Western Technical College

10508103 Dental Radiography

Course Outcome Summary

Course Information

Description
Prepares dental auxiliary students to operate x-ray units and expose bitewing, periapical, extra oral, and occlusal radiographs. Emphasis is placed on protection against x-ray hazards. Students also process, mount, and evaluate radiographs for diagnostic value. In this course students demonstrate competency on a manikin. In addition, students expose bitewing radiographs on a peer, role-play patient. Students gain further experience in exposing radiographs on patients in the clinical portion of their program. This course also provides the background in radiographic theory required for students to make informed decisions and adjustments.

Career Cluster
Health Science

Instructional Level
Associate Degree Courses

Total Credits
2.00

Textbooks


508-103 Dental Radiography Course Manual. Western. Publisher: Western. Required.

Learner Supplies

Uniform: Black lab jacket - $22, black pants - $22, white shoes - $20-35, and safety glasses - $5.50. Vendor: To be discussed in class. Required.

Latex free exam gloves. Vendor: To be discussed in class. Required if clinic does not supply.

Core Abilities

1. Apply mathematical concepts.

2. Demonstrate ability to think critically.

3. Demonstrate ability to value self and work ethically with others in a diverse population.
4. Make decisions that incorporate the importance of sustainability.

5. Transfer social and natural science theories into practical applications.

6. Use effective communication skills.

7. Use technology effectively.

Course Competencies

1. Illustrate how radiography technology has progressed since its first use to the ways in which it is used in providing dental health care today

   Assessment Strategies
   1.1. by assembling a timeline identifying highlights of history of dental radiography

   Learning Objectives
   1.a. Define the key words
   1.b. Summarize the importance of dental radiographs
   1.c. List the uses of the dental radiographs
   1.d. Summarize the discovery of x-radiation
   1.e. List the highlights in the history of x-ray equipment and film
   1.f. List the highlights in the history of dental radiographic techniques

2. Explain how the process of exposing radiographs works

   Assessment Strategies
   2.1. by labeling a diagram of a x-ray tube using proper terminology
   2.2. by presenting a written, oral, or graphic explanation of how the process of exposing radiographs works
   2.3. by responding to scenarios presenting clinical decisions related to the process of exposing radiographs
   2.4. by answering questions that require you to apply knowledge about this competency (Your instructor may require several written exams as a part of this course. You will be notified in advance.)

   Learning Objectives
   2.a. Define key terms
   2.b. Describe the general concepts and physical properties of radiation
   2.c. Describe the biological effects of radiation exposure
   2.d. Identify the component parts of the x-ray machine
   2.e. Describe the effect of kilovoltage on the quality of the x-ray beam.
   2.f. Describe how the milliamperage affects the quality of the x-ray beam
   2.g. Explain how x-rays are produced

3. Apply principles of radiation safety to patient and operator

   Assessment Strategies
   3.1. by preparing to expose radiographs on a manikin in a laboratory setting
   3.2. by responding to scenarios presenting clinical decisions related to radiographic exposure
   3.3. by answering questions that require you to apply knowledge about this competency (Your instructor may require several written exams as a part of this course. You will be notified in advance.)

   Learning Objectives
   3.a. Identify the methods of patient radiation protection
   3.b. Identify the methods of operator radiation protection
   3.c. Identify the integrity, handling, and storage of a lead apron
   3.d. Differentiate between a prescription and consent for radiographs
   3.e. State the contraindications for radiographs
4. **Operate the x-ray equipment**
   **Assessment Strategies**
   4.1. in the completion of a role-play on the operation of the x-ray unit and assembling various film holders
   **Learning Objectives**
   4.a. Identify the component parts of the x-ray unit
   4.b. Differentiate between the x-ray machines used for intra-oral and extra-oral films
   4.c. Describe the purpose and the use of film holders and devices
   4.d. Identify commonly used dental x-rays film holders and devices

5. **Select the film for a radiograph**
   **Assessment Strategies**
   5.1. by responding to scenarios that require you to select the appropriate film for a variety of situations
   5.2. by answering questions that require you to apply knowledge about this competency (Your instructor may require several written exams as a part of this course. You will be notified in advance.)
   **Learning Objectives**
   5.a. Identify the components and function of a film packet
   5.b. Identify the composition of x-ray film
   5.c. Explain how x-ray radiation energy is stored as a latent image
   5.d. Explain the uses and handling techniques for the types of film used in dental radiography
   5.e. Differentiate the need for bitewing, periapical, extra-oral and occlusal radiographs
   5.f. Compare film size for bitewing, periapical, extra-oral and occlusal radiographs
   5.g. Explain what determines the film speed
   5.h. Explain the purpose of intensifying screens

6. **Process radiographs of diagnostic quality**
   **Assessment Strategies**
   6.1. in a laboratory setting using automatic and/or manual processing equipment process radiographs of diagnostic quality
   6.2. by submitting processed radiographs for evaluation for evaluation
   **Learning Objectives**
   6.a. Describe the characteristics of an ideal darkroom to include location, size, lighting and equipment
   6.b. Describe the composition of the processing chemicals
   6.c. Discuss the parts of the processing equipment and function
   6.d. Check to ensure that equipment has met quality assurance standards
   6.e. Outline the step by step procedure for manual processing
   6.f. Outline the step by step procedure for automatic processing
   6.g. Explain the process of film duplication used in dentistry
   6.h. Describe film processing problems that result from time and temperature errors
   6.i. Describe film processing problems that result from chemical contamination errors
   6.j. Describe the care and maintenance if the process solutions, equipment, and equipment accessories used in film processing

7. **Manage patients during the radiography process**
   **Assessment Strategies**
   7.1. working with a role play partner in a simulated situation
   7.2. using the patient management forms provided in the laboratory/clinical setting
   **Learning Objectives**
   7.a. Identify some important patient management skills for various film exposures
   7.b. List examples of special need patients
   7.c. Identify physical oral discrepancies
   7.d. Identify some important patient management skills for the anxious patient
   7.e. Identify some important patient management skills for the special need patient
   7.f. Identify some important patient management skills for the patient who gags
   7.g. Identify some important patient management skills for uncooperative patients

8. **Use proper infection control procedures while producing radiographs**
Assessment Strategies
8.1. by using infection control techniques prior to exposure, during exposure, and following exposure on a manikin or role-play patient in a laboratory setting
8.2. by using infection control techniques processing unexposed radiographs

Learning Objectives
8.a. Detail infection control procedures necessary prior to, during, and following film exposure
8.b. Detail infection control procedures necessary for film processing
8.c. Describe the infection control procedure for using a daylight loader of an automatic processor

9. **Expose bitewing radiographs**

Assessment Strategies
9.1. by exposing radiographs on a manikin or role-play patient in a laboratory setting
9.2. by submitting processed radiographs
9.3. using the forms provided in the laboratory setting

Learning Objectives
9.a. you identify the purposes of exposing a bite-wing radiograph.
9.b. Show how bitewing radiographs are helpful in achieving the goals of preventative dentistry
9.c. Demonstrate correct patient position and film placement
9.d. Describe the steps for exposing a bitewing x-ray
9.e. Compare the bitewing radiograph with the periapical technique

10. **Expose periapicals using the paralleling technique**

Assessment Strategies
10.1. by exposing radiographs on a manikin or role-play patient in a laboratory setting
10.2. by submitting processed radiographs
10.3. using the forms provided in the laboratory setting

Learning Objectives
10.a. State basic principles of paralleling technique
10.b. Discuss placement of film
10.c. Discuss placement of film holders
10.d. Describe placement of PID and angulation
10.e. Identify parts of film holding devices
10.f. Demonstrate proper patient positioning for film exposure

11. **Expose periapicals and occlusals using the bisecting angle technique**

Assessment Strategies
11.1. by exposing radiographs on a manikin or role-play patient in a laboratory setting
11.2. by exposing an occlusal radiograph on a manikin or role-play patient in a laboratory setting
11.3. by submitting processed radiographs
11.4. using the forms provided in the laboratory setting

Learning Objectives
11.a. State basic principles of bisecting technique
11.b. Compare the essential characteristics between paralleling and bisecting techniques
11.c. Discuss placement of film
11.d. Discuss placement of film holders
11.e. Describe placement of PID and angulation
11.f. Identify parts of film holding devices
11.g. Demonstrate proper patient positioning for film exposure
11.h. List the uses of the occlusal exam.
11.i. State the purpose of localization techniques

12. **Illustrate how extraoral films integrate with the use of intraoral films in dentistry**

Assessment Strategies
12.1. by creating a chart comparing panoramic, extraoral and digital radiographs
12.2. working with a group of your peers

Learning Objectives
12.a. Describe the uses and purpose of panoramic radiography
12.b. Describe the equipment used in panoramic radiography
12.c. Discuss the advantages and disadvantage panoramic radiography
12.d. Describe the uses and purpose of extraoral radiography
12.e. Describe the equipment used of extraoral radiography
12.f. Describe the uses and purpose of digital radiography
12.g. List and describe the equipment used in digital radiography
12.h. List and describe the three types digital radiography
12.i. List and discuss the advantages and disadvantage digital radiography

13. Mount radiographs using anatomical landmarks

Assessment Strategies
13.1. by submitting correctly mounted radiographs
13.2. by demonstrating optimal viewing conditions
13.3. in the lab using given materials and equipment

Learning Objectives
13.a. List reasons to use a film mount
13.b. Describe the labeling information used on the film mount
13.c. Identify the equipment necessary for viewing the mounted x-ray
13.d. Identify the anatomic landmarks used in film mounting
13.e. Describe the step by step procedures for film mounting
13.f. List the methods of film mounting

14. Evaluate radiographs for diagnostic value

Assessment Strategies
14.1. by completing a checklist of radiographic evaluation on a manikin or patient
14.2. in a skill demonstration in a clinical/laboratory setting

Learning Objectives
14.a. List the visual characteristics of an acceptable radiograph
14.b. Define radiographic characteristics of density and contrast
14.c. Explain the quality control procedures necessary in dental radiographs
14.d. Given a radiograph of poor quality, identify the cause of errors
14.e. Recognize radiograph errors and explain how to correct

15. Interpret radiographic findings

Assessment Strategies
15.1. by interpreting radiographs using the form provided identifying normal anatomy, dental caries, periodontal disease, and periodontal lesions.
15.2. without the use of references

Learning Objectives
15.a. Explain the differences between interpretation and diagnosis of radiographs and who performs these functions
15.b. Describe dental caries
15.c. Explain why caries appear radiolucent on a dental radiograph
15.d. Identify specific radiographic finding - i.e. abscess, resorption, fractures