Western Technical College

10526230 Advanced Radiographic Imaging

Course Outcome Summary

Course Information

Description	Explores the factors that impact image acquisition, display, archiving and retrieval. Guidelines for selecting exposure factors and evaluating images within digital systems are discussed. Principles of digital system quality assurance and maintenance are presented.
Career Cluster	Health Science
Instructional Level	A.A.S. - Associate in Applied Science
Total Credits	2

Pre/Corequisites

Prerequisite 10526159 Radiographic Imaging

Textbooks

Essentials of Radiographic Physics and Imaging – with Access. 3rd Edition. Copyright 2020. Johnston, James. Publisher: Elsevier Science. **ISBN-13:** 978-0-323-56668-1. Required. (Part of Western Bundle Package **ISBN-13:** 978-0-323-78061-2)

Success Abilities

1. Refine Professionalism: Improve Critical Thinking

Program Outcomes

1. Carryout the production and evaluation of radiographic images

Course Competencies

1. Examine basic principles of digital acquisition and display

Assessment Strategies

1.1. Oral, written, graphic and/or skill assessment

Criteria

1.1. you identify digital image characteristics
1.2. you identify various digital receptors
1.3. you compare detector properties
1.4. you describe dynamic range

Learning Objectives

1.a. Explain the function of each component of image receptor systems
1.b. Differentiate between the purpose, principles, and applications of digital/electronic imaging and CR technology

2. Illustrate the process of image acquisition

Assessment Strategies

2.1. Oral, written, graphic and/or skill assessment

Criteria

2.1. you describe "latent image" acquisition
2.2. you compare computed radiography (CR) and digital radiography (DR) image extraction (formation)
2.3. you explain various ways of describing exposure indicators
2.4. you interpret exposure indicators
2.5. you manipulate technical factors based on exposure indicators

3. Identify image acquisition errors

Assessment Strategies

3.1. Oral, written, graphic and/or skill assessment

Criteria

3.1. you explain an exposure histogram
3.2. you recognize histogram errors
3.3. you identify routine photostimulable plate care
3.4. you make corrective actions
3.5. you describe scatter control in the digital system

4. Analyze initial and post image processing

Assessment Strategies

4.1. Oral, written, graphic and/or skill assessment

Criteria

4.1. you describe the relationship between window level and image brightness
4.2. you describe the relationship between window width and image contrast
4.3. you perform all image manipulation functions e.g. level, width, annotation, smoothing, etc.
4.4. you recognize effects of excessive processing
4.5. you explore the implications of manipulation of electronic data

5. Outline fundamental principles of exposure

Assessment Strategies

5.1. Oral, written, graphic and/or skill assessment

Criteria

5.1. you describe appropriate selection of exposure factors for a digital system
5.2. you describe the relationship between exposure factors and patient dose (exposure creep)

6. Evaluate digital images

Assessment Strategies

6.1. Oral, written, graphic and/or skill assessment

Criteria

6.1. evaluation includes evidence of appropriate exposure
6.2. evaluation includes evidence of appropriate contrast
6.3. evaluation includes evidence of appropriate detail
6.4. evaluation includes evidence of appropriate anatomical display
6.5. evaluation includes identification of artifacts
6.6. evaluation includes where in the image chain the artifact occurred

7. Distinguish among the components of a digital image display

Assessment Strategies

7.1. Oral, written, graphic and/or skill assessment

Criteria

7.1. you describe viewing systems
7.2. you describe display resolution factors and their effect on image quality

8. Differentiate between types of informatics and archiving systems

Assessment Strategies

8.1. Oral, written, graphic and/or skill assessment

Criteria

8.1. you describe a PACS system
8.2. you identify relevant data information systems
8.3. you recognize importance of the DICOM standard
8.4. you explain the use of telemedicine in radiography

9. Perform quality control tests for digital systems

Assessment Strategies

9.1. Oral, written, graphic and/or skill assessment

Criteria

9.1. you follow established testing guidelines
9.2. you record test results
9.3. you select correct testing tools

10. Analyze quality control test results for digital systems

Assessment Strategies

10.1. Oral, written, graphic and/or skill assessment

Criteria

10.1. you interpret test results
10.2. you compare test results to established criteria
10.3. you identify corrective measures