6. Human Measurement

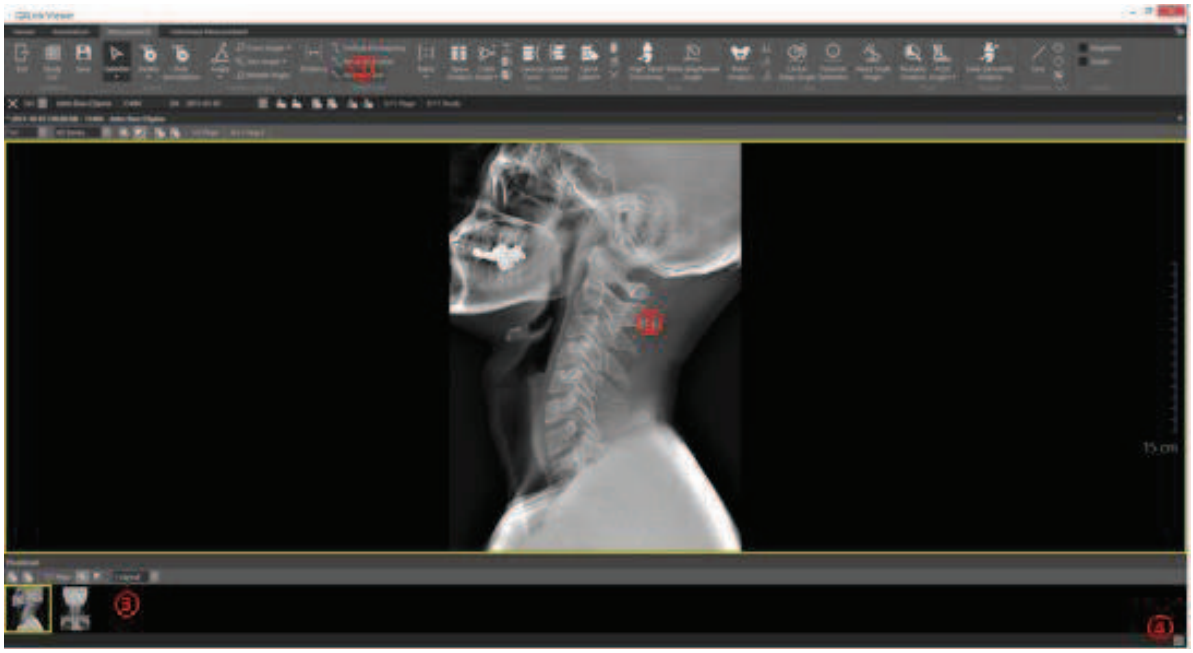
This chapter explains about the composition and functions of measurement for human.

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

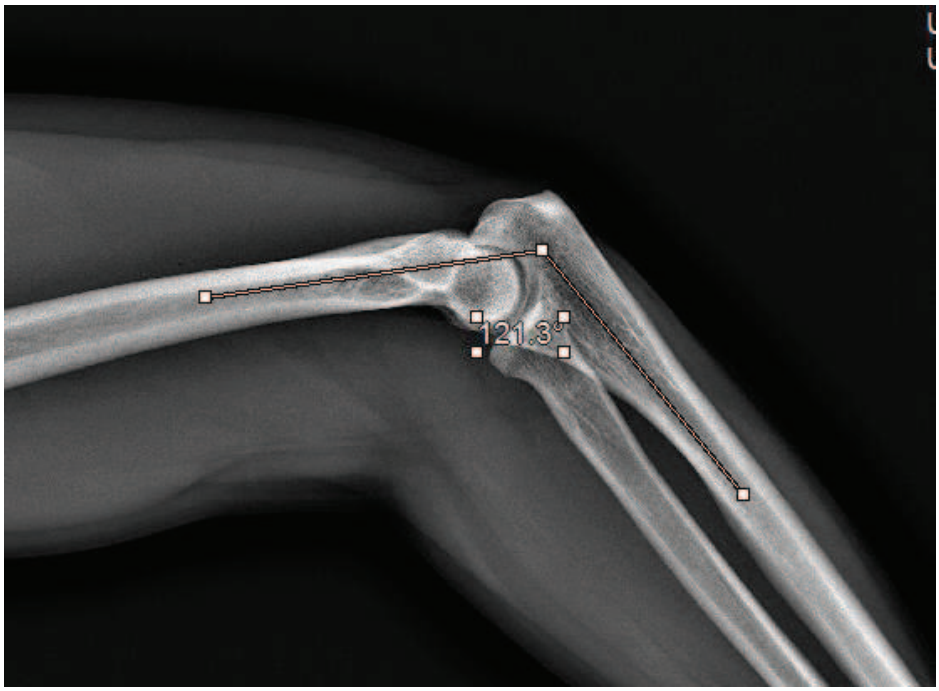
- The range of maximum tolerance for angle measurement is ±0.5°.
- The range of maximum tolerance for length measurement is ±0.5%.

- 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.



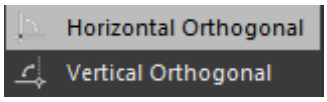
- You can change the measurement angle by moving two points to be measured.
  - The angle indicated between the two segments is limited to less than 180°.

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**.

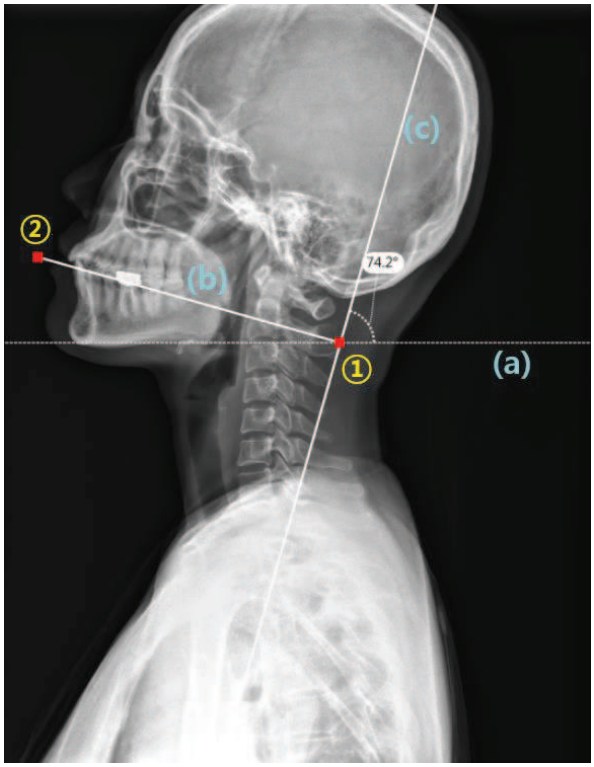


3 Click a point (①) on the image to create a horizontal line (a) as a dotted one.

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.



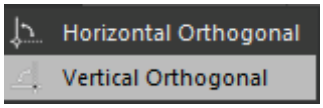
- An acute angle between a horizontal line (a) and a segment crossed the horizontal line (c).

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**.

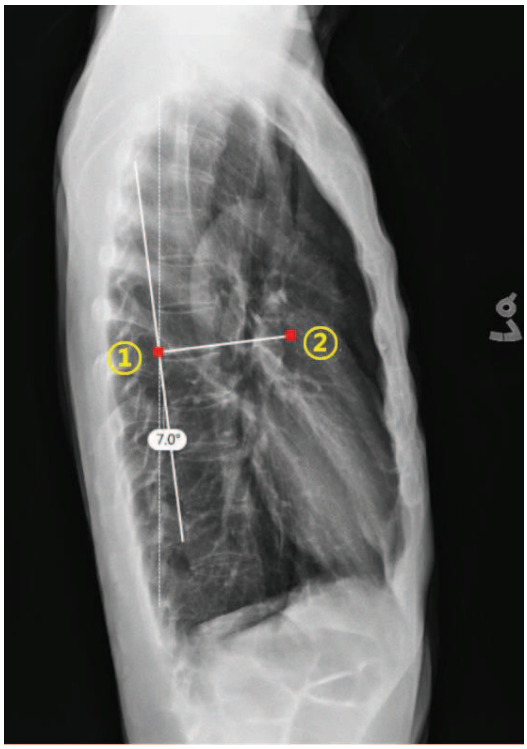


3 Click a point on the image (①) to create a vertical line (a) as a dotted one.

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**

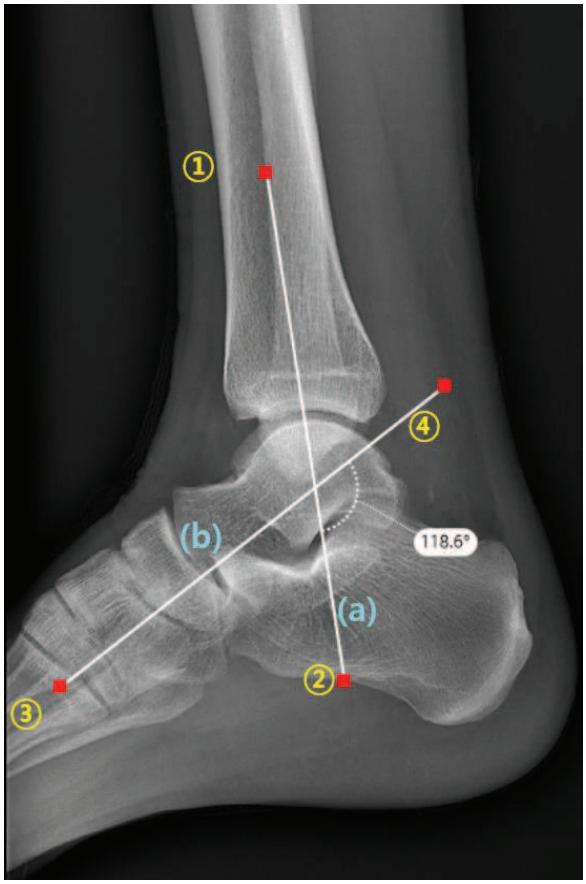
1 Select an image from the desired study.

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.



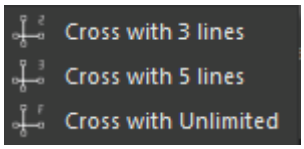
• An angle between a point (②) of the segment (a) and a point (④) of the segment (b).

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.

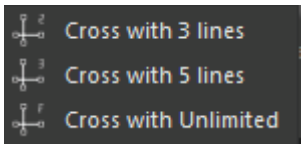
7 The angle between the second and the third segments is indicated.

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.

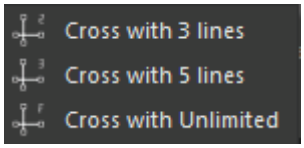
5 You can draw up to five segments.

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.

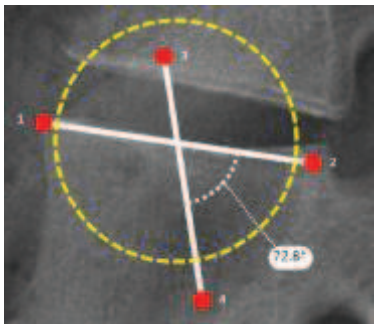
1 Select an image from the desired study.

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.

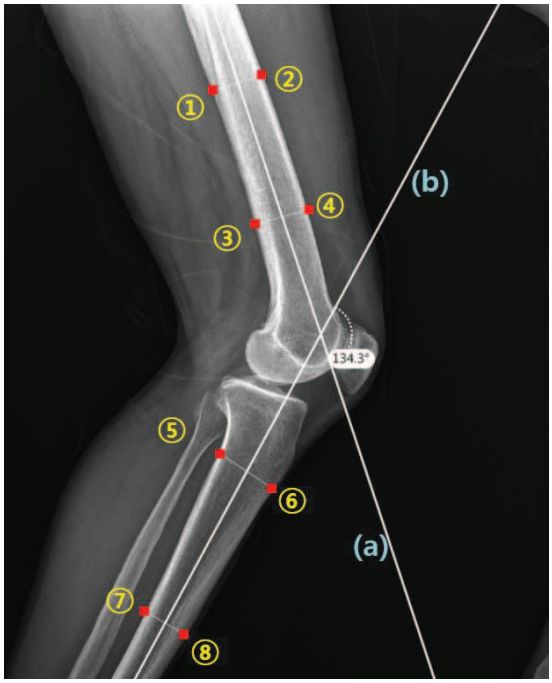
2 Click on the **Axis Angle** button from tool buttons and move a mouse pointer to the image view screen.

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.

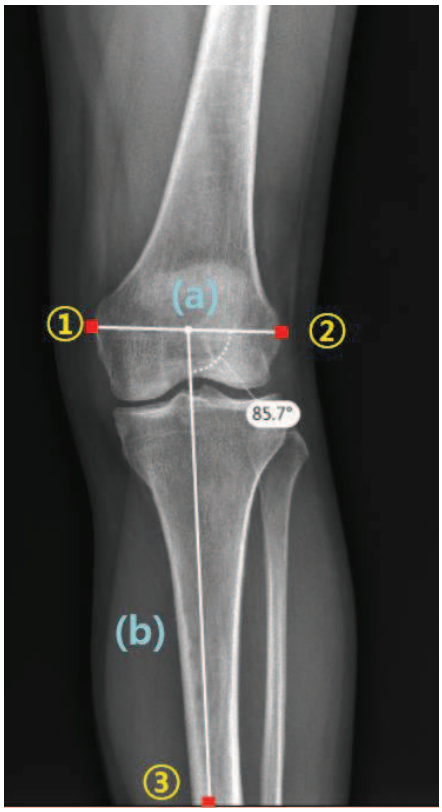
1 Select an image from the desired study.

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.

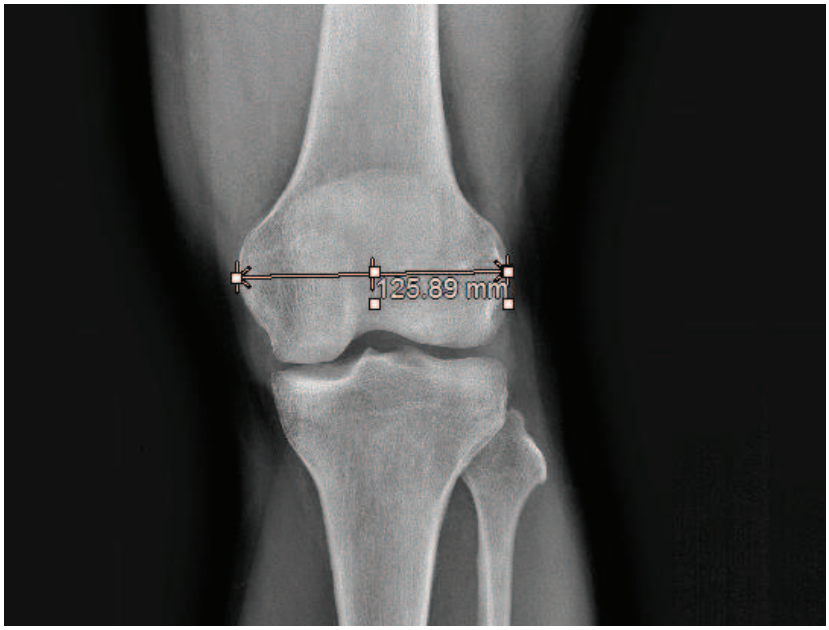
3 Move the mouse pointer to the image, then the mouse pointer will be changed to a ruler shape 

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

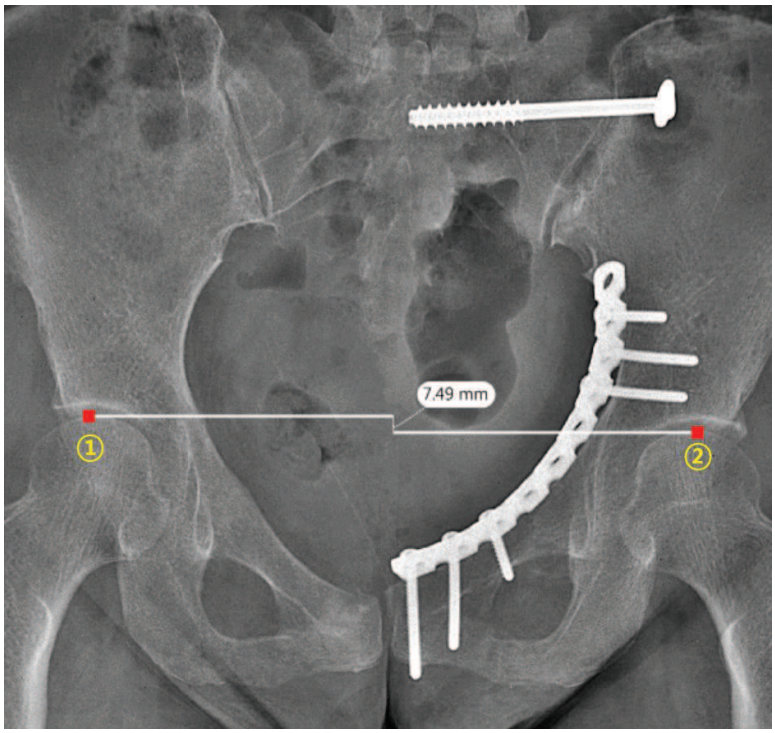
Button	Description
	Measures how twisted the two points which were supposed to be a symmetry.

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.

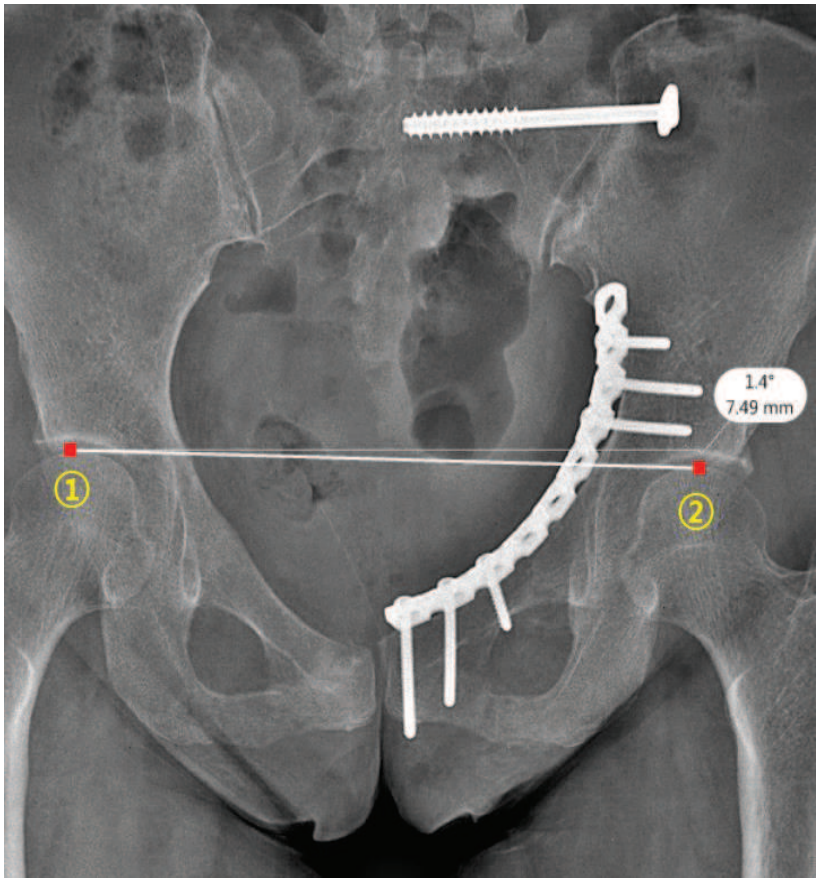
1 Select an image from the desired study.

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.

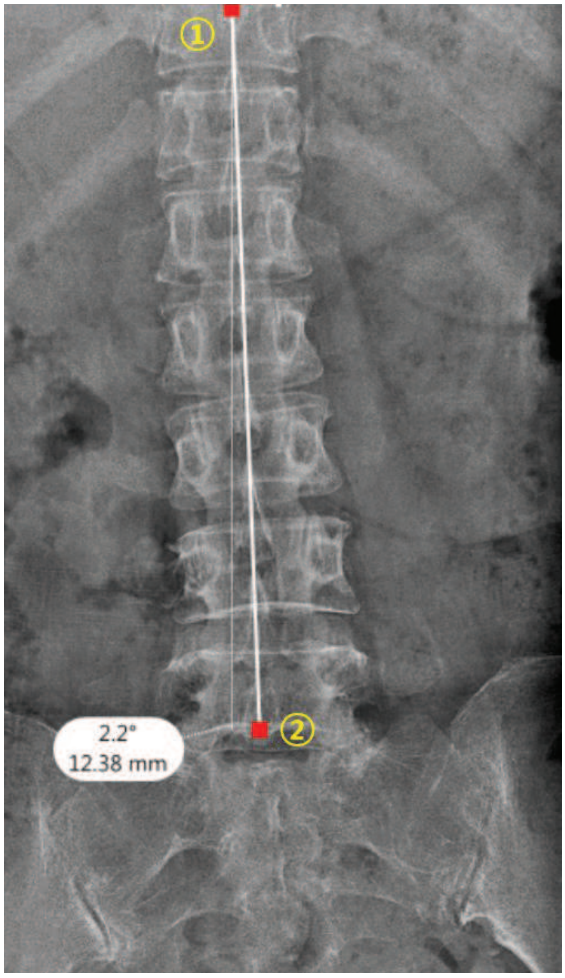
1 Select an image from the desired study.

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

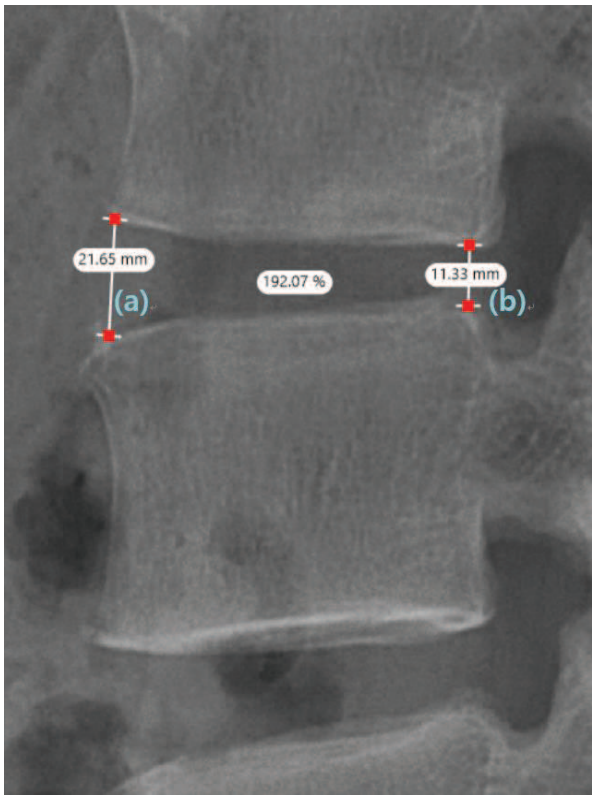
Button	Description
	Used for indicating ratio of two segment lines created by clicking four points. Click button at the bottom of the icon to use the advanced functions. • **3 Point Ratio** • **CT Ratio**

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).

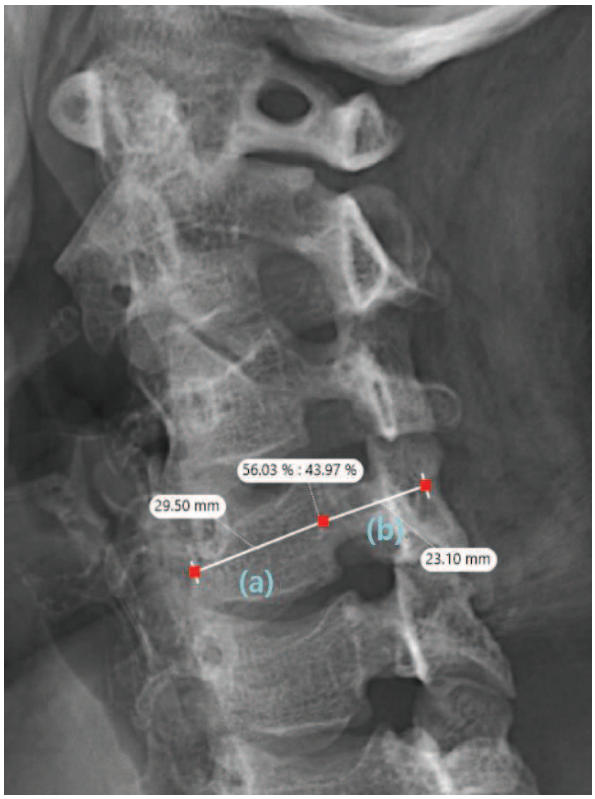
4 The length of two segments and the ratio of one segment (a) to the other one (b) is indicated.



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

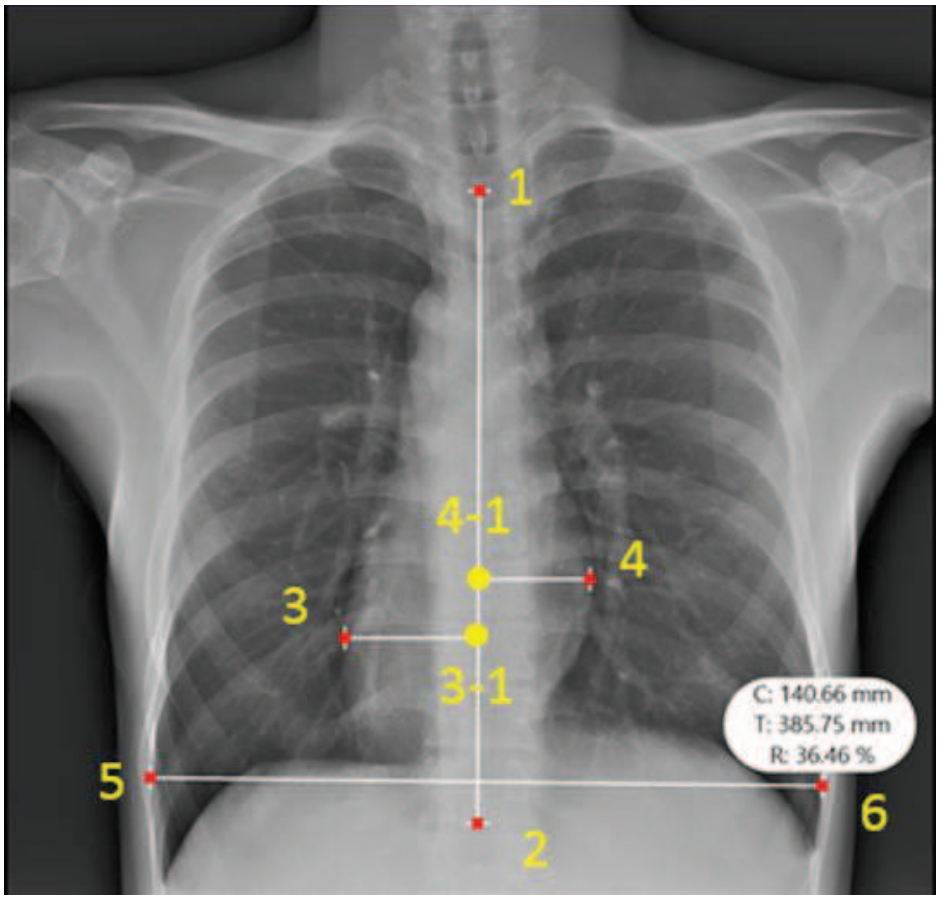
1 Draw a baseline to connect the spinous process of spine. (from point ① to ②)

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

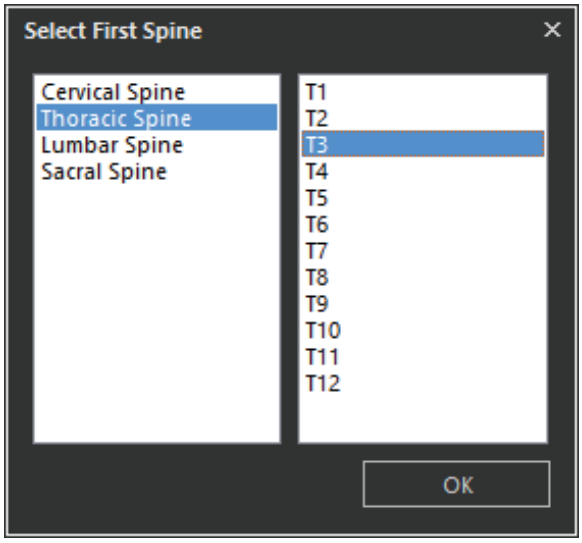
1 Click left / right points at the top and bottom of the first vertebrae to specify area to be measured.

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

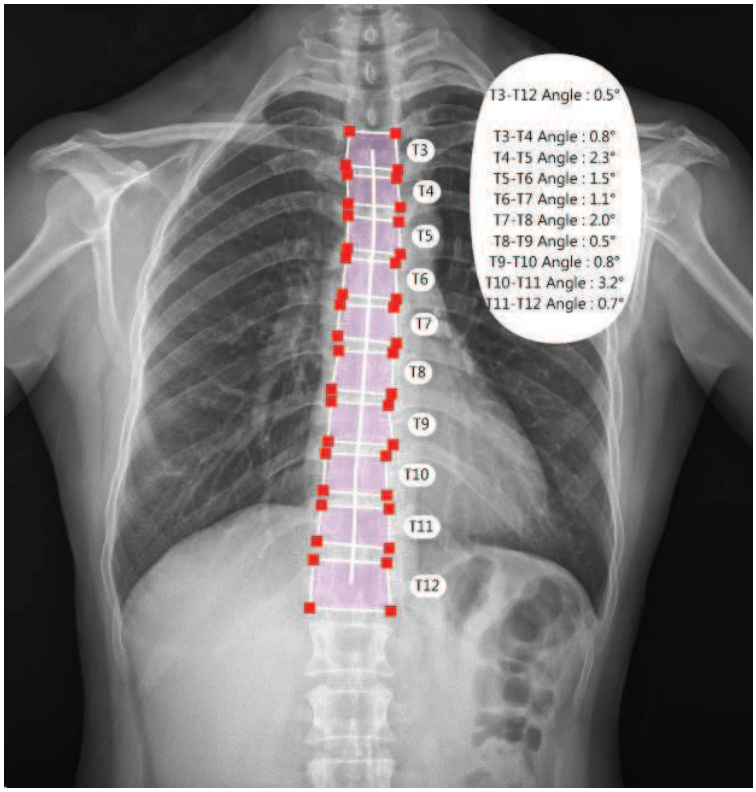
3 The centerline connected the center of each area is created automatically.

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

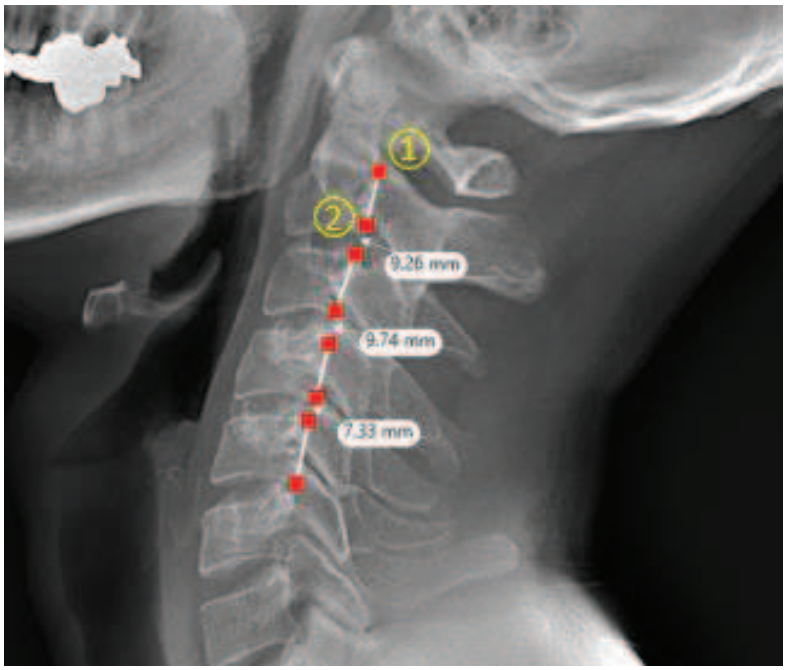
1 Select an image from the desired study.

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.

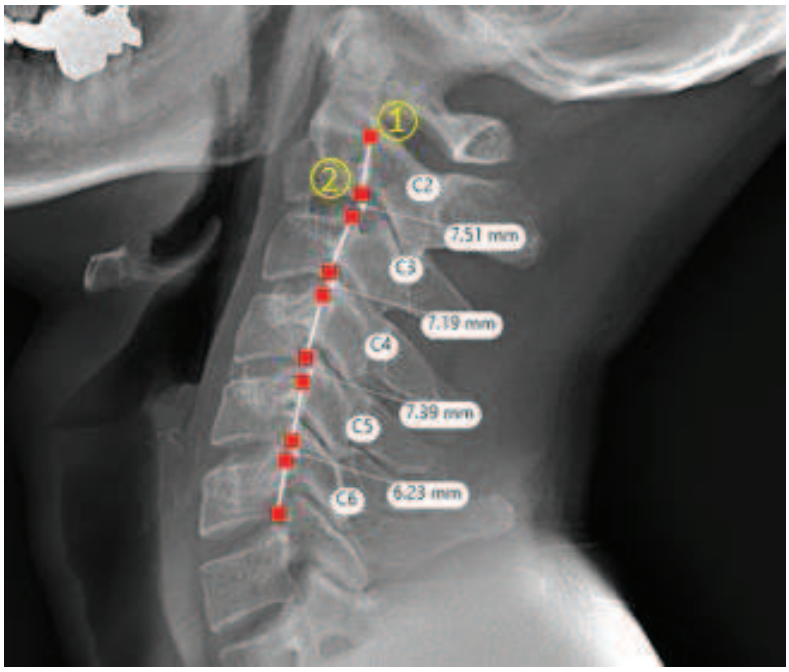


6.2.14 George's Line with Label

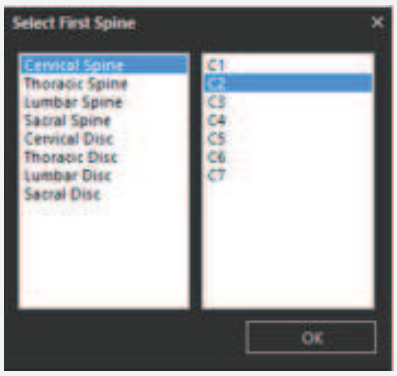
Button	Description
	Indicates a george's line and the position of vertebrae to check if its continual line is well-arranged and to check the position as well as the interval of vertabrae.

- 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.

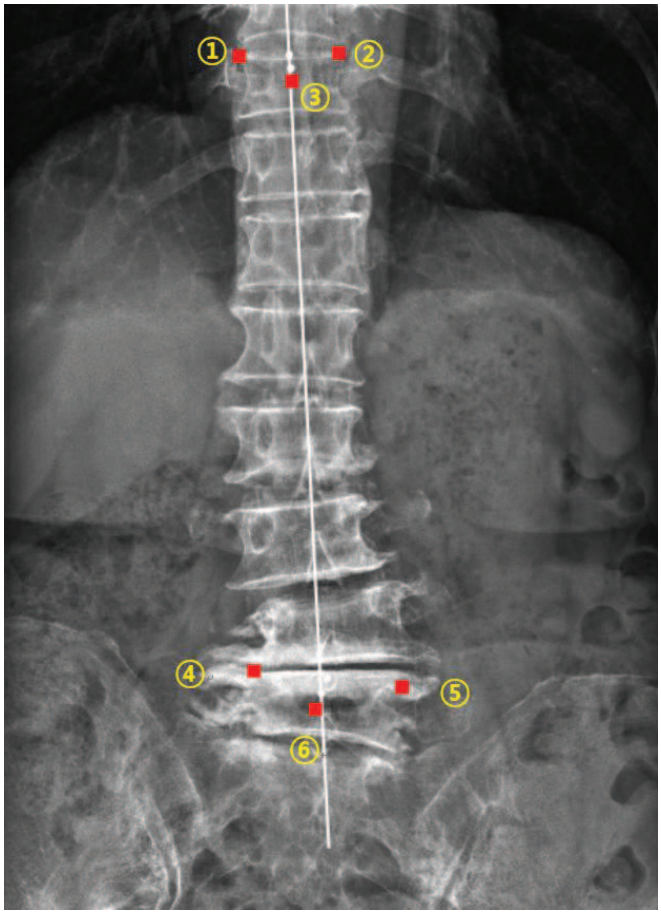
2 Click on the **Vertebral Line** button from the tool menus and move a mouse pointer to the image view screen.

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

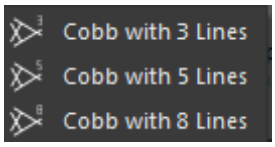
Button	Description
	Measures an angle between two lines that do not intersect each other. Click button at the bottom of the icon to use advanced functions from the popup menus. • **Cobb with 3 Lines** • **Cobb with 5 Lines** • **Cobb with 8 Lines**

- 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.

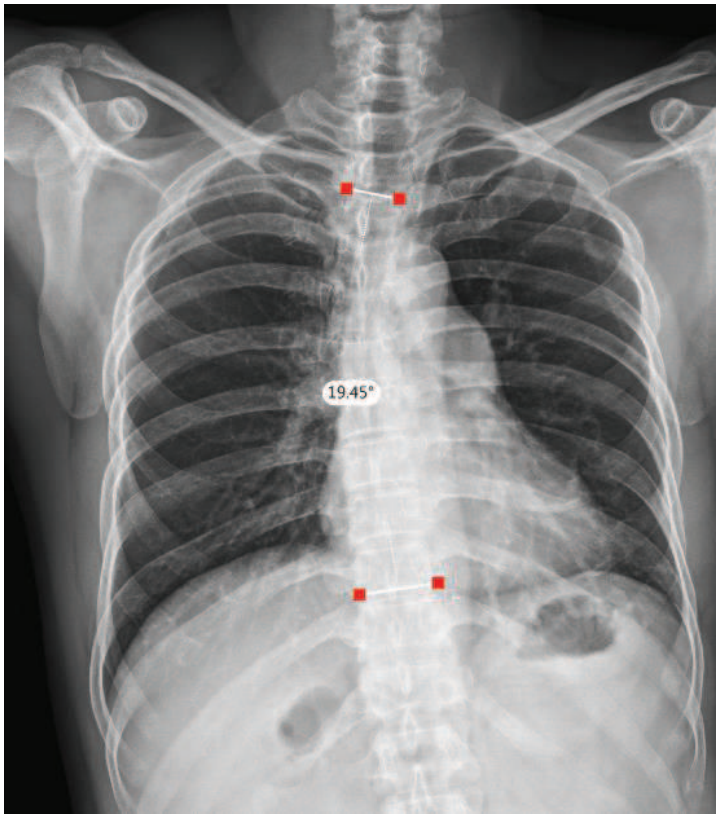


3 Move a mouse pointer to the image.

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.



6.2.17 Cervical Curve

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

- 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 on the upper rear of the first vertebrae (①) to measure a curved line.

4 Click on the bottom rear of the last vertebrae (②), and then a curve is created.

5 Move a mouse pointer left and right based on the curve and click a point to set the direction of the line to be bent.

6 The length of a straight line between the two points (①,②) and the angle between the center point of a circle and the two points are indicated.

- The curvature of a curve is created as making a virtual point determined by the radius value and a circle around the virtual point pass through the two points (①,②).
- 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.

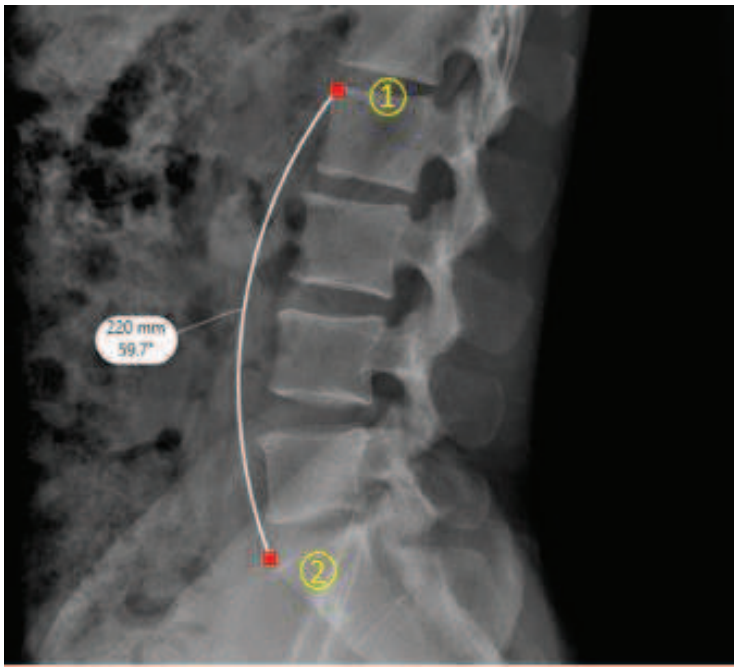
2 Click on the **Lumbar Curve** button from the tool menus and move a mouse pointer to the screen.

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 Move a mouse pointer left and right based on the curve and click a point to set the direction of the line to be bent.

6 The length of a straight line between the two points (①,②) and the angle between the center point of a circle and the two points are indicated.



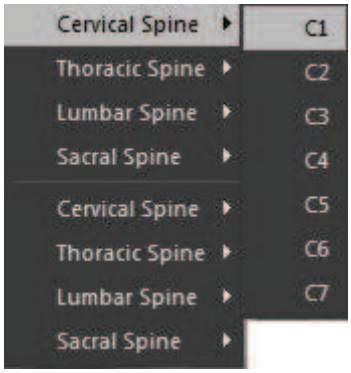
- The curvature of a curve is created as making a virtual point determined by the radius value and a circle around the virtual point pass through the two points (①,②).
- You can change the initial size of radius as follows.
  - Right click on the screen where **Lumbar Curve** is applied > **Properties** > **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
	• Checks deformation of the whole vertebrae (sagittal plane) at once, and measures its length, degree and arrangement. • Click on the right mouse button and choose **Properties** to use the following menus. ▫ **Cobb with 3 Lines** ▫ **Cobb with 5 Lines** ▫ **Cobb with 8 Lines**

- Application Example: Spine Alignment

1 Select an image from the desired study.

2 Click on the **Sagittal Spine Alignment** button from tool menus and move a mouse pointer to the screen.

3 Mark the first, second, and third points on the outline of the first femoral head to create a circle passes through the first femoral head.

4 Mark the first, second, and third points on the outline of the second femoral head to create a circle passes through the second femoral head.

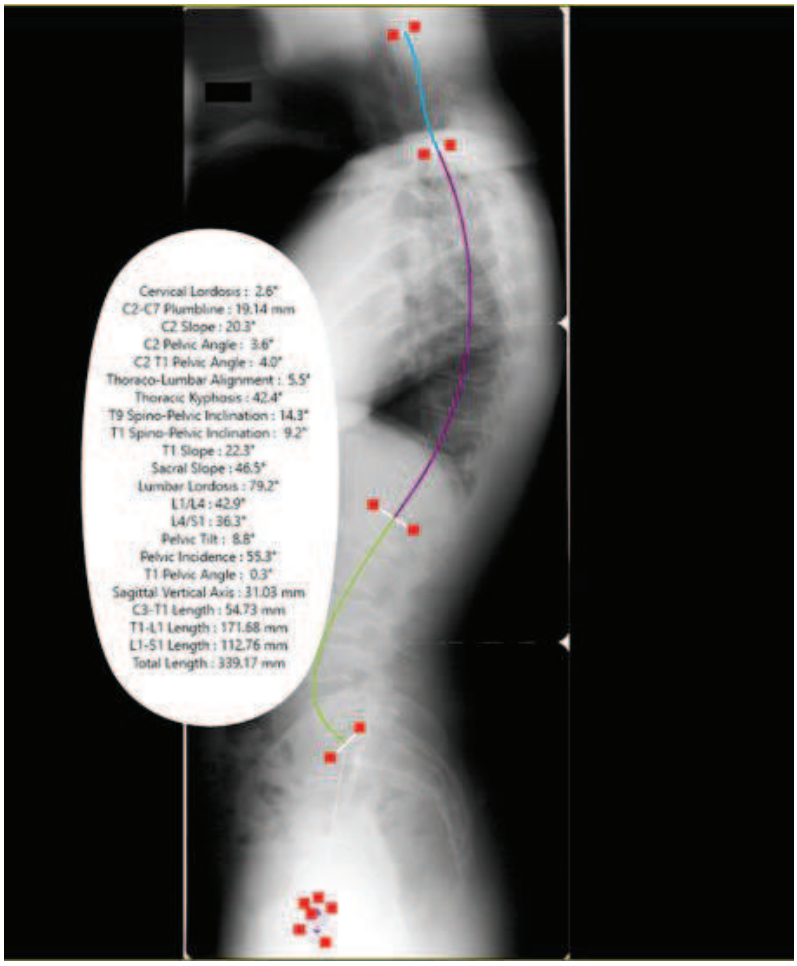
5 Mark each point on the upper front and rear of the sacrum spine to create a sacrum line.

6 Mark each point on the upper front and rear of the lumbar spine #1 to create a lumbar line.

7 Mark each point on the upper front and rear of the thoracic spine #1 to create a thoracic line.

8 Mark each point on the bottom front and rear of the cervical spine #2 to create a cervical ine.

9 After that, a spine line is created automatically with analysis result.



- Refer to <5.2.25 Guide Funtionality> to use the guide function of **QXLink Viewer** for setting exact location during the measurement.
- When you place a mouse cursor on the analysis result, the measured part is highlighted in a yellow color.
- Click on the right mouse button to use the following functions from pop-up menus.
  - **Show Spine Shape**: Changes a spinal line as the type of vertebrae bone shape (square).
  - **Reset Spine Shape**: If the **Reset Spine Shape** function is not checked under the **Show Spine Shape** mode, you can change or move the shape of vertebrae bone.

- The angle shows on the screen is made between the upper and bottom sides of the top / bottom vertebrae.
  - **L1 / L4**: The angle between the upper side of L1 and the bottom sides of L4.
- The length shows on the screen means a straight line between center points of the segments of the vertebrae's top / bottom sides.
  - **T1-L1 Length**: Length between the center points of a thoracic line and a lumbar line.

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: Pelvic Distortions

1 Select an image from the desired study.

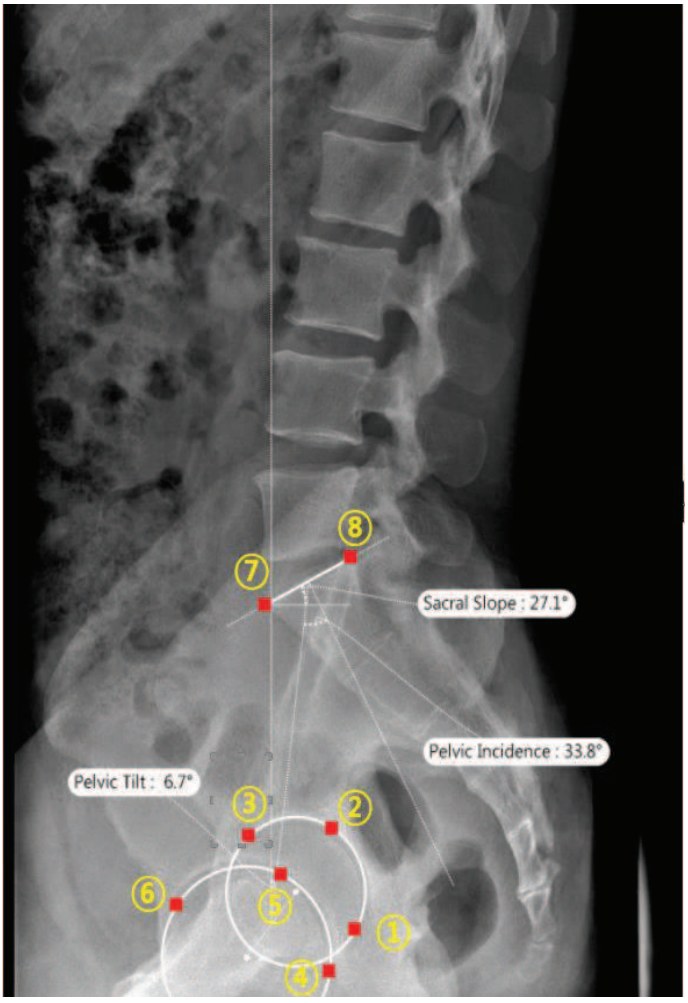
2 Click on the **Pelvic Parameters** button from tool menus and move a mouse pointer to the screen.

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

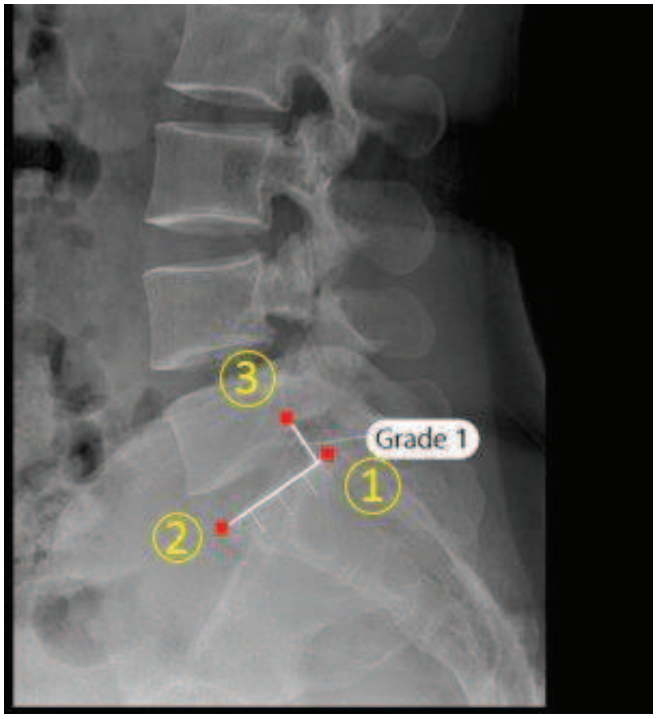
3 Click on the top back (①) and top front (②) of sacrum (S1) to create a segment.

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).

5 The degree of dislocation is indicated as follows.

▫ In case of the degree 4

- 0% > Out of grade / Out of grade >100%
- 0% ≤ Grade 1 <25%,
- 25%≤ Grade 2 < 50%,
- 50% ≤ Grade 2 < 75%,
- 75% ≤ Grade 2 ≤ 100%



- This function employs an imaging analysis, "Meyerding Scale", whose clinical usage is widely recognized to describe the severity of spondylolisthesis. A published literature by Brian K. Kwon and Todd J. Albert (2005) supports this analysis technic.
- You can change the number of grades to subdivide the degree of dislocation. (min. 2 ~ max. 10).

	▫ Right click on the screen where **Spondylolisthesis** is applied > **Properties** > **Number of Grade**. ▫ As **Number of Grade** increases, the range of each grades is getting smaller, which will enable more detailed measurement of spondylolisthesis severity.

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

1 Select an image from the desired study.

2 Click three points along the edge of a femoral head in the direction where you try to measure. Then a circle is created.

3 Click on the bottommost of the left lateral condyle of a femur, and on the bottom of the medial condyle.

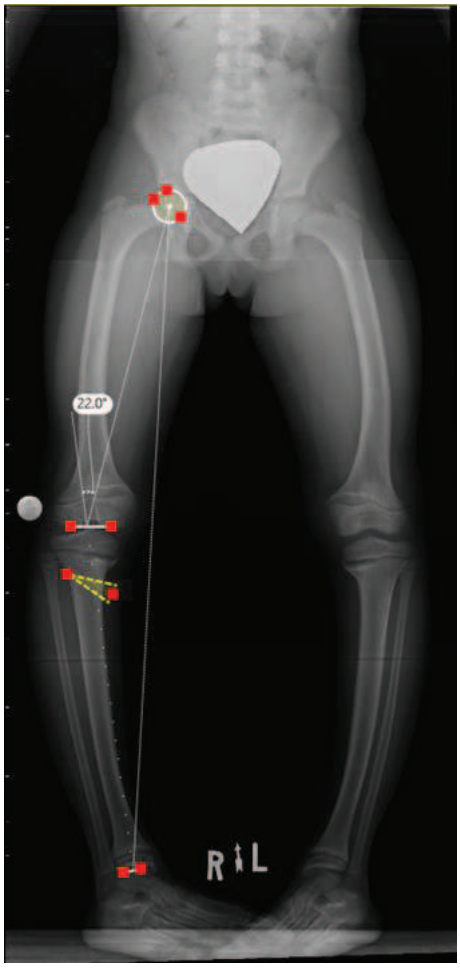
4 The degree of bending is indicated as an angle between the center point of a circle created in the step 2, and the segments connecting two points marked in the step 3.

5 Click each point on the both ends of the ankle joint.

6 A line is indicated connecting the center point of a circle created in the step 2, and the center point of a segment created in the step 5.

7 Mark a starting point on the position where you try to make an incision.

8 Move a mose cursor and mark an ending point of the cutting line with the angle created in the step 4.



- Refer to <5.2.25 Guide Funtionality> to use the guide function of **QXLink Viewer** for setting exact location during the measurement.

6.2.24 Meta-Diaphyseal Angle

Button	Description
	Takes 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.

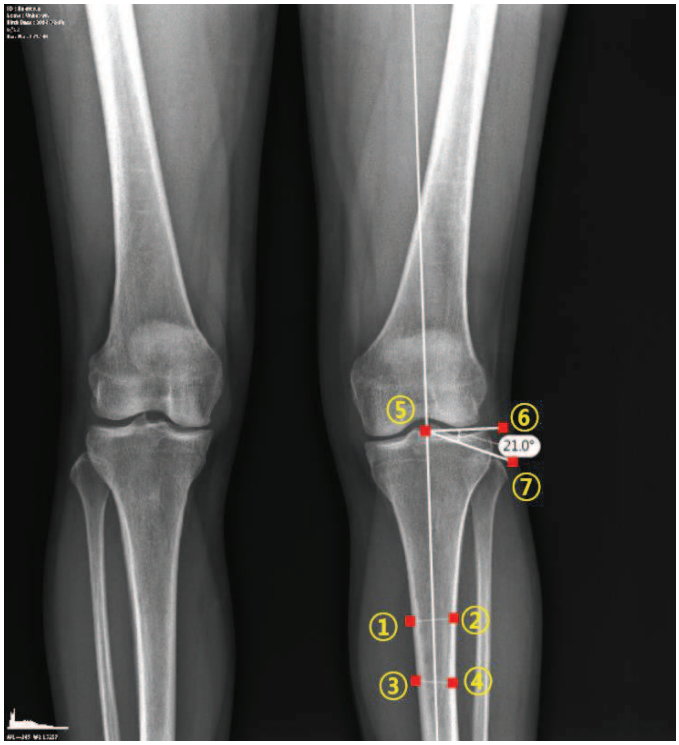
2 Click on the **Meta-Diaphyseal Angle** button and move a mouse button to the screen.

3 Click four points on the tibia (①~④) to indicate the axis of tibia.

4 Click a point (⑤) on the tibia epiphysis.

5 Click a point perpendicular to the axis of tibia (⑥), and click the end point of tibia epiphysis sticking out the most (⑦).

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

1 Select an image from the desired study.

2 Mark each point on the highest position on the left and right sides of the femur head to create FHL (Femur Head Line).

3 Mark a point on the highest position of the right iliac crest, and on the lowest position on the right ischial tuberosity to make a segment vertically with FHL. The distance of segment is indicated on the image.

4 Mark a point on the highest position of the left iliac crest, and on the lowest position on the left ischial tuberosity to make a segment vertically with FHL. The distance of segment is indicated on the image.

5 Mark a point on the S2 tubercle to create a straight ine (SCL).

6 Mark a point on the center of the pubic symphysis to measure a degree of bending from SCL.

7 Mark each point on the ending points of the left / right S1 facet base.

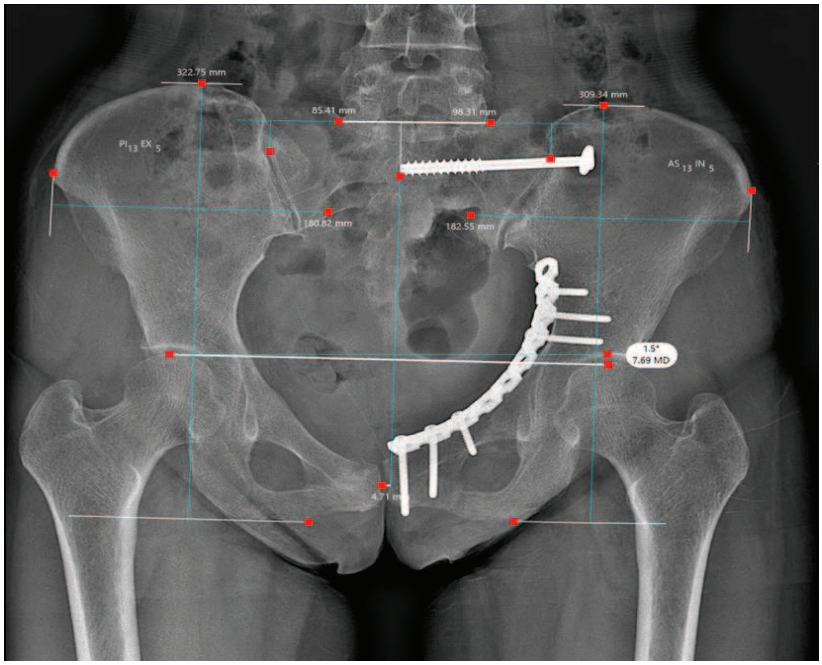
8 Mark a point on the most lateral aspect of the right sacral wing. A length from the point where SBL and SCL join is indicated.

9 Mark a point on the most lateral part of the left sacral wing. A length from the point where SBL and SCL join is indicated.

10 Mark a point on the most medial part of the right PSIS (Posterior Superior Iliac Spine), and on the most lateral part of the right iliac wing. A length between the two points is indicated.

11 Mark a point on the most medial part of the left PSIS (Posterior Superior Iliac Spine), and on the most lateral part of left iliac wing. A length between the two points is indicated.

12 Mark a point just above the lower point of the two femur heads marked in step 2 and 3. Then the angle and height difference between the left / right femoral heads are indicated.



- Refer to <5.2.25 Guide Funtionality> to use the guide function of **QXLink Viewer** for setting exact location during the measurement.

6.2.26 Leg Length Discrepancy

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

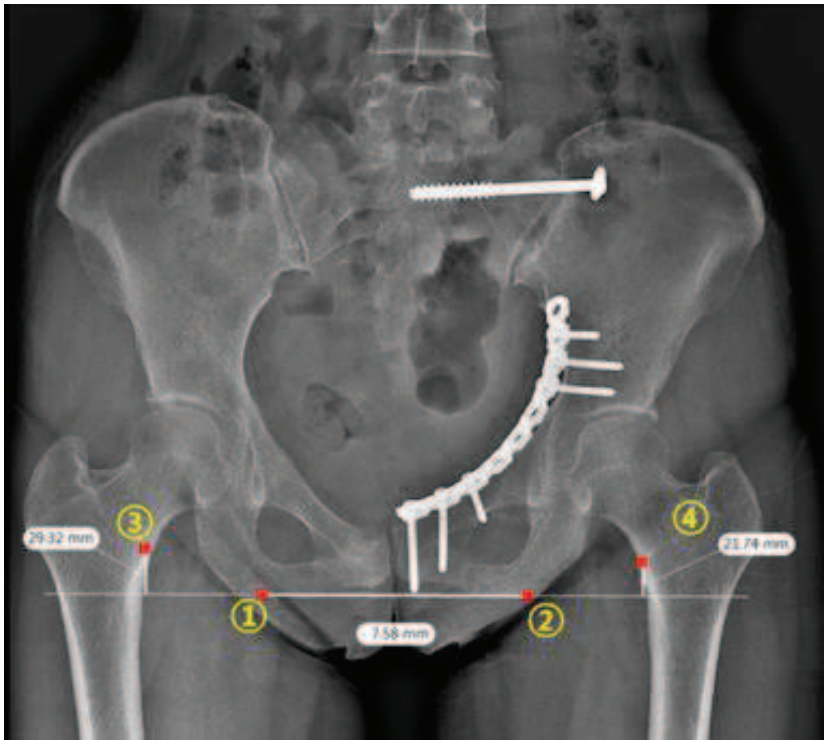
1 Select an image from the desired study.

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

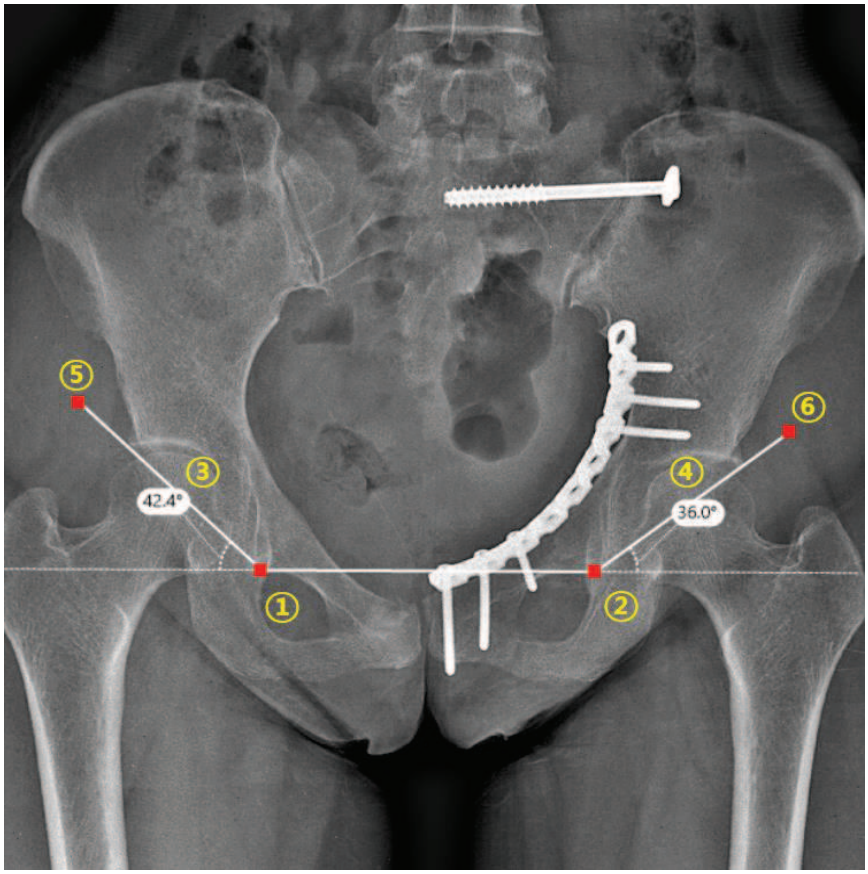
1 Select an image from the desired study.

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.

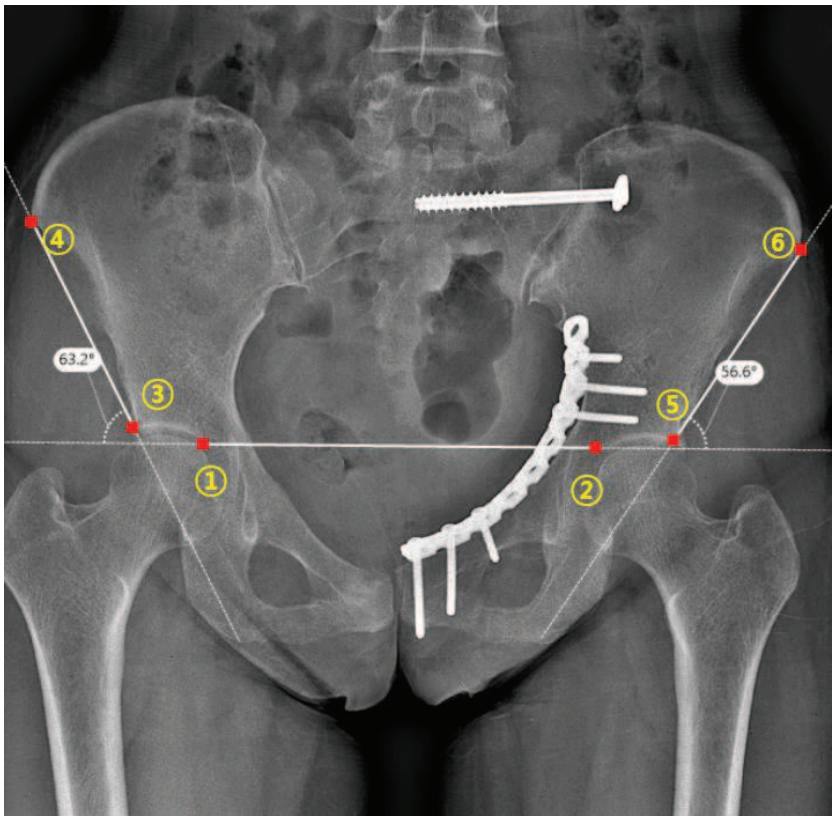
2 Click on the **Iliac Angle** button from tool menus and move a mouse pointer to the screen.

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.

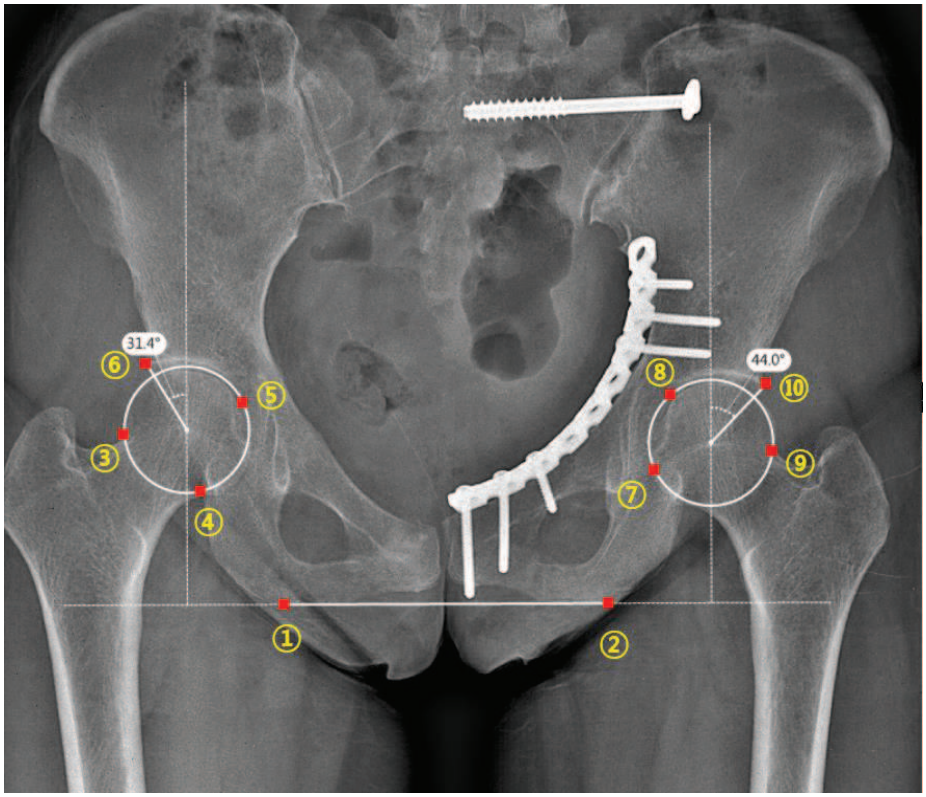
2 Click **Center Edge Angle** button and move a mouse pointer to the image view screen.

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.

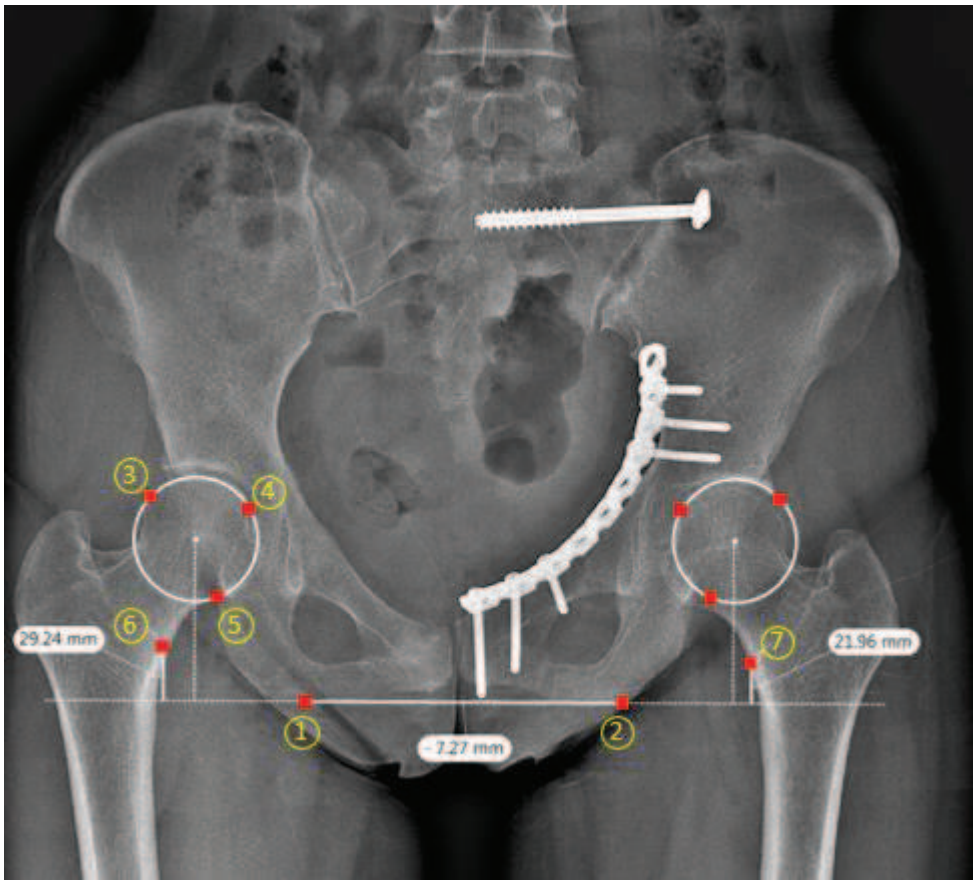
2 Click on the **Femoral Symmetry** button from tool menus and move a mouse pointer to the screen.

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.