**Kaiser Symposium, April 14, 2018**

**Presenter: Dr. Lisa F. Schmidt**

***Title: Quality Assurance in Radiography – from Beginning to End.***

*Objectives:*

1. State the characteristics of what an optimal projection is and how radiographers should develop the ability to analyze radiographs based on a set of standards to include superimposition, adjacent structure, optical density, contrast, spatial resolution, magnification and shape distortion.
2. Determine the amount of patient or CR adjustments that are necessary when poorly positioned projections are obtained.
3. Discuss how images are to be properly displayed for all projections, to include proper collimation and markers.
4. Describe the factors that affect spatial resolution (formerly called recorded detail) in a projection.
5. Discuss universal radiation protection practices that are to be followed in order to limit patient and personnel dose.

*Outline:*

1. State the characteristics of what an optimal projection is and how radiographers should develop the ability to analyze radiographs based on a set of standards to include superimposition, adjacent structure, optical density, contrast, recorded detail/spatial resolution, magnification and shape distortion.
   1. Analysis of radiographic images – key factors
      1. Superimposition of structures
      2. Adjacent structures
      3. Optical density and contrast
      4. Spatial resolution
      5. Magnification and shape distortion
      6. Use of an image analysis form for determination
2. Determine the amount of patient or CR adjustments that are necessary when poorly positioned projections are obtained.
   1. Patient positioning
   2. Histogram analysis errors
   3. Underexposed images
   4. Overexposed images
   5. Other exposure related factors
      1. Scatter, grids,
      2. Collimation,
      3. Anode Heel Effect,
      4. Patient conditions,
      5. Artifacts
3. Discuss how images are to be properly displayed for all projections, to include proper collimation and markers.
   1. Characteristics of the optimal image
   2. CR Image receptor placement and Patient Orientation
   3. Direct-indirect capture digital radiography orientation
   4. Adjusting when there is poor display
   5. Use of a contrast mask
4. Describe the factors that affect recorded detail (spatial resolution) in a projection.
   1. Spatial resolution – digital imaging.
   2. Focal Spot Size (large vs small)
   3. Distance (SID and OID)
   4. Motion (voluntary and involuntary)
   5. Double exposure
5. Discuss universal radiation protection practices that are to be followed in order to limit patient and personnel dose.
   1. Dose Creep
   2. ALARA principles
   3. Before the procedure begins, it all starts with the radiographer
   4. Patient condition and immobilization
   5. Personnel protection and dose

*References:*

* + - 1. Hermann, T, et al, *Best Practices in Digital Radiography,* ASRT White Paper, 2012.
      2. Long, B, J Hall Rollins, and B Smith, *Merrill’s Atlas of Radiographic Positioning and Procedures,* Elsevier, Vol. I, 2016.
      3. McQuillen-Martensen, K, *Radiographic Image Analysis,* Elsevier, 2015.