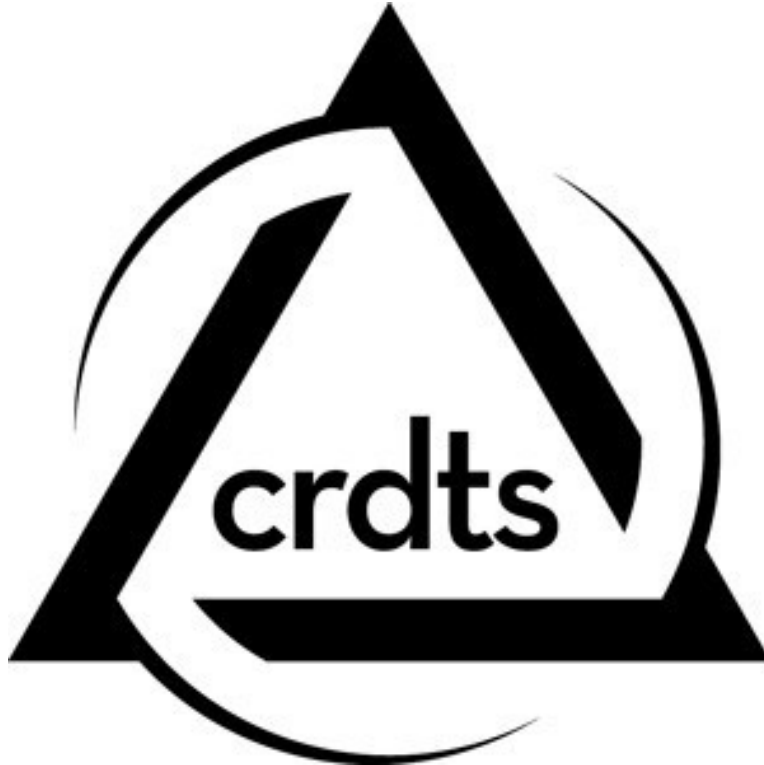


DENTAL EXAMINATION ENDODONTIC CANDIDATE MANUAL

Class of 2027



A National Dental Examination

As administered by:

Central Regional Dental Testing Service, Inc.

1725 SW Gage Blvd.

Topeka, Kansas 66604

(785) 273-0380

www.crdts.org

Please read this candidate manual prior to attending the candidate orientation and bring it with you to the orientation and the examination.

Endodontic Examination

Table of Contents

CONTENT OVERVIEW	1
SCORING SYSTEM	1-3
PART II: ENDODONTICS EXAMINATION	
General Requirements	4-5
Requirements Specific to the Part II: Endodontic Examination	5-6
Criteria Specific to the Part II: Endodontic Examination	
Anterior Endodontic Procedure:	
Access Opening	7
Canal Instrumentation	8
Root Canal Obturation	9
Posterior Endodontic Procedure	
Access Opening ONLY	10-11
Treatment Management	11
Endodontic Progress Form	12

CONTENT, CRITERIA & SCORING SYSTEM - OVERVIEW

PART II: ENDODONTICS EXAMINATION

CONTENT	FORMAT
1. Endodontic access opening only on tooth #14, a multi-rooted artificial tooth. 2. Endodontic access, canal instrumentation and obturation on tooth #8, a single-canal artificial tooth.	- Performed on a Simulated Patient - Time: 2.5 hours

SCORING SYSTEM

The examination scoring system was developed in consultation with three different measurement specialists; the scoring system is criterion-based and was developed using an analytical model.

Only State Boards of Dentistry are legally authorized to determine standards of competence for licensure in their respective jurisdictions. However, in developing the examination, CRDTS has recommended a score of 75 to be a demonstration of sufficient competence; and participating State Boards of Dentistry have agreed to accept that standard. In order to achieve “CRDTS status” and be eligible for licensure in a participating state, candidates must achieve a score of 75 or more **on each procedure** within each Part of the examination.

Each examination score is based on 100 points. If all sections of an examination are not taken, a score of “0” will be recorded for that specific examination.

PARTS II: SCORING SYSTEM FOR ENDODONTICS SIMULATED PATIENT PROCEDURES

CRDTS and other testing agencies have worked together on a national level to draft and refine the performance criteria for each procedure in this examination. For the majority of those criteria, gradations of competence are described across a 4-level rating scale. Those criteria appear in this manual and are the basis of the scoring system. Those four rating levels may be generally described as follows:

SATISFACTORY

The treatment is of good to excellent quality, demonstrating competence in clinical judgment, knowledge and skill. The treatment adheres to accepted mechanical and physiological principles permitting the restoration of the tooth to normal health, form and function.

MINIMALLY ACCEPTABLE

The treatment is of acceptable quality, demonstrating competence in clinical judgment, knowledge and skill to be acceptable; however, slight deviations from the mechanical and physiological principles of the satisfactory level exist which do not damage the patient nor significantly shorten the expected life of the restoration.

MARGINALLY SUBSTANDARD

The treatment is of poor quality, demonstrating a significant degree of incompetence in clinical judgment, knowledge or skill of the mechanical and physiological principles of restorative dentistry, which if left unmodified, will cause damage to the patient or substantially shorten the life of the restoration.

CRITICALLY DEFICIENT

The treatment is of unacceptable quality, demonstrating critical areas of incompetence in clinical judgment, knowledge or skill of the mechanical and physiological principles of restorative dentistry. The treatment plan must be altered and additional care provided, possibly temporization in order to sustain the function of the tooth and the patient’s oral health and well-being.

In Part II, a rating is assigned for each criterion in every procedure by three different examiners evaluating independently. Based on the level at which a criterion is rated by at least two of the three examiners, points may be awarded to the candidate. In any instance that none of the three examiners' ratings are in agreement, the median score is assigned. However, if any criterion is assigned a rating of **critically deficient** by two or more of the examiners, **no points are awarded for that procedure**, even though other criteria within that procedure may have been rated as satisfactory. A description of Part II and the number of criteria that are evaluated appears below:

Part II: ENDODONTICS EXAMINATION

The Endodontics Examination is a simulated patient examination which consists of two procedures: an access opening on an artificial posterior tooth and an access opening, canal instrumentation and obturation on an artificial anterior tooth. The criteria for these procedures are:

Anterior Endodontics	12 Criteria
Posterior Access Opening	9 Criteria

To compute the score for each individual procedure, the number of points the candidate has earned for each criterion is totaled, divided by the maximum number of possible points for that procedure and the results are multiplied by 100. This computation converts scores for each procedure to a basis of 100 points. Any penalties that may have been assessed during the treatment process are deducted **after** the total score for the Examination Procedure has been converted to a basis of 100 points.

PENALTY DEDUCTIONS

Throughout the examination, not only clinical performance will be evaluated, but also the candidate's professional demeanor will be evaluated by Clinic Floor Examiners. A number of considerations will weigh in determining the candidate's final grades and penalties may be assessed for violation of examination standards, as defined within this manual, or for certain procedural errors as described below:

Any of the following may result in a deduction of points from the score of the examination procedure or dismissal from the exam in any of the clinical procedures:

1. Violation of universal precautions (1 point) or infection control; gross asepsis; operating area is grossly unclean, unsanitary or offensive in appearance; failure to dispose of potentially infectious material and clean the operatory after individual examinations (10 points)
2. Poor Professional Demeanor – unkept, unclean, or unprofessional appearance (1 point); inconsiderate or uncooperative with other candidates, examiners or testing site personnel (10 points)
3. Improper Operator/Manikin position (1 point)
4. Inadequate isolation -The isolation dam is inappropriately applied, torn and/or leaking. (1 point)
5. Rubber Dam remnants (1 point)
6. Pencil marks on teeth (1 point)
7. Uncleanliness of models when turned in that would impede visual assessment of the procedure (1 point)

The following infractions will result in a loss of **all** points for the entire examination Part:

1. Violation of Examination Standards, Rules or Guidelines
2. Treatment of teeth or surfaces other than those approved or assigned by examiners
3. Damage to an adjacent tooth that requires a restoration
4. Gross iatrogenic damage to the simulated gingiva and/or typodont located anywhere within or near the treatment selection.

5. Fractured root in the anterior endodontic procedure
6. Use of canned compressed air
7. Critical Lack of Diagnostic/Clinical Judgment Skills – This penalty would be applied when the prognosis of the treatment and/or the simulated patient’s well-being is seriously jeopardized. Examples include but are not limited to:
 - Damage to the typodont outside of the assigned work area

The penalties or deficiencies listed above do not imply limitations, since obviously some procedures will be classified as unsatisfactory for other reasons, or for a combination of several deficiencies.

Professional Conduct – All substantiated evidence of falsification or intentional misrepresentation of application requirements, collusion, dishonesty, or use of unwarranted assistance during the course of the examination shall automatically result in failure of the entire examination by any candidate.

In addition, there will be no refund of examination fees and that candidate cannot apply for re- examination for one full year from the time of the infraction. Any of the following will result in failure of the entire examination:

- a. Falsification or intentional misrepresentation of application requirements
- b. Cheating (Candidate will be dismissed immediately)
- c. Any candidate demonstrating complete disregard for the oral structures, welfare of the simulated patient and/or complete lack of skill and dexterity to perform the required clinical procedures
- d. Misappropriation of equipment (theft)
- e. Receiving unwarranted assistance
- f. Alteration of examination records

PART II: ENDODONTICS EXAM

The Endodontics Examination is a stand-alone examination. The Endodontics Examination consists of two procedures, as follows:

PART II: ENDODONTICS EXAMINATION

1. Endodontic access opening only on tooth #14, a multi-rooted artificial tooth
2. Endodontic access, canal instrumentation and obturation on tooth #8, a single-canal artificial tooth

GENERAL REQUIREMENTS

1. **Manikin Requirements and Mounting:** A mounted manikin with full facial shroud should be provided by the testing site for insertion of the typodont. The manikin heads must accommodate the examination typodont which can be adapted to a chair-mounted post or a high-tech simulation lab unit. If the typodonts are to be chair-mounted, they must have an articulating hinge attached. If a simulation lab is being used, the typodonts must be adapted with appropriate connectors. Please check with the site regarding equipment provided.
2. **Patient Simulation:** The correct patient/operator position must be maintained while operating. Throughout the simulated patient procedures, the treatment process will be observed by Clinic Floor Examiners and evaluated as if the manikin were a live patient. With the exception of having the manikin wear protective eyewear, the manikin is subject to the same treatment standards as any patient. The facial shroud may not be displaced other than with those retraction methods which would be reasonable for a patient's facial tissue. Some modifications in the treatment procedure are imposed due to the mechanical simulation conditions. For example, since the tooth length on #8 is directly measured prior to the procedure, no radiographs are utilized before or after treatment.
The Candidate should use only air but may use both air and water spray when preparing tooth #14. For tooth #8, when performing the complete endodontic procedure, the use of water irrigation is preferred when cleaning and filing the canal. If water spray is utilized, a mechanism to collect and remove the water must be in place during the use of the water spray. Models or pre-preparations are not permitted to be brought to the examination site.
3. **Security Requirements:** No written materials may be in the operating area other than this Candidate Manual and CRDTS forms.
4. **Infection Control:** The candidate must follow the most current recommended infection control procedures as published by the CDC during all simulated patient clinical procedures. The only exception to standard infection control precautions is that the candidate is not required to maintain protective eyewear on the manikin during simulated patient procedures. Infection control will be monitored by Clinic Floor Examiners. (www.cdc.gov/oralhealth/infectioncontrol/guidelines)
5. **Assigned Teeth:** Once a procedure has been started, the procedure must be carried to completion on the assigned tooth/teeth with no substitutions permitted. Substitution of teeth or preparation of the wrong tooth/teeth during the Endodontic Examination will result in failure of the specific examination.
6. **Assistants:** Auxiliary personnel are not permitted to assist at chair side or in a laboratory during the simulated patient examination. Candidates may not assist each other, critique or discuss one another's work.
7. **Adjacent Damage:** The candidate's score will be penalized for any unwarranted damage to adjacent teeth or to the simulated gingival area during simulated patient procedures.

8. **Examination Sequence:** Candidates must mount their endodontic modules and the Clinic Floor Examiner must check the mounting of the endodontic typodont and authorize the candidate to proceed. During all simulated patient procedures, the typodont may *not be disassembled* without the permission of a Clinic Floor Examiner.

Requirements Specific to the Endodontic Examination

1. **Required Materials: Endo Typodont and Modules:** CRDTS will provide all necessary modules for the candidate, which include the following: CRDTS typodont model with all modules. This includes the mandibular arch and endo segments for the anterior endodontic procedure, the #8 examination tooth which will be mounted in the module at the exam, the #14 examination tooth and the module it is to be inserted into.

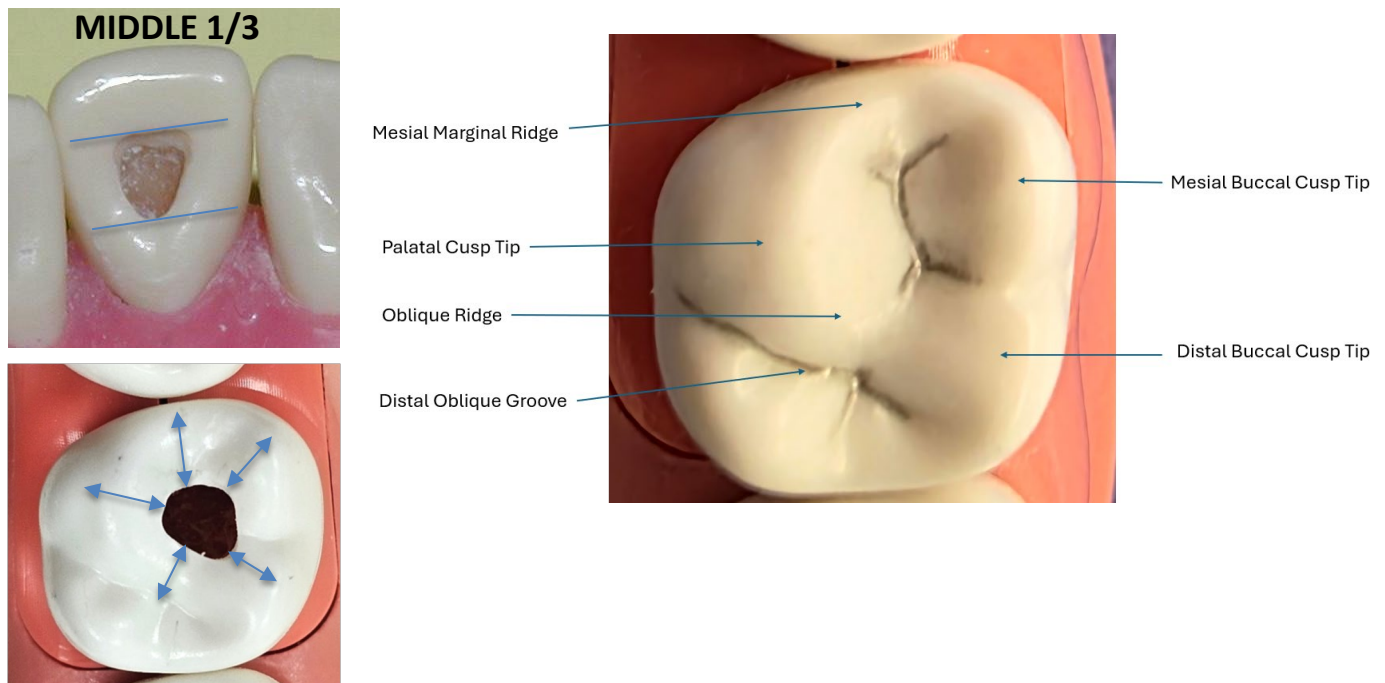
These modules will be distributed to the candidate before the Endodontic Examination begins. Testing modules will have the candidate number pre-entered, candidates must verify the number before working on the modules.

Endodontic Typodont Modules: Endodontic treatment must be completed on two artificial endodontic teeth, one multi-rooted endodontic first maxillary molar (#14) and one single-canal endodontic incisor (#8). Both #8 and #14 will be mounted in endodontic modules. The endodontic modules will be inserted in a typodont and mounted in a manikin with a shroud to be provided by the testing site. The typodont may be mounted on a post and strapped into an operator chair or mounted in a simulation laboratory. Post-mounted typodonts will require an **articulating hinge**. A CFE will verify the correct placement of an occlusal opening limiting rod prior to examination start time.

Once the typodont is mounted in the manikin, request a Start Check from a Clinic Floor Examiner.

2. **Preparation of Teeth:** Tooth #8 must be used to complete the access opening, canal instrumentation and obturation. Tooth #8 is considered to have a normal size pulp chamber for a 21-year-old. The size, shape, and extent of the prepared access opening should reflect such anatomy and will be graded accordingly. The #14 artificial endodontic tooth must be used to complete access opening to the canals.

The photos shown below of prepared teeth depict an access opening performed to SAT/ACC criteria. (Carefully refer to the examination manual for exact criteria.)



3. **Dismantling Manikin:** The typodont should be as clean as it was when you received it. During both the endodontic and the prosthodontic procedures, **the candidate may not disassemble the manikin without permission of the Clinic Floor Examiner.** A CFE must be notified prior to disassembly of the typodont. The modules will be returned to the module storage bag until they are graded and all grade forms/Progress Forms will be collected by the Clinic Floor Examiners. Removal of the manikin, typodont or teeth during the examination without permission of the Clinic Floor Examiner will result in failure.

4. **Isolation dam:** Both the endodontic procedures must be **performed under two separate isolation dams.** In order to avoid evulsion, ***no clamps should be placed on the teeth to be treated;*** clamps should be placed on nearby artificial teeth. All work must be done with the isolation dam in place.

The dam must be removed at the completion of the procedures and remnants removed from the module. **Failure to place an isolation dam is a violation of examination standards and will result in a critical failure.**

5. **Instruments:** Other than the instruments and materials provided by the testing site, the candidates are responsible for providing the instruments, files and materials of their choice. Rotary instruments are permissible during the endodontic procedure.

6. **Treatment:** On the anterior tooth, any form of gutta-percha filling technique may be used, including any warm gutta-percha or carrier-based, thermoplasticized gutta-percha techniques. Instrumentation technique, either mechanical or manual is at the candidate's discretion.

- a. On the posterior tooth, access opening to all canals must be completed.
- b. If either of the teeth fractures during treatment contact the Clinic Floor Examiner as soon as possible.
- c. No occlusal reduction of clinical crowns may be done, other than the normal access preparation. Any other alteration will result in a deduction of points.

7. **Reference Point:** The cemento-enamel junction (CEJ) on the facial surface should be used as the reference point to determine the fill depth.

8. **No Temporaries:** No temporary material may be placed over the obturation material.

9. **Evaluation:** As soon as the endodontic procedure is complete, a Clinic Floor Examiner must authorize dismantling the typodont. If candidates have completed the endodontic portion of the examination before the official end time they may contact a Clinic Floor Examiner and request permission to dismantle the typodont, submit their procedures and leave the clinic area.

- a. The endodontic modules must be removed from the carrier trays and must be inserted into the module storage bag. The candidate's Progress Form must accompany the module bag when turned in to the examiners.
- b. The treated endodontic modular sections will be maintained by CRDTS as part of the candidate's examination record.

***Retake Policy: Please see Dental Examination Overview, Policy and Procedures Manual**

ANTERIOR ENDODONTIC PROCEDURE

Access Opening – Artificial Anterior #8

PLACEMENT

SAT	The placement of the access opening reflects the position of the pulp chamber and straight-line access to the root canal system.
ACC	The placement of the access opening is not directly over the pulp chamber but would allow for straight-line access to the root canal system.
SUB	The placement of the access opening is not over the pulp chamber and would not allow straight-line access to the root canal system.
DEF	The placement of the access opening is not over the pulp chamber and would not allow access to the root canal system.

SIZE

SAT	The access opening incorporates the middle one-third of the lingual surface mesiodistally and incisio-gingivally and allows for complete debridement of the pulp chamber.
ACC	The access opening is not less than $\frac{1}{4}$ or greater than $\frac{1}{2}$ of the lingual surface, and does not weaken the marginal ridges or incisal edge.
SUB	The access opening is <input type="checkbox"/> less than $\frac{1}{4}$ and allows for partial debridement of the pulp chamber or <input type="checkbox"/> greater than $\frac{1}{2}$ the width of the lingual surface, or <input type="checkbox"/> the access opening weakens the marginal ridge(s). <input type="checkbox"/> The access encroaches on, but does not include the incisal edge.
DEF	The access opening includes the marginal ridge(s) and/or the incisal edge. The access opening is so small that debridement of the pulp chamber is impossible. The canal orifice is not accessed. The anterior crown is fractured due to excessive access preparation.

INTERNAL FORM

SAT	From the lingual surface to the cervical portion, the internal form tapers to the canal opening with no ledges.
ACC	From the lingual surface to the cervical portion, the internal form tapers to the canal opening with slight ledges.
SUB	The internal form lacks taper to the canal orifice(s), gouges are present that do not affect access to the canal orifice.
DEF	The internal form exhibits excessive ledging or gouges that do not allow access to the canal orifices and/or perforation.

PULP HORN REMOVAL

SAT	All pulp horns are removed through the access opening.
ACC	Pulp horns are not fully removed through the access opening.
SUB	Pulp horns are not entered.

ANTERIOR ENDODONTIC PROCEDURE

Canal Instrumentation – Artificial Anterior #8

CERVICAL PORTION

SAT	The cervical portion of the canal is enlarged facial-lingually and mesio-distally to allow access to the apical portion of the canal.
ACC	The cervical portion of the canal is too small and makes access to the apical portion of the canal difficult.
SUB	In the cervical portion, the canal is over or under prepared.
DEF	The cervical portion of the canal is grossly over prepared and/or perforated.

MID-ROOT PORTION

SAT	The mid-root portion of the canal blends with the cervical portion and no ledges or shoulders are present.
ACC	The mid-root portion of the canal does not blend smoothly with the cervical portion, but no ledges or shoulders exist.
SUB	The mid-root portion of the canal does not blend with the cervical region of the canal and/or ledging or shoulders are present that will inhibit canal obturation. The mid-root portion of the canal is transported.
DEF	The mid-root portion of the canal is perforated and/or has gross shoulders or ledges that will prevent canal obturation.

APICAL PORTION

SAT	The apical portion is instrumented to within 0.5 to 1.0 mm of the anatomical apex.
SUB	The apical portion of the canal is prepared more than 1.0 mm and not greater than 2.0 mm short of the anatomical apex. The apical portion is transported, but the apical portion still blends with the anatomical apex.
DEF	The apical portion of the canal is over prepared and instrumented beyond the anatomical apex, or is under prepared greater than 2.0 mm from the anatomical apex. The apical portion of the canal is transported and does not blend with the anatomical apex and/or there is a perforation of the root.

ANTERIOR ENDODONTIC PROCEDURE

Root Canal Obturation – Artificial Anterior #8

OVERFILL/UNDERFILL

SAT	The root canal is obturated with gutta percha to the apex or up to 1.0 mm or less from the apical foramen.
ACC	The root canal is obturated with gutta percha or extruded file up to 0.5 mm beyond the apical foramen.
SUB	The root canal is obturated with gutta percha more than 1.0 mm up to 2.0 mm short of the apical foramen. The root canal is obturated with gutta percha or extruded file greater than 0.5 mm to 1.0 mm beyond the apical foramen.
DEF	The root canal is obturated with gutta percha more than 2.0 mm short of the apical foramen. The root canal is obturated with gutta percha or a file extruded greater than 1.0 mm beyond the apical foramen.

EXTRUDED SEALER

SAT	There is 1.0 mm or less of sealer extruded beyond the apical foramen, measured in any direction.
SUB	There is more than 1.0 mm of sealer extruded, beyond the apical foramen, measured in any direction.

VOIDS IN GUTTA PERCHA

SAT	There are no voids in the gutta percha from the CEJ to the apical foramen.
ACC	The apical 1/3 of the gutta percha in the root canal is dense and without voids.
SUB	There are voids present throughout the obturation of the root canal.
DEF	There are large voids throughout the obturation of the root canal, there is no gutta percha present in the root canal, or a material other than gutta percha was used to obturate the canal.

FILLED CORONAL/APICAL TO CEJ

SAT	There is no gutta percha, restorative material, or sealer in the pulp chamber.
ACC	The gutta percha in the root canal is 1.0 mm to 2.0 mm short of the CEJ. Gutta percha and/or sealer is evident in the pulp chamber extending up to 1 mm coronal to the CEJ.
SUB	The gutta percha in the root canal is more than 2.0 mm but less than 3.0 mm short of the CEJ. Gutta percha and/or sealer is evident in the pulp chamber extending greater than 1.0 mm, but no more than 2.0 mm coronal to the CEJ.
DEF	The gutta percha in the root canal is more than 3.0 mm short of the CEJ. Gutta percha and/or sealer is evident in the pulp chamber extending more than 2.0 mm coronal to the CEJ. There is restorative material in the pulp chamber.

SEPARATED FILE

SAT	There is no evidence of a separated file.
ACC	A file is separated in the root canal, but does not prevent the obturation of the root canal.
DEF	A file is separated in the root canal, and prevents the obturation of the root canal.

POSTERIOR ENDODONTIC PROCEDURE

Access Opening ONLY – Artificial Posterior #14

PLACEMENT

SAT	The placement of the access opening is the mesial triangular pit and central fossa of the tooth and would allow for straight-line access to the root canal system.
ACC	The placement of the access opening is not directly over the pulp chamber, but would allow for straight-line access to the root canal system.
SUB	The placement of the access opening is not over the pulp chamber and would not allow straight-line access to the root canal system.
DEF	The placement of the access opening is not over the pulp chamber, and would not allow access to the root canal system.

SIZE

SAT	The access opening is of optimal size and allows for complete debridement of the pulp chamber.
ACC	The access opening is underextended allowing for partial debridement of the pulp chamber.
DEF	The access opening is underextended so that debridement of the pulp chamber or access to one or more canal orifices is impossible.

INTEGRITY OF OCCLUSAL ANATOMY

SAT	The access opening preserves 2mm or more of the mesial marginal ridge and all cusp tips.
ACC	The access opening is overextended but preserves at least 1mm but less than 2mm of the mesial marginal ridge and/or any cusp tip.
DEF	The access opening is overextended but preserves less than 1mm of the mesial marginal ridge and/or any cusp tip.

INTEGRITY OF OBLIQUE RIDGE

SAT	Greater than or equal to 3.0mm as measured from the distal oblique groove
ACC	Greater than 2.0mm but less than 3.0mm as measured from the distal oblique groove
SUB	Greater than 1.0mm but less than 2.0mm as measured from the distal oblique groove
DEF	Less than or equal to 1.0mm as measured from the distal oblique groove

INTERNAL FORM - LEDGING

SAT	The internal form tapers to the canal opening with no ledges.
ACC	The internal form lacks taper to the canal orifice(s), gouges are present that do not affect access to the canal orifice(s).
DEF	The internal form exhibits excessive ledging or gouges that do not allow access to the canal orifices and/or there is a perforation of the crown or the floor of the pulp chamber.

INTERNAL FORM - PULP CHAMBER ROOF

SAT	The access opening completely removes the pulp chamber roof.
SUB	The access opening partially removes the pulp chamber roof.
DEF	The pulp chamber roof has not been entered.

PULP TISSUE DEBRIDEMENT

SAT	All pulp tissue is removed.
ACC	Pulp tissue remains but is not on the floor or covering the orifice of the canals.
SUB	Pulp tissue remains on the floor and covers 1 or more of the canal orifices.
DEF	All pulp tissue remains.

CANAL ACCESS

SAT	The access opening allows straight line access to three canal orifices.
ACC	The access opening allows straight line access to two canal orifices.
SUB	The access opening allows straight line access to one canal orifice.
DEF	The access opening does not allow access to the canal orifices.

PULP HORN REMOVAL

SAT	All pulp horns are removed through the access opening.
ACC	One or two of the pulp horns are not removed through the access opening.
DEF	All pulp horns have not been fully removed.

ENDODONTIC PROCEDURES

Penalty Points / Treatment Management / Critical Errors

Penalty Points ONLY

CONDITION OF ADJACENT TEETH

SAT	The adjacent teeth and/or restorations are free from damage.
ACC	Damage to adjacent tooth/teeth can be removed with polishing without adversely altering the shape of the contour and/or contact.
SUB	Damage to adjacent tooth/teeth requires recontouring which changes the shape and/or position of the contact.
DEF	There is gross damage to adjacent tooth/teeth which requires a restoration.

CONDITION OF SOFT TISSUE

SAT	The simulated gingiva and/or typodont is/are free from damage.
ACC	There is slight damage to simulated gingiva and/or typodont consistent with the procedure.
SUB	There is iatrogenic damage to the simulated gingiva and/or typodont inconsistent with the procedure.
DEF	There is gross iatrogenic damage to the simulated gingiva and/or typodont inconsistent with the procedure.

TYPODONT CONDITION

1. Rubber Dam remnants
2. Pencil marks on teeth
3. Uncleanliness of models when turned in

CRITICAL ERRORS

1. Wrong Tooth/Surface Treated
2. Critical Lack of Clinical Judgment/Diagnostic Skills
3. ANTERIOR ENDODONTIC PROCEDURE - Root is fractured

