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The Importance of Image Analysis

Image Analysis = The evaluation of radiographic images for acceptability

- Performed by Radiographers
 - Requires knowledge of what is acceptable *and* of department protocols
 - Radiographers must ensure all elements of their images meet quality standards
- We are the “eyes” for the Radiologist



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Elements of a radiograph

Optimal images...

1. Are **oriented** correctly
2. Include all **anatomy** of interest
3. Demonstrate anatomy in the proper **position** by...
 - Maintaining the geometric integrity of all anatomy
 - Centering accurately for optimal visualization of anatomy
4. Exhibit adequate **collimation**
5. Include the correct lead **marker**
6. Display the best possible **visibility** and **resolution** with minimal noise
7. Exclude any preventable **artifacts**

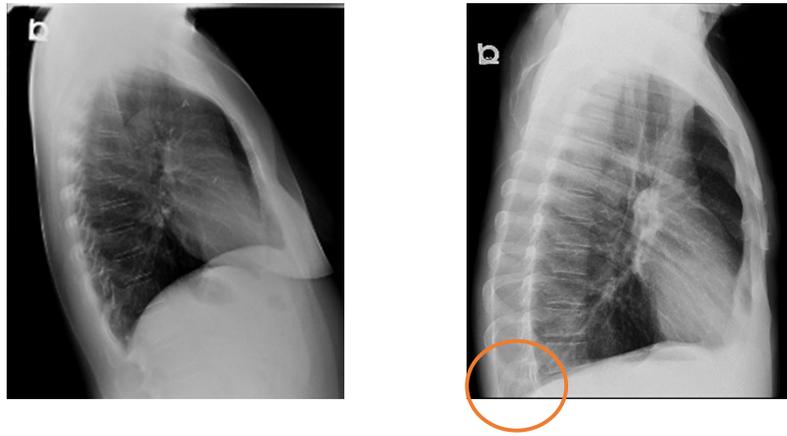
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- Orientation



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- Anatomy of Interest



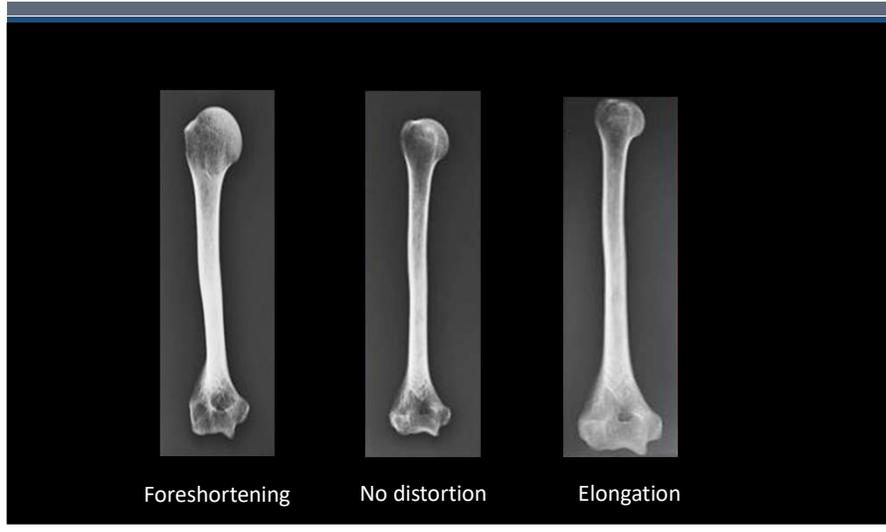
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- Positioning



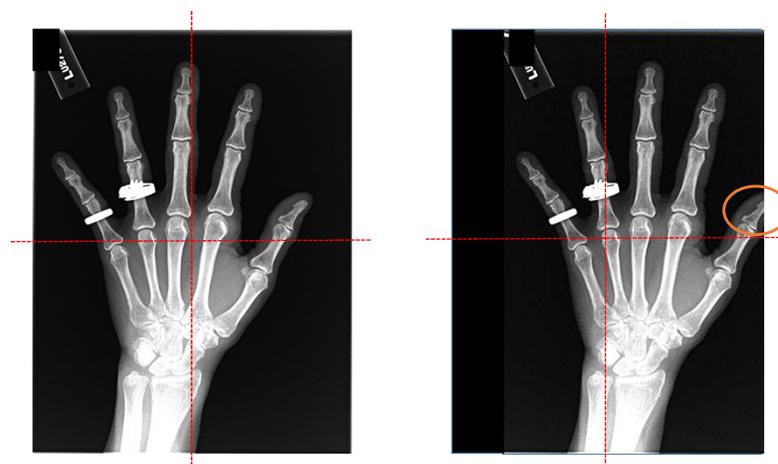
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- Geometric integrity

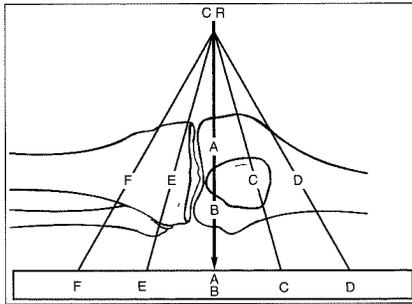


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- Centering



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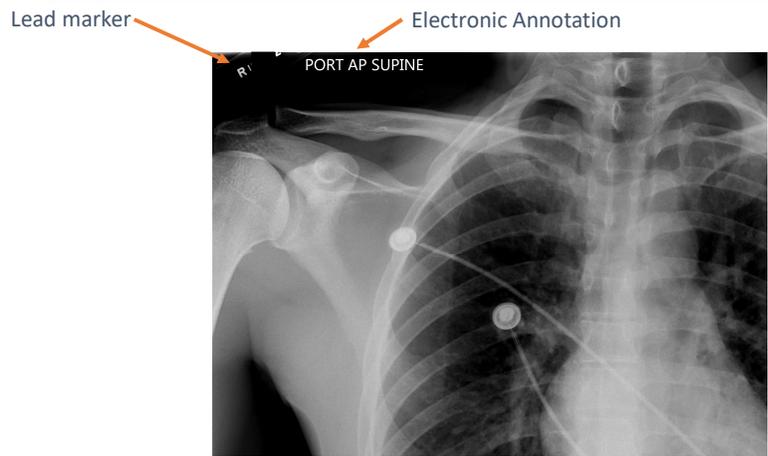
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- Collimation



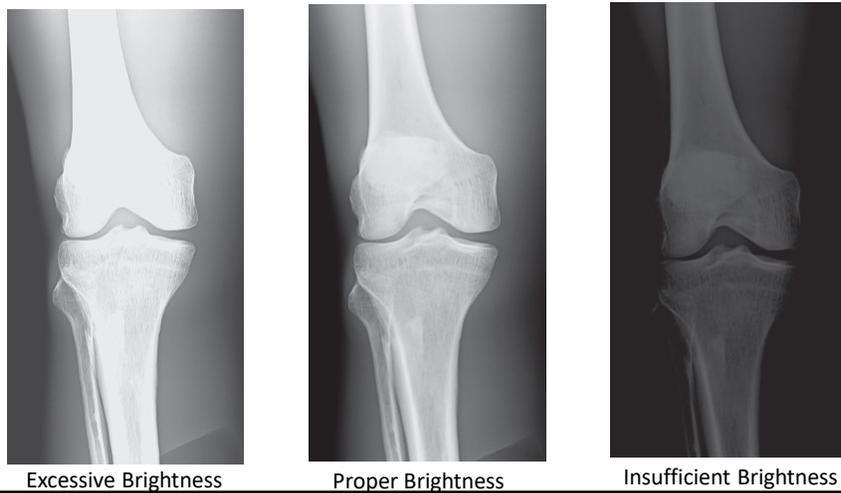
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- Markers



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- Visibility: Brightness



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- Visibility: Contrast



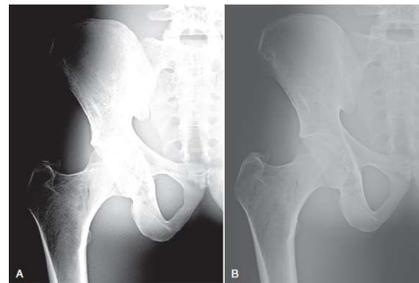
= High Contrast



= Low Contrast



= no contrast



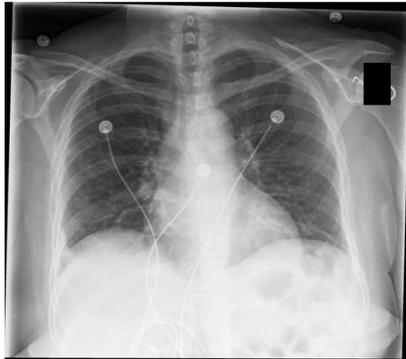
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- Resolution



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- Artifacts



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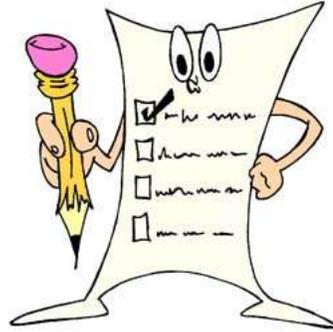
Wait, There's More!

- Proper tube angulation
- Correct demographic information
 - Patient name, view performed, institution data
- Shielding (if applied) is properly placed
- No patient motion
- Breathing instructions were given and followed (if applicable)

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Image Analysis Critique Method

- Oriented correctly?
- Necessary anatomy included?
- Centered well?
- Positioned accurately?
- Collimated as required?
- Marker(s) on correctly?
- What is the EI?
- Artifacts?
- Was image criteria met for this image?
 - Yes or No
 - If No, how would you correct it?



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Is this image repeatable?

Technologists must decide if the image is ...

- Acceptable (*meeting evaluation criteria*)
- Not Acceptable (*not meeting evaluation criteria and errors affect diagnostic quality – Repeatable*)

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Repeating an image

Technologists must use critical thinking to determine how to sufficiently fix the errors before re-exposing the patient.

**STUDENTS MAY NEVER REPEAT AN IMAGE
WITHOUT A REGISTERED
TECHNOLOGIST'S ASSISTANCE.**

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Other Factors Affecting Acceptability

- A. Visual acuity/perception
- B. Radiologists' and physicians' preferences
- C. Exam demands versus patient ability

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- Visual Acuity

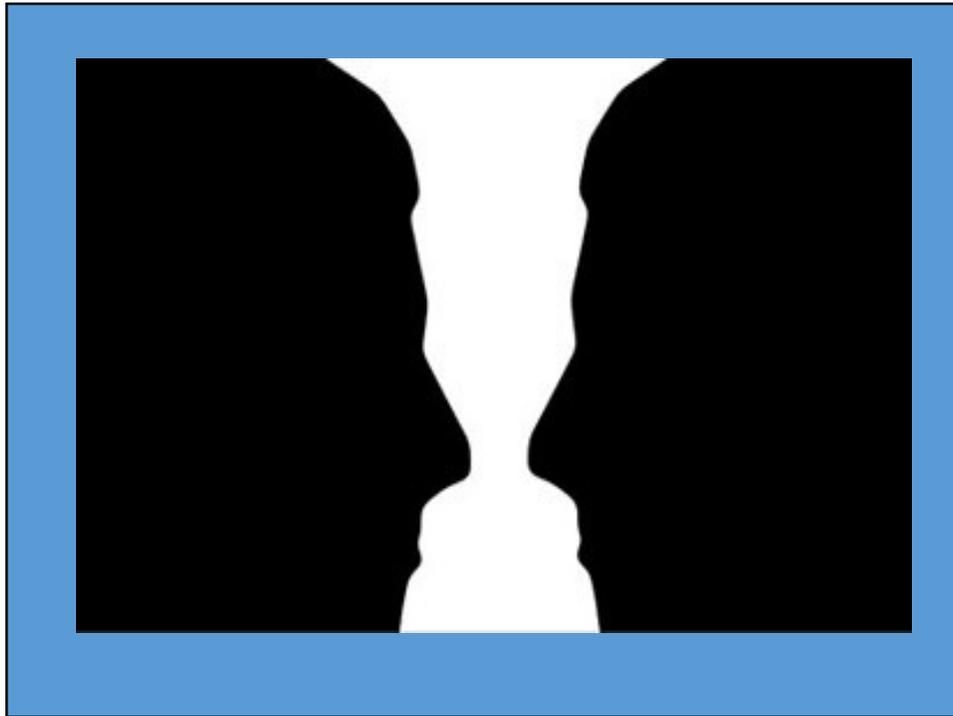
Affected by...

- Lighting
- Pathology
- Viewing distance- varying distance changes perception
 - Optic Nerve area - creates a blind spot for viewing at 9"
- Misperception

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- Radiologists' Preferences

- Desired contrast/ density
- Desired orientation of images
- Repeat? Or no repeat?



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- Patient ability

- Acceptable vs Not Acceptable
- Documentation is our friend!



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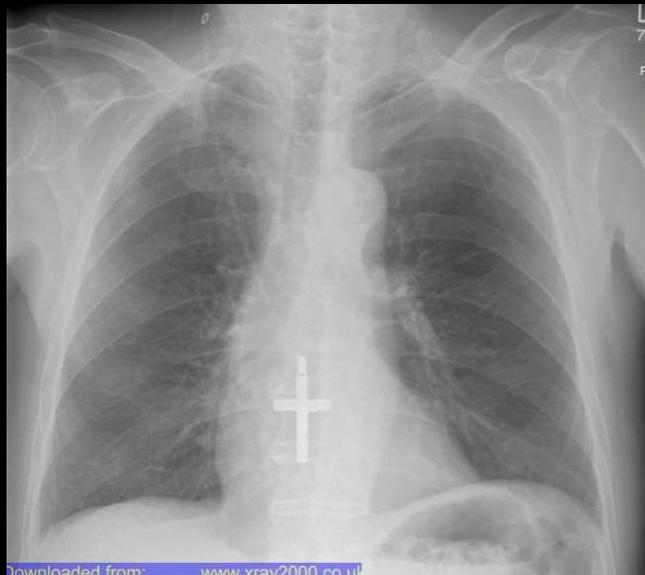
Corrective Actions may need to occur for the following with Image Analysis...

- Technical factors?
- Procedural factors?
- Equipment?
- Artifacts?

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EXAMPLES

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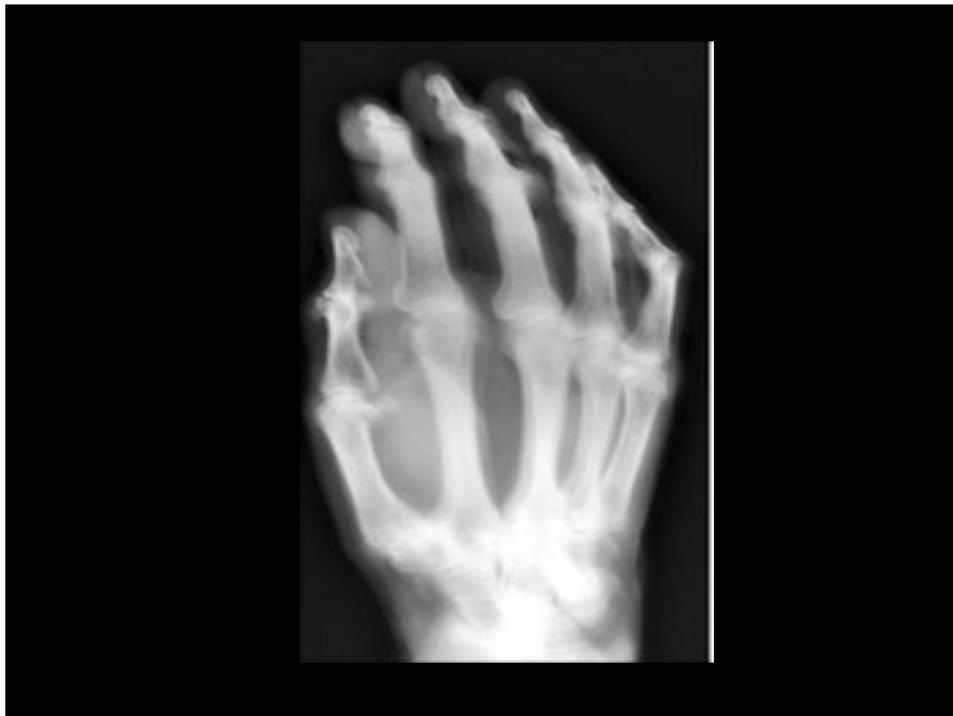
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