Radiation Health and Safety (RHS®)

Exam Outline and References

The RHS exam is a component of the National Entry Level Dental Assistant (NELDA®) and Certified Dental Assistant™ (CDA®) certification programs.

There are no eligibility requirements to take the RHS exam.

The purpose of the RHS exam is to ensure that individuals meet the minimum national standard for knowledge-based competence in radiation health and safety tasks critical to the health and safety of patients and oral healthcare workers.

The RHS exam is testing on digital radiography only. There have been no conventional, film-based concepts tested on the RHS exam since July 7, 2022.

NELDA component exams

Anatomy, Morphology and Physiology (AMP)

Radiation Health and Safety (RHS)

Infection Control (ICE®)

CDA component exams

Radiation Health and Safety (RHS)

Infection Control (ICE)

General Chairside Assisting (GC)

Effective 01/04/2024

RHS

Exam Outline Overview

Exam Weighting by Domain

I. Purpose and Technique (50%)

II. Radiation Protection (25%)

III. Infection Prevention and Control (25%)

Exam Characteristics	
Number of Multiple-Choice Questions	75
Time for Exam (minutes)	60
Time for Appointment (minutes)	65

The exam is administered in-person and through remote online proctoring. The candidate may choose the method they prefer. Remote proctoring allows candidates to take exams using their own computer while being monitored by webcam and microphone.

DANB uses computer adaptive testing (CAT). Exams are scored based on the difficulty of the questions answered correctly. This method can more accurately pinpoint a candidate's ability level. Each candidate is presented with the same percentage of questions from each domain. The average candidate will answer around 50% of the questions correctly.

RHS Exam Outline

I: Purpose and Technique (50%)

A. Anatomical landmarks, conditions and materials observed on images, including but not limited to:
   1. apical pathology.
   2. caries.
   3. dental anomalies (e.g., supernumerary teeth).
   4. dental implants.
   5. edentulous arches.
   6. localization of impacted teeth and foreign objects.
   7. periodontal conditions.
   8. sinus areas.
   9. temporomandibular joint.

B. Purpose of dental images
   1. Periapical
   2. Bitewing
   3. Full mouth series
   4. Full mouth survey
   5. Occlusal
   6. Panoramic
   7. Cephalometric
   8. Cone-beam computed tomography (CBCT)

C. Technique to acquire dental images.
   1. Review patient medical and dental histories for contraindications, including medications.
   2. Intraoral techniques
      a. Paralleling
      b. Bisecting angle
   3. Extraoral techniques
      a. Panoramic
      b. Cephalometric
      c. CBCT (cone-beam computed tomography) basics

4. Technique modifications based on anatomical variations and clinical conditions, including but not limited to:
    a. tori.
    b. cleft palate.
    c. shallow palate.
    d. narrow arch.
5. Error correction, including but not limited to:
    a. unexposed, underexposed or overexposed sensor.
    b. sensor placement.
    c. position-indicating or beam alignment device placement.
    d. horizontal angulation / overlapped contacts.
    e. vertical angulation / distorted image.
    f. artifacts and foreign objects.
    g. sensor integrity.
6. Purpose and maintenance of radiographic equipment, including but not limited to:
    a. sensors (e.g., wired or wireless, PSP, CMOS, CCD).
    b. x-ray unit (e.g., control panel, extension arm, tubehead).
    c. computer (e.g., monitor, keyboard, mouse).
7. Patient management techniques (e.g., verbal, non-verbal).
8. Image viewing and mounting
    a. Anatomic landmarks
    b. Anatomic order
    c. Radiopaque vs. radiolucent
    d. Tooth names
    e. Universal Tooth numbers including primary and permanent teeth
    f. Orientation (e.g., anterior/posterior, mesial/distal, maxillary/mandibular, facial/lingual)
9. Legal requirements for maintaining dental images (e.g., HIPAA, retention, transfer).

II: Radiation Protection (25%)

A. Radiation physics
    1. Factors affecting x-ray production (e.g., kVp, mA, exposure time, dose)
    2. Radiation characteristics (e.g., wavelength, frequency, velocity)
    3. Radiation physics (e.g., absorption, penetrating power, travel)
        a. Primary
        b. Scatter (secondary)
B. Radiation biology
    1. Cell and tissue radiation sensitivity
    2. Type of exposure (e.g., acute, cumulative)
    3. Biological effect periods (e.g., latent, recovery)

4. Biological effects (e.g., short- or long-term, genetic, somatic)
5. Units of radiation measurement

C. Radiation protection
   1. Oral healthcare provider exposure to radiation
   2. Patient exposure to radiation
      a. Maximum permissible dose (MPD)
      b. As Low as Reasonably Achievable (ALARA)
      c. American Dental Association (ADA) and Food and Drug Administration (FDA) guidelines
   3. Causes of unnecessary radiation exposure
   4. Factors affecting radiation protection, including but not limited to:
      a. filtration.
      b. shielding.
      c. collimation.
      d. position indicating device (PID).
      e. beam alignment device.
   5. Patient concerns about exposure to radiation
   6. Informed consent or patient refusal of exposure to radiation
   7. Protocol for suspected x-ray unit malfunctions

III: Infection Prevention and Control (25%)

A. Standard precautions for equipment and supplies according to ADA, CDC and OSHA, including but not limited to:
   1. breakdown and setup of treatment room.
   2. barriers.
   3. position indicating and beam alignment devices.
   4. clinical contact surfaces.
   5. critical and semi-critical instrument sterilization.

B. Standard precautions for patients and operators according to ADA, CDC and OSHA, including but not limited to:
   1. hand hygiene.
   2. Personal Protective Equipment (PPE) (e.g., selection, donning, doffing).
   3. cross contamination.

RHS Exam Suggested References

DANB exam committees use the following textbooks and reference materials to develop this exam. This list does not include all available study materials; these are the resources that exam committees have determined provide the most up-to-date information needed to meet a determined level of competence on this exam. Any one reference will likely not include all the study material required to pass the exam. **Please note that previous editions of the resources below may be used for study purposes if the previous version was published within the past 5 years.**

This list is intended to help prepare for this exam. It is not an endorsement of the publications. You should prepare for the RHS exam using as many different study materials as possible.

Suggested References

1. Bird, D., & Robinson D. (2020). *Modern Dental Assisting* (13th ed.). Elsevier Health Sciences.
2. Ianucci, J., & Howerton, L. (2022). *Dental Radiography* (6th ed.). Elsevier Health Sciences.
3. Thomson, E., & Johnson, O. (2017). *Essentials of Dental Radiography* (10th ed.). Pearson Education.
4. Miller, C. (2021). *Infection Control and Management of Hazardous Materials for the Dental Team* (6th ed.). Elsevier Health Sciences.

Additional/Optional Study Resources

1. Centers for Disease Control and Prevention (CDC). www.cdc.gov.
   - *Guidelines for Infection Control in Dental Health-Care Settings — 2003* (MMWR, Vol. 52, RR 17). www.cdc.gov/mmwr/preview/mmwrhtml/rr5217a1.htm
   - *Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Oral Health; 2016. https://www.cdc.gov/oralhealth/infectioncontrol/summary-infection-prevention-practices/index.html*
2. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA). www.osha.gov.
   - *Hazard Communication Standard (Code of Federal Regulations #29, Part 1910)*
   - *Bloodborne Pathogens Standard (1910.1030)*
3. American Dental Assistants Association (ADAA). www.dentalassistant.org.
   - *An Introduction to Basic Concepts in Dental Radiography* (Course #715)
4. The DALE Foundation. www.dalefoundation.org.
   - *DANB RHS Review*
   - *DANB RHS Practice Test*
   - *DANB ICE Review*
   - *DANB ICE Practice Test*

The following is a list of acronyms that may appear on the exam.

Acronym	
AAPD	American Academy of Pediatric Dentistry
ADA	American Dental Association
ALARA	as low as reasonably achievable
CBCT	cone beam computed tomography
CCD	charge-coupled device
CDC	Centers for Disease Control and Prevention
C/kg	coulombs per kilogram
CMOS	complementary metal oxide semiconductor
CT	computed tomography
DNA	deoxyribonucleic acid
EPA	Environmental Protection Agency
FDA	Food and Drug Administration
FMX	full mouth x-ray
Gy	gray
HIPAA	Health Insurance Portability and Accountability Act
HIV	human immunodeficiency virus
IQ	intelligence quotient
kVp	kilovoltage peak
mA	milliampere
µm	micrometer
MPD	maximum permissible dose
MRI	magnetic resonance imaging
mSv	millisievert
OPIM	other potentially infectious materials
OSAP	Organization for Safety, Asepsis and Prevention
OSHA	Occupational Safety and Health Administration
OSL	optically stimulated luminescence
PID	position indicating device
PPE	personal protective equipment
PSP	phosphor storage plate
SDS	safety data sheet
SLOB	same lingual, opposite buccal
TB	Tuberculosis
TMJ	temporomandibular joint

Radiography Terms

Below is a list of terms that may appear on the RHS exam. Please note that the list does not include every term from the RHS exam and there may be terms that do not appear on the exam.

Terms
abscess / cyst / granuloma
acrylic
ala-tragus line
amalgam / composite
anode object-sensor distance
anode target-sensor distance
autoclave
bilateral
bite block
bite tab
bone (e.g., alveolar, hyoid, mastoid, cortical)
bone loss
buccal object rule
cast gold
cataracts
cathode
cementum / dentin / enamel
central ray / central x-ray beam
cephalostat
chronic
clinical contact surface
clinical indications
cone cut
contrast / density
cortical / cancellous
cross-sectional
curve of Spee
dermatitis / erythema
differentiated tissue
disease transmission
disinfect / sanitize / asepsis
divergent
electrons / neutrons / photons
elongation / foreshortened
epithelial tissue
facial / buccal
focal spot size

Terms
foramen (e.g., mental, incisive, lingual, palatine, nasopalatine, mandibular, optic)
fossa
Frankfort plane
genetic
genial tubercle
ghost image
impulses
incipient
indicator tape
instrument processing
intensity / quality
internal / external
intestine
inverse square law
inverted Y formation
kinetic energy / microwave energy
labial / lingual
lamina dura
laser beam
lateral
leakage
ligament
lingual / interproximal / proximal
lymphoblast / lymphocyte
magnetic field
magnification / sharpness / distortion
mental ridge / mylohyoid ridge
microseconds / nanoseconds
mucosa
multiplanar
necrosis
nerve
neural
nutrient canal
orientation (e.g., multiplanar, coronal sagittal, axial)
osteoblast / osteocyte

Terms
palatine
parallel / perpendicular
pathology
penumbra
porcelain
process (e.g., coronoid, zygomatic, hamular)
protuberance
pterygoid plate
quadrant
radiation beam
radiation types: background / cosmic / gamma / infrared / ionizing / isotopic / microwave / nuclear / thermal / ultraviolet
resolution
right-angle method
software

Terms
somatic
stainless steel
sterility
superior / inferior
tongue depressor
topographical
torus (tori)
transcranial
Trendelenburg position
tungsten
two-dimensional; three-dimensional
Waters projection
work practice controls
zygoma

Exam Development and Maintenance

How exams are developed

DANB exams are developed using this exam outline, which is annually reviewed by subject matter experts. The outline is developed using a content validation study, which includes a job analysis survey where practicing DANB certificants and certificate holders are asked how often tasks are performed and how critical competent performance of tasks is to the health and safety of the public and oral healthcare worker. This study is conducted every five to seven years to ensure the outline is consistent with current clinical practices. DANB's Board of Directors approves all updates to DANB exam outlines.

How the passing standard is determined

The exam passing standard is evaluated and a Standard Setting Study is conducted the year following a Content Validation Study. DANB uses a modified Angoff standard setting method and convenes a panel of subject matter experts to evaluate and make judgements about the difficulty of the exam items and the criticality of the content of the exam items. Modified Angoff standard setting methods are commonly used to set the passing standards for certification exams. DANB's Board of Directors approves all changes to DANB exam passing standards.

How exams are scored

In a criterion-referenced examination, a candidate must obtain a score equal to, or higher than, the passing score to pass the test. A minimum passing scaled score of 400 must be obtained to pass the exam with scores ranging from 100 to 900 points. Exam results are reported as a "scaled score" which is neither a "number correct" nor a "percent correct" score. Performance on the exam is not compared to the performance of others taking the exam.

Receiving your exam results

You will be notified by email within 1-3 business days after your exam that your exam results are available in your online DANB account.

State Regulations

Each state's dental board implements regulations and establishes rules for delegating legally allowable duties to dental assistants. Passing one or more of the DANB component exams or earning DANB certification only conveys authority to perform these duties in those states that recognize these exams or this certification as meeting state dental assisting requirements. This information is available at www.danb.org.