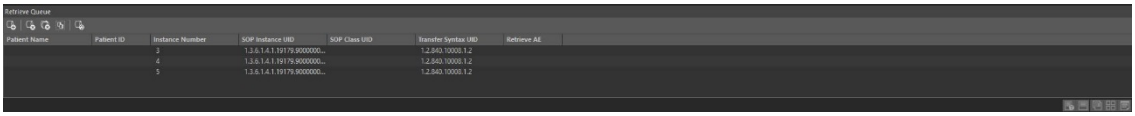
1 Select instance of the desired from the study list.



Instance Number	SOP Instance UID	SOP Class UID	Transfer Syntax UID	Retrieve AE
John Doe-Chest	6258	1943-03-10	M	69
John Doe-CSpine	11494	1971-04-17	M	65
John Doe-Elbow	24345	1943-07-14	F	94
1	DX	1.3.6.1.4.1.19179.9000000...		
2	1.3.6.1.4.1.19179.9000000...		1.2.840.10008.1.2	
3	1.3.6.1.4.1.19179.9000000...		1.2.840.10008.1.2	
4	1.3.6.1.4.1.19179.9000000...		1.2.840.10008.1.2	
5	1.3.6.1.4.1.19179.9000000...		1.2.840.10008.1.2	
John Doe-Foot	30349	1988-07-18	M	93

2 Click on the **Add Queue** button.

3 Select added items in the **Queue** list.



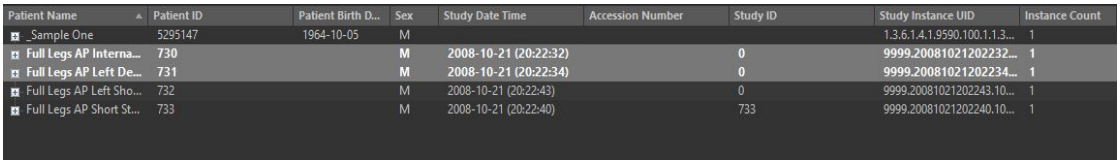
4 Click on the **Retrieve** button from the **Queue** list toolbar.

3.5 DICOM DIR Tab

You can display study information from DICOM Directory (DICOMDIR). To display study information, insert CD / DVD, local drive or USB drive and choose a specific folder where DICOMDIR exists. Click on the **Search** button after you complete setting the search conditions.

3.5.1 Opening as the Unit of Study

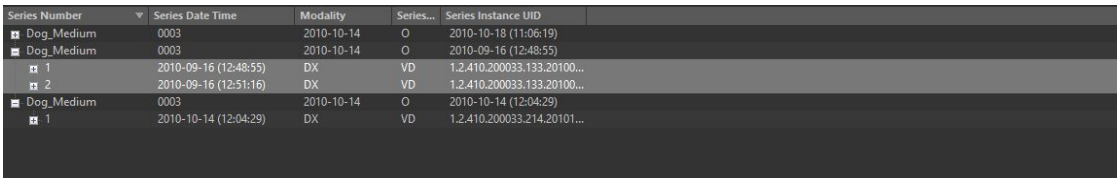
1 Select studies from the searched list.



2 Click on the **View** button.

3.5.2 Opening as the Unit of Series

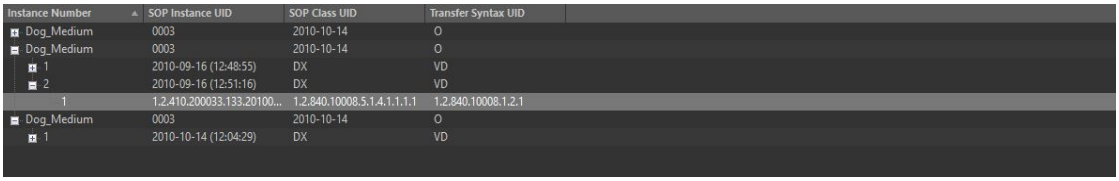
1 Select series of the desired study from the study list.



2 Click on the **View** button.

3.5.3 Opening as the Unit of Image

1 Select images of the desired study from the study list.



2 Click on the **View** button.

4. Viewer

This chapter explains about the composition and functions of the Viewer program.

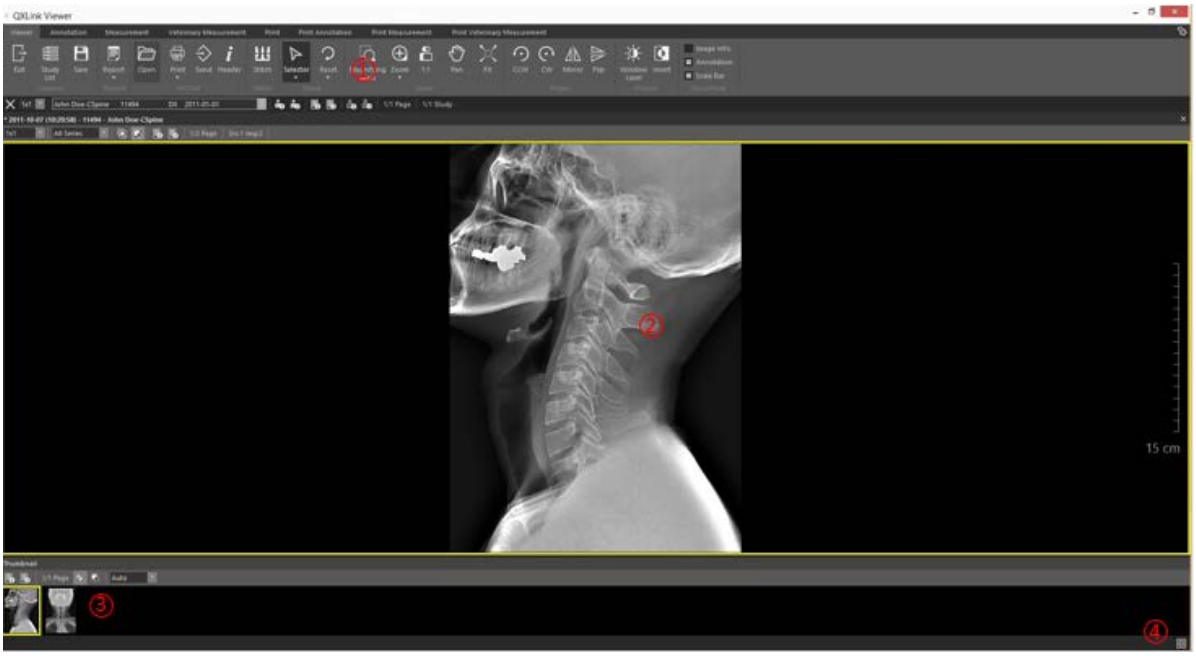
Composition

Ribbon Tools

Functional Description of Viewer

4.1 Composition

4.1.1 Viewer Window



No.	Name	Function
1	**Image manipulation toolbar**	Displays the tools used for image manipulation.
2	**Study Viewer**	Displays the image of a selected study.
3	**Thumbnail**	Displays the thumbnail image of a selected study.
4	**Status Bar**	Shows or hides the thumbnail.

- If you drag the thumbnail image with a left mouse button and drop it on the image processing icon to apply, the relevant function is applied to the image automatically.

4.1.2 Status Bar

Image	Function
	Shows or hides thumbnail

- You can change the location and size of the thumbnail pane in the Viewer window. Refer to <3.1.6 Changing the Size and Location of Window> for the information.

4.1.3 Thumbnail

No.	Name	Function
1	**Previous page / Next page**	• Moves to the previous or next page of thumbnail. • Changes the thumbnail page by scrolling a mouse wheel while selecting a thumbnail window.
2	**Current page / Total page**	• Displays the current page and total number of pages.
3	**Thumbnail display**	• **Show All Images** • **Show First Image on All Series**
4	**Thumbnail display option**	• **1 Layout / 2 Layouts / 3 Layouts**
5	**Thumnail image viewer**	• Checks the relevant thumbnail image.
6	**Thumbnail location control**	• Moves thumbnail to desired location by dragging a mouse button. • The thumbnail can be floated or docked by clicking it with a right mouse button or double-clicking it with a left mouse button.

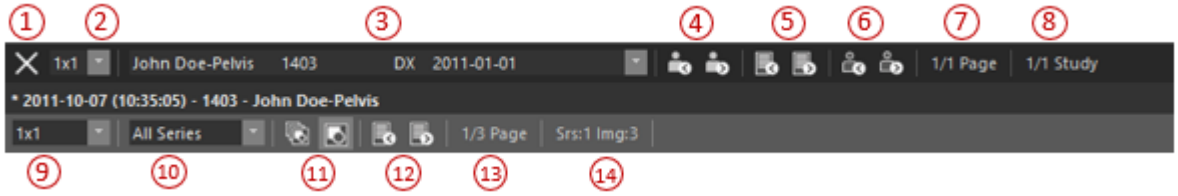
- If there is a thumbnail image loaded abnormally, it is not displayed on the screen.

4.1.4 Real Size

No.	Name	Function
1	**Image Information**	• Indicates a patient name and ID, the date and time of image.
2	**Fit Window to Screen**	• Maximizes the study viewer to fit to the current monitor screen.
3	**Restore Window**	• Restores the study viewer to the previous size.
4	**Previous page / Next page**	• Moves to the previous or next image based on the current image.
5	**Selector**	• Default status of a mouse pointer. Double click on the image to move to the viewer screen.
6	**Pan**	• Moves the image to desired location in the viewer window.
7	**Close the Real Size Pane**	• Closes the **Real Size** window.

- Double-click the left mouse button to display the Real size window. Refer to <11.6 Viewer Option> for the detailed information about the related options.

4.1.5 Study Viewer



No.	Name	Function
1	**Close all exams**	• Closes all opened studies.
2	**Study layout**	• Changes the study layout up to four columns and four rows.
3	**Available exams**	• Lists the currently opened studies.
4	**Open the previous study / Open the next page**	• Opens the previous or next study in the Viewer window based on the current study.
5	**Previous page / Next page**	• Moves to the previous or next page based on the study layout. • The first page of the study is activated when you retrieve studies by page.
6	**Previous study / Next study**	• Moves to the previous or next study based on the activated study.
7	**Page information of the current study**	• Current page / Total pages
8	**Order information of the current study**	• Current study / Total studies
9	**Image layout**	• Changes the layout of images included in the activated study up to 10 columns and 10 rows.
10	**Series list**	• Series list of the current study.
11	**Apply to this series / Apply to selected images**	• Applies effects such as window level, zoom, pan, counterclockwise rotation, clockwise rotation, mirror, flip and invert to all or selected images. The default value is **Apply to Selected Images**.
12	**Previous page / Next page**	• Searches the image of currently activated study by page.
13	**Page information of the current study**	• Moves to the desired page.
14	**Series and image information of the current study**	• Displays the total number of series and images of the currently activated study.

4.2 Ribbon Tools

4.2.1 Switching to the Study List Window

Button	Name	Description
	**Study List**	Moves to the **Study List** window.

- Press the F2 key to switch between the windows of **Viewer** and **Study List**.

4.2.2 Saving Study Status

Button	Name	Description
	**Save**	Saves the status of image. The saved information is as follows. • **Annotation** • **Window Level** • **Zoom** • **Pan** • **Image Layout** • **User Magnification Factor**

- Status information of all images included in the relevant study is saved.
- The **Save** button becomes deactivated if the study has a stitched image which is not sent to the server.
- The **Save** button becomes deactivated if the study is being retrieved by opening DICOM files.

How to reset image status information

1 Choose selected or all images.
2 Click on the **Reset** button to initialize the status information of image.
3 Click on the **Save** button to save the initialized information of image.

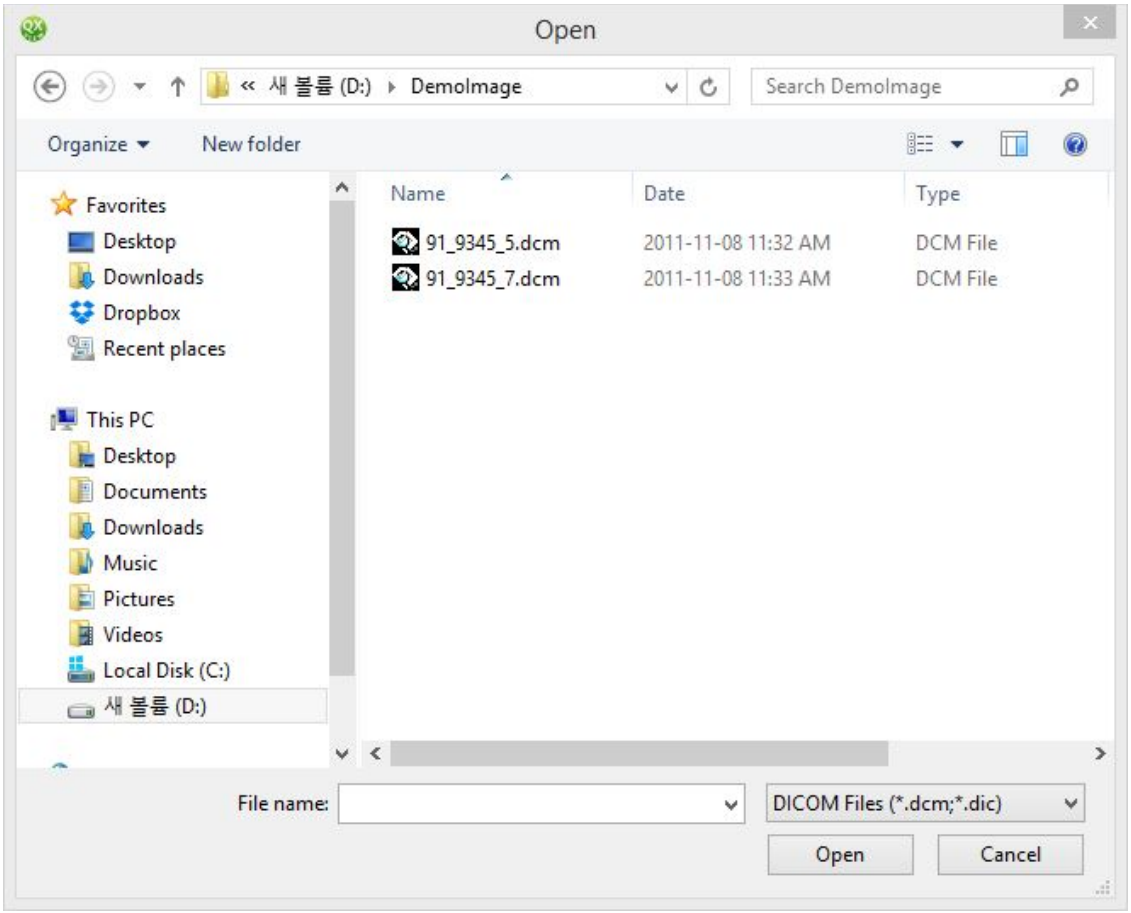
4.2.3 Opening DICOM File

Button	Name	Description
	**Open**	Opens the DICOM file in the local drive manually.

1 Click on the **Viewer Window** button  to switch **Study List** to **Viewer** window.

2 Click on the **Open** button on the toolbar.

3 Select desired files to retrieve and click on the **Open** button.



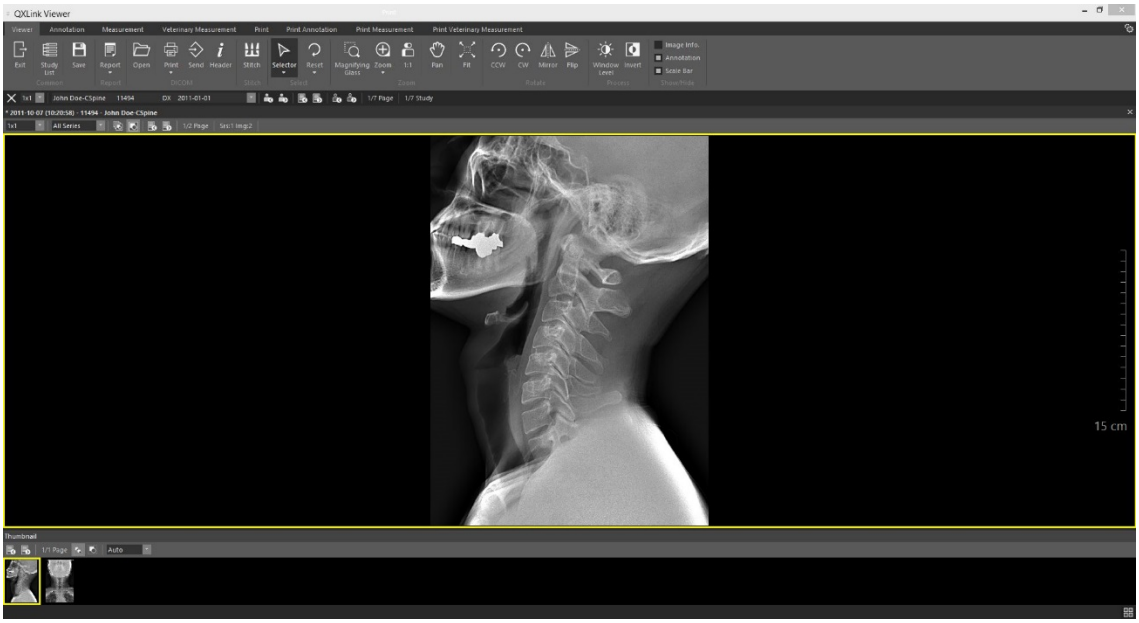
- You can also open images by selecting DICOM files from Windows Explorer and drag them to **Viewer** window.

4.2.4 Print

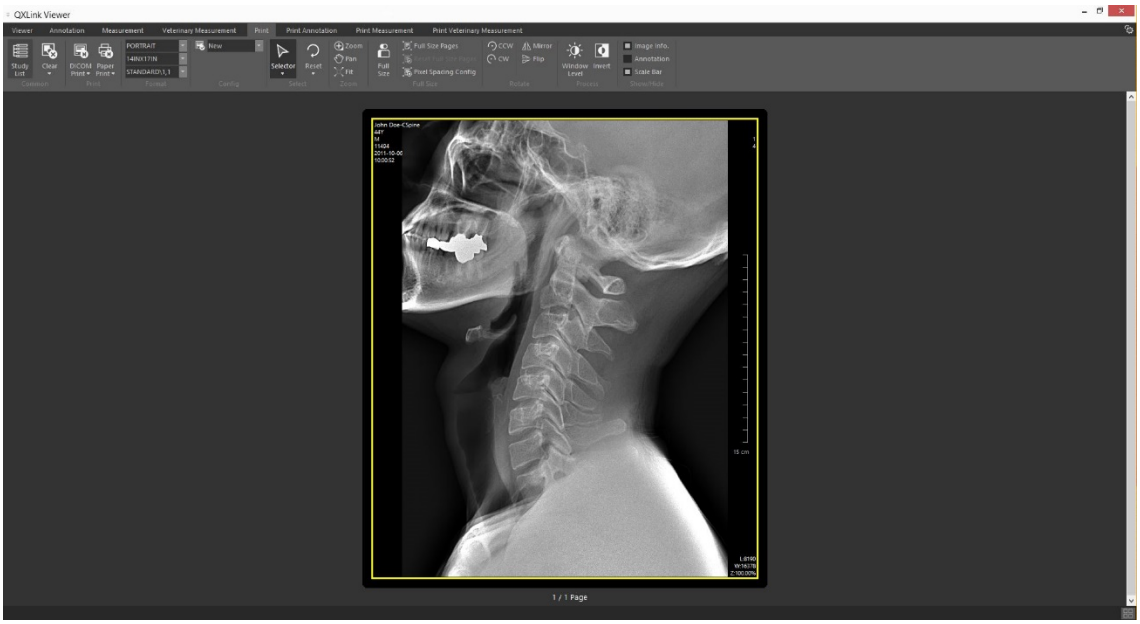
Sending images to the print window

Button	Name	Description
	**Open into New Film**	Removes an image on the **Print** window, and copy the selected image from the **Viewer** window to the **Print** window.

1 Select an image from the desired study.



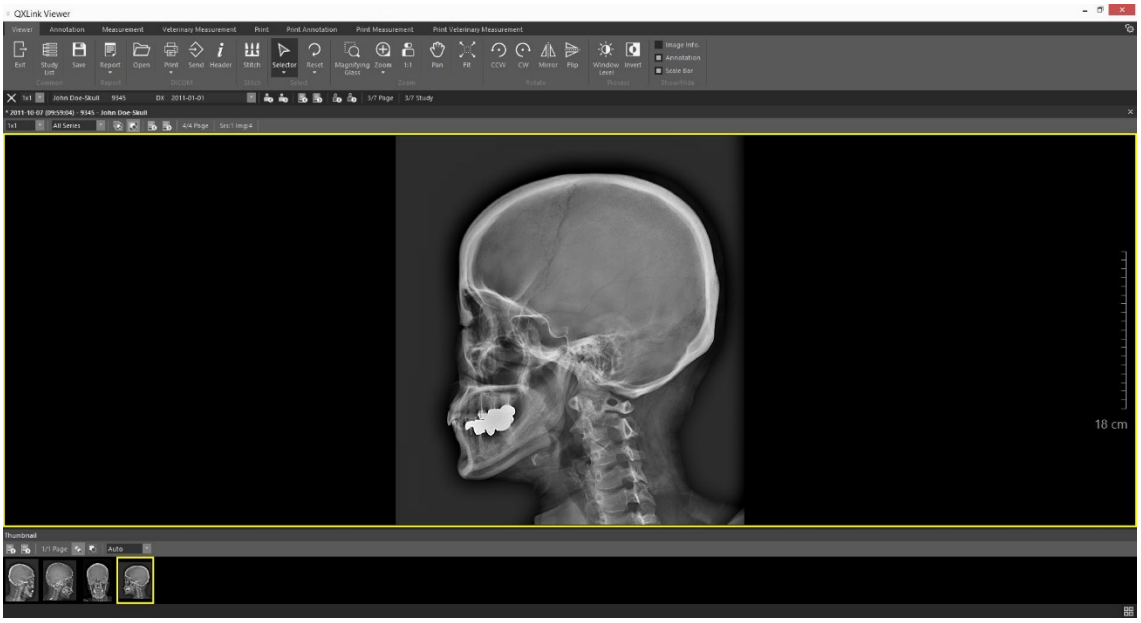
2 Click the bottom of the **Print** button on the toolbar and select the **Open into New Film** menu.



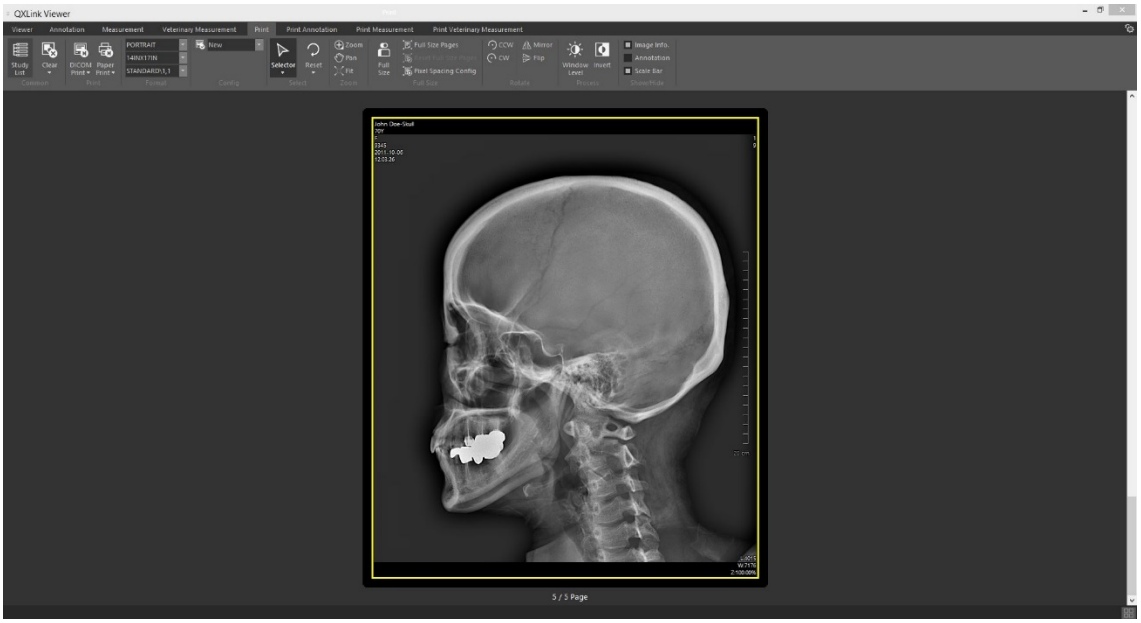
Adding images to the existing film

Button	Name	Description
	**Add to Existing Film**	Adds a selected image to the existing film. This function is useful when you select images from the multiple studies and print them out.

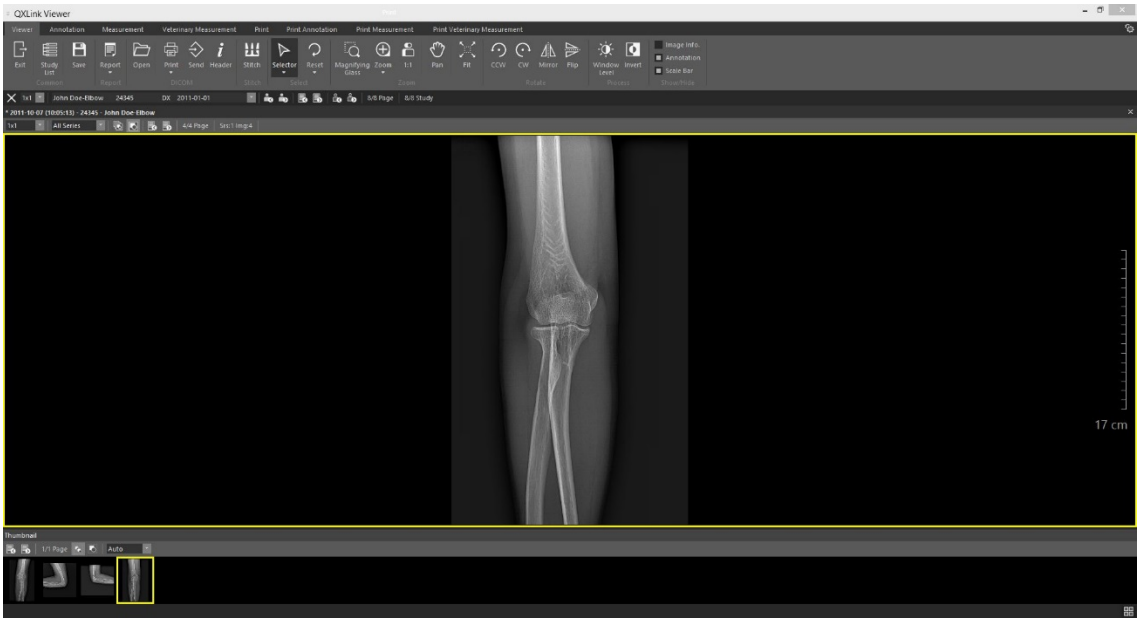
1 Select an image from the desired study.



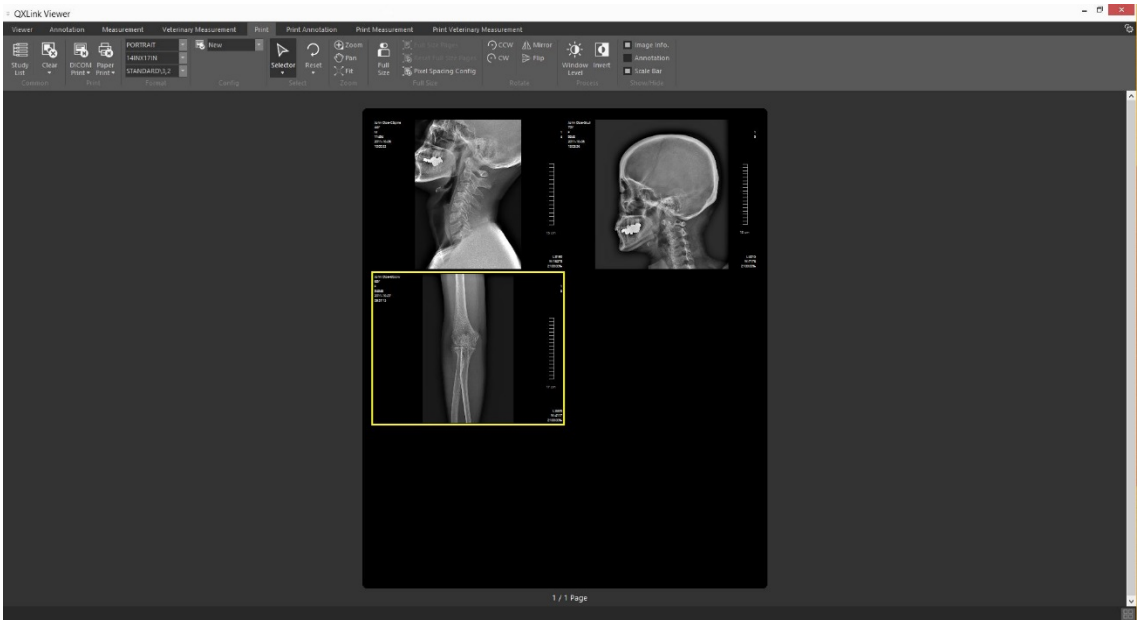
2 Click on the **Print** button on the toolbar.



3 Select an image from another study on the **Viewer** window.



4 Click the bottom of the **Print** button on the toolbar and select the **Add to Existing Film** menu.



- The information of Window Level, Annotation, Zoom In/Out ratio and Pan will be maintained even if you copy an image from the **Viewer** window to the **Print** window.
- If the image is consisted of multiple frames, **QXLink Viewer** will copy the image displayed on the window to the **Print** window.

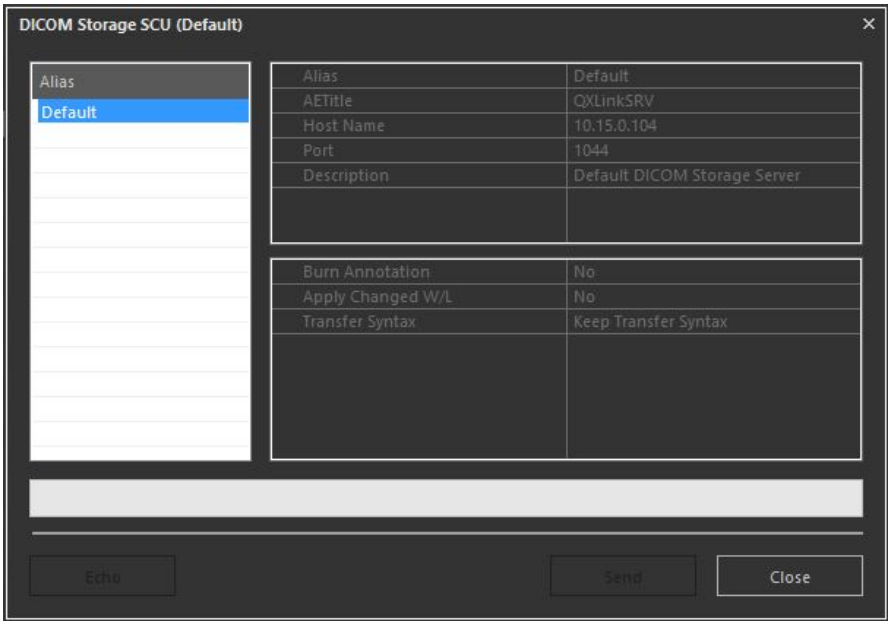
4.2.5 DICOM Send

Button	Name	Description
	**Send**	Sends the selected images to the other DICOM server.

1 Select an image from the desired study.

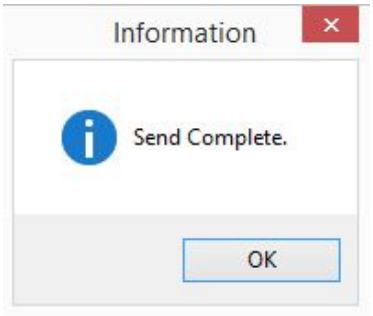
2 Click on the **DICOM Send** button on the toolbar.

3 Select the **Alias** of the application where you want to send images.



4 Configure sending options from the bottom of the screen.

5 Click on the **Send** button and check the message.



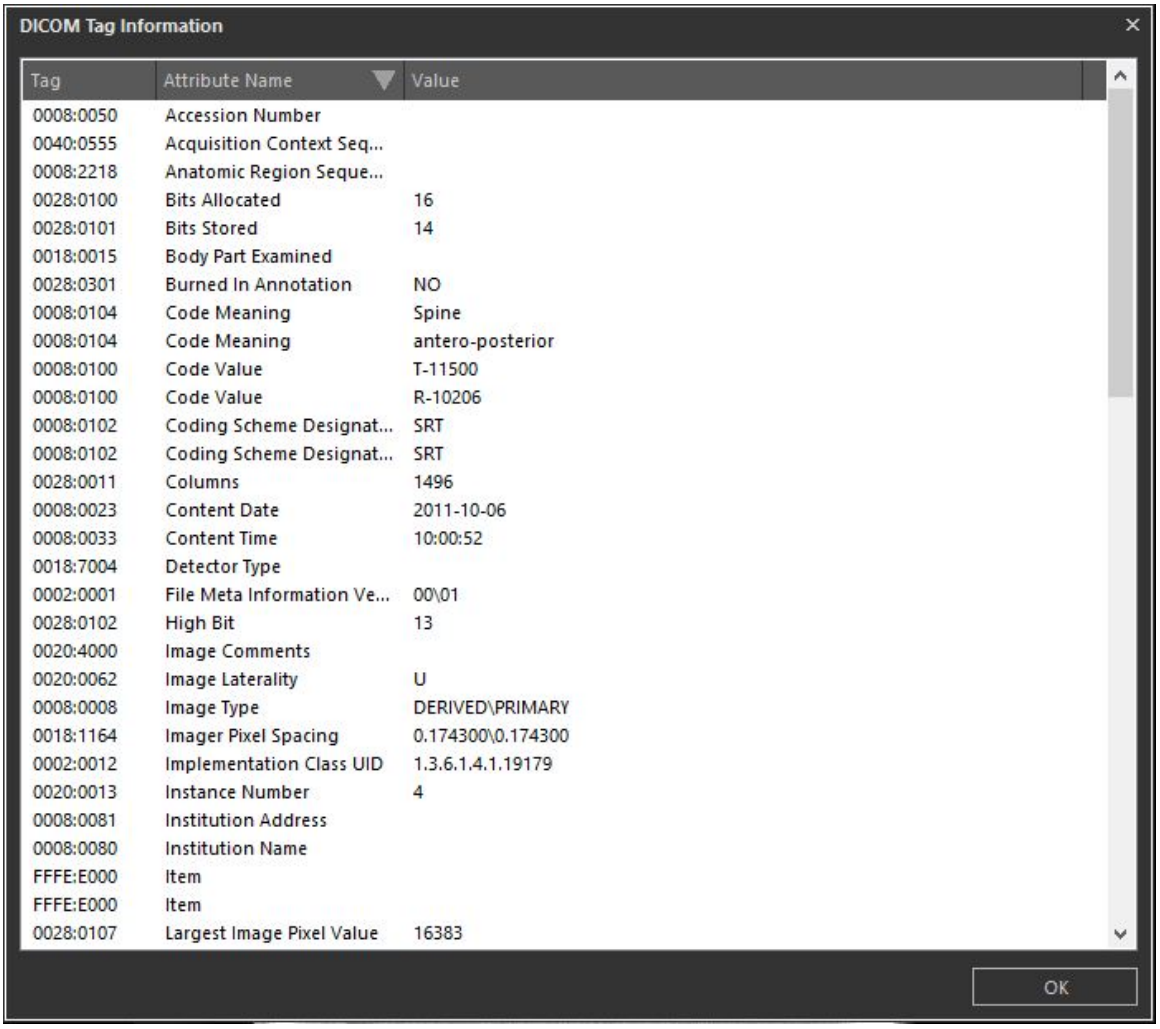
- You cannot send studies to the default server being retrieved from database.

4.2.6 Checking DICOM Header Information

Button	Name	Description
	**Header**	Checks the DICOM header information of the selected image.

1 Select an image from the desired study.

2 Click on the **Header** button on the toolbar.

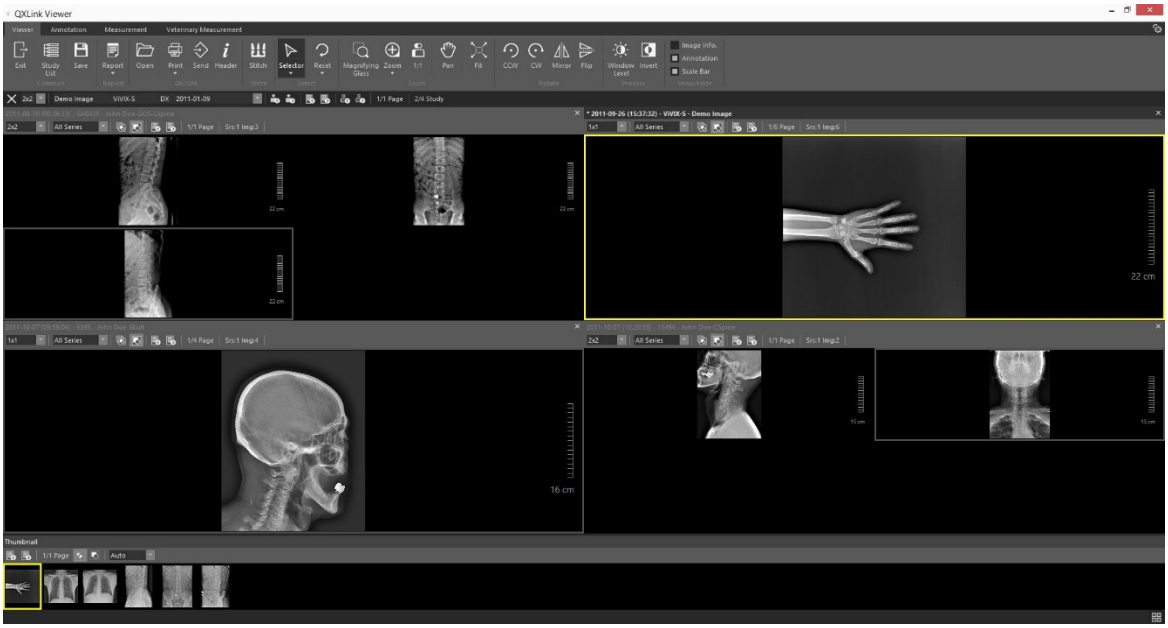


4.2.7 Selector

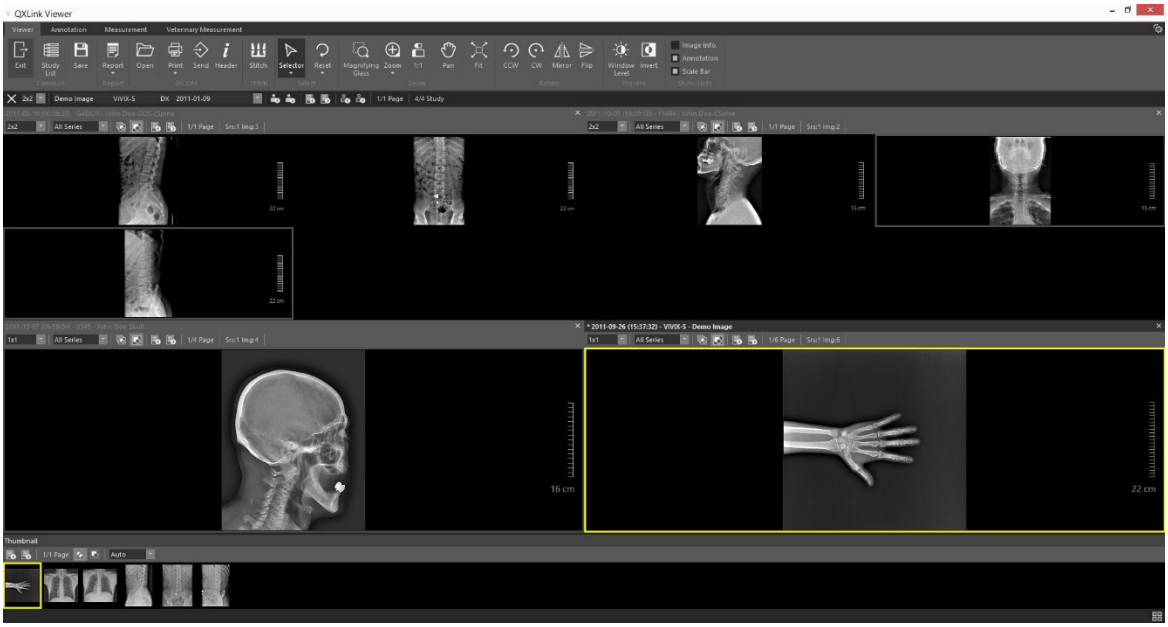
Button	Name	Description
	**Selector**	• Default status of a mouse pointer. • When you click on the **Selector** button on the toolbar, the activated functions are deactivated. You can also select or deselect an image as well as multiple images by using Ctrl or Alt key.

- To change the image position, drag the top of an image with a mouse button while pressing the **Shift** key.

Before changing position



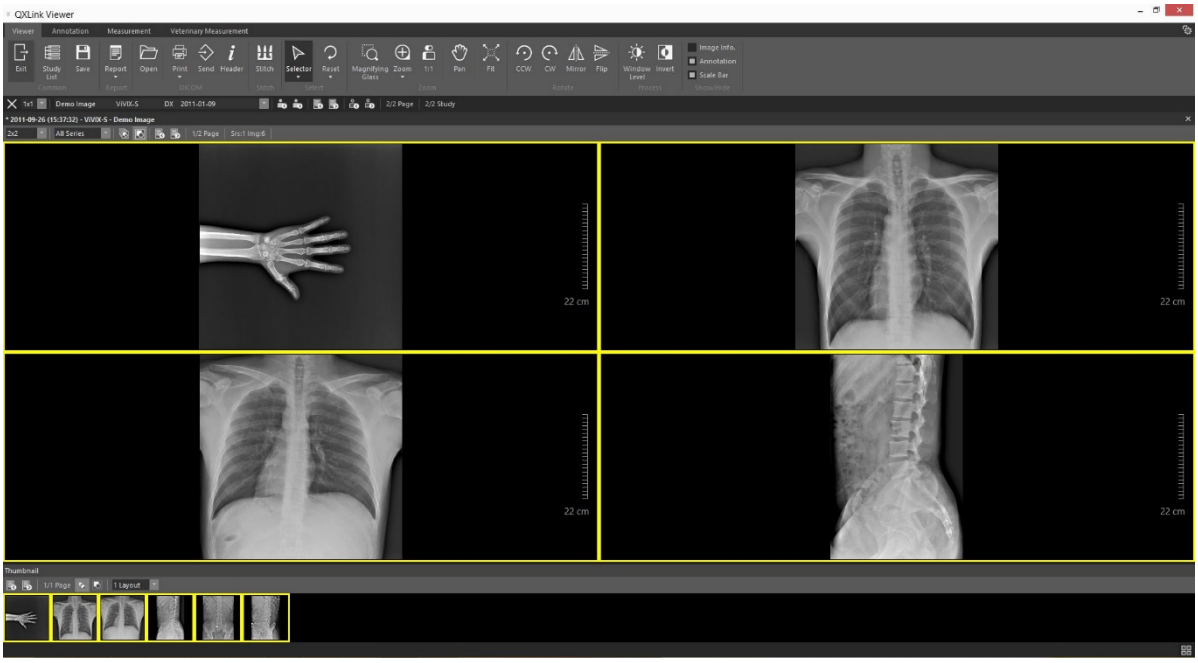
After changing position



- You can choose multiple images by putting a left mouse button on the thumbnail and dragging images you want.

4.2.8 Select All

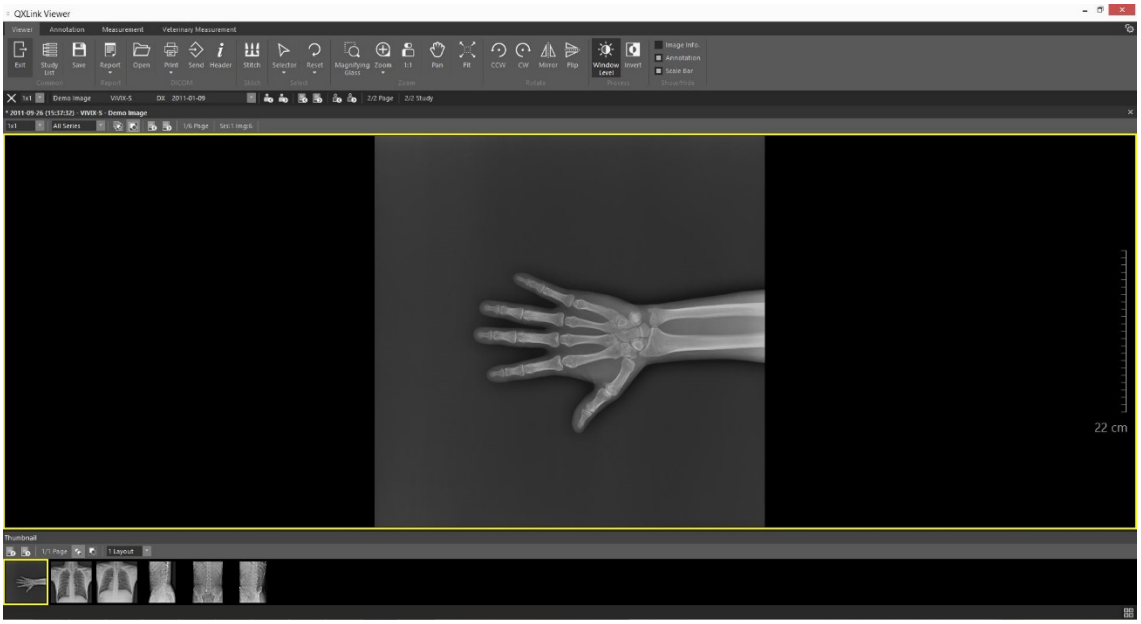
Button	Name	Description
	**Select All**	• To select all images in the current study, click on the **Select All** button on the toolbar. • To deactivate the **Select All** function, click an image with a left mouse button.



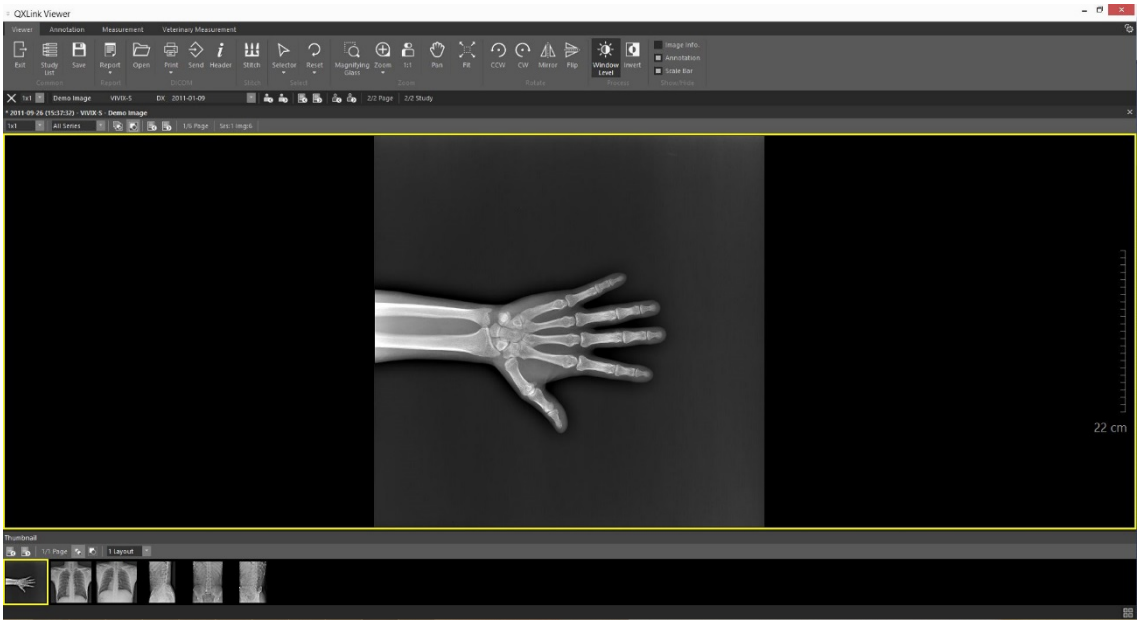
4.2.9 Reset

Button	Name	Description
	**Reset**	Resets status information of the selected image.

1 Select an image from the desired study. (e.g. Applies **Mirror** and **Pan** tools)



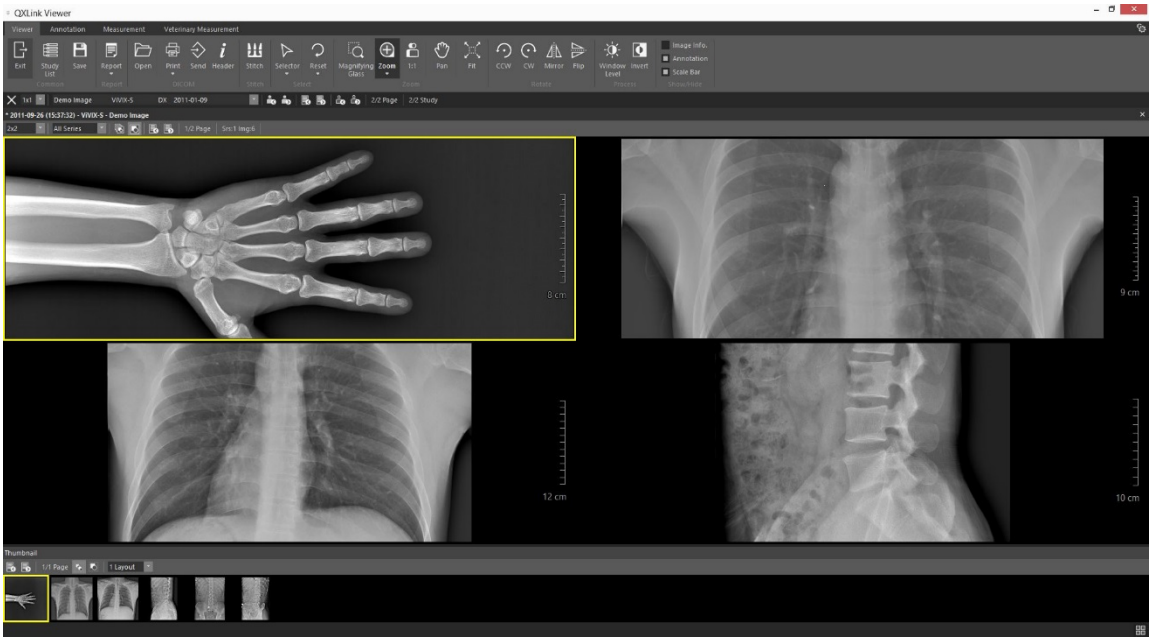
2 Click on the **Reset** button on the toolbar. All status information except annotation will be reset.



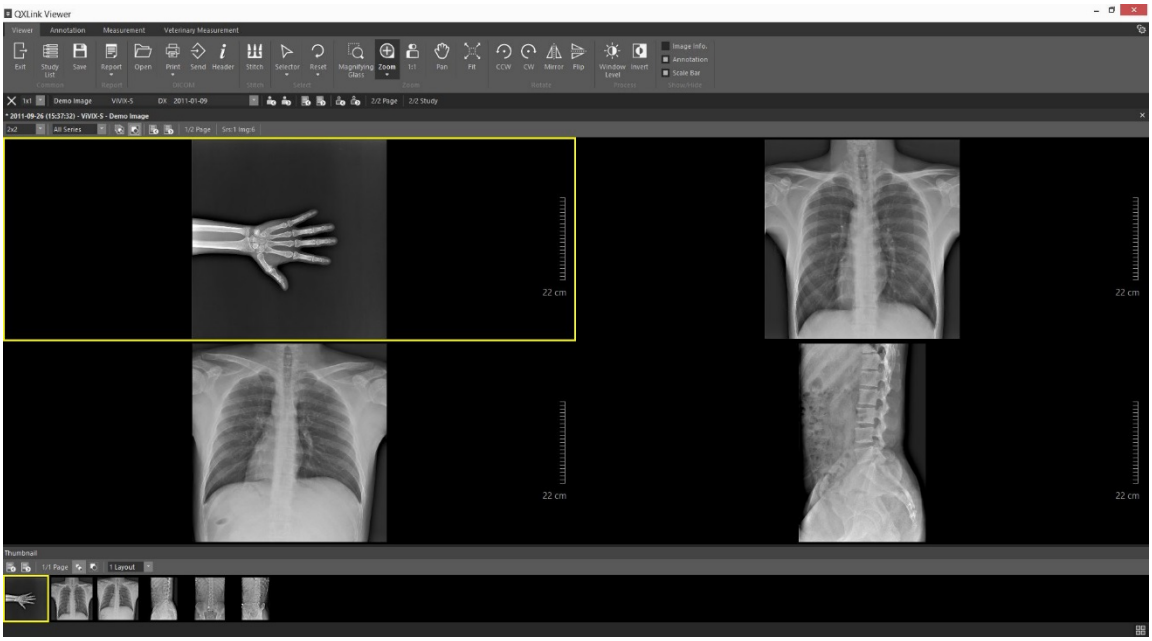
4.2.10 Rest All

Button	Name	Description
	**Reset All**	• Initializes the status information of all images included in the selected series. • To reset status information of all images included in the current series, click on the **Reset All** button on the toolbar.

Before applying Reset All (e.g. zoom image)



After applying Reset All



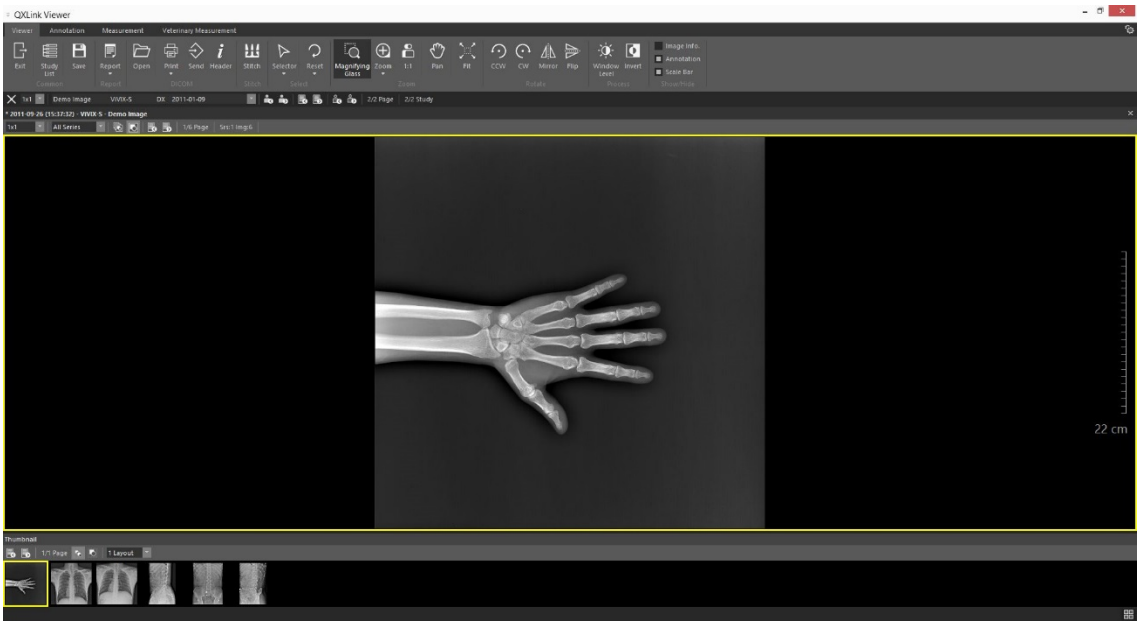
- All status information except annotation will be reset.
- This function is the same as selecting all images and click on the **Reset** button.

4.2.11 Magnifying Glass

Button	Name	Description
	**Magnifying Glass**	Magnifies a region of interest partially.

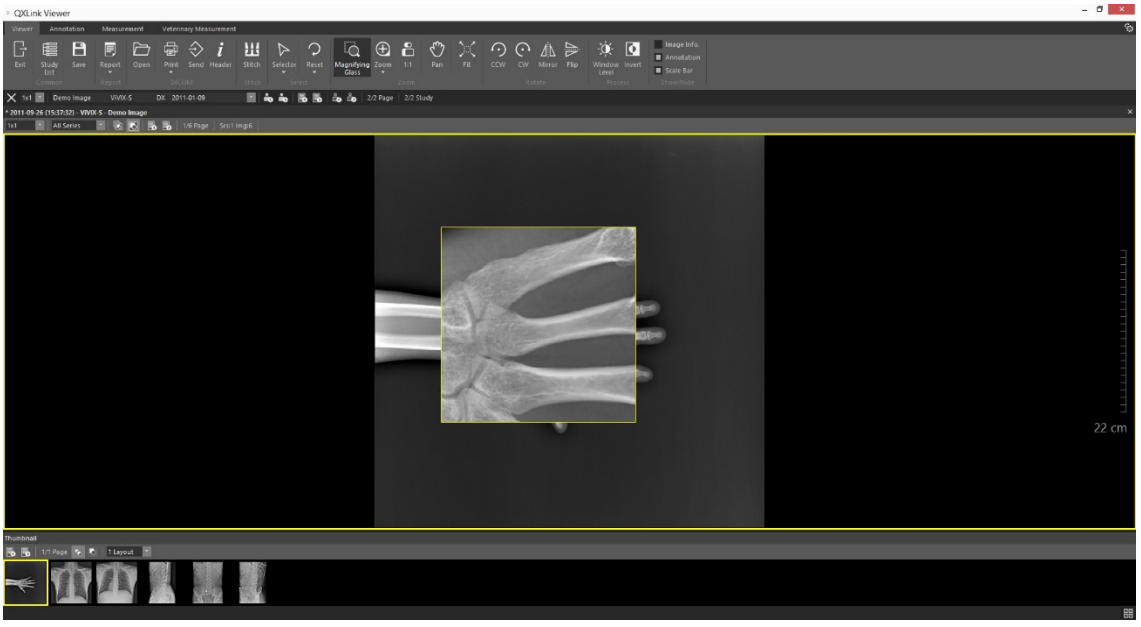
1 Select an image from the desired study.

2 Click on the **Magnifying Glass** button on the toolbar.



3 Move the mouse pointer to the region of interest to be magnified.

4 Press and hold the left mouse button to enlarge the area to four (4) times comparing to the current screen scale.

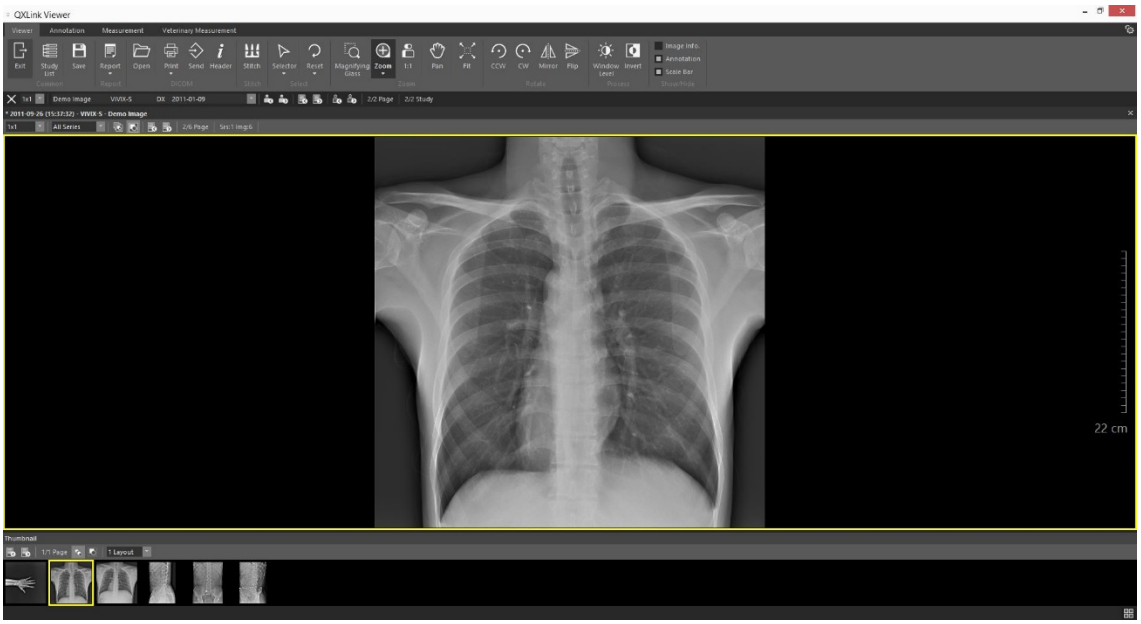


4.2.12 Zoom In / Out

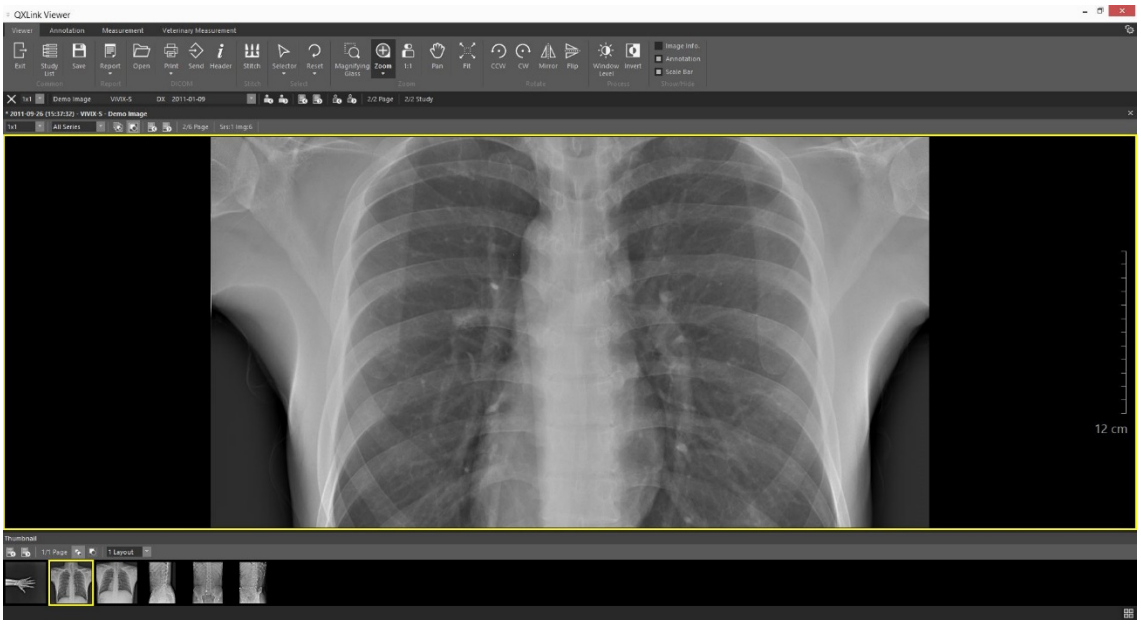
Button	Name	Description
	**Zoom**	Zooms in or zooms out the image by a specific ratio.

1 Select an image from the desired study and click on the **Zoom** button on the toolbar.

2 Move the mouse pointer to the selected image.



3 Press and hold the left mouse button, and then drag the mouse upward or downward.



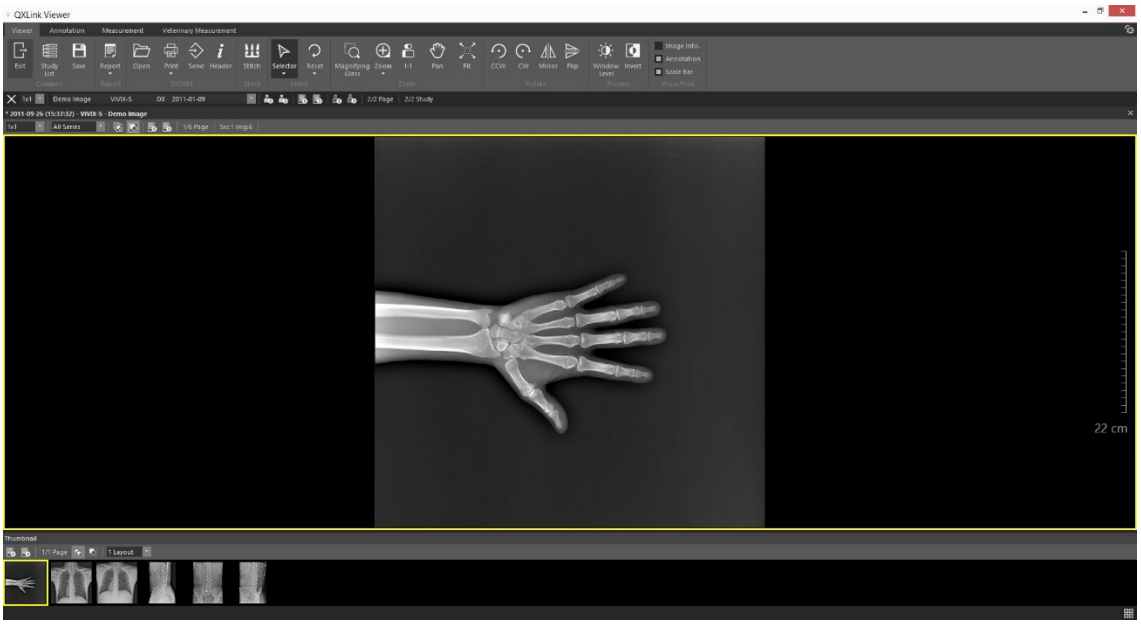
4 The zoom ratio is displayed on the right bottom of the image.

- The minimum zoom ratio is 10% from the current image size.
- The maximum zoom ratio is 2000% from the current image.

4.2.13 Real Size

Button	Name	Description
	**1:1**	Displays the selected image to the screen as its real size.

1 Select an image from the desired study.



2 Click on the **1:1** button on the toolbar.

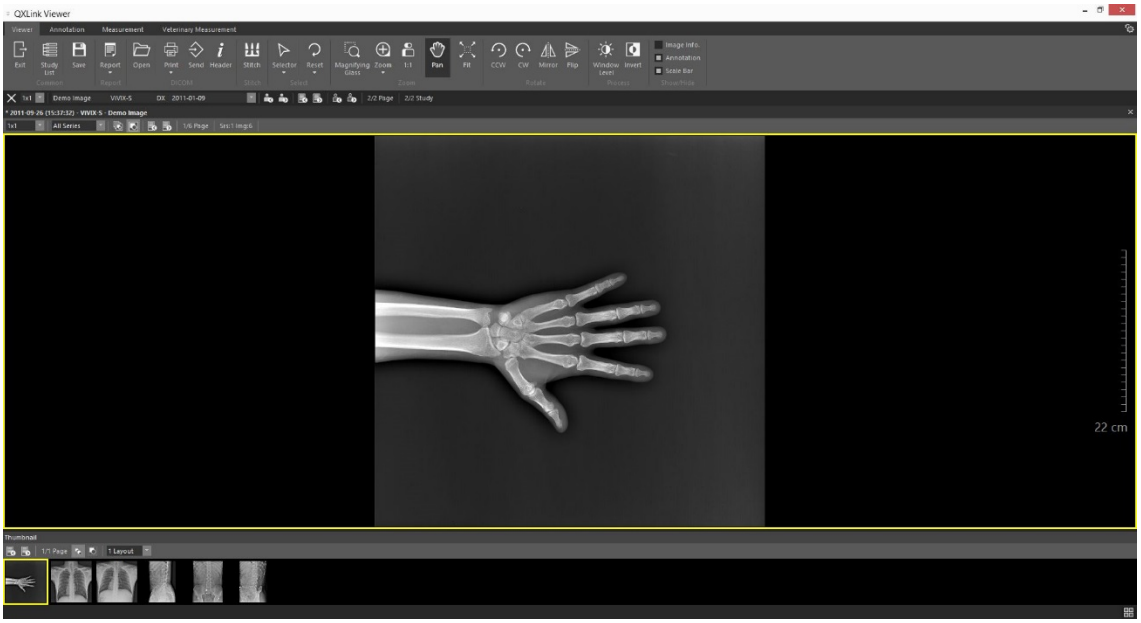
4.2.14 Panning Image

Button	Name	Description
	**Pan**	Moves the selected image to desired position.

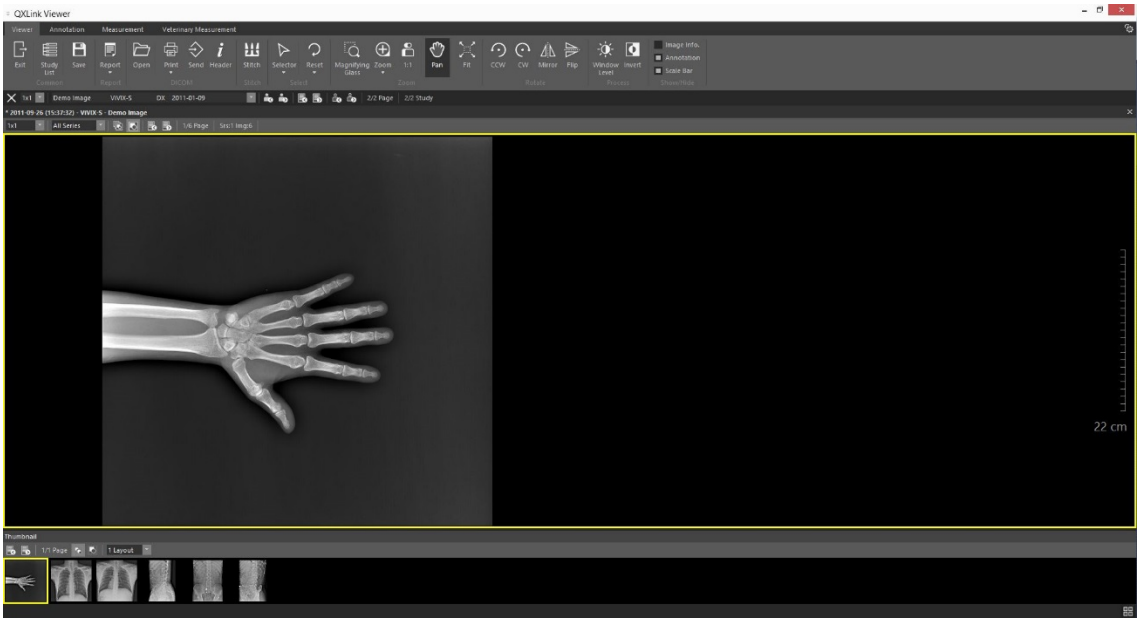
1 Select an image from the desired study.

2 Click on the **Pan** button on the toolbar.

3 Press and hold the left mouse button while dragging the image to the desired position.



4 Release the left mouse button to complete moving the image.

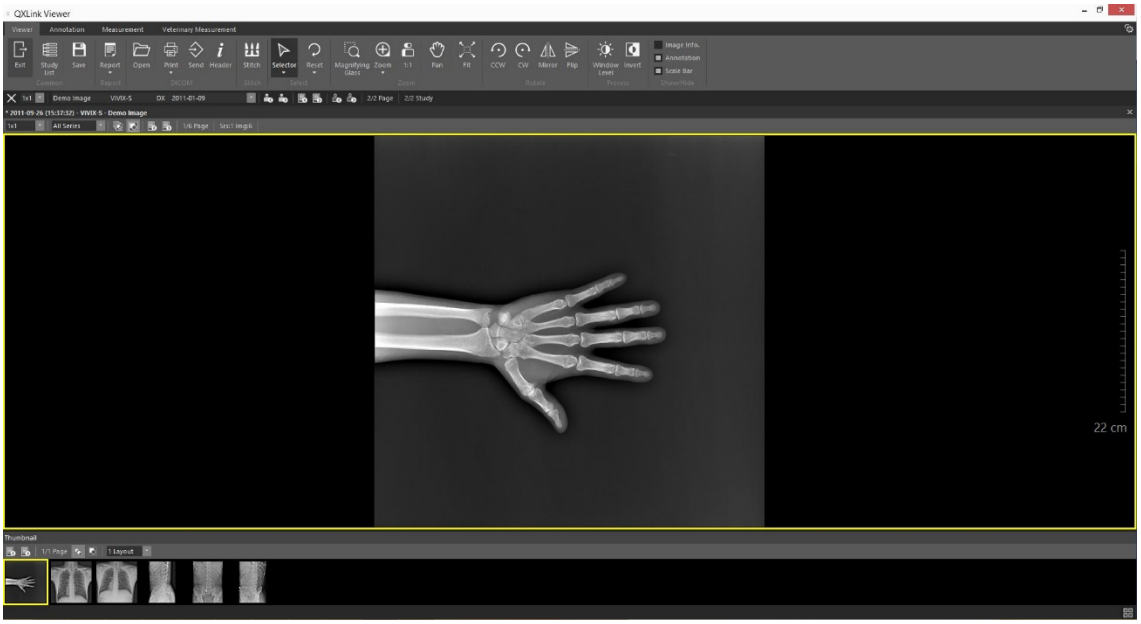


4.2.15 Fit to Window

Button	Name	Description
	**Fit**	Fits the selected image to the main window size.

1 Select an image from the desired study.

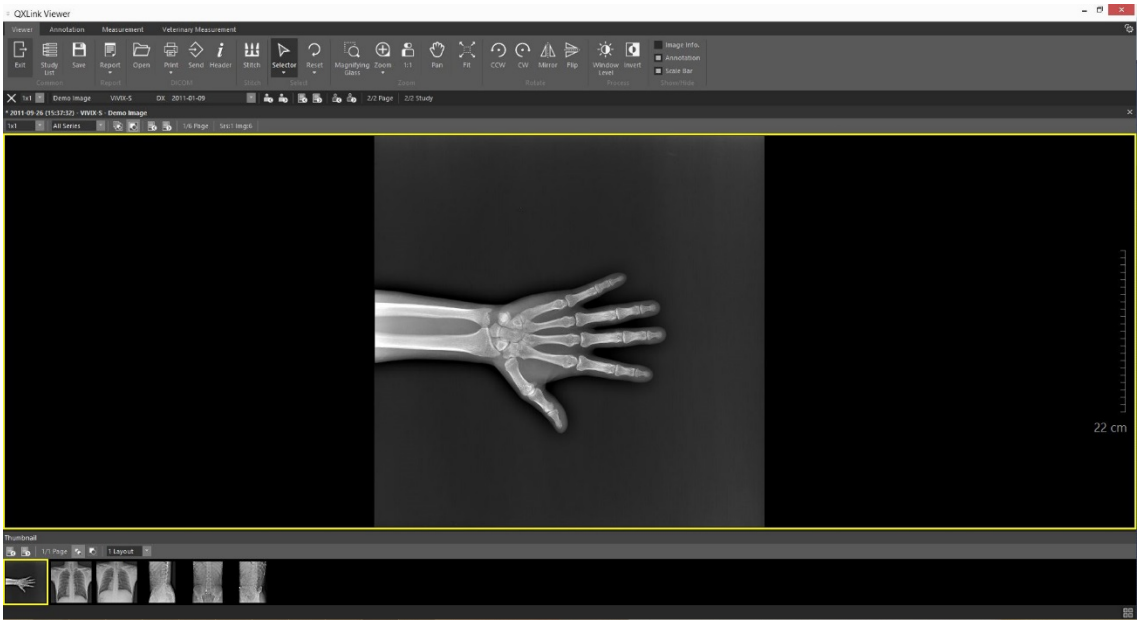
2 Click on the **Fit** button on the toolbar.



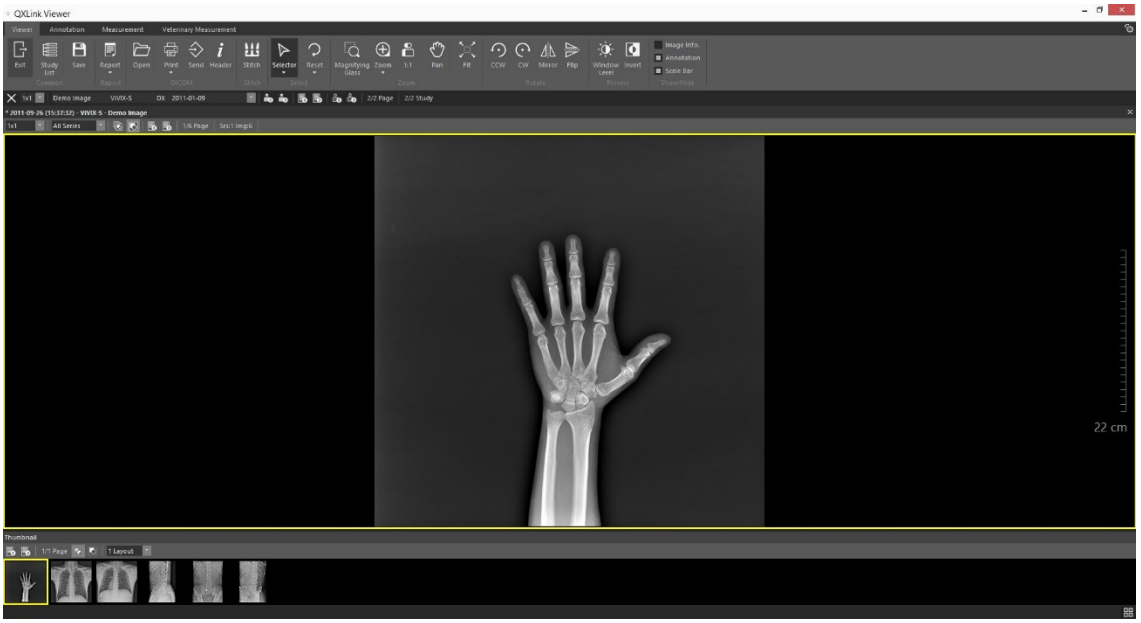
4.2.16 Rotate Counterclockwise

Button	Name	Description
	**CCW**	Rotates an image by 90° counterclockwise.

1 Select an image from the desired study.



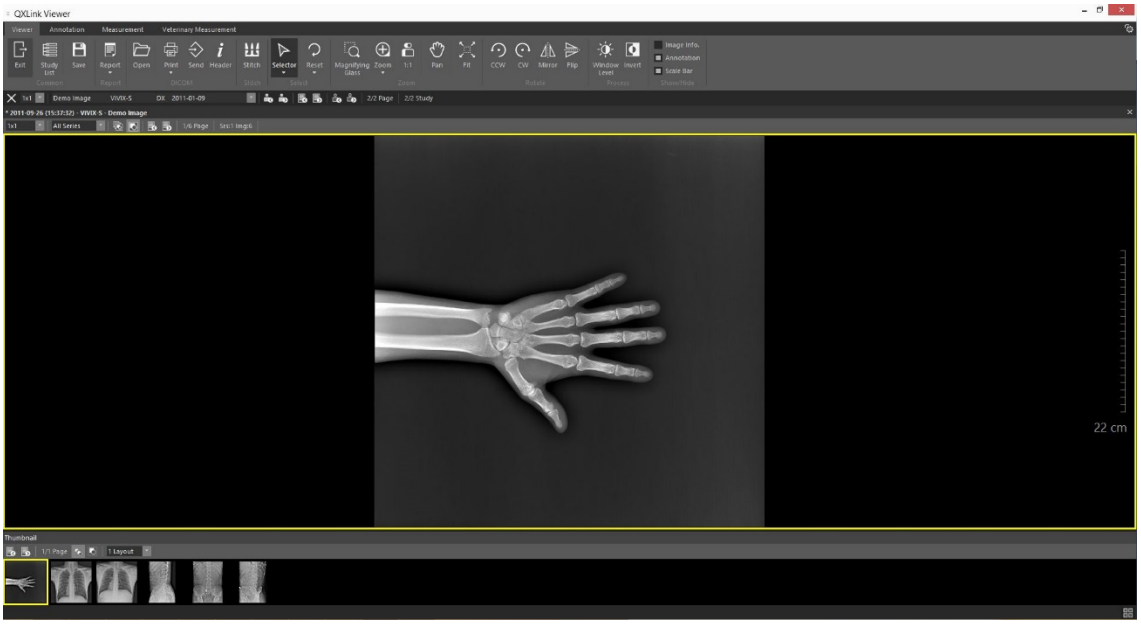
2 Click on the **CCW** button on the toolbar.



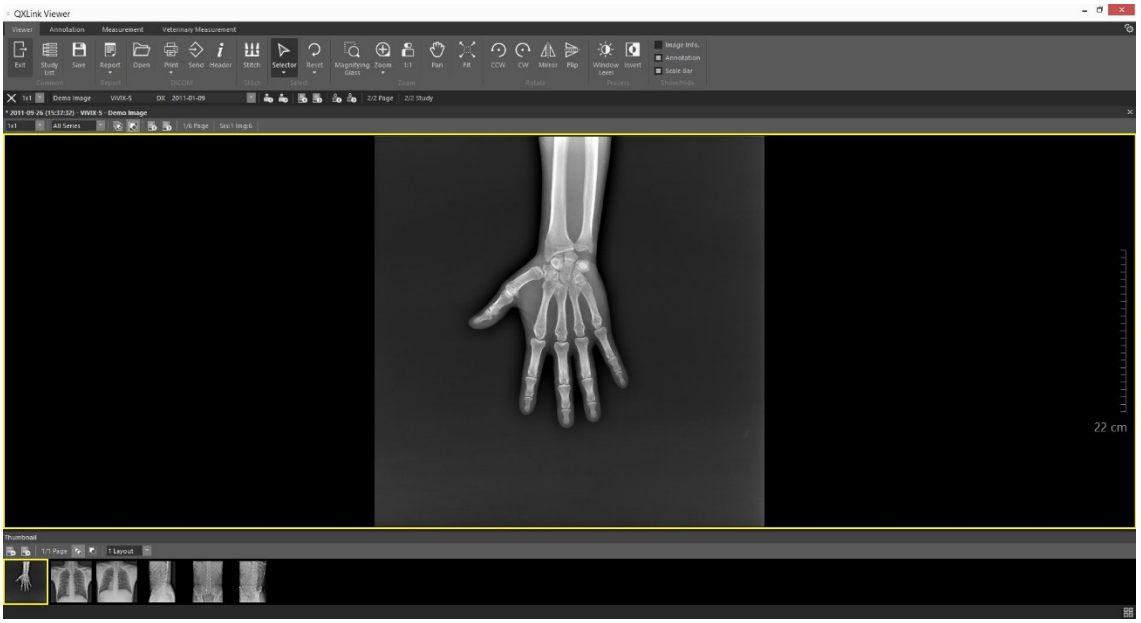
4.2.17 Rotate Clockwise

Button	Name	Description
	**CW**	Rotates an image by 90° clockwise.

1 Select an image from the desired study.



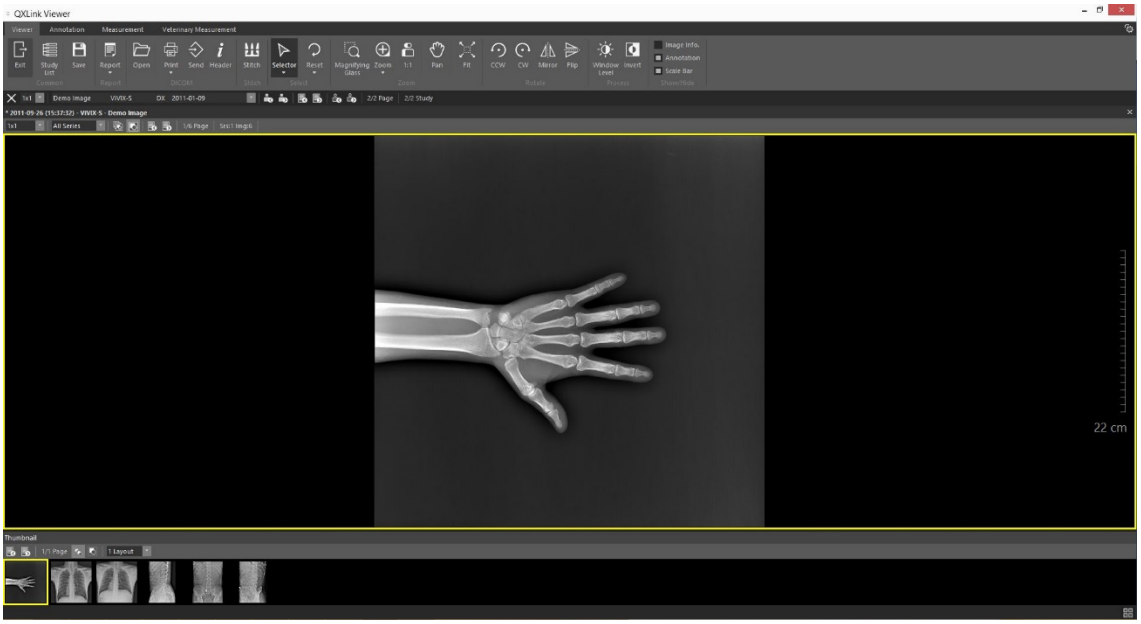
2 Click on the **CW** button on the toolbar.



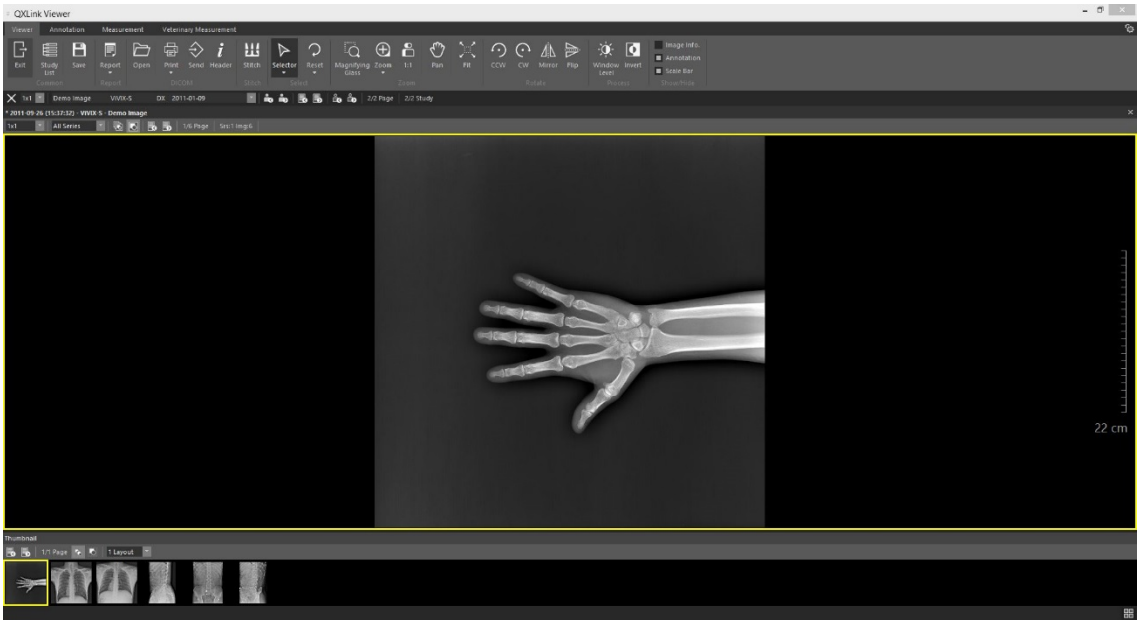
4.2.18 Flip Image Horizontal

Button	Name	Description
	**Mirror**	Flips an image horizontally.

1 Select an image from the desired study.



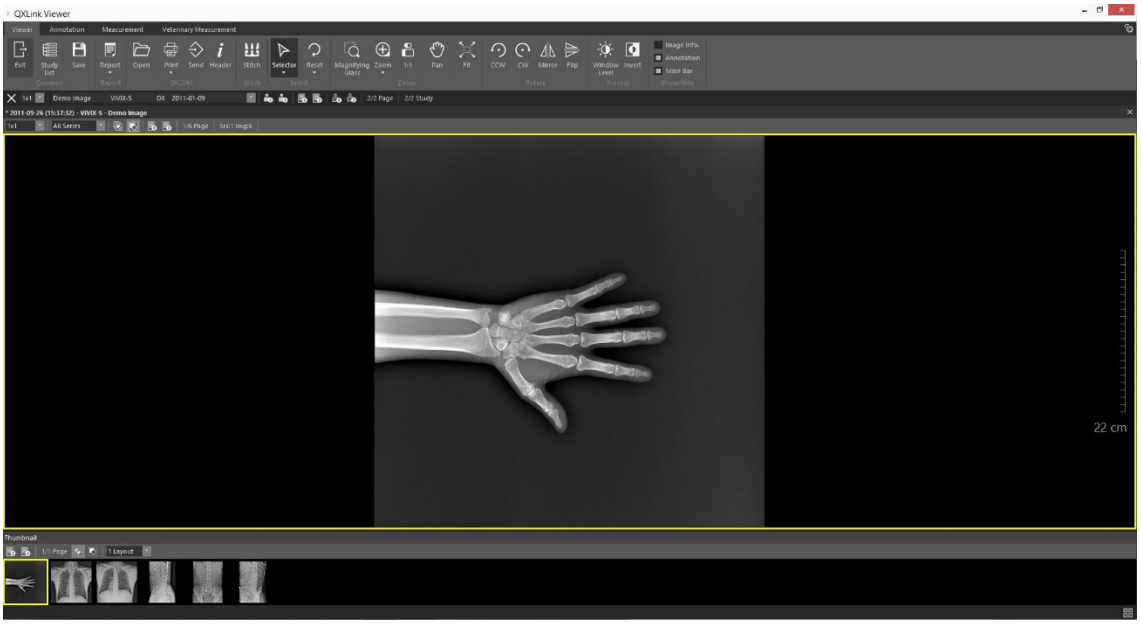
2 Click on the **Mirror** button on the toolbar.



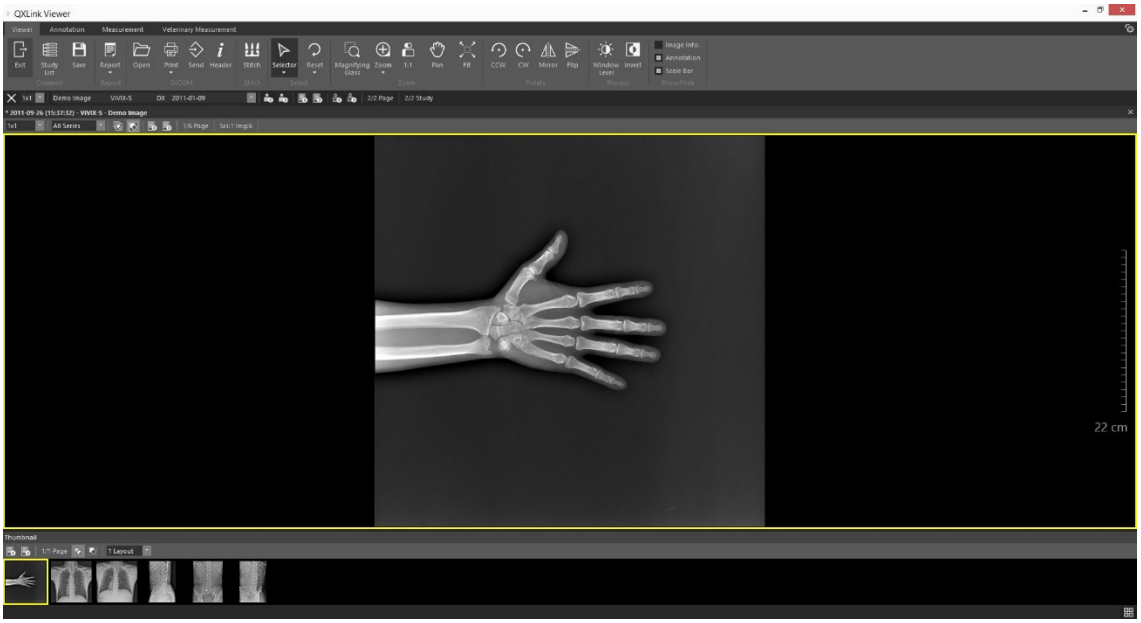
4.2.19 Flip Image Vertical

Button	Name	Description
	**Flip**	Flips an image vertically.

1 Select an image from the desired study.



2 Click on the **Filp** button on the toolbar.



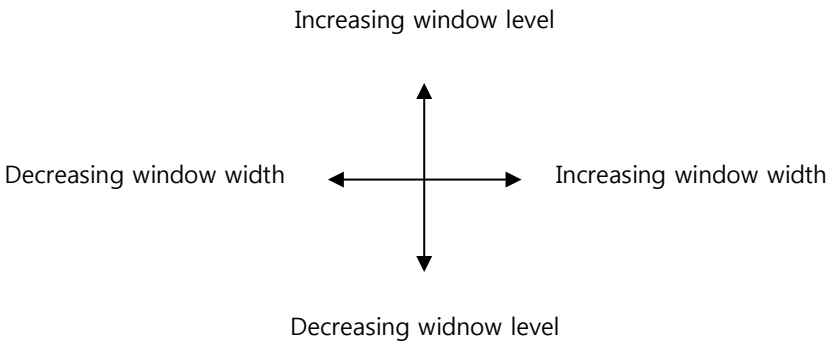
4.2.20 Window Level

Button	Name	Description
	**Window Level**	Adjusts the window level (image density and contrast).

1 Select an image from the desired study.

2 Click on the **Window Level** button on the toolbar.

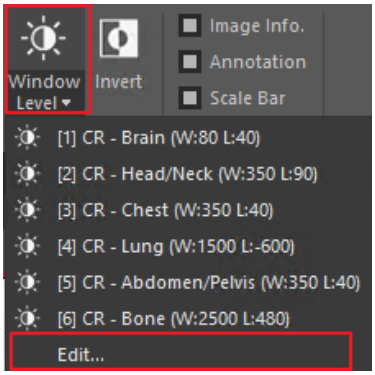
3 Press and hold the left mouse button while dragging the mouse to the following direction.



- You can also adjust window level by pressing and holding the right mouse button, then drag the mouse button on the image window.
- Press and hold the **Ctrl** key, then drag the mouse to adjust the window width only.
- Press and hold the **Alt** key, then drag the mouse to adjust the window level only.
- You can adjust the brightness more precisely by pressing the **Shift** key with **Ctrl** or **Alt** key.
- If you click the bottom of the Window Level button and then select the **Edit** option, you can preset the Window level value according to the Modality.

Registering Window Level

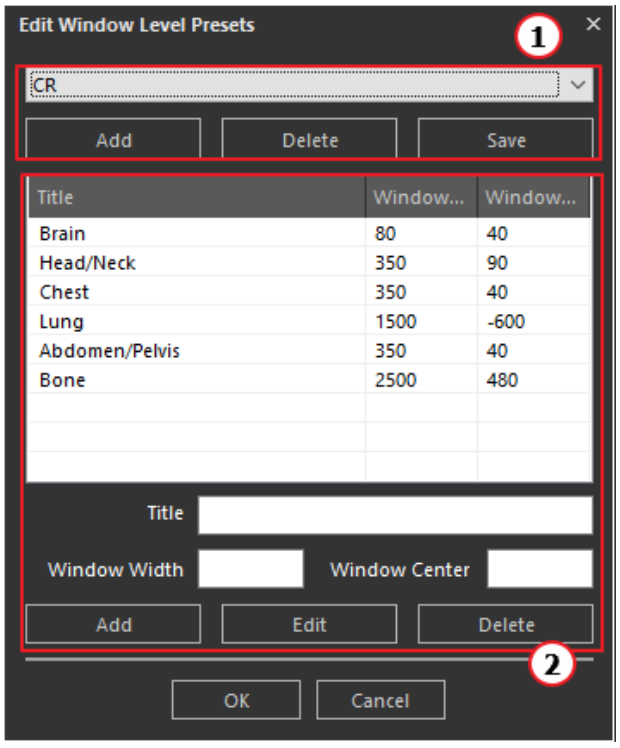
1 Click on the bottom of the Window Level button and select '**Edit..**' to register Window Level setting according to modality..



2 The following window appears.

▫ You can select / add / detele / save modality in part ① shown below.

3 You can add / modify / delete the window level list to be applied to the images shot in the selected modality in part ②.



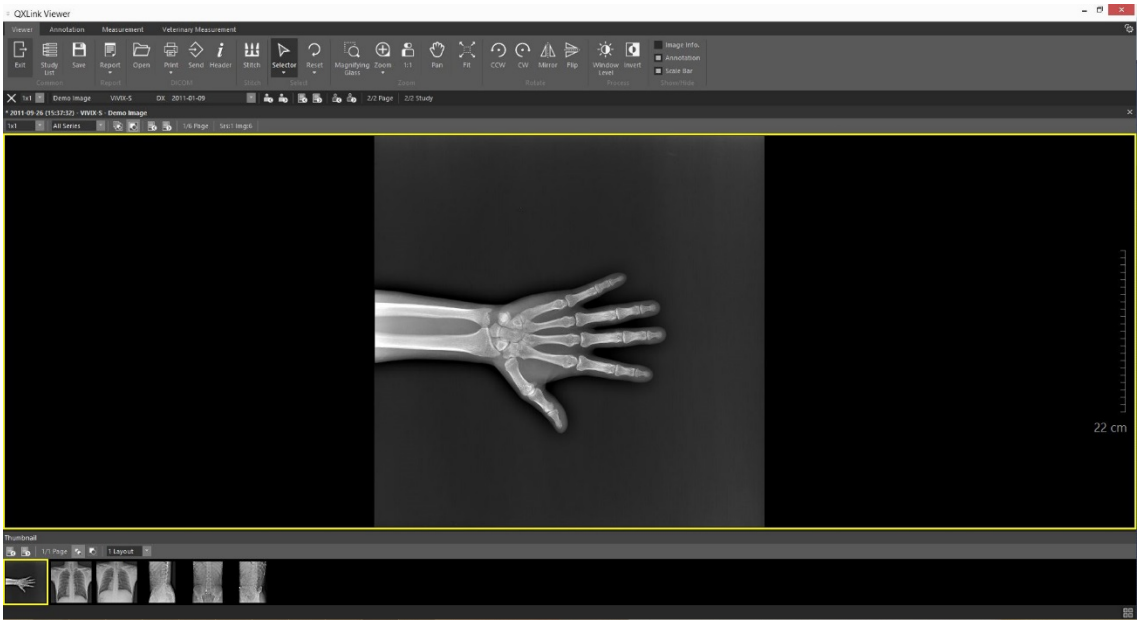
• Up to 10 modalities can be added.

4 When you open the image of added modality in viewer, you can check the list of window level setting added by clicking the bottom of the Window Level button.

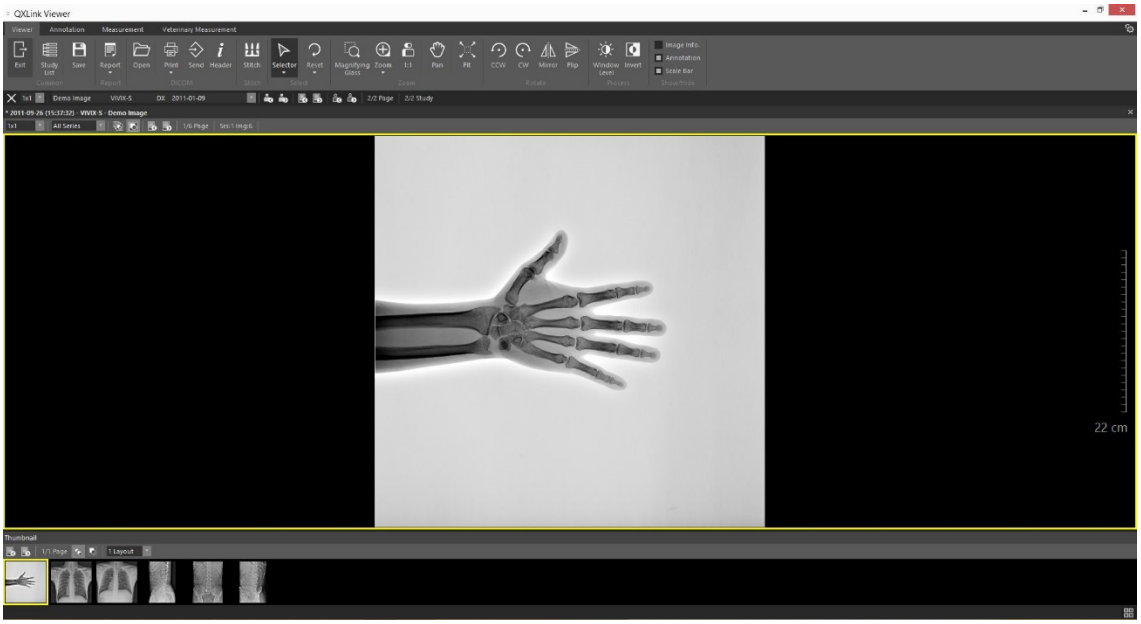
4.2.21 Invert Image

Button	Name	Description
	**Invert**	Inverts black and white pixels of the image.

1 Select an image from the desired study.



2 Click on the **Invert** button on the toolbar.



3 To restore the image, click on the **Invert** button again.

4.2.22 Displaying the Image Information

The **Show / Hide** menus are applied to the **Viewer** and **Print** windows separately.

Item	Description
Image Info.	Show or hide image information such as patient, study and image information displayed on the image.
Annotation	Show or hide annotations added to the image.
Scale Bar	Show or hide a scale bar on the image.

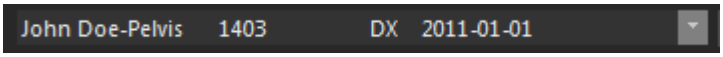
- This function is applied to the all images included in the currently-opened study.
- The scale bar is indicated be referring to the pixel spacing value (0028, 0030) first.

4.3 Functional Description of Viewer

4.3.1 Checking the Opened Study List (Available Exams)

You can verify the currently opened studies or select other study.

- The exam list is consisted of **Patient's Name**, **Patient's ID**, **Modality**, **Study Date Time**.



4.3.2 Moving the Study

Item	Description
	Moves to the previous page.
	Moves to the next page.
	Activates the previous study.
	Activates the next study.

4.3.3 Closing the Study

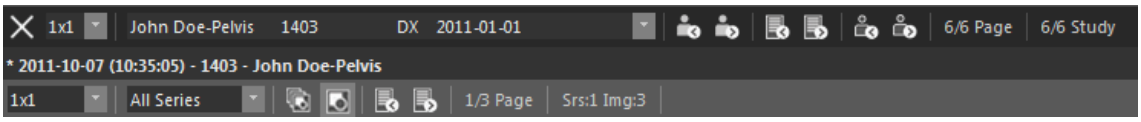
Close the study which is being retrieved.

Close the selected study

- Click on the **X** button on the top right corner of the **Viewer** window to close the selected study.

Close all studies

- To close all studies opened in the **Viewer** window, click on the **X** button on the left top of the study toolbar.

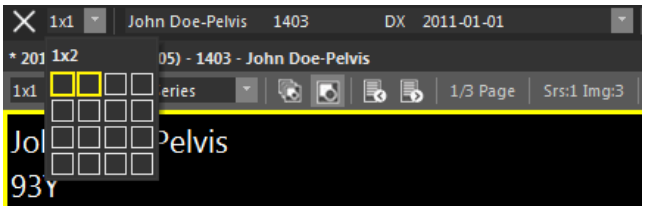


4.3.4 Changing the Study Layout

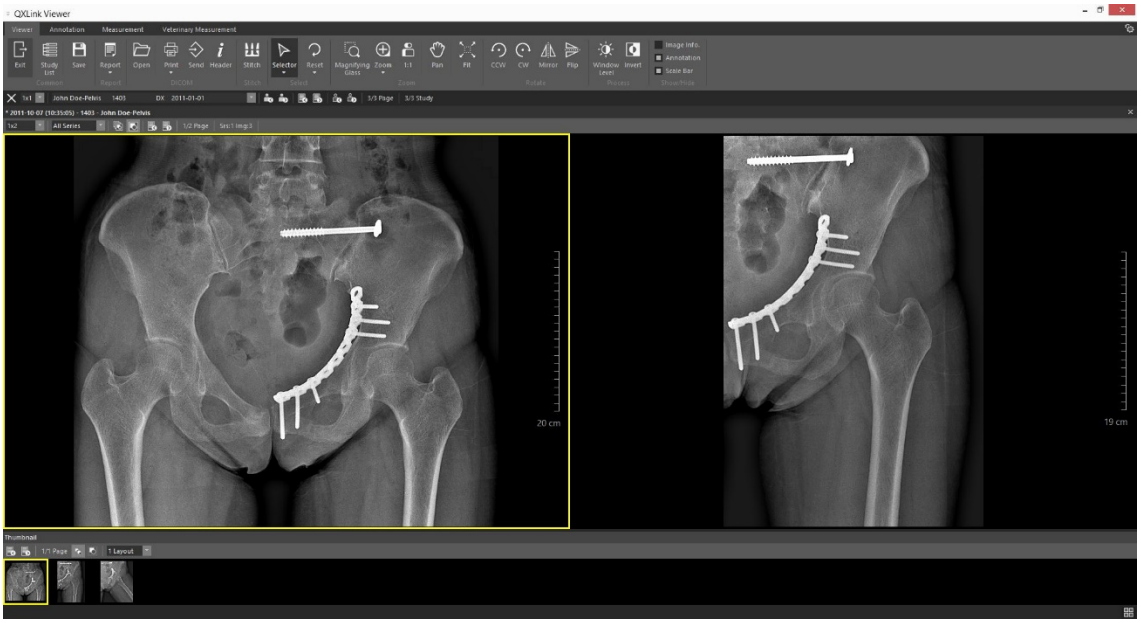
You can change the study layout as displaying more than one study on the screen. It is useful when you compare images from different studies. The allowed layout number of study is up to four columns and four rows.

1 Select and open one or more studies from the study list.

2 Select a layout from the **Study Layout** options in the study viewer.



3 Check if the study layout is changed successfully.

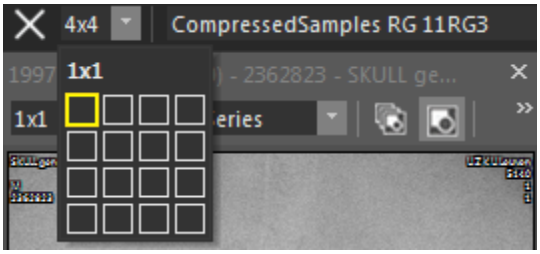


- The changing study layout is maintained even if you restart the **QXLink Viewer** program

How to maximize Study Layout

If the study layout is not one column and one row, maximize it to one column and one row.

1 Change the layout of selected study as follows.



2 Or, double click the study information bar.

How to activate study

You can activate another study from the screen where the layout is not organized with one column and one row.

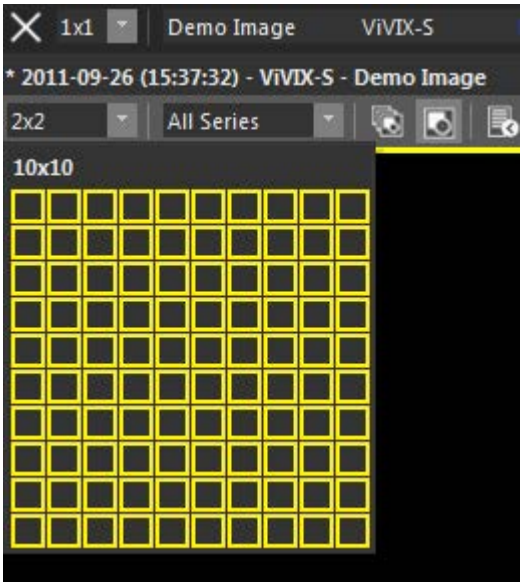
1 Click the study information bar with the left mouse button to activate.

2 Otherwise, select an image in the deactivated study to activate it.

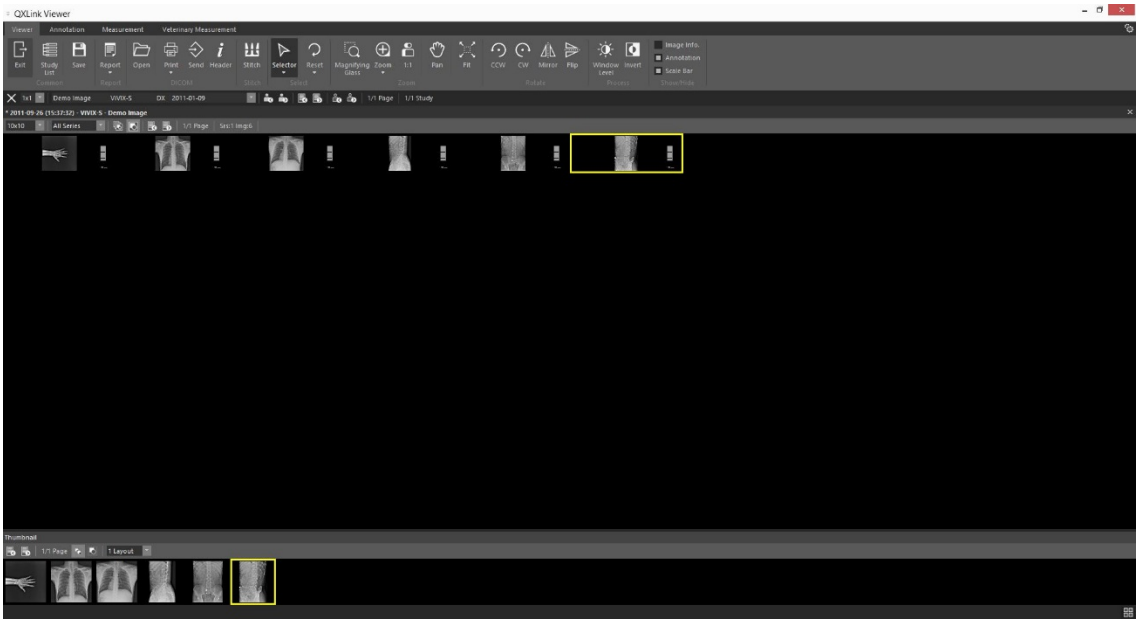
4.3.5 Changing the Image Layout

You can change the image layout of the study up to ten columns and ten rows.

1 Select the image layout option as follows.



2 Check if the layout is changed successfully.

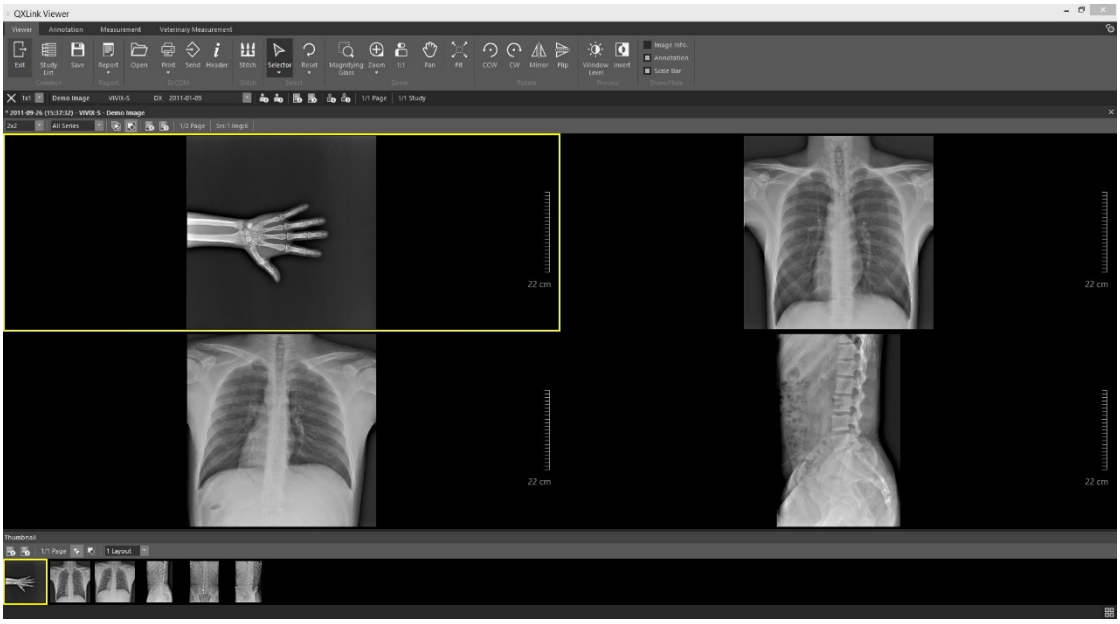


- You can preset the favorite image layout to each modalities.
- Click on the **Save** button to save the changing image layout.

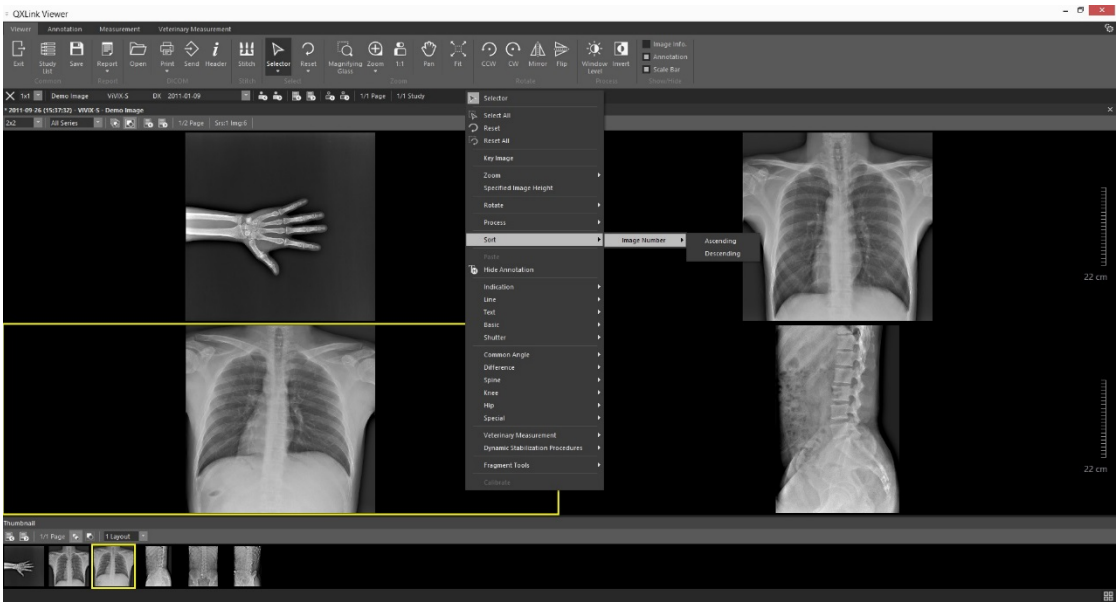
4.3.6 Sorting Images

You can sort images in the selected study. The images are sorted according to the series and instance number.

1 Select a desired study.

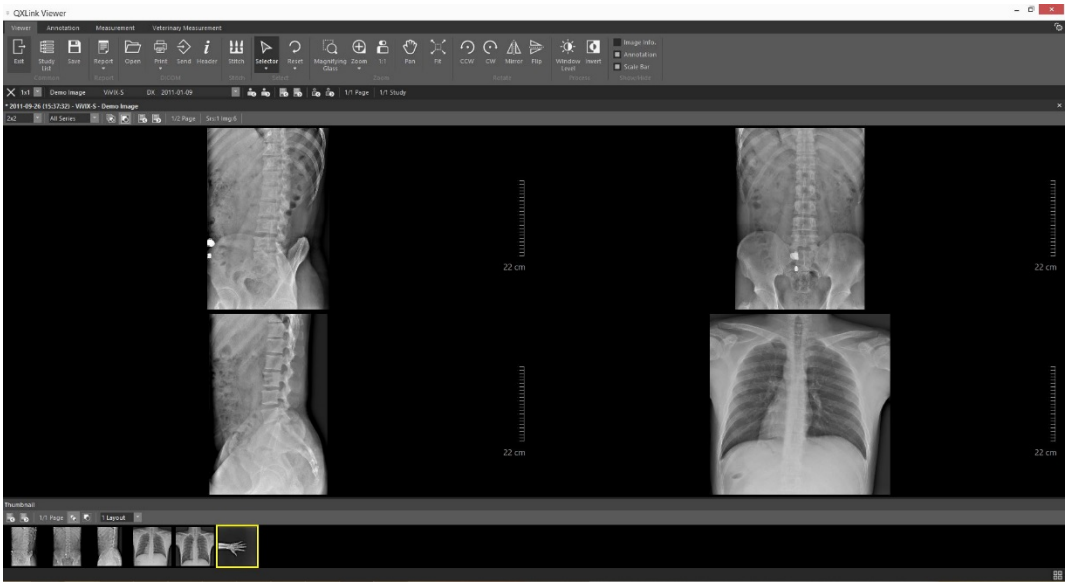


2 Click the right mouse button to display popup menus and select the **Sort** menu.



3 Select a sort type from the options (**Ascending / Descending**)

4 Check the sorted images.



4.3.7 Checking the Image in Real Size

Enlarge and display the selected image to its original size.

1 Double-click the selected image with a left mouse button to enlarge the image to its original size.

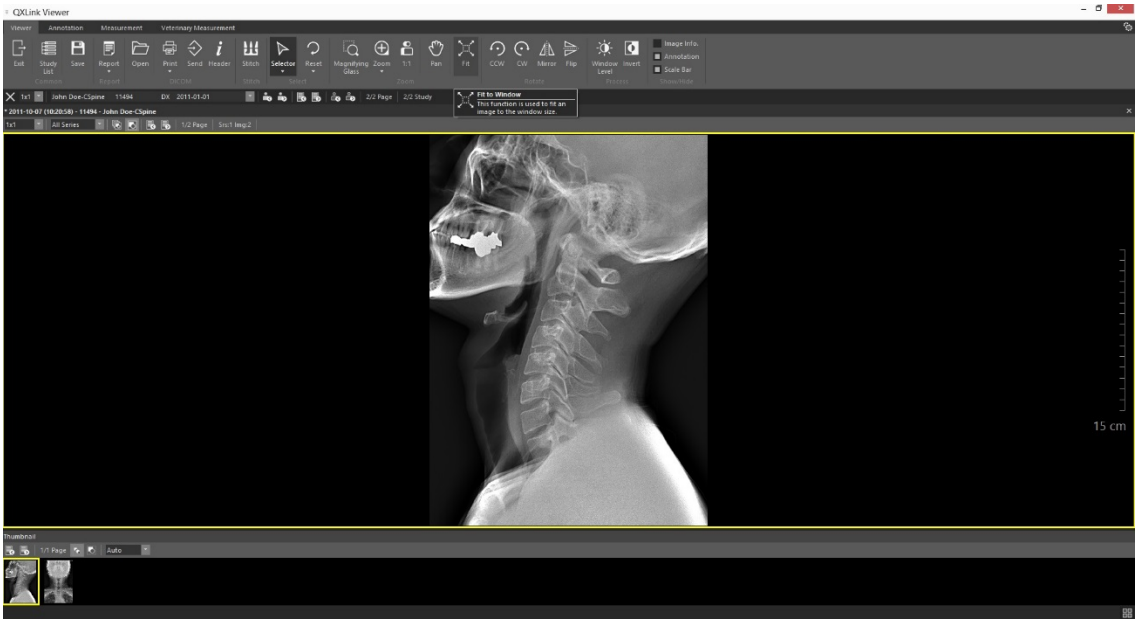
2 To close the **Real Size** window, double click the selected image or click **X** button on the top right corner.

- From **Presets**, you can set whether you use the **Real Size** function or not.
- The **Real Size** function is not available to use for the multi-frame image.
- When switching a window to **Print** or **Stitch**, the **Real Size** window will be closed.
- If you modify the following items from the **Real Size** window, they will be applied to the original image when you close the window.
  - **Window Level**, **Mirror**, **Flip**, **Invert**, **Rotation**, **Annotation**

4.3.8 Checking the Image in Screen Size

Resize the selected image to fit to the screen.

1 Double click the selected image with a left mouse button to fit the image to the screen.

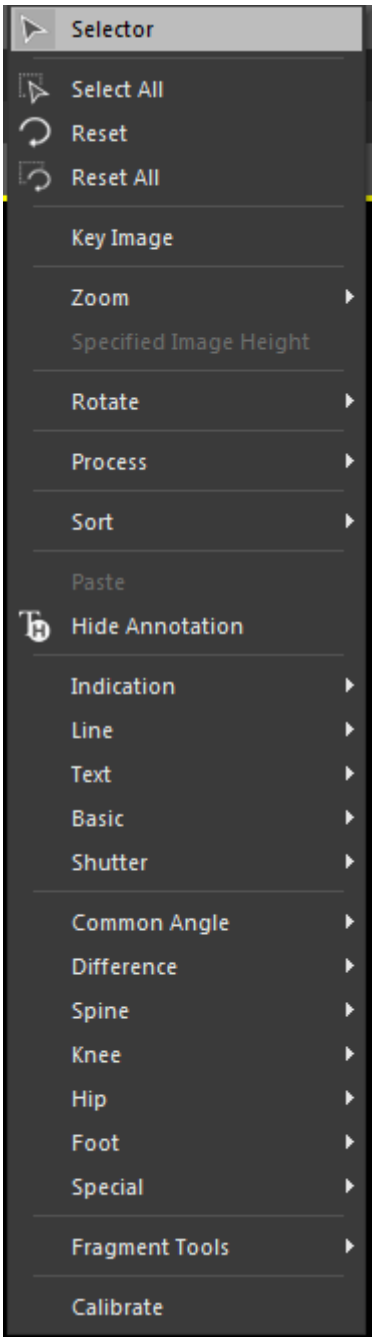


2 Double click the selected image or click on the **X** button on the top right corner to close the **Screen Size** window.

- In **Presets**, you can set whether to use the **Screen Size** function or not.
- The **Screen Size** funtion is not available to use for the multiple frame image.
- When you switch to the **Print** or **Stitch** window, the **Screen Size** window will be closed.
- If you modify the following items from the **Real Size** window, they will be applied to the original image when you close the window.
- **Window Level**, **Mirror**, **Flip**, **Invert**, **Rotation**, **Annotation**

4.3.9 Popup Menu

Click the right mouse button on the image window to display the popup menus.

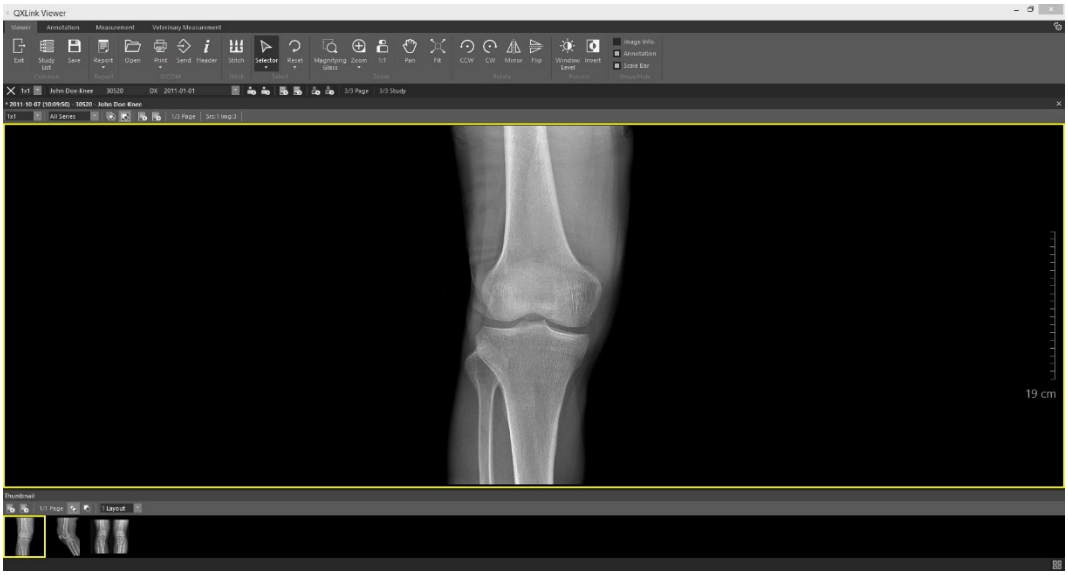


- The pop-up menus are available from the **Viewer** window only.

4.3.10 Specified Image Height

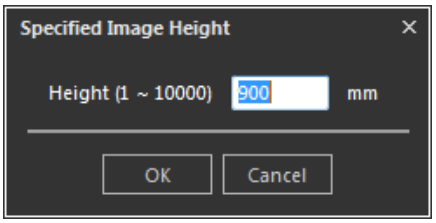
You can display an image by a user-defined height. This feature is useful when you diagnose the stitched image by displaying it as a fixed size.

1 Select an image from the desired study.

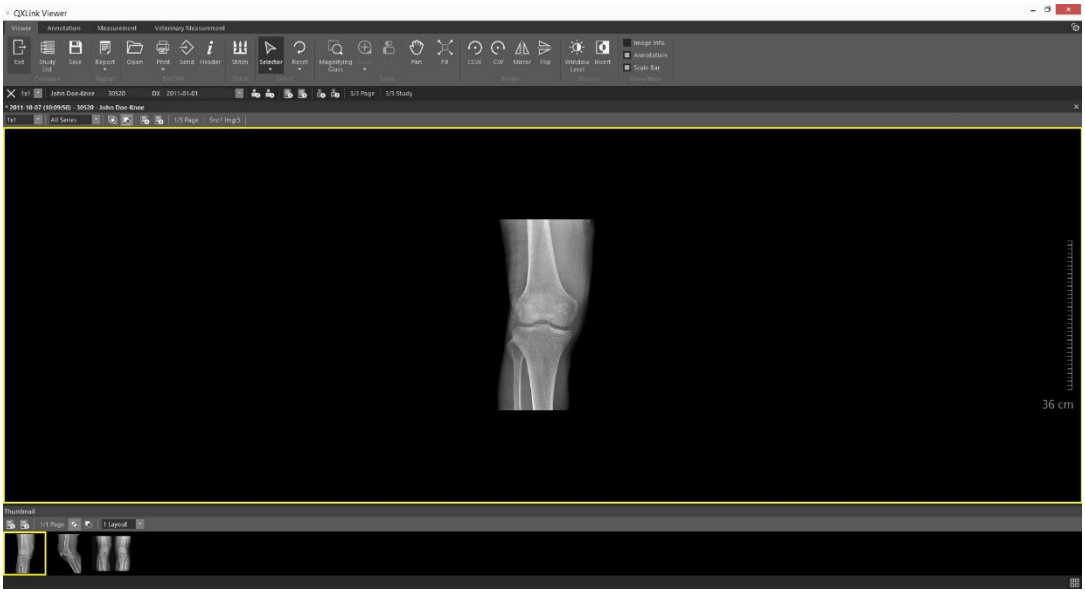


2 Click the righrt mouse button and choose **Specficied Image Height** from the popup menus.

3 Input the height of image.



4 Check if the height of relevant image is changed successfully.



- If you want to display the image at a specific height, the **Zoom** and **1:1** functions cannot be used.
- Click on the **Save** button to save the height you entered.

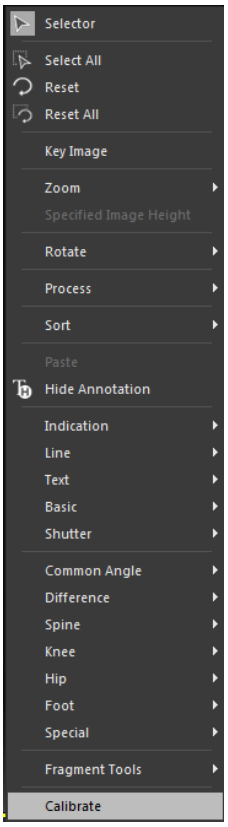
4.3.11 Changing User Magnification Factor

You can adjust the pixel spacing of a DICOM image where no pixel spacing information exists.

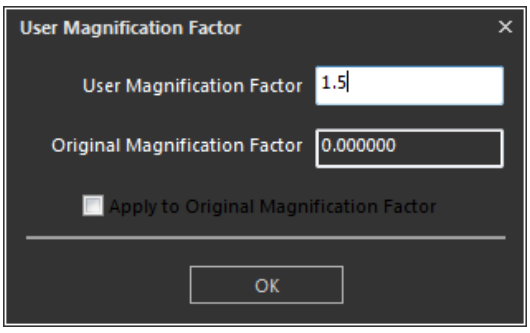
- This function is not available to the images which have a DICOM tag of the pixel spacing (0028, 0030).
- This function is not available to the stitched image.

1 Select an image from the desired study.

2 Click the right mouse button to display popup menus and select **Calibrate**.



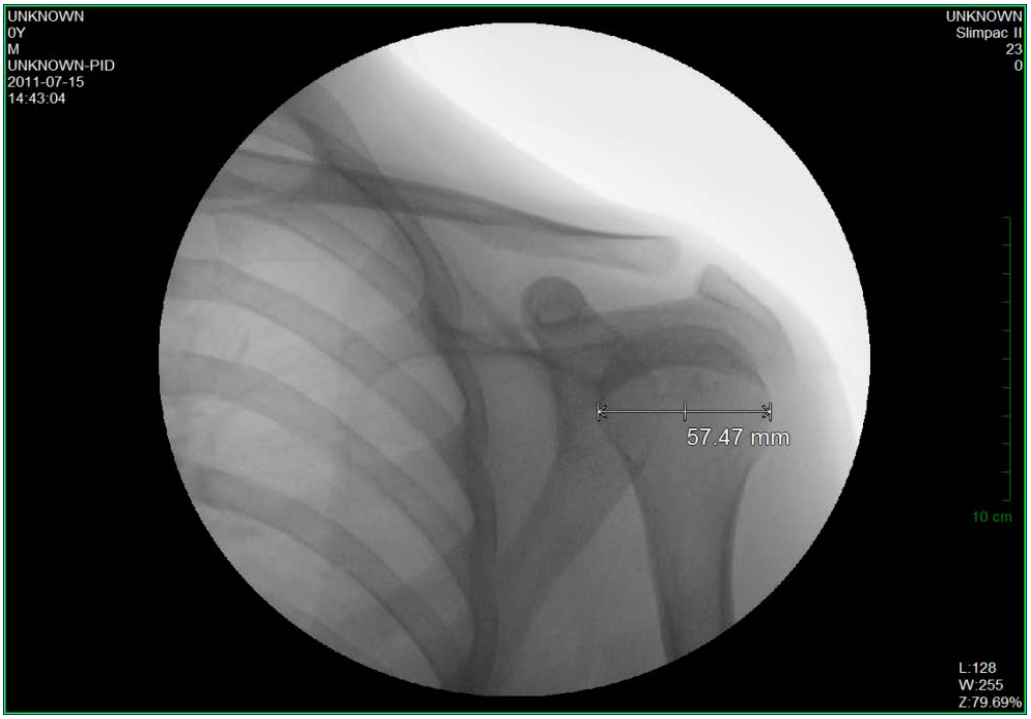
3 Enter the **User Magnification Factor** value and click **OK** button.



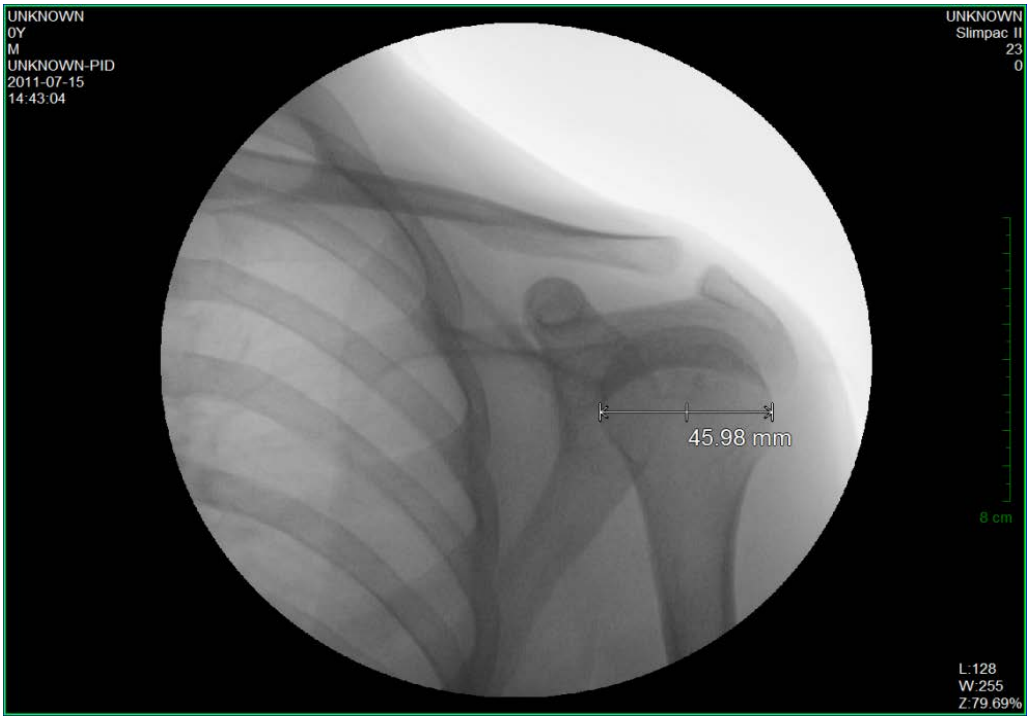
- If there is no DICOM tag or value of '(0018, 1114) Estimated Radiographic Magnification Factor', the original magnification factor is indicated as '0.0'.
- Check **Apply to Original Manginfication Factor** to calculate intervals with the value of original magnification factor.

4 The distance and scale bar will be changed according to the magnification factor.

▫ Before



▫ After

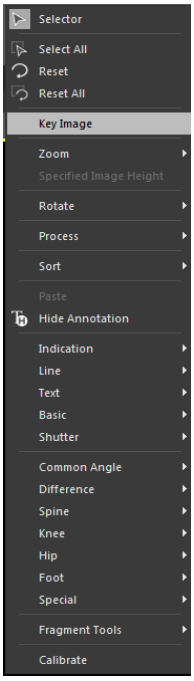


4.3.12 Specifying / Releasing the Key Image

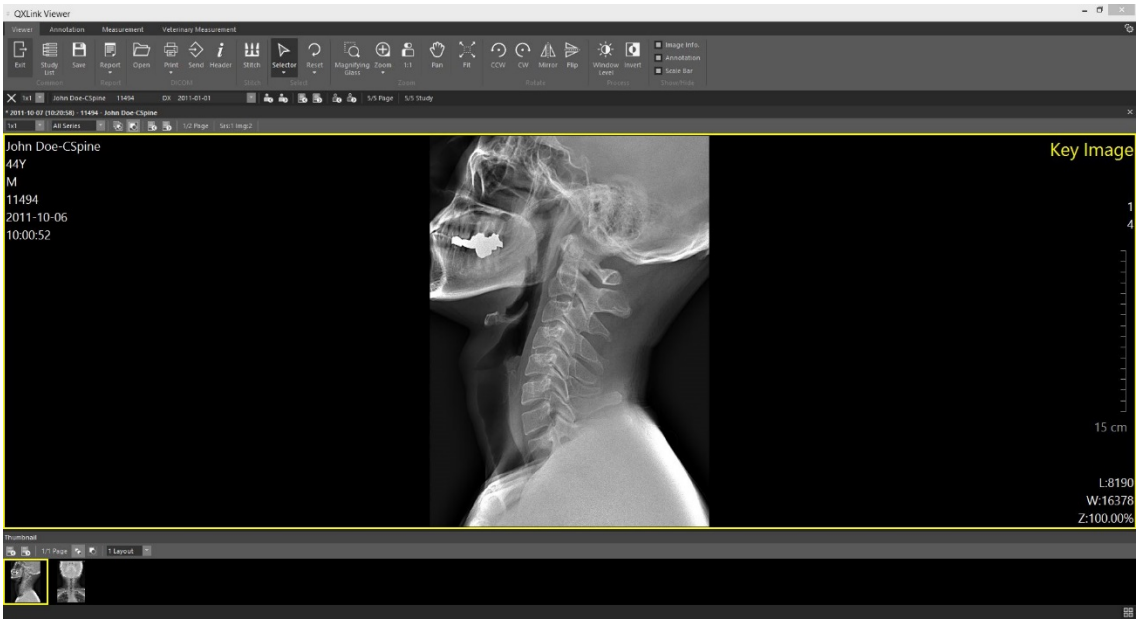
You can specify an image with clinical comments as a key image. Key When you print out a report, the key image will be automatically attached to the **Picture** field.

1 Select an image from the desired study.

2 Click the right mouse button to display popup menus and select **Key Image**.



3 Check a mark on the top right corner to see whether a key image is specified or not.



- Save the study to maintain the key image setting.

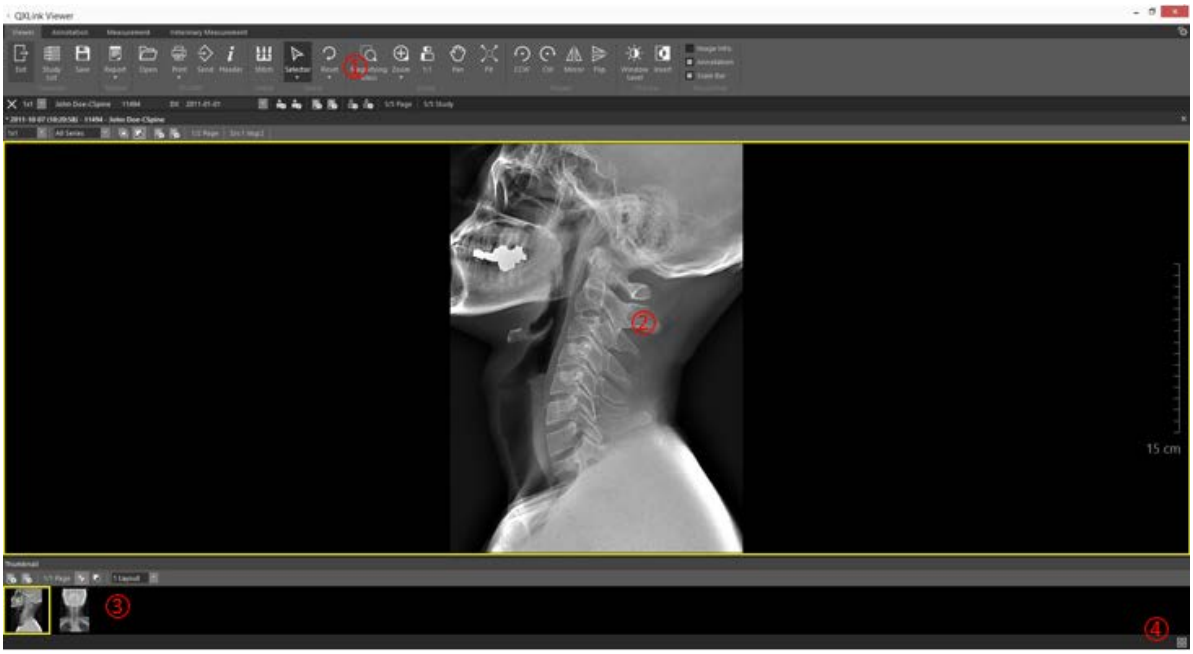
5. Annotation

This chapter explains about the composition of annotation window and its functions.

Composition of Annotation

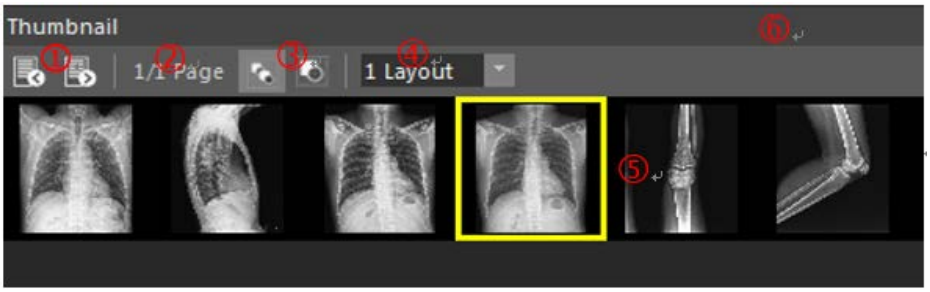
Annotation Tools

5.1 Composition of Annotation



No.	Name	Function
1	**Image manipulation toolbar**	Displays the tools used for image manipulation.
2	**Study Viewer**	Displays the image of a selected study.
3	**Thumbnail**	Displays the thumbnail image of a selected study.
4	**Status Bar**	Shows or hides the thumbnail.

5.1.1 Thumbnail



No.	Name	Function
1	**Previous page / Next page**	• Moves to the previous or next page of thumbnail. • Changes the thumbnail page by scrolling a mouse wheel while selecting a thumbnail window.
2	**Current page / Total page**	• Displays the current page and total number of pages.
3	**Thumbnail display**	• **Show All Images** • **Show First Image on All Series**
4	**Thumbnail display option**	• **1 Layout** • **2 Layouts** • **3 Layouts**
5	**Thumnail image viewer**	• Checks the relevant thumbnail image.
6	**Thumbnail location control**	• Moves thumbnail to the desired location by dragging a mouse button. • The thumbnail can be floated or docked by clicking it with a right mouse button or double-clicking it with the left mouse button.

• If there is a thumbnail image loaded abnormally, it is not displayed on the screen.

5.1.2 Status Bar

Image	Function
	Shows or hides a thumbnail.

• You can change the location and size of thumbnail in the viewer window. Refer to <3.1.6 Changing the Size and Location of Window> for the detailed information.

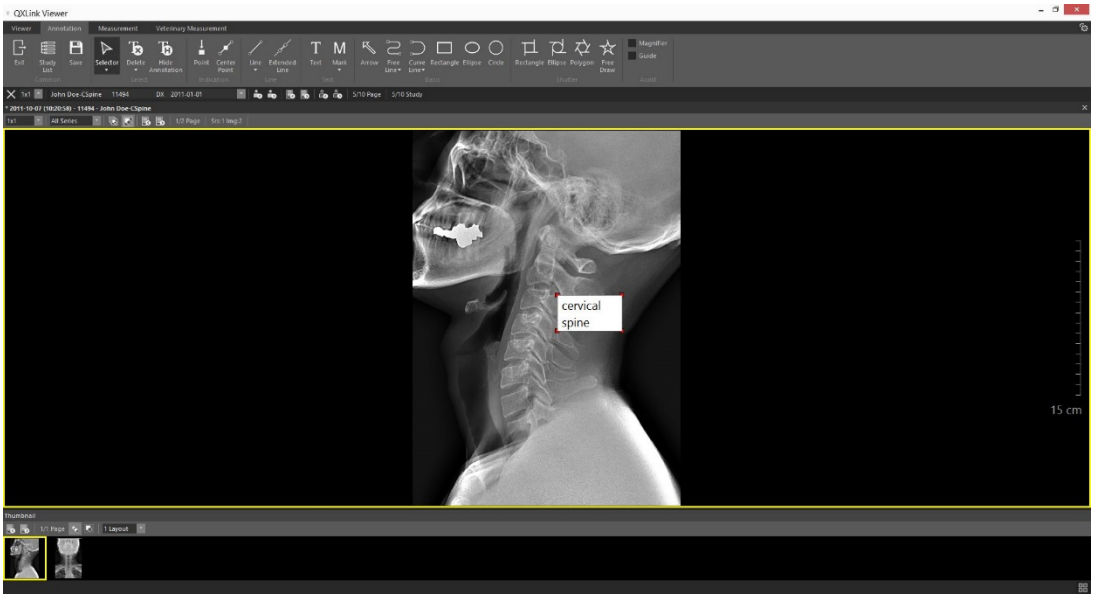
5.2 Annotation Tools

5.2.1 Delete Annotation

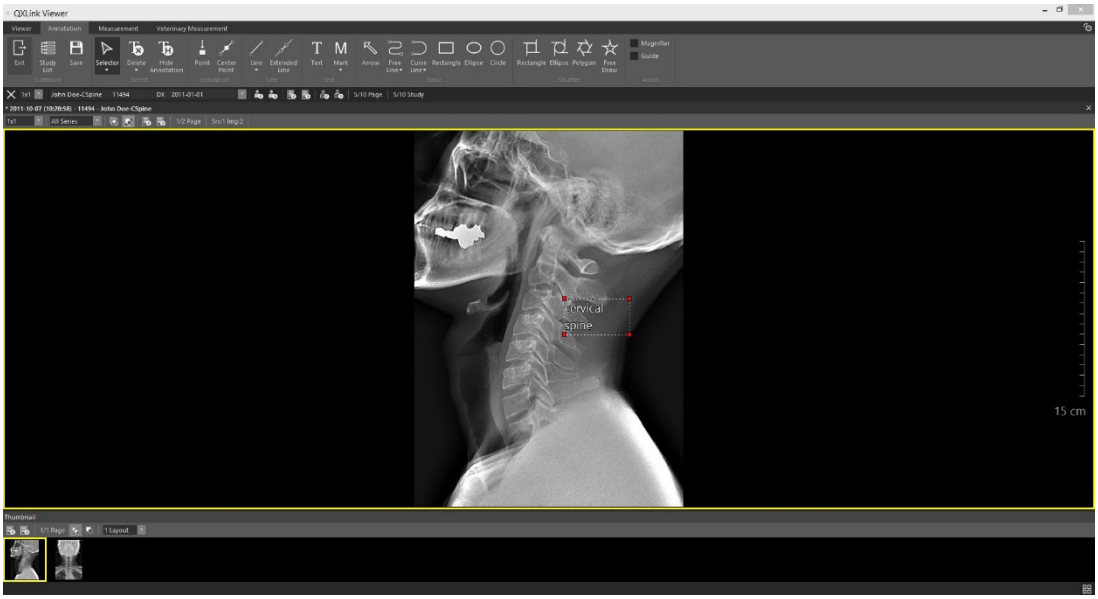
Button	Description
	Deletes the selected annotation.

1 Select an image from the desired study.

2 Select an annotation with the left mouse button. Use the **Ctrl** or **Shift** key yo select multiple annotations.



3 Or, drag an area with the left mouse button where the annotation to be selected is included.



4 Click on the bottom of **Delete** button from the toolbar, and choose the desired option.

- **Delete All Annotations / Delete Selected Annotation(s)**

	• You can delete all annotations by clicking on the **Delete** button.

5.2.2 Hide Annotation

Button	Description
	Shows or hides annotations on the image.

	• If you hide annotations, the related annotation tools will be deactivated.

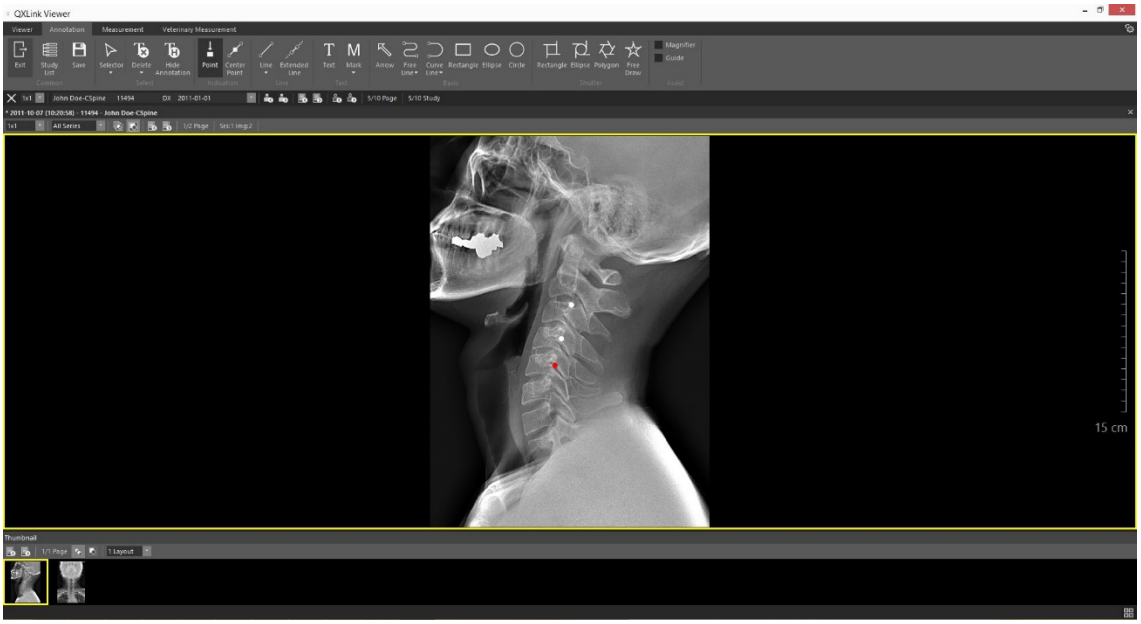
5.2.3 Point

Button	Description
	Indicates points at the specific location of an image.

1 Select an image from the desired study.

2 Click on the **Point** button from the tool buttons and move a mouse pointer to the image view screen.

3 Click on the image where you want to mark points.



5.2.4 Center Point

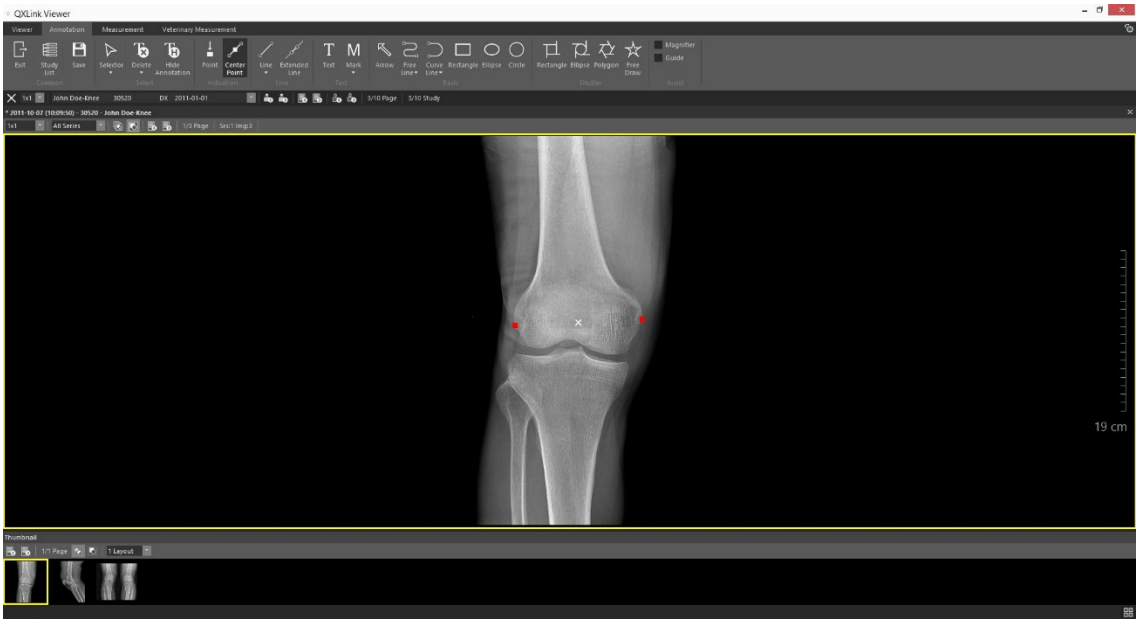
Button	Description
	Indicates a centeral point between the two selected points on the image.

1 Select an image from the desired study.

2 Click on the **Center Point** button from the tool buttons and move a mouse pointer to the image view screen.

3 Click two points on the image as you want.

4 A centeral point between the two points is indicated as 'X' on the image automatically.



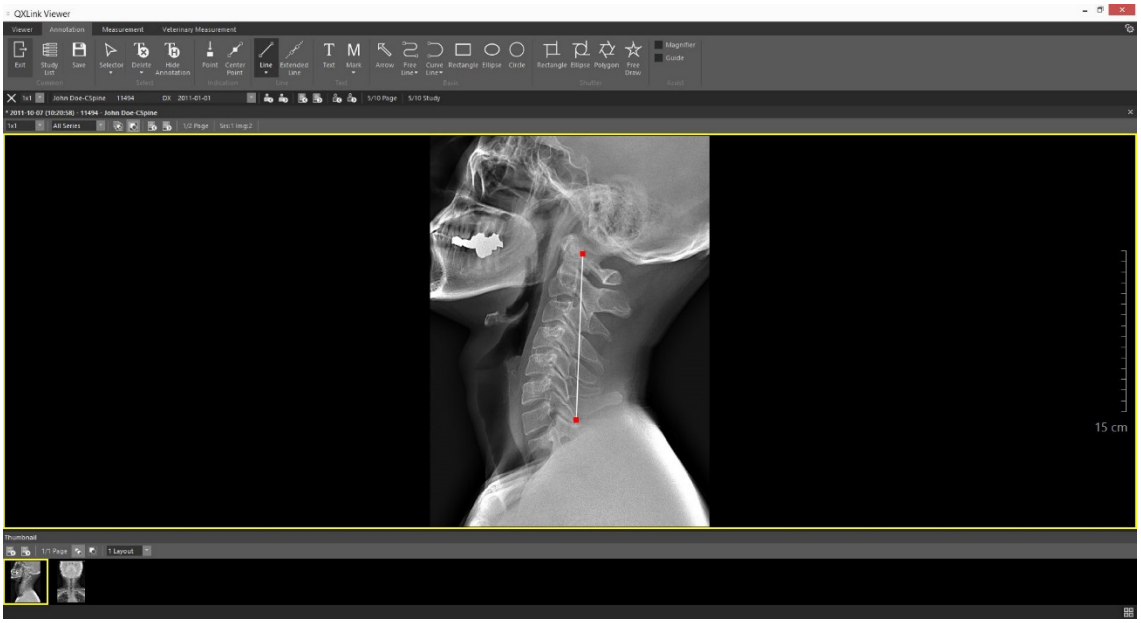
5.2.5 Line

Button	Description
	Indicates a segment line connecting two points.

1 Select an image from the desired study.

2 Click on the **Line** button from the tool menus and click two points on the image as you want.

3 A segment line is indicated connecting the two points.



5.2.6 Horizontal Line

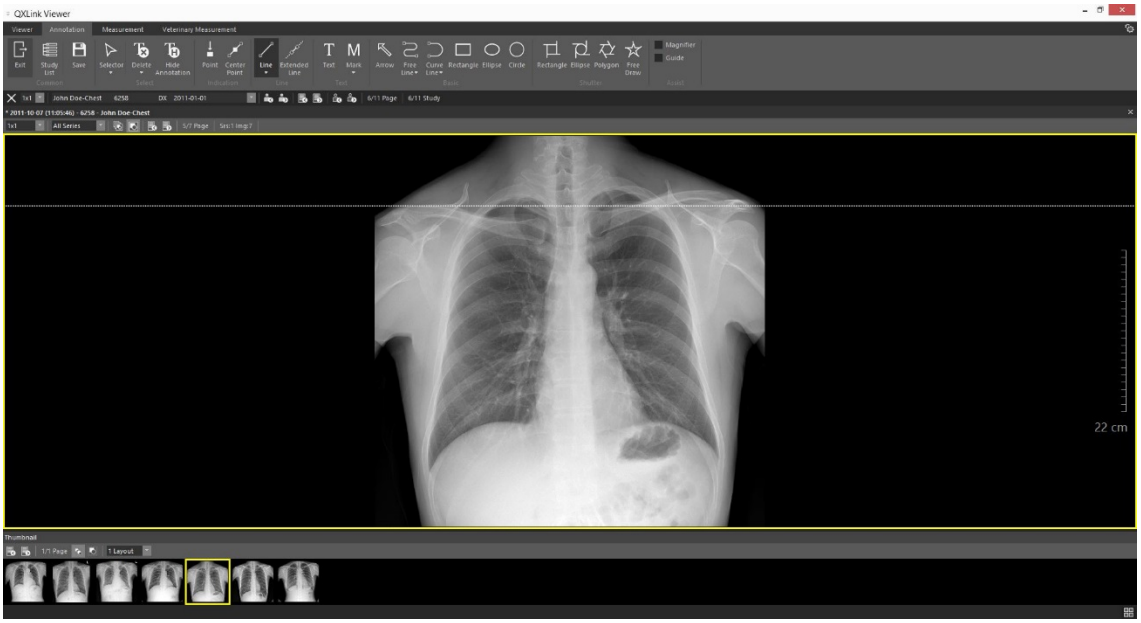
Image	Description
	Indicates a horizontal line on the image.

1 Select an image from the desired study.

2 Click on the **Line** button from the tool menus and then the options for selecting a horizontal or a vertical line is shown.

3 Select **Horizontal Line** and click a point on the image.

4 A horizontal line passed the point is indicated.



5.2.7 Vertical Line

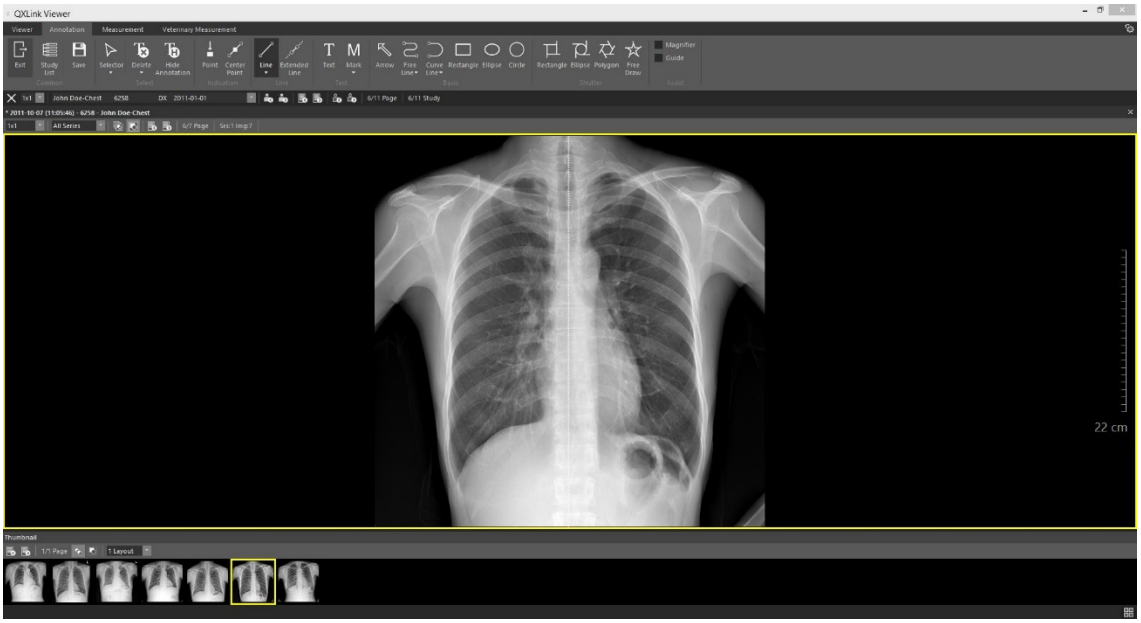
Image	Description
	Indicates a vertical line on the image.

1 Select an image from the desired study.

2 Click on the **Line** button from the tool menus and then the options for selecting a horizontal or a vertical line is shown.

3 Select **Vertical Line** and click a point on the image.

4 A vertical line passed the point is indicated.



5.2.8 Extended Line

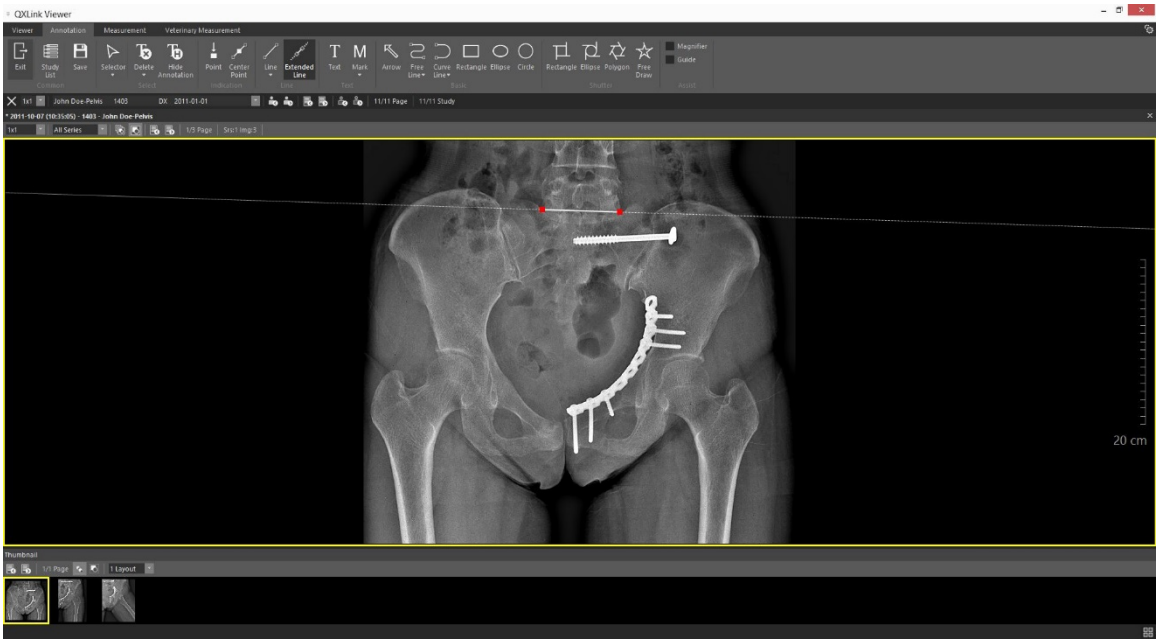
Button	Description
	Indicates a line segment connecting two points and a straight line extended from the segment.

1 Select an image from the desired study.

2 Click on the **Extended Line** button from the tool buttons and move a mouse pointer to the image view screen.

3 Click two points on the image and then a segment line shows based on the two points.

4 The extended line connects the two points is indicated as a dotted line.



5.2.9 Text

Button	Description
	You can input texts on the image.

How to input texts

1 Select an image from the desired study.

2 Click on the **Text** button on the toolbar, and move a mouse pointer to the image.

3 At the position to input text, press and hold the left mouse button, and then draw a rectangle text input field by dragging the mouse.

4 Enter texts on the field.

5 To stop entering text, press the **Esc** key or click outside area of the input field.

- If you draw a text input field smaller than one character size, the text input field will be cancelled.
- Semicolon (;) and character "|" are not allowed to enter.

How to modify texts

1 Click on the **Selector** button to set the mouse pointer as a default.

2 Move the mouse pointer to the text input field, then the pointer shape will be changed.

3 Click the left mouse button to modify texts in the input field.

4 To stop entering text, press the **Esc** key or click outside area of the input field.

5.2.10 Mark

Button	Description
	You can mark special characters on the image.

How to insert mark

1 Select an image from the desired study.

2 Click on the **Mark** button in the **Annotation** window.

- Click on the bottom of the **Mark** button to check the pre-registered letters from a popup menu.

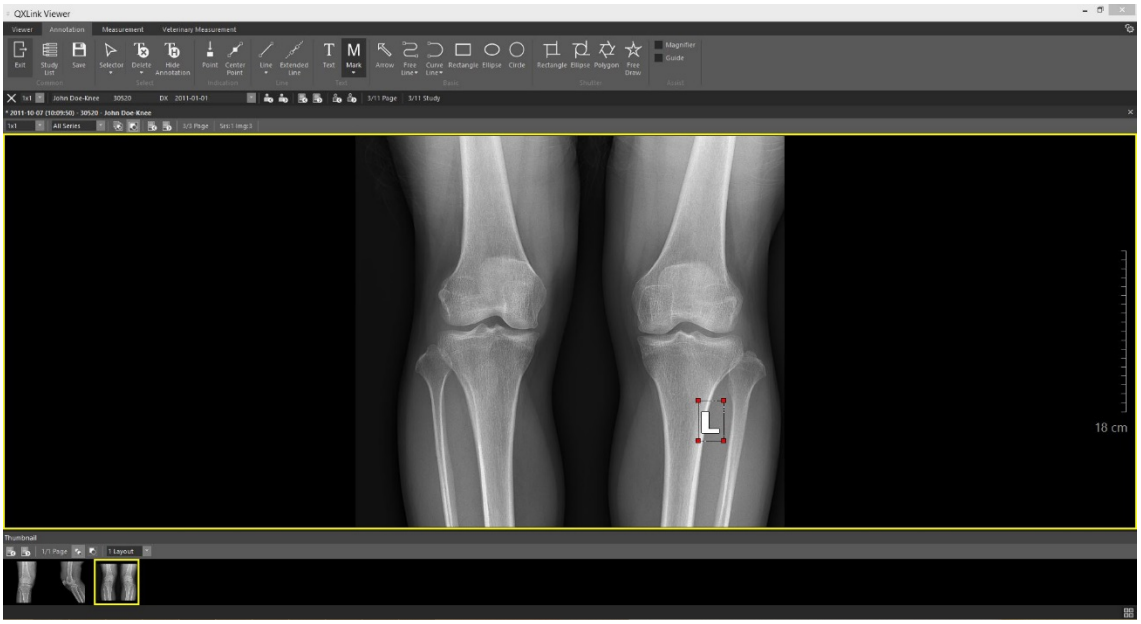
3 If you mark on the image without checking a popup menu, the letter registered on the top will be marked.

4 You can select a letter to mark on the image from the list registered to the popup menu.

5 Move the mouse pointer to the image view screen.

6 Left click on the image where you want to put a mark, and then adjust its size by dragging the mark.

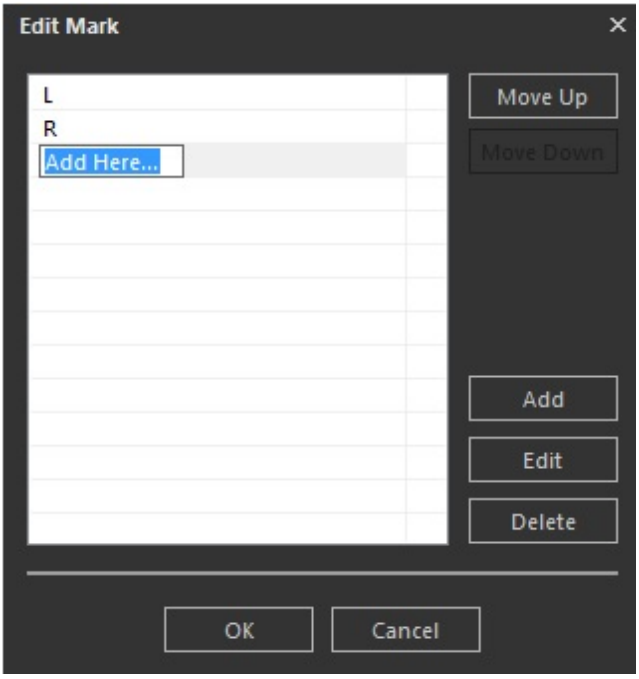
7 Check the inserted mark.



How to add / modify mark

1 To add or modify a mark, click the bottom of the **Mark** button and select **Edit** from the popup menu.

2 The following window is displayed. Input letters or adjust priority, and then click **OK** button.



- You can add up to 100 marks.
- You can input up to 16 mark characters.

5.2.11 Arrow

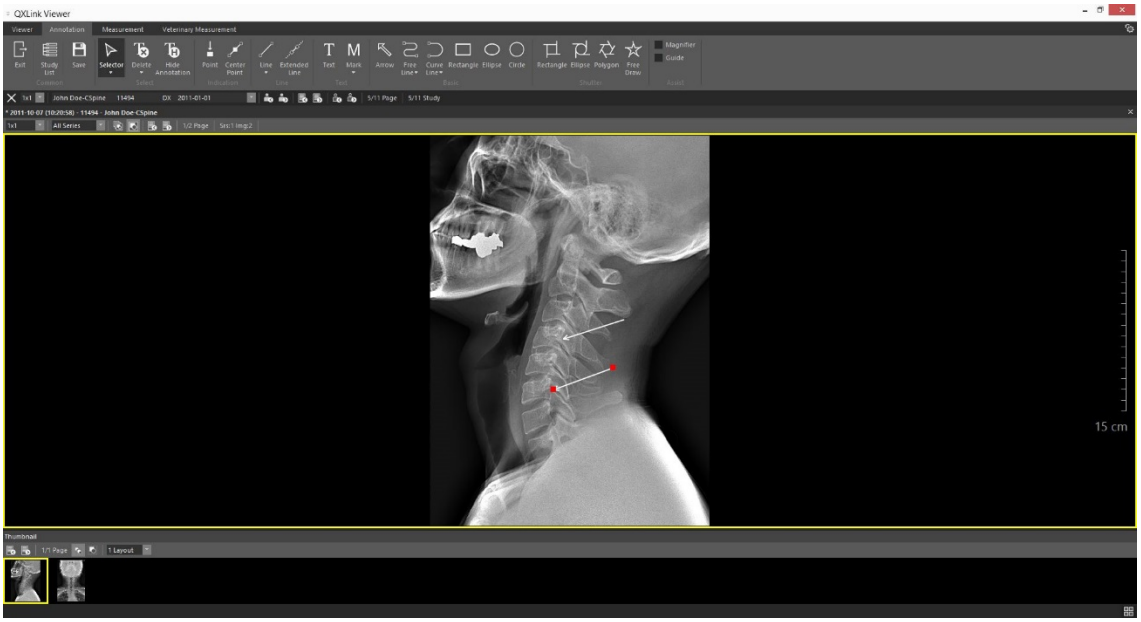
Button	Description
	You can mark an arrow on the image.

1 Select an image from the desired study.

2 Click on the **Arrow** button on the toolbar and move a mouse pointer to the image.

3 Press and hold the left mouse button, and then drag it on the desired location

4 Release the mouse button and check the arrow as follows.



- You can draw and adjust the angle of an arrow in 45° by dragging a mouse button while pressing the **Shift** key.

5.2.12 Free Line

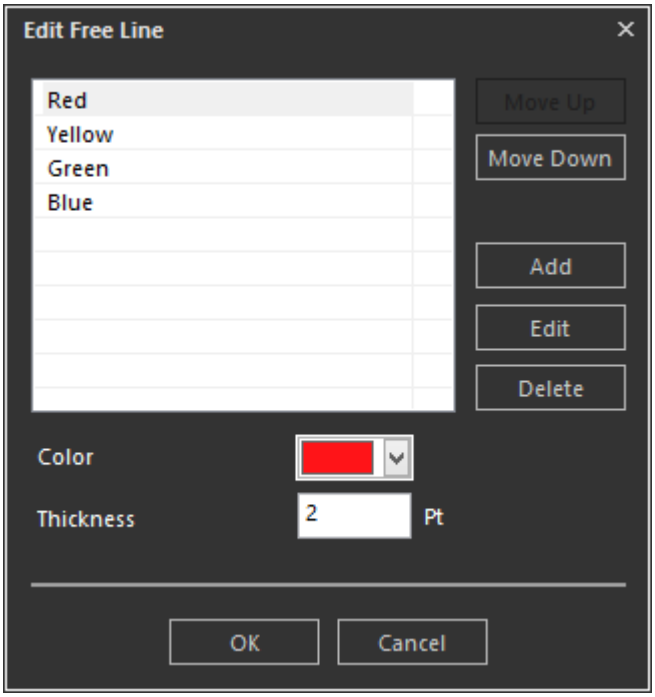
Button	Description
	You can draw a region of interest on the image with a selected color.

1 Select an image from the desired study.

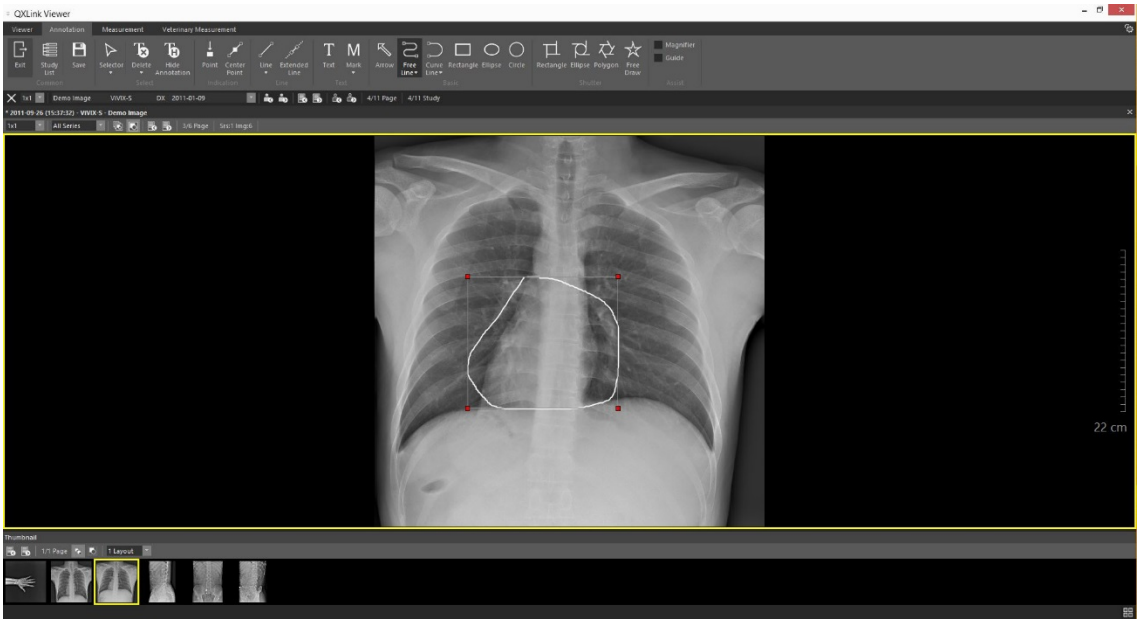
2 Click on the **Free Line** button from the tool menus to start the Free Line function with a default color.

3 Click on the bottom of **Free Line** button to select a desired color from the popup menus.

4 You can also add a color from **Edit Free Line** by clicking the **Edit** option.



5 Move a mouse pointer to the image view screen, and draw a region of interest by dragging a left mouse button on the desired location.



5.2.13 Rectangle

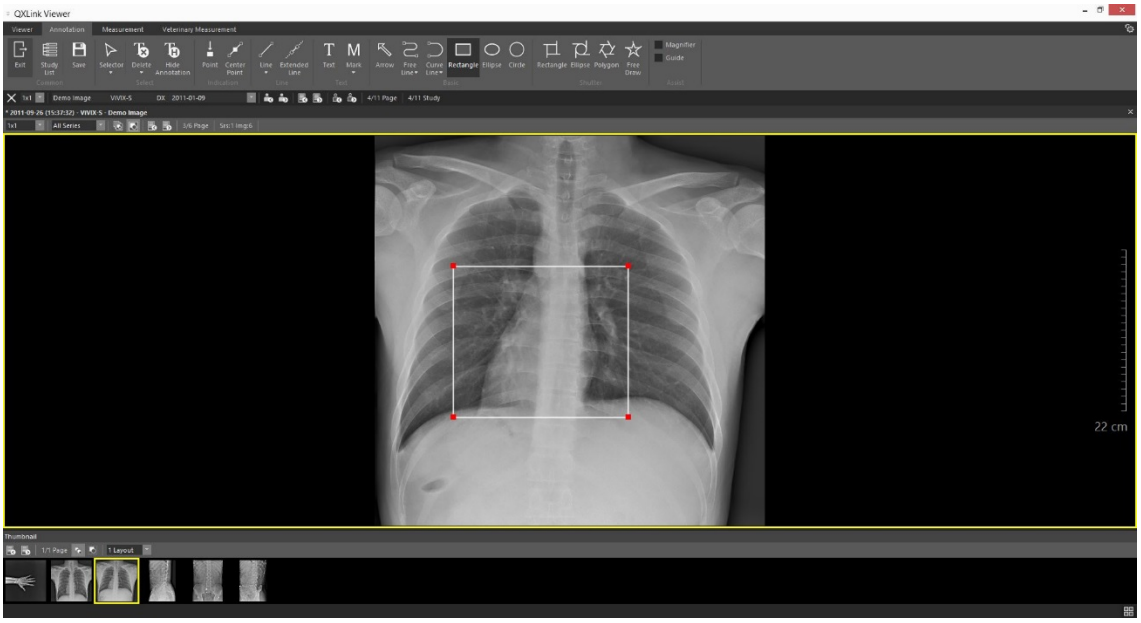
Button	Description
	You can draw a rectangle over an image to indicate a region of interest.

1 Select an image from the desired study.

2 Click on **Basic** → **Rectangle** button on the toolbar and move a mouse pointer to the image.

3 Press and hold the left mouse button, and then drag it to draw a rectangle on a desired position.

4 Check the rectangle indicating a region of interest.



5.2.14 Ellipse

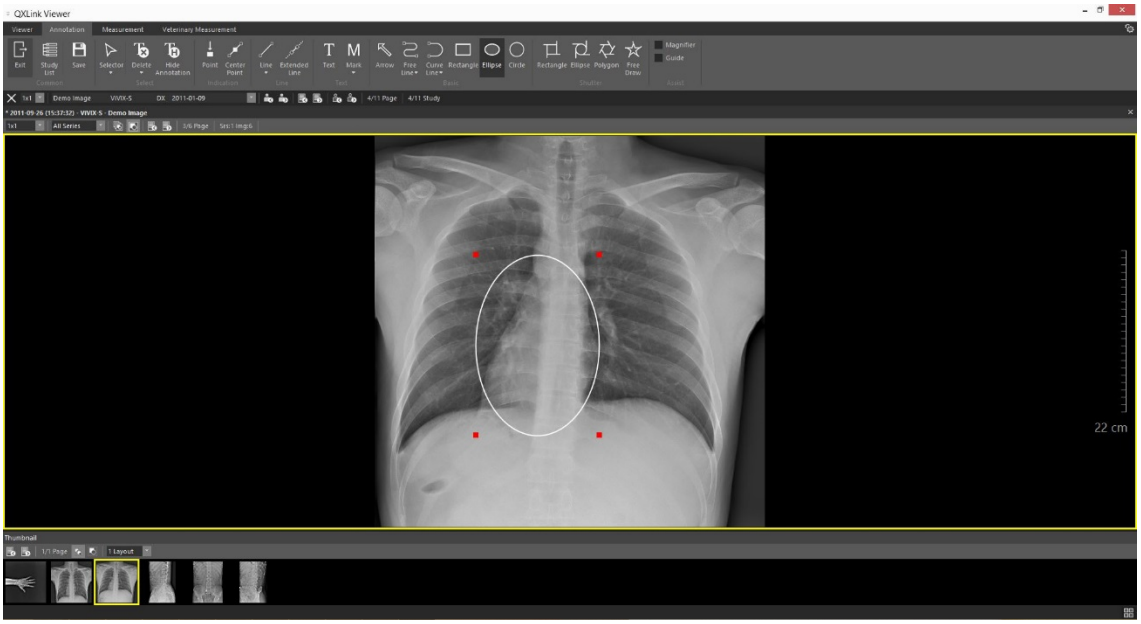
Button	Description
	You can draw an ellipse on the image to indicate a region of interest.

1 Select an image from the desired study.

2 Click on **Basic** → **Ellipse** button on the tool menus and move a mouse pointer to the image.

3 Press and hold the left mouse button, and then drag it to draw an ellipse.

4 Check the ellipse indicating a region of interest.



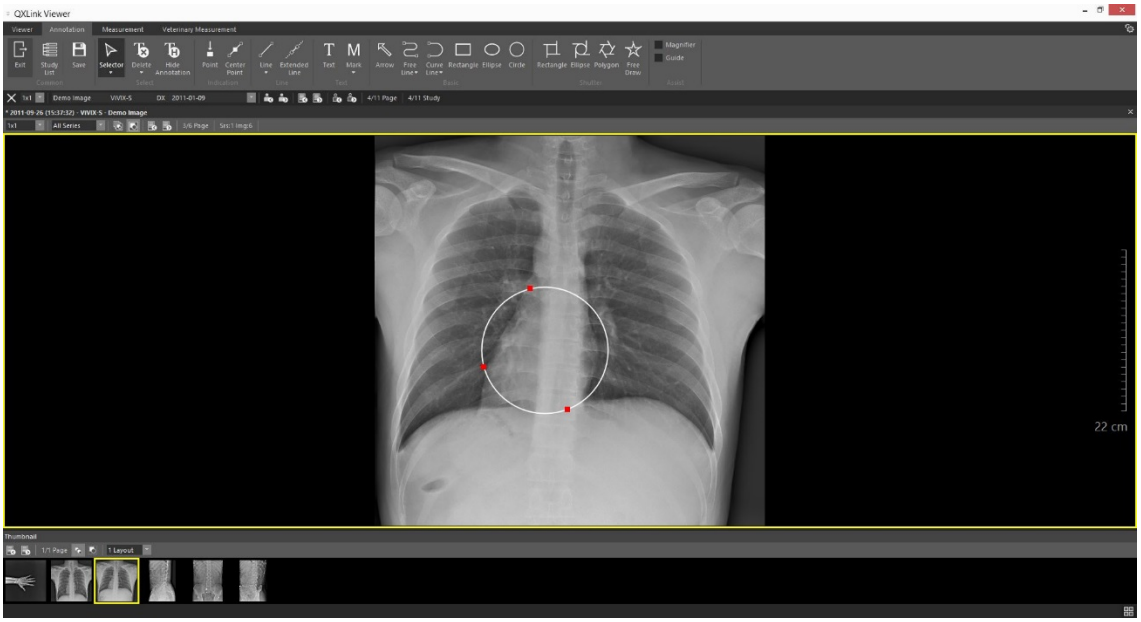
5.2.15 Circle

Button	Description
	You can draw a circle on the image to indicate a region of interest.

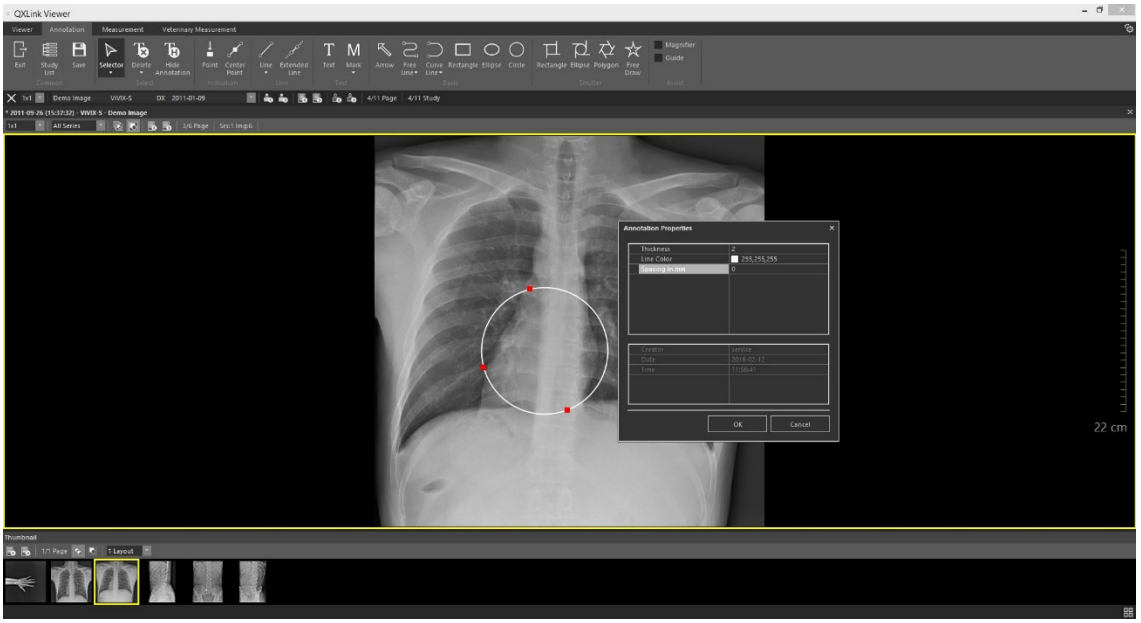
1 Select an image from the desired study.

2 Click on **Basic** → **Circle** button on the tool menus and move a mouse pointer to the image.

3 Click three points on the image to create circle passing the points.



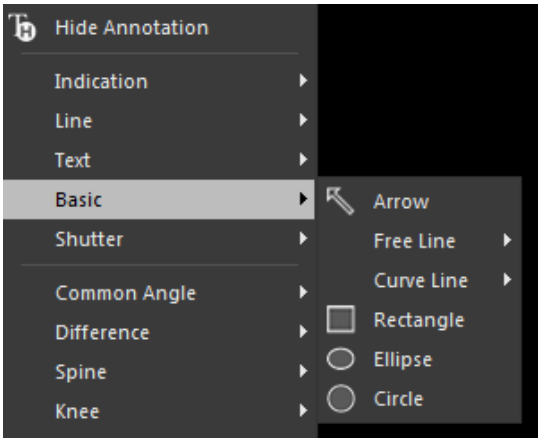
4 You can draw several concentric circles in 'mm' by right-clicking and adjusting **Spacing in MM** in **Property**.



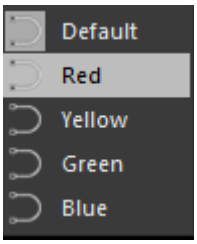
5.2.16 Curve Line

Button	Description
	You can draw a curve line over an image to indicate ROI (Region of Interest).

1 Right-click in the image area and select **Basic > Curve Line** from the menu below.

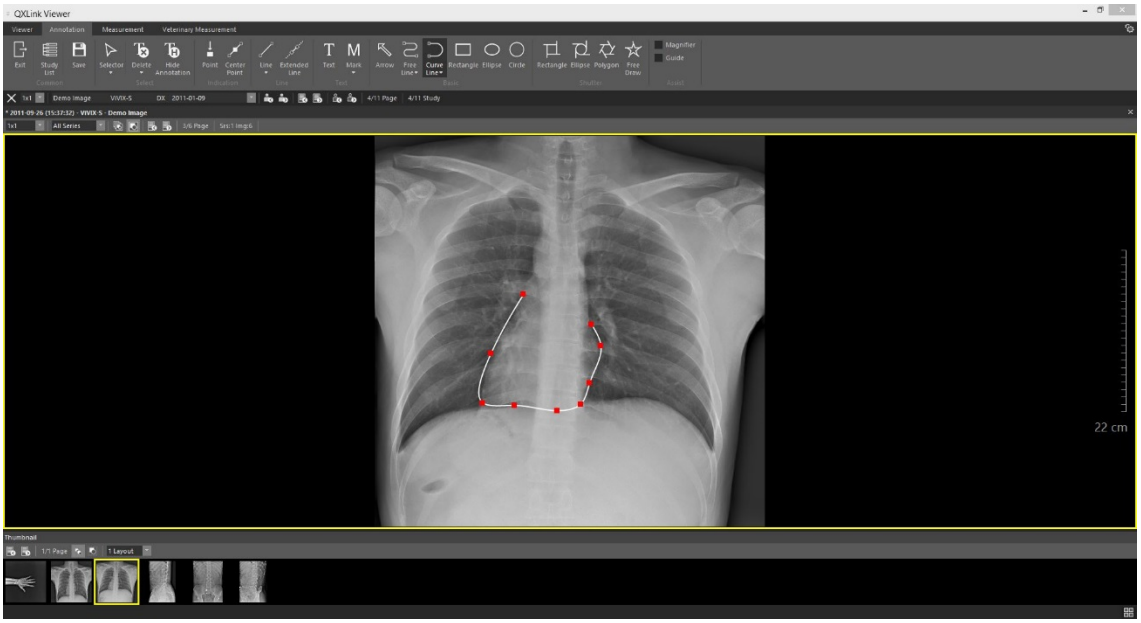


2 Select the desired color.



3 Click a mouse button on the desired location of image to specify a bending point.

4 Right-click to complete drawing the curve line.



5.2.17 Rectangle Shutter

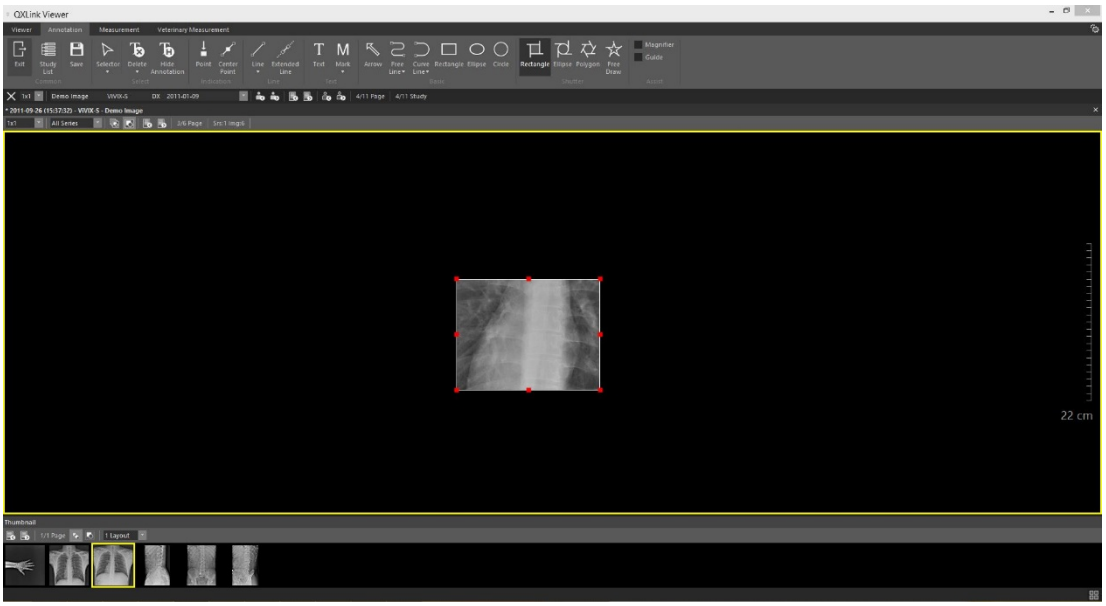
Button	Description
	You can draw a rectangle shutter to display the necessary region of image only.

1 Select an image from the desired study.

2 Click on the **Rectangle** button on the toolbar and move a mouse pointer to the image.

3 Press and drag a left mouse button on the desired location to draw a rectangle shutter.

4 Check if the region of the rectangle shutter displays on the window.



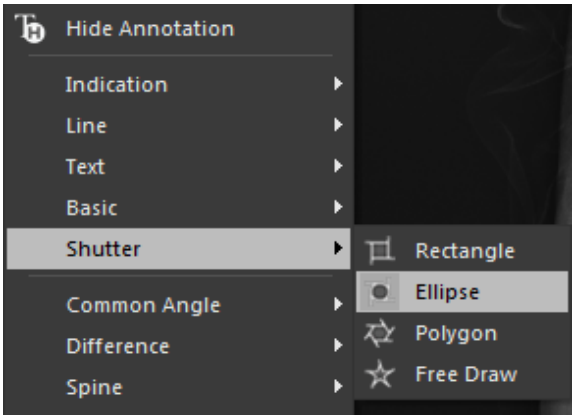
- You can select and apply another shutter option to the image additionally.
- The shutter on the image is disappeared when it becomes smaller below a certain size.

5.2.18 Ellipse Shutter

Button	Description
	You can draw an ellipse shutter to display the necessary region of image only.

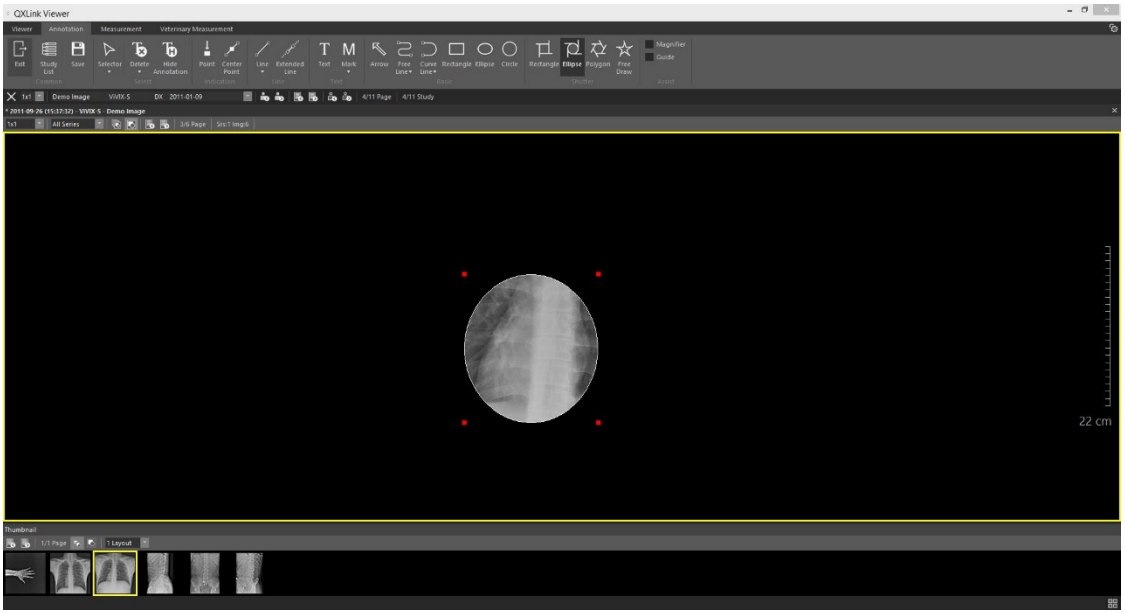
1 Select an image from the desired study.

2 Right-click on the image and select **Shutter > Ellipse**, then move the mouse pointer to the image window.



3 Press and drag a left mouse button on the desired location to specify area to be indicated.

4 Make sure that unnecessary area is hidden.



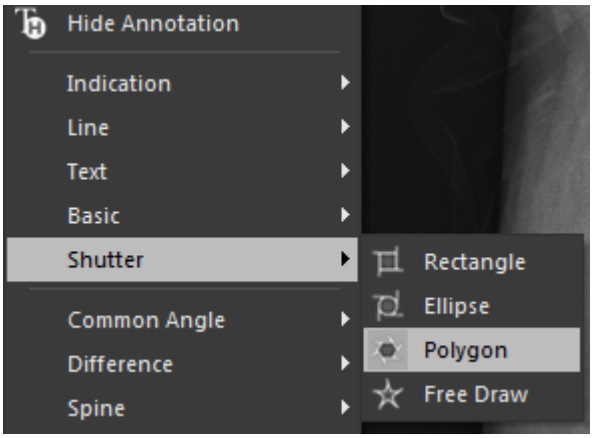
- You can select and apply another shutter option to the image additionally.
- The shutter on the image is disappeared when it becomes smaller below a certain size.

5.2.19 Polygon Shutter

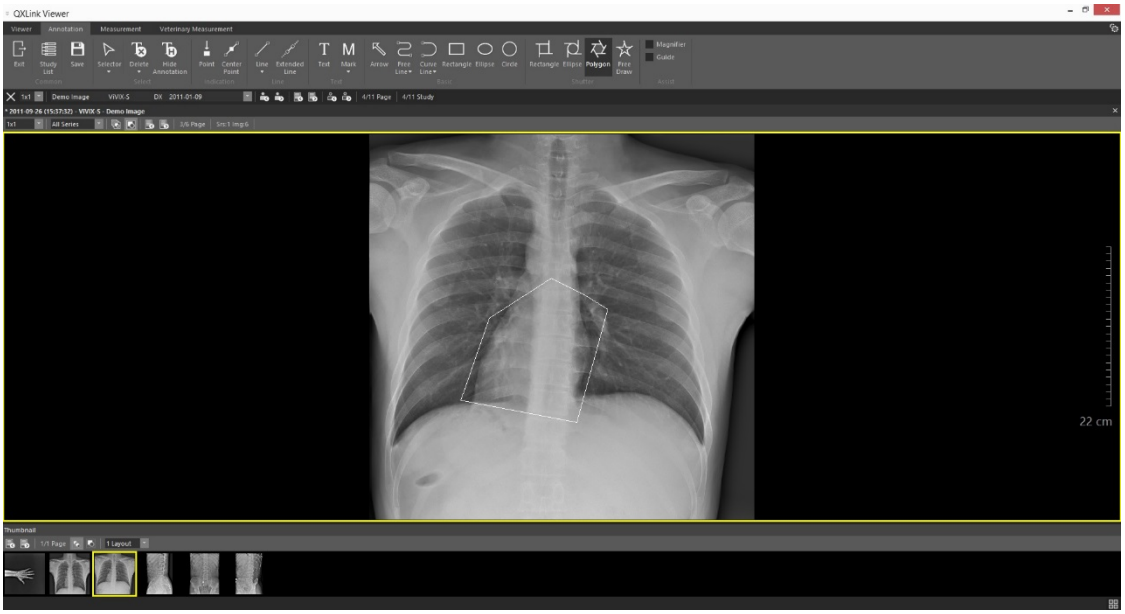
Button	Description
	You can draw a polygon shutter to display the necessary region of image only.

1 Select an image from the desired study.

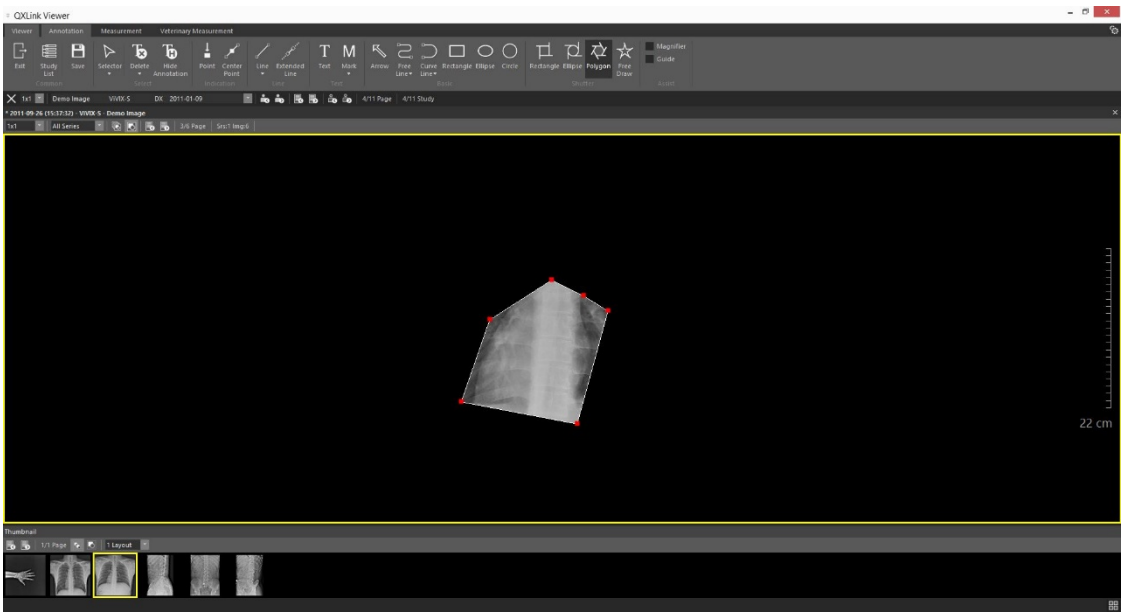
2 Right-click on the image and select **Shutter** > **Polygon**, then move the mouse pointer to the image window.



3 Press and hold the left mouse button, and then drag lines. Click the mouse button when you add a line, and double click the button to complete drawing the polygon.



4 Check if the region of the polygon shutter displays on the window.



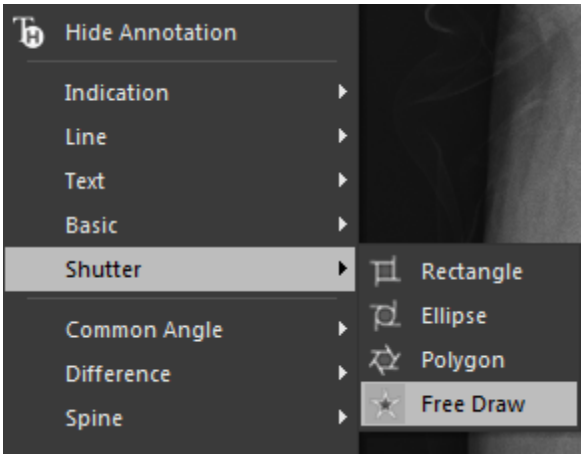
- You can select and apply another shutter option to the image additionally.
- The shutter on the image is disappeared when it becomes smaller below a certain size.

5.2.20 Free Draw Shutter

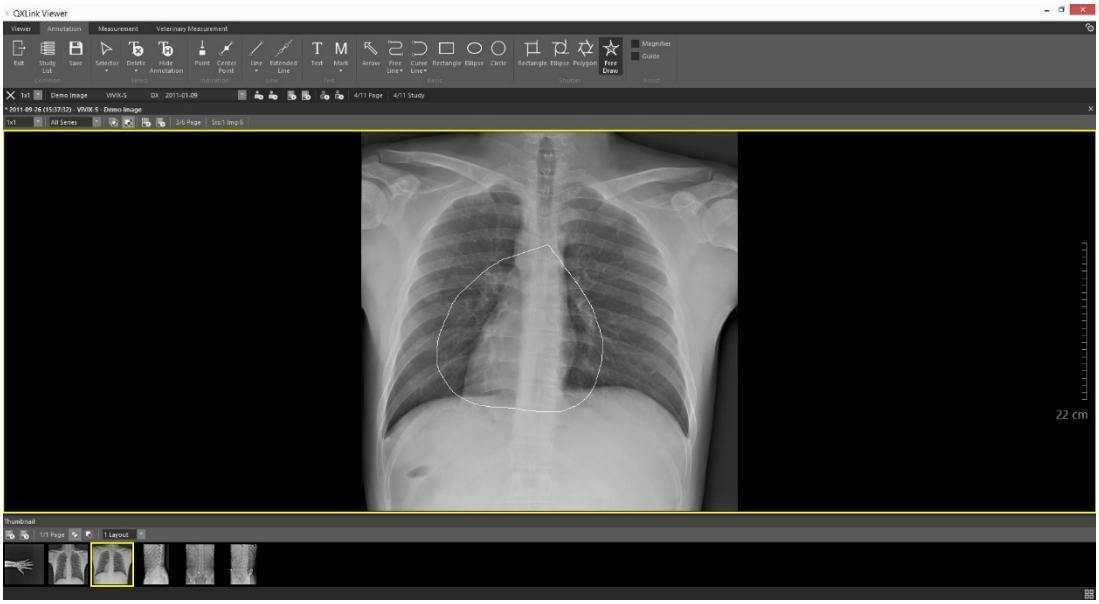
Button	Description
	You can use a free draw shutter to display or hide area on the image as you want.

1 Select an image from the desired study.

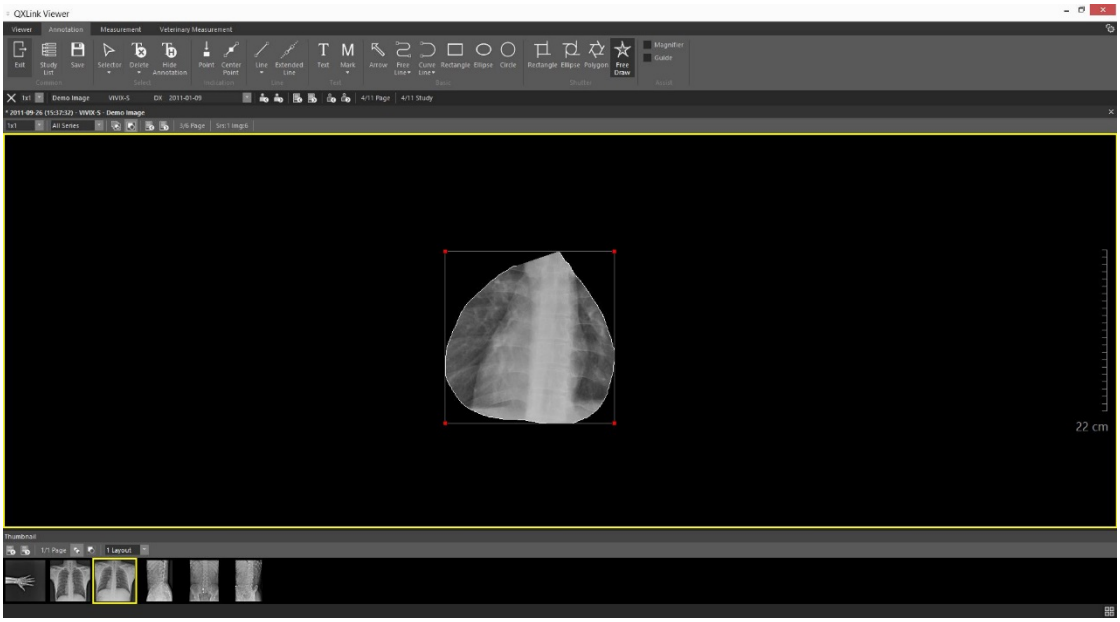
2 Click on **Shutter** → **Free Draw** button on the toolbar and move a mouse pointer to the image.



3 Press and drag the left mouse button to make a free draw line.



4 Check if the region of the free draw shutter displays on the window.

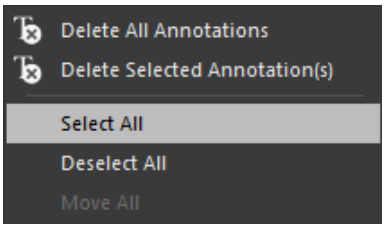


- You can select and apply another shutter option to the image additionally.
- The shutter on the image is disappeared when it becomes smaller below a certain size.

5.2.21 Select all annotations

1 Select an image of the desired study and choose an annotation.

2 Click a right mouse button to display the pop-up menus and click **Select All**.



3 Check the selected annotations.

5.2.22 Check Annotation Information

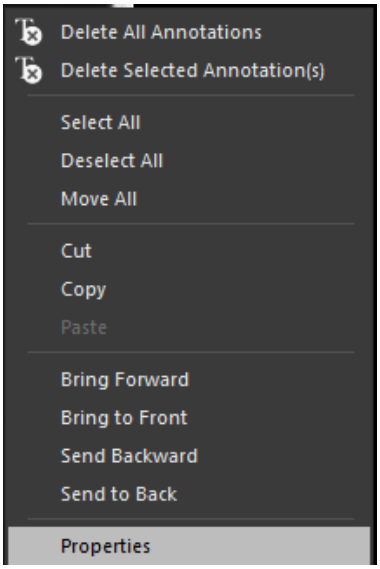
You can verify the following annotation properties.

- Creator, Created date, Created time

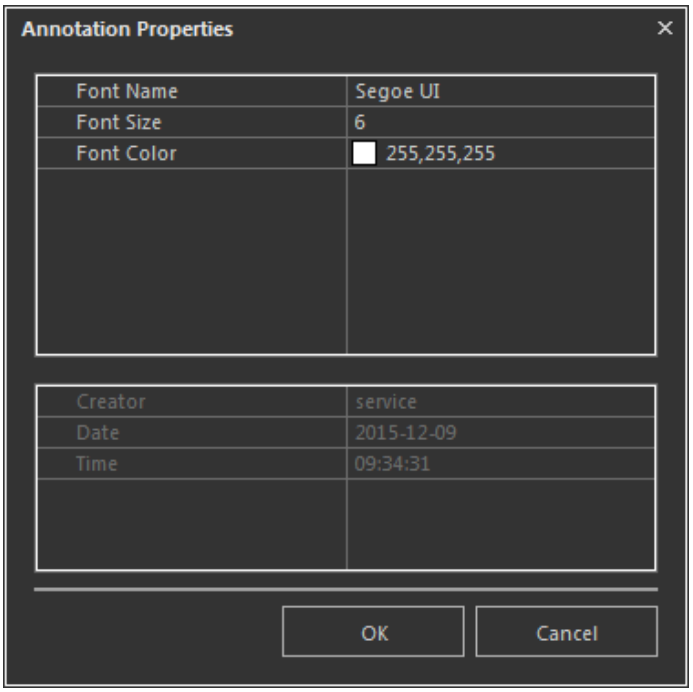
1 Select an image from the desired study.

2 Select an annotation to verify its property.

3 Click the right mouse button to display a popup window and select **Properties**.



4 Check the annotation properties.



5.2.23 Modify Annotation Properties

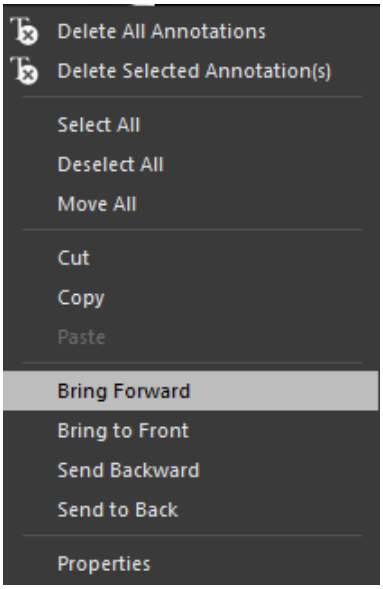
You can modify the annotation properties such as sequence, font color, size, etc.

How to modify the order of annotation

1 Click an annotation to change its order with a right mouse button.

2 A popup window displays as follows. You can move the selected annotation forward or backward by selecting relevant menus.

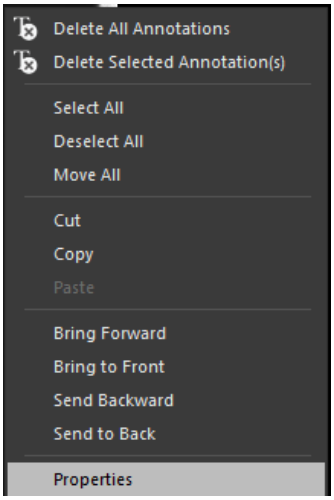
3 You can cut, copy, or paste annotations.



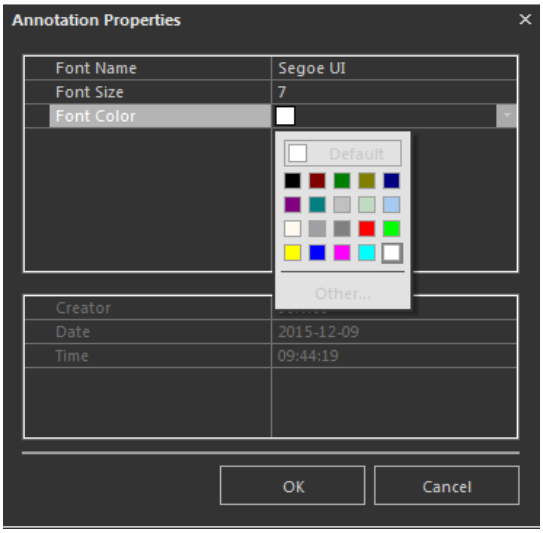
How to change properties of annotation

1 Select an image from the desired study, and elect an annotation to modify its properties.

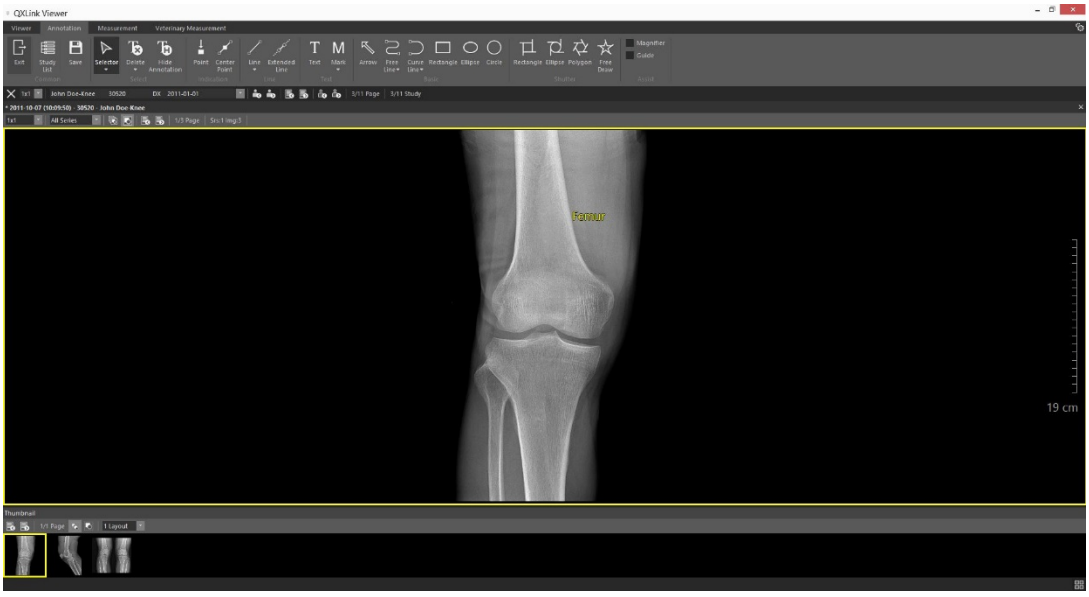
2 Click a right mouse button to display the popup window and select **Properties**.



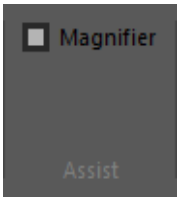
3 Change the annotation properties as you want.

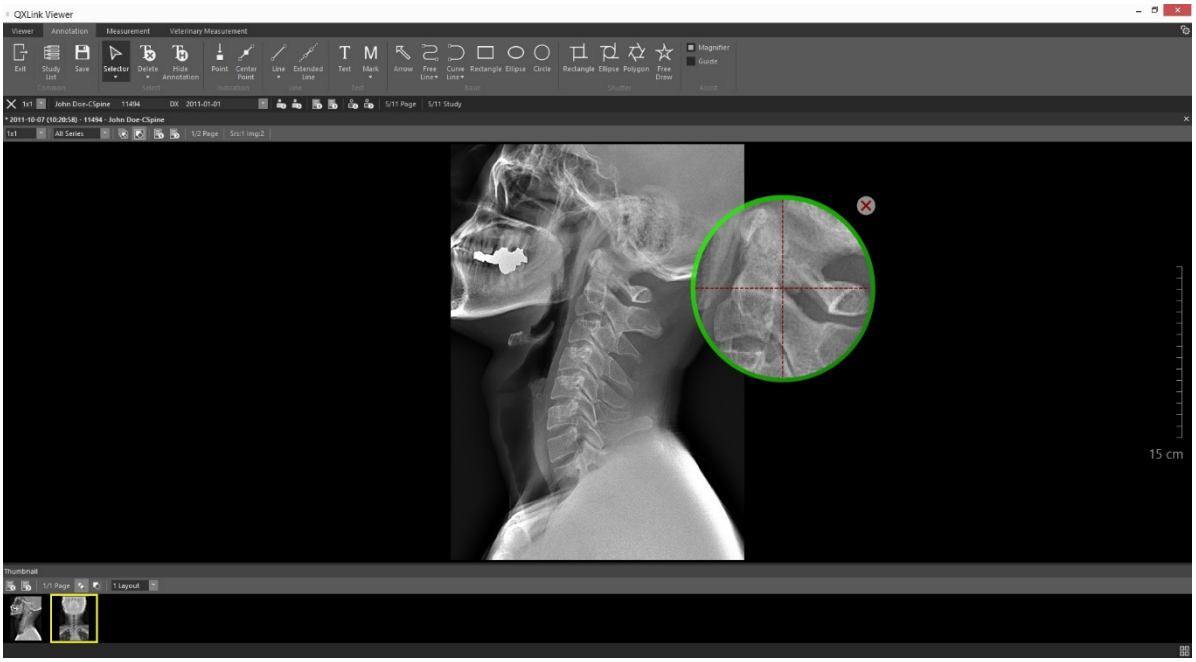


4 Click the **OK** button.



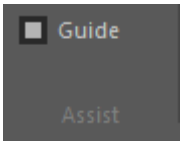
5.2.24 Magnifier

Image	Function
	Check this menu to magnify the desired region of a selected image.

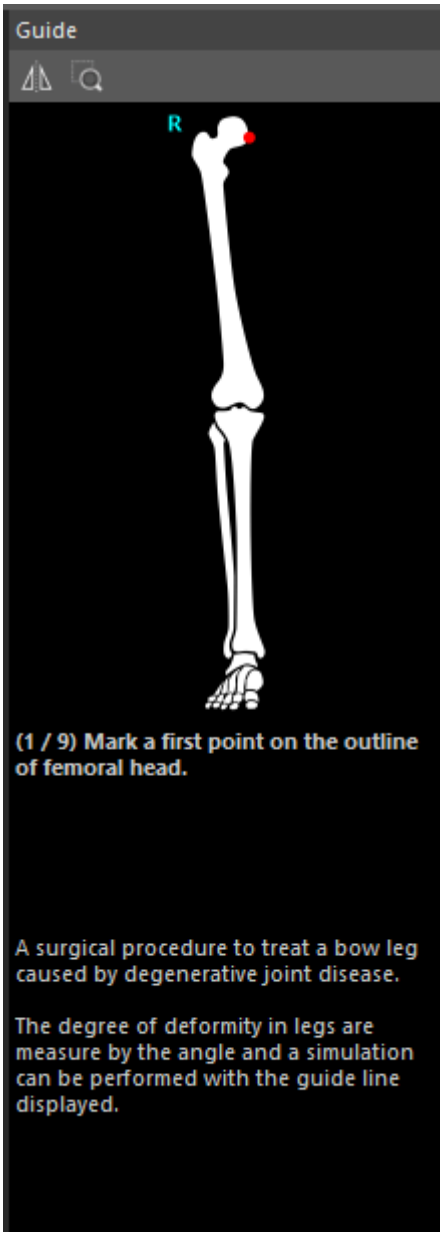


- When you put a mouse cursor on the magnifier window, the cursor turns to a cross line and the location of the magnifier window can be moved.
- Adjust the rate of enlargement by moving a mouse wheel.

5.2.25 Guide Funtionality

Image	Function
	Check this menu to see a measurement guide for the support tools only.

- Example (High Tibial Osteotomy)



- The blinking red dot in the image above is a marker that used as a guide.
- When you measure the image, use this function by clicking mouse points on the image according to the order of markers.

6. Human Measurement

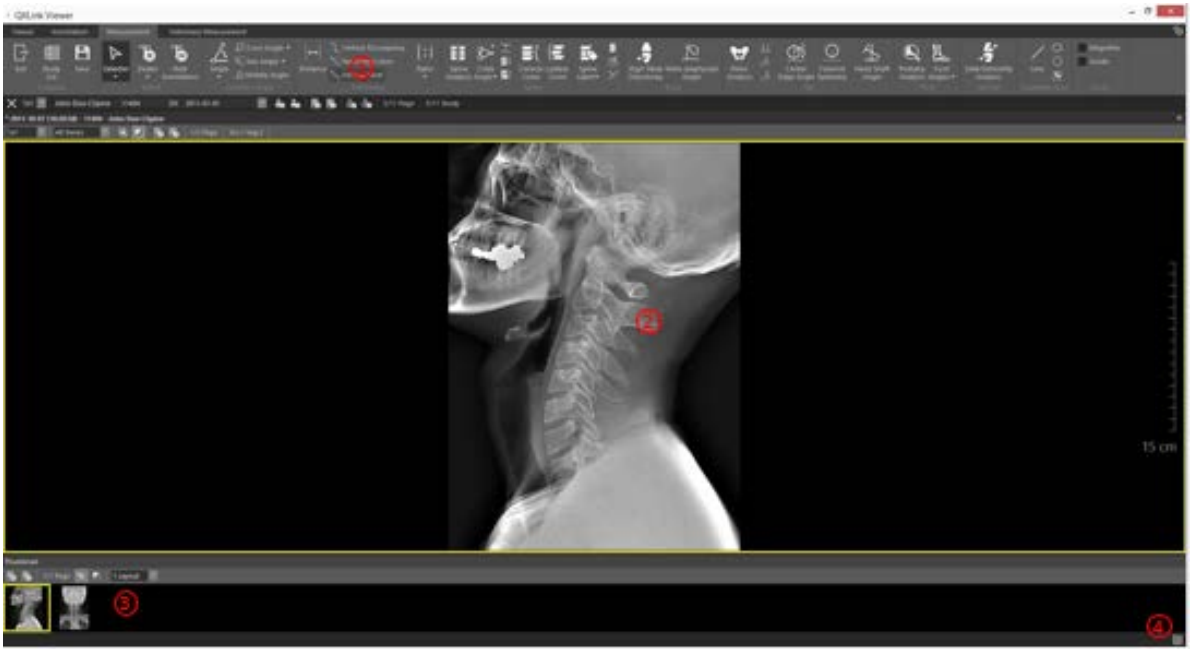
This chapter explains about the composition and functions of measurement for human.

Composition of Measurement for Human

Measurement Tools for Human

6.1 Composition of Human Measurement

The measurement function in use can be converted to the other one, or turned it to the previous condition.



No.	Function
1	Measurement tools for human
2	Study viewer
3	Thumbnail
4	Status bar

6.2 Human Measurement Tools

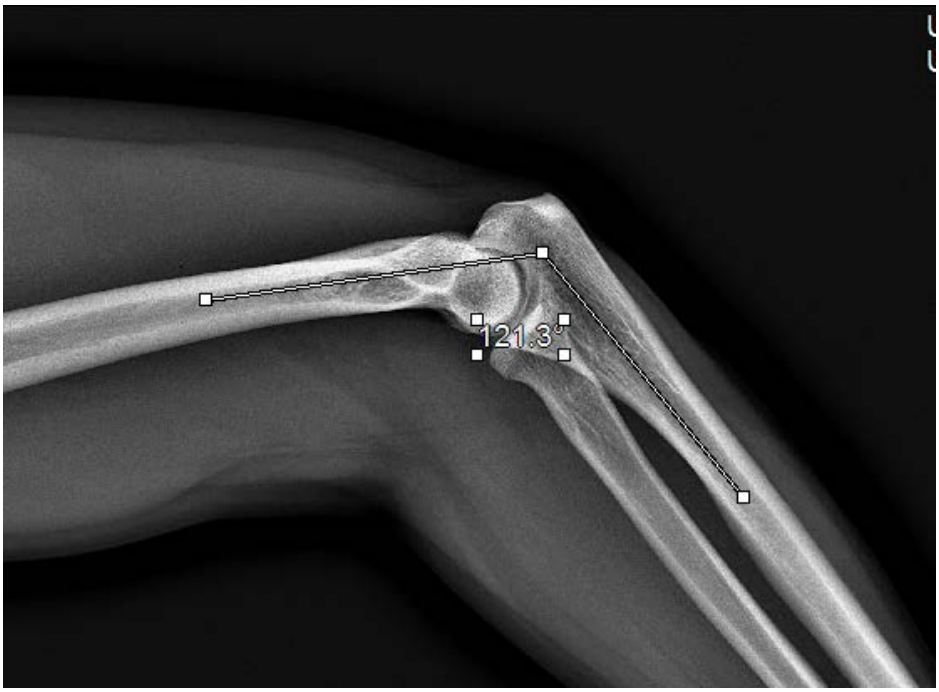
- The range of maximum tolerance for angle measurement is ±0.5°.
- The range of maximum tolerance for length measurement is ±0.5%.

- If the distance cannot be measured because the value such as (0028, 0030) pixel spacing does not exist, the distance is indicated as 'OO pt'.

6.2.1 Angle

Icon	Description
	Measures an angle among three points of difference. When draw an angle, its value is calculated and showed automatically.

1 Select an image from the desired study.
2 Click on the **Angle** button from tool buttons and move a mouse pointer to the image view screen.
3 Left click on a central point to take an angle.
4 Left click on a point to take an angle.
5 Left click on another point to take an angle.
6 Check the measured angle on the image.
7 Move the text (angle information) to the desired location.



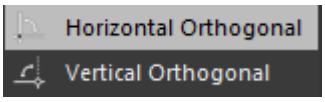
- You can change the measurement angle by moving two points to be measured.
  - The angle indicated between the two segments is limited to less than 180°.

6.2.2 Horizontal Orthogonal Angle

Icon	Description
	Measures an angle between the straight lines based on a horizontal line.

1 Select an image from the desired study.

2 Click on the bottom of **Angle** button ( ) from the tool buttons and select **Horizontal Orthogonal**.

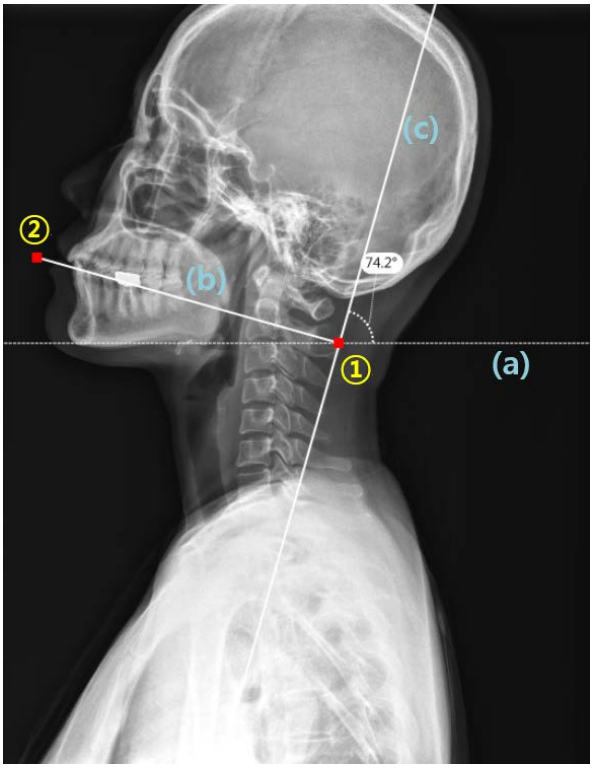


3 Click a point (①) on the image to create a horizontal line (a) as a dotted one.

4 The location of a segment connecting two points (①/②) and the line crossed at right angles to the segment (c) are also adjusted.

5 Click a point on the desired position (②), and then the angle between a horizontal line and a straight line (c) is indicated.

6 The angle between a line crossed at right angles to the segment (c) and a horizontal line (a) is indicated.



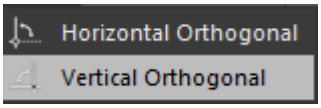
- An acute angle between a horizontal line (a) and a segment crossed the horizontal line (c).

6.2.3 Vertical Orthogonal Angle

Icon	Description
	Measures an angle between the straight lines based on a vertical line.

1 Select an image from the desired study.

2 Click on the bottom of **Angle** button (▾) from the tool buttons and select **Vertical Orthogonal**.

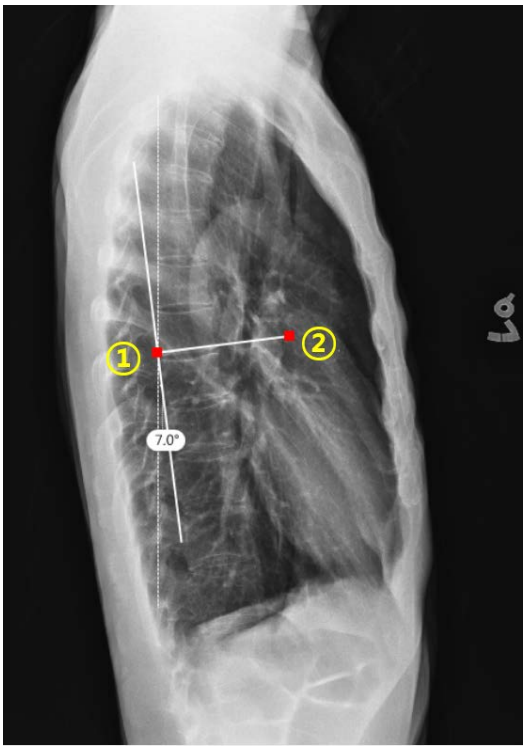


3 Click a point on the image (①) to create a vertical line (a) as a dotted one.

4 The location of a segment (b) connecting two points (①/②) and the line crossed at right angles to the segment (c) are also adjusted.

5 Click a point on the desired position (②), and then the angle of a vertical line and a straight line (c) is indicated.

6 The angle between a line (c) crossed at right angles to the segment (b) and a vertical line (a) is indicated automatically.



- An acute angle between a vertical line (a) and a segment crossed the vertical line (c).

6.2.4 Cross Angle

Button	Description
	Takes the angle between two segments. Click ▾ button at the bottom of the icon to use the advanced functions. • **Cross with 3 lines** • **Cross with 5 lines** • **Cross with unlimited**

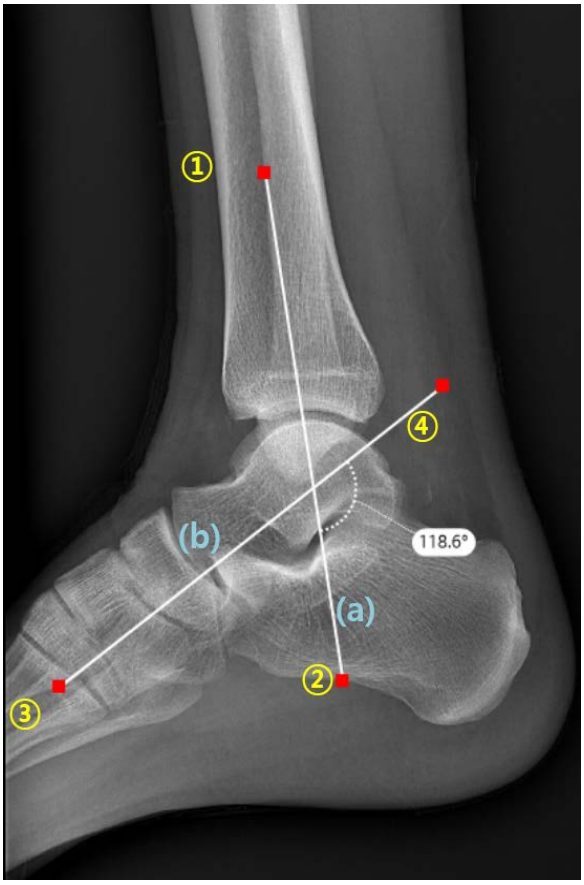
1 Select an image from the desired study.

2 Click on the **Cross Angle** button from tool buttons and move a mouse pointer to the image view screen.

3 Click two points (①/②) on a desired location to create a segment line (a).

4 Click two points again on another location (③/④) to create a segment line (b).

5 The angle between the two segments are indicated as follows.



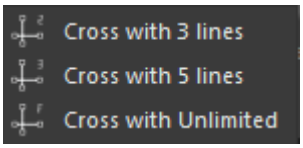
• An angle between a point (②) of the segment (a) and a point (④) of the segment (b).

Cross with 3 lines

This option is the extended function of **Cross Angle**, used for creating three segments and measuring an angle among them.

1 Select an image from the desired study.

2 Click button at the bottom of **Cross Angle** button and select **Cross with 3 lines** from the popup menu.



3 Click two points on a desired location to create a segment.

4 Click two points again on another location to create another segment.

5 The angle between the two segments are indicated.

6 Click two points again on another location to create a segment.

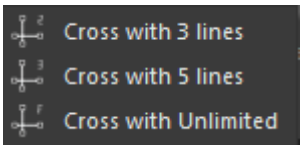
7 The angle between the second and the third segments is indicated.

Cross with 5 lines

This option is the extended function of **Cross Angle**, used for creating up to five segments and taking the angle between the existing segment and an additional segment.

1 Select an image from the desired study.

2 Click button at the bottom of **Cross Angle** button and select **Cross with 5 lines** from the popup menu.



3 Click two points on a desired location to create a segment line.

4 Click two points again on another location to create a segment line, and then the angle between the two segments (created from step 3 and step 4) are indicated.

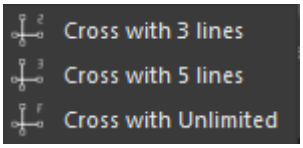
5 You can draw up to five segments.

Cross with Unlimited

This option is the extended function of **Cross Angle**, used for drawing as many segments as you want and measuring the angle between the existing segment and an additional segment.

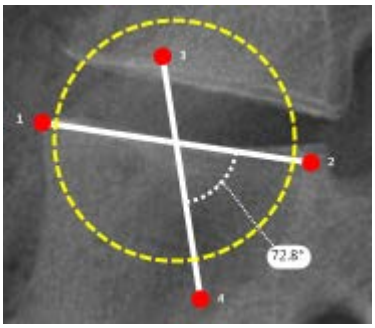
1 Select an image from the desired study.

2 Click button at the bottom of **Cross Angle** and select **Cross with Unlimited** from the popup menu.



3 Draw two segment lines ((a), (b)) to measure an angle.

4 Click one of the angles where two segment lines ((a), (b)) are crossed. Then the angle of a selected one is measured and indicated.



5 Draw another segment (c) and click one of the angles where the two segment lines ((b), (c)) are crossed. Then the angle of a selected angle is measured and indicated.

6 You can repeat the steps above to take angles between the existing and the newly created segment lines.

6.2.5 Axis Angle

Button	Description
	Measures the angle between two straight lines passed center of the two sets of segment. Click ▾ button at the bottom of the icon to use the advanced functions. • **Axis with 3 Lines** • **Axis with 5 Lines**

1 Select an image from the desired study.

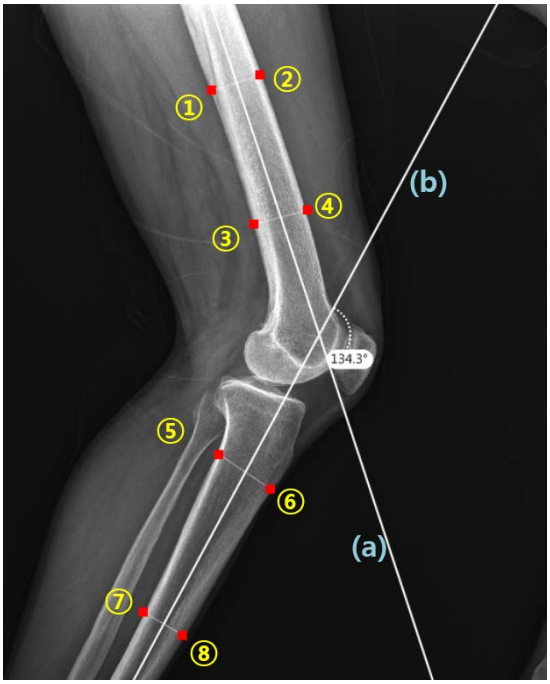
2 Click on the **Axis Angle** button from tool buttons and move a mouse pointer to the image view screen.

3 Click two points on the image (①,②) to create a dotted segment connecting the points.

4 Click other two points again (③,④), then a dotted segment connecting the points and a vertical line (a) passed center of the segment is created.

5 Repeat the step 3 and step 4 to the other points (⑤~⑥, ⑦~⑧), then two segments connecting two points each, and a straight line (b) passed the center of the two segments are created.

6 The angle between the vertical lines ((a), (b)) are indicated at the same time.



Axis with 3 Lines

This memu is the extended function of **Axis Angle**, used for measuring angles between the two axes created from each four points. You can measure angles of the additional axes with each existing axes.

Axis with 5 Lines

This menu is the extended function of **Axis Angle**, used for measuring angles between the two axes created from each five points. You can measure angles of the additional five axes with each existing axes.

6.2.6 Middle Angle

Button	Description
	A vertical line starting from the center of a baseline indicates a curved angle.

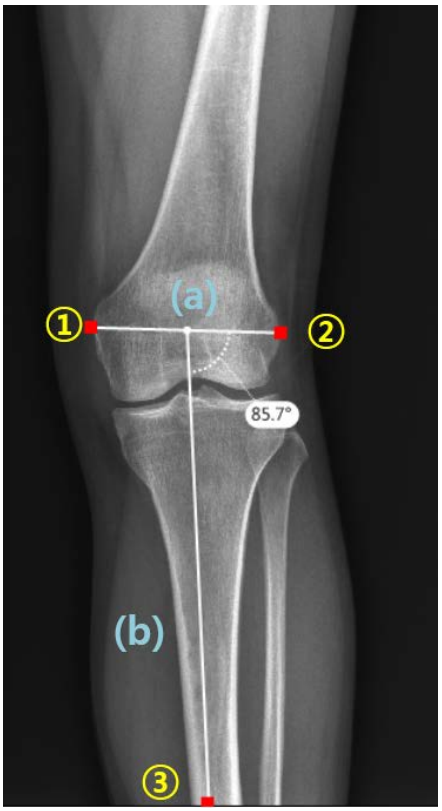
1 Select an image from the desired study.

2 Click on the **Middle Angle** button and move a mouse pointer to the image view screen.

3 Click two points (①/②) on a desired location to create a baseline (a).

4 A vertical line (b) is created from the center of the baseline to a mouse pointer.

5 Click on a desired position and fix a vertical line (b) to indicate an angle with the baseline.



6.2.7 Distance

Button	Description
	Draws a line between two points on the image and measure the length.

1 Select an image from the desired study.

2 Click on the **Distance** button from the tool menus.

3 Move the mouse pointer to the image, then the mouse pointer will be changed to a ruler shape 

4 Press and hold the left mouse button while dragging it from one point to another.

5 Release the left mouse button to create a line between the two points.

6 Check a length between the two points.

7 Move the distance texts to the desired position.

- You can adjust the angle of a segment line at the interval of 45° by dragging a mouse button while pressing the **Shift** key. This function is useful when you measure a length of a vertical and horizontal lines.

6.2.8 Vertical Discrepancy

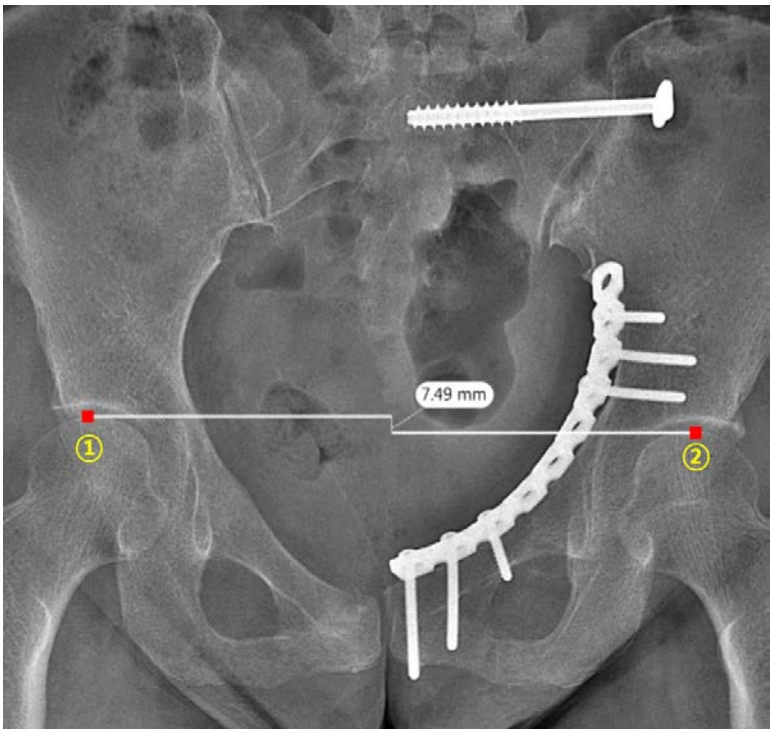
Button	Description
	Measures how twisted the two points which were supposed to be a symmetry.

1 Select an image from the desired study.

2 Click on the **Vertical Discrepancy** button and move a mouse pointer to the image view screen.

3 Click a point on the position where you want to measure the twisted part (①), and click another point on the other side (②).

4 Two horizontal lines are created based on each point, and the difference of height between the two lines is indicated.



6.2.9 Horizontal Level

Button	Description
	Measures the difference of height and the angle between two points twisted above and below, which were supposed to be a symmetry.

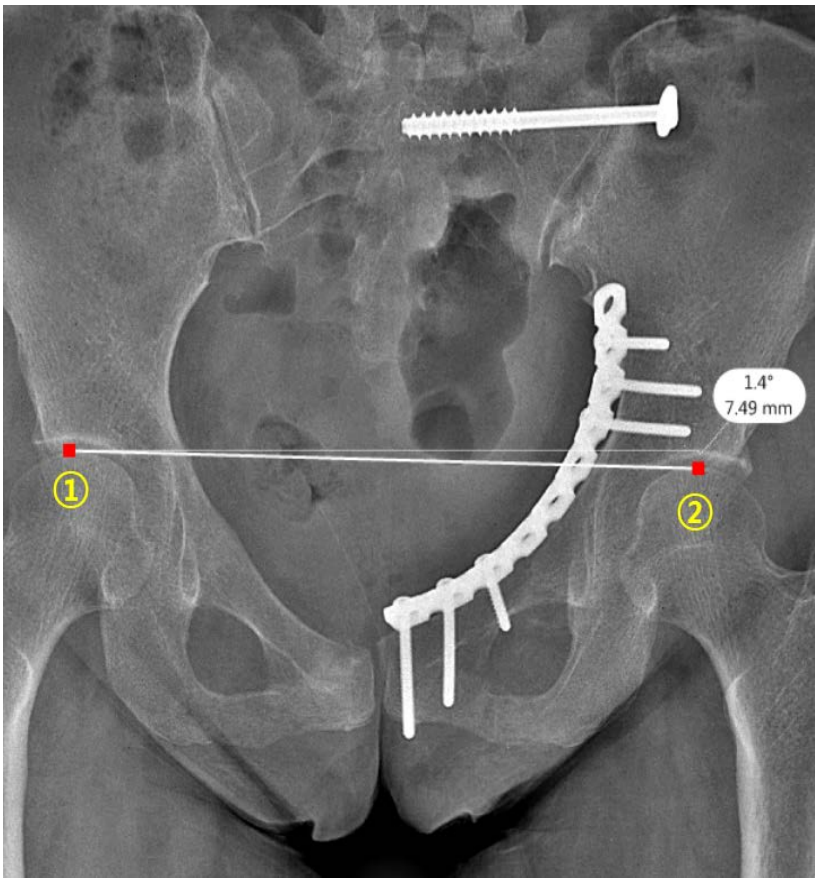
1 Select an image from the desired study.

2 Click on the **Horizontal Level** button and move a mouse pointer to the image view screen.

3 Click a point on the position where you want to measure the twisted part (①), and click another point on the other side (②).

4 A segment line connecting two points are created, and a solid line flush with the point (①) is indicated.

5 The difference of height and angle between the two points (①/②) are indicated.



6.2.10 Vertical Level

Button	Description
	Measures the difference of length and the angle between two points twisted to the left and right, which were supposed to be vertical.

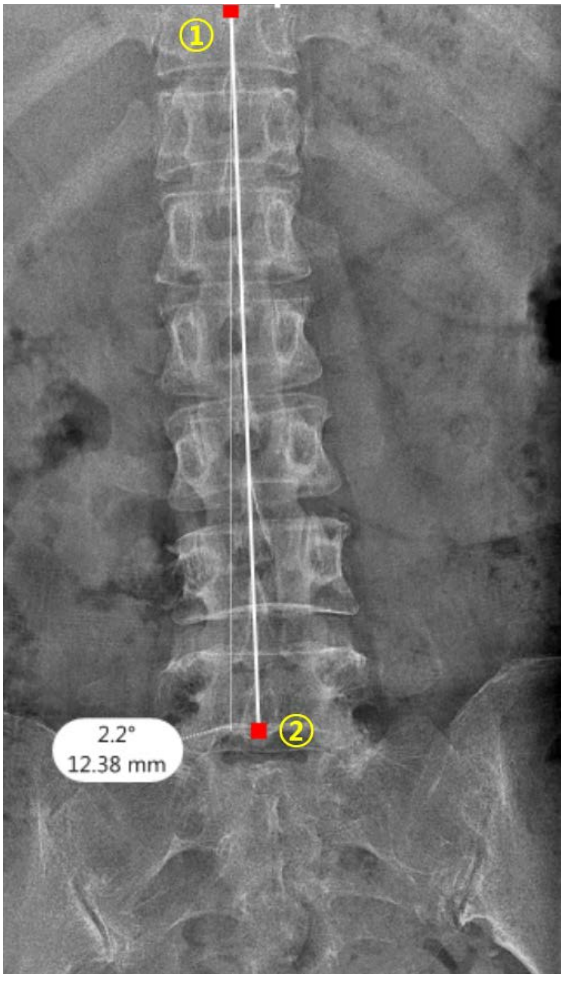
1 Select an image from the desired study.

2 Click on the **Vertical Level** button and move a mouse pointer to the image view screen.

3 Click a point on the position where you want to measure the twisted part (①), and click another point on the other side (②).

4 A segment line connecting two points are created, and a solid line perpendicular to the point (①) is indicated.

5 The distance and angle between the two points (①/②) are indicated.



6.2.11 4 Point Ratio

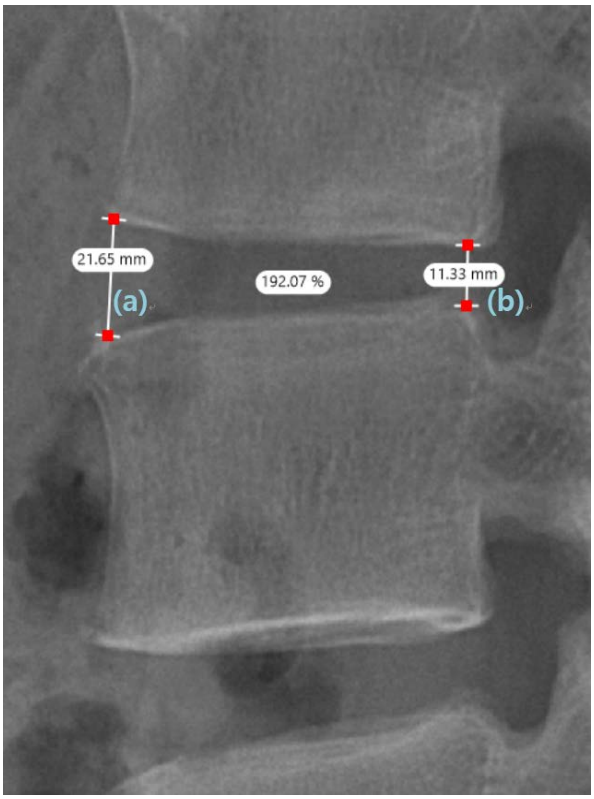
Button	Description
	Used for indicating ratio of two segment lines created by clicking four points. Click ▾ button at the bottom of the icon to use the advanced functions. • **3 Point Ratio** • **CT Ratio**

1 Select an image from the desired study.

2 Click on the **Vertical Level** button from tool buttons and move a mouse pointer to the image view screen.

3 Click two points on the desired position to create a segment (a), and click other two points to create a segment (b).

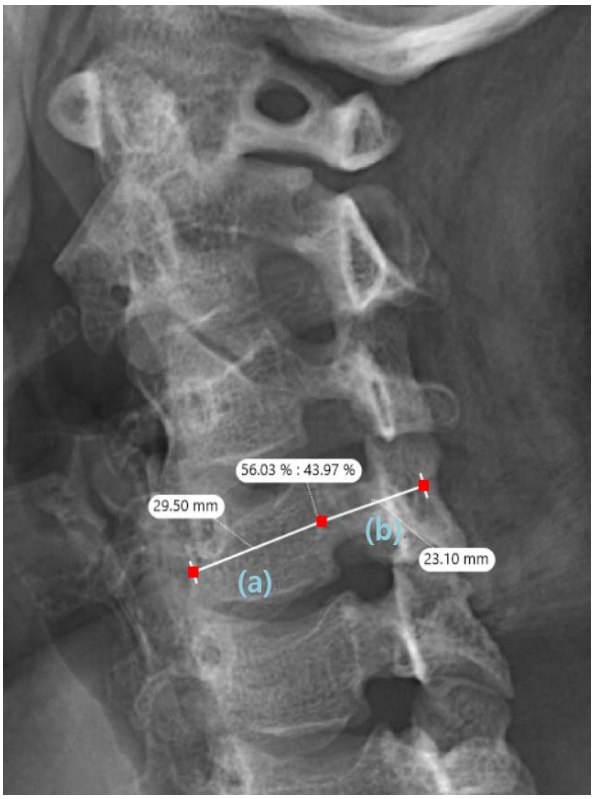
4 The length of two segments and the ratio of one segment (a) to the other one (b) is indicated.



3 Point Ratio

The length of the two segments ((a), (b)) formed by clicking three points are indicated on each segment. In addition, the ratio of each segment for the summentation of the two segments' length is indicated in the middle of the two segments.

- Application example: Measuring cervical stenosis



CT Ratio (Cardio-Thoracic Ratio)

This function is used for measuring the maximum length of left / right artrium and the thorax based on the spinous process to calculate their ratio.

- Application example: Measuring hypertrophic cardiomyopathy, Cardiomegalia

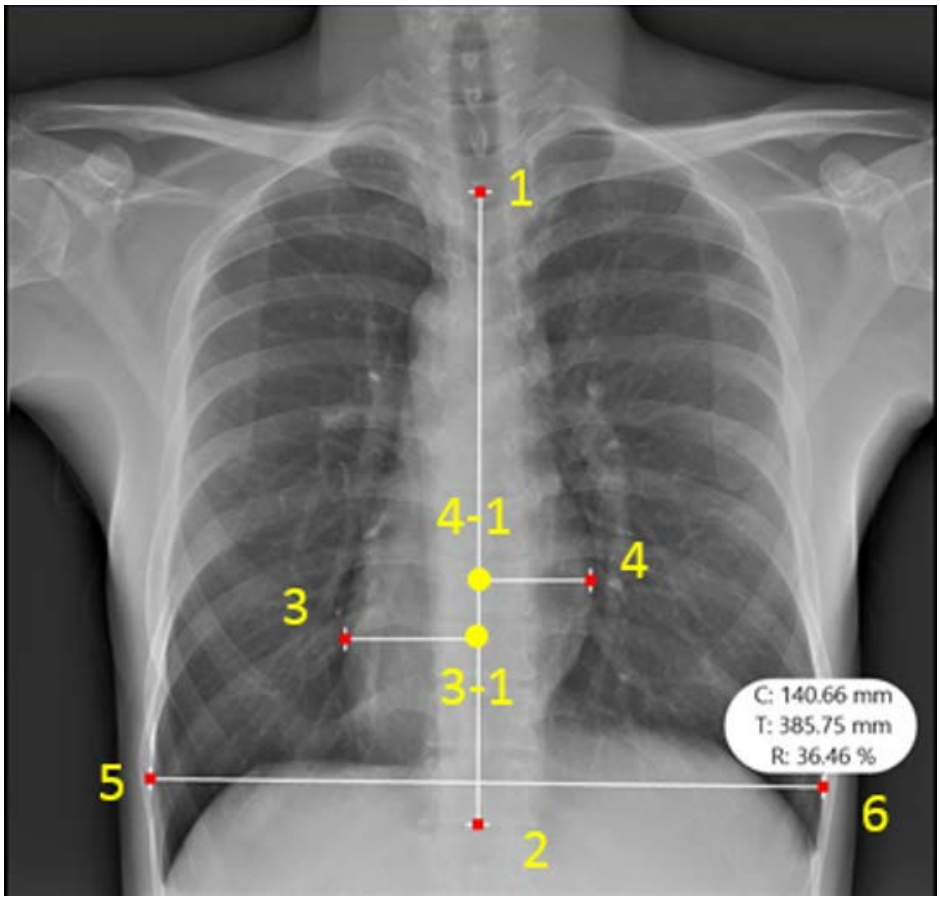
1 Draw a baseline to connect the spinous process of spine. (from point ① to ②)

2 Draw a segment as a maximum length by clicking on the left end (③) and right end (④) of the heart.

3 Draw a segment as a maximum length of the left and right thorax. (from point ⑤ to ⑥)

4 The measured value is indicated as below.

- C: size of the heart (Maximum width: Sum of length from 3 to 3-1 and length from 4 to 4-1.)
- T: size of the thorax (Maximum width of the inner thoracic cage : Length from 5 to 6)
- R: size ratio of the heart with the thorax (Ratio: C/T * 100%)



6.2.12 Spine Analysis

Button	Description
	Takes an angle between the adjacent vertebrae and indicates their centerline by defining area of each vertebrae.

- Application example: Scoliosis

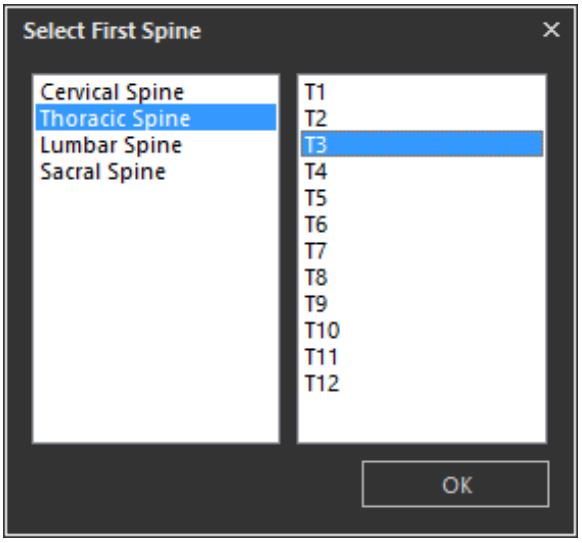
1 Click left / right points at the top and bottom of the first vertebrae to specify area to be measured.

2 Repeat the step 1 to specify each area of the vertebrae.

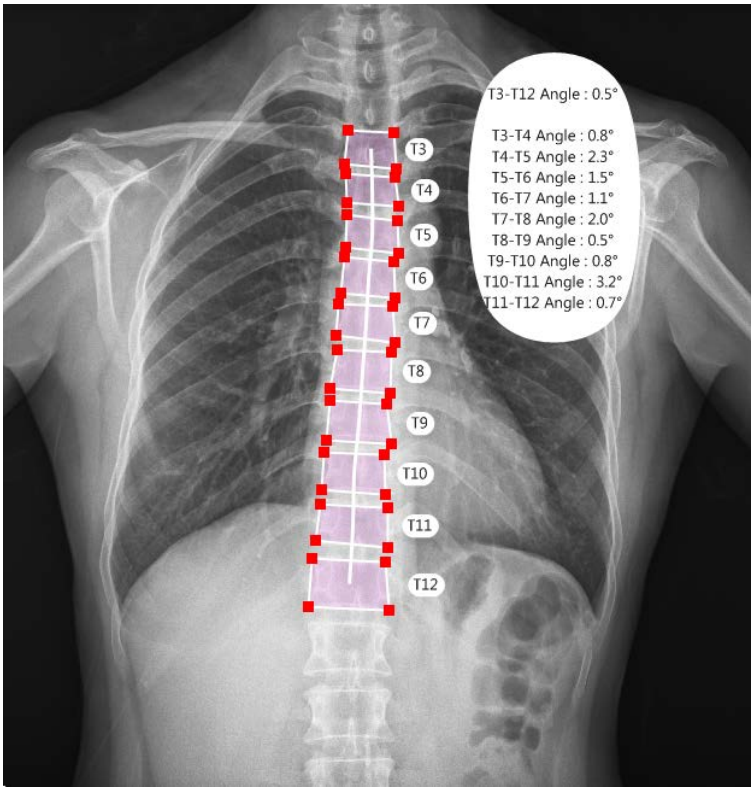
3 The centerline connected the center of each area is created automatically.

4 After you complete specifying the last area of vertebrae, double click the left mouse button on a desired position. Then a pop-up window displays to set a label.

5 Select the label of the first vertebrae from the pop-up window and click on the **OK** button.



6 Labels are indicated at the right side of each area from the vertebrae selected first. The angles between the first and the last vertebrae and between the two adjacent vertebrae are also indicated in order at the same time.



- The angle between the upper and lower side of spinal cords is indicated as follows.
  - L1-L5: Angle between the upper side of L1 and lower side of L5.
  - L4-L5: Angle between the upper side of L4 and lower side of L5.

6.2.13 George's Line

Button	Description
	Used for creating a george's line to check if the continual line of vertebrae is well arranged and to check the interval of vertebrae.

- Application example: Post-traumatic cervical injury

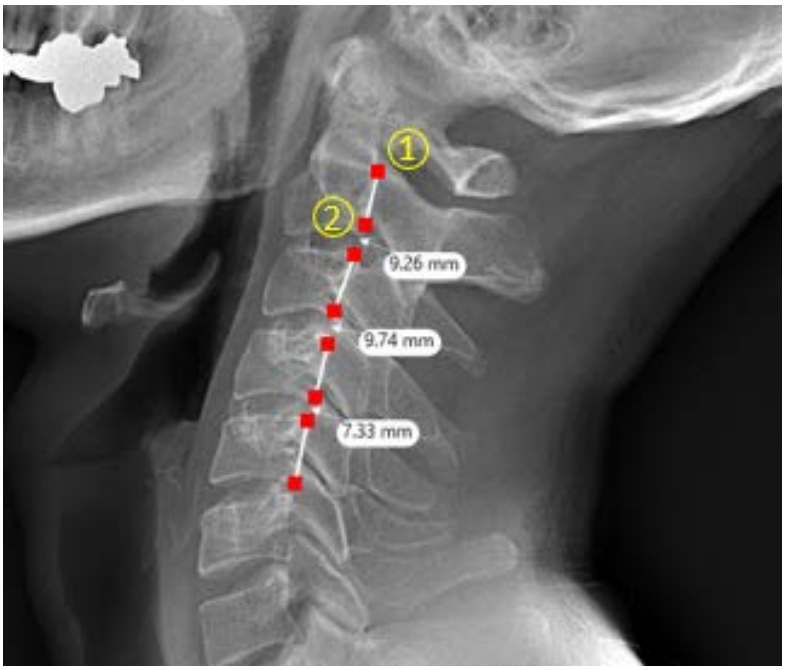
1 Select an image from the desired study.

2 Click on the **Geroge's Line** button from tool menus and move a mouse pointer to the image screen view.

3 Click on the rear top / rear bottom of vertebrae to measure (①/②) to create a segment.

4 Repeat step 3 to the adjacent vertebrae to indicate the distance between the two segments.

5 Double click a left mouse button on a desired position to complete all steps.

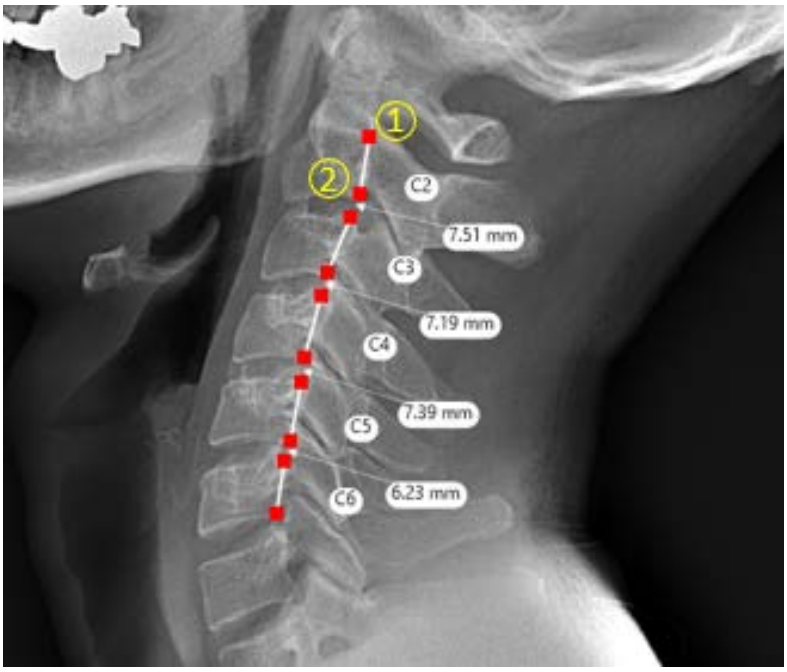


6.2.14 George's Line with Label

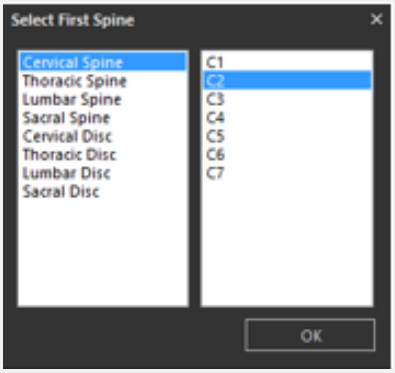
Button	Description
	Indicates a george's line and the position of vertebrae to check if its continual line is well-arranged and to check the position as well as the interval of vertabrae.

- Application example: Post-traumatic cervical injury

1 Select an image from the desired study.
2 Click on the **Geroge's Line with Label** button from tool menus and move a mouse pointer to the image screen view.
3 Click on the rear top / rear bottom of vertebrae to measure (①/②) to create a segment.
4 Repeat step 3 to the adjacent vertebrae to indicate the distance between the two segments.
5 Double click on a desired position to open the **Select First Spine** dialog. After that, the selected position will be indicated as the first label.



- You can change the starting point of George's Line Label from the dialog below.
  - Right click on the screen where **George's Line with Label** is applied > **Properties** >**Select First Spine**



6.2.15 Vertebral Line

Button	Description
	Checks how much the spine is twisted by creating a centerline on it.

1 Select an image from the desired study.

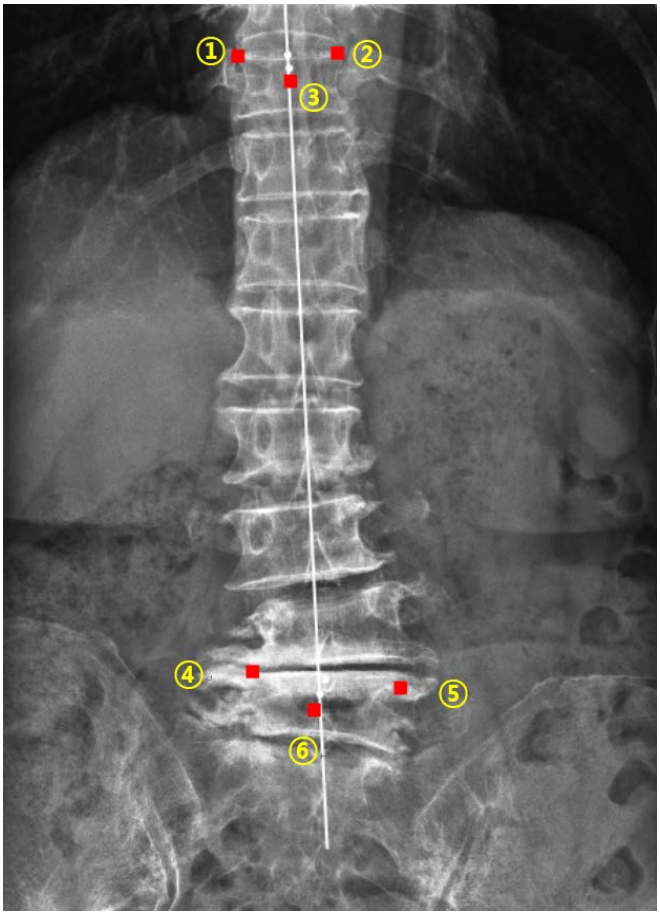
2 Click on the **Vertebral Line** button from the tool menus and move a mouse pointer to the image view screen.

3 Click on the left / right top of the 1st vertebrae to measure in order (①/②).

4 Click spinous process of the vertebrae (③).

5 Apply the step 3 and 4 to the last vertebrae.

6 A centerline is indicated through the two vertebrae.



6.2.16 Cobb Angle

Button	Description
	Measures Cobb Angle, which indicates the degree of scoliosis.

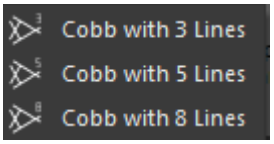
- Tolerance range of Cobb Angle is ±0.5°.

- Application example: Scoliosis

1 Select an image from the desired study.

2 Click **Cobb Angle** button from the tool menus and move a mouse pointer to the image.

▫ Or, click ▾ button at the bottom of the icon to select an option depending on the number of curve to be measured.



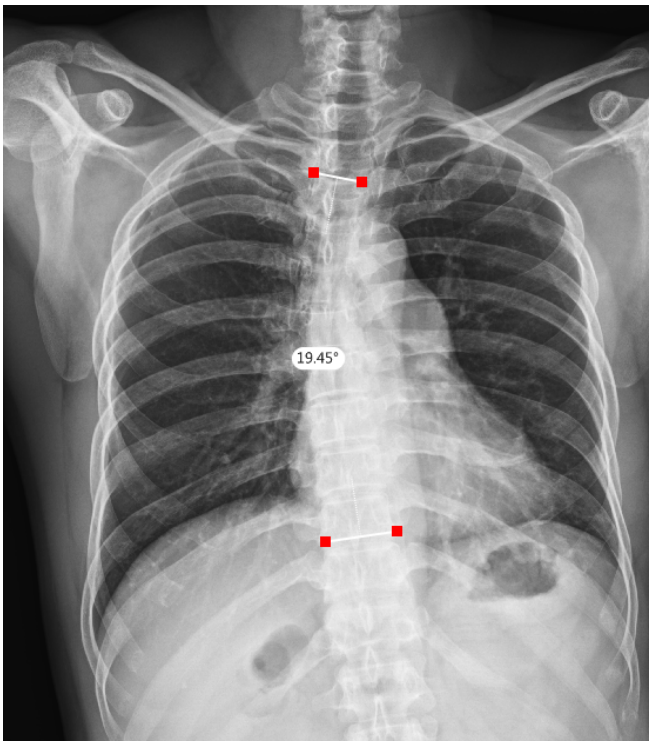
3 Move a mouse pointer to the image.

4 Click two points under the left/right bottom of the upper vertebrae that the most tilted one. Then a line is created connecting the two points.

5 Create another line at the lower end of the vertebrae to be measured as follows.

6 Check the Cobb angle measured between the two lines.

7 You can move the measured cobb angle information to the desired position.

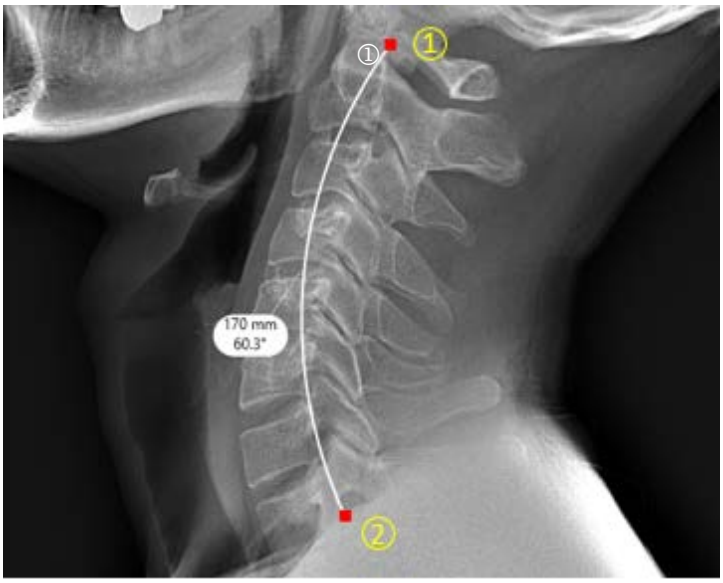


6.2.17 Cervical Curve

Button	Description
	Use this function to judge whether the degree of bending is normal by drawing a curve of vertebrae (cervical curve).

- Application example: Forward head posture

1 Select an image from the desired study.
2 Click on the **Cervical Curve** button from the tool menus and move a mouse pointer to the screen.
3 Click the point of the first vertebra to measure the curve (①).
4 Click the point of the last spinal bone to measure the curve (②) to create a curve.
5 By moving the mouse pointer around the drawn curve, you can determine the direction in which the curve is curved.
6 When you click on any point, the vertical distance (radius) and angle of the two points are displayed. (Example screen: 170mm / 60.3°).



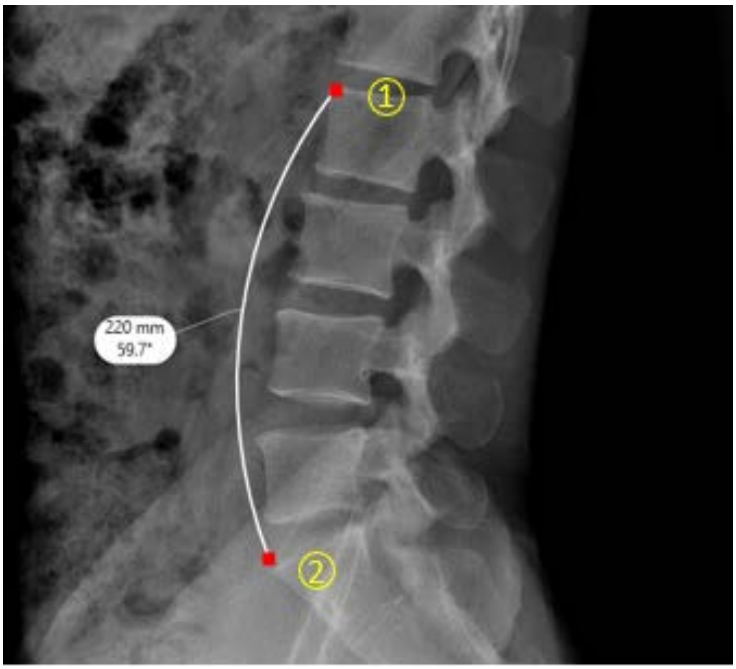
- You can change the initial size of radius as follows;
  - Right click on the screen where **Cervical Curve** is applied > **Properties** >**Radius in mm**.

6.2.18 Lumbar Curve

Button	Description
	Determines whether the twisted spine is normal or not by drawing a curve along the lumbar vertebrae.

- Application example: Lordosis

1 Select an image from the desired study.
2 Click on the **Lumbar Curve** button from the tool menus and move a mouse pointer to the screen.
3 Click on the selected point of the 1st vertebrae (①) to measure a curved line.
4 Click on the selected point of the last vertebrae (②), and then a curved line is created.
5 By moving the mouse pointer around the drawn curve, you can determine the direction in which the curve is curved.
6 When you click on any point, the vertical distance (radius) and angle of the two points are displayed. (Example screen: 220mm / 59.7°).



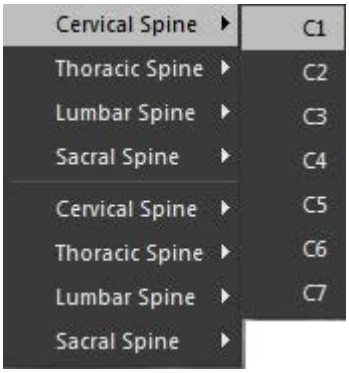
- You can change the initial size of radius as follows.
  - Right click on the screen where **Lumbar Curve** is applied > **Properties** > **Radius in mm**

6.2.19 Spine Label

Button	Description
	Attaches a label to the spine.

1 Select an image from the desired study.

2 Click on the **Spine Label** button from tool menus and select the 1st spinal column to attach labels on it.



3 Click on the 1st spinal column and the others in order to attach labels on them.

6.2.20 Sagittal Spine Alignment Analysis

Button	Description
	• Measures the degree of alignment of the vertebrae.

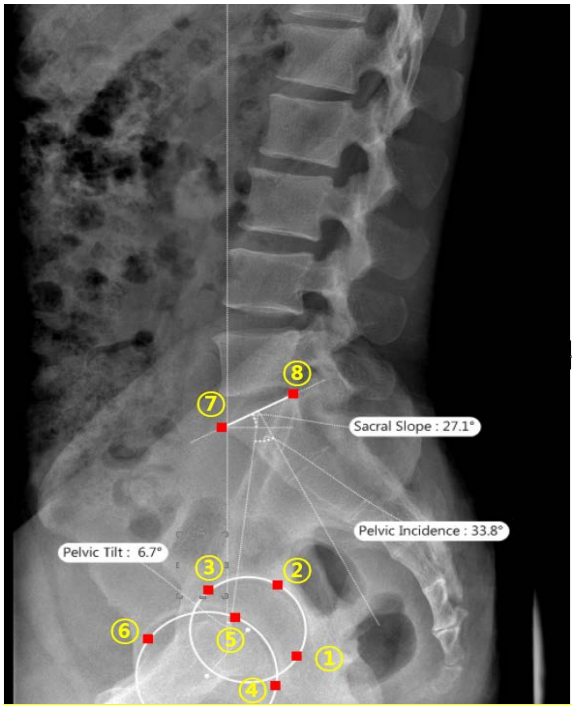
- For the measurement method, refer to <5.2.25Guide Funtionality>.
- After the analysis is completed, the measurement area is highlighted in yellow and the matched analysis result value is displayed when you place the mouse cursor on the measurement area.

6.2.21 Pelvic Parameters

Button	Description
	Measures how much the pelvis is twisted before and after by using femoral head and sacrum.

- Application example: Spinopelvic Alignment

1 Select an image from the desired study.
2 Click on the **Pelvic Parameters** button from tool menus and move a mouse pointer to the screen.
3 Click three points (①~③) along the edge of the 1st femoral head to create a circle.
4 Draw a circle by clicking points (④~⑥) along the edge of the 2nd femoral head.
5 Click the front top of S1 (⑦), the 1st bone of sacrum.
6 Appoint the rear top of S1 (⑧), and then the values of pelvic tilt, sacral slope and pelvic incidence are indicated.



6.2.22 Spondylolisthesis

Button	Description
	Measures the degree of spondylolisthesis by checking the dislocation of Lumbar 5 (L5) along the upper side of Sacrum (S1).

- Application example: Meyerding's Grade (Meyerding classification) of spondylolisthesis.

1 Select an image from the desired study.

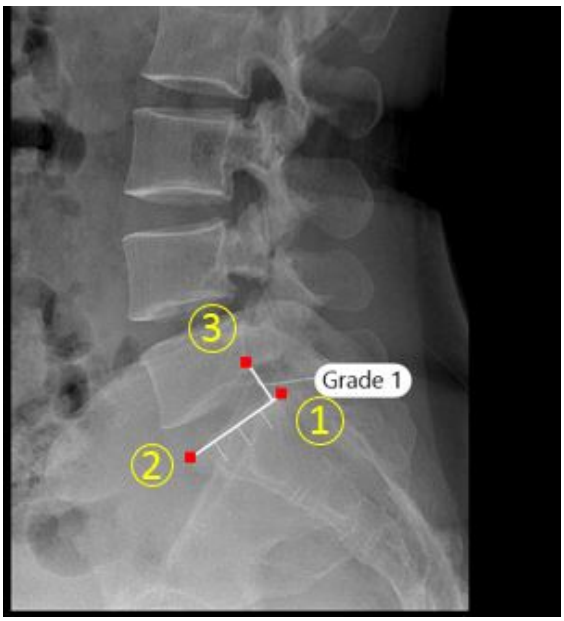
2 Click the **Spondylolisthesis** button from tools and move a mouse pointer to the image view screen.

3 Click on the rear upper (①) and front upper (②) of sacral base to create a segment.

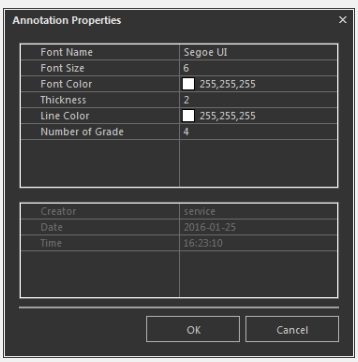
4 Click a point on the position (③) where the sacral base line is perpendicular to the point and passed the rear bottom of the twisted lumbar (L5) to create a line.

5 The dislocation degree is indicated as follows.

▫ Dislocation degree (grade 4): (Grade 1 (<25%) / Grade 2 (25%~50%) / Grade 3 (50%~75%) / Grade 4 (75%~100%)



- If you use the feature for other purposes, you can change the number of ratings. (Minimum 2 to maximum 10).
  - ▫ Right click on the screen where **Spondylolisthesis** is applied > **Properties** > **Number of Grade**.



6.2.23 High Tibial Osteotomy

Button	Description
	Measures the surgical site from high tibial osteotomy to correct deformity of bow legs due to degenerative arthritis.

- Application example: High tibial osteotomy

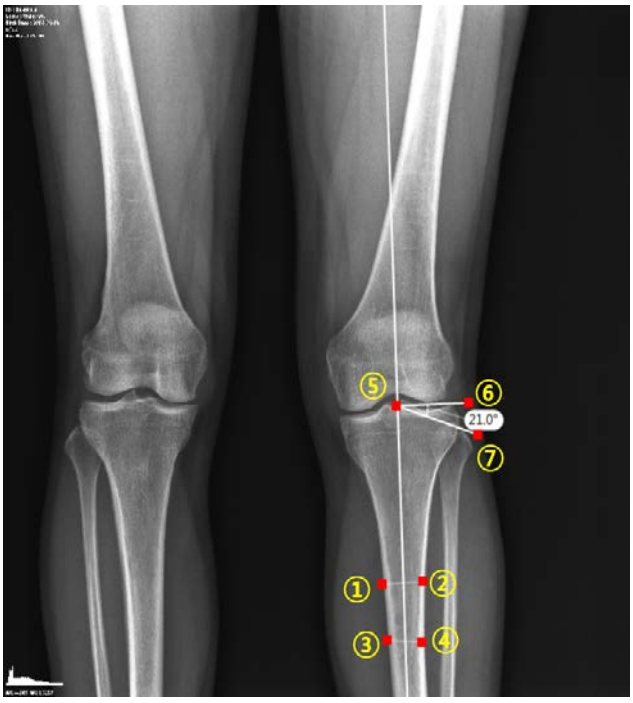
- For the measurement method, refer to <5.2.25Guide Funtionality>.

6.2.24 Meta-Diaphyseal Angle

Button	Description
	Measures a meta-diaphyseal angle to examine bow leg or tibia vara (Blount's disease).

- Application example: Tibia vara

1 Select an image from the desired study.
2 Click on the **Meta-Diaphyseal Angle** button and move a mouse button to the screen.
3 To set the axis of tibia, click the four points (①, ②, ③, ④) over the tibia.
4 Click the point (⑤) on the top of the tibia (Tibia epiphysis).
5 Click the point (⑥) perpendicular to the axis of tibia, and finally click on the most extruded bone end point (⑦) of the tibia epiphysis.
6 Check the measured meta-diaphyseal angle.



6.2.25 Pelvis Analysis

Button	Description
	Measures pelvic subluxation by analyzing the rotation of the front and the rear pelvis and the twisted condition of the left and right pelvis.

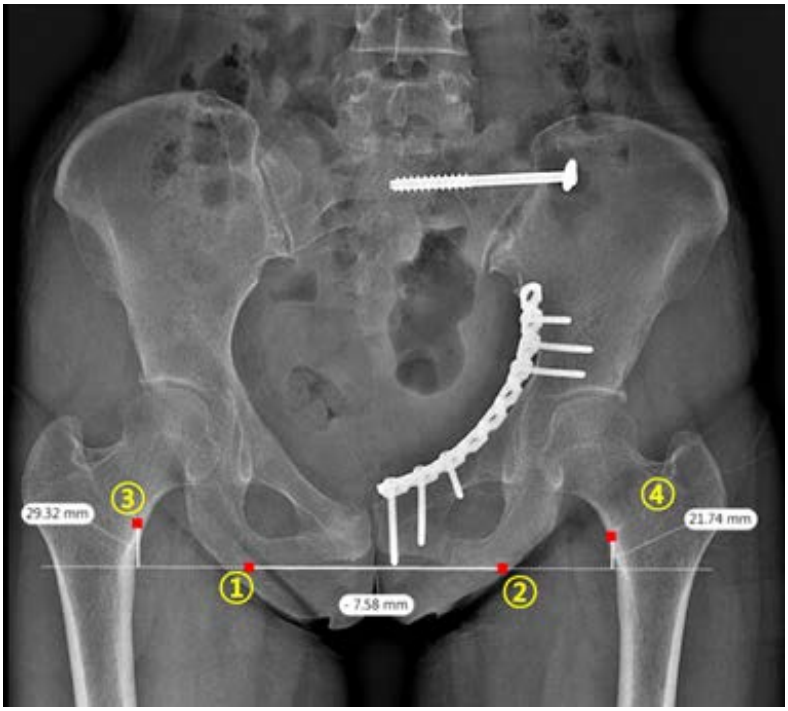
- Application example: Pelvic subluxation

- For the measurement method, refer to <5.2.25Guide Funtionality>.

6.2.26 Leg Length Discrepancy

Button	Description
	Measures the length difference of legs by using the twisted condition between pelvis and femur.

1 Select an image from the desired study.
2 Click on the **Leg Length Discrepancy** button from the tool menus and move a mouse pointer to the screen.
3 Click the left / right lowermost ischium (①,②) each to create a dotted base line and extended line connecting the two points of pelvis.
4 Click lesser trochanters of the left / right femur (③,④).
5 The length from left to right lesser trochanter is indicated based on the pelvic basedline, and the lengh difference is also indicated under the baseline.



6.2.27 Acetabular Angle

Button	Description
	Measures the latent developmental dysplasia of the hip.

- Application example: Hip dysplasia

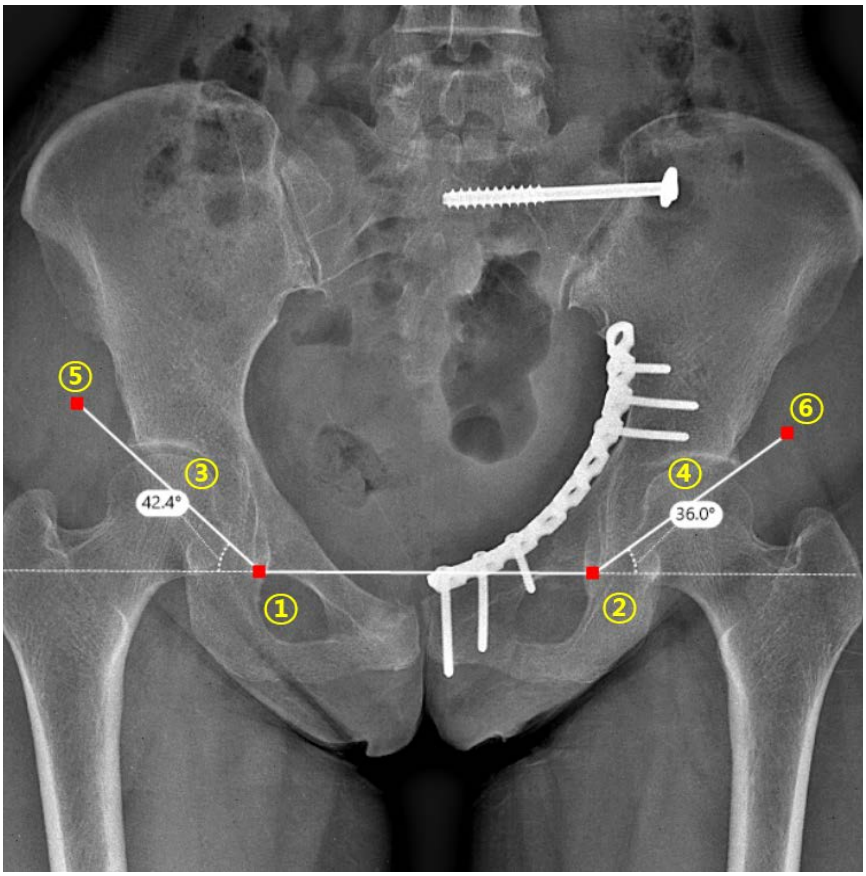
1 Select an image from the desired study.

2 Click on the **Acetabular Angle** button from the tool menus, and move a mouse pointer to the screen.

3 Click the left / right inferior tear drops (①,②) to create a line connecting the two points.

4 Click a point to pass the both acetabular rooves (③,④)

5 Check the measured value. (The sample image below is a pelvic tear drop's line for adults.)



- It is possible to take an acetabular angle by using a pelvic tear drop's line or a hilgenreiner's line depending on where you click a point on the image.

6.2.28 Iliac Angle

Button	Description
	Measures the latent developmental dysplasia of the hip.

- Application example: Hip dysplasia

1 Select an image from the desired study.

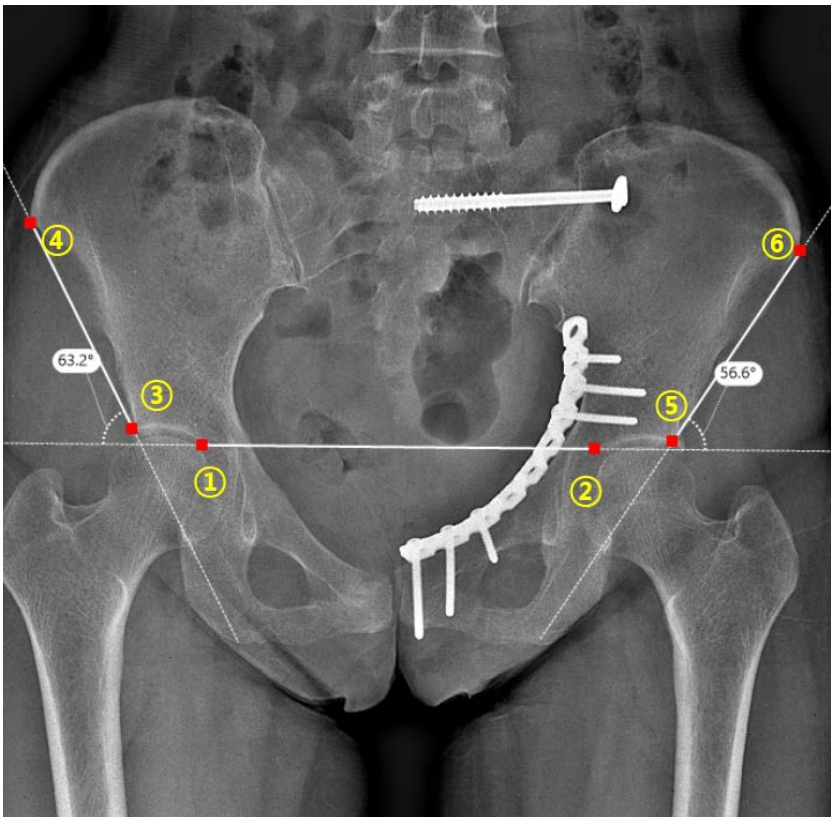
2 Click on the **Iliac Angle** button from tool menus and move a mouse pointer to the screen.

3 Click on the left (①) and right (②) triradiate cartilages to create a line.

4 Click on the outermost part of the left acetabluar roof (③) and the left iliac ala (④) to connect them with a line.

5 Repeat step 4 to the outermost part of the right acetabluar roof and the right iliac ala.

6 Check the measured iliac angle.



6.2.29 Center Edge Angle

Button	Description
	Takes the center edge angle by using the lateral edges of a femoral head and an acetabular roof.

- Application example: Hip dysplasia

1 Select an image from the desired study.

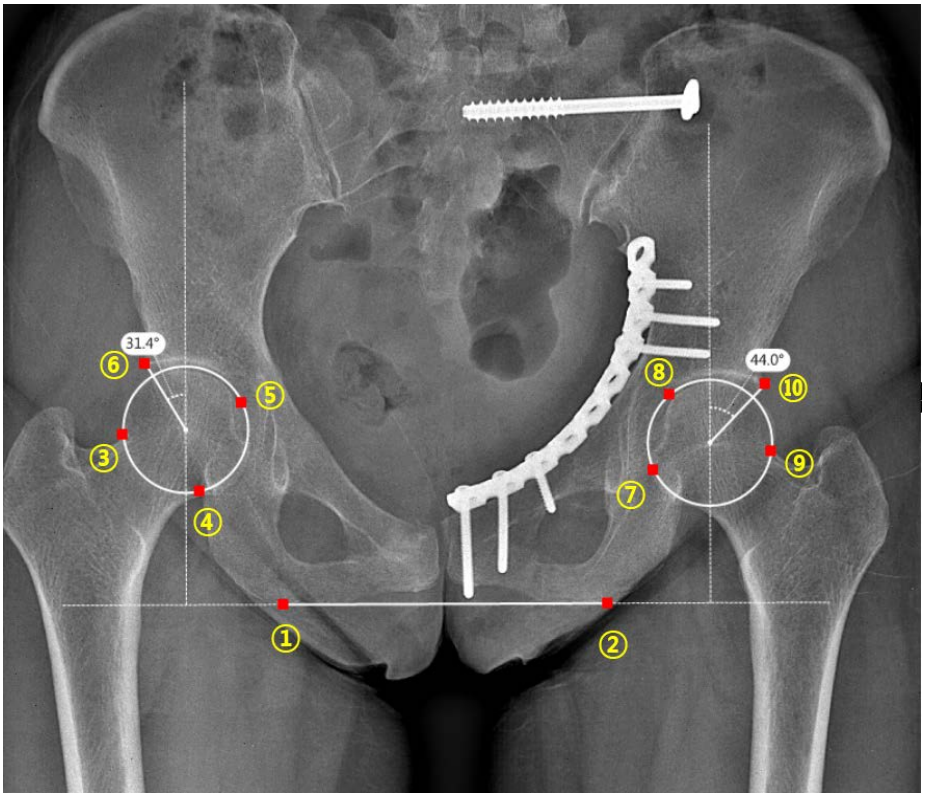
2 Click **Center Edge Angle** button and move a mouse pointer to the image view screen.

3 Click on the lowermost part of the left / right ischium (①,②) to create a connection line and its extended line.

4 Click three points (③~⑤) along the outskirts of left head of femur to create a circle.

5 Click the side corner of left (⑥), then an angle is indiacted from the center of left head of femur (the center of a circle).

6 Repeat the steps 4 and 5 to the right head of femur.



6.2.30 Femoral Symmetry

Button	Description
	Measures a length difference of legs by checking the twisted condition of pelvis and femur, and also checking the twisted condition of a head of femur

- Application example: Hip dysplasia

1 Select an image from the desired study.

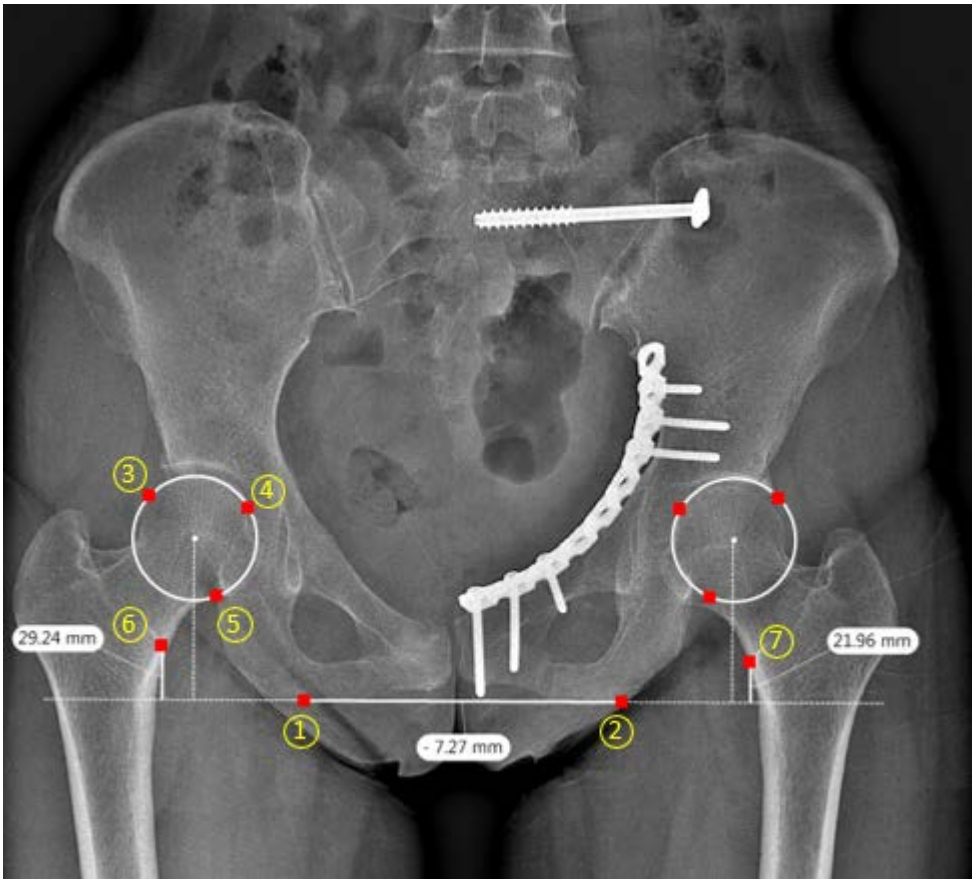
2 Click on the **Femoral Symmetry** button from tool menus and move a mouse pointer to the screen.

3 Click the lowermost parts of left / right ischium to create a pelvic baseline and an extended line to connect the two points.

4 Click three points on the outskirt of the left femoral head to create a circle of femoral head size.

5 Another circle of a size is created at the right side (symmetrical with the left circle) based on the center point of the pelvic baseline at the same time.

6 Click the left / right lesser trochanters of the femur to indicate the length between them and their length difference based on the pelvic baseline.



6.2.31 Head Shaft Angle

Button	Description
	Measures the angle of a curved femoral neck.

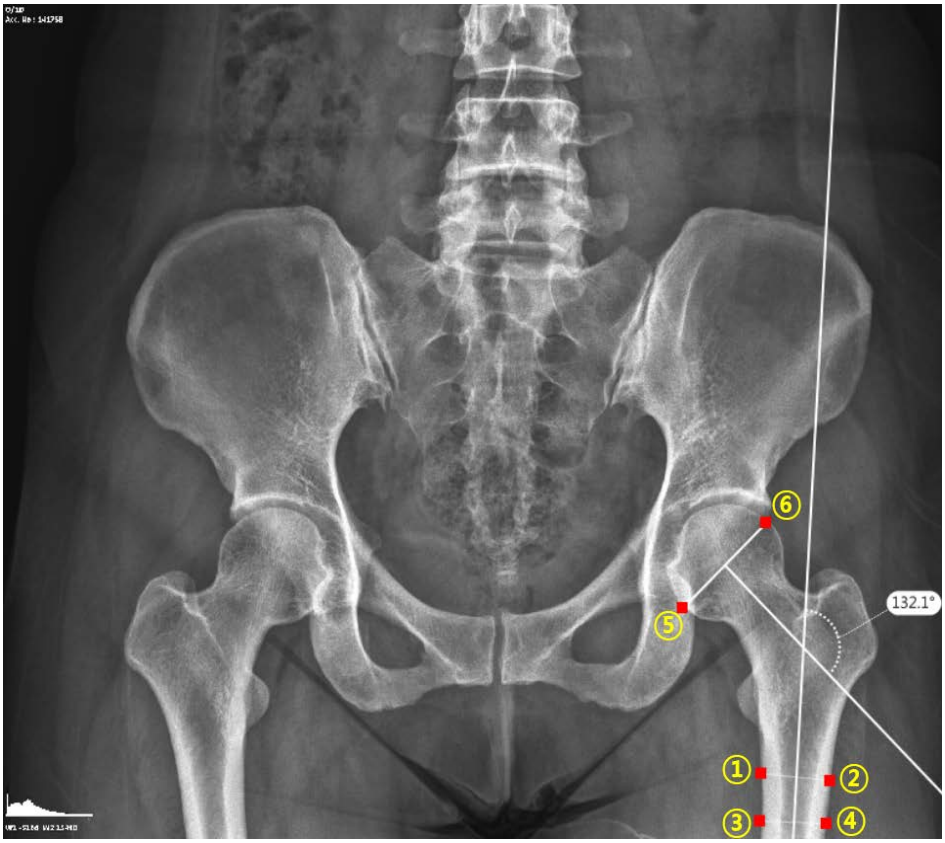
1 Select an image from the desired study.

2 Click **Head Shaft Angle** button from the tool menus and move a mouse pointer to the image view screen.

3 Click four points along the femur (①~④) to define its axis.

4 Click the end points on the left (⑤) / right (⑥) of femoral head as making them pass through the center of the femoral head. Then the axis of femoral neck is defined.

5 The angle between the two axes is indicated as below.



6.2.32 Podiatry Analysis

Button	Description
	Checks the overall deformity of toe bones at a time.

- For the measurement method, refer to <5.2.25Guide Funtionality>.

Measurement Result	Description
HVIA	Hallux Valgus Interphalangeus Angle
HVA	Hallus Valgus Angle
MPVA	Metatarsus Primus Varus Angle
IMA	Intermetatarsal Angle
DMAA	Distal Metatarsal Articular Angle
PMAA	Proximal Metatarsal Articular Angle
MAA	Metatarsus Adductus Angle
MBA	Metatarsal Break Angle

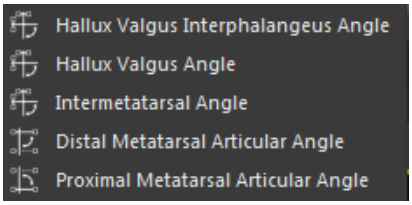
- Place a mouse cursor on the measured part after completing the podiatry analysis. Then the part is highlighted and the matched value of analysis result is indicated.

6.2.33 Foot Angle

Button	Description
	Measures the hallux valgus or the degree of deformity. • Hallux Valgus Interphalangeus Angle • Hallus Valgus Angle • Intermetatarsal Angle • Distal Metatarsal Articular Angle • Proximal Metatarsal Articular Angle

1 Select an image from the desired study.

2 Click on the bottom of **Foot Angle** icon (▾) and select a foot angle option to use from the popup menu.



Hallux Valgus Interphalangeus Angle (HVIA)

This tool is used for measuring the degree of deformity on hallux valgus.

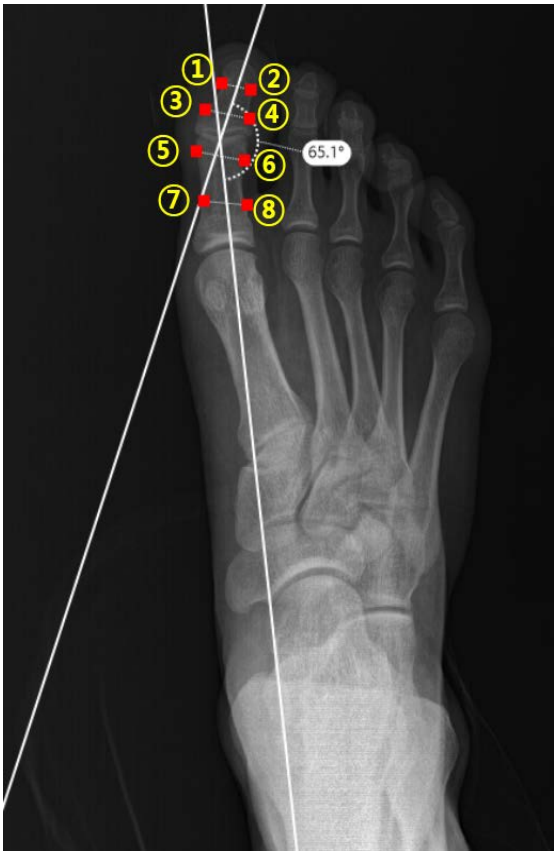
- Application example: hallux valgus

1 Click on the **Podiatry Analysis** button from tool menus and move a mouse pointer to the screen.

2 Click four points along the first distal phalanx of the left / right sides to create a centerline.

3 Click four points along the first proximal phalanx of the left / right sides to create a centerline.

4 Check the angle between the two straight lines.



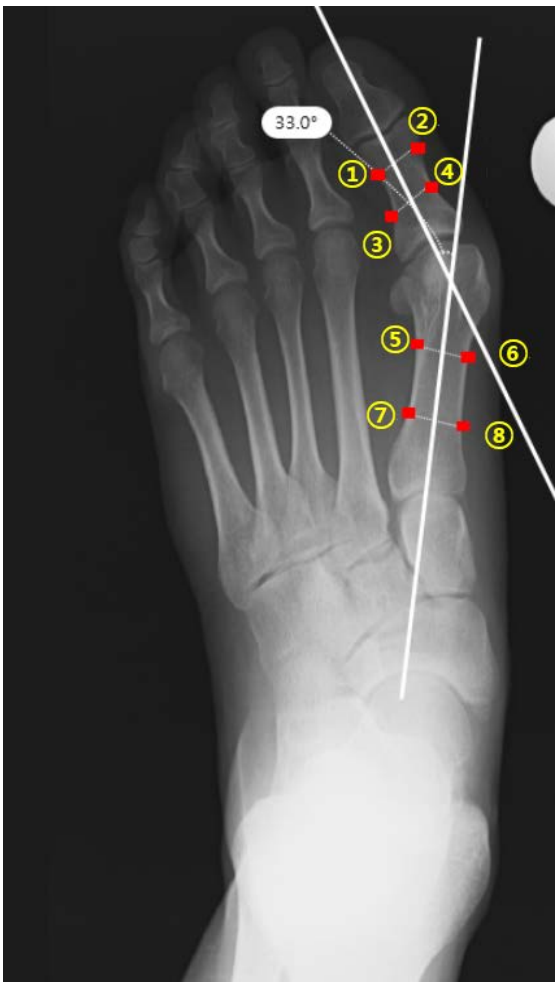
Hallux Valgus Angle (HVA)

- This tool is used for measuring the degree of deformity on the hallux.

1 Click four points on the left / right side of the first proximal metatarsal (①~④) to create a longitudinal axis of proximal phalanx.

2 Click four points on the left / right side of the first metatarsal (⑤~⑧) to create a longitudinal axis of proximal phalanx.

3 Check the measured angle as below.



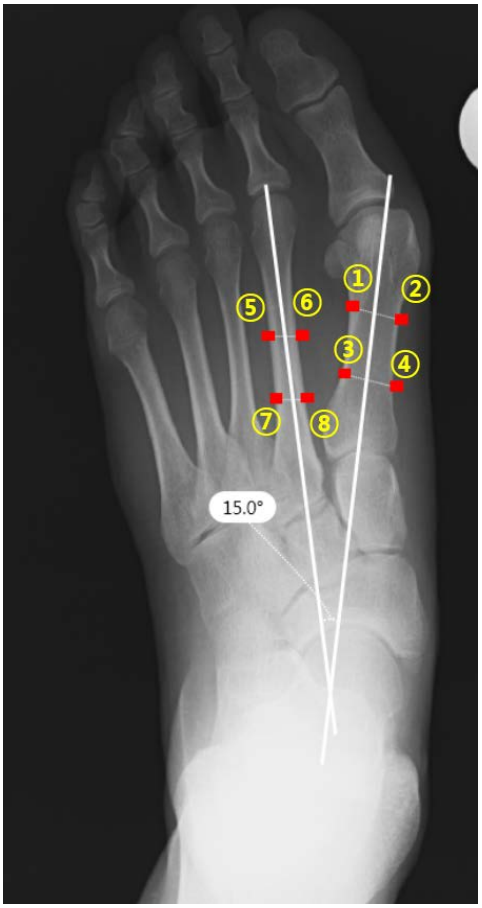
Intermetatarsal Angle (IMA)

- This tool is used for measuring the intermetatarsal angle to check the deformity of hallux.

1 Click four points on the left / right side of the first metatarsal (①~④) to create a longitudinal axis.

2 Click four points on the left / right side of the second metatarsal (⑤~⑧) to create a longitudinal axis.

3 Check the measured angle as below.



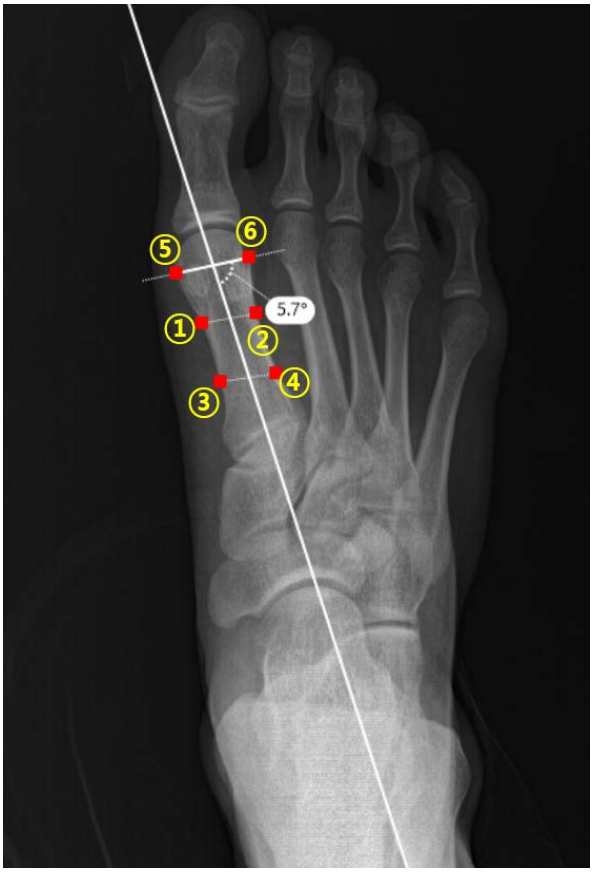
Distal Metatarsal Articular Angle (DMAA)

- This function is used for measuring the deformity of hallux.

1 Click four points on the left / right side of the first metatarsal on hallux (①~④) to create a longitudinal axis.

2 Click the widest distal parts of the left / right of the first metatarsal (⑤,⑥) to create a line.

3 Check the measured angle as below.

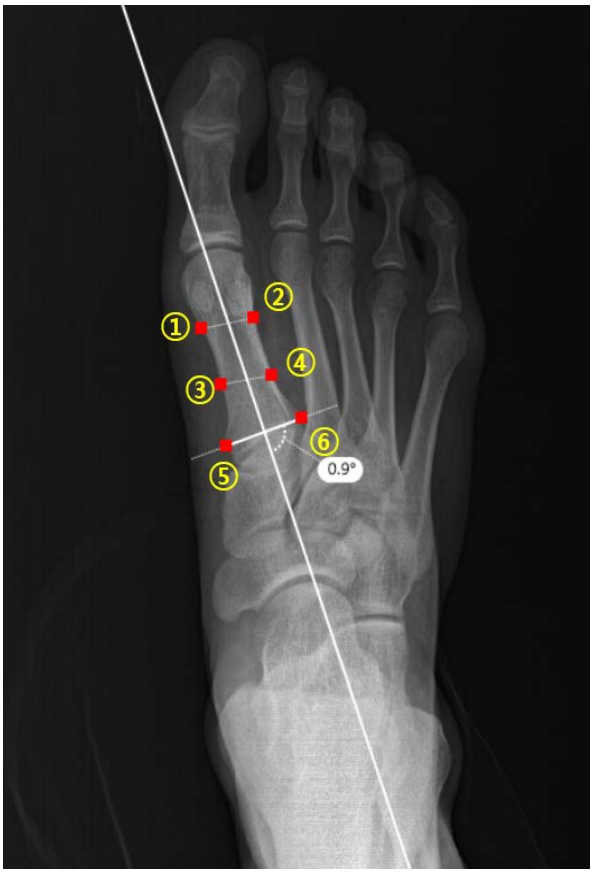


Proximal Metatarsal Articular Angle (PMAA)

- This function is used for measuring the deformity of hallux.

1 Click four points on the left / right side of the first metatarsal (①~④) to create a longitudinal axis.

2 Click the widest proximal parts of the left / right metatarsal (⑤,⑥) to create a line.



6.2.34 Limb Deformity Analysis

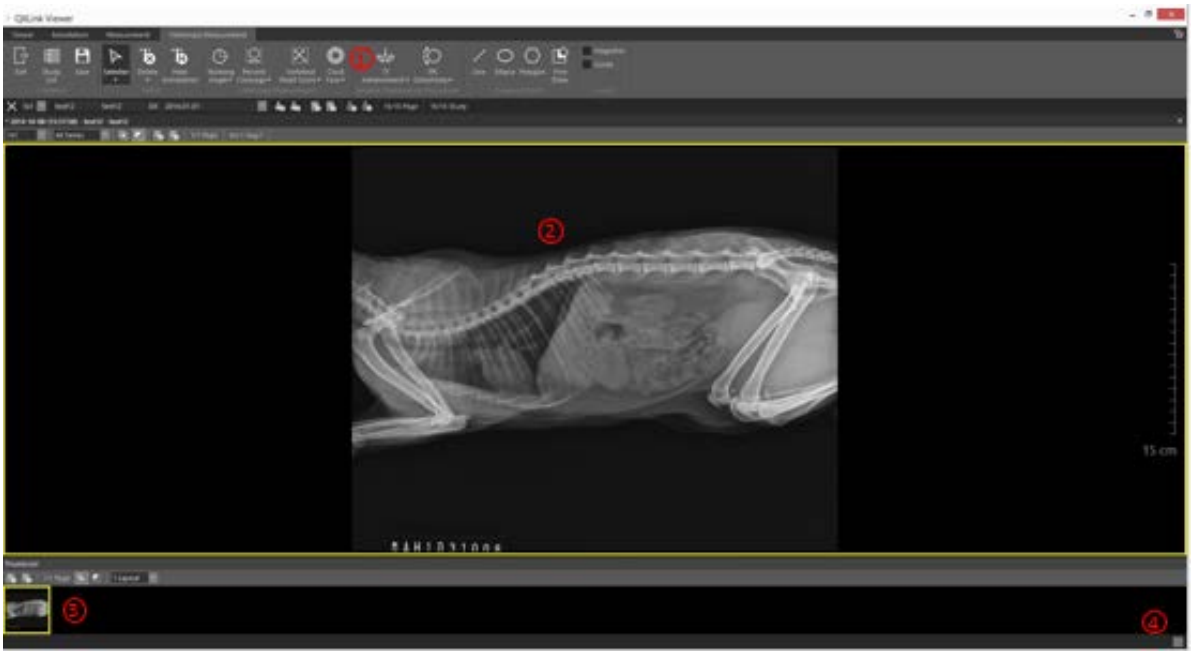
Button	Description
	Measures the degree of deformity on limb.

- For the measurement method, refer to <5.2.25Guide Funtionality>.

7. Veterinary Measurement

This chapter explains about the composition and functions of veterinary measurement.

7.1 Composition of Veterinary Measurement



No.	Function
1	Image Adjustment Tools
2	Study Viewer
3	Thumbnail
4	Status Bar

- If you drag the thumbnail image with the left mouse button and place it on the desired image processing icon, the corresponding function will be executed automatically.

7.2 Veterinary Measurement Tools

7.2.1 Norberg Angle

Image	Function
	Diagnoses the problem with formation in an animal's (esp. canine) hip joint.

1 Open the image of pelvis in ventrodorsal view.

2 Click the arrow on the **Norberge Angle** menu to select **Template** and the example angle shown below will appear. Adjust the angle by dragging the desired range with the mouse button.

3 Or click on the corresponding menu to set the diagnosis area manually as shown below

3-1 Set the diagnostic area by clicking the mouse button three times so that a circle is formed along the edge of the femoral sphere to the left of the image (right side of the patient).

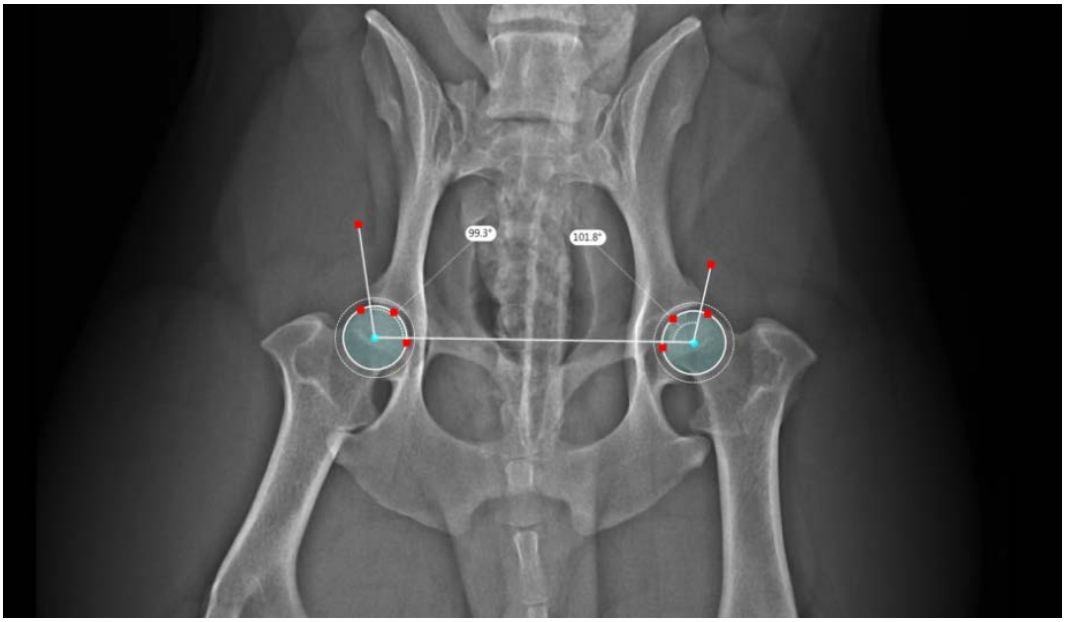
3-2 A straight line starting from the center of circle and circle is formed in the diagnosis area.

3-3 Select the endpoint of the straight line so that the straight line passes through one outermost point of the left acetabulum.

3-4 Repeat the above procedure for the right femoral ball.

4 When you exit the process, the angle is automatically calculated and displayed.

5 To delete the measurement tool you have set up, right-click and select the **Delete Annotation** menu.



7.2.2 Percent Coverage

Image	Function
	Diagnoses the problem with formation in an animal's hip joint.

1 Open the image of pelvis in ventrodorsal view.

2 Click the arrow at the bottom of the **Percent Coverage** menu to select **Template**, and the example range will appear as shown in the image below. You can adjust the length and range percentage by dragging the desired range with the mouse button.

3 Or Percent Coverage, and set the diagnosis area manually as shown below.

3-1 Set the diagnosis area by clicking the mouse button 3 times so that a circle can be formed along the edge of the femoral sphere to the left of the image (right side of the patient).

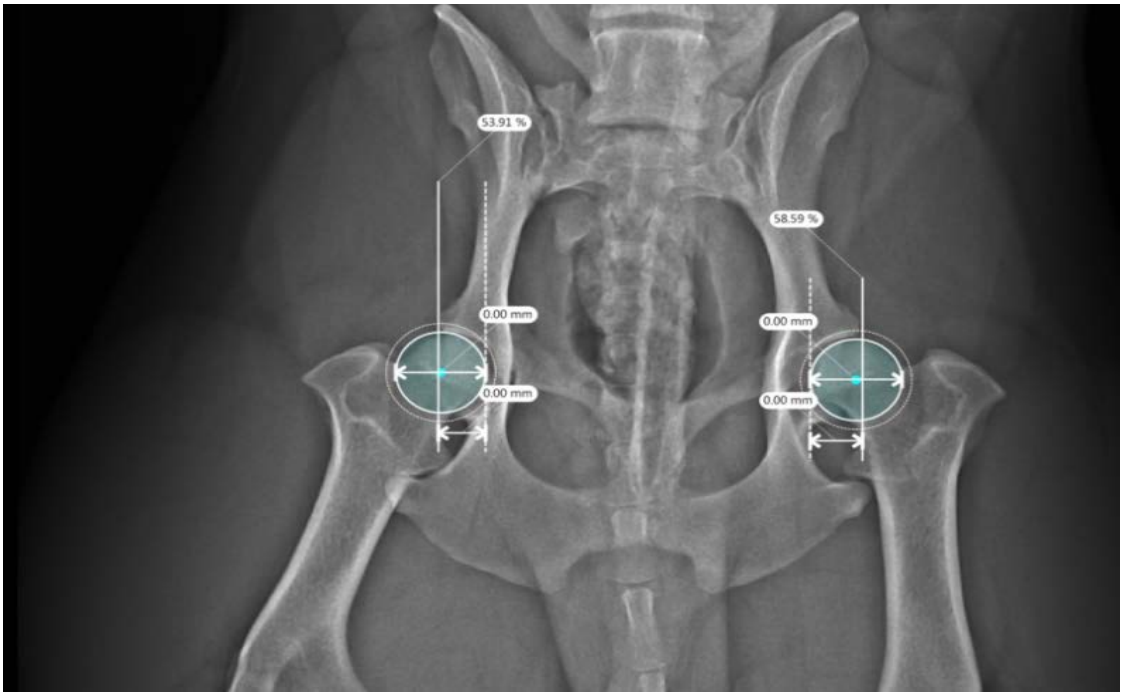
3-2 A straight line is formed passing the circle and the circle perpendicular to the diagnosis area.

3-3 Select the end point of the straight line so that the straight line passes through one outermost point of the left acetabulum.

3-4 Repeat the same procedure for the right femoral ball.

4 The diameter and range percentage (%) for the two circles are automatically measured and displayed.

5 To delete the measurement tool you have set up, right-click and select the **Delete Annotation** menu.



7.2.3 Vertebral Heart Score

Image	Function
	Diagnoses the heart size of animals (A dog or a cat).

1 Open the image of lateral thoracic.

2 Click on the **Vertebral Heart Score** button from the toolbar and move a mouse pointer to the image view.

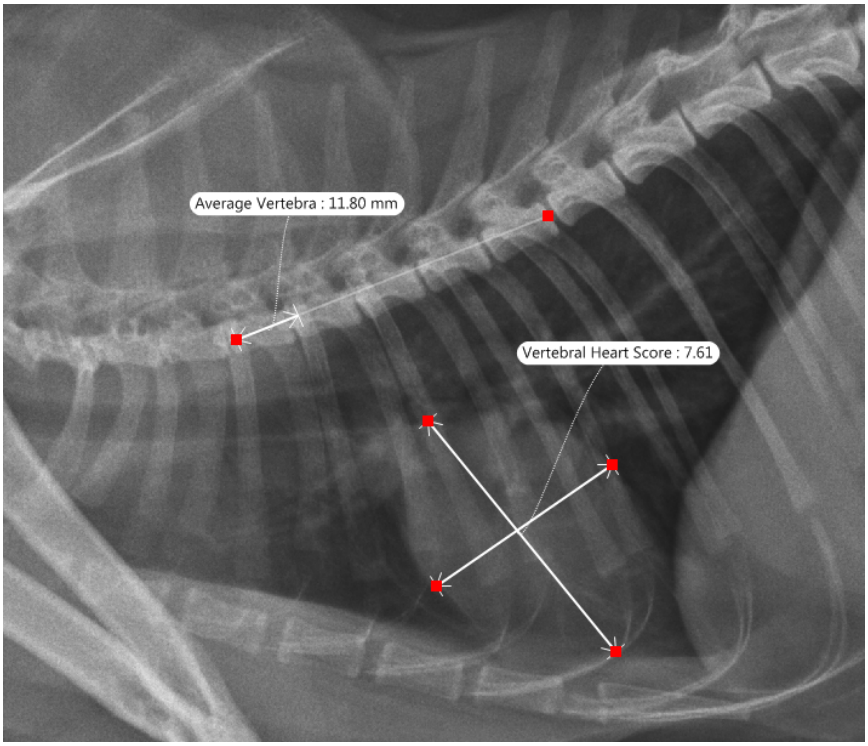
3 Or select the menu and start measurement manually as shown below.

3.1 Click the start point of the fourth thoracic spine and click on the tip of the ninth thoracic spine to specify the measurement point.

3.2 Specify the longest axis in the portrait direction by clicking on the top and bottom end points of the heart respectively.

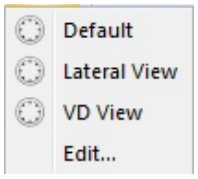
3.3 Specify the longest axis in the horizontal direction by clicking on the left and right end points of the heart respectively.

4 The value of Vertebral Heart Score (VHS) is calculated and displayed automatically.



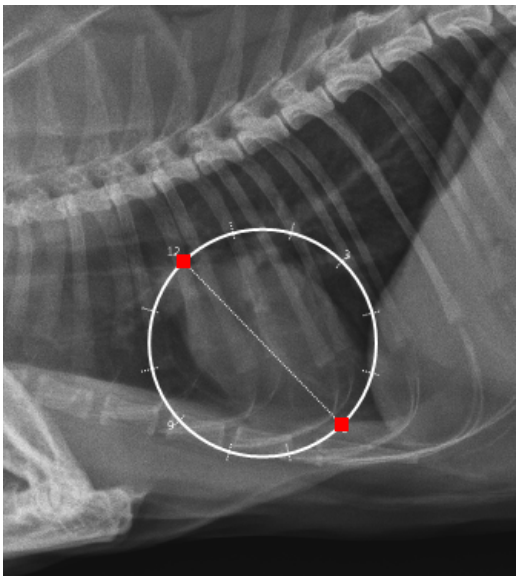
7.2.4 Clock Face

Image	Function
	Indicates the anatomical information of vertebrate hearts.

	Menu	Function
	**Default**	Default value (based on the image in ventrodorsal view.)
	Lateral View	Indicates the anatomical information of vertebrate hearts if the image is in lateral view.
	VD View	Indicates the anatomical information of vertebrate hearts if the image is in ventrodorsal view.
	Edit...	Changes the setting value of Lateral View and VD View. Adds a new clock face.

Default

The anatomical structure of animal heart is indicated by clock-shaped templates only.



1 Open the lateral image or the image in ventrodorsal view.

2 Click ▾ button of **Clock Face** and select the submenu. Then a template and sample values set prevouisly are indicated.

3 Click a point in the direction of 12 o'clock and another in the direction of 6 o'clock. Then a clock-shaped circle and the anatomical information of the relevant direction are indicated.

- You can add or change the setting value depending on the species.
- The default setting value is based on a small dog.

Lateral View

Templates to indicate the anatomical structure of animal hearts in a clockwise direction.

Name	Direction
Main Artery	11-1 o'clock
Pulmonary Artery	1-2 o'clock
Left Auricle	2-3 o'clock
Left Ventricle	3-5 o'clock
Right Ventricle	5-9 o'clock
Right Auricle, Aortic Arch, Pulmonary Trunk	9-11 o'clock

VD View

Diagnose the vertebrate hearts by indicating its anatomical information in a clockwise direction.

Name	Direction
Main Artery	11-1 o'clock
Left Auricle	2-3 o'clock
Left Ventricle	3-6 o'clock
Right Ventricle	6-9 o'clock
Right Atrium	9-11 o'clock

7.3 Dynamic Stabilization Procedures

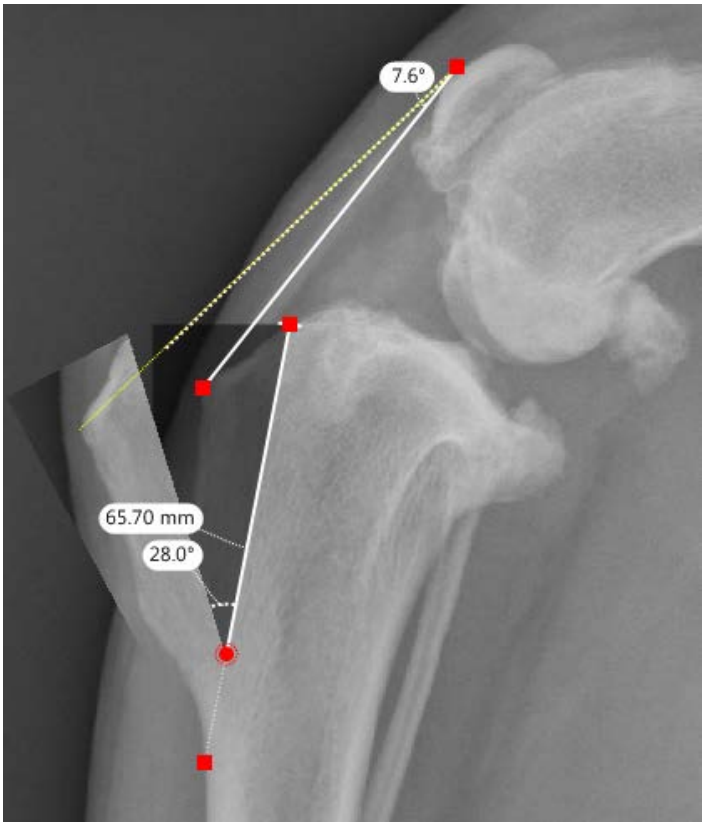
7.3.1 TT Advancement (TTA)

Image	Function
	To prevent anterior cruciate ligament rupture of a decrepit or obese dog, acquires the information about TTA (Tibial Tuberosity Advancement) before deciding to operate it.

Menu	Function
Template for Right	A pre-designated template to the right leg.
Template for Left	A pre-designated template to the left leg.

- Click a newly-generated template with a right mouse button and choose **Save as Templete (Right)** or **Save as Templete (Left)** to make the tool as a template.

1 Open the leteral image of a knee.
2 Click the arrow at the bottom of the **TT Advancement** menu to select **Template**, or select the menu to start the measurement manually.
3 Create a circle that is closest to the tibia (Condyles of the tibia).
4 Create a circle that is closest to the femur (Condyles of the femur).
5 Draw a line from the skull side of patellar tendon to the tibial crest point.
6 As shown in the image below, draw a line to be cut to the area where the end is expected.
7 Right-click and select **Move Fragment** to preview the expected results.



7.3.2 TPL Osteotomy (TPLO)

Image	Function
	To prevent anterior cruciate ligament rupture of a decrepit or obese dog, acquires the information about TPLO (Tibial Plateau Leveling Osteotomy) before deciding to operate it.

Menu	Function
Template for Right	A pre-designated template to the right leg.
Template for Left	A pre-designated template to the left leg.

Click a new generating tool with a right mouse button and choose **Save asTemplete (Right)** or **Save as Templete (Left)** to make the tool as a template.

1 Open the lateral image of knee.

2 Click the arrow at the bottom of the **TPL Osteotomy** menu to select **Template**, or select the menu to start the measurement manually.

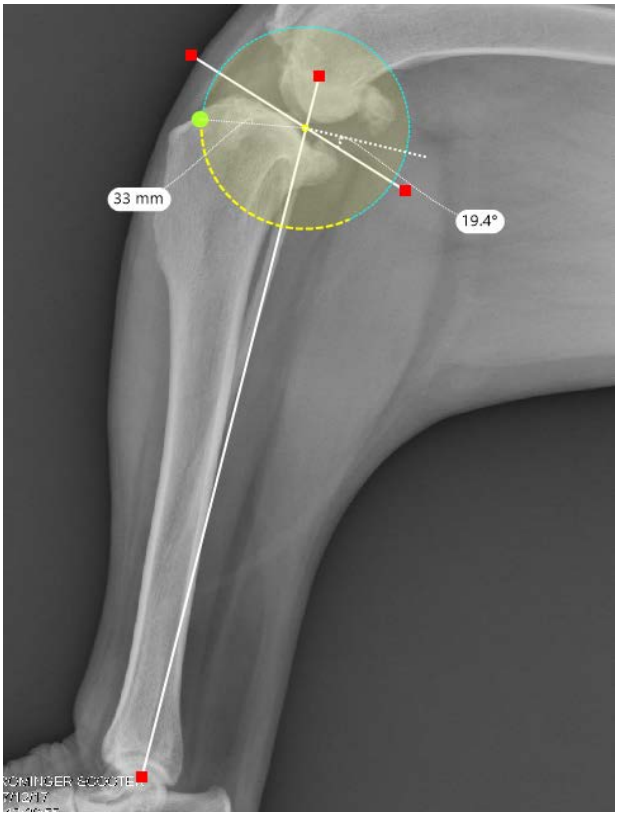
3 Specify a horizontal line through the tibial plateau.

4 Specify a line from the center of the femur (Condyles of the femur) to the center of the talus along the tibial axis (Axis).

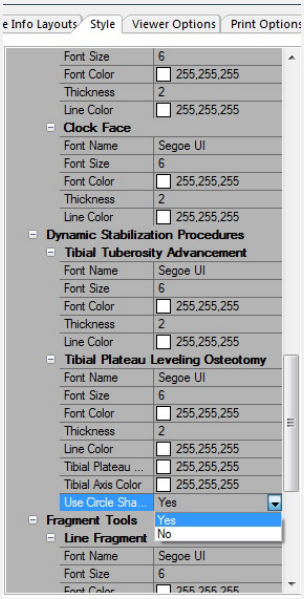
▫ To pinpoint the center of the talus, check the notes below.

5 Select the point to determine the size of the saw blade. A circle appears indicating the size of the saw blade.

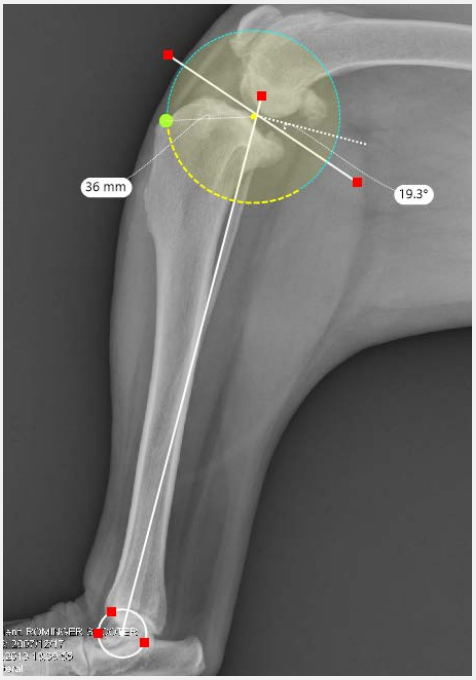
▫ The saw blade size is adjusted to a fixed size. (12mm/15mm/18mm/21mm/24mm/27mm/30mm).



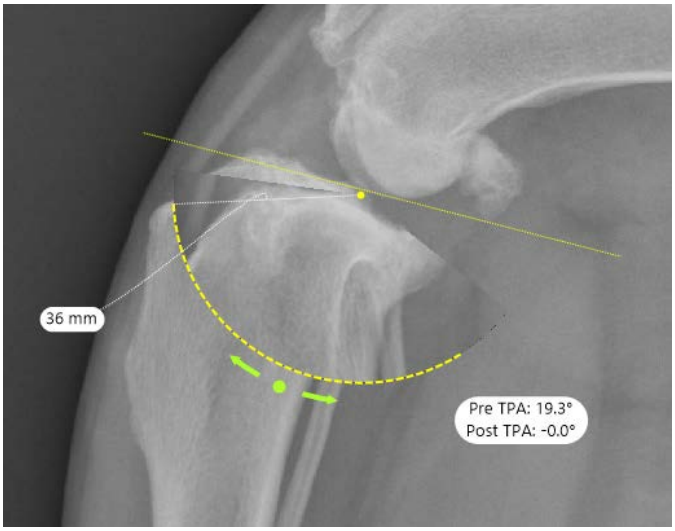
- The way of appointing the center of talus is as follows.
  - Click ⚙ on the right top of **QXLink Viewer** screen to move to **Setting**.
  - Move to **Style > Dynamic Stabilization Procedures**.
  - Choose **Yes** from **Use Circle Shape of Astragalus Bone**, and click **OK** button to close the **Setting** dialog. After that, restart **QXLink Viewer**.



  - Appoint the center of condyles of the femur, and select two points on the center of talus.
  - When a circle dispalys, select another point to appoint the center of talus accurately.



6 Click a right mouse button and click **Rotate Saw Blade** to view the expected results of operation in advance.



Additional functions (by clicking a right mouse button)

Menu	Function
Show Saw Blade	Sets whether to display a circle which shows the size of saw blade.
Lock to Center	Fixes the center of the circle with the center of two perpendicular lines.
Lock Saw Size	Fixes circle area.
Rotate Saw Blade	Indicates result of the surgical site rotated to the expected angle in advance.

7.4 Fragment Tools

Fragment tool is the virtual surgical instruments used for cutting a bone in the image into desired form.

7.4.1 Line

Image	Function
	Cuts a bone in the image in a straight line and check the cutting part.

1 Choose **Line**.

2 Click and drag at the desired location and click again to draw a straight line.

3 Press the **ESC** key or click on **Selector**.

4 Move a mouse pointer while holding down the light green point to adjust the angle.

7.4.2 Ellipse

Image	Function
	Cuts a bone in the image as an ellipse shape and check the cutting part.

1 Choose **Ellipse**.

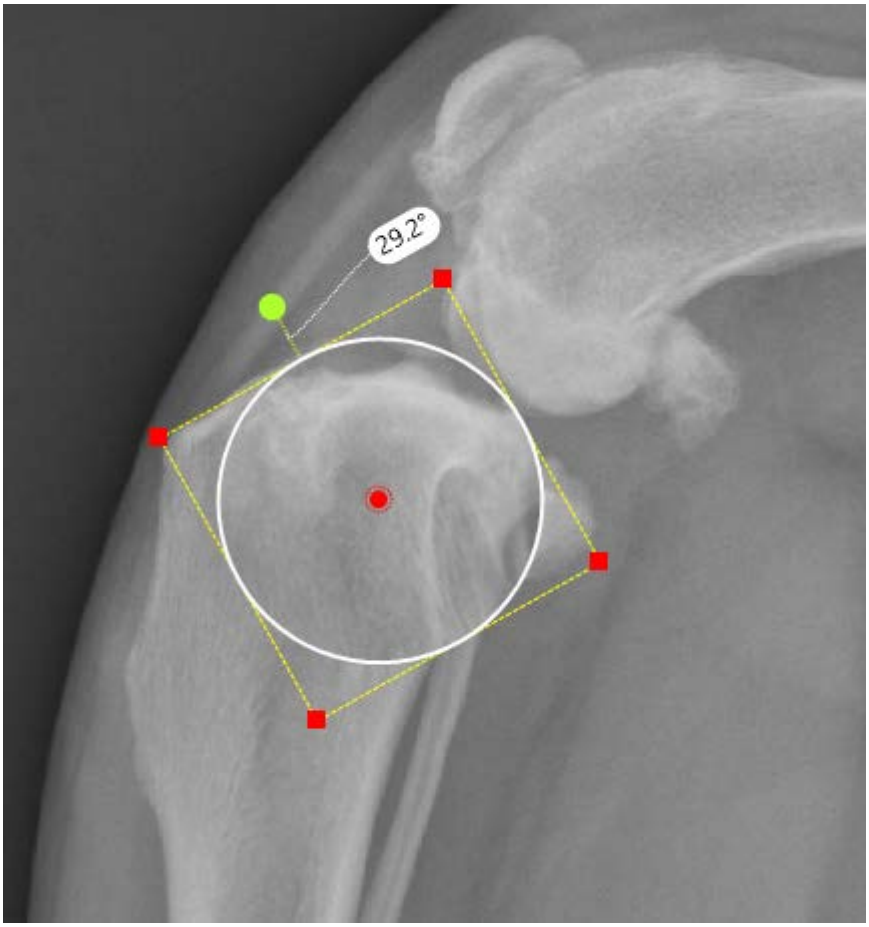
2 Click and drag a mouse button in the desired position and click again to draw an ellipse.

3 Press the **ESC** key or click on **Selector**.

4 Move the center of an ellipse with a mouse button while clicking the red point.

5 Rotate an ellipse by dragging a mouse button while the green point.

6 Or, move an ellipse by clicking and dragging a mouse button.



7.4.3 Polygon

Image	Function
	Cuts a bone in the image as a polyon shape and check the cutting part.

1 Choose **Polygon**.

2 Click a mouse button on the desired position and draw a polygon by dragging a mouse button several times.

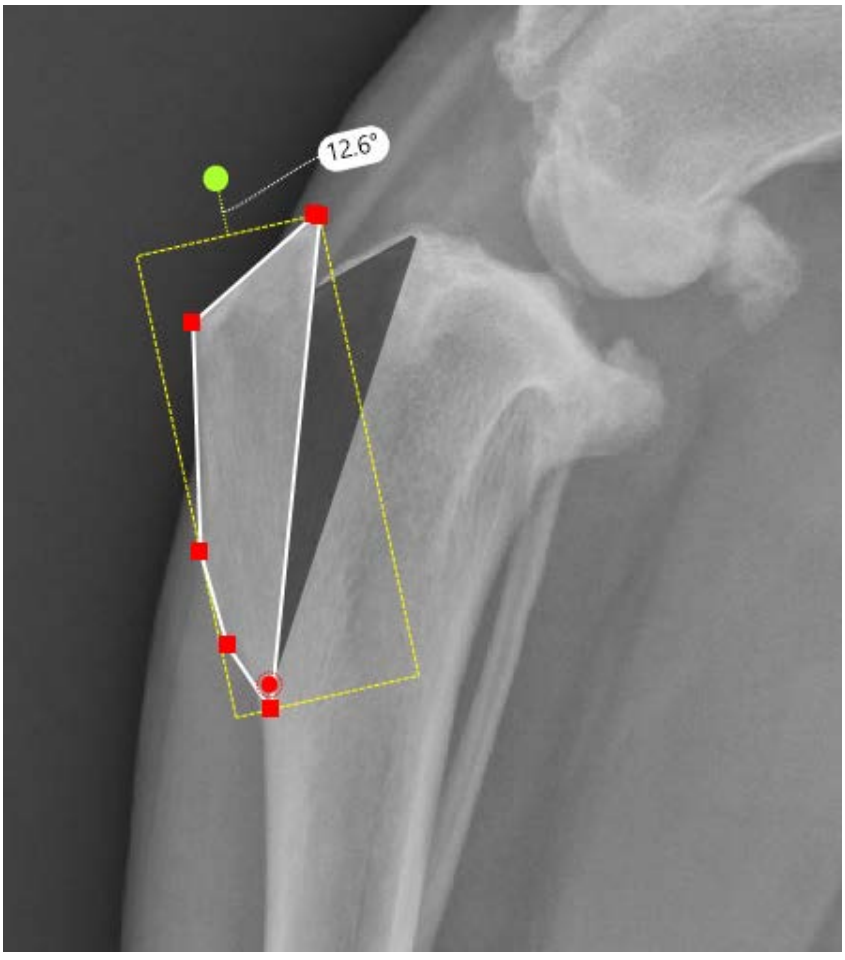
3 Double click a mouse button to complete drawing a polygon.

4 Press the **ESC** key or click on **Selector**.

5 Move a centeral point of rotation by moving a red point in the polygon with a mouse button.

6 Rotate the polygon by clicking and dragging a green point with a mouse button.

7 Or, move the polygon by clicking and dragging a mouse button.



7.4.4 Free Draw

Image	Function
	Cuts a bone in the image as a desired shape and check the cutting part.

1 Choose **Free Draw**.

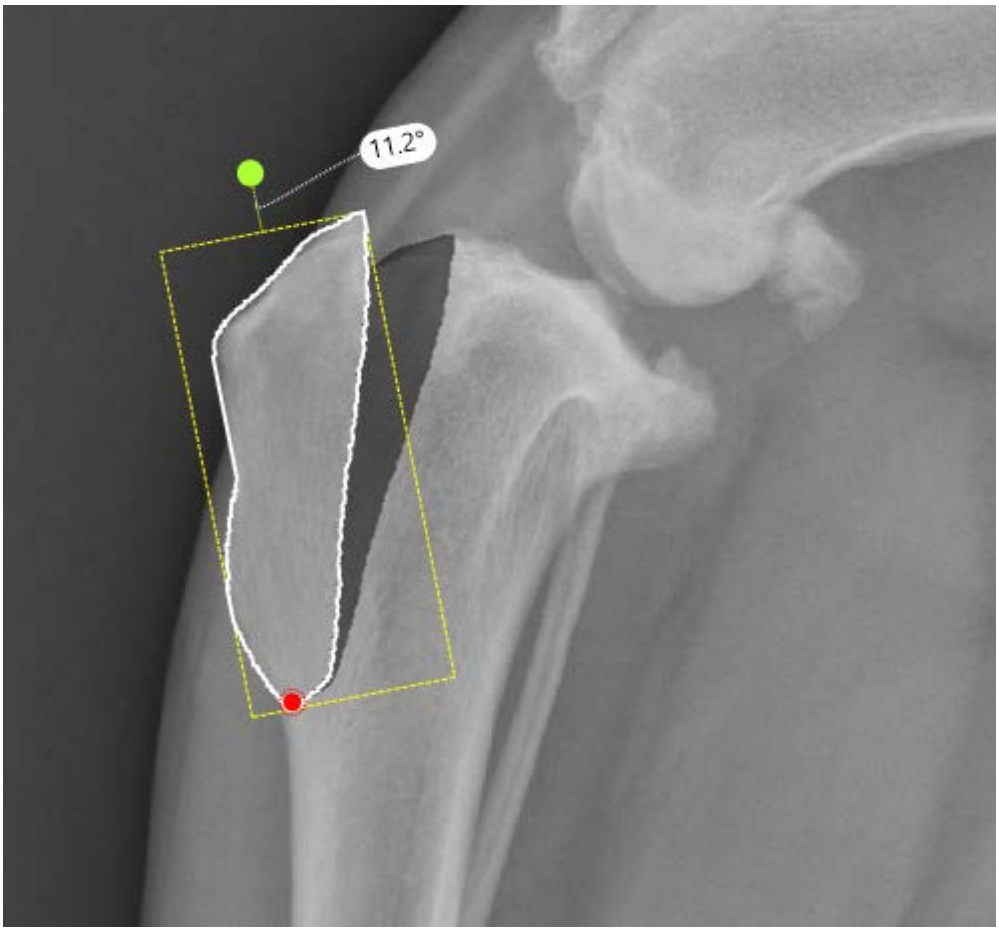
2 Click a mouse button on any position of the image and draw a figure as a desired shape by dragging a mouse button.

3 Press the **ESC** key or click on **Selector**.

4 Set a centeral point of rotation by moving a red point in the figure with a mouse button.

5 Rotate the figure by clicking and dragging a green point with a mouse button

6 Or, move the figure by clicking and dragging a mouse button.



8. Report

This chapter explains about the composition of report window and its functions.

Report

Report Builder

8.1 Report

In the **Report** window, you can draw up a study report as well as print it as a user-defined format. In addition, you can print the report with attaching the image of the relevant study or an external file for reference.

8.1.1 Composition of Report

Home (Viewer > Report)

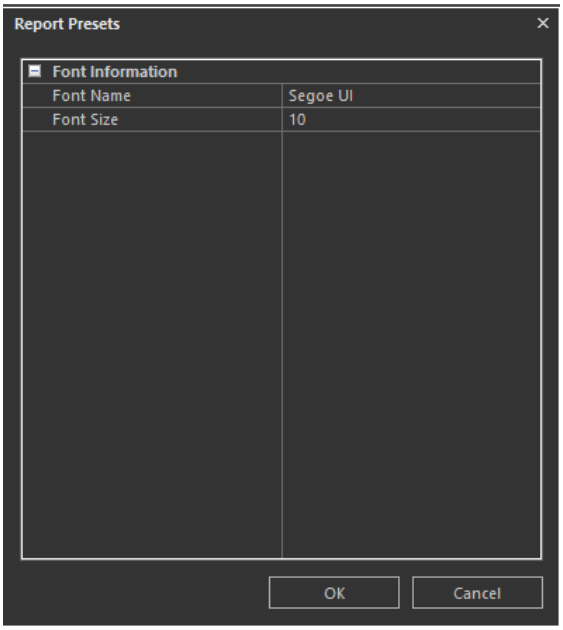
No.	Item	Description
1	**Toolbar**	
2	**Report Template**	Creating customized templates for your reports.
3	**Reading**	Inputting reading contents of the image. (Max. 4,096 letters)
4	**Conclusion**	Inputting results of the reading contents. (Max. 4,096 letters)

History

No.	Item	Description
1	**History List**	Displays the history of the report.
2	**Reading**	Shows the previous contents of reading.
3	**Conclusion**	Shows the previous result of reading.

Report Preset

You can change the font name and size, and the changed values will be reflected in the Report Home.



- The changed values in Report Preset will be applied when re-opening the Report window.
- The values changed in Report Preset are retained even if you restart the program.

8.1.2 Drawing Up Report

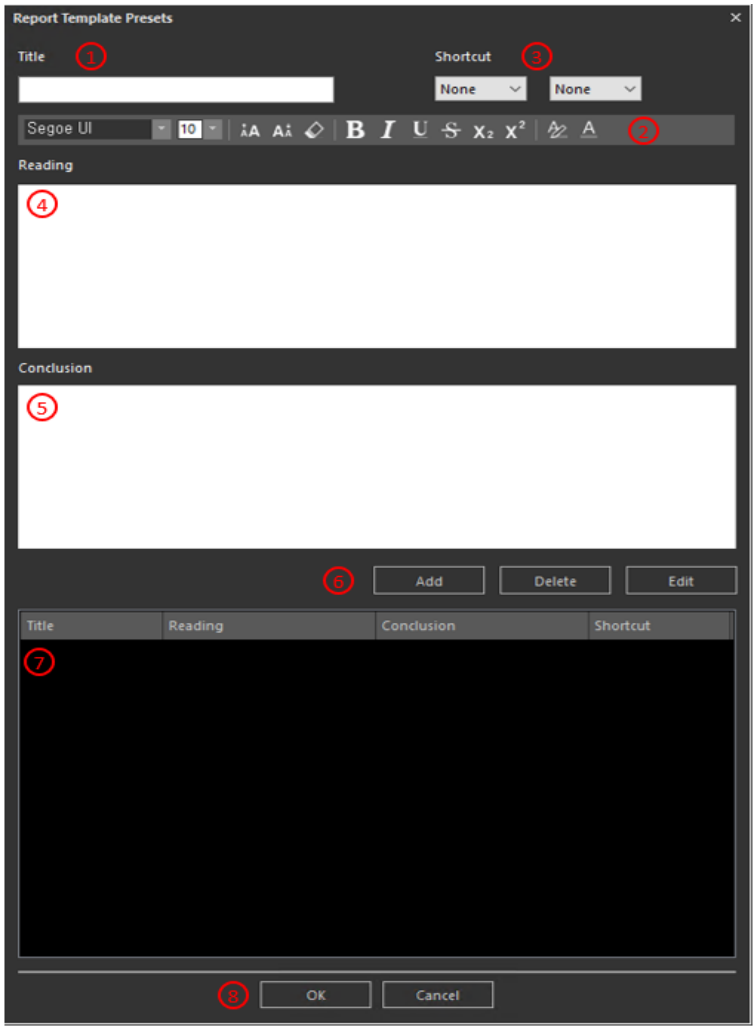
1 Select a study in the **Study List** window to open it.
2 In the **Viewer** window, click **Report** button.
3 Input the reading contents and the reading conclusion by using the report tools.
4 Save the reading contents and conclusion.

8.1.3 Save

Button	Name	Description
	**Save**	Saves the report being written currently. You can modify and save the existing contents of report. The past contents can be checked in the **History** tab.

- The saved reports are not editable by other users who log on to the other account.

8.1.4 Report Template

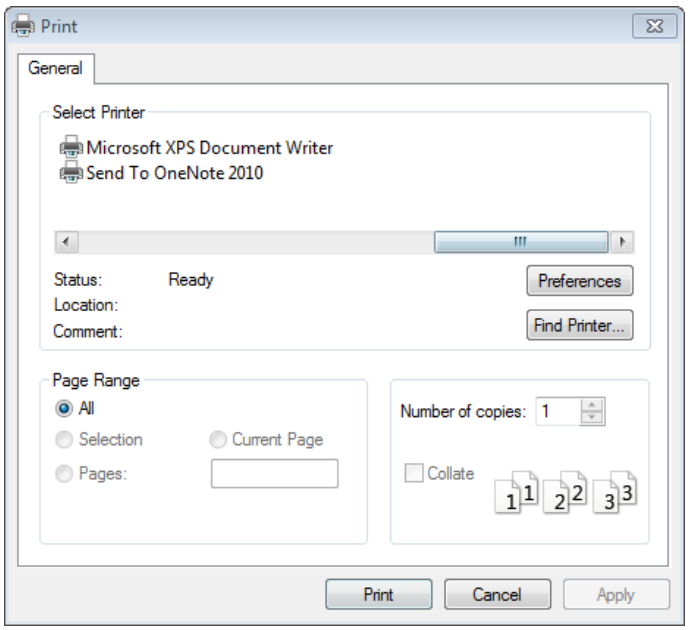


No.	Item	Description
1	**Title**	Specifies the title of the report template.
2	**Toolbar**	Displays the toolbar of the report template.
3	**Shortcut**	Specifies the shortcut for the report template.
4	**Reading**	Creates a reading of the report.
5	**Conclusion**	Creates the conclusion of the report.
6	**Add / Delete / Edit**	Adds, edits, or deletes reports that have been created.
7	**Template List**	Displays a list of previously created report templates.
8	**OK / Cancel**	Saves or cancels the addition, modification, or deletion of report templates.

- You can quickly load saved report templates using shortcuts in the report input window.

8.1.5 Print

Button	Description
	Prints out a report as a default layout format. • Specifies a printer to print out a report.

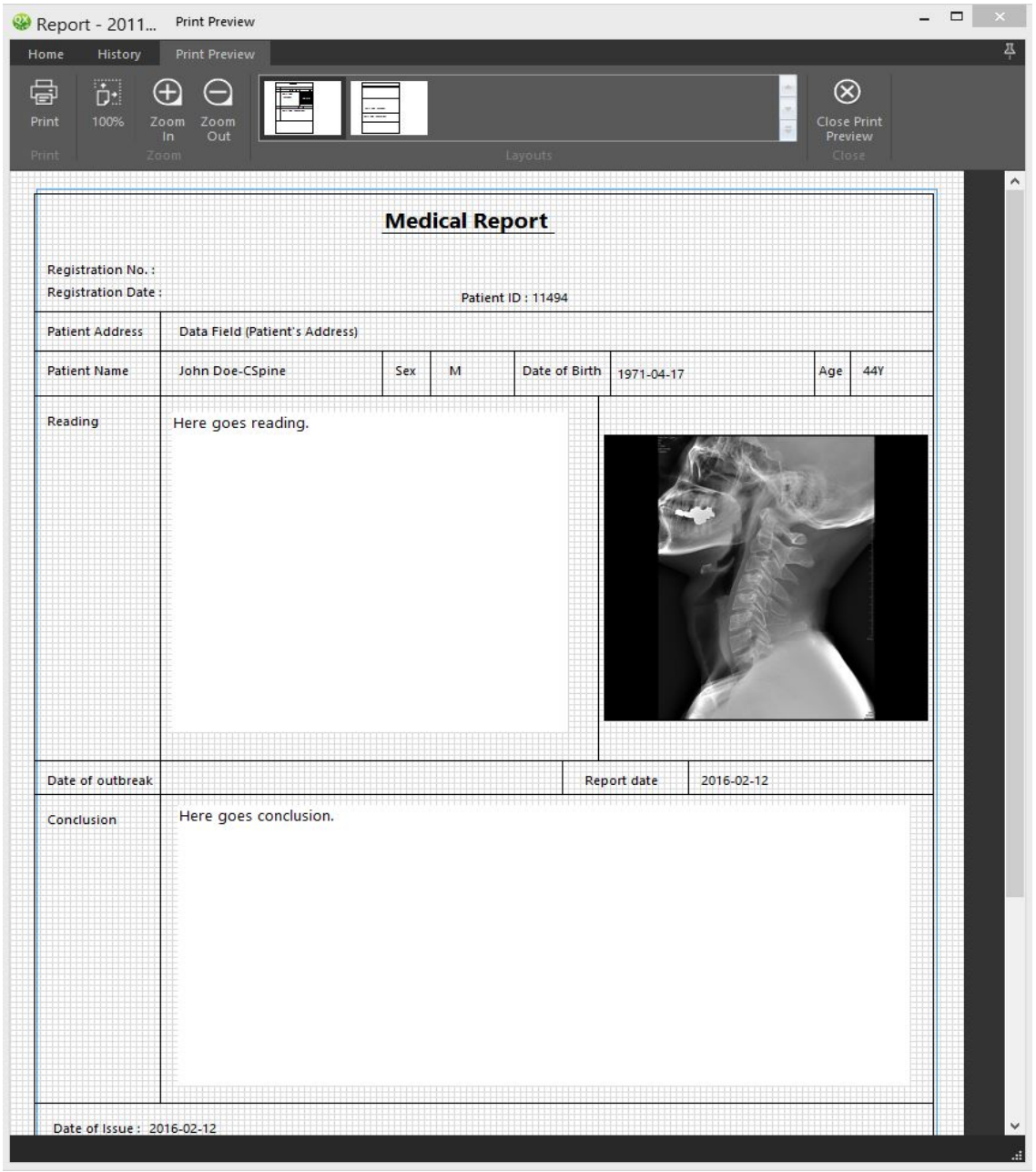


8.1.6 Quick Print

Button	Description
	Prints out a report with a printer defined as a default one.

8.1.7 Print Review

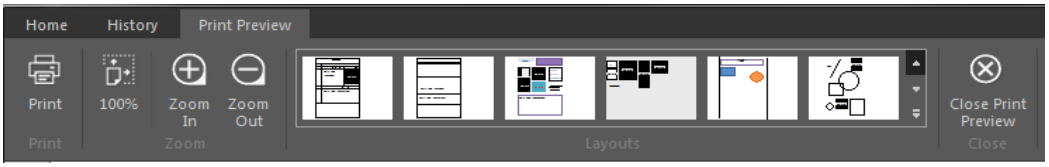
Button	Description
	Previews the layout of a report before printing and remove unnecessary areas from the layout or modify the layout properly.



8.1.8 Change print layout

Print out a report by selecting a pre-defined layout.

- Select a layout to be used from the **Layout** panel.

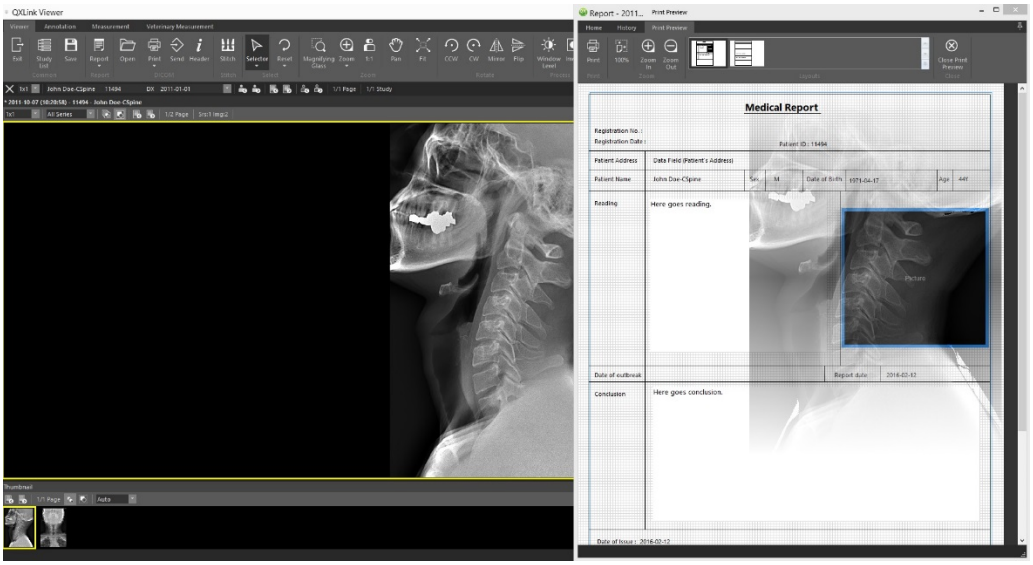


Attach image

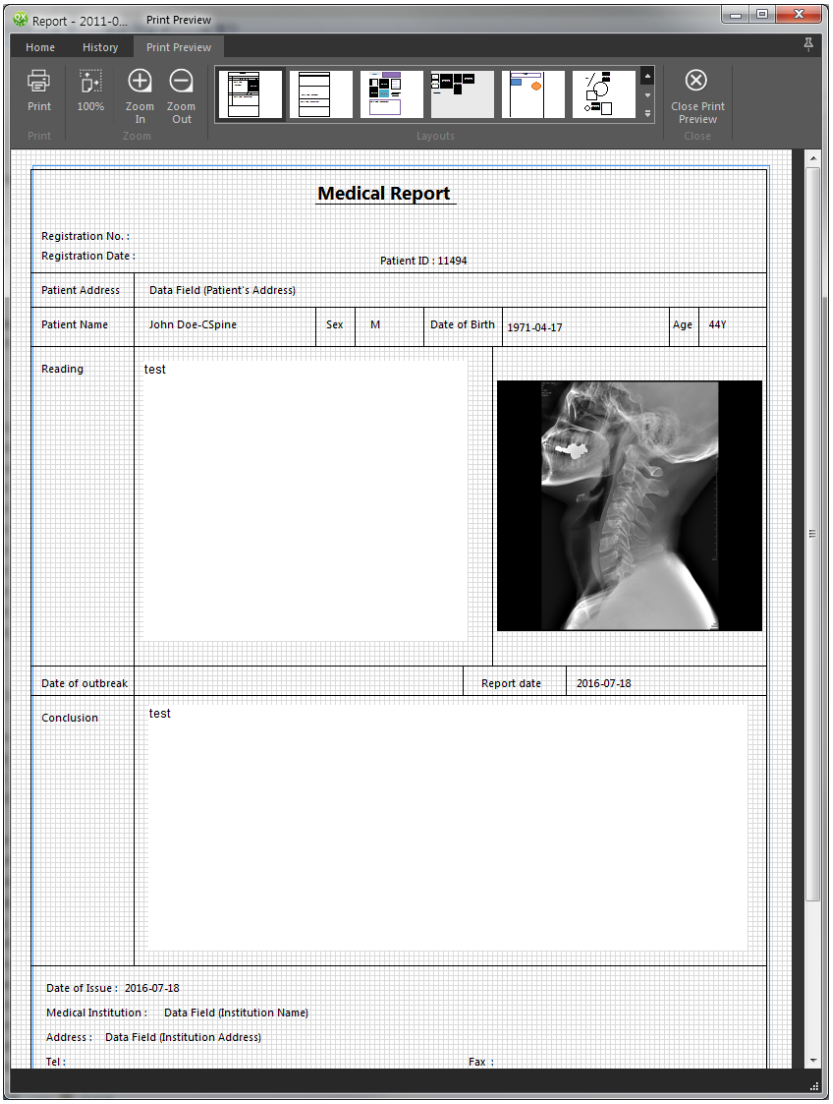
Attach a selected image to the **Picture** field. This function is useful when you attach an image which is not specified as a key image or when you change the order of the attachments.

1 Select an image from the desired study.

2 Drag the image to the picture area of the report while pressing and holding the **Alt** key and the left mouse button.



3 Check the attached image.



- If you already set an image as the key image, it is inserted in the report layout automatically.
- Make sure that there should be the **Picture** area in the report layout to attach the image or video registered as a key image by dragging a mouse button.

8.1.9 Clipboard

Button	Name	Description
	Cut	Cuts out a selected area and store it in the clipboard temporarily.
	Copy	Copies a selected area and store it in the clipboard temporarily.
	Paste	Pastes the contents in the clipboard into a desired location.

8.1.10 Font

Change the current font type / size or those of the selected text.

Button	Name	Description
	**Grow font**	Increases the text size.
	**Shrink font**	Decreases the text size.
	**Clear formatting**	Clears every format of the selected area and leaves the plain texts only.
	**Bold**	Indicates the selected text in bold style.
	**Italic**	Indicates the selected text in Italic style.
	**Underline**	Draws a line under the selected text.
	**Strikethrough**	Draws a line through the middle of selected text.
	**Subscript**	Creates a small letter below the baseline of text.
	**Superscript**	Creates a small letter above the line of text.
	**Change case**	• Changes the first character of the selected text to uppercase. • Changes the selected text to lowercase. • Changes the selected text to uppercase. • Capitalizes each word of the selected text. • Toggles between the uppercase and lowercase.
	**Text highlight color**	Applies a specific color to mark the text or change the background color.
	**Font color**	Changes the text color.

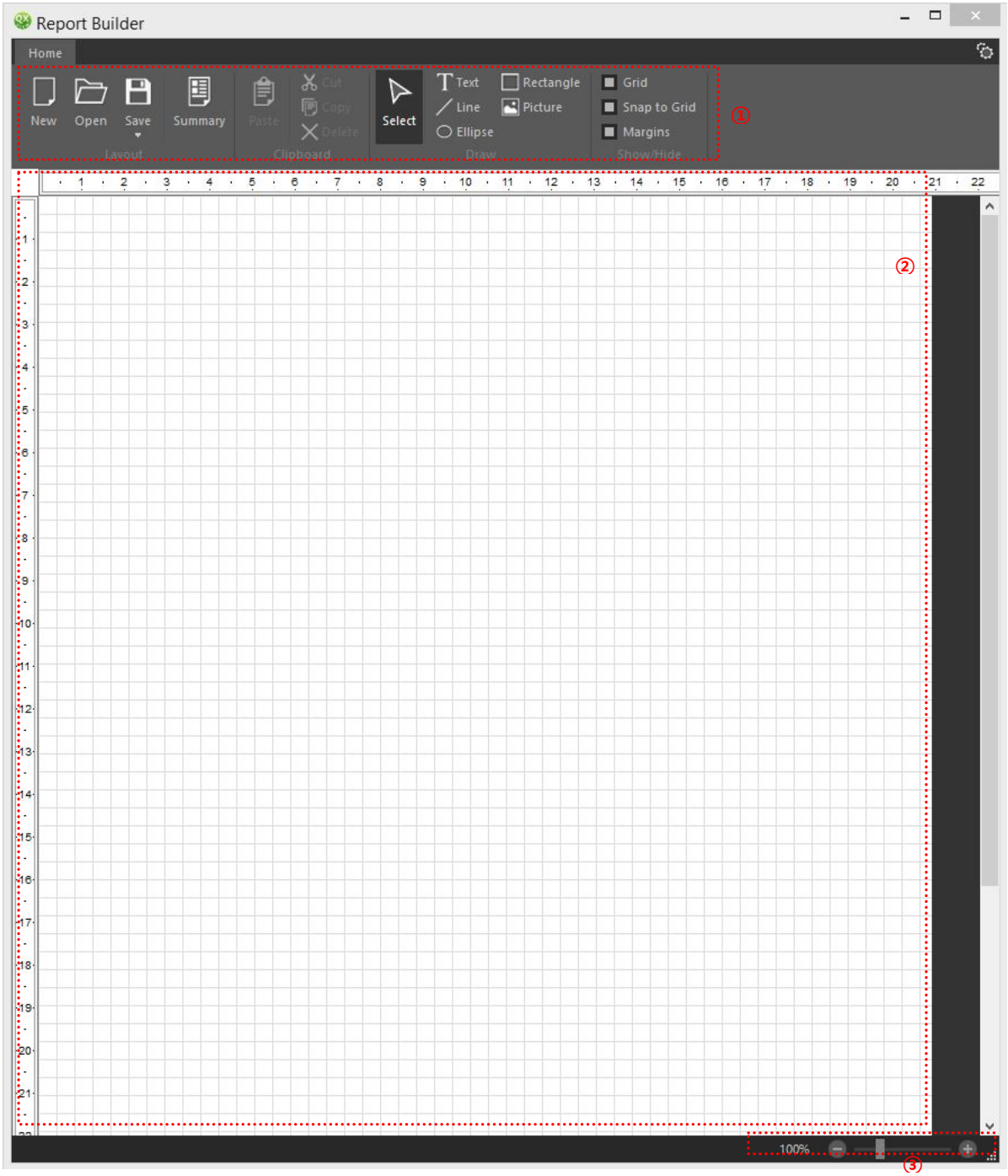
8.1.11 Paragraph

Button	Name	Description
	**Decrease indent**	Decreases the indent level of the paragraph.
	**Increase indent**	Increases the indent level of the paragraph.
	**Align Text Left**	Aligns the text to the left.
	**Center**	Aligns the text to the center.
	**Align Text Right**	Aligns the text to the right.
	**Justify**	Aligns the text to both the left and right margins, adds extra space between words as necessary.

8.2 Report Builder

8.2.1 Composition of Report Builder

Home



No.	Item
1	Toolbar
2	Report Format
3	Status Bar

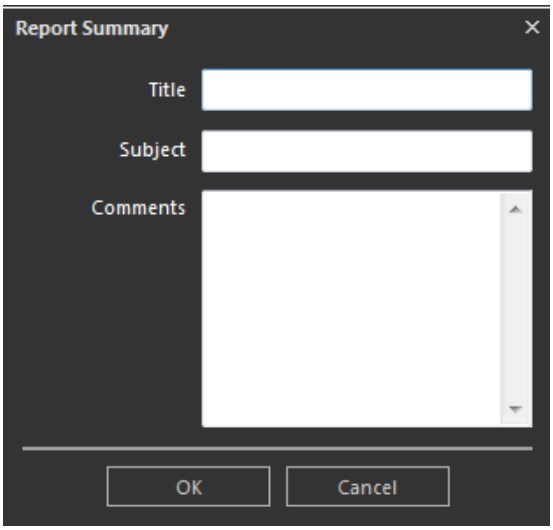
8.2.2 Layout

Button	Name	Description
	**Creating a new layout**	Closes the currently edited layout and create a new one. If you did not save the current layout, a confirmation message will appear before closing the layout.
	**Opening an existing layout**	Opens the stored layout file.
	**Saving layout**	Saves the currently edited layout to the external file.
	**Save As**	Saves a layout as a different name.
	**Save As Default**	Specifies a layout as a default one.

- Be sure to save a report layout file to the folder **C:₩Program Files₩Vieworks₩Viewer₩Repory**.
- Check if the file extension is **.RPT**.

8.2.3 Report Summary

Button	Name	Description
	**Report Summary**	Inputs summary information of the current report layout such as the title, subject and brief description.



8.2.4 Clipboard

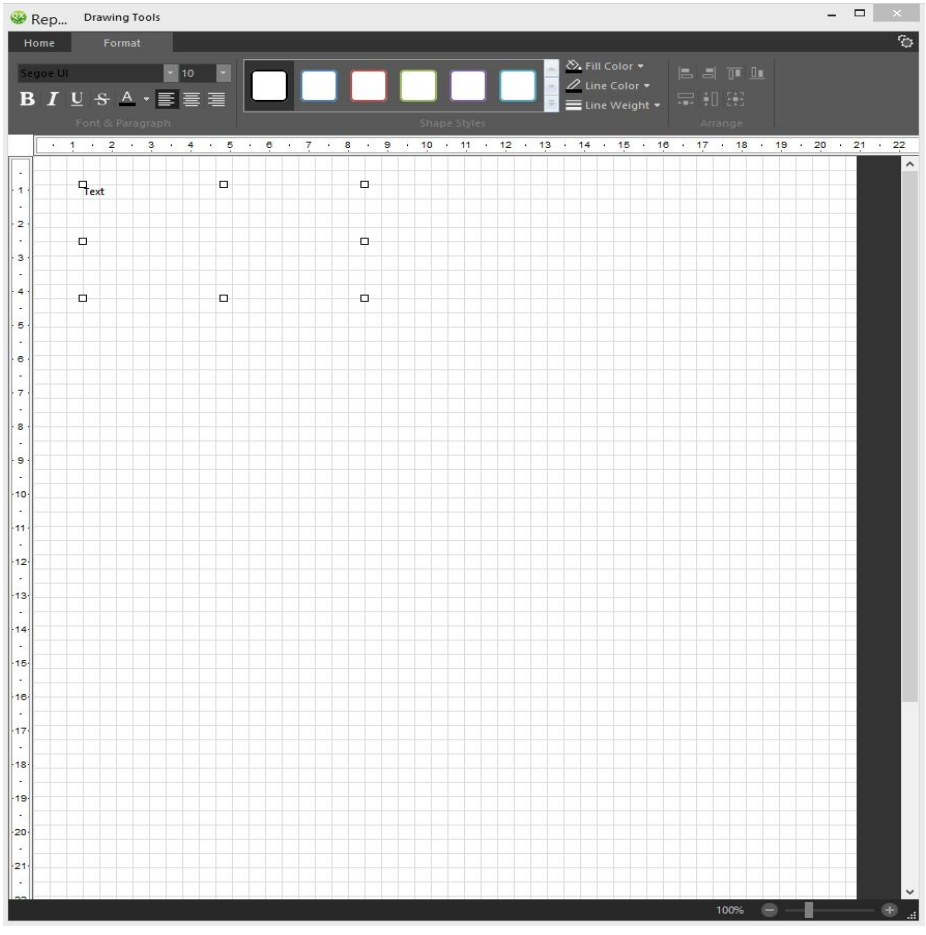
Button	Name	Description
	**Cut**	Cuts out the selected part and store it in the clipboard temporarily.
	**Copy**	Copies the selected part and store it in the clipboard temporarily.
	**Delete**	Deletes the selected object.
	**Paste**	Pastes the contents in the clipboard to a desired location.

8.2.5 Inserting Text

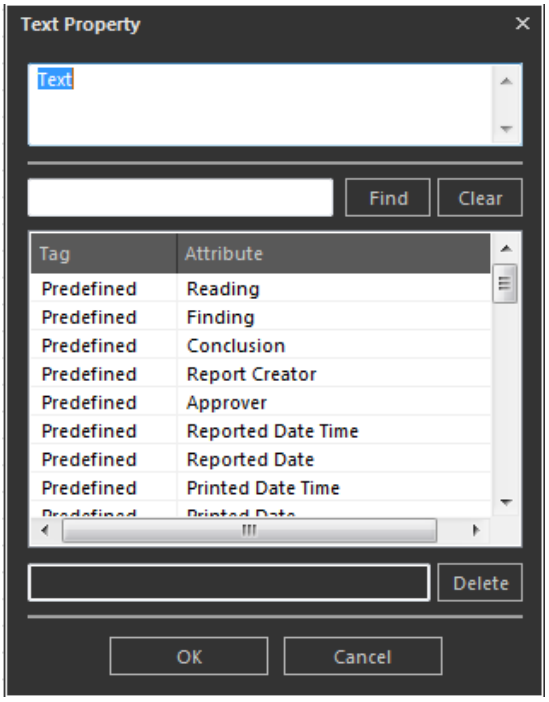
Button	Name	Description
	**Text**	Adds text to the report to print out. You can input the text directly or import and indicate the specific information of study.

1 Click on the **Text** button.

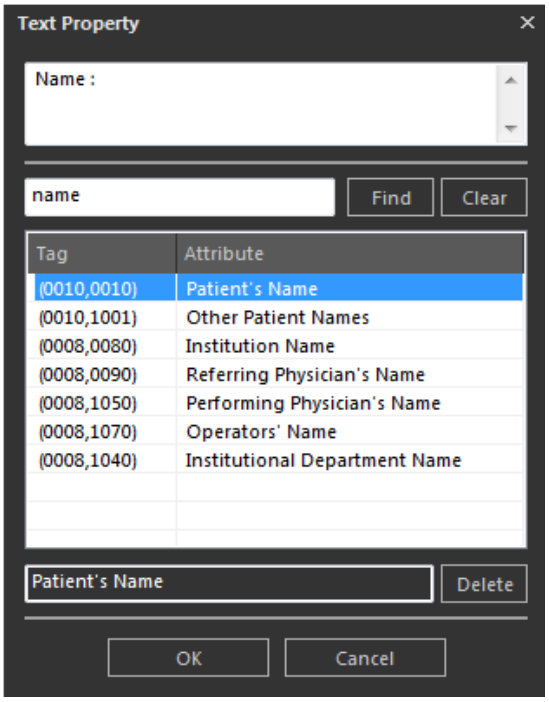
2 Press and hold the left mouse button, and draw a text input field by dragging the mouse.



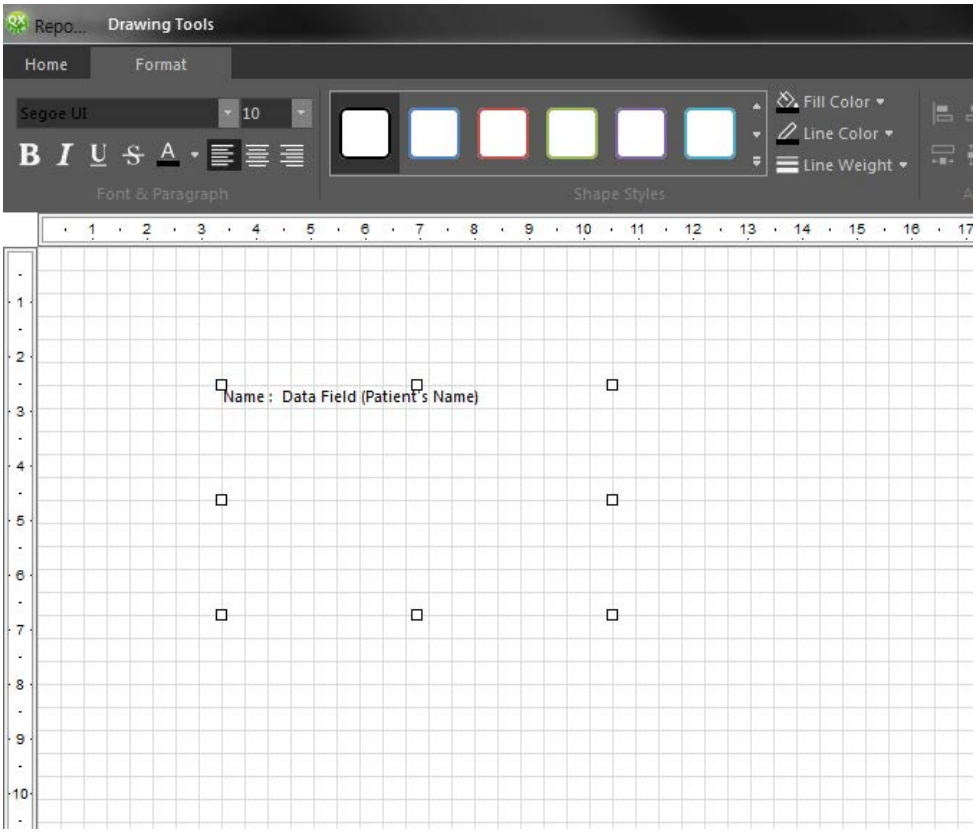
3 Double-click the text input field to open the **Text Property** window.



4 Enter the text in the text input field, or double-click an item in the **Tag** list to indicate it.



5 Click the **OK** button and check the configured items.



- Be sure to input texts in the fixed field.
- The pre-defined tags are as follows. If you use the tags below, the tag value for each exam will be inserted to the report automatically.
  - Reading, Finding, Conclusion, Report creator, Approver, Report Date Time, Report Date, Printed Date Time, Printed Date, Patient's Name, Patient ID, Other Patient IDs, Other Patient Names, Patient's Age, Occupation, Patient's Birth Date, Patient's Birth Time, Patient's Sex, Patient's Size, Patient's Weight, Patient's Address, Patient Comments, Current Patient Location, Medical Alerts, Allergies, Special Needs, Institution Name, Institution Address, Referring Physician's Name, Requesting Physician, Study Date, Study Time, Study ID, Accession Number, Study Description, Modality, Performing Physician's Name, Operator's Name, Body part Examined, Requesting Service, Institutional Department Name

8.2.6 Drawing a Figure

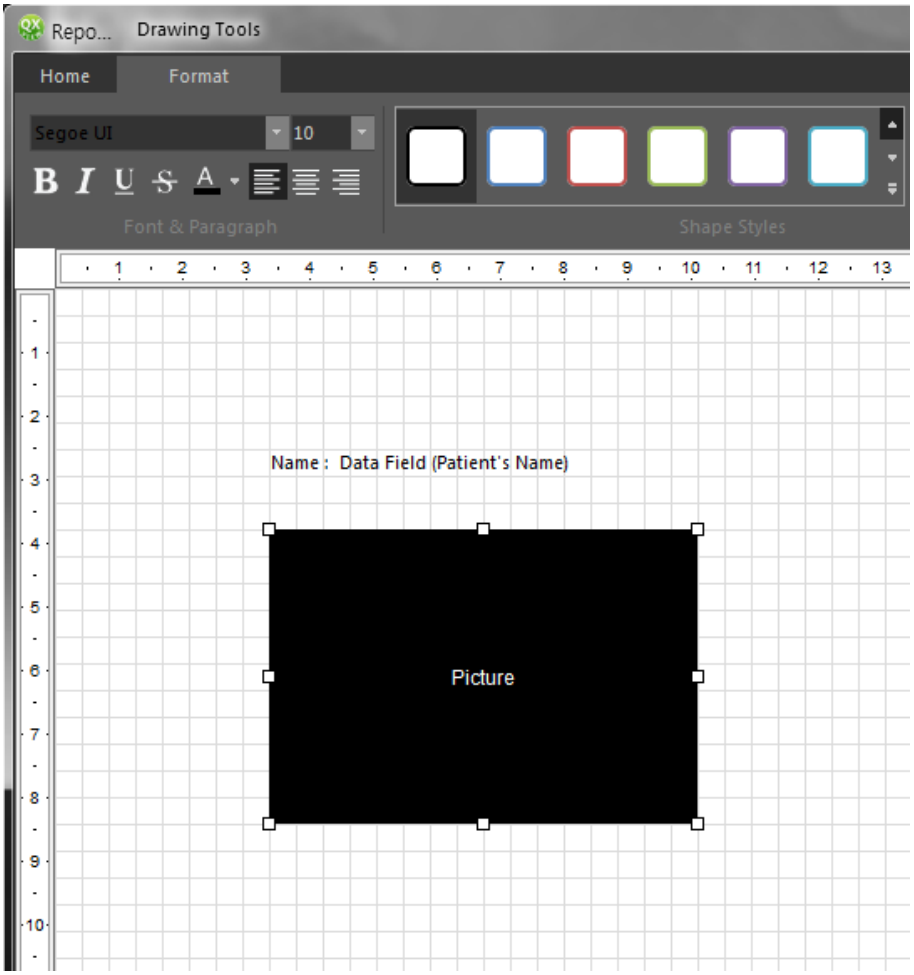
Button	Name	Description
	**Line**	Adds a line.
	**Ellipse**	Adds an ellipse.
	**Rectangle**	Adds a rectangle.

8.2.7 Inserting a Picture

Button	Name	Description
	**Picture**	Attaches an image to the study and prints it.

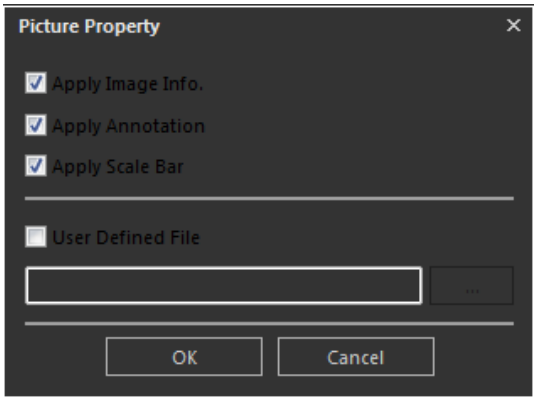
1 Click on the **Picture** button.

2 Press and hold the left mouse button, and draw an insertion field of picture by dragging the mouse.



3 Double-click the **Picture** field to open the **Picture Property** window.

4 When you attach an image of the study, you can select the following information.

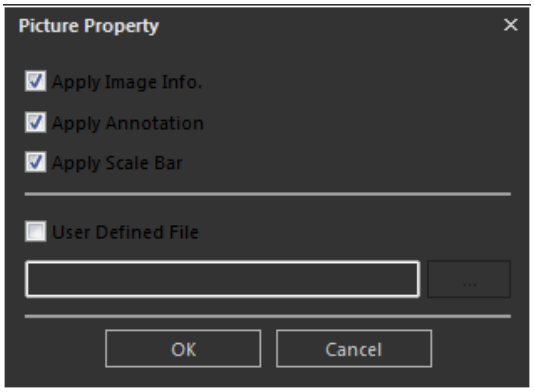


Attaching the User-Defined Picture

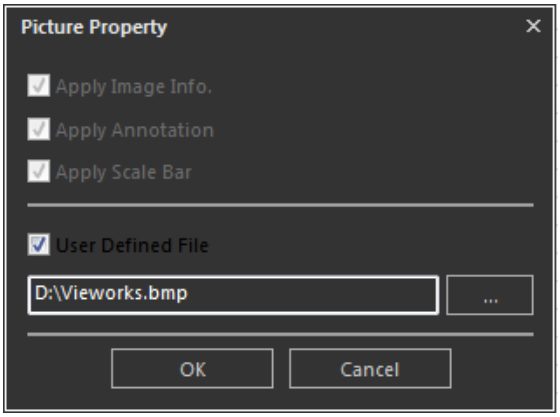
You can attach a general image file, not an image from the study. This function is useful when you insert a hospital logo, a signature of physician or clinical reference images.

- The extension of **.BMP** file is supported only.

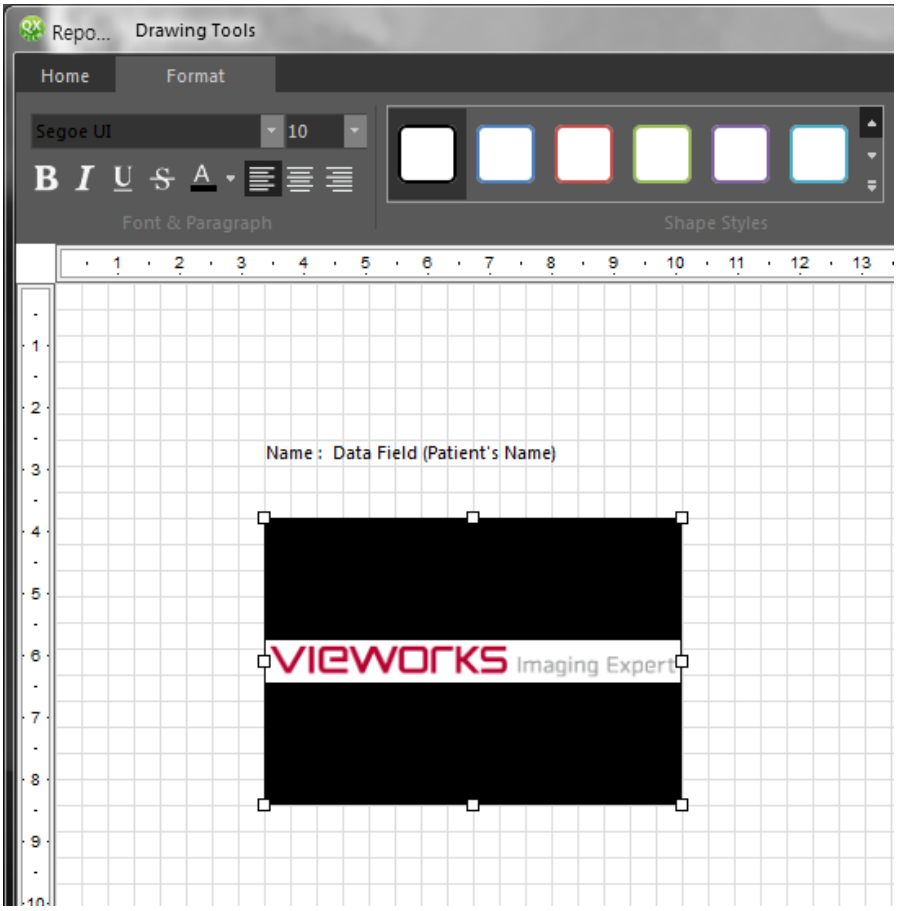
1 Double-click the added input field to open the **Picture Property** window.



2 **User Definedf file** Selct the **User Defined file** checkbox and click ... button, then select an image file to insert.



3 Click the **OK** button and check if the image is indicated normally.



- You cannot attach an image of the study to the picture area where you inserted a user-defined file.

8.2.8 Grid / Margin

Function	Description
Show / Hide Grid	Shows or hides a gird. The grid is not showed when printing out the report.
Snap to Grid	When you move or resize an object, it will align or snap to the nearest intersection of lines in the grid. This is useful when you align objects including the layout.
Show / Hide Margin	Shows or hides margin guidelines of the paper to be printed out. The guideline is not showed when printing out the report.

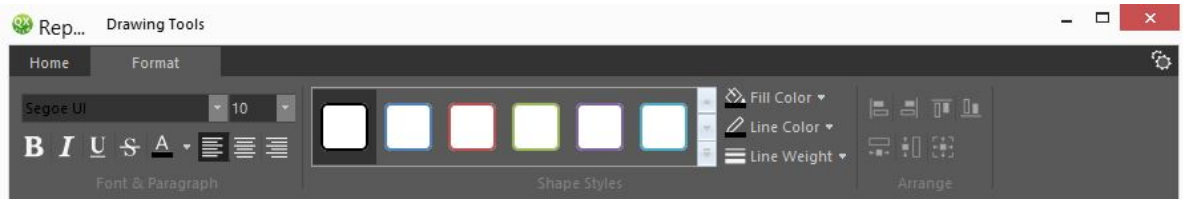
8.2.9 Changing Font Type and Size

Change the font type and size of texts showed on the screen.

Button	Name	Description
	**Bold**	Indicates the selected text in bold style.
	**Italic**	Indicates the selected text in Italic style.
	**Underline**	Draws a line under the selected text.
	**Strikethrough**	Draws a line through the middle of selected text.
	**Font color**	Changes the text color.
	**Align text left**	Aligns the text to the left.
	**Center**	Aligns the text to the center.
	**Align text right**	Aligns the text to the right.
	**Center for Justify**	Aligns text evenly between the left and right margins.

8.2.10 Applying the Figure Style

Apply a pre-defined figure style.



Name	Description
Fill Color	Fills a selected shape with a specified color.
Line Color	Changes the color of selected lines.
Line Weight	Changes the thickness of a line or border.

8.2.11 Arrangement of Objects

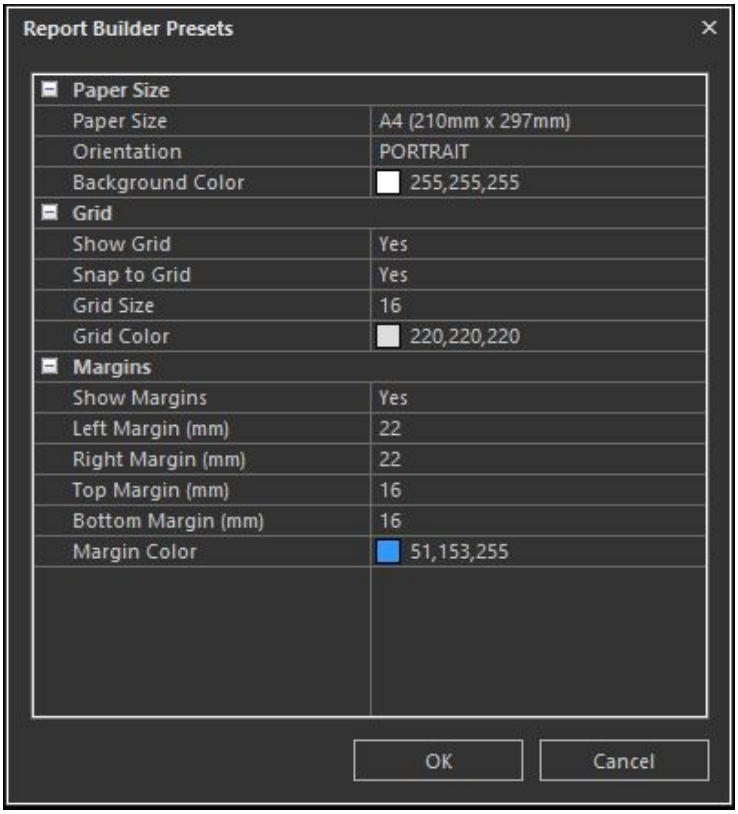
Align or resize the objects based on the lastly selected object.

Button	Function	Description
	**Align Lefts**	Aligns the edges of the objects to the left.
	**Align Rights**	Aligns the edges of the objects to the right.
	**Align Tops**	Aligns the top edges of the objects.
	**Align Bottoms**	Aligns the bottom edges of the objects.
	**Make Same Width**	Matches the width of objects as same.
	**Make Same Height**	Matches the height of objects as same.
	**Make Same Size**	Matches the height and width sizes of objects as same.

8.2.12 Setting Environment of Report Builder

You can set various options of report formats. The preset options are as follows.

Name		Description
Paper Size		
	Paper Size	Sets the paper size
	Orientation	Sets the orientation of paper
	Background Color	Changes the background color
Grid		
	Show Grid	Indicates grids
	Snap to Grid	Hides grids
	Grid Size	Sets the grid size
	Grid Color	Sets the grid color
Margins		
	Show Margins	Indicates the guideline of margins.
	Left Margin (mm)	Sets the left margin in mm.
	Right Margin (mm)	Sets the right margin in mm.
	Top Margin (mm)	Sets the top margin in mm.
	Bottom Margin (mm)	Sets the bottom margin in mm.
	Margin Color	Changes the color of margin lines.


Report Builder Presets
Paper Size
Paper Size
A4 (210mm x 297mm)
Orientation
PORTRAIT
Background Color
255,255,255
Grid
Show Grid
Yes
Snap to Grid
Yes
Grid Size
16
Grid Color
220,220,220
Margins
Show Margins
Yes
Left Margin (mm)
22
Right Margin (mm)
22
Top Margin (mm)
16
Bottom Margin (mm)
16
Margin Color
51,153,255
OK
Cancel

9. Print

This section explains about the way to print selected images.

Print Window

Print Type

Changing Format

Adjusting Size

Changing Position

9.1 Print Window

No.	Name	Function
1	**Image manipulation toolbar**	• Displays tools used for image manipulation.
2	**Print area**	• Displays the printed area of selected image.
3	**Stauts bar**	• Displays function and its status.

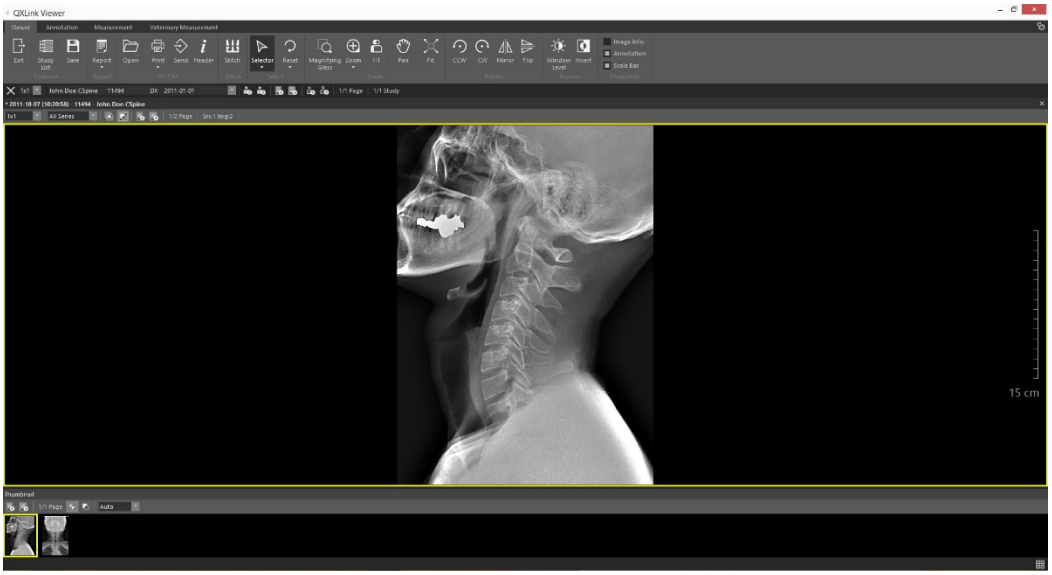
9.1.1 Moving to the Print Window

- The information of Window Level, Annotation, Zoom In/Out ratio and Pan will be maintained even if you copy an image from the **Viewer** window to the **Print** window.
- If the image is consisted of multiple frames, **QXLink Viewer** will copy the image displayed on the **Viewer** window currently to the **Print** window.

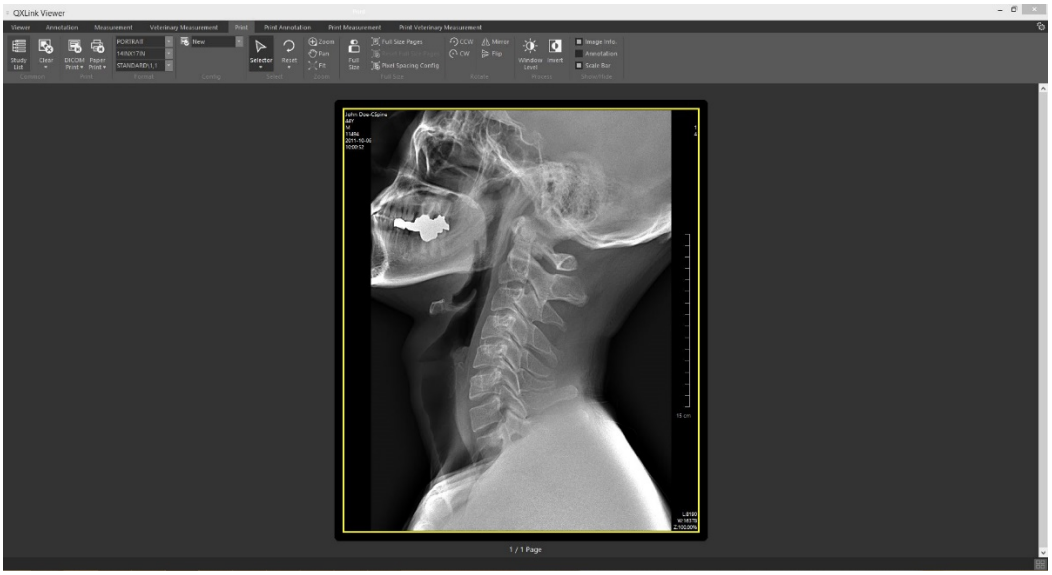
Opening into New Film

Button	Name	Description
	**Open into New Film**	Removes an image on the **Print** window, and copies the selected image from the **Viewer** window to the **Print** window.

1 Select an image from the desired study.



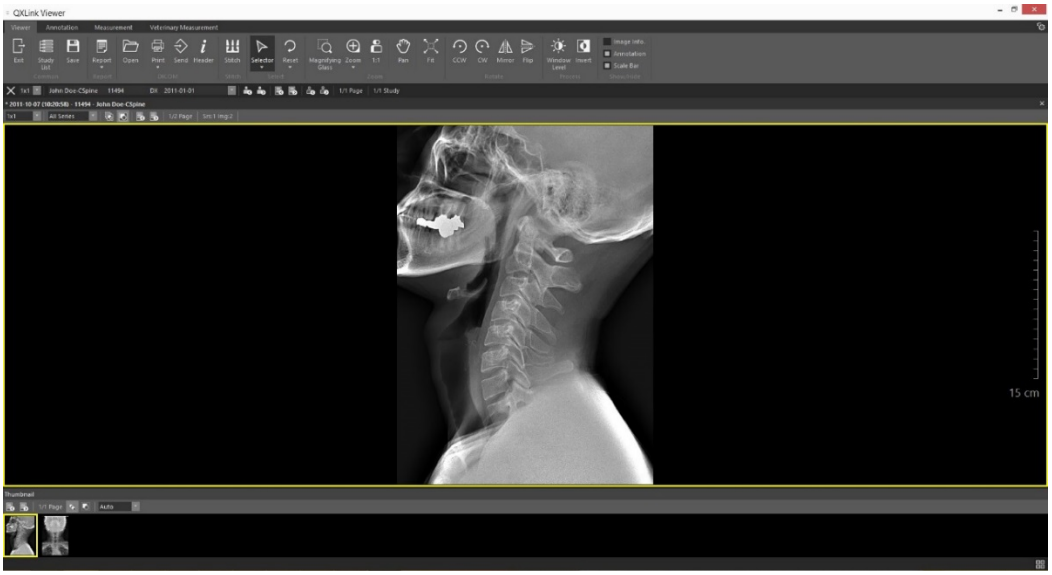
2 Click the bottom of the **Print** button on the toolbar and select the **Open into New Film** menu.



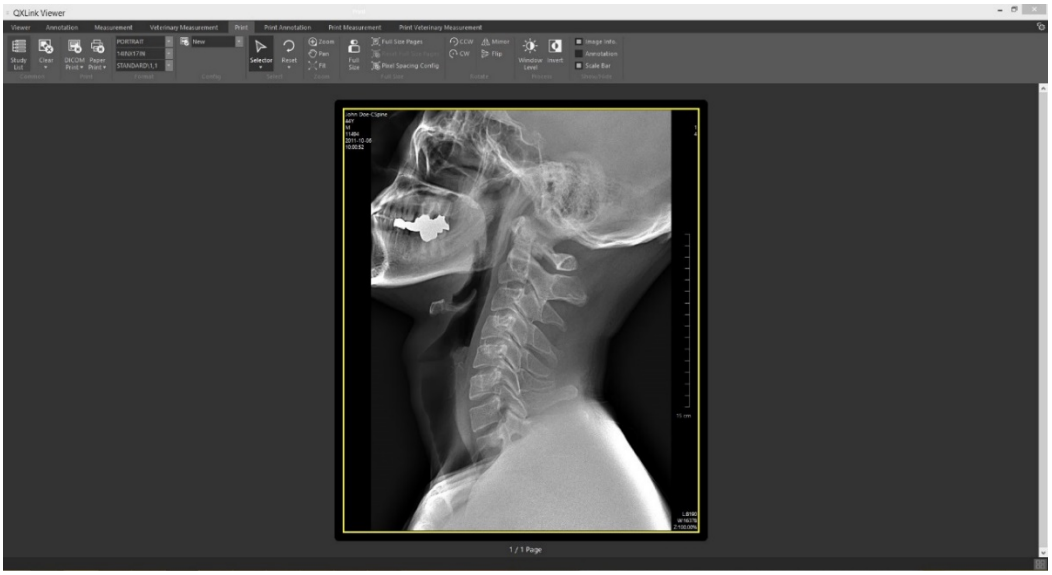
Adding to Existing Film

Button	Name	Description
	**Add to Existing Film**	Adds a selected image to the existing film. This function is useful when you select images from the multiple studies and print them out.

1 Select an image from the desired study.

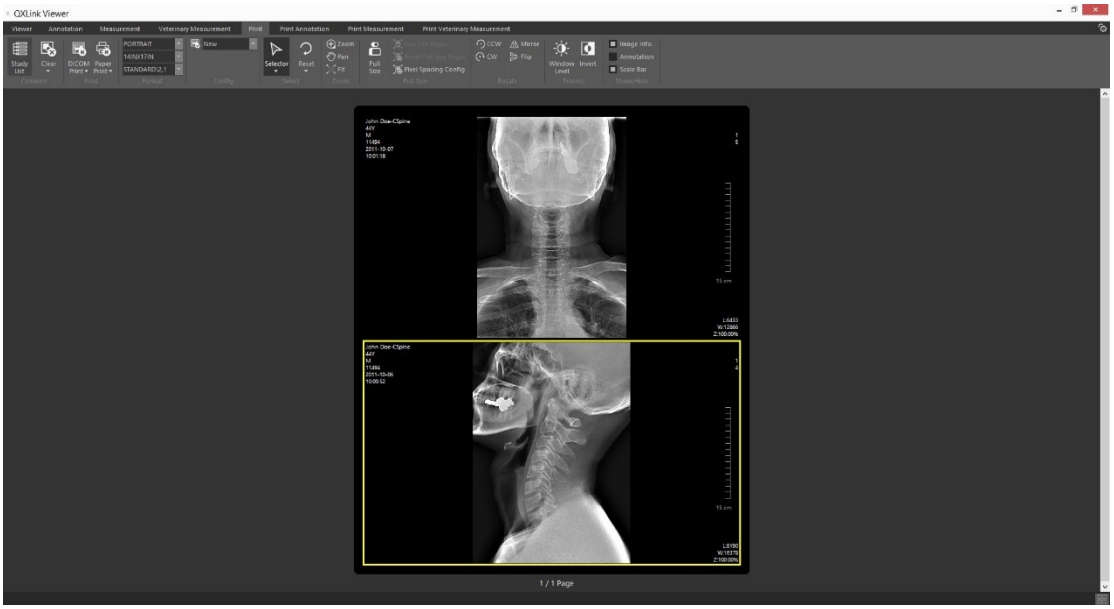


2 Click on the **Print** button on the toolbar.



3 Select an image from another study in the **Viewer** window.

4 Click the bottom of the **Print** button on the toolbar and select the **Add to Existing Film** menu.



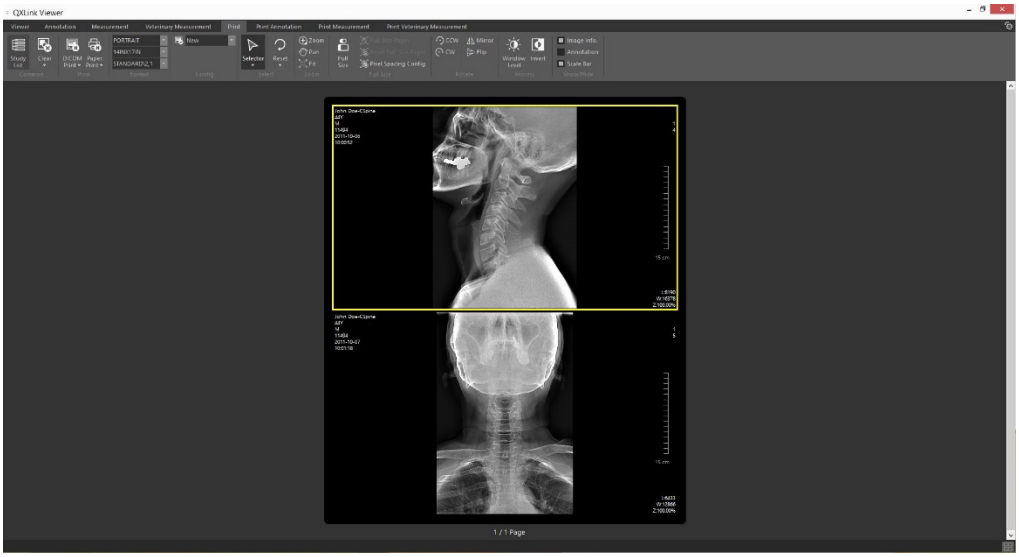
9.1.2 Closing the Print Window

Clear

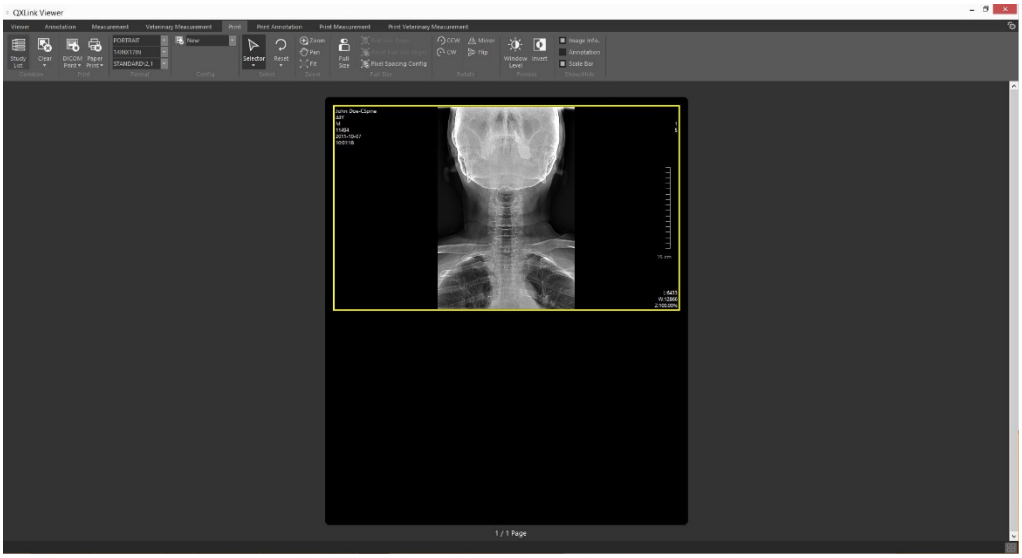
Button	Name	Description
	**Clear All**	Removes all images in the **Print** window, and moves to the **Viewer** window.
	**Clear Selected Image(s)**	Removes the selected image from the **Print** window.

- The contents of image changed from the **Print** window are not applied to the image in the **Viewer** window.
- If there is only one image in the **Print** window, the **Print** window will be closed and moved to the **Viewer** window after deleting the image.

1 Select an image to remove.



2 Click the bottom of **Clear** button on the toolbar and select the **Clear the Selected Image(s)** menu.



9.2 Print Type

9.2.1 DICOM Print

Button	Name	Description
	**Print All Pages**	Transfers all images from the **Print** window to the DICOM printer. You can stop DICOM printing while printing out images.
	**Print Current Page**	Transfers images in the current page to the DICOM printer.

- When the images are transferred to the DICOM printer normally, the mark **Printed** will be displayed on the right top corner of the image.

9.2.2 Paper Print

Button	Name	Description
	**Print All Pages**	Prints out all images in the **Print** window on paper.
	**Print Current Page**	Prints out images in the current page on paper.

9.3 Changing Format

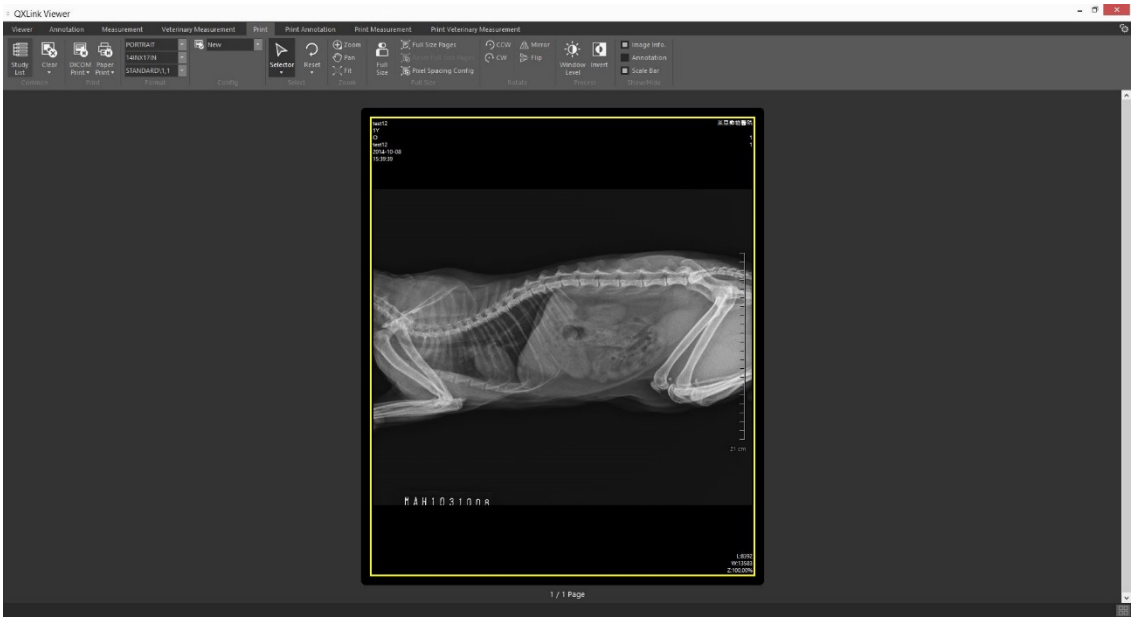
Change the print orientation and film size.

- The default value configured on the DICOM printer is used, and the lastly changed settings will be maintained while operating **QXLink Viewer**.

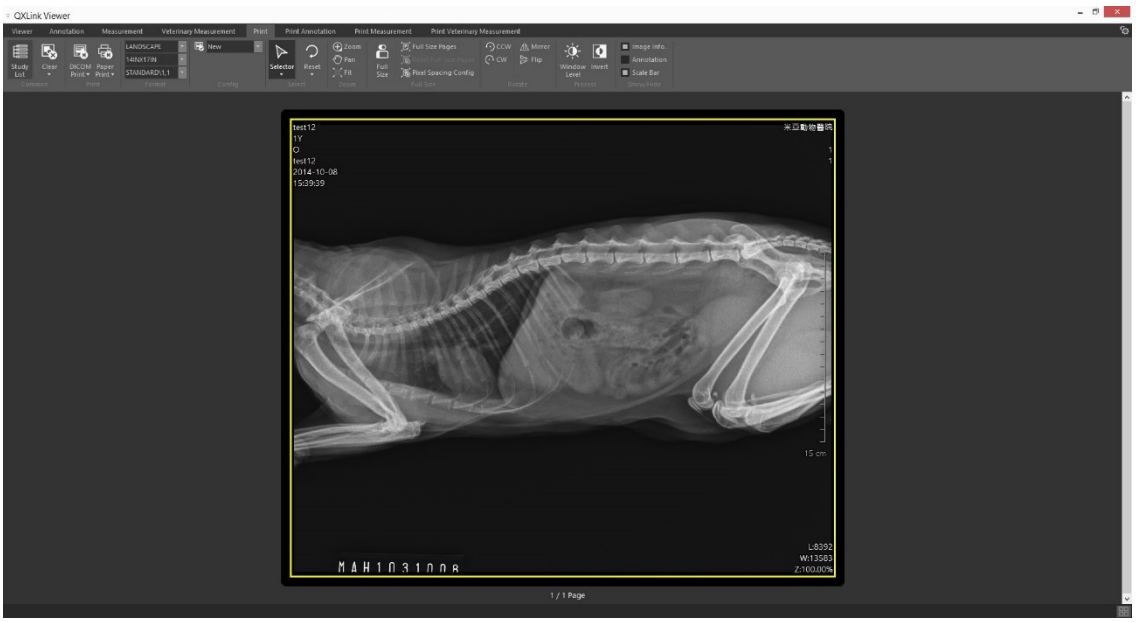
9.3.1 Changing Print Orientation

You can change the print orientation of image.

Portrait



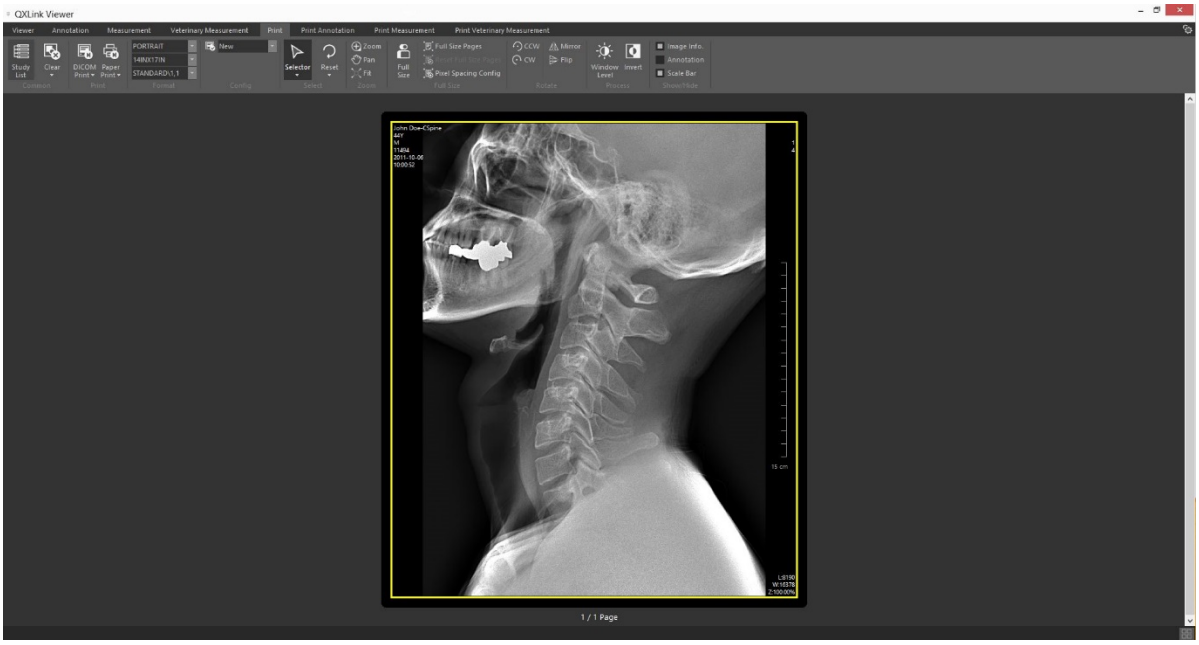
Landscape



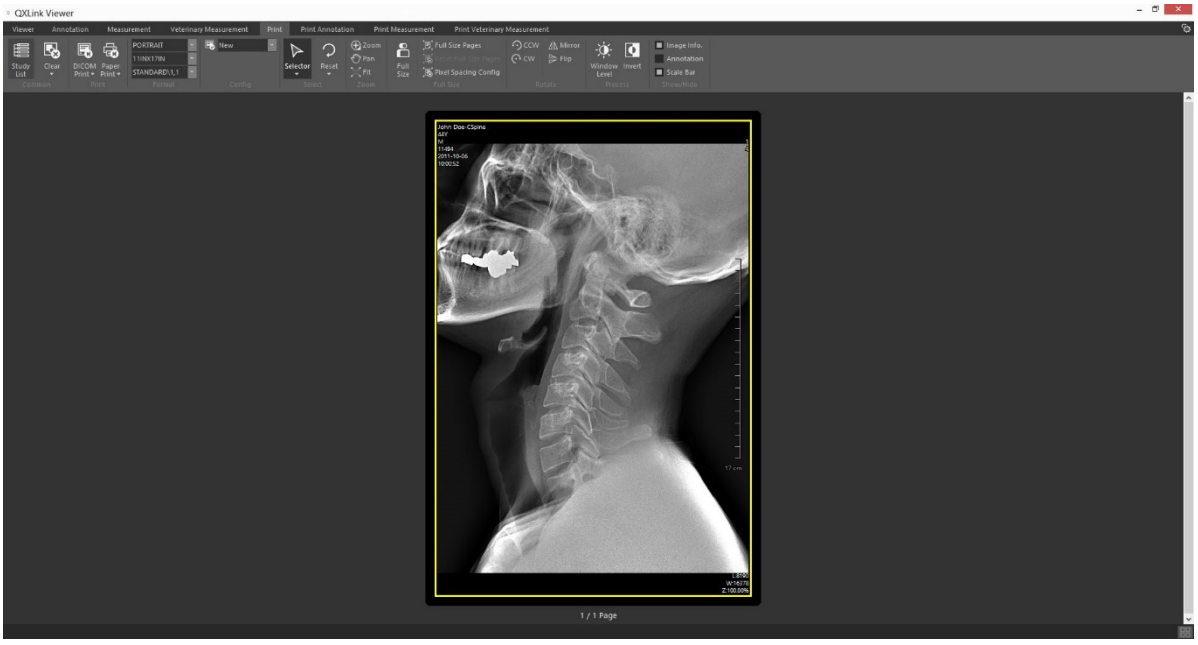
9.3.2 Changing Film Size

You can choose the film size to print out. The image displayed on the screen is resized properly according to the configured film size.

14IN x 17IN



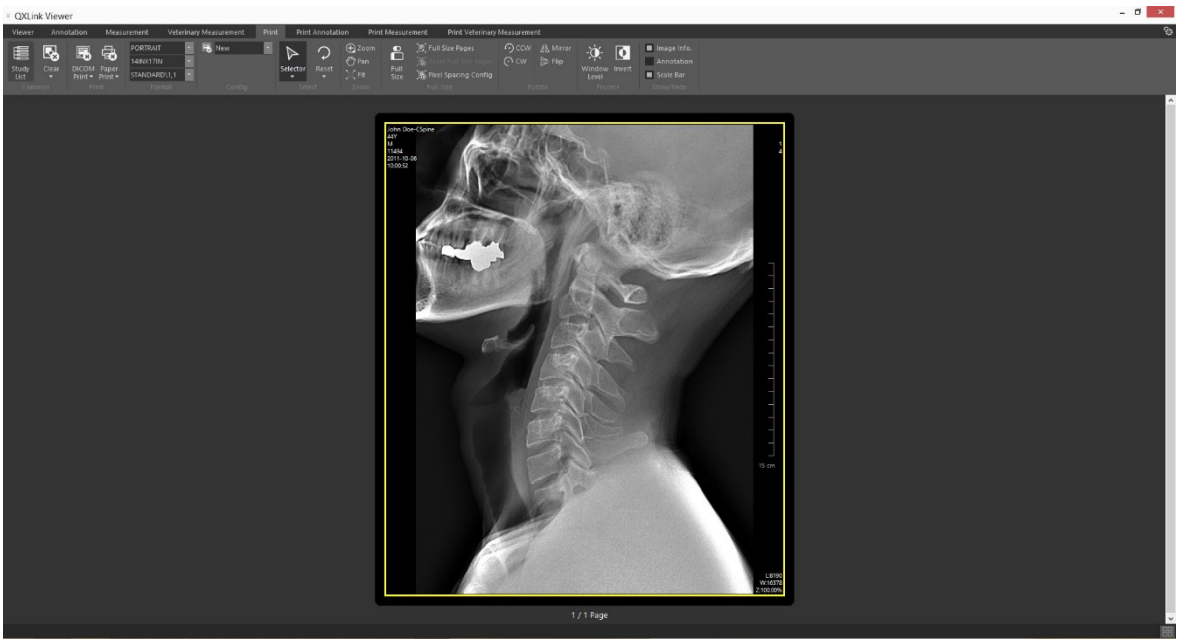
11N x 17N



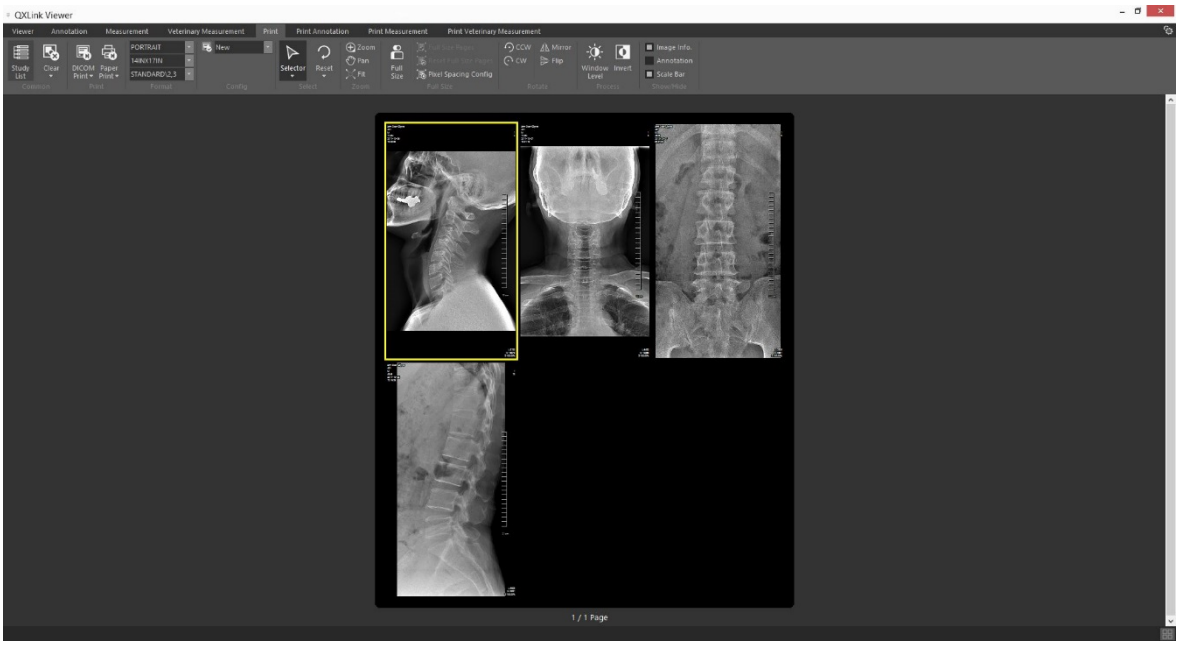
9.3.3 Changing Layout

You can change the image layout. Print out the image according to the layout displayed on the screen.

STANDARD₩1,1



STANDARD₩2,3



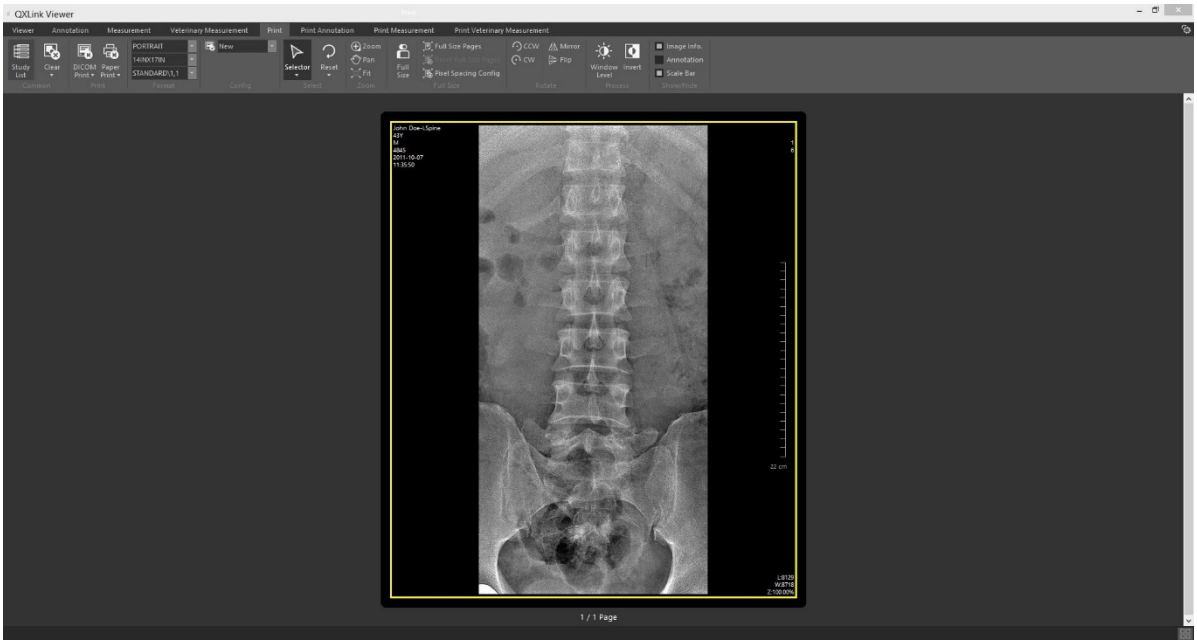
- You can change the order or type of image layout. For more information, refer to the **Preset** chapter.

9.4 Adjusting Size

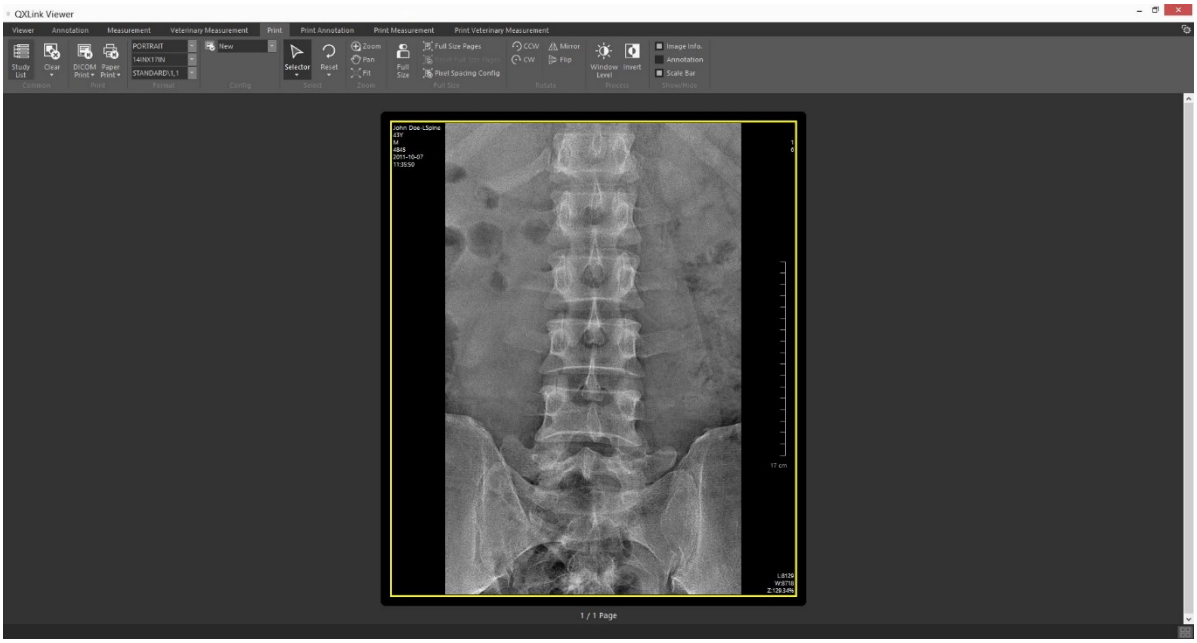
9.4.1 Full Size

Button	Name	Description
	**Full Size**	Enlarges or reduces the selected image to fit to the current film size. The image displays in a different size according to the film space settings available to be printed out.

Before applying Full Size to 14IN x 17IN Size



After applying Full Size to 14IN x 17IN Size

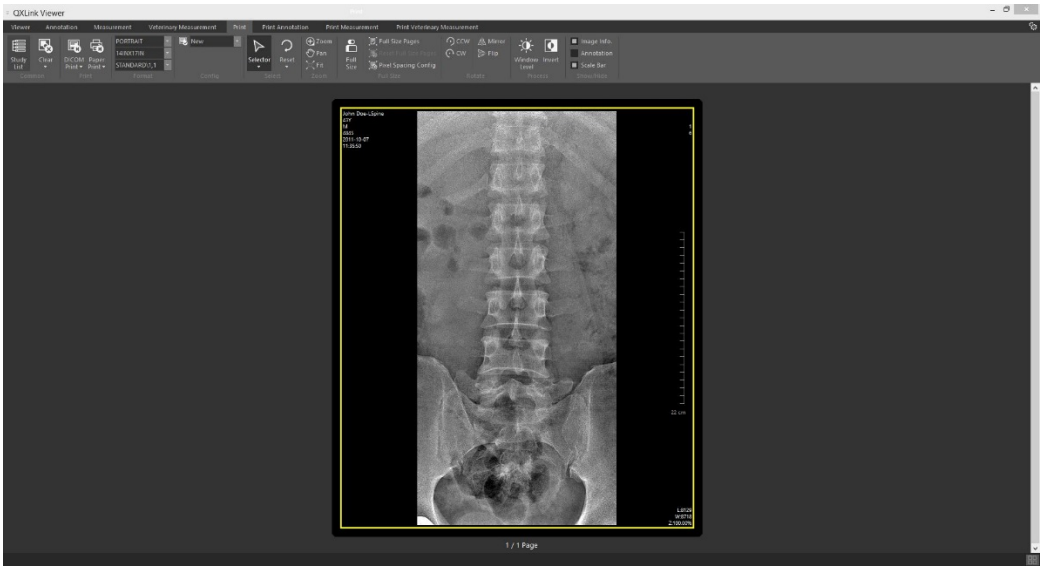


9.4.2 Full Size Pages

Button	Name	Description
	**Full Size Pages**	Enlarges the selected image to fit to the current film size and divide it to display each page. This function is useful when you divide and print the stitched image.

1 Select an image from the **Print** window.

2 Change the image layout to 1 column and 1 row.

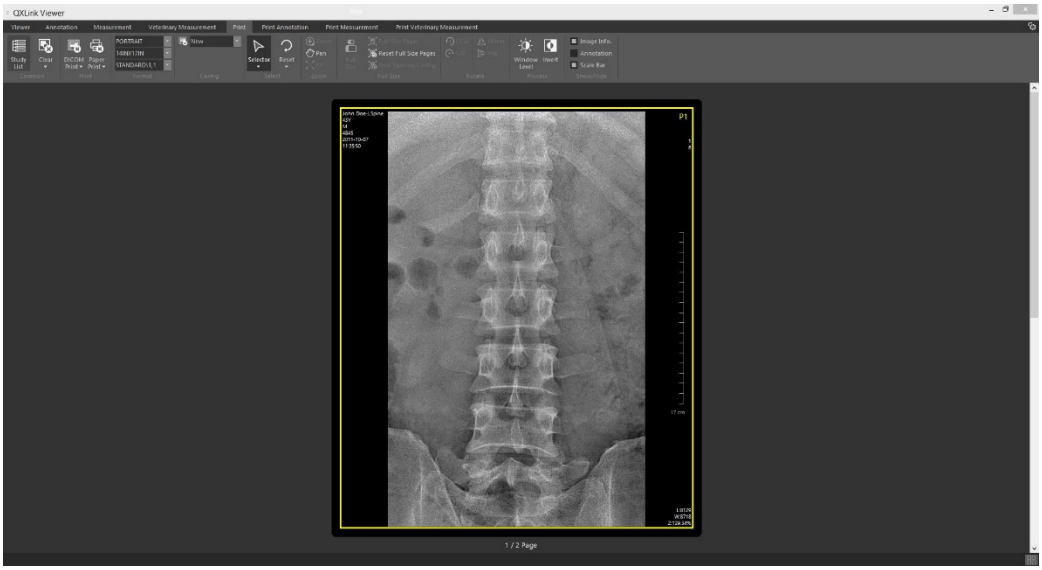


3 Click on the **Full Size Pages** button on the toolbar.

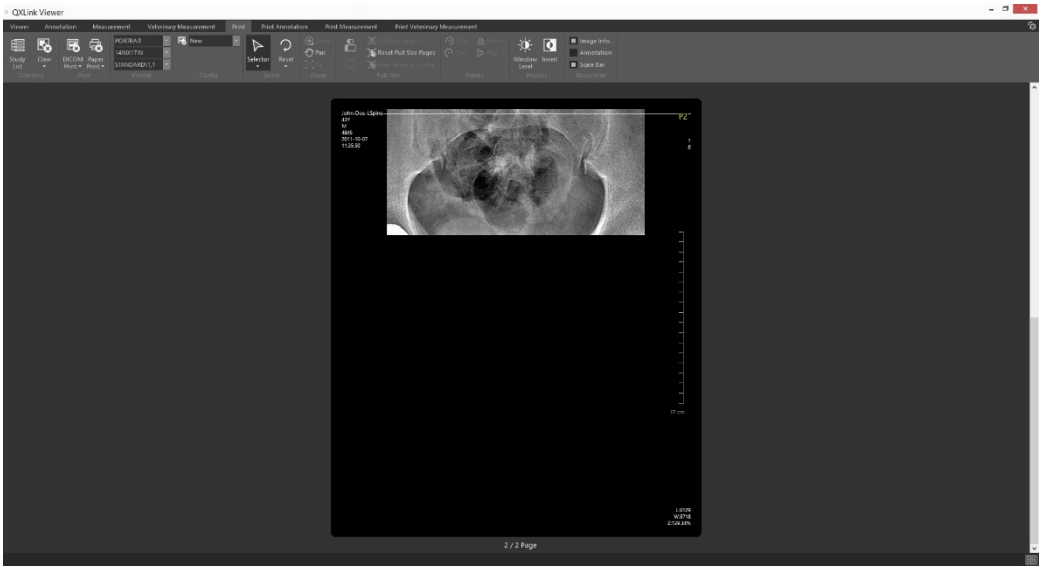
- If more than one image is selected or the image layout is set to other than 1 column and 1 row, the **Full Size Pages** button will be deactivated.

4 Check the enlarged image divided into pages.

▫ Page 1 (P1)



- Page 2 (P2)



5 The following functions cannot be used in the enlarged image divided in pages.

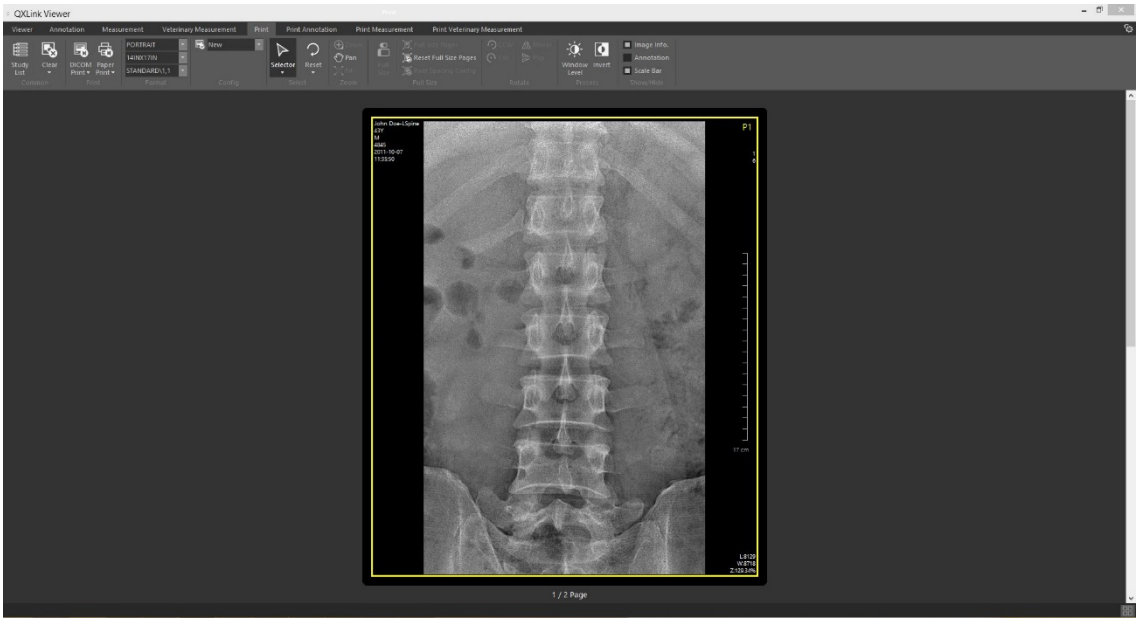
- Zoom
- Fit
- Full Size
- CW (Clockwise)
- CCW (Counter Clockwise)
- Mirror
- Flip

- The page information as P1 and P2 is displayed on the right top of the separated images.
- The separated images can be moved from side to side only.

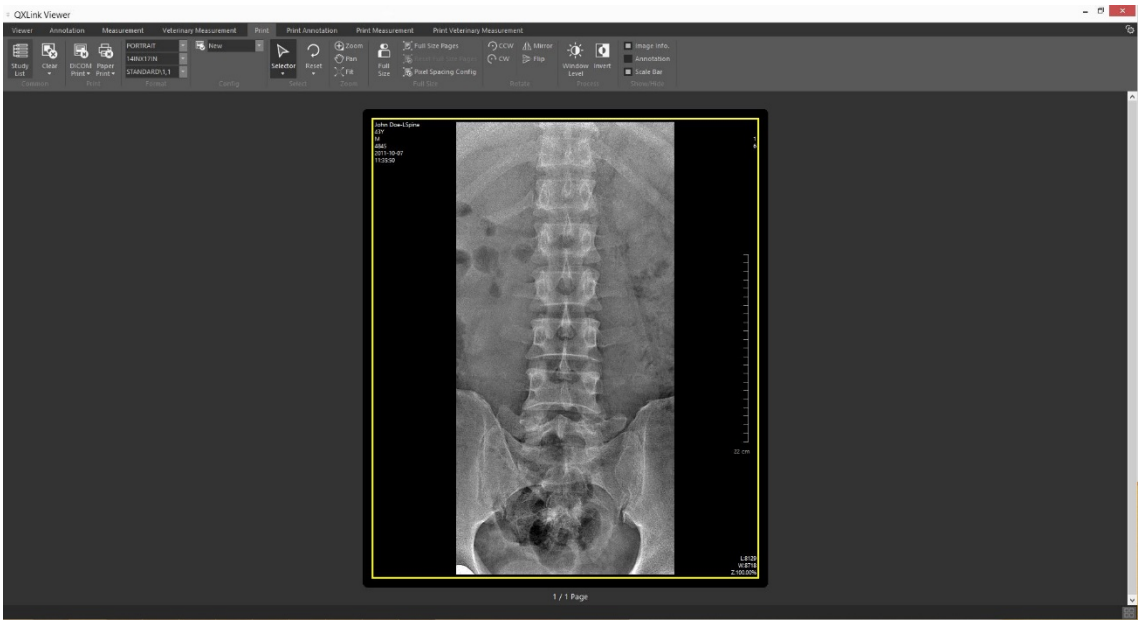
9.4.3 Reset Full Size Pages

Button	Name	Description
	**Reset Full Size Pages**	Resets the enlarged image separated in pages to its original state.

1 Select an enlarged image separated in pages.



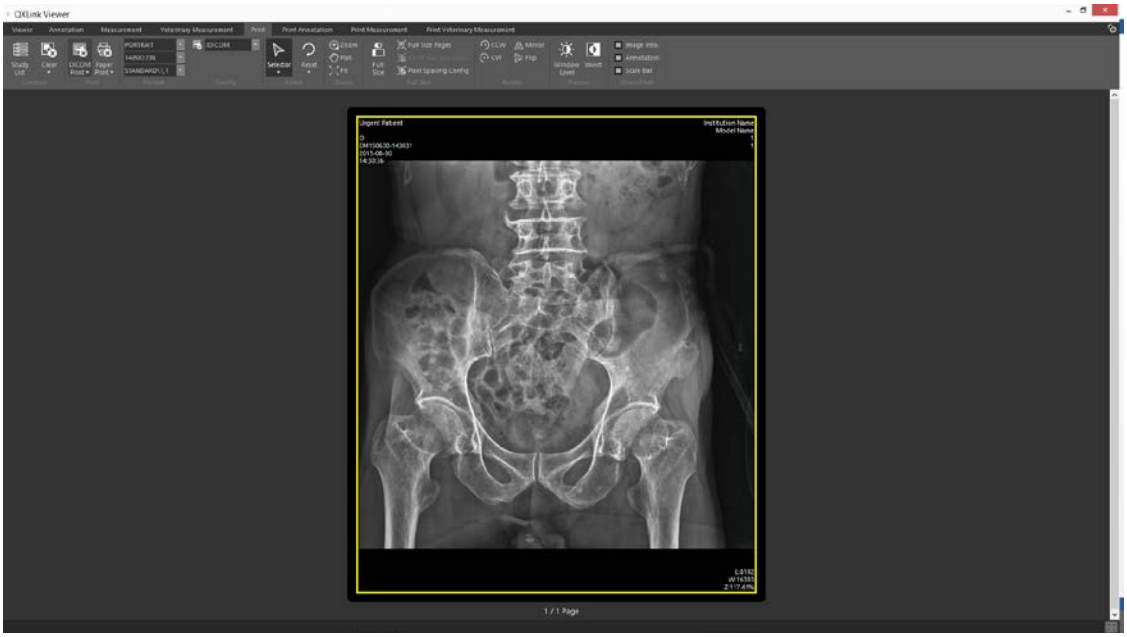
2 Click on the **Reset Full Size Pages** button on the toolbar.



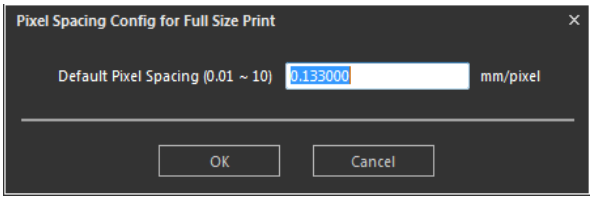
9.4.4 Setting Pixel Spacing

Button	Name	Description
	**Pixel Spacing Config**	Inputs the pixel spacing directly. When you perform the full size function, it will enlarge the image according to the current film size and the configured pixel spacing.

1 Select an image without a pixel spacing value.

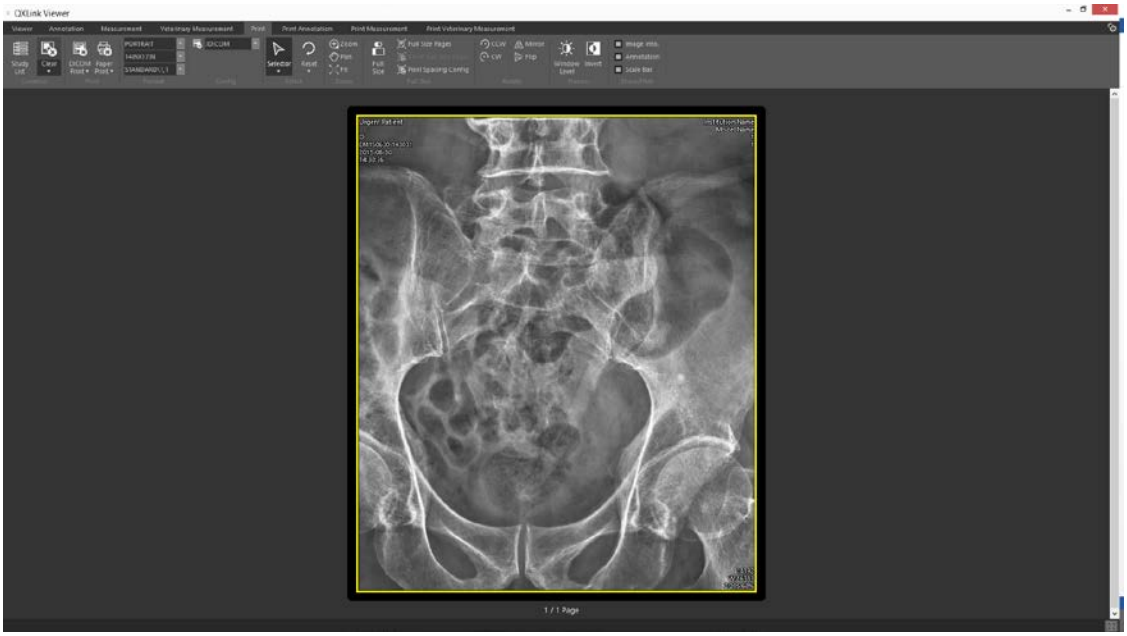


2 Click on the **Pixel Spacing Config** button on the toolbar.



3 Input the pixel spacing value and click the **OK** button.

4 Perform the **Full Size** function to verify whether the pixel spacing is appropriate or not.



- You can only configure the pixel spacing on the image which does not have **(0028,0030) Pixel Spacing** DICOM tag.
- The default value is 0.133. If you make changes to pixel spacing, the changed value will be maintained even when you restart **QXLink Viewer**.

9.5 Changing Position

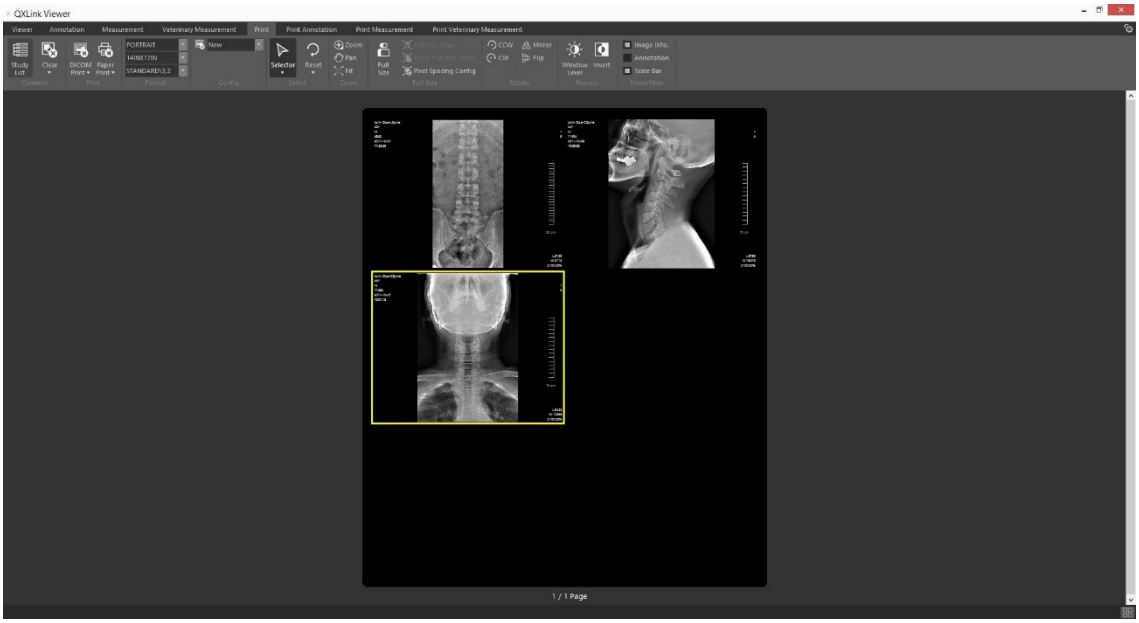
You can change the position of the images.

- You cannot change the position of the images which are enlarged and split into pages in full size.

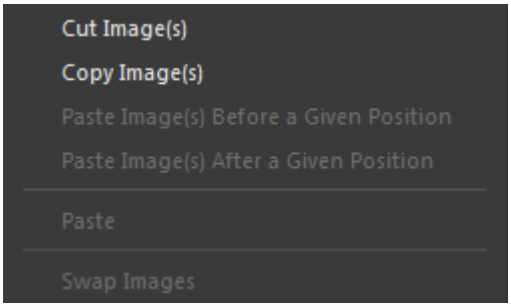
9.5.1 Paste Image in front of the Selected Location

Move the selected image in front of the specificed one.

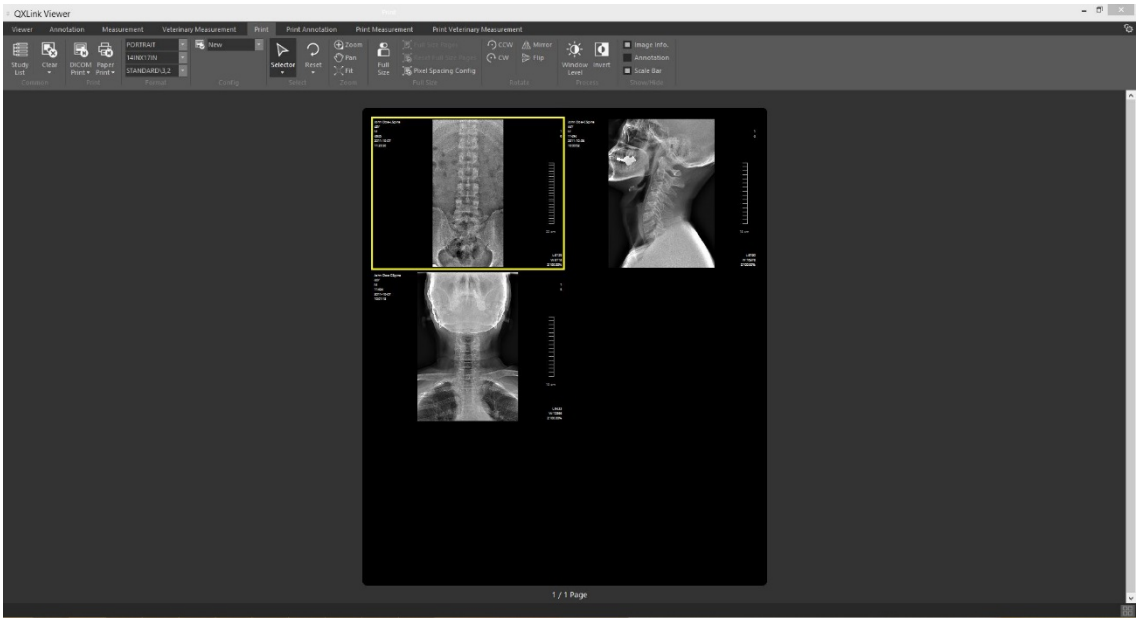
1 Select an image to change its position. (Available to choose multiple images)



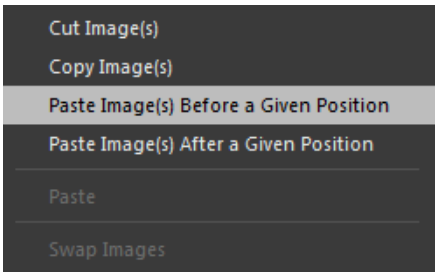
2 Click on a right mouse button to display popup menus and select **Cut Image(s)** or **Copy Image(s)**.



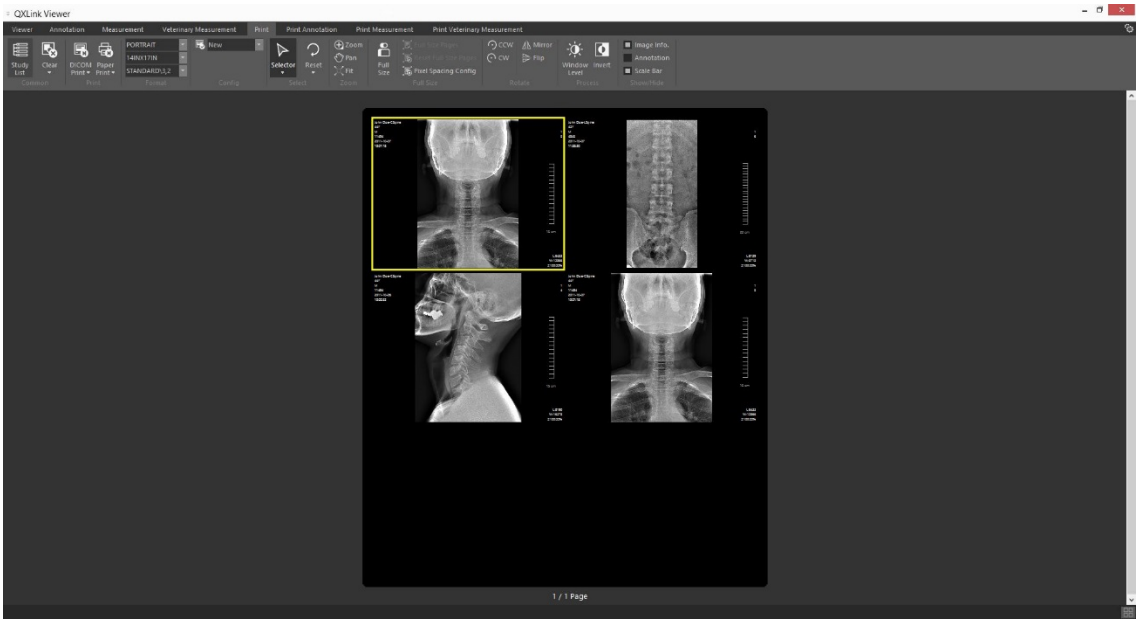
3 Choose a position to paste the image.



4 Click the right mouse button to display popup menus and select **Paste Image Before a Given Position**.



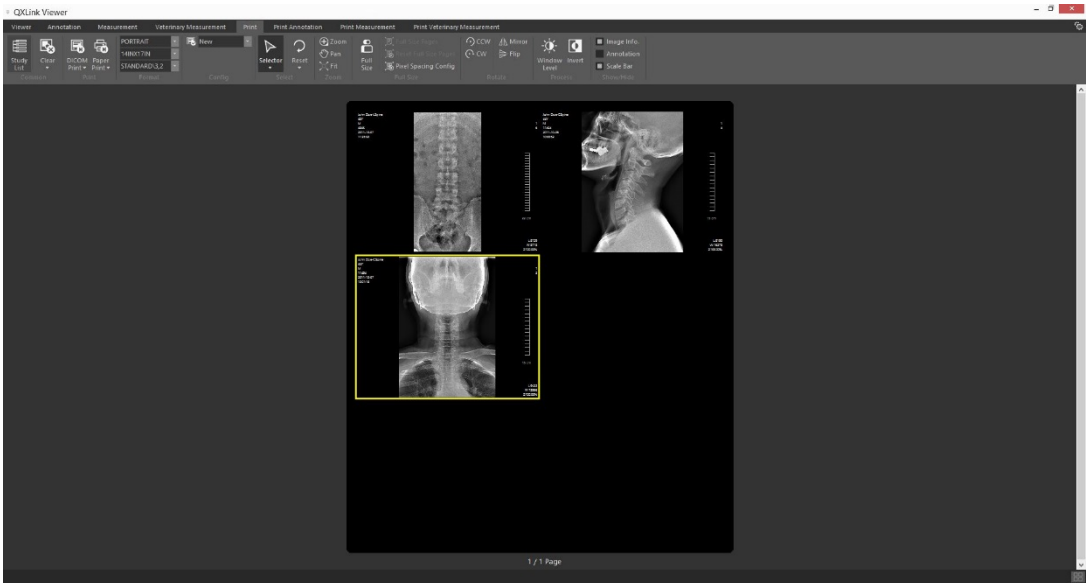
5 Check if the position is changed successfully.



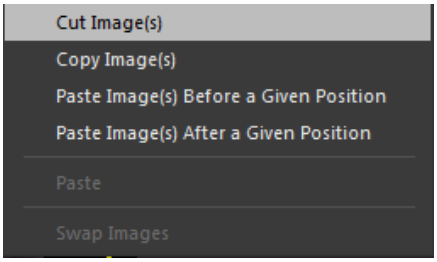
9.5.2 Paste Image Next to the Selected Position

Move the selected image next to the specified one.

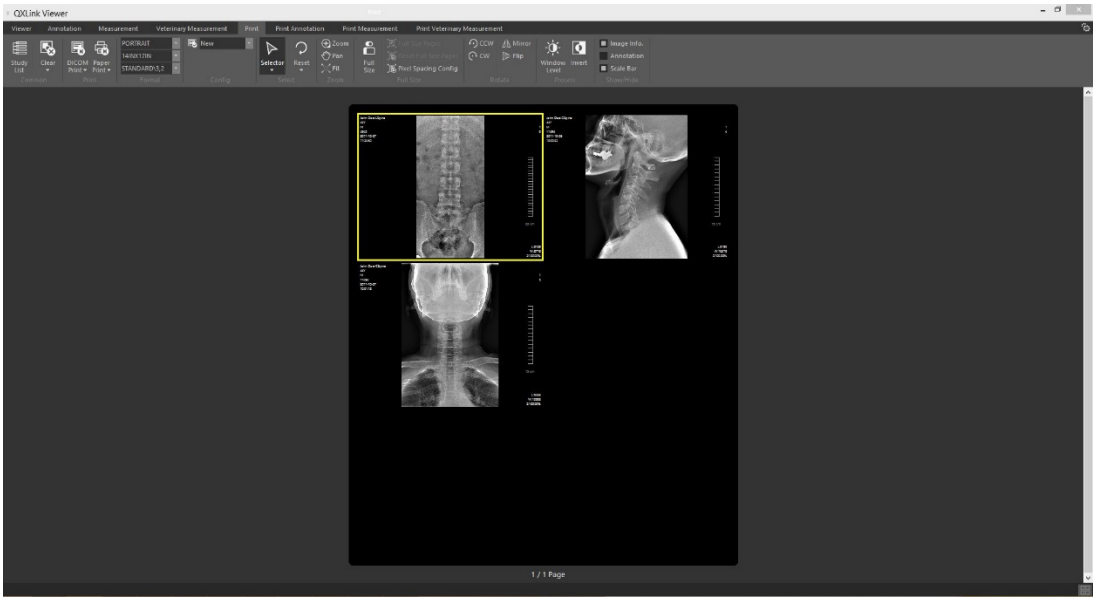
1 Select an image to change its position.



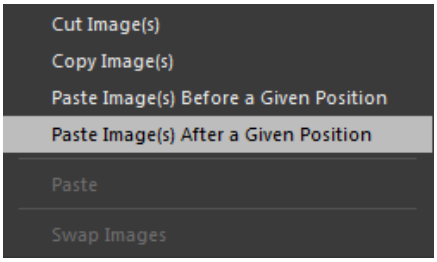
2 Click on the right mouse button to display popup menus and select **Cut Image**.



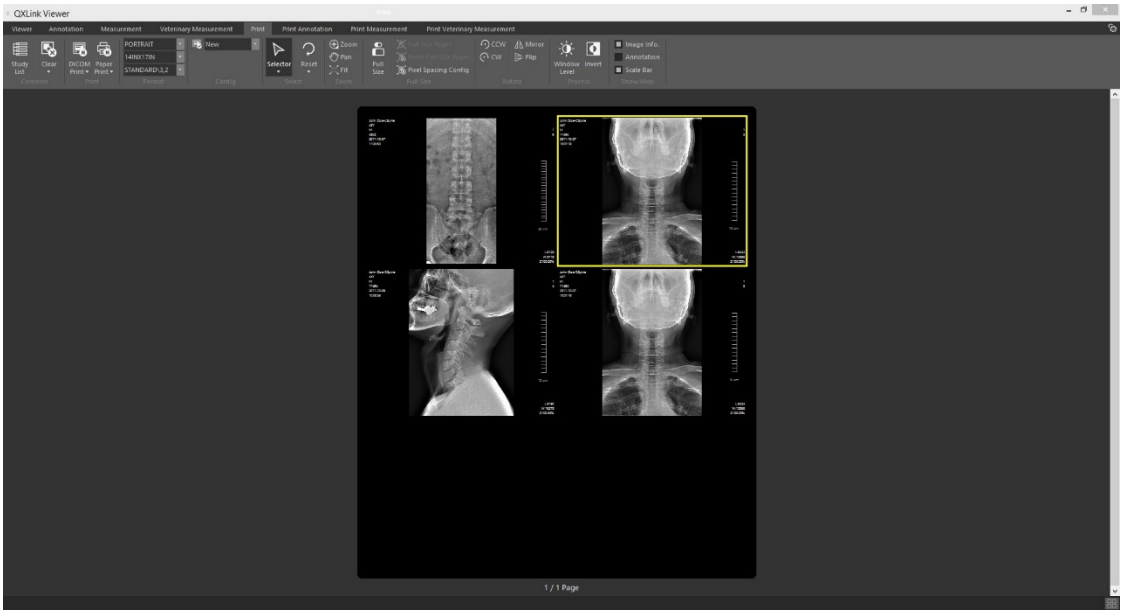
3 Choose a position to paste the image.



4 Click on the right mouse button to display popup menus and select **Paste Image After a Given Position**.



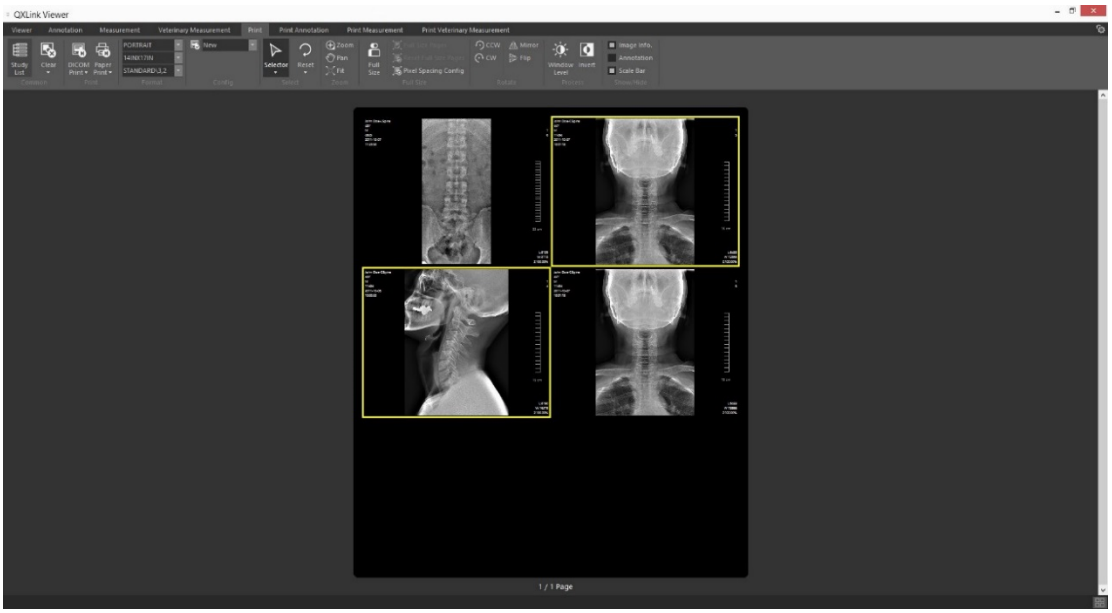
5 Check if the position is changed successfully.



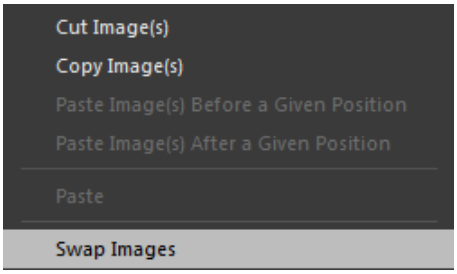
9.5.3 Swap Images

Swap the position between the two images.

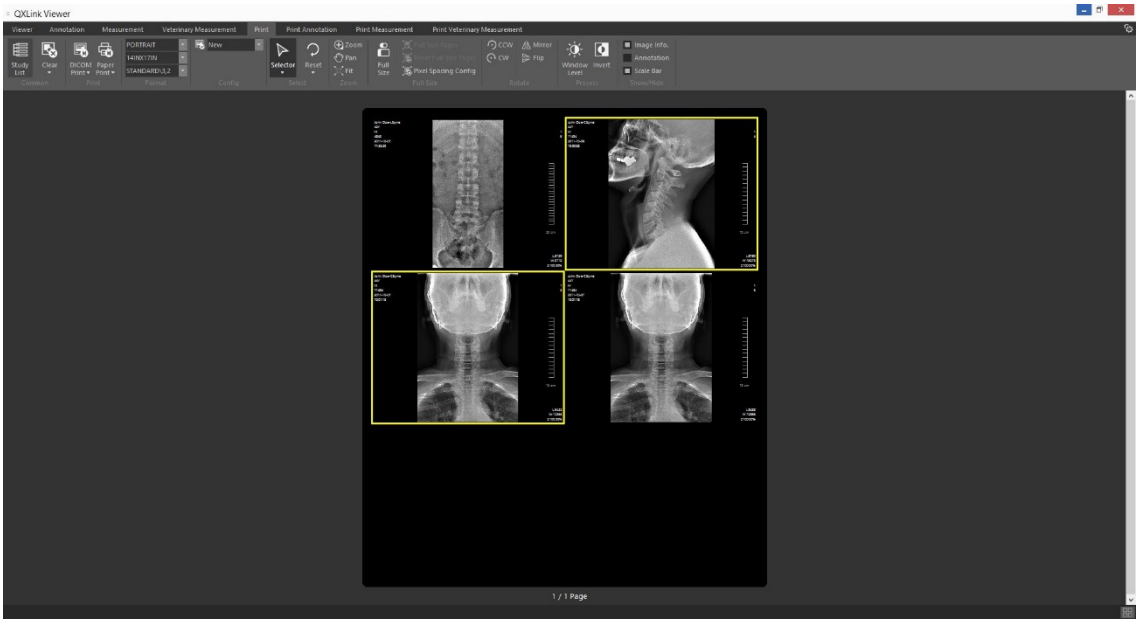
1 Select two images to swap the position.



2 Click on the right mouse button to display popup menus and select **Swap Images**.



3 Check if the position of two images is changed successfully.



10. Stitch

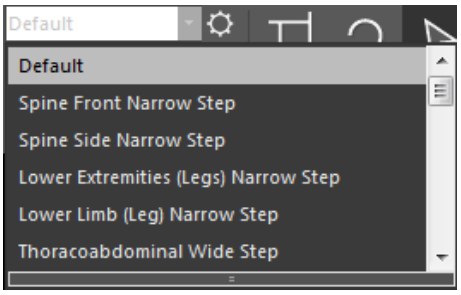
This section provides information about the process of stitching images and setting the related menus.

Creating Stitched Image
Composition of Stitch Window
Setting the Automatic Stitch Parameter
Image Manupulation
Sorting and Changing the Order of images
Setting Border
Applying Blend
Adjusting Position
Adjusting Brightness

10.1 Creating Stitched Image

10.1.1 Auto Stitch

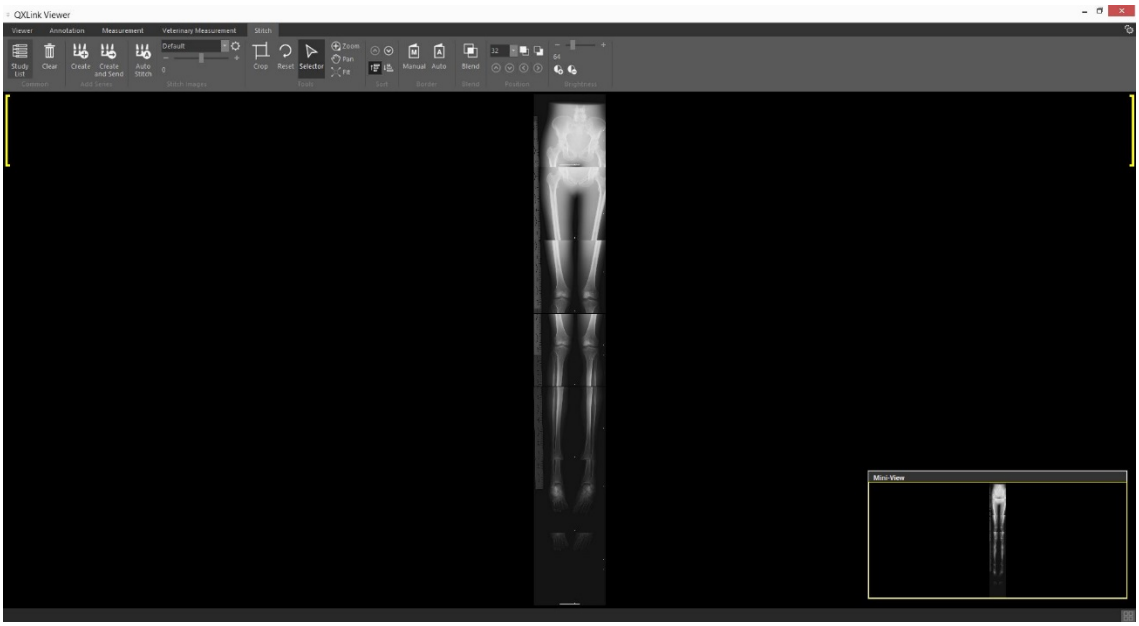
Button	Name	Description
	**Auto Stitch**	Stitches images using the registered parameters. Select the registered parameters according to the body parts of the images.



10.1.2 Create

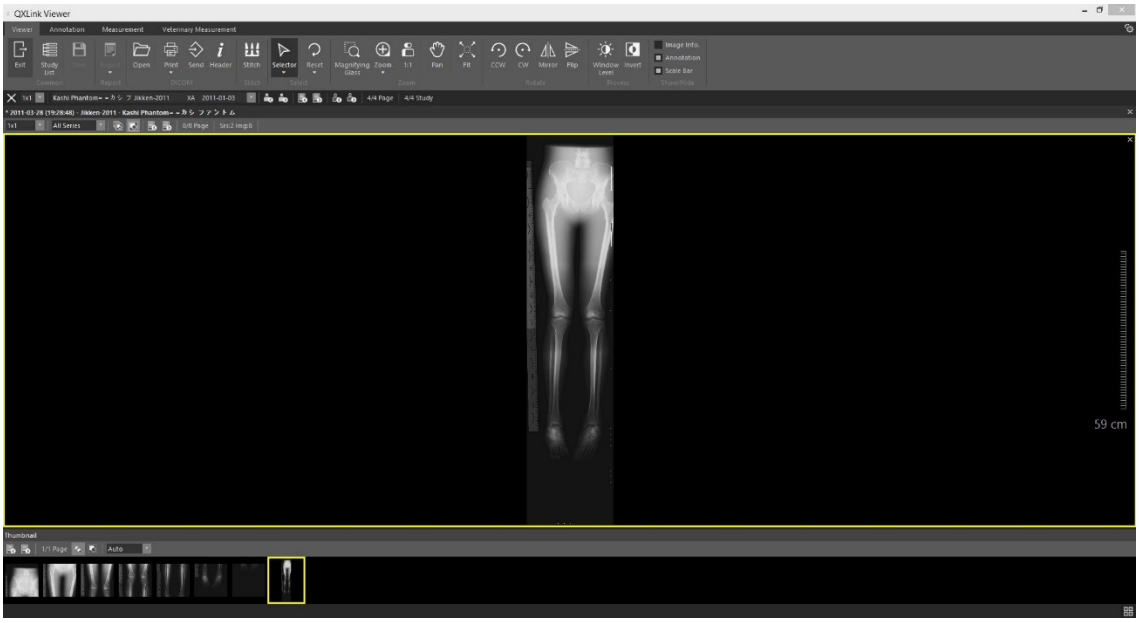
Button	Name	Description
	**Create**	Creates the stitched image in the current screen as a DICOM file.

1 Apply auto or manual stitch to the image.



2 Click on the **Create** button on the toolbar.

3 Check the stitched image loaded to the **Viewer** window.



4 You cannot delete the stitched image from the study if it is not transferred to the default server. Click **X** button on the top right corner of the screen to delete the image.

- You can reduce the height of the image when you create a DICOM file. Refer to <11 Environment Setting> for the detailed information.

10.1.3 Create and Send

Button	Name	Description
	**Create and Send**	Creates the stitched image in the current screen as a DICOM file and send it to the default server.

10.2 Stitch Window

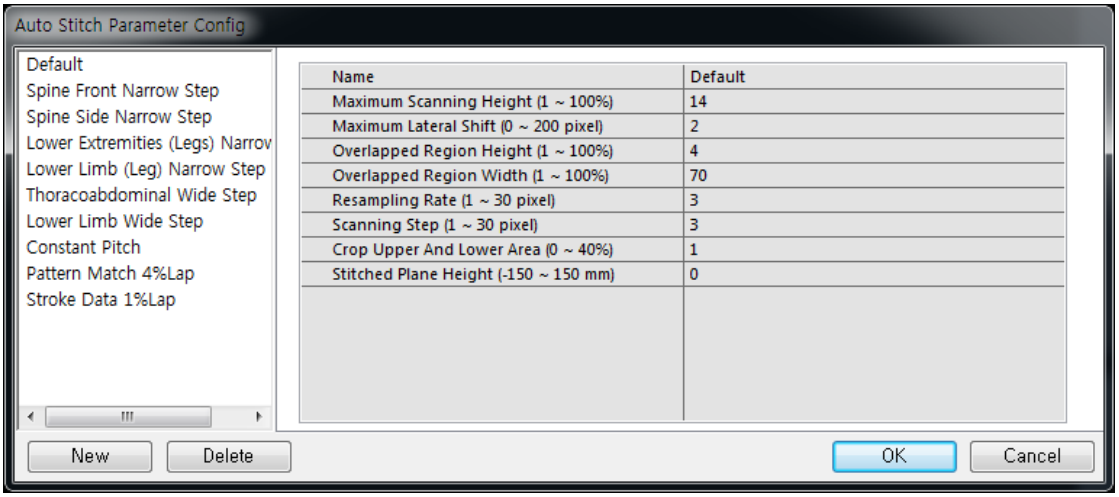
No.	Name	Function
1	**Image manipulation toolbar**	• Displays tools used for image manipulation.
2	**Stitch area**	• Displays the stitched area of selected image.
3	**Mini-View**	• Dispalys the current image on the mini view screen.
4	**Stauts bar**	• Displays function and its status.

10.2.1 Mini View

No.	Name	Function
1	**Window area of mini image**	• Zooms in or out the image based on the ratio of the stitched image.
2	**Pan**	• Drag the image in the mini view by pressing the left mouse button and move it to the desired direction. ▫ You can move the center of the area of interest from the window easily where a stitched image is located.

10.3 Setting Auto Stitch Parameter

Button	Name	Description
	**Auto Stitch Parameter Config**	Adds or edits the parameters used for auto stitch. You can set appropriate values according to the body part of the images to be stitched.



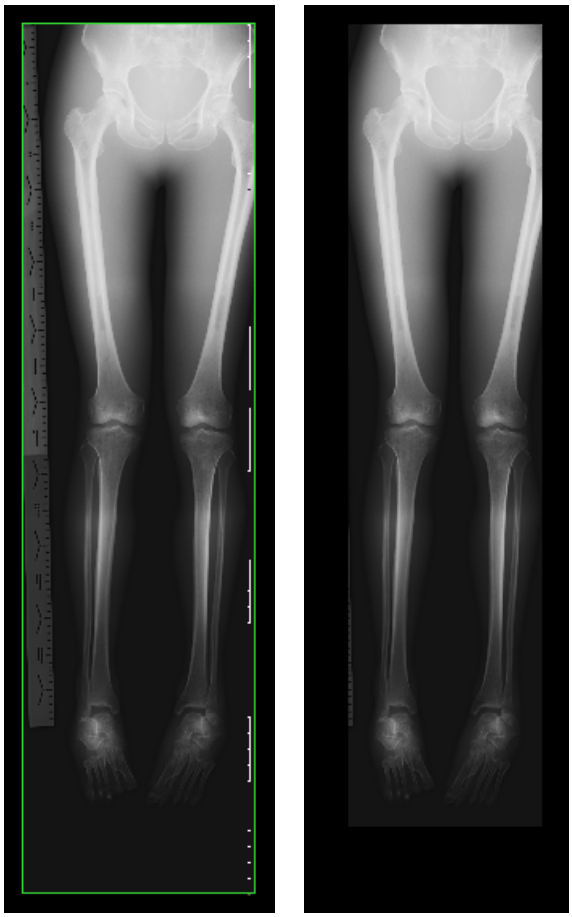
- You cannot register duplicate alias.

10.4 Image Manipulation

10.4.1 Crop

Button	Name	Description
	**Crop**	Crops out the unnecessary parts from the image.

1 Click on the **Crop** button on the toolbar.
2 Move the mouse pointer to the image.
3 Set the necessary areas by using the top, bottom, left and right green lines.
4 Click on the **Crop** button on the toolbar again or press the Esc key.
5 Check if the unnecessary parts are cropped out from the image normally.



- When you select the **Crop** function, the other functions in use become deactivated and the image is fit to the current screen.

10.4.2 Reset

Click on the **Reset** button on the toolbar.

Button	Name	Description
	**Reset**	Resets all status information of the image including stitched one.

10.4.3 Zoom

Click on the **Zoom** button on the toolbar.

Button	Name	Description
	**Zoom**	Presses and holds the left mouse button, and then drag the mouse upward or downward to zoom in or out an image by a specific ratio.

- You can also zoom in or out the image by moving the mouse wheel.
- The minimum / maximum zoom ratio 10% and 2500% based on the current viewer size.

10.4.4 Pan

Click on the **Pan** button on the toolbar.

Button	Name	Description
	**Pan**	Presses and holds the left mouse button while dragging the image to the desired position. You can move the center of ROI (Region of Interest) in the image view.

10.4.5 Fit

Click on the **Fit** button on the toolbar.

Button	Name	Description
	**Fit**	Fits an image to the current window size.

10.5 Sorting and Changing the Order of Images

10.5.1 Sorting

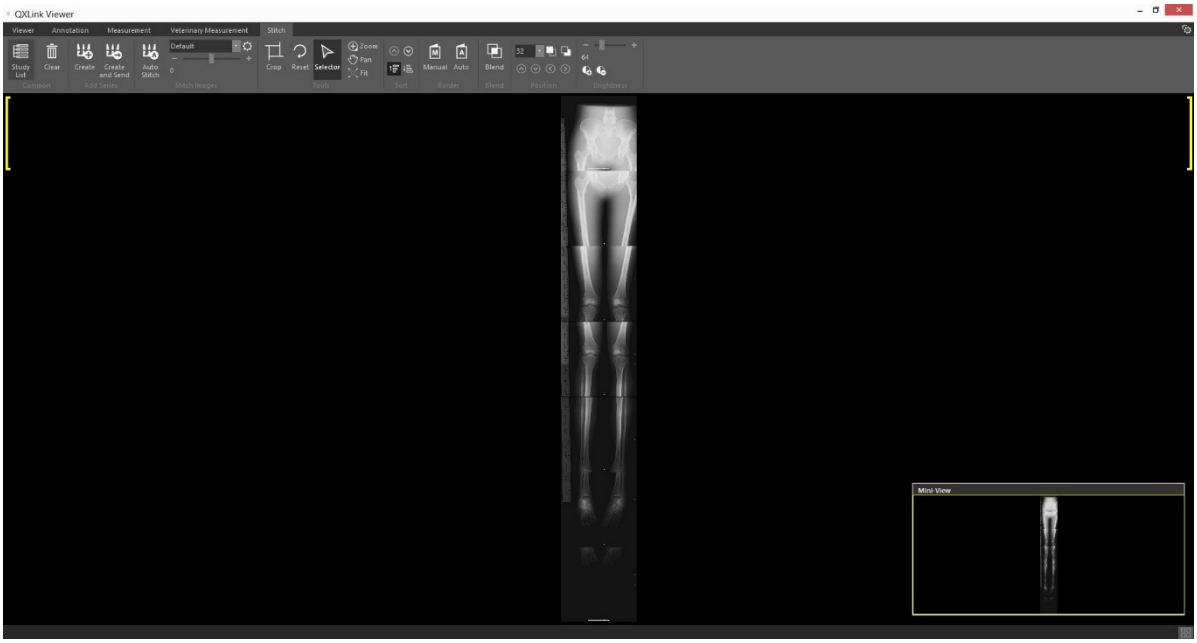
Displays images by sorting them based on series number and instance number in order.

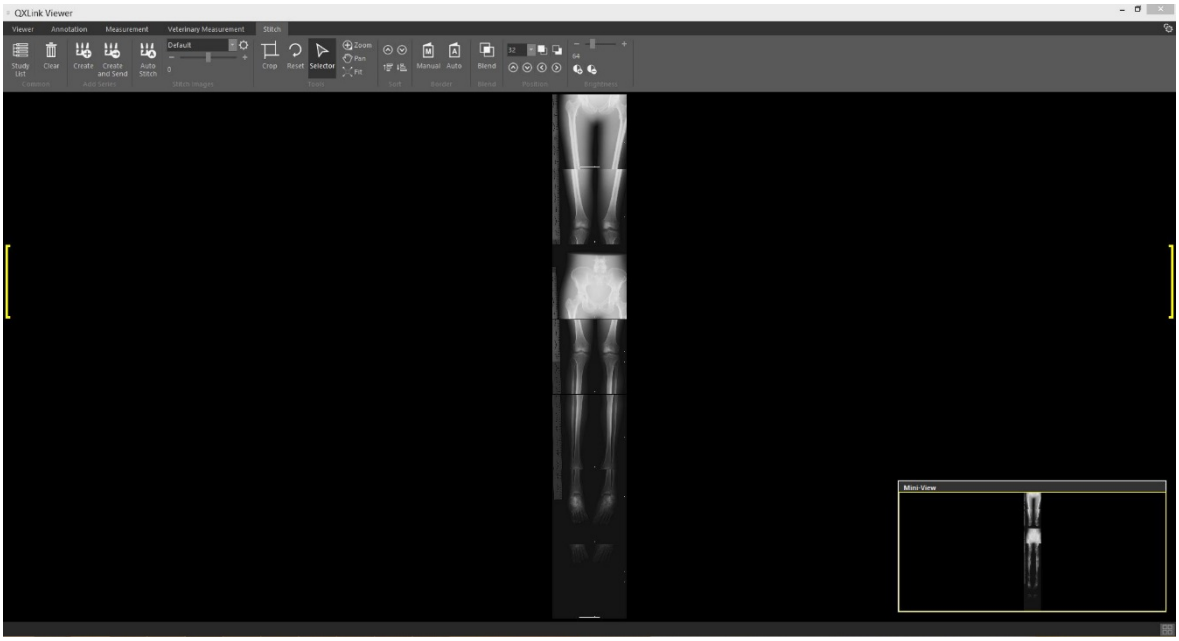
Button	Name	Description
	**Ascending Sort**	Sorts images in ascending order. (Default)
	**Descending Sort**	Sorts images in descending order.

10.5.2 Changing Order

Displays image by changing the order of selected images. This function is useful when you align the disordered images.

Button	Name	Description
	**Move Up**	Moves up the selected image.
	**Move Down**	Moves down the selected image.




QXLink Viewer
Viewer
Annotation
Measurement
Veterinary Measurement
Stitch
Study List
Clear
Create
Create and Send
Auto Stitch
Default
Crop
Reset
Selector
Zoom
Pan
Fit
Manual
Auto
Blend
Mini-View

10.6 Setting Border

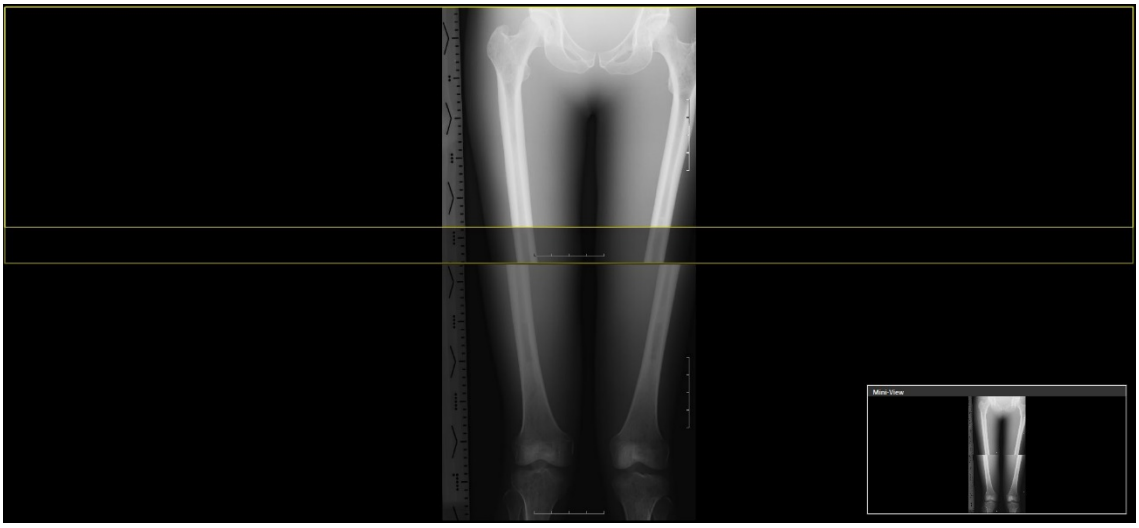
You can set a border between the images to be stitched.

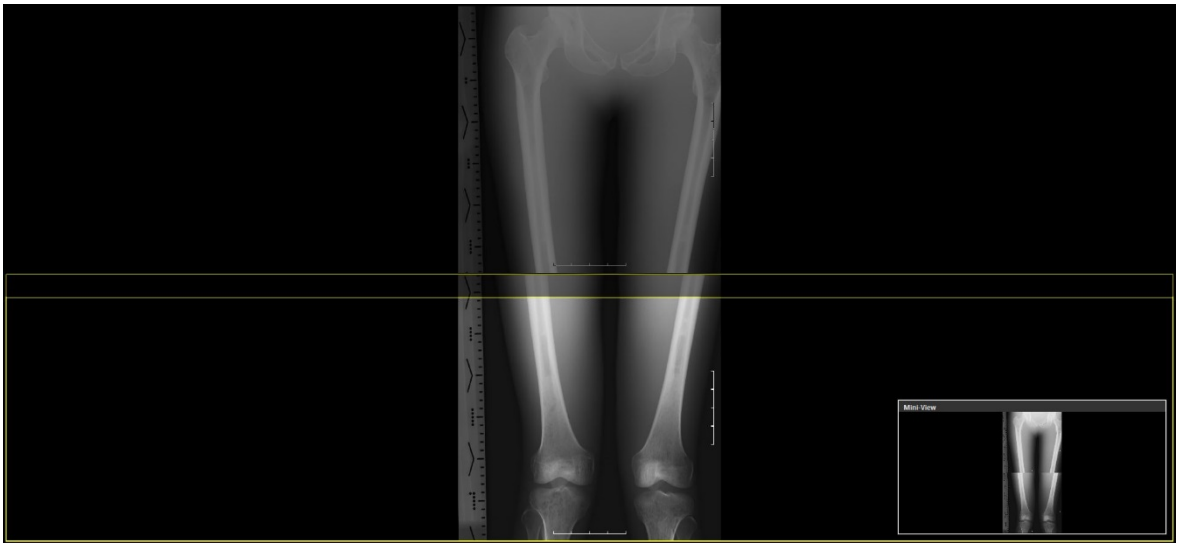
10.6.1 Manual Border

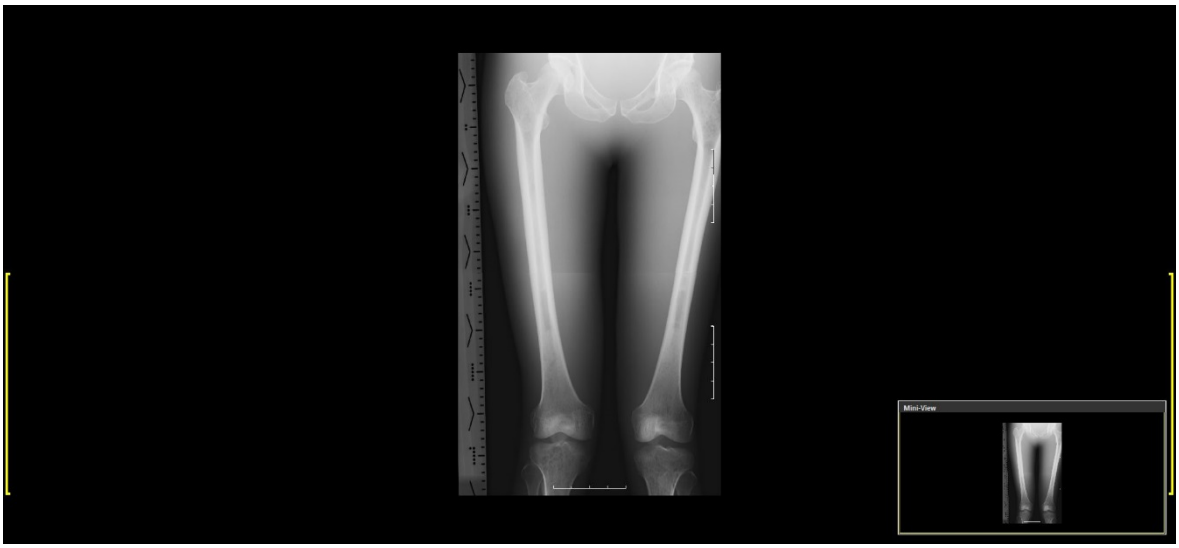
Button	Name	Description
	**Manual Border**	Specifies the area to be cut manually before you combine images.

1 Click on the **Manual** button on the toolbar.

2 Select an image and adjust the border of area to be cut.







10.6.2 Auto Border

Button	Name	Description
	**Auto Border**	Specifies the area to be cut automatically before you combine images.

10.7 Applying Blend Effect

Button	Name	Description
	**Blend Effect**	Blends the border of images smoothly.

Before

After

10.8 Adjusting Position

Changes the displaying order of the stitched images. This function cannot be applied to the 1st one among the stitched images.

10.8.1 Set to Foreground

Button	Name	Description
	**Set to Foregrond**	Brings the selected image to the front of the overlapped image.

10.8.2 Set to Background

Button	Name	Description
	**Set to Background**	Sends the selected image to the back of the overlapped image.

10.8.3 Selecting Interval of Movement

Sets the interval of movement in pixels and move the images to the top, bottom, left and right directions.

1 Select a desired image and select the interval of movement in pixels.
2 Click on the arrow button to move. You can select among the following pixel units.
   ▫ 1, 4, 8, 16, 32, 70, 100, 150

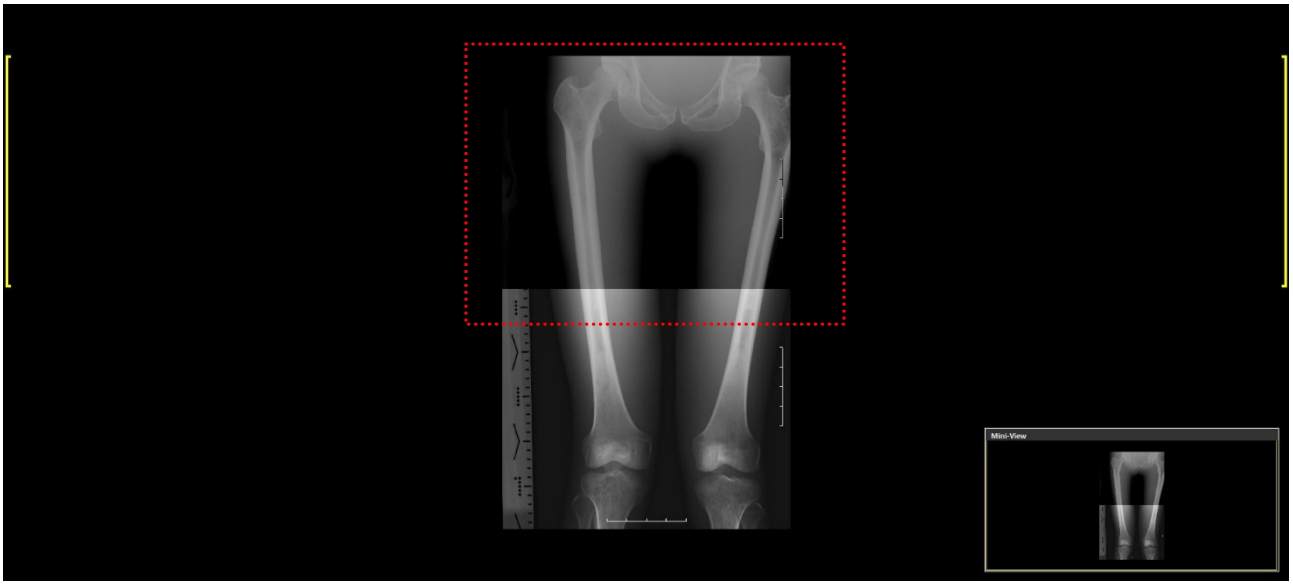
- The 1st image cannot be moved.

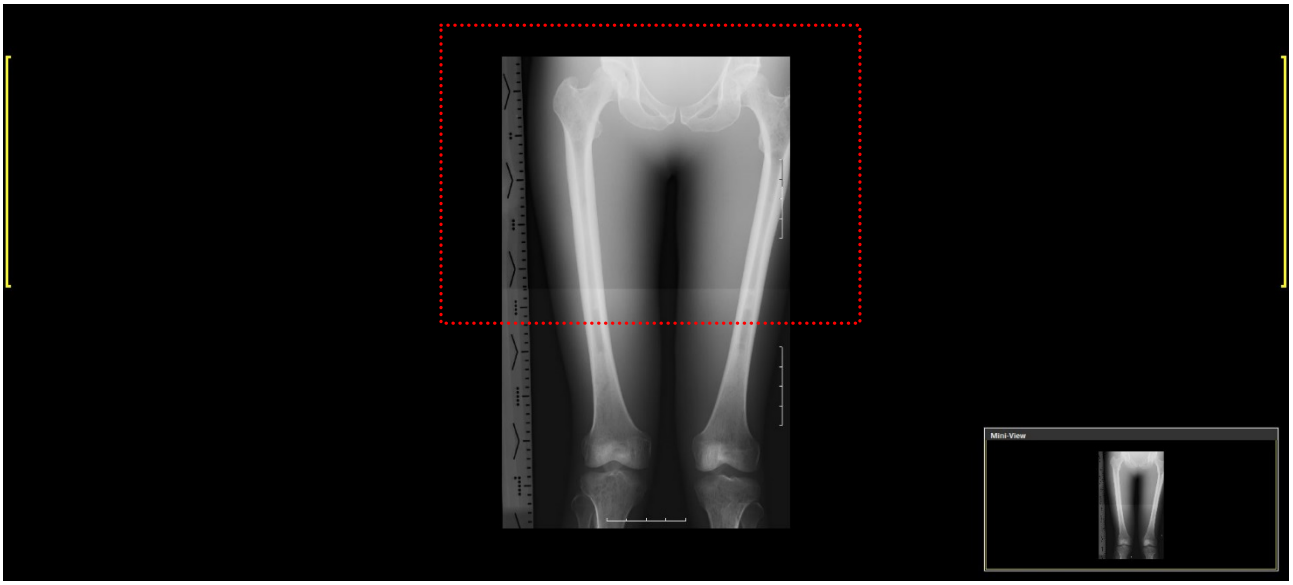
Button	Name	Description
	**Move Pixel Upward**	Moves the selected image upward by a specified pixel unit.
	**Move Pixel Downward**	Moves the selected image downward by a specified pixel unit.
	**Move Pixel to the Left**	Moves the selected image to the left by a specified pixel unit.
	**Move Pixel to the Right**	Moves the selected image to the right by a specified pixel unit.

10.9 Adjusting Brightness

Adjusts the brightness of two images similarly each other.

Button	Name	Description
	**Brighten**	Brightens the selected image by a specified unit.
	**Darken**	Darkens selected image by a specified unit.





11. Environment Setting

This section instructs about the various way of environment settings in the program.

Version Information

Changing a Laguage

DICOM Configuration

Setting Display / Layout of Image Information for Printing

Changing Styles

Viewer Option

Print Option

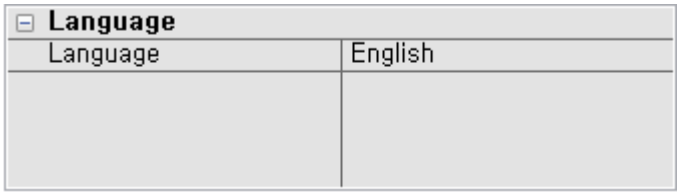
Stitch Option

11.1 Version Information

You can check the release date and version information of **QXLink Viewer**.

Version Information	
Release Date	2016-04-29
Version	V3,2,0 (Build 010)

11.2 Changing a Language

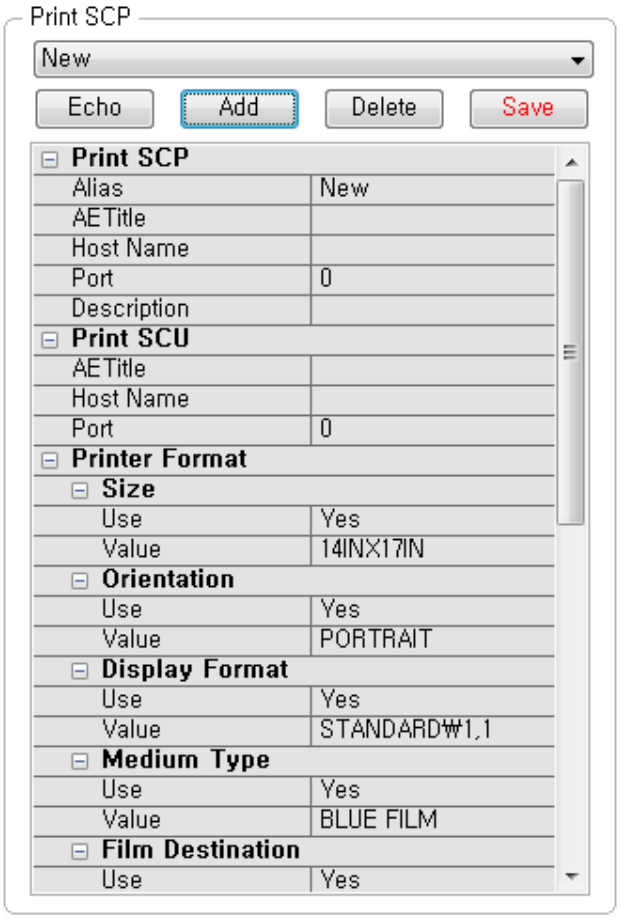


- The language setting is maintained even if you log on to the program with another user account.

11.3 Setting DICOM

11.3.1 Print SCP

You can configure the DICOM printer.



How to add the DICOM Printer

1 Click on the **Add** button.

2 Input the alias.

3 Choose items you want to copy.

4 Click **OK** button.

5 Input or choose the items related to the following options.

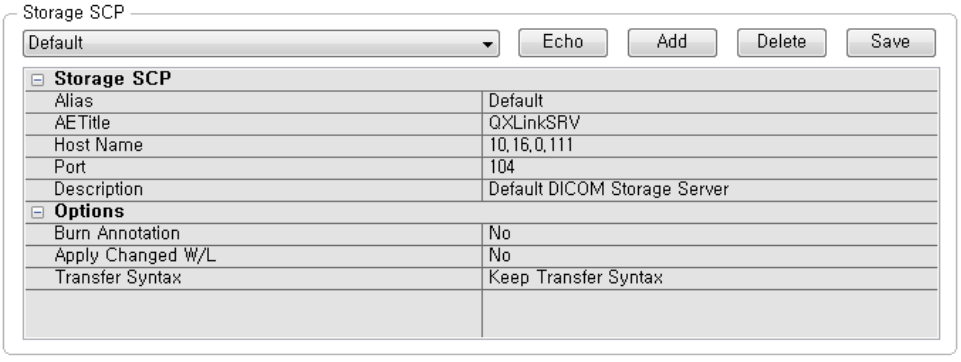
6 Click on the **Save** button.

Name	Description
Print SCP	Configures the necessary information to access to the DICOM printer.
Alias	Alias
AE Title	AE Title
Host Name	Host name
Port	Port number

Description	Description
Print SCU	Configures information about the accessed client (current viewer) when accessing to the DICOM printer.
AE Title	AE Title
Host Name	Host name
Port	Port number
Printer Format	Cofigures the components of the relevant printer (Print SCP).
Size	Film size
Orientation	Orientation
Display Format	Display format
Medium Type	Medium type
Film Destination	Film destination
Priority	Priority
Trim	Trim
Magnification Type	Magnification Type
Request Resolution	Requested resolution
Min Density	Minimum density
Max Density	Maximum density

11.3.2 Storage SCP

You can register DICOM server of other companies.



How to add DICOM server

1 Click on the **Add** button.

2 Enter **Alias**.

3 Select items to copy.

4 Click the **OK** button.

5 Enter contents to **AE Title**, **Host Name**, **Port Number** and **Description**.

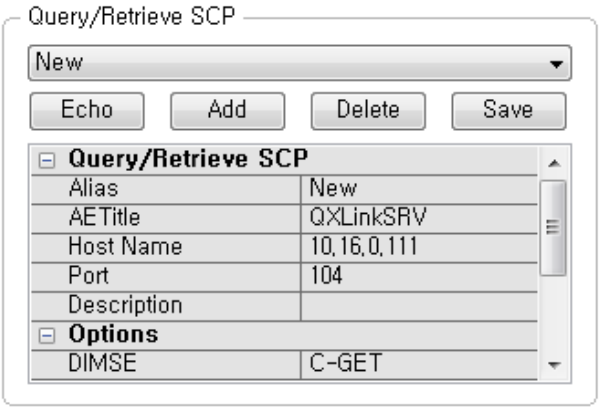
6 Select options.

7 Click on the **Save** button.

- You cannot change the basic information of **Default**.

11.3.3 Query / Retrieve SCP

Query and retrieve DICOM images from the remote PACS server. You can query or retrieve DICOM images and studies saved in third party devices or PACS.

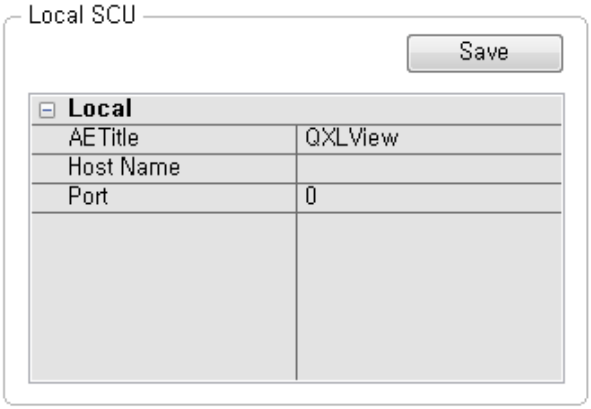


How to add Query / Retrieve SCP

1 Click on the **Add** button.
2 Enter **Alias**.
3 Select items to copy.
4 Click the **OK** button.
5 Enter contents to **AE Title**, **Host Name**, **Port Number** and **Description**.
6 Select a type of **DICOM Query** and root model.
7 You can decide whether to use **Wildcard(*)** or not depending on features of a server.
8 Set **Response Timeout** of the server from 3sec. to 30sec.
9 Click on the **Save** button.

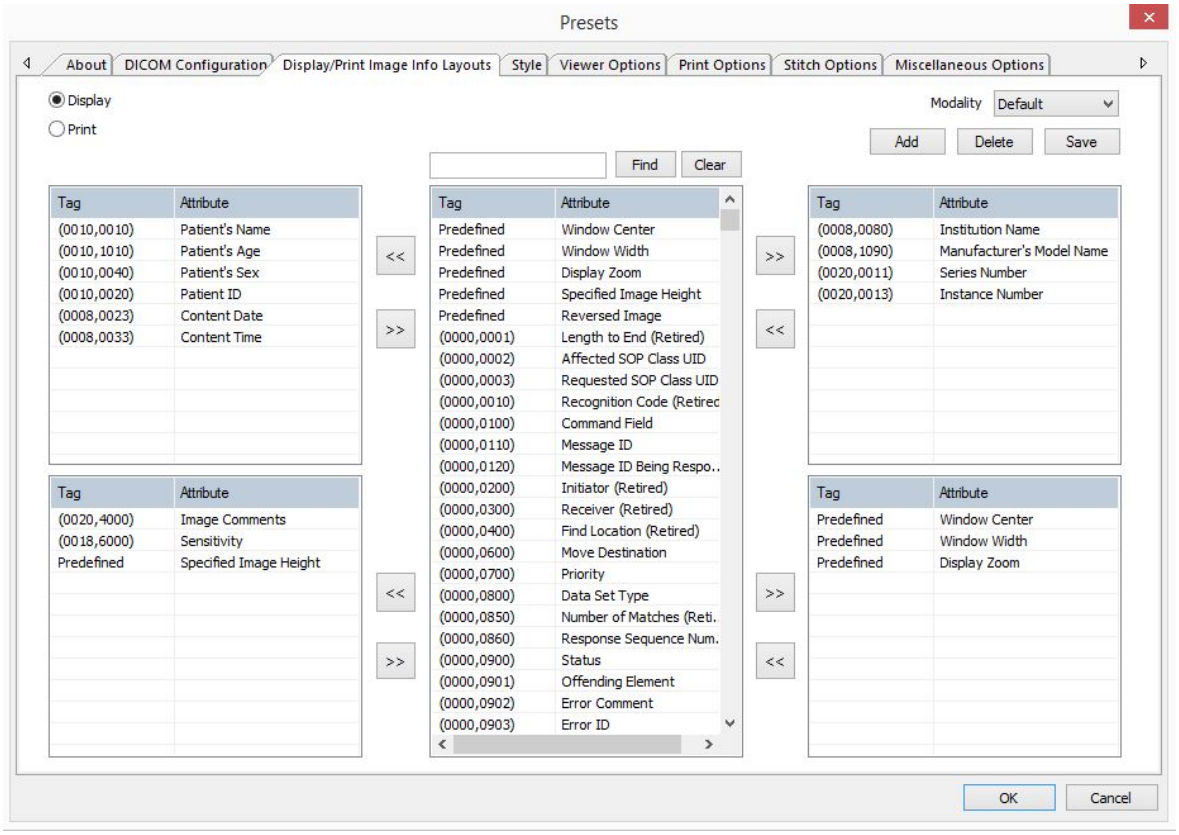
11.3.4 Local SCU

Configures the AE title, Host Name, and Port of the current viewer to perform DICOM service.



11.4 Setting Display / Layout of Image Information for Printing

Configures the patient, study and image information to each modality to display on the image. The information displayed on the image is classified for **Display** and for **Print**.



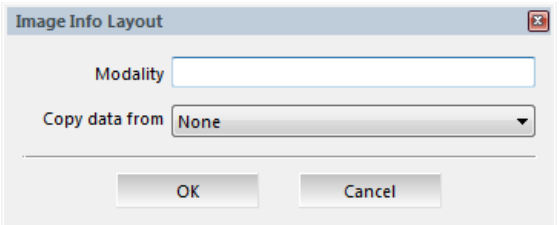
- You can set the image information indicated in four corners of left / right top and bottom of the image area.
- Make sure to click on the **Save** button after changing the setting value and apply it.
- Duplication input of items is allowed.

How to add the layout of image information

1 Select either **Display** or **Print** option.

2 Click on the **Add** button.

3 Enter the name of **Modality**.

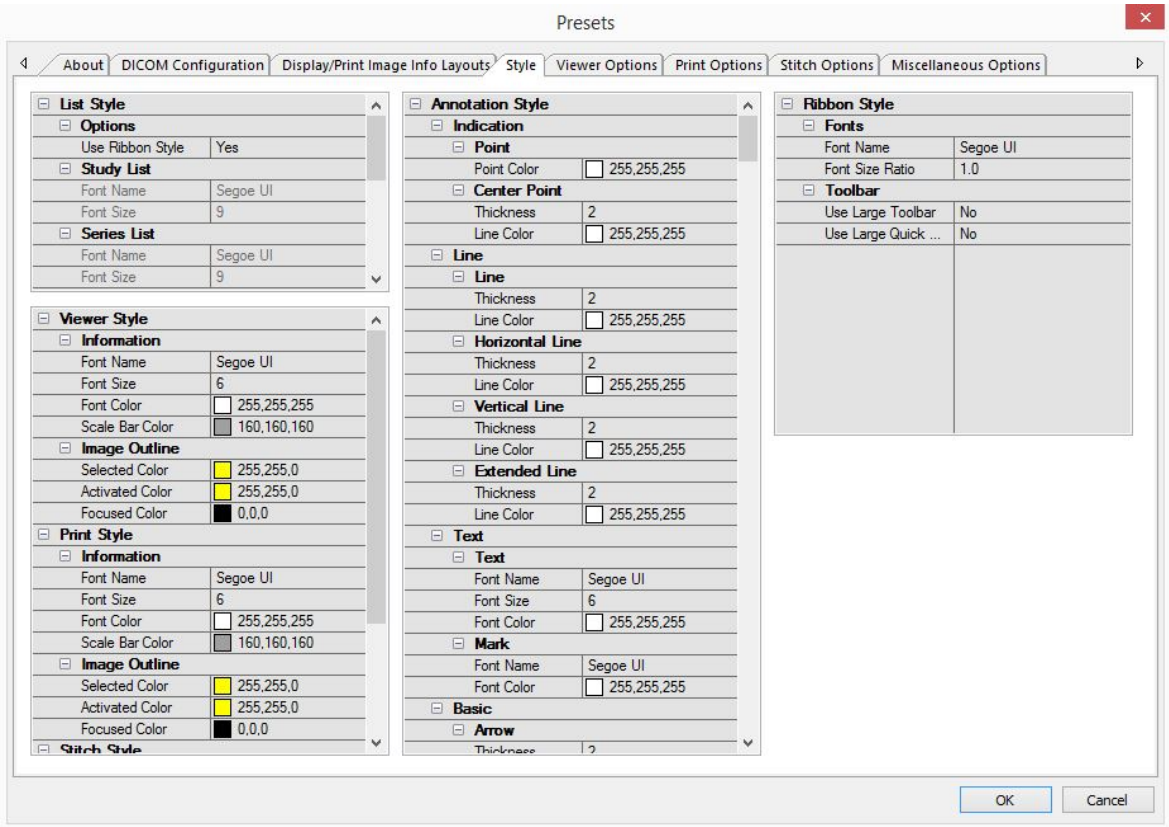


4 Select an item to copy.

5 Add DICOM attributes to be displayed on each list.

6 Click on the **Save** button.

11.5 Changing Styles



11.5.1 List Style

You can change the font type and size in the following list as well as determine whether to use the ribbon style or not.

Name	Meaning
Study List	Study List
Series List	Series List
Query List	Query List
Queue List	Queue List
Dir List	DICOM DIR List

11.5.2 Window Style

Changes the font and color information displayed on the following windows.

Viewer Style

Name	Meaning
Font Name	Font name
Font Size	Font size
Font Color	Font color
Scale Bar Color	Scale bar color
Selected Color	Selected color
Activated Color	Activated color
Focused Color	Focused color

Print Style

Name	Meaning
Font Name	Font name
Font Size	Font size
Font Color	Font color
Scale Bar Color	Scale bar color
Selected Color	Selected color
Activated Color	Activated color
Focused Color	Focused color

Stitch Style

Name	Meaning
Selected Color	Selected color
Unselected Color	Unselected color
Crop Line Color	Crop line color

11.5.3 Annotation Color

Changes the font and color information of each annotation.

Length / Angle / Cobb Angle

Name	Meaning
Font Name	Font name
Font Size	Font size
Font Color	Font color
Thickness	Thickness
Line Color	Line Color

Text / Mark

Name	Meaning
Font Name	Font name
Font Size	Font size
Font Color	Font color

Arrow / Rectangle) / Ellipse

Name	Meaning
Thickness	Thickness
Line Color	Line Color

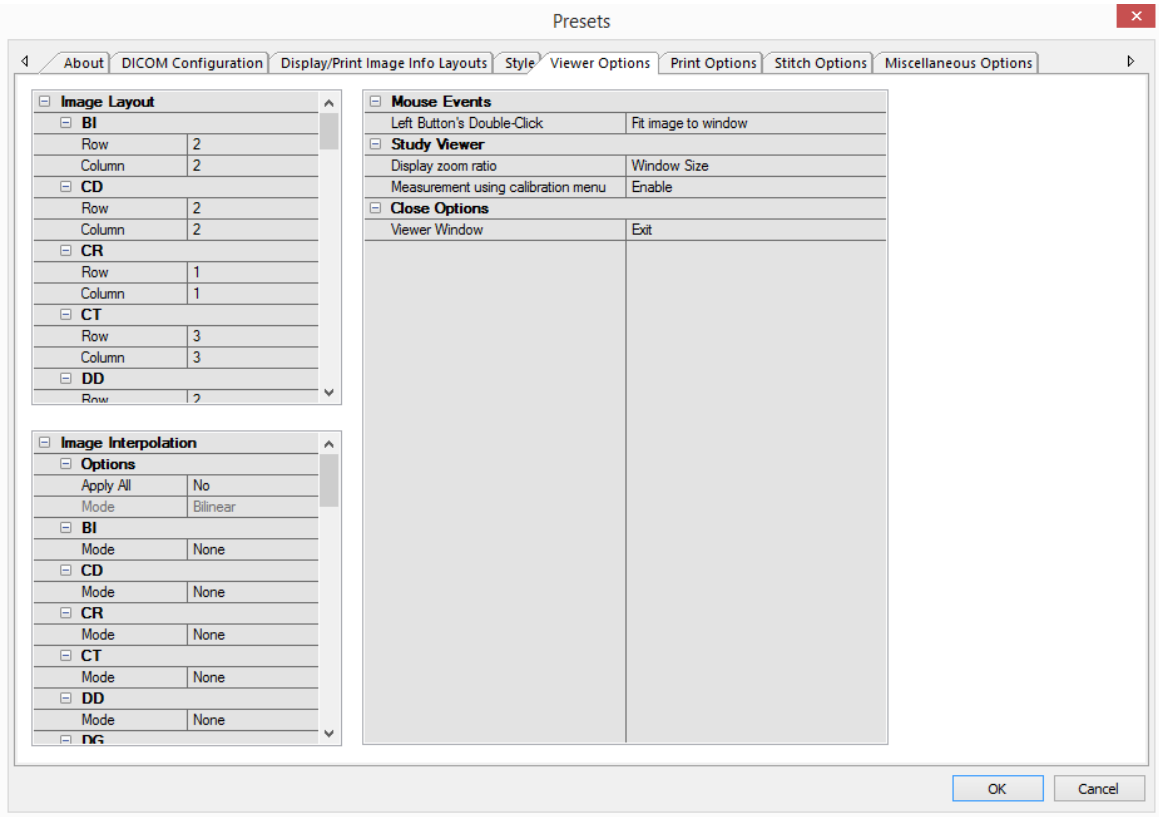
- The information of changed font and color is not applied to the annotations generated previously.

11.5.4 Ribbon Style

Name	Meaning
Change the font type and ratio	Changes the font type and font ratio displayed on the study list and viewer window.
Use Large Toolbar	Displays the icons on the toolbar larger. Changes the size of all icons on the toolbar displayed on the study list and viewer window. • Restart **QXLink Viewer** to apply changes of **Use Large Toolbar** settings.
Use Large Quick Access Toolbar	Displays the quick access toolbar larger added to each window.

11.6 Viewer Option

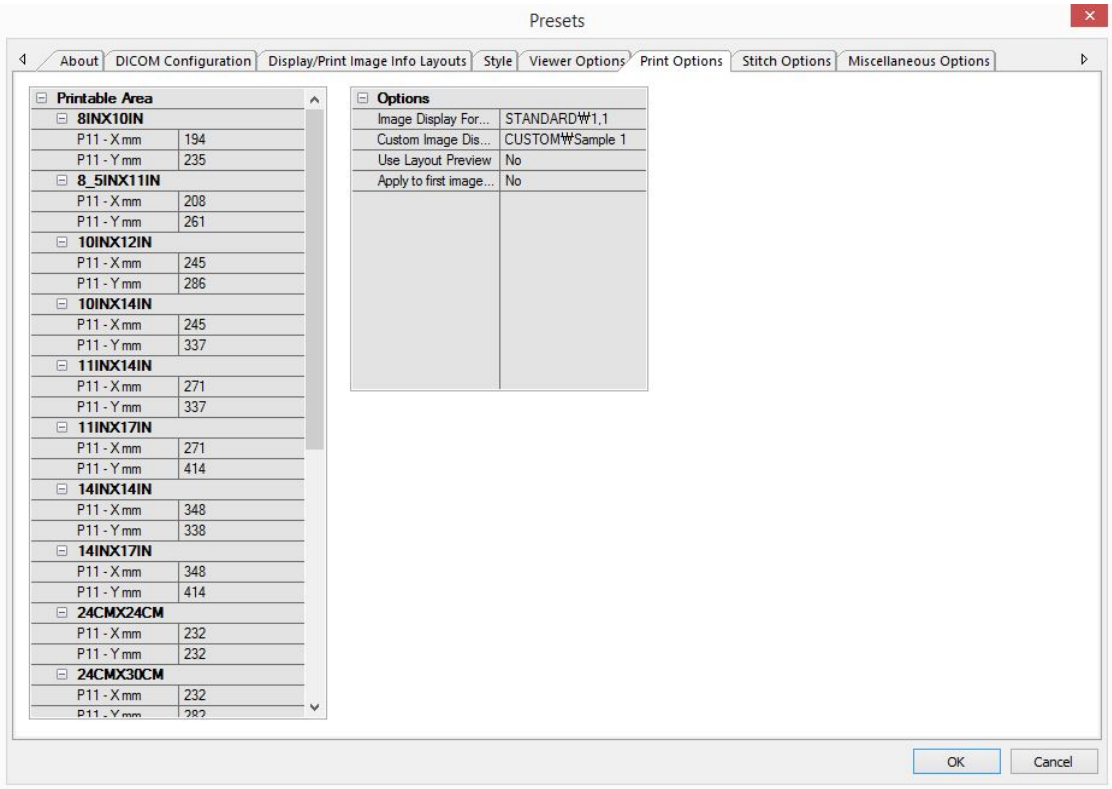
Configures options for image display.



Name	Meaning
Image Layout	Configures the layout of preferred image by each modality type.
Image Interpolation	Sets the way of interpolation of images for each modality.
Mouse Events	
Left Button's Double-Click	You can select the tasks to be performed when you double click the image. • **Fit image to window** • **Use real size on fixed window** • **Use real size on movable window** • **Use fitted size on fixed window** • **Use fitted size on movable window** ▫ This function is useful to move a real size window to another monitor when you use multiple monitors.
Study Viewer	
Display Zoom Ratio	Configures the way to display zoom ratio on the image. • **Window Size**: Calculates and displays the zoom ratio based on the window size. • **Image Size**: Calculates and displays the zoom ratio based on the original image size.

	Measurement using calibration menu	Decides whether to use the calibration menu from the **Viewer** window or not.
	Close Option	
	Veiwer Window	Sets whether you close the viewer window only or end the QXLink program. • **Hide Window and Close Stidies**: Closes the viewer window. • **Exit**: Exits from the QXLink program when you close the viewer window.

11.7 Print Option



11.7.1 Setting Printable Area

Configures the printable area for each film size when you print out using the **Full Size Page** mode.

Default values of printable area by film size

Film size	Width	Height
8INX10IN	194	235
8_5INX11IN	208	261
10INX12IN	245	286
10INX14IN	245	337
11INX14IN	271	337
11INX17IN	271	414
14INX14IN	348	338
14INX17IN	348	414
24 cm × 24 cm	232	232
24 cm × 30 cm	232	282
A4	202	279
A3	289	402
B4	249	349
CUSTOM1	10	10
CUSTOM2	10	10

The default setting value of divided prints

You can configure an overlapped area of split images in the range 0 to 99 and display guidelines to distinguish overlapped area.

Full Size Page	
Overlapped Rows	30
White Line for Border	True

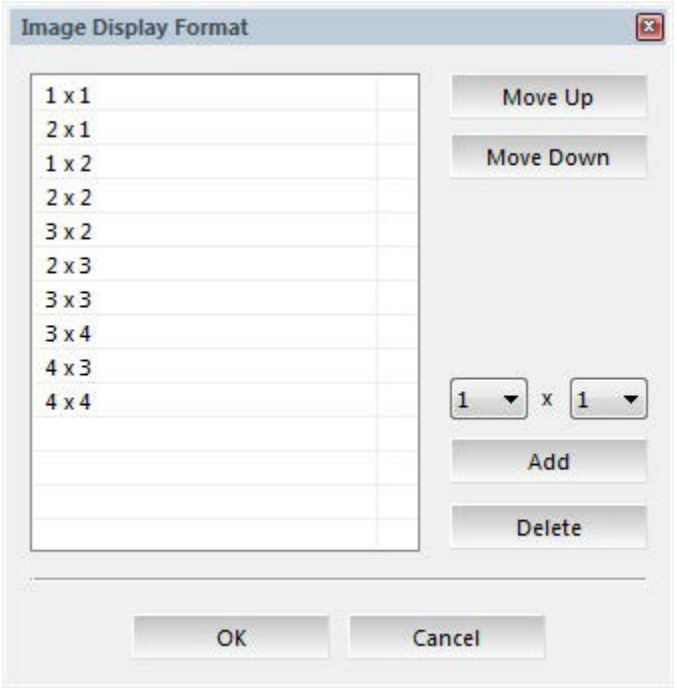
11.7.2 Setting Image Display Format

From **Image Display Format**, you can add or change the basic image layout to use in the **Print** window.

Default image layout of the Print window

- STANDARD₩1,1
- STANDARD₩1,2
- STANDARD₩2,2
- STANDARD₩3,2
- STANDARD₩2,3
- STANDARD₩3,3
- STANDARD₩3,4
- STANDARD₩4,3
- STANDARD₩4,4

Managing the default imge layout of the Print window



Name	Meaning
Move Up	Adjusts the layout sequence to upward.
Move Down	Adjusts the layout sequence to downward.
Add	Adds a specified layout newly.
Delete	Removes the layout.

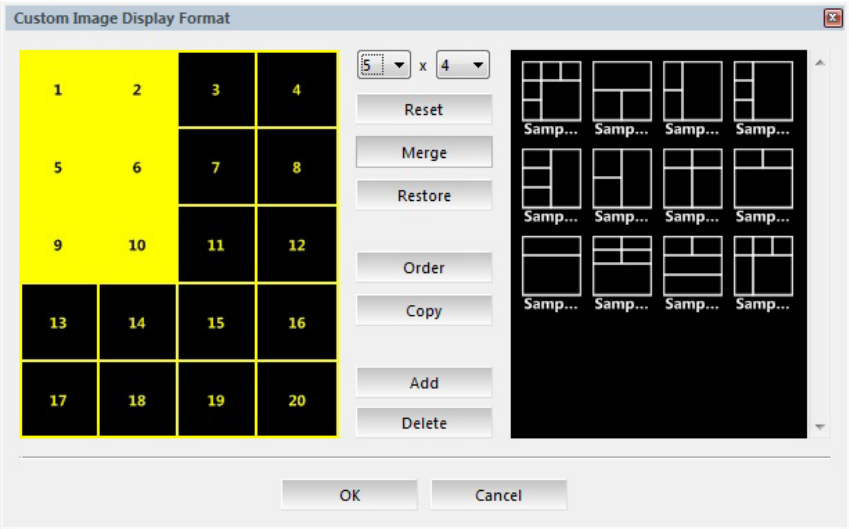
- The layout can be configured 10 x 10 in maximum.

11.7.3 Setting Custom Image Display Format

From **Custom Image Display Format**, you can add or change the user-defined image layout to use in the **Print** window.

Default user-defined layout of the Print window

- CUSTOM₩Sample1 ~ 12

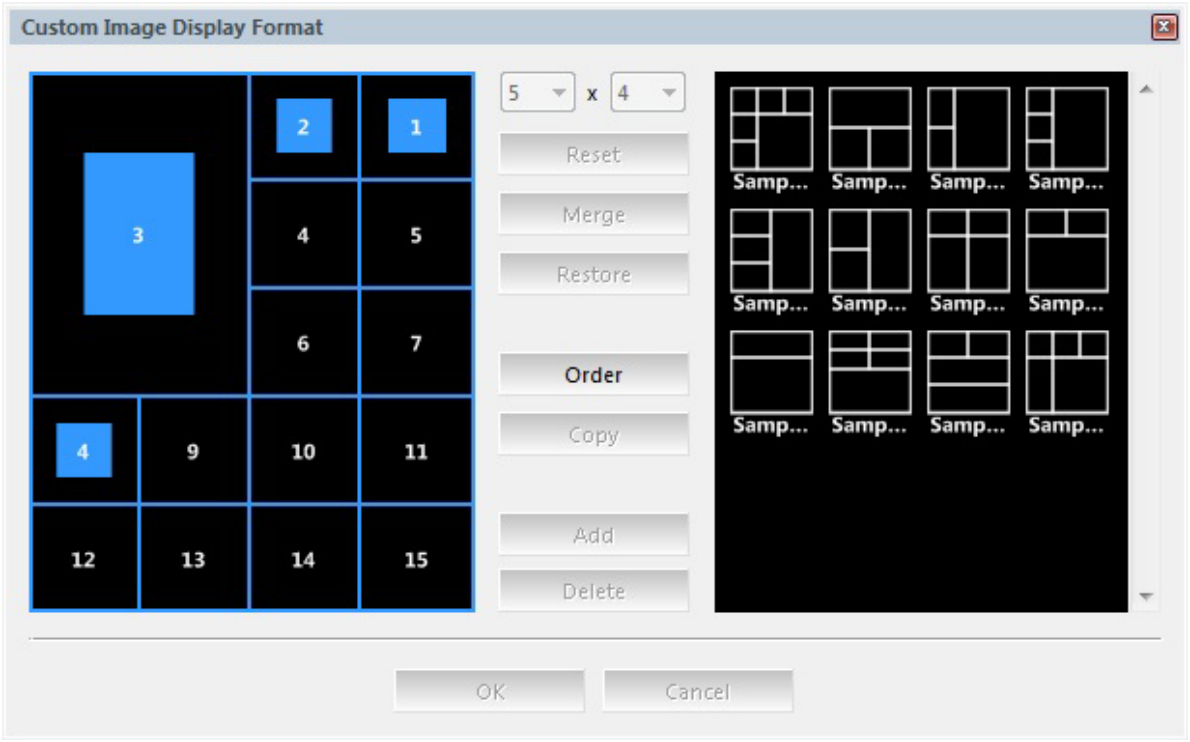


Name	Meaning
Reset	Cancels all settings and turns the layout back to the default one.
Merge	Merges the adjacent windows by dragging them with a mouse.
Retore	Selects and releases the merged windows.
Order	Assigns the order of each window.
Add	Adds a new layout.
Delete	Removes the selected layout.

- The allowed number of user-defined image layout is up to 30.

Assign the sequence of printed images

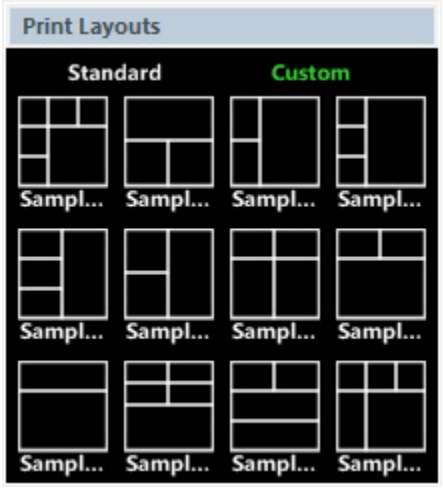
Press the **Order** button to assign numbers in order of each window. Images are added to the windows in accordance with the order of number.



- A blue block is created around the new assigned numbers by clicking each window.

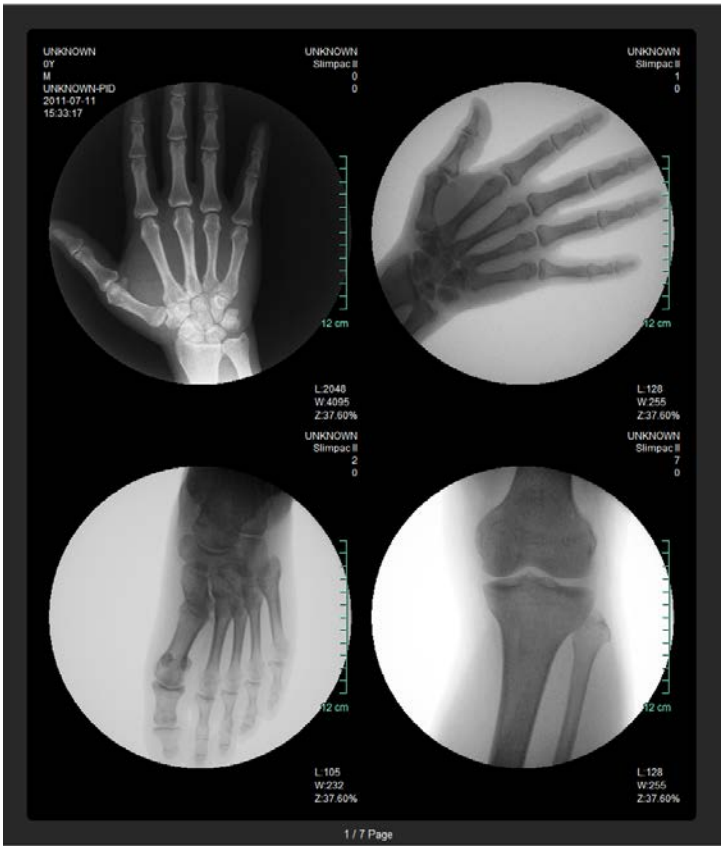
11.7.4 Use Layout Preview

You can set whether to display the preview of print layouts. The following preview window is displayed at the top of **Print** window when the setting is **Yes**. You can also change the print layout by selecting it from the preview window.



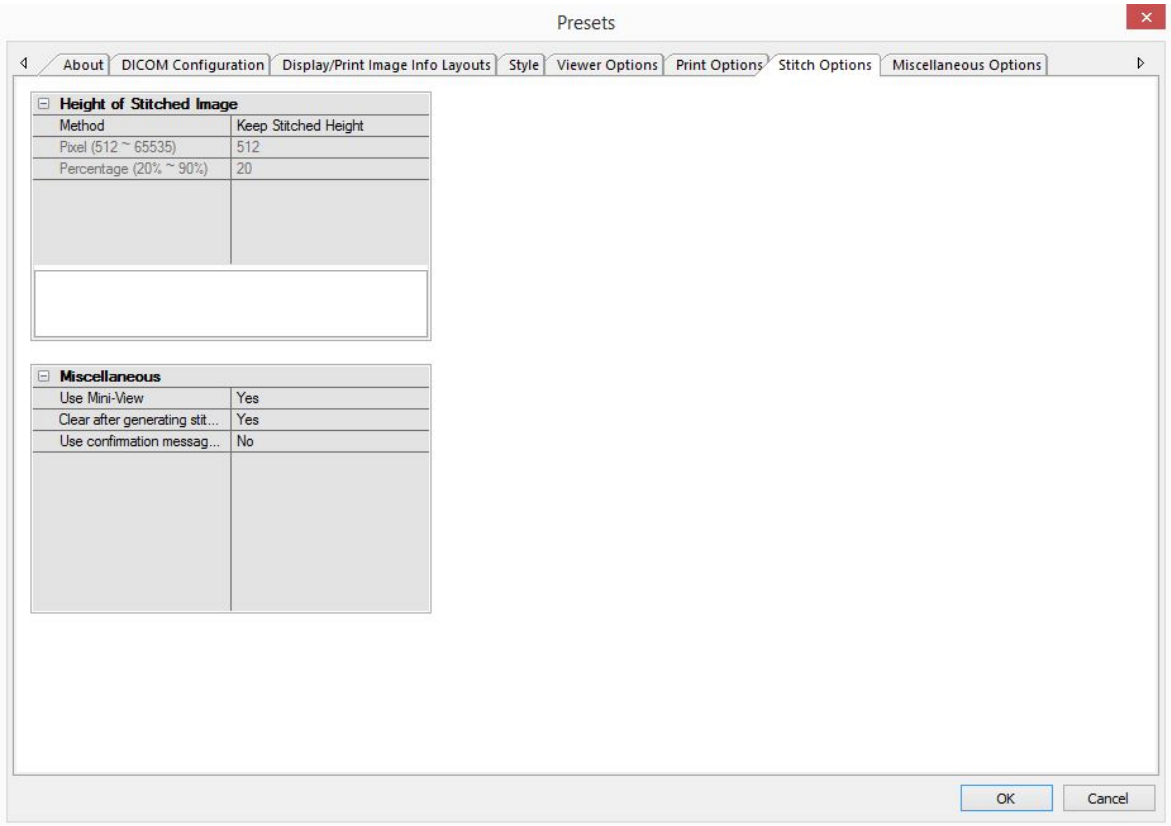
11.7.5 Apply to first image per sheet

Configures whether to display image information on the left top of the first image.



11.8 Stitch Options

Configures the stitch options as you desire.



Name	Meaning
Height of Stiched Image	Reduces a height of image to specific size or ratio when you generate a stitched image. • **Keep Stitched Height**: Maintains the original size of the stitched image. • **Resized by Fixed Pixel**: The height of the image can be lowered as much as the specified pixel. ▫ This function is not available if you set higher value than the height of the stitched image. • **Resized by Percentage**: The width of image is calculated automatically depending on the configured height ratio.
Use Mini-View	You can use mini-view on the **Stitch** window.
Clear after generating stitched image	Keeps **Stitch** window being opened after generating a stitched image.
Use confirmation message	Displays a confirmation message for asking whether to delete the existing image and converts to the **Stitch** window.

12. Others

Stopping the Task

User-Defined Toolbar

Moving Quick Access Toolbar

Keyboard Shortcut

Regulatory Inforamtion

Revision History

12.1 Stopping the Task

12.1.1 Stopping Image Loading

You can stop the study being loaded.

12.1.2 Stopping Print

You can stop the DICOM printing.

12.2 User-Defined Toolbar

You can add frequently-used functions on the viewer to quick access toolbar..

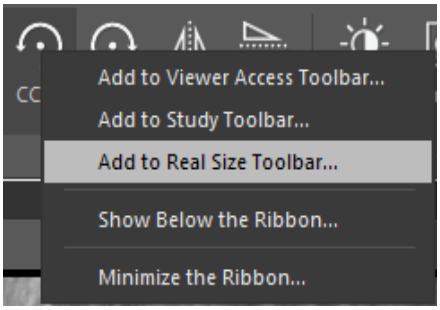
- The added or removed status of tools is applied after restarting **QXLink Viewer**.
- You cannot edit the toolbar from **Study List** window.

12.2.1 Original Size or Screen Size Toolbar

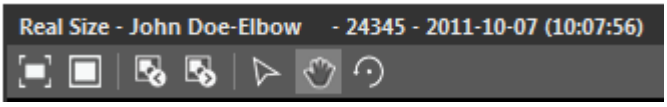
Add tools

1 Open the **Real Size** window.

2 Click the tools to add with a right mouse button and choose **Add to Real Size Toolbar**.



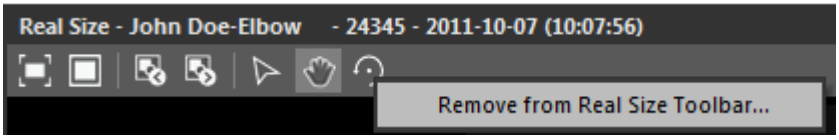
3 Check if the tools are added successfully.



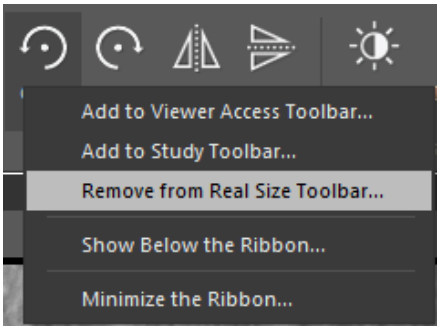
Remove tools

1 Open the **Real Size** window.

2 Click the tools to remove with a right mouse button.

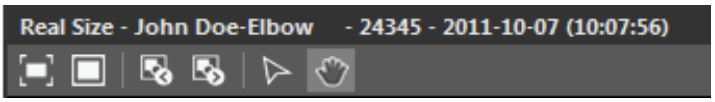


3 Otherwise, click the tools on the toolbar with a right mouse button.



4 Choose **Remove from Real Size Toolbar**.

5 Check if the tools are removed successfully.

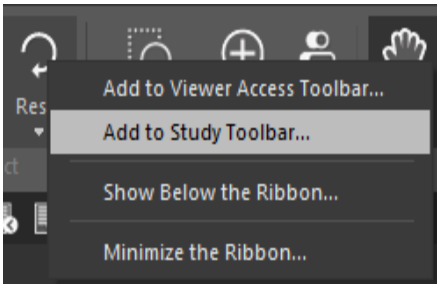


- You can add or remove tools when the **Real Size** window is being activated.
- You cannot add the deactivated tools.

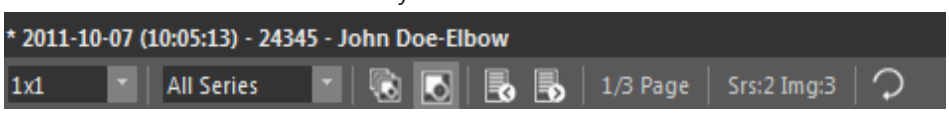
12.2.2 Study Toolbar

Add tools

1 Click the tools to add with a right mouse button and choose **Add to Study Toolbar**.



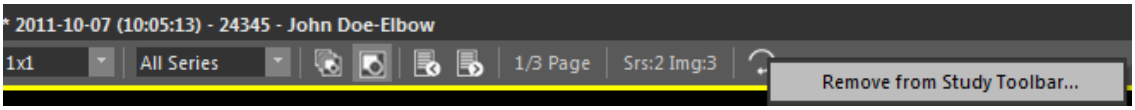
2 Check if the tools are added successfully.



Remove tools

1 Click the tools to remove with a right mouse button.

2 Choose **Remove from Study Toolbar**.



3 Check if the tools are removed successfully.

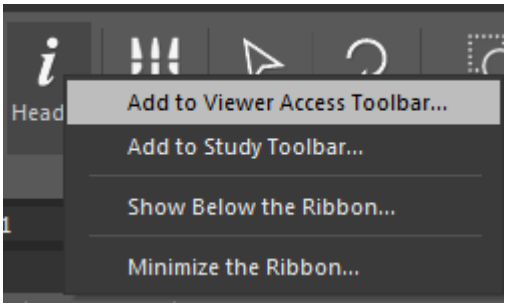
- For adding or removing a tool to/from study toolbar, at least one or more study must be opened.

12.2.3 Viewer Access Toolbar

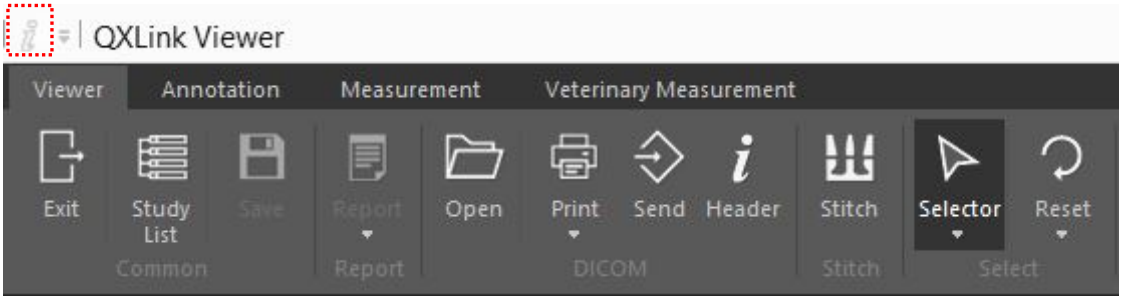
Add tools

1 Open the **Viewer** window.

2 Click the tools to add with a right mouse button and choose **Add to Viewer Access Toolbar**.

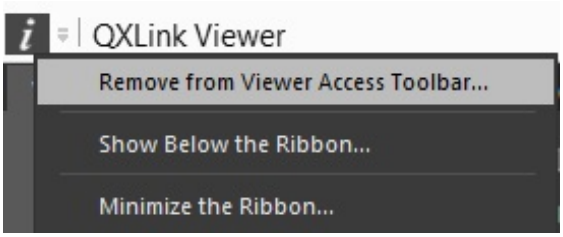


3 Check if the tools are added successfully.



Remove tools

1 Click the tools to remove with a right mouse button and choose **Remove from Viewer Access Toolbar**.



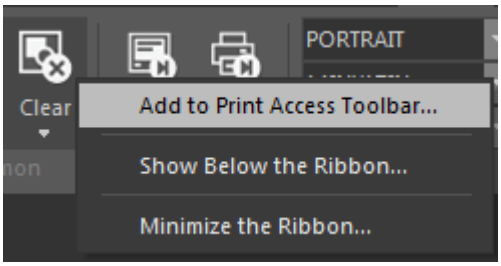
2 Check if the tools are removed successfully.

12.2.4 Print Access Toolbar

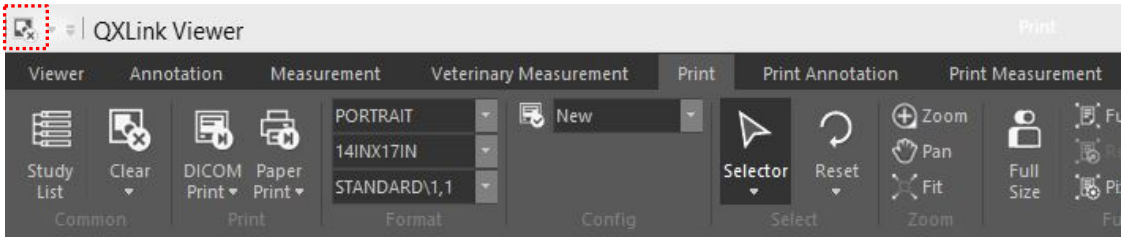
Add tools

1 Open the **Print** window.

2 Click the tools to add with a right mouse button and choose **Add to Print Access Toolbar**.

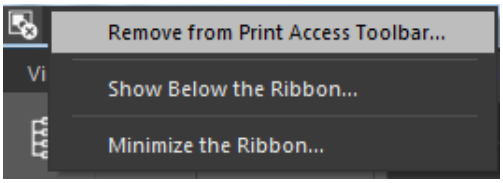


3 Check if the tools are added successfully.



Remove tools

1 Click the tools to remove with a right mouse button and choose **Remove from Print Access Toolbar**.



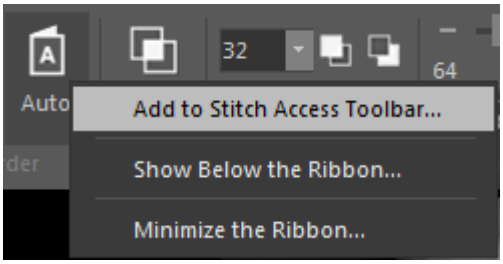
2 Check if the tools are removed successfully.

12.2.5 Stitch Access Toolbar

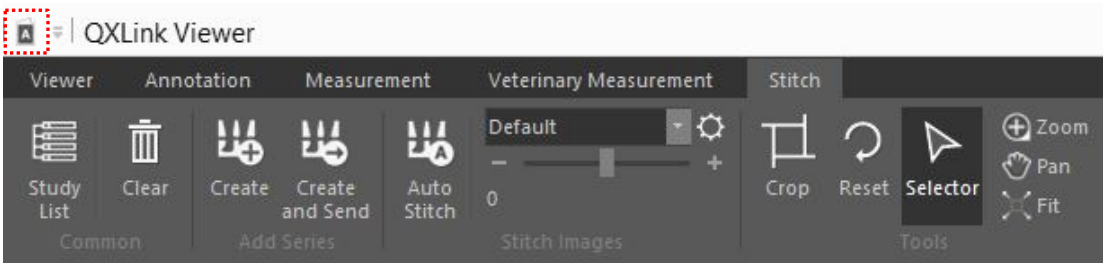
Add tools

1 Open the **Stitch** window.

2 Click the tools to add with a right mouse button and choose **Add to Stitch Access Toolbar**.



3 Check if the tools are added successfully.



Remove tools

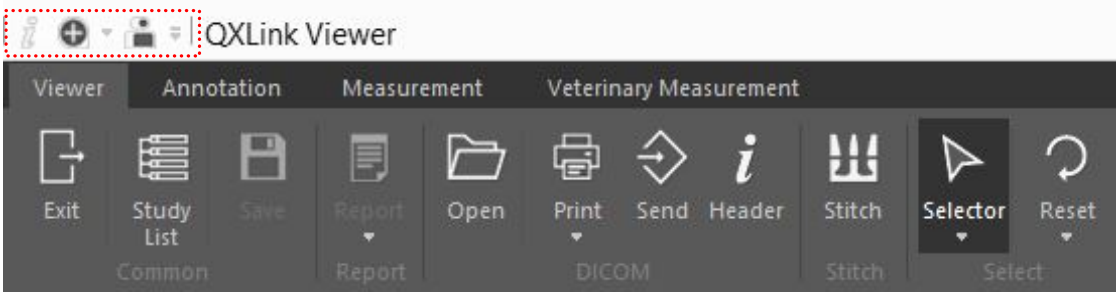
1 Click the tools to remove with a right mouse button and choose **Remove from Stitch Access Toolbar**.

2 Check if the tools are removed successfully.

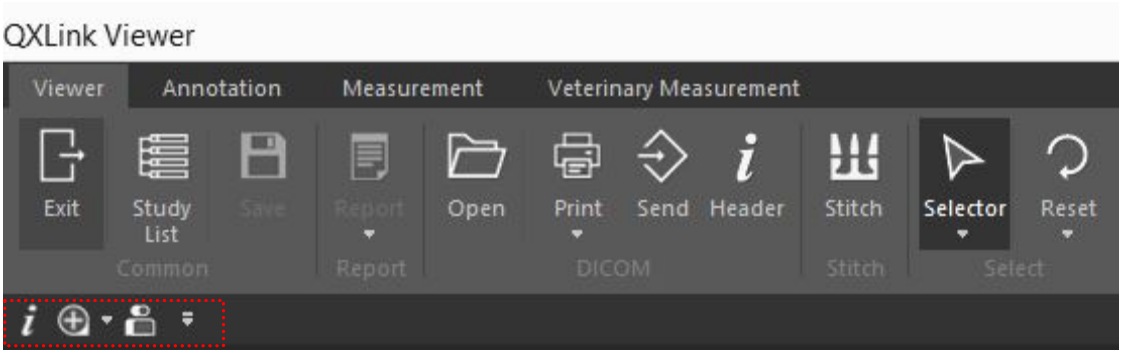
12.3 Changing the Position of Quick Access Toolbar

You can move quick access toolbar above or below the ribbon menu. The changed position of quick access toolbar is applied to all windows.

1 Click the right mouse button on the quick access toolbar and choose **Show Above (Below) the Ribbon**.



2 You can see that the toolbar is moved to the bottom of the ribbon menus.



12.4 Keyboard Shortcut

Name	Appliable window	Function
F2	**Study List**	Moves to the Study List window
	Viewer	Moves to the Viewer window
F3	**Viewer**	Opens the Report window
Esc		Cancels the current task being processed.
Delete		Deletes the selected annotation Or, deletes the step which was measured just before the current step.
Home		Moves to the first page of the current study.
End		Moves to the last page of the current study.
Page Up		Moves to the previous page from the current study
Left Arrow		
Up Arrow		
Page Down		Moves to the next page from the current study
Right Arrow		
Down Arrow		

13. Appendix

13.1 Appendix

This chapter explains available functions of the measurement tools (Chiropractic, Orthopedic, Veterinary) depending on your intended use.

Functions	Chiropractic	Orthopedic	Veterinary
Point	O	O	O
Center Point	O	O	O
Line	O	O	O
Extended Line	O	O	O
Text	O	O	O
Mark	O	O	O
Arrow	O	O	O
Free Line	O	O	O
Curve Line	O	O	O
Rectangle	O	O	O
Ellipse	O	O	O
Circle	O	O	O
Rectangle Shutter	O	O	O
Ellipse Shutter	O	O	O
Polygon Shutter	O	O	O
Free Draw Shutter	O	O	O
Angle	O	O	O
Horizontal Orthogonal	O	O	X
Vertical Orthogonal	O	O	X
Cross Angle	O	O	O
Cross with 3 lines	O	O	X
Cross with 5 lines	O	O	X
Cross with unlimited	O	O	X
Axis Angle	O	O	O
Axis with 3 Lines	O	O	O
Axis with 5 Lines	O	O	O
Middle Angle	O	O	O
Distance	O	O	O
Vertical Discrepancy	O	O	O
Horizontal Level	O	O	X
Vertical Level	O	O	X
4 Points Ratio	O	O	X
3 Points Ratio	O	O	X
CT Ratio	O	O	X
Cobb Angle	O	O	O

Cobb with 3 lines	O	O	O
Cobb with 5 lines	O	O	O
Cobb with 8 lines	O	O	O
Vertebral Line	O	O	X
George's Line	O	O	X
George's Line with Label	O	O	X
Spine Analysis	O	O	X
Cervical Curve	O	O	X
Lumbar Curve	O	O	X
Spine Label	O	O	X
Sagittal Spine Alignment	O	O	X
Pelvic Parameters	O	O	X
Spondylolisthesis	O	O	X
High Tibial Osteotomy	X	O	X
Meta-diaphyseal Angle	X	O	X
Pelvis Analysis	O	O	X
Leg Length Discrepancy	X	O	X
Acetabular Angle	X	O	X
Illiac Angle	X	O	X
Center Edge Angle	X	O	X
Femoral Symmetry	X	O	X
Head Shaft Angle	X	O	X
Podiatriy Analysis	X	O	X
Hallux Valgus Interphalangeus Angle	X	O	X
Hallux Valgus Angle	X	O	X
Intermetatarsal Angle	X	O	X
Distal Metatarsal Articular Angle	X	O	X
Proximal Metatarsal Articular Angle	X	O	X
Limb Deformity Analysis	X	O	X
Norberg Angle	X	X	O
Percent Coverage	X	X	O
Vertebral Heart Score	X	X	O
Clock Face	X	X	O
TTA	X	X	O
TPLO	X	X	O
Line Fragment	O	O	O
Ellipse Fragment	O	O	O
Polygon Fragment	O	O	O
Free Draw Fragment	O	O	O

14. Revision History

14.1 Revision History

Ver.	Date	Description	Applied ver. (Viewer)
1.0	2012-10-15	• Initial Release	V3.0.0.5
1.1	2013-04-13	• (Updated) Totally revised	V3.0.0.6 – V3.0.0.10
	2013-04-18	• (Added) 1.2.1 Login with a new edit server • (Added) 17.1 Network properties check • (Deleted) CE mark in the front cover	V3.0.0.10
	2013-04-22	• (Deleted) 17. Troubleshooting - Move the contents to the Troubleshooting guide	V3.0.0.10
2.0	2013-10-19	• (Changed) Front cover/relevant pages • (Added) FDA regulations	V3.0.0.10
2.1	2014-02-21	• (Added) 'CE 0434' mark on the front cover • (Updated) 4 Study list UI layouts • (Updated) 5.1.3 DICOM Directory • (Updated) 5.3 Searching from database • (Updated) 9 QXLink Viewer • (Updated) 10 Viewer	V3.0.0.12
2.2	2014-07-14	• (Updated) 9.1.1 Thumbnail • (Updated) 9.1.3 Study Viewer • (Updated) 10.3 Opening DICOM file manually • (Updated) 10.6.1 Selector • (Updated) 10.7 Annotation common menu • (Updated) 17.2.3 Query/Retrieve SCP • (Updated) 17.5.3 Study veiwer • (Updated) 17.6.2 Image display format • (Updated) 17.6.3 Custom image display format • (Added) 10.6.16 Changing the location of study	V3.0.0.15
3.1	2015-03-24	• (Changed) Title • (Changed) Company address and logo • (Changed) Document format • (Added) 7 Veterinary Measurement	V3.1.0.4
3.2.0.14	2016-08-30	• (Updated) Screen shots and icons • (Added) 6 Human Measurement • (Added) 13 Appendix • (Changed) 7 Veterinary Measurement • (Changed) Version format of a document file • (Changed) 9 Print • (Changed) 11.5 Viewer Option	V3.2.0.14
3.2.0.27	2018-07-13	• Added) 4.2.20 Window Level • Updated) 5.2 Annotation Tools • Updated) 6.2 Human Measurement Tools	V3.2.0.27

		• Updated) 7.2 Veterinary Measurement Tools • Updated) 8.1 Report	
3.2.0.32	2019-04-09	• Added a note in the chapter 2.1.2 Setting Login Server • Updated the chapter 3.2 Search Condition • Updated the chapter 3.3.13 Portable Viewer • Updated the chapter 4.2.20 Window Level • Updated the chapter 8.1 Report	V3.2.0.32

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