Table of Contents.

Cervical X-rays
- AP Cervical X-rays  Section 1_A
  - Line Drawing  Section 1_A_1
  - Display Results  Section 1_A_2
- Lateral Cervical X-ray  Section 1_B
  - Line Drawing  Section 1_B_1
  - Display Results  Section 1_B_2
- Open Mouth X-rays  Section 1_C
  - Line Drawing  Section 1_C_1
  - Display Results  Section 1_C_2

Thoracic X-rays  Section 2
- AP Thoraic X-rays  Section 2_A
  - Line Drawing  Section 2_A_1
  - Display Results  Section 2_A_2
- Lateral Thoracic X-ray  Section 2_B
  - Line Drawing  Section 2_B_1
  - Display Results  Section 2_B_2

Lumbar X-rays  Section 3
- AP Lumbar X-rays  Section 3_A
  - Line Drawing  Section 3_A_1
  - Display Results  Section 3_A_2
- Lateral Lumbar X-ray  Section 3_B
  - Line Drawing  Section 3_B_1
  - Display Results  Section 3_B_2

Pelvic X-rays  Section 4
- AP Pelvic X-ray  Section 4_A
  - Line Drawing  Section 4_A_1
  - Display Results  Section 4_A_2

Dicom Digital X-ray Viewer  Section 5

KEY:
- Return to Table of Contents
- Previous page  Next page
At the menu at the top of the screen click on Relative Size (Highlighted here in Yellow)

Extend a line from the back of the measuring object (Red Arrow) to the front of the measuring object. (Blue Arrow)
Yellow line will be drawn thin will disappear.

Click on the radio button marked Cobb Angle (Red Arrow) if it is not already selected.
From this point follow the tool tips that appear when you move your cursor over the photo

Follow the instructions of the tooltip which says: Extend a line across the top of Axis. This is done by placing the cursor at the left superior body of axis (Red Arrow points to it) and dragging the line to the right superior body of axis. (Blue arrow points to it.)
The next tooltip appears instructing:
Extend a line across the superior body of T1. This is done by placing the cursor at the left superior body of T1 (Red Arrow points to it) and dragging the line to the right superior body of T1. (Blue arrow points to it.). Use the inferior body of C7 if it is more visible.

The next tooltip appears instructing:
Extend line across Atlas transverse processes. Left (Red Arrow) to Right (Blue Arrow).

The next tooltip appears instructing:
Extend line from center of T4 (Red Arrow) (or most visible inferior vertebra) through the apex of the scoliosis.(Blue Arrow)
The next tooltip appears instructing:
Extend line from center of C2 (Red Arrow) through the apex of the scoliosis (Blue Arrow).

The next tooltip appears instructing:
Extend line from center of T1 (Red Arrow) through the center of C2 (Blue Arrow).

The next tooltip appears instructing:
Click on the center of each Cervical vertebra from T3 (Red Arrow) to T7 (Blue Arrow).

This concludes the AP Cervical X-ray Line Drawing. You can now display the results of the analysis.
<table>
<thead>
<tr>
<th>Checking Here</th>
<th>Displays This</th>
<th>Gives this information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cobb Angle</strong></td>
<td><img src="image1" alt="Cobb Angle" /></td>
<td>The Cobb Cervical Scoliosis Angle is 6° The Normal is 0°</td>
</tr>
<tr>
<td><strong>Atlas Tilt</strong></td>
<td><img src="image2" alt="Atlas Tilt" /></td>
<td>The atlas tilt measures 2° The Normal is 0°</td>
</tr>
<tr>
<td><strong>Angle of Intersection</strong></td>
<td><img src="image3" alt="Intersection" /></td>
<td>The angle of intersection of the lumbar scoliosis is 5°</td>
</tr>
<tr>
<td><strong>Translation T1 - C2</strong></td>
<td><img src="image4" alt="Translation" /></td>
<td>The C2 to T1 lateral translation is 4mm</td>
</tr>
</tbody>
</table>

### Diagrams:
1. Cobb Angle: Indicates the Cobb angle, which is used to measure the severity of scoliosis. The normal Cobb angle for the cervical spine is 0°.
2. Atlas Tilt: Shows the angle of the atlas relative to the occiput, normal range is 0°.
3. Angle of Intersection: Illustrates the angle between the lumbar spine and the sacrum.
4. Translation T1 - C2: Visualizes the lateral translation between T1 and C2.
<table>
<thead>
<tr>
<th>Checking Here</th>
<th>Displays This</th>
<th>Gives this information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobb Angle</td>
<td></td>
<td>The C3 to T1 lateral translation is 3mm</td>
</tr>
<tr>
<td>Atlas Tilt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angle of Intersection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Translation T1 - C2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Translation T1 - C3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Translation T1 - C4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Translation T1 - C5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Translation T1 - C6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Translation T1 - C7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thoracic Lat Flex Angle</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Cobb Angle    |              | The C4 to T1 lateral translation is 3mm |
| Atlas Tilt    |              |                        |
| Angle of Intersection | |                        |
| Translation T1 - C2 | |                        |
| Translation T1 - C3 | |                        |
| Translation T1 - C4 | |                        |
| Translation T1 - C5 | |                        |
| Translation T1 - C6 | |                        |
| Translation T1 - C7 | |                        |
| Thoracic Lat Flex Angle | |                        |

| Cobb Angle    |              | The C5 to T1 lateral translation is 4mm |
| Atlas Tilt    |              |                        |
| Angle of Intersection | |                        |
| Translation T1 - C2 | |                        |
| Translation T1 - C3 | |                        |
| Translation T1 - C4 | |                        |
| Translation T1 - C5 | |                        |
| Translation T1 - C6 | |                        |
| Translation T1 - C7 | |                        |
| Thoracic Lat Flex Angle | |                        |

<p>| Cobb Angle    |              | The C6 to T1 lateral translation is 4mm |
| Atlas Tilt    |              |                        |
| Angle of Intersection | |                        |
| Translation T1 - C2 | |                        |
| Translation T1 - C3 | |                        |
| Translation T1 - C4 | |                        |
| Translation T1 - C5 | |                        |
| Translation T1 - C6 | |                        |
| Translation T1 - C7 | |                        |
| Thoracic Lat Flex Angle | |                        |</p>
<table>
<thead>
<tr>
<th>Checking Here</th>
<th>Displays This</th>
<th>Gives this information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>The C7 to T1 lateral translation is 2mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thoracic Lateral Flexion Angle measures 3º</td>
</tr>
</tbody>
</table>
Follow the instructions of the tooltip which says:

Extend a line from the posterior superior body of Axis to the anterior superior body of Axis.
This is done by placing the cursor at the posterior superior body of axis (Red Arrow points to it) and dragging the line to the anterior superior body of axis. (Blue arrow points to it.)

The next tooltip appears instructing:

Extend a line from the posterior superior body of C7 to the anterior superior body of C7.
This is done by placing the cursor at the posterior superior body of C7 (Red Arrow points to it) and dragging the line to the anterior superior body of C7. (Blue arrow points to it.)
The next tooltip that appears instructs:
Extend a line from the center of the odontoid process of Axis to the posterior inferior body of C7.
This is done by placing the cursor at the center of the Odontoid Process (Red Arrow points to it) and dragging the line to the posterior inferior body of C7. (Blue arrow points to it.) The line is shown here in yellow but in reality no actual line is drawn. It is only to determine the height of the cervical curve and determine the anterior gravity line starting point.

The next tooltip that appears instructs:
Extend a line through Atlas P to A.
You may do this by drawing a line through the center of the posterior arch of Atlas (Red Arrow through the center of the anterior arch of Atlas.(Blue Arrow)
Some may wish to use the most inferior portions of the arches as their guide lines… this is perfectly acceptable.

The next tooltip that appears instructs:
Extend a line from the posterior inferior body of Axis (Red Arrow) to the posterior superior body of Axis.(Blue Arrow)

The next tooltip that appears instructs:
Extend a line from the posterior inferior body of C3 (Red Arrow) to the posterior superior body of C3.(Blue Arrow)
The next tooltip that appears instructs:
Extend a line from the posterior inferior body of C4 (Red Arrow) to the posterior superior body of C4.(Blue Arrow)

The next tooltip that appears instructs:
Extend a line from the posterior inferior body of C5 (Red Arrow) to the posterior superior body of C5.(Blue Arrow)

The next tooltip that appears instructs:
Extend a line from the posterior inferior body of C6 (Red Arrow) to the posterior superior body of C6.(Blue Arrow)

The next tooltip that appears instructs:
Extend a line from the posterior inferior body of C7 (Red Arrow) to the posterior superior body of C7.(Blue Arrow)

This completes the Line drawing for Lateral Cervical X-rays
You are now ready to display the results of your analysis
Displaying Lines and information on the Lateral Cervical X-ray including CBP protocols

<table>
<thead>
<tr>
<th>Checking Here</th>
<th>Displays This</th>
<th>Gives this information</th>
</tr>
</thead>
</table>
| The Cobb Angle measures 38°  
The Normal is 40° |
| The gravity line is 57.11 mm anterior to the normal placement. |
| The Atlas Plane Angle is 12°  
The Normal is 28.7° |
| The Atlas/Axis Angle is 12°  
The Normal is 2° |
The C2/C3 relative rotation angle is 27°
The Normal is 9.4°

The C3/C4 relative rotation angle is 0°
The Normal is 8.2°

The C4/C5 relative rotation angle is 6°
The Normal is 8.2°

The C5/C6 relative rotation angle is -2°
The Normal is 8.2°

The C6/C7 relative rotation angle is -1°
The Normal is 8.2°
The vertical axis line indicates the gravity line is 88 mm posterior to the normal placement.

The C2/C3 relative rotation angle is 27°
The Normal is 9.4°
The C3/C4 relative rotation angle is 0°
The Normal is 8.2°
The C4/C5 relative rotation angle is 6°
The Normal is 8.2°
The C5/C6 relative rotation angle is -2°
The Normal is 8.2°
The C6/C7 relative rotation angle is -1°
The Normal is 8.2°

The Ruth Jackson Lines form an angle of 32°
The normal is between 30° and 40°
The lines should cross at the level of C5.

Any combination of these views can be displayed at the same time.
Whatever is displayed is what is printed.
It is a WYSIWYG or “What You See Is What You Get”
Click on the radio button marked Cobb Angle (Red Arrow) if it is not already selected. From this point follow the tool tips that appear when you move your cursor over the photo.

Extend line left side (Red Arrow) to right side (Blue Arrow) across the most superior vertebra in the scoliosis.

Extend line left side (Red Arrow) to right side (Blue Arrow) across the most inferior vertebra in the scoliosis.
Extend line from the most center of the most superior vertebrae in the scoliosis (Red Arrow) through the center of the apex vertebrae (Blue Arrow)

Extend line from the most center of the most inferior vertebrae in the scoliosis (Red Arrow) through the center of the apex vertebrae (Blue Arrow)

This completes the Line drawing for Thoracic AP X-rays
You are now ready to display the results of your analysis
Checking Here | Displays This | Gives this information
---|---|---
- **Cobb Angle**
- **Angle of Intersection**

The Cobb Angle measures 32º
The Normal is 0º

The scoliosis angle of intersection measures 29º
The Normal is 0º

The Cobb Angle measures 32º
The Normal is 0º
The scoliosis angle of intersection measures 29º

<Plus any report information you wish to add>

Analysis can be displayed and or printed separately or combined.
At the menu at the top of the screen click on Relative Size (Highlighted here in Yellow)

Extend a line from the back of the measuring object (Red Arrow) to the front of the measuring object. (Blue Arrow) Yellow line will be drawn thin will disappear.

Click on the radio button marked Cobb Angle (Red Arrow) if it is not already selected.
From this point follow the tool tips that appear when you move your cursor over the photo

The first tool tip tells you to extend a line from across the top of the 12th thoracic vertebrae. Draw the line from The left superior body of T12 (Red Arrow) to the Right superior body of T12. (Blue Arrow) If the top of T12 is not visible use the inferior surface of T12.

The next tool tip tells you to extend a line across the top of the L5 Draw the line from The left inferior body of L5 (Red Arrow) to the Right inferior body of L5. (Blue Arrow).
The next tool tip tells you to extend a line across the base of the sacrum. Draw the line from the left sacral notch (Red Arrow) to the right sacral notch (Blue Arrow).

The next tool tip tells you to extend a line from the center of L5 (Red Arrow) through the center of the apex vertebra in a scoliosis (Blue Arrow).

The next tool tip tells you to extend a line from the center of T12 (Red Arrow) through the center of the apex vertebra in a scoliosis (Blue Arrow).
The next tool tip tells you to extend a line from the Second Tubercal of the Sacrum (Red Arrow) to the center T12 (Blue Arrow).

The next tool tip tells you to Click on the center of each of the lumbar vertebra starting with L1 (Red Arrow) and ending with L5 (Blue Arrow).

This completes the Line drawing for AP Lumbar X-rays. You are now ready to display the results of your analysis.
### Section 3.A.2
Displaying Lines and information on the AP Lumbar X-ray including CBP protocols

<table>
<thead>
<tr>
<th>Checking Here</th>
<th>Displays This</th>
<th>Gives this information</th>
</tr>
</thead>
</table>
| **The Cobb Lumbar Scoliosis Angle** is 14°  
The Normal is 0°  
<Plus any report information you wish to add> |

| **The Sacral Tilt** is 6°  
The Normal is 0°  
<Plus any report information you wish to add> |

| **The angle of intersection of the lumbar scoliosis** is 21°  
<Plus any report information you wish to add> |

| **The Lumbosacral Angle** is 11°  
<Plus any report information you wish to add> |
<table>
<thead>
<tr>
<th>Draw</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The T12 to Sacrum lateral translation is 23mm Right

<Plus any report information you wish to add>

The L1 to Sacrum lateral translation is 23mm Right

<Plus any report information you wish to add>

The L2 to Sacrum lateral translation is 26mm Right

<Plus any report information you wish to add>

The L3 to Sacrum lateral translation is 24mm Right

<Plus any report information you wish to add>
The L4 to Sacrum lateral translation is 18mm Right
<Plus any report information you wish to add>

The L5 to Sacrum lateral translation is 4mm Right
<Plus any report information you wish to add>

The T12 to Sacrum lateral translation is 23mm Right
The L1 to Sacrum lateral translation is 23mm Right
The L2 to Sacrum lateral translation is 26mm Right
The L3 to Sacrum lateral translation is 24mm Right
The L4 to Sacrum lateral translation is 18mm Right
The L5 to Sacrum lateral translation is 4mm Right
<Plus any report information you wish to add>

As you can see .... Any combination of lines and textbox information can be displayed.
What ever is displayed can also be printed simply by clicking print.
At the menu at the top of the screen click on Relative Size (Highlighted here in Yellow)

Extend a line from the back of the measuring object (Red Arrow) to the front of the measuring object. (Blue Arrow) Yellow line will be drawn thin will disappear.

Click on the radio button marked Cobb Angle (Red Arrow) if it is not already selected.
From this point follow the tool tips that appear when you move your cursor over the photo

Follow the instructions of the tooltip which says: Extend a line from the posterior superior body of L1 to the anterior superior body of L1. This is done by placing the cursor at the posterior superior body of L1 (Red Arrow points to it) and dragging the line to the anterior superior body of L1. (Blue arrow points to it.)

The next tooltip appears instructing: Extend a line from the posterior superior body of L5 to the anterior superior body of L5. This is done by placing the cursor at the posterior superior body of L5 (Red Arrow points to it) and dragging the line to the anterior superior body of L5. (Blue arrow points to it.)
The next tooltip that appears instructs:
Extend a line from the Anterior Superior body of L1 to the posterior inferior body of L5. This is done by placing the cursor at the Anterior Superior body of L1 (Red Arrow points to it) and dragging the line to the posterior inferior body of L5. (Blue arrow points to it.) The line is shown here in yellow but in reality no actual line is drawn. It is only to determine the height of the Lumbar curve.

The next tooltip that appears instructs:
Across the base of the sacrum from posterior (Red Arrow) to anterior. (Blue Arrow)

The next tooltip that appears instructs:
Click on the center of L3. (Red Arrow)
No line is draw simply place the cursor at the center of the body of L3 and click the left mouse button once.

The next tooltip that appears instructs:
Extend a line from the posterior inferior body of L5 (Red Arrow) to the posterior Superior body of L5. (Blue Arrow)
The next tooltip that appears instructs:
Extend a line from the posterior inferior body of L4 (Red Arrow) to the posterior Superior body of L4.(Blue Arrow)

The next tooltip that appears instructs:
Extend a line from the posterior inferior body of L3 (Red Arrow) to the posterior Superior body of L3.(Blue Arrow)

The next tooltip that appears instructs:
Extend a line from the posterior inferior body of L2 (Red Arrow) to the posterior Superior body of L2.(Blue Arrow)

The next tooltip that appears instructs:
Extend a line from the posterior inferior body of L1 (Red Arrow) to the posterior Superior body of L1.(Blue Arrow)

This completes the Line drawing for Lateral Lumbar X-rays
You are now ready to display the results of your analysis
<table>
<thead>
<tr>
<th>Checking Here</th>
<th>Displays This</th>
<th>Gives this information</th>
</tr>
</thead>
</table>
| The L1 to L5 Cobb Angle measures 39º  
The Normal is 44º |
| The L1 to L5 Cobb Angle measures 39º  
The Normal is 44º |
| Fergusons angle measures 34º  
The Normal is 41º(±-7)º |
| The L3 Gravity line should pass through the anterior 1/3 of the sacral base  
The gravity line is 3 mm anterior to the normal placement. |
| The lumbosacral angle is 12º  
The Normal is 10 to 15º |
The L4/L5 relative rotation angle is 18º  
The Normal is 9.4º

The L3/L4 relative rotation angle is 10º  
The Normal is 8.2º

The L2/L3 relative rotation angle is 14º  
The Normal is 8.2º

The L1/L2 relative rotation angle is 6º  
The Normal is 8.2º

Ullmann’s line should pass through the anterior 1/3 of L5.
Displaying Lines and information on the Lateral Lumbar X-ray including CBP protocols

<table>
<thead>
<tr>
<th>Checking Here</th>
<th>Displays This</th>
<th>Gives this information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draw</td>
<td>Display</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- The L4/L5 angle is 18°
- The Normal is 9.4°
- The L3/L4 angle is 10°
- The Normal is 8.2°
- The L2/L3 angle is 14°
- The Normal is 8.2°
- The L1/L2 angle is 6°
- The Normal is 8.2°

- The Global Lumbar Angle is 48°
- The normal is 44°

Any combination of these views can be displayed at the same time.
Whatever is displayed is what is printed.
It is a **WYSIWYG** or “**What You See Is What You Get**”
When you click on the patient’s name – the date – then XPelAP the screen will resemble the one Below.

Notice the box that appears on the lower right side of the screen
It is enlarged below for your convenience.

If it is not already selected … click on the radio button that says Draw Gonstead Pelvic Lines.
Move your cursor over the photo and follow the tooltips as explained on the next page.
When you move your cursor over the photo … a tooltip will appear telling you to extend a line from the top center of the left femor (Red Arrow) head to the top center of the right femor head. (Blue Arrow)
Do this by positioning the cursor at the top center of the left femor head … depressing the left mouse button and dragging the line across to the top center of the right femor head before releasing the mouse button.

Another ToolTip will appear telling you to extend a line from the top of the Left Iliac Crest (Red Arrow) to the top of the Right Iliac Crest. (Blue Arrow)
In all cases try to start and stop at the exact point given in the tooltip.

The Next ToolTip instructs you to extend a line from the bottom of the left pubic bone (Red Arrow) to the bottom of the right pubic bone. (Blue Arrow)

The next tooltip instructs you to extend a line from the most lateral point of the left Ilium (Red Arrow) to the lateral point of the right ilium. (Blue Arrow)

The next tooltip instructs you to extend a line from the most medial point of the left Ilium (Red Arrow) to the medial point of the right ilium. (Blue Arrow)
The next tooltip instructs you to extend a line from the center of the symphysis pubis (Red Arrow) to the second Tubercal of the sacrum. (Blue Arrow)

The next tooltip instructs you to extend a line from the most lateral point of the left side of the sacrum (Red Arrow) to the lateral point of the right side of the sacrum. (Blue Arrow)

Next tooltip instructs you to extend a line from the left sacral notch (Red Arrow) to the right sacral notch. (Blue Arrow)

Finally the last tooltip instructs you to determine relative size. Click on Relative Size from the menu at the top of the screen…then click on the left side of the image of the sticker (Red Arrow) you placed on the photo of the x-ray …. Drag the yellow line across the sticker image and release it at the right side of the sticker image.(Blue Arrow)

You are now finished drawing lines:
Before you can display the results however … Once again click on the patient’s name … the date and the radio button beside XPelAP. This is necessary to reconfigure all of the lines to display properly. This by the way is the only view requiring this step.
Once you have completed all of the line drawing … displaying the lines and measurements is very simple. Below we will show you what happens when each check box is checked.
Displaying lines and information on the AP Pelvic X-ray including Gonstead protocols.

- The width of the right innominate bone is 101 mm
- The width of the left innominate bone is 92 mm
- The horizontal distance from the Sacral Tubercle to the Symphyseal Pubis is 7 mm
- The distance from the right side of the Sacrum to the Sacral Tubercle is 70 mm
As you can see .... Any combination of lines and textbox information can be displayed.

What ever is displayed can also be printed simply by clicking print.
You can view the images in black and white or color. You can also change the contrast and brightness by pressing the left mouse button and dragging the mouse around the image.

You can also use the measure instrument in place of a measuring object to determine size. For instance the 2nd lumbar vertebra measures 35 mm across making this the measuring object when the photo is used in ACUROM.

Choose the button save as jpg in order to be able to use DiCom image in ACUROM. The .dcm format is changed to a .jpg format and the image is saved in C:\Program Files\Acurom\TempPhotos. From here – on the main form – you can click enter new photos and use it like any other photo.

Clicking on the File Folder opens up the C:\DiCom Folder - You should store all digital photos you wish to import into ACUROM in this Photo. Choose the photo you wish to import. In this case it is a Lumbar-Pelvic View. All Digital photos must have the extension .dcm in order to be imported.
Bringing up a photo and clicking Transfer to DiCom will save a copy of the .dcm image to the C:\Dicom folder. It must be in this folder in order to be able to change the image to jpg. Exit returns you to the main Form.