



Dental Assisting National Board, Inc.

Measuring Dental Assisting Excellence™

Exam Blueprint

for

Radiation Health and Safety (RHS)

A component of the DANB Certified Dental Assistant (CDA) Exam

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Radiation Health and Safety (RHS) Exam Blueprint

- (37%) I. EXPOSE AND EVALUATE**
- A. Select appropriate radiographic technique.
 - 1. Describe use and purpose of various intraoral and extraoral radiographs, such as:
 - a. periapical.
 - b. bitewing.
 - c. occlusal.
 - d. panoramic.
 - e. cephalometric and other extraoral views.
 - 2. Select appropriate radiographic film to examine, view, or survey conditions, teeth, or landmarks, such as:
 - a. caries.
 - b. temporomandibular joint.
 - c. periodontal conditions.
 - d. apical pathology.
 - e. sinus areas.
 - f. dental anomalies, such as supernumerary teeth.
 - g. edentulous arches.
 - h. localization of impacted teeth, foreign objects, etc.
 - i. dental implants.
 - B. Select appropriate equipment for radiographic techniques.
 - 1. Describe purpose or advantage of accessories for radiographic techniques, including film holders, cotton rolls, bitewing tabs, bite blocks, lead apron, and thyroid collar.
 - 2. Select appropriate film size and film speed (sensitivity) depending on patient characteristics and exposure technique indicated.
 - 3. Describe purpose and advantage of dual (double) film packets.
 - 4. Storage.
 - a. Inspect and evaluate film storage areas for proper temperature, humidity, radiation protection and inventory control.
 - 1. Identify and correct errors related to improperly storing exposed and unexposed radiographic film.
 - C. Select infection control techniques and barriers to minimize cross-contamination in the operatory according to ADA/CDC and OSHA guidelines.
 - D. Select patient management techniques before, during, and after radiographic exposure.
 - 1. Address patient concerns about x-radiation, including patient refusal of radiography.
 - 2. Describe techniques for patient management while exposing radiographs, including patients with special needs.

- E. Expose dental films, using various techniques.
 - 1. Define radiographic exposure concepts, including:
 - a. film speed.
 - b. kilovoltage.
 - c. milliamperage.
 - d. collimation.
 - e. filtration.
 - f. film density.
 - g. latent image.
 - 2. Intraoral
 - a. Define factors that influence quality of exposure, such as:
 - 1. mA setting.
 - 2. kVp setting.
 - 3. primary beam angles (horizontal and vertical).
 - 4. PID (cone) length.
 - 5. exposure time.
 - b. Compare paralleling and bisecting angle techniques, including advantages and disadvantages of each.
 - c. Name the parts and functions of an x-ray film packet.
 - 3. Extraoral
 - a. Identify function and maintenance of film cassettes and intensifying screens.
 - b. Describe appropriate technique for exposing (patient positioning)
 - 1. panoramic film.
 - 2. cephalometric film.
- F. Demonstrate basic knowledge of digital radiography and other modern imaging techniques.
 - 1. Advantages/disadvantages of digital radiography
 - 2. Image receptors
 - 3. Infection control for digital equipment
- G. Evaluate radiographs for diagnostic value.
 - 1. Describe features of a diagnostically acceptable radiograph.
 - 2. Identify and correct errors related to exposing intraoral radiographs, including:
 - a. elongation.
 - b. foreshortening.
 - c. horizontal overlapping.
 - d. cone cutting.
 - e. light image.
 - f. dark image.
 - g. film bending.
 - h. reverse film (herringbone or tire track effect).
 - i. blank (clear) film.
 - j. blurred image.
 - k. superimposed image.
 - l. double exposure.
 - m. film placement errors.

3. Identify and correct errors related to exposing panoramic radiographs, including patient positioning errors.

(16%) II. PROCESS

- A. Prepare, maintain, and replenish radiographic solutions for manual and automatic processors.
 1. Describe functions of processing solutions.
 2. Describe procedures for maintaining the integrity of processing solutions.
- B. Process exposed intra- and extraoral radiographs by use of manual and automatic techniques, but not limited to:
 1. Identify optimum conditions and procedures for processing radiographs.
 2. Identify and correct errors related to radiographic processing, including:
 - a. fogging.
 - b. light and dark images.
 - c. clear (blank) film.
 - d. partial images.
 - e. overlapped films.
 3. Identify and correct errors due to improper film handling, including:
 - a. scratches.
 - b. white or black lines.
 - c. static electricity artifacts.
 - d. fingerprints.
- C. Practice infection control for radiographic processing, following ADA/CDC and OSHA guidelines.
- D. Properly store chemical agents used in radiography procedures according to the local regulatory agency, in compliance with the OSHA Hazard Communication Standard.
- E. Properly dispose of all chemical agents and other materials used in dental radiography procedures.
- F. Implement quality assurance procedures (e.g., daily recording of solution temperatures, dates of solution changes, test film runs, clean and maintain equipment, knowledge of periodic inspections).

(11%) III. MOUNT AND LABEL

- A. Mount radiographs using buccal (facial) view.
 1. Identify anatomical landmarks that aid correct mounting.
 2. Match specific tooth views to specified tooth mount windows.
 3. Demonstrate appropriate technique for optimum viewing.
- B. Identify anatomical structures, dental materials and patient information observed on radiographs, including differentiating between radiolucent and radiopaque areas.
- C. Prepare radiographs for legal requirements, viewing, and duplication.

1. Identify methods for duplicating radiographs.
2. Identify information that must legally appear on the mount label.
3. Identify reasons for exposing and retaining radiographs.

(24%) IV. RADIATION SAFETY – PATIENT

- A. Apply the principles of radiation protection and health physics and hazards in the operation of radiographic equipment.
 1. Demonstrate knowledge of the factors affecting x-ray production, including kVp, mA, and exposure time.
 - a. Describe the characteristics of x-radiation.
 2. Demonstrate understanding of x-ray machine factors that influence radiation safety, including concepts of filtration, shielding, collimation, and PID (cone) length.
 3. Demonstrate understanding of radiation physics:
 - a. primary radiation.
 - b. scattered (secondary) radiation.
 4. Describe protocol for suspected x-ray machine malfunctions.
- B. Practice patient safety measures to provide protection from x-radiation.
 1. Identify major causes of unnecessary x-radiation exposure.
 2. Demonstrate understanding of radiation biology.
 - a. Short- and long-term effects of x-radiation on cells and tissues.
 - b. Demonstrate understanding of concepts of radiation doses, and effective dose.
 3. Identify ways to reduce radiation exposure to patients (ALARA).
 4. Identify guidelines that determine frequency of exposure.

(12%) V. RADIATION SAFETY – OPERATOR/OTHER STAFF

- A. Practice operator safety measures to provide protection from x-radiation.
 1. Identify sources of x-radiation to operators/other staff while exposing radiographs.
 2. Identify safety measures to reduce operator x-ray exposure.
 3. Demonstrate understanding of radiation physics and biology pertaining to the operator exposure.
- B. Describe techniques for monitoring individual radiation exposure.
 1. Describe the ALARA principle as related to operator safety.
 2. Explain the function of a personal monitoring device.