

# Image Viewer Tools

The Opal-RAD Image Viewer features a vast array of image manipulation tools to assist in diagnostic interpretation of medical images. Most of these tools have easy, one-click toolbar buttons to activate them. They are also available from the Images or Tools menu located at the top of your viewer screen.



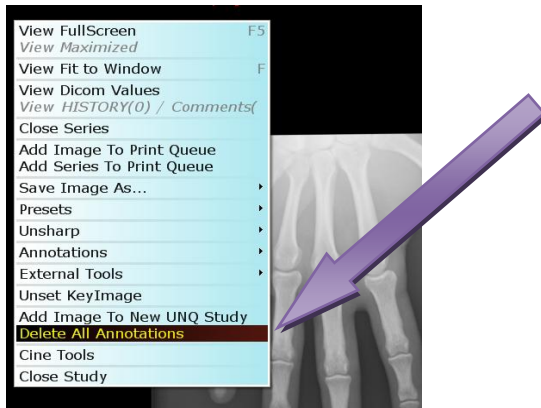
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

1. **RESET IMAGE:** Resets the image properties back to their original state.
2. **INVERT CONTRAST:** Inverts black and white pixel data, giving image a “negative” appearance.
3. **ROTATE LEFT:** Rotates image 90° to the left
4. **ROTATE RIGHT:** Rotates image 90° to the right
5. **FLIP VERTICAL:** Flip image vertically
6. **FLIP HORIZONTAL:** Flip image horizontally
7. **ACTUAL SIZE:** Displays image in its actual (anatomical) size. NOTE: Monitor must be calibrated.
8. **1 TO 1:** Displays image in its true size (1 pixel on CR plate = 1 pixel on the viewer screen)
9. **FIT TO WINDOW:** Expands/shrinks an image so that it fits in the image viewing window
10. **MAGNIFY:** Use this tool to magnify *parts* of the image. Activate by holding down left mouse button, then drag mouse and magnify area.
11. **ZOOM:** Use this tool to change the size of the *entire* image. Activate by holding down left mouse button, then Drag UP = Zooms IN, Drag DOWN = Zooms OUT
12. **PAN:** Use this tool to move an image around within its display window. Activate tool by holding down left mouse button, then drag image to pan around.
13. **\*EDIT ANNOTATIONS:** Allows annotations to be edited when selected.
14. **\*ACTIVATE/DEACTIVATE ANNOTATION:** When enabled (highlighted), each annotation is activated only once. When disabled (non-highlighted), a selected annotation remains active for multiple uses, until deactivated.
15. **\*ARROW:** Creates an arrow (or “pointer”) that will point at an area of the image. To create, left click to place the head of the arrow, move mouse in desired direction, then left click to place the tail.
16. **\*MEASUREMENT:** Used to measure straight line distance of an area on the image (in millimeters). To create, left click the starting point, move mouse in desired direction, left click the end point.
17. **\*ANGLE:** Used to find the angle of two intersecting lines. To create, left click to place the apex of the angle, move the mouse, left click to place the first leg, move mouse, left click to place the second leg, move mouse to show the *inside* or *outside* of the angle, left click to place the angle measurement.
18. **\*COBB ANGLE:** Used to find the angle of two unconnected lines on the SPINE). To create, left click to place first point of first line, move mouse along vertebrae, left click to place second point of the first line, move mouse, left click to place first point of second line, move mouse along vertebrae, left click to place second point on second line, move mouse, left click to place measurement.
19. **\*LEFT MARKER:** Creates a LEFT marker label. To create, left click icon then place marker on spot.
20. **\*RIGHT MARKER:** Creates a RIGHT marker label. To create, left click icon then place marker on spot.
21. **\*TEXT BOX:** Allows you to place typed text any where on the image. To create, left click icon then place on area of image, enter text in the “Enter Annotation Text” box provided, then click OK.
22. **\*SHUTTER BOX:** Allows you to create a boxed area of interest. To create, left click on top left area to be shuttered, move mouse down/right, left click bottom right of shutter. The area *outside* of the box is masked out.

23. **\*MAGNIFY AREA:** Creates a stationary, magnified region of an image. To activate, left click on the top left of the area to be magnified, move mouse down/right, left click to place bottom right of box. The area *inside* the box is magnified.
24. **\*AUTO W/L ROI:** Adjusts the window and level, or simply the brightness and contrast of an image inside a box. To activate, left click on the top left of the area to be W/L, move mouse down/right, left click to place bottom right of shutter. The area *inside* the box is windowed and leveled using the average ROI.
25. **DISPLAY MANAGEMENT:** Hanging protocols. Used to save the default presentation of all images in a series based on study description or body part.
26. **\*UNSHARP MASKING:** Reprocesses an image into a more defined resolution by increasing the contrast. Activate by left clicking the icon and from the dropdown menu select anywhere from "OFF" (no making/soft) - 100% (most making/bone)

**\*NOTE: The Image Viewer includes the ability to select, edit and delete previously created annotations. Before you are able to edit or delete an annotation you must first select it, and to do this requires that you enable the "Annotation Edit Mode" button.**

- To edit a selected annotation:
  - Select an annotation by left clicking on it. The annotation should change colors.
  - Move your mouse over the selected annotation.
    - If the cursor changes to a four way arrow, you may left click to grab the annotation. Move your mouse, then release the button to drop the annotation in place.
    - If the cursor changes to a crosshair, you may left click to grab the handle. Move your mouse to resize the annotation, then release the button when you are finished.
- To delete an annotation:
  - Select the annotation by left clicking on it. The annotation should change color.
  - Right click anywhere on the image, then press DELETE on your keyboard.
- To delete ALL annotations:
  - Right click anywhere on the image and a drop down box will appear. Click "Delete All Annotations".



**SHORT CUT KEYS:**

**A= Annotation, Toggle Toolbar**  
**F = Fit to window**  
**L=Auto Link Series**  
**T = True size**

**C = Cutlines, show/hide**  
**K = Key Image, undo/set**  
**O = Overlays, show/hide**  
**0 = Original/Reset contrast**

**Additional Tools in other modalities, for further reference:**



1. **SPAN/SCROLL IMAGES:** Allows user to quickly scroll through a multi-image series. When selected, allows the user to left click and drag through a current series.
2. **CONTEXT:** Allows user to locate a slice in one or more series by selecting a point on another. When selected, shows the location of the cursor in other planes identified by a circle.
3. **3D CURSOR:** Shows your relative position on all series images when focus is on one series.
4. **ROI:** Elliptical tool which contains Hounsfield units/pixel value of an enclosed area.
5. **SPINE LABELS:** Spine markers commonly used to identify vertebral bodies on MRI/CT studies.
6. **SPINE LABELS 3D:** Custom spine label that generates labels on corresponding views.
7. **LINK SERIES:** Manually links two series. To link, highlight icon, then left click on first series, then left click on second series.  
NOTE: If the series are on the same plane, the linking will be based on the slice location. If the series are on different planes, the linking will be based on the frame number.
8. **AUTO LINK:** Similar functionality to LINK SERIES but will link by anatomy where appropriate.



9.

**HOUNSFIELD UNIT:** Activates a crosshair that will display a pixel's density reading, or Hounsfield unit. When selected, shows the Hounsfield value for the single pixel located at the tip of the arrow.

**Static Toolbar with additional tools and links to functionality from the worklist:**



\*{2-6} If highlighted IN COLOR, then information exists.

- |                            |                              |
|----------------------------|------------------------------|
| 1. <b>DIVIDE WINDOW</b>    | 5. <b>*PATIENT DOCUMENTS</b> |
| 2. <b>*PRIOR EXAMS</b>     | 6. <b>*TRANSCRIPTION</b>     |
| 3. <b>*EXAM NOTES</b>      | 7. <b>PEER REVIEW</b>        |
| 4. <b>*PATIENT REPORTS</b> | 8. <b>STITCHING</b>          |

- 1 2 3
1. **AUTO OPEN NEXT STUDY**
2. **AUTO UPLOAD DICTATION**
3. **CLOSE STUDY/RETURN TO WORKLIST**