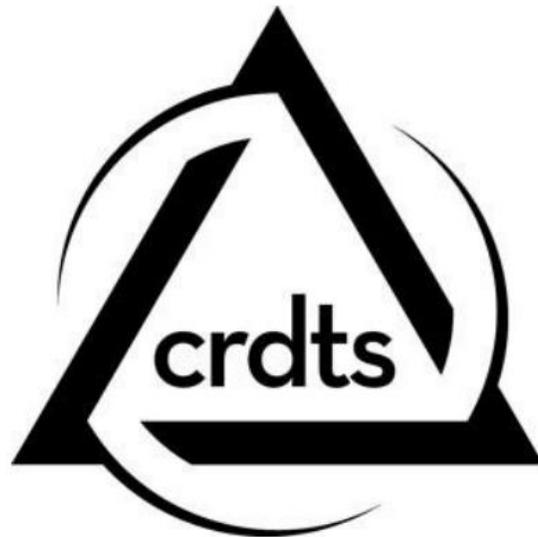


**2023**

**DENTAL HYGIENE**

**SIMULATED PATIENT EXAM**

**CANDIDATE MANUAL**



**A National Dental Hygiene Clinical Examination**

As administered by:

**CENTRAL REGIONAL DENTAL TESTING SERVICE, INC.**

**1725 SW Gage Blvd.**

**Topeka, Kansas 66604**

**(785) 273-0380**

**[www.crdts.org](http://www.crdts.org)**

**Please read this manual carefully and bring it with you to the examination.**

Copyright © 2023 Central Regional Dental Testing Service, Inc.



# Table of Contents

Introduction.....	1
Application Information & Requirements.....	3
Reporting of Scores .....	6
Petition for Review/Complaint Review Process.....	7
Policy for Reexamination and Remediation.....	8
Policy for On-Site Retakes .....	8
Policy for Testing of Candidates with Disabilities .....	9
Online Candidate Orientation – Q&A’s.....	10
Dental Hygiene Examination Content and Scoring Overview.....	10
Professional Conduct .....	11
Exam Time Schedule Overview .....	12
General Directives and Information ( <i>listed in alphabetical order</i> ) .....	12
Performance Requirements .....	14
Extra/Intra Oral Assessment Written OSCE.....	14
Periodontal Measurements Performance Criteria .....	15
Calculus Detection .....	16
Scaling/Subgingival Calculus Removal.....	17
Tissue Management .....	17
Checklist of Required Exam Materials .....	18
References.....	18
CRDTS Oral Assessment OSCE Security Measures .....	19
Hold Harmless Agreement Form.....	21
Progress Form .....	22

This page intentionally left blank

## Introduction

This manual has been designed to assist dental hygiene candidates in their preparation for this examination. The general directives and information for the conduct of the examination are outlined in this manual.

The Simulated Patient Exam is administered on a manikin, also known as a typodont, and mounted on a pole attached to the dental unit. Throughout this manual, the term “simulated patient” will be used to refer to what is also known as a manikin or typodont examination.

**Mission Statement:** To provide the dental examination community with test construction and administrative standardization for a national, uniform, dental hygiene clinical licensure examination. The examination will demonstrate integrity and fairness to assist state boards with their mission to protect the health, safety, and welfare of the public by assuring that only competent and qualified individuals are allowed to practice dental hygiene.

**Jurisdictional Authority:** State Boards of Dentistry are established by state law as the regulatory agencies of the dental profession, accountable to the state legislature and charged with protection of the public. Although all state laws are different, there are commonalities in their responsibilities to regulate the profession through licensure requirements, to interpret and enforce the dental practice act, to discipline those licensees who practice unethically or illegally, and to assess the competence of applicants for licensure in their jurisdictions through theoretical and clinical examinations. To evaluate competence, the CRDTS’ member state boards have joined together to develop and administer skill-based examinations in dentistry and dental hygiene that are fair, objective, and meet established principles of measurement for clinical evaluation.

**Purpose:** The purpose of this examination is to assess the candidate’s professional knowledge, skills, abilities, and judgment (KSAJ’s) as applied in clinical treatment procedures that are a representative sample of the services that are provided in the practice of dental hygiene, based on the criticality of the procedure to the patient’s systemic and oral health and the frequency with which that service is provided in practice.

**CRDTS:** The Central Regional Dental Testing Service, Inc. (hereinafter abbreviated CRDTS) is an independent testing agency which develops and administers clinical competency examinations in dentistry and dental hygiene on behalf of its member and participating states. Regional testing agencies, such as CRDTS, do not have the authority to license individuals or to implement policy that goes beyond the laws of its member states. Regional testing agencies should not be confused with state boards of dentistry.

**CRDTS Member States:** The member states of CRDTS are Alabama, Arkansas, Arizona, California, Georgia, Hawaii, Illinois, Iowa, Idaho, Kansas, Minnesota, Missouri, Nebraska, New Mexico, North Dakota, South Carolina, South Dakota, Texas, Utah, Washington, West Virginia, Wisconsin, and Wyoming.

**CRDTS Recognizing Jurisdictions:** In addition to the Member States listed above, several non-member states recognize the results of the CRDTS examination. Current information indicates over 40 state boards, nationwide, recognize the CRDTS dental hygiene examination results for initial licensure. Prior to applying, candidates should contact the state board where they wish to seek licensure to confirm and verify exact licensing requirements for that state. Some states may have restrictions, limitations, or additional licensing requirements that have changed since the publication of this manual or what is posted on CRDTS website.

**Candidate Ethical Responsibilities:** Licensure as a dental health professional and the public trust, respect, and status that accompanies it, is both a privilege and a responsibility. Implicit in a state board's charge to protect the public is the responsibility to ensure that practitioners are not only competent, but also ethical. In addition to the American Dental Hygienists' Association's *Code of Ethics*, there are codes of professional conduct within state laws, and the requirements of many state boards for periodic continuing education courses in ethics for maintenance and renewal of licenses.

During the examination process, there are policies, rules and standards of conduct that are part of the candidate's responsibility; the candidate is expected to read the entire Candidate Manual and comply with all the rules and requirements.

**Examiners:** Candidates will be evaluated by examiners from the jurisdictions which comprise CRDTS. These examiners may be members of their state boards or may have been selected by their state boards to serve as examiners. All examiners are trained and calibrated to CRDTS exam criteria prior to each examination. In addition, there may be observers at CRDTS exams such as: faculty members from other schools, new CRDTS' examiners, or examiners from other states. Such observers are authorized to participate in calibration and monitor all portions of the examination; however, they do not assign grades or participate in the grading process.

**Test Development:** In all aspects of test development, administrative protocol, and evaluation methodologies, CRDTS strives to be aligned with and guided by:

- *Standards for Educational and Psychological Testing*, published jointly by the American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education
- *AADB's Guidelines for Clinical Licensure Examinations in Dentistry*
- Annual Statistical Analysis of each section of the exam along with summary statistics of candidate performance by school of graduation
- Statistical profiles for examiners' self-assessment
- Technical Reports by measurement specialists
- Periodic Occupational Analysis

In particular, the dental hygiene examination is developed and revised by the CRDTS Dental Hygiene Examination Review Committee (HERC). HERC is comprised of representatives from CRDTS' Member States, as well as a dental hygiene faculty representative and content expert consultants. With both practitioners and educators involved, the Committee has considerable content expertise from which to

draw. The Committee also relies on practice surveys, current curricula, and standards of competency to assure that the content and protocol of the examination is current and relevant to practice. Determining the examination content is also guided by considerations such as the potential to ensure that a skill can be evaluated reliably.

## **Application Information & Requirements**

CRDTS offers two options for dental hygiene clinical licensure exams: Patient-Based and Simulated Patient (Manikin). These exams require different hardware, software, and materials to be shipped to exam sites. **Due to these restrictions, candidates are required to choose which exam they will take when they register/apply for an exam and will not be allowed to switch to a different exam type at the site.**

Qualified candidates may apply to take the examination by applying online at [www.crdts.org](http://www.crdts.org). Once an application is completed, it is considered a contract with CRDTS. Additional portions of the application can be uploaded online. Detailed information regarding required documents, fees, test sites, and examination dates/deadlines are outlined on the CRDTS website and in this manual. A fully executed application, complete with appropriate documentation and fee is required to take the examination.

Please read the entire application form before submitting any information. Make sure to complete the Release and Hold Harmless Agreement Form online. Be accurate and complete. If directions are not followed, the application may not be accepted.

### **After completing the online application, the following items must be provided:**

#### **Proof of Graduation:**

- **2023 Accredited Graduates** – Candidates who have not yet graduated but are in the final semester of their dental hygiene education, must submit a “Letter of Certification” (a form provided by CRDTS online) signed by their Program Director stating that they will successfully complete a prescribed course of study in a dental hygiene program accredited by the ADA Commission on Dental Accreditation. The “Letter of Certification” serves to verify that the candidate has demonstrated sufficient clinical competence, is in good standing, and is anticipated to have met all school requirements by the time of graduation. For programs with multiple applicants, Program Directors may email one blanket “Letter of Certification” from the Program Director’s college email with a list of all eligible graduates.
- **Pre-2023 Accredited Graduates** – Candidates who have graduated from an accredited dental hygiene program before the present year of testing, must furnish a certified or notarized copy of their diploma or provide a letter on official letterhead from their school of graduation, signed by the Program Director, verifying their name and date of graduation.

**Examination Fee** – The examination fee is 1,025.00 and payment must be submitted on or before the published deadline date. Payment must be for the exact amount and can be paid online via VISA, Mastercard, or by cashier’s check or money order with the applicant’s 10-Digit CRDTS ID number written in the lower left-hand corner. Personal checks are not accepted.

**Testing Site Selection:** While every effort will be made to grant applicants their first choice in testing sites, it is not always possible to do so. Consequently, candidates are asked to enter three testing site choices.

**Social Security Number and CRDTS ID Number:** Candidates must enter their US government-issued social security number when applying online. Candidates without a social security number must contact CRDTS Central Office. The social security number will remain a part of the candidate's secure record. Each candidate will be assigned a 10-digit CRDTS ID number. **The ID number will appear on candidate examination forms and will become the Username for login to the CRDTS website. When logged in, candidates will be able to manage their information and view examination results. The 10-digit CRDTS ID number will link the results to the candidate's permanent record.**

**Photograph:** Candidates must submit a digital photograph that is recent, square, and of passport quality. The photograph may be in black and white or color, JPG/JPEG, GIF, or PNG formats and must have minimal resolution of 200x200 and maximum resolution of 500x500.

**Signature of Candidates:** The candidate will sign the online application electronically. The electronic signature is legally binding and has the full validity and meaning as the applicant's handwritten signature. With the signature the applicant acknowledges that they have read and understand the application and the CRDTS Dental Hygiene Simulated Patient Exam Candidate Manual and agrees to abide by all terms and conditions contained therein.

#### **Other General Application Information and Policies:**

**Professional Liability Insurance:** Insurance in the amount of 1,000,000/3,000,000 is required. The Medical Protective Company of Fort Wayne, IN, in cooperation with CRDTS, will provide complimentary professional liability coverage in the required amount for all candidates taking this examination. No action or payment is required by candidates.

**Application Deadlines:** The application deadline for all exams is approximately 40 days before the date of the examination. Applications and all required documentation must be received by CRDTS Central Office on or before the published deadline date. It should be noted that for both the application and the required documentation, the testing agency uses the 'date of receipt' (not the 'date of postmark') and assumes no responsibility for insufficient postage or delays caused by the post office or other delivery agencies. Applications will be processed on a first-come, first-served basis.

**Application Confirmation:** Candidates will receive an email acknowledging receipt of their application.

**Administrative Fee:** An administrative fee of \$100 is included in the examination fee. This administrative fee is non-refundable and deducted from all returned application fees.

**Incomplete Application:** It is the candidate's responsibility to ensure that all application requirements are met and that all required items are received in CRDTS Central Office on or before the published deadline date. All applications with incorrect or missing information, documentation or fees will be assessed a \$100 fee and held until the missing item(s) and/or fees are received at CRDTS Central Office.

Once an exam site deadline has passed, no additional applications will be processed, and forfeiture of fees may apply.

**Exam Testing Site, Date & Time Confirmation:** Candidates will receive an email approximately 10 days after the deadline date for one of their three testing site choices submitted at the time of application.

The email will include the following information, attachments, and/or links:

- Confirmation of the assigned exam site, exam date, exam time and one or two digit candidate number.
- A letter from the school serving as a testing site, providing general information about their facilities, policies and “Testing Site Fee”, with a deadline for payment. All testing sites charge a site fee for use of their clinic facilities, supplies, disposables, renting of power scalers etc. Testing sites set their own fee and deadline for advance payment. The “Testing Site Fee” must be remitted to the school, not to CRDTS. The site letter may also include additional information regarding nearby hotels and other information and/or forms which are required by the testing site.

Candidates taking the examination at a school other than their own are encouraged to visit the site prior to the time of the examination. It is the responsibility of the candidate to plan with the school for the provision of equipment if required (i.e., power scalers, adaptors) and to ascertain whether the appropriate equipment is available.

**Exam Assignment & Schedule Changes:** Examination assignments (day and time of testing) are considered final when issued and emailed to the candidate. School personnel do not have the authority to accept a candidate for examination at their site or to make assignment changes. Such arrangements made between school personnel and the candidate may preclude the candidate from being admitted to the examination, as well as forfeiture of fee. If unusual circumstances warrant a schedule change, the CRDTS Coordinator is the only authorized individual who may consider/authorize approval for such a request.

**Disqualification:** After applying, a candidate may be disqualified to sit for the exam by their Program Director (or designated school official) for any reason within their discretion. Notification of disqualification by the Program Director must be sent to and received at CRDTS Central Office in writing, via email, prior to the start date of the candidate’s scheduled examination.

Depending on timing of the notice, CRDTS refund policy will apply. Candidates who are disqualified shall have access to the examination upon graduation and presentation of diploma or in a subsequent academic year in which the Program Director (or designated school official) has appropriately certified the candidate. A new application must be submitted with all required documentation and appropriate fee.

**Fee Deferral:** Under extenuating circumstances the examination fee may be deferred to a later examination. Requests will be considered on an individual basis when received before the candidate’s scheduled exam start date. Requests must be made in writing via email to CRDTS and must include

original documentation in support of the request. Notification will be sent immediately after a determination is made. Should a fee deferral be granted, the terms and conditions for the future examination will be included. Requests for fee deferral on or after the date of the scheduled examination will not be considered.

**Fee Refunds:** Notification of cancellation must be made in writing via email and submitted to the CRDTS Central Office. A refund (administrative fee deducted) will be made if notification is submitted at least 30 days prior to the candidate's scheduled exam start date. A 50% refund (administrative fee deducted) will be made if notification is submitted at least six business days prior to the candidate's scheduled exam start date. After that time, any cancellations will result in forfeiture of the entire examination fee. In addition, failure to appear for the exam will result in a forfeiture of the entire examination fee. This policy applies to all cancellations, regardless of reason.

## **Reporting of Scores**

**Passing Score:** As the testing agency responsible for administering the examination, CRDTS has provided information to state boards that a score of 75 or more on the examination may represent an acceptable demonstration of competence to practice dental hygiene. However, each state board is responsible for determining whether a candidate has fulfilled its standards and requirements for licensure. The state boards' determinations are controlled by state law; the requirements may not be uniform. Each licensing jurisdiction may use the examination results to the extent authorized by its statutes.

**Release of Scores to Candidates:** Scores will be released to candidates online (via their private CRDTS profile) after each testing group. To access scores online, candidates must login to their personal profile using their assigned 10-digit CRDTS ID number and candidate- created password. The Candidates' tab will allow access to scores. In addition, CRDTS will mail candidates two certified copies of their final examination results in sealed envelopes approximately 3-4 weeks after their examination. Candidates should mail the first sealed, certified copy directly to the licensing state of their choice. **DO NOT OPEN** the second sealed envelope. Keep the second sealed envelope for future use (i.e., in case it is needed for an additional state board). For security and confidentiality reasons, no official scores can be released by telephone or email.

**Release of Scores to State Boards:** A Master Grade Report, listing all scores, will be automatically distributed to all CRDTS' member state boards, as well as those non-member states which recognize CRDTS' results and have requested routine receipt of examination results. Each state board has its own requirements regarding proof of testing to grant licensure. For state boards that do not accept the CRDTS Master Grade Report or the official results letter with watermark as proof of testing, candidates can request a score report to be sent to a state board by submitting an online "Score Request" (See Duplicate Score Request Instructions).

**Release of Scores to Dental Hygiene Schools:** Scores will be reported to the dental hygiene school of graduation if the candidate is a current graduate.

**Duplicate Score Request:** Scores will be sent upon receipt of a request made online via the CRDTS website. The “Score Request” link can be found on the CRDTS homepage. Such requests must include the following:

- Candidate’s name, mailing address and telephone number
- Candidate’s name at the time of examination
- Year in which the CRDTS clinical examination was completed
- Address to where the results are to be sent
- \$50 for up to three score reports

If the candidate wishes to have the Candidate Manual sent along with the scores to provide an explanation of scores, an additional \$25 will be assessed. There is an additional fee of \$4 to have the scores notarized. A credit card must be used when requesting a Score Report online.

### **Petition for Review/Complaint Review Process**

CRDTS maintains a complaint review process whereby a candidate may request a review of documentation, concerns, or protocols affecting their individual examination results. This is a formalized process conducted by a special committee whose charge is to review the facts to determine if the examiners’ findings substantiate the results. Any request for such a review must be submitted in writing (filed and received) to the Administrative Office of CRDTS no later than 14 days following the official date on which the scores were released to the candidate or the candidate’s dental hygiene school. The Committee is required to complete its review within 60 days from the time of receiving a formal request; during that time, the candidate may apply for reexamination. If the candidate files a formal complaint, then retests and passes the examination before the complaint has been fully processed, the complaint review will be terminated. Forms to submit a formal complaint may be obtained from CRDTS Central Office or from the CRDTS website (Complaint Review). Documentation for the complaint must be submitted on this form.

In determining whether to file a petition, the candidate should be advised that all reviews are based on a reassessment of documentation of the candidate’s performance on the examination. The review does not include a regrading of their performance; it is limited to a determination of whether there exists substantial evidence to support the judgment of the examiners at the time of the examination. The review will not take into consideration other documentation that is not part of the examination process, such as: post-treatment photographs, models, character references or testimonials, dental hygiene school grades, faculty recommendations or the opinions of other “experts” solicited by the candidate. In addition, the review will be limited to consideration of the results of only one examination at a specific test site. If a candidate has completed more than one CRDTS examination, the results of two or more examinations cannot be selectively combined to achieve an acceptable final score.

Candidates who contact CRDTS Central Office regarding their examination results, must clearly indicate whether they simply wish to express a concern relating to the examination or are interested in initiating a formal petition for review. A non-refundable \$250 filing fee will be charged by CRDTS to file and process a formal review petition.

## **Policy for Reexamination and Remediation**

Candidates who are unsuccessful can retest on-site (see **Policy for On-site Retakes** to review eligibility criteria) or retest at a future exam site.

Candidates who are unsuccessful and retest at a future exam site must submit a new application and pay the examination fee of \$1025.00. Candidates who are retaking the examination at a future exam site must fulfill current examination requirements.

All portions of the unsuccessful examination must be retaken, not just the procedures with the deficient performance. The candidate applying for reexamination at a future exam site must provide documentation that all school requirements have been completed and the candidate has graduated.

It is the responsibility of each state or licensing jurisdiction to enforce its own remediation policy. There is no state which requires remediation after only one unsuccessful attempt. However, some states require remediation after two unsuccessful attempts. Any candidate intending to seek licensure in one of the states that accepts the results of the CRDTS examination should check with the appropriate state board regarding its remediation and reexamination requirements.

After three unsuccessful attempts, CRDTS requires that the candidate submit documentation from a state which accepts the results of the CRDTS examination, verifying that the candidate has completed remediation requirements for that state and that the state will accept the results of the candidate's reexamination with CRDTS.

## **Policy for On-Site Retakes**

All candidates who are unsuccessful with their **first ever** CRDTS dental hygiene exam attempt will be eligible for the complimentary on-site retake option, except for candidates who are unsuccessful for the following reasons:

- Unprofessional conduct
- Critical tissue trauma

### **More Information Regarding On-Site Retakes:**

- Scores will be available to candidates after each testing group.
- Candidates will need to have access to the internet (i.e., cell phone or computer) and the CRDTS Website to access their score.
- Candidates will need to login to their private CRDTS profile using their 10-digit CRDTS ID number and password to access their score.
- Unsuccessful candidates will receive an online critique listing the reason(s) for being unsuccessful.
- An additional testing group will be available to accommodate eligible candidates who wish to take advantage of the on-site retake option.
- Candidates will be informed of the exact day/date of the on-site retake group for the exam in their initial exam assignment confirmation email.
- The timing of the on-site retake group will follow a similar time schedule as published in this manual.

- Candidates must notify the CRDTS Coordinator of their intent to retake within an hour after scores are released for their initial attempt testing group.
- There is NO fee or payment required for on-site retakes.  
**Note:** Candidates who do not take advantage of the complimentary retake on their **first ever attempt** at their initial testing site must pay the full exam fee of \$1025.00 at a future exam site.
- No additional documentation from the candidate is needed for on-site retakes, as the initial application and letter of certification submitted by program directors/school officials will suffice.

**Note:** All exam attempts (e.g., initial, on-site retake, and future retakes) are reported to state boards and may affect the state’s reexamination remediation requirements. Candidates should carefully consider whether the on-site option is in their best interest.

### **Policy for Testing of Candidates with Disabilities**

Any candidate with a documented physical and/or learning disability that impairs sensory, physical, or speaking skills which require a reasonable deviation from the normal administration of the examination may be accommodated. All reasonable efforts will be used to administer the examination in a place and manner accessible to persons with disabilities or an attempt will be made to offer alternative accessible arrangements for such individuals. Efforts will be made to ensure that the examination results accurately reflect the individual’s impaired sensory, physical, or speaking skills, except where those skills are factors the examination purports to measure. Also, attempts will be made to provide appropriate auxiliary aids for such persons with impaired sensory, physical, or speaking skills unless providing such auxiliary aids would fundamentally alter the measurement of the skills or knowledge the examination is intended to evaluate or would result in undue burden.

Candidates seeking modifications or auxiliary aid, must note their request on the CRDTS online application, under “Additional Considerations.” This allows CRDTS to ensure that an auxiliary aid or other requested modification exists and can be provided. Please note the following:

- Requests received after the registration deadline or retroactive requests will not be considered.
- Documentation of the need for the auxiliary aid or modification must be provided. If the candidate is a student in an accredited school, a letter from a school official fulfills this requirement. Otherwise, a letter from the appropriate health care professional is required.
- The candidate must make known in their request, the exact auxiliary aids or modifications required and indicate the exact portion(s) of the examination for which such auxiliary aid or modification will be needed.

In providing such auxiliary aids or modifications, the testing agency reserves the ultimate discretion to choose between effective auxiliary aids or modifications and reserves the right to maintain the security of the examination.

All information obtained regarding any physical and/or learning disability of a candidate will be kept confidential with the following exceptions:

- Authorized individuals administering the examination will be informed regarding any auxiliary aid or modification.
- First aid and safety personnel at the test site may be informed if the disability may require emergency treatment.

### Online Candidate Orientation – Q&A’s

Candidates are advised to view the Online Candidate Orientation available on the CRDTS website PRIOR to their examination and submit questions in advance via email to CRDTS Central Office at [info@CRDTS.org](mailto:info@CRDTS.org). There will be a brief on-site Q&A session prior to each testing group, however, this is not a replacement for viewing the Online Candidate Orientation.

### Dental Hygiene Examination Content and Scoring Overview

The dental hygiene examination is based on clinical simulated patient treatment, with an evaluation of specific clinical skills, as well as the candidate’s compliance with professional standards during treatment. The simulation experience includes similar criteria and processes as the patient-based exam with the manikin being treated as a “live” patient. Proper simulated patient and operator positioning must always be maintained.

Following, is a summary of the specific content and scoring associated with the examination:

Clinical Skill	Scorable Items x	Points Scored Per Item =	Max Points
Extra/Intra Oral Assessment OSCE	16	1	16
Calculus Detection	12	1	12
Scaling/Subgingival Calculus Removal	12	5	60
Periodontal Probing	12	1	12
<b>TOTAL EXAM POINTS/MAX SCORE</b>			<b>100</b>

**Examination Scoring System:** The dental hygiene simulated patient examination is administered in two parts; the written Extra/Intra Oral Assessment Objective Structured Clinical Examination (OSCE) and the clinical skills examination performed on a typodont/manikin. Both parts of the examination will be reported as one comprehensive total score as shown above. CRDTS utilizes a criterion-based grading system to differentiate between acceptable and unacceptable performance. Criteria have been established for each clinical procedure. Three examiners independently evaluate all treatment and apply the criteria in assessing performance. For every scorable item that is confirmed as an error by at least two independent examiners, points will be deducted from the 100 possible points.

**Examination Timing:** Candidates will have fifteen (15) minutes to complete the written Oral Assessment OSCE section of the exam and two (2) hours to complete the calculus detection, scaling/subgingival calculus removal and periodontal probing sections of the exam.

**Penalty Point Deductions:** Penalty points for unacceptable treatment selections and Treatment Standards categories will be computed into the score. If a candidate is assessed any penalty points, they will be notified during the exam, via written communication (Instructions to the Candidate Form and/or Treatment Standards Form) from the Dental Hygiene Coordinator.

**Treatment Standards:** Penalty points are assessed for violation of exam standards as defined for:

- Professional Demeanor -2 Points
- Infection Control/Asepsis/PPE Violations -2 Points
- Tissue Trauma (1-2 errors are assessed individually) -5 Points
  - 3 or more errors constitutes a Critical Error -100 Points
- Time Penalty 1-15 minutes late -10 Points
- Time Penalty 16 or more minutes late DISMISSAL FROM EXAM
- Unprofessional Conduct DISMISSAL FROM EXAM

**Critical Errors:** Critical errors result in a non-passing score of the Dental Hygiene Examination, even though other rated treatment criteria are acceptable.

## Professional Conduct

**Dishonesty Clause:** Candidates who are unsuccessful due to dishonesty, shall be denied reexamination for one full year from the time of the infraction. Additionally, all state boards will be notified of the situation. Some states consider candidates who do not pass for dishonesty, permanently ineligible for licensure. Therefore, candidates should address these matters with the state(s) where they desire licensure prior to retaking the examination.

As a participant in an examination to assess professional competency, each candidate is expected to maintain professional standards. The candidate's conduct and treatment standards will be observed during the examination and inability to maintain appropriate conduct and/or standards may result in point penalties and/or dismissal from the exam.

Each candidate is expected to conduct themselves in an ethical, professional manner and always maintain a professional appearance. Candidates are prohibited from using any study or reference materials during the examination, other than what is provided by CRDTS. Any substantiated evidence of dishonesty, such as: collusion, use of unauthorized assistance, or intentional misrepresentation during registration, pre-examination or during the examination shall automatically result in dismissal from the exam and no points awarded. In addition, the candidate will forfeit all examination fees for the current examination.

Examples of unprofessional conduct that would result in dismissal/no points awarded:

- Falsification or intentional misrepresentation of application requirements
- Cheating
- Misappropriation or thievery of equipment during the examination
- Alteration of examination records
- Using unauthorized equipment at any time during the examination process

- Performing required examination procedures outside of the allotted examination time
- Receiving assistance from another practitioner including, but not limited to; another candidate, dental hygienist, dentist, faculty, university/college representative(s) etc.
- Unprofessional, rude, abusive, uncooperative, or disruptive behavior to other candidates and/or exam personnel
- Noncompliance with anonymity requirements
- Noncompliance with established guidelines for asepsis and/or infection control
- Unauthorized use of cell phones/electronic equipment, or the taking of photographs/videos in clinic areas by the candidate during any part of the examination

### Exam Time Schedule Overview

Examinations will be conducted over the course of several days with separate groups assigned to each day. Candidates will be informed of their examination date and group assignment in advance of the examination and need only report to the school on this date and time. Each exam will have a unique schedule depending on the number of candidates and groups assigned.

EXAMPLE OF A GROUP ASSIGNED TO APPEAR AT 6:30 am	Approximate (~) Times
Candidate Arrives, Shows ID, Receives Exam Materials	6:30 am
Brief Orientation and Review of Exam Process	6:45 am
Oral Assessment OSCE (15 minutes)	7:00 am
Set-up Cubicle for Simulated Patient Exam	7:15 am
Simulated Patient Exam: All Candidates Assigned Start Time	7:30 am
All Candidates Assigned Finish Time (2 hours)	9:30 am
Candidate Turns in Exam Materials and Leaves Testing Site	9:45 am

### General Directives and Information *(listed in alphabetical order)*

**Anonymity:** The anonymous testing procedures for the examination shall exclude the possibility that any person who is involved with the grading of the examination may know, learn of, or establish the identity of a candidate. The candidate’s name and school information should not appear on any examination forms. CRDTS examiners will be physically isolated from the candidates in a separate grading area. All examination forms and materials are identified by the candidate’s one or two-digit Candidate Number, which is assigned prior to the examination.

**Approved Communication:** All approved communication must be in English.

**Attire:** Candidates must wear CDC and OSHA mandated clinical attire. No uncovered arms, legs, or open-toed shoes are allowed in the clinic area. Lab coats and/or long-sleeved protective garments are all acceptable with no restriction on color and style.

**Authorized Photography:** At some select test sites, photographs may be taken randomly during the examination by an authorized photographer retained by CRDTS. The purpose is to capture a broad

representation of actual procedures which can be used for examiner calibration exercises. The photographs will not include identification of candidates.

**Electronic Equipment:** There will be no unauthorized use of cellular phones or any electronic equipment or the taking of photographs in clinic areas by candidates during any part of the examination.

**Equipment Malfunction:** In case of equipment malfunction, the Dental Hygiene Coordinator must be notified immediately, so the issue may be corrected.

**Equipment (Use/Misappropriation/Damage):** No equipment, instruments, or materials may be removed from the examination site without written permission of the owner. Non-payment of site fees for rental of space or equipment will be treated as misappropriation of equipment.

**Evaluation:** Each candidate's performance will be evaluated by 3 independent examiners. Candidates are not assigned specific examiners; the first available examiners will evaluate all procedures.

**Examination Materials:** CRDTS examination materials distributed by the testing agency may NOT be removed from the exam site, nor may unauthorized personnel review the forms. All required forms and records must be turned in to the Dental Hygiene Coordinator's Desk before the examination is considered complete.

**Extraneous Study Materials:** Candidates are encouraged to bring a printed copy of the Candidate Manual with them to the exam and keep it in their cubicle for easy reference. No textbooks or other study materials are permitted in the candidate's cubicle.

**Failure to Follow Directions:** Failure to follow directions and instructions from CRDTS personnel will be considered unprofessional conduct. Unprofessional conduct and improper behavior are cause for dismissal from the examination with a non-passing score.

**Goggles or Face Shield:** Candidates must wear goggles or a face shield during the clinical portion of the examination. Safety glasses are not a substitute for goggles. If a candidate chooses to wear goggles, per the CDC, they must fit the face immediately surrounding the eyes and form a protective seal around the eyes. If a candidate chooses to wear a face shield, loupes and/or prescription glasses may be worn under the face shield.

**Identification Picture Badge:** Prior to the examination, the Dental Hygiene Coordinator will verify the candidate's valid driver's license/photo ID with the CRDTS issued candidate ID picture badge.

**Infection Control Standards:** During all simulated patient procedures, the candidate must follow the most current recommended infection control guidelines as published by the CDC and OSHA (to include the use of High-Volume Evacuation whenever aerosols are generated) and must be consistent with the policies of the testing site. In addition, the operatory must remain clean and orderly in appearance.

**Instruments:** Candidates will provide and use their own instruments for use during the exam. The instruments do NOT need to be sterile but must be clean and stored in a container for safe transport to and from the exam. Candidates should be familiar with using a periodontal probe with 1,2,3,4,5,6,7,8,9,10mm markings (e.g., UNC-12) and an 11/12 explorer, since these are the instruments

the examiners will utilize to evaluate each candidate's performance. Examiners will use CRDTS provided instruments to complete their evaluations.

**New Technology:** New and innovative technologies are constantly being developed and marketed in dentistry. Until such time that these innovations become the standard of care and are readily available to all candidates at all testing sites, the use of such innovative technologies will not be allowed during the examination, unless expressly written as allowed elsewhere in this manual.

**Power Scalers:** Candidates must supply their own power scaling units and are responsible for confirming connections are compatible with testing site equipment. Connection information will be included in the Testing Site Letter which will be attached to the candidate's exam confirmation email. Arrangements for rental of power scaling units may be made through the testing site.

**Simulated Patient/Operator Positioning:** The correct simulated patient/operator position intended to preserve the candidate's optimal working posture must be maintained during the examination and will be observed by the Dental Hygiene Coordinator.

**Test Site Fees:** All testing sites (schools) charge a fee for use of clinical facilities, equipment, supplies and disposables. This fee is independent of CRDTS examination fee and is not collected by the testing agency. Testing site fees vary from school to school. Specific information regarding site fees will be included in the candidate's application email confirmation.

**Tissue Management:** There shall be no unwarranted damage caused by the candidate to the simulated soft tissues (typodont and/or oral cavity cover/shroud). Damage/trauma that is inconsistent with the procedures performed and/or careless management of simulated soft tissues, will result in a reduction of points and/or a non-passing score.

**Tooth Identification:** The tooth numbering system 1-32 will be used for the examination. In this system, the maxillary right third molar is number 1 and the mandibular left third molar is number 17.

**Visitors/Unauthorized Personnel:** Only authorized personnel will be allowed in the examining and clinic areas. Visitors are not allowed.

## **Performance Requirements**

### **Extra/Intra Oral Assessment Written OSCE**

A simulated patient extra/intra oral assessment written OSCE will be presented to candidates via CRDTS tablet. Candidates will have fifteen (15) minutes to view and answer sixteen (16) multiple choice questions. Candidates will be required to sign and uphold the Candidate Statement of Understanding about CRDTS Oral Assessment OSCE Security Measures. This form is located at the back of this manual for candidates to read prior to their examination. An official form is included with the exam materials and is required to be signed and submitted on the day of the examination.

The purpose of this part of the examination is to evaluate the level of a candidate's competency in identifying gross head and neck anatomy, variations of normal anatomy, palpation techniques used to

examine the head and neck extra and intraoral structures, and atypical or abnormal findings, whether pathologic or non-pathologic. The OSCE mirrors the Patient-Based Extra/Intra Oral Assessment Evaluation.

In addition to the above, the following categories provide a guide for items to study and with which to be familiar:

EXTRAORAL	SIGNIFICANT FINDINGS
Head, Face, and Neck Lymph Nodes, TMJ	Asymmetry, Infected Piercings, Swellings, Lesions Description of Location, Restricted Opening
INTRAORAL	SIGNIFICANT FINDINGS
Oral Mucosa/Lips and Supporting Structures	Lesions, Chemical/Physical Irritations, Tattoos, Swellings, Hematomas, Nodules
Alveolar Ridge	Lesions, Chemical/Physical Irritations, Exostosis, Torus/Tori, Tattoos, Swellings, Hematomas, Nodules
Palate and Oral Pharynx (tonsils and tonsillar pillars)	Torus, Lesions, Chemical/Physical Irritation, Other Significant Findings
Tongue	Hairy Tongue, Fissured Tongue, Loss of Papilla, Geographic Tongue, Glossitis, Nodules, Lesions
Floor of the Mouth	Ankyloglossia, Hematomas, Lesions, Tattoos, Other Significant Findings

### Periodontal Measurements Performance Criteria

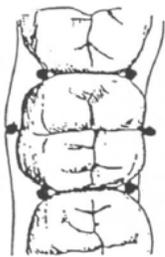
The candidate will complete the periodontal measurements on two randomly assigned teeth chosen from the candidate's Treatment Selection quadrant. The candidate must accurately chart within +/- 1mm the depth of the simulated gingival sulcus/pocket depths to the nearest mm on 6 aspects of the 2 assigned teeth. Candidates are instructed to place the probe at 6 defined aspects of the teeth: MF, F-midpoint, DF, ML, L-midpoint, DL. Candidates record their findings on the Progress Form, making sure every shaded box has a measurement recorded.

<b>Periodontal Measurements:</b> COORDINATOR assigns 2 TEETH for Probing Depths:	#	mm	#	mm
<b>Candidates:</b> Measure and record the depth of each sulcus on six aspects for the two assigned teeth  <b>Note measurements in the shaded boxes ONLY</b>  <b>ANY BOX LEFT BLANK WILL BE RECORDED AS AN ERROR</b>	DF		DF	
	F		F	
	MF		MF	
	DL		DL	
	L		L	
	ML		ML	

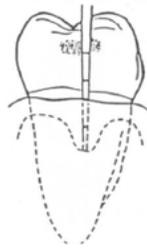
**Candidate Instructions for Periodontal Measurements**

- Periodontal measurements should be recorded AFTER scaling.
- Direct facial and direct lingual readings should be at the MIDPOINT of the tooth with the probe positioned parallel to the root surface and the long axis of the tooth.
- Interproximally, the probe should be positioned with the shank against the contact point and the tip angled slightly into the col, so it is directly beneath the contact area.
- If a tooth is not in contact, the probe should be placed at the midpoint of the proximal surface and the same measurement recorded for both facial and lingual aspects.
- Using light pressure, the tip of the probe should be positioned to the depth of the sulcus.

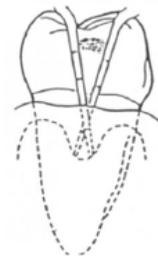
The illustrations that follow depict the proper placement of the probe, from both the occlusal and interproximal perspectives:



**Probe Positions from Occlusal**



**Probing When No Contact**



**Interproximal Angulation**

**Calculus Detection**

**Calculus Detection:** COORDINATOR assigns 12 SURFACES from maxillary quadrants.

2M	2L	4D	5F	6D	8M	10L	12M	13D	14L	14D	15M
Y	Y	N	N	Y	N	N	Y	Y	Y	N	Y

**Candidates:** Explore assigned surfaces as listed above and indicate the presence of subgingival calculus by recording a **Y** (yes, present) or **N** (no, not present) in the shaded boxes.

**Performance Criteria for Calculus Detection**

- The candidate will randomly be assigned 12 surfaces to explore on the maxillary arch.
- The candidate must accurately indicate by recording the presence (“Y”/Yes) or absence (“N”/No) of calculus on each of the 12 assigned surfaces.
- The maxillary arch is for calculus detection ONLY, not scaling.

**Candidate Instructions for Calculus Detection**

- Prior to completing the calculus detection exercise, explore several (~ 1-3 teeth) circumferentially to become familiar with the anatomy of the tooth (i.e., root surface, CEJ).
- Deposits detected on a line angle should be marked on the closest interproximal surface.

## **Scaling/Subgingival Calculus Removal**

### **Performance Criteria for Scaling/Subgingival Calculus Removal**

- When completing the initial online application, the candidate will select either the right or left mandibular quadrant to scale.
- Twelve (12) surfaces will be evaluated by examiners in the quadrant selected for treatment.
- Since the candidate does not know which 12 surfaces will be selected for evaluation, the candidate is expected to scale all surfaces of all teeth in the selected quadrant.
- The candidate must effectively remove subgingival calculus so that no deposits are detectable with an 11/12 explorer. The presence of subgingival calculus constitutes a scaling error.
- Supragingival deposit/stain removal is not a part of this examination, so rubber cup polishing is not needed or required.

## **Tissue Management**

### **Performance Criteria for Tissue Management**

- All simulated soft tissues will be evaluated, to include the extraoral cavity cover/shroud (to be assessed by the Coordinator at the beginning and conclusion of each exam group) and intraoral gingiva.
- The candidate must effectively utilize power scalers and hand instruments so that no unwarranted simulated soft tissue trauma (i.e., abrasions, lacerations, or ultrasonic burns) occurs as a result of the treatment procedures.
- Acceptable performance will have been demonstrated if 100% of all simulated soft tissues are well managed and exhibit no unusual mechanical damage.
- Tissue trauma errors are assessed individually if there are two or less (-5 Points per incidence).

### **Critical Tissue Trauma Error**

Critical tissue trauma is defined as: unwarranted iatrogenic damage to extra/intraoral simulated soft tissues which would result in significant injury, given the manikin were actually a “live” patient.

**A simulated soft tissue trauma critical error resulting in an unsuccessful score of the Dental Hygiene Examination, will be assessed if any of the following exists:**

- Damage to 3 or more areas of simulated gingival tissue and/or shroud.
- Unwarranted damage to simulated soft tissue caused by cures or ultrasonics.
- An amputated papilla of the simulated tissue.
- A laceration or damage that requires suturing or perio packing (simulating the Patient-Based Exam).
- An unreported broken instrument tip found in the typodont sulcus.

## Checklist of Required Exam Materials

**On the Day of the Exam, please bring the following required materials with you:**

- Picture ID for admission to the examination
- This Candidate Manual (optional, but encouraged)
- Watch (non-smart) or small clock to synchronize with Official CRDTS Exam Clock
- Pen – BLUE INK IS PREFERRED
- Operator Goggles or Face Shield
- Power Scaler (if not provided or available to rent at the exam site)
- Dental Hygiene Scaling Instruments of choice (instruments do NOT need to be sterile, but must be clean and stored in a safe container for transporting to and from the exam site)

## References

1. ADHA Standards for Clinical Dental Hygiene Practice: *ADHA Supplement to Access; June 2016.*
2. Daniel, Harfst & Wilder Dental Hygiene Concepts, Cases and Competencies: Mosby, 2008.
3. Bowen & Pieren Darby & Walsh Dental Hygiene Theory and Practice 5<sup>th</sup> Edition: Elsevier, 2020.
4. Glickman Index of Horizontal Furcation Classifications.
5. Malamed, SF Medical Emergencies in the Dental Office 7<sup>th</sup> Edition: Elsevier, 2015.
6. Wilkins, EM Clinical Practice of the Dental Hygienist 13<sup>th</sup> Edition: Lippincott, Williams & Wilkins 2021.



## Candidate Statement of Understanding with regard to CRDTS Oral Assessment Exam Security Measures

1. The Central Regional Dental Testing Service (CRDTS) simulated patient Oral Assessment Examination is highly confidential. The examination questions are the property of CRDTS. Unauthorized disclosure of examination questions is prohibited under copyright laws. By signing this statement of understanding, you agree to maintain the confidentiality of the CRDTS simulated patient Oral Assessment Examination.
2. You must therefore:
  - Keep the exam content confidential for a period for at least five (5) years as discussed below.
  - You will not give, receive or obtain any form of unauthorized assistance prior to or during the examination.
  - You will not disclose (in whole or in part) any examination questions or answers to anyone before, during or after the examination, whether orally, in writing, on Internet chat rooms, blogs or otherwise.
  - You will not reproduce or attempt to reproduce examination materials through memorization, recording or other means.
  - You will not provide information relating to examination content that may provide unfair advantage to other candidates.
  - You will not use or participate in the electronic posting of information regarding examination content or answers.
  - You will not discuss exam cases, content, questions or answer options with anyone (ie: family, friends, fellow colleagues, classmates, school faculty, etc.) who took the exam before you, with you or those who have not yet taken the exam.
  - You may not use or be in possession of any unauthorized electronic devices (such as cell phones, cameras, etc.) during the exam.
3. With regard to the CRDTS simulated-patient Oral Assessment exam, candidates agree to abide by all rules, as well as oral and written instructions controlling the conduct of the examination. These rules are intended to preserve the integrity of the examination process by providing standard test administration conditions that yield valid and reliable results.
4. Candidates will be observed at all times while they are taking the CRDTS simulated-patient Oral Assessment Examination. This observation will include direct observation by proctors. Proctors may not necessarily inform you of their observations, but they are required to report behavior that may violate the terms and rules of the exam or other forms of irregular behavior.

5. Any cheating and/or breach of confidentiality/security or any attempt to subvert the examination process by any candidate violates the purpose and principles of the examination and is grounds for immediate dismissal from the examination.
6. Any candidate who witnesses or has knowledge of known exam security breaches must report it to the Proctor and/or CRDTS personnel as soon as possible. Morally and ethically, reporting known exam breaches allows CRDTS personnel the opportunity to investigate and take appropriate action.
7. CRDTS strives to report results that accurately reflect the skill and performance of each candidate and represent a valid measure of their knowledge or competence as sampled by the examination.
8. Accordingly, our standards and procedures for administering examinations have two related goals: giving candidates comparable opportunities to demonstrate their abilities, and preventing any of them from gaining an unfair advantage over others. To promote these objectives, CRDTS reserves the right to cancel or withhold any examination results when, in the sole opinion of CRDTS, a testing irregularity occurred; cheating has occurred; there is an apparent discrepancy in, or falsification of, a candidate's identification; a candidate engages in misconduct or plagiarism; when aberrancies in performance are detected for which there is no reasonable and satisfactory explanation; or the results are believed to be invalid for any other reason.
9. Conduct occurring before, during or after testing that violates these principles may result in invalidation of examination results and/or other penalties such as the revocation of exam scores which will be reported to State Dental Licensing Boards.
10. Any unauthorized disclosure of the examination's content could also result in civil liability and criminal penalties.
11. Candidates proven to violate examination security rules will have their exam scores voided and denied access to retesting for two years.

I have read, understand and agree to abide by the above statement.

Candidate Name

(Please Print): \_\_\_\_\_

Candidate Number: \_\_\_\_\_

Candidate Signature: \_\_\_\_\_

Date: \_\_\_\_\_



Central Regional Dental Testing Service, Inc.  
1725 SW Gage Blvd.  
Topeka, KS 66604-3333  
[www.crdts.org](http://www.crdts.org)

Ph: 785-273-0380  
FX: 785-273-5015  
[info@crdts.org](mailto:info@crdts.org)

---

## **CRDTS Dental Hygiene Simulated Patient (Manikin) Examination Release and Hold Harmless Agreement**

**At the end of your online application, you will be asked to check a box stating you have READ and AGREE to the following:**

I do hereby acknowledge that I have been informed of the potential licensure limitations related to the CRDTS Dental Hygiene Simulated Patient (Manikin) Examination. I acknowledge that the examination results I receive will potentially only be eligible for licensure in the state the examination is given. I further acknowledge that limited portability potentially exists for these examination results and that not all State Boards of Dentistry will accept these examination results for licensure. Therefore, to be licensed in those states I will potentially be required to take a different examination and incur additional costs related to any addition examinations.

Being thus informed, I voluntarily and freely elect to take the CRDTS Dental Hygiene Simulated Patient (Manikin) Examination. Furthermore, I hereby agree to release from liability and hold CRDTS its managers, officers, directors, employees, agents, affiliates, and successors harmless for any and all losses, damages, liabilities, deficiencies, claims, actions, judgments, settlements, interest, awards, penalties, fines, costs, or expenses of whatever kind, including but not limited to costs for retesting, costs of applications for state licensure, lost income, missed opportunities, professional fees, and attorney's fees that are incurred as a result of the possible limited portability of the CRDTS Dental Hygiene Simulated Patient (Manikin) Examination.

# CRDTS

## DENTAL HYGIENE SIMULATED PATIENT EXAMINATION PROGRESS FORM

**STARTING TIME:** \_\_\_\_\_ **FINISH TIME:** \_\_\_\_\_

*CRDTS will provide the candidate a pre-assembled typodont and oral cavity cover. Candidates should CONFIRM the label on their typodont matches their Candidate ID#. When instructed to do so, candidates will begin operatory set-up. The exam start and finish time will be announced after all candidates have completed their operatory set-up. When finished, candidates should notify the Coordinator who will help with dismantling the candidate's typodont.*

### DENTAL HYGIENE TREATMENT ASSIGNMENTS

**\*\*NON-SHADED TO BE COMPLETED BY EXAMINERS\*\* SHADED TO BE COMPLETED BY CANDIDATES\*\***

**CANDIDATE:** Please CIRCLE your selected Scaling Quadrant:    **Mandibular Right**    **Mandibular Left**

**CRDTS COORDINATOR:**

**Periodontal Measurements:**

**COORDINATOR assigns 2 TEETH for Probing Depths:**

	mm		mm
DF		DF	
F		F	
MF		MF	
DL		DL	
L		L	
ML		ML	

**Candidates:** Measure and record the depth of each sulcus on six aspects for the two assigned teeth

**Note measurements in the shaded boxes ONLY**

**ANY BOX LEFT BLANK WILL BE RECORDED AS AN ERROR**

**Calculus Detection:** COORDINATOR assigns 12 SURFACES from maxillary quadrants.


**Candidates:** Explore assigned surfaces as listed above and indicate the presence of subgingival calculus by recording a **Y** (yes, present) or **N** (no, not present) in the shaded boxes.

CRDTS Coordinator Initials

**TYPODONT MOUNTING APPROVED**  
Correct Candidate ID# & Facial Shroud Mounted

CRDTS Coordinator Initials

**COORDINATOR AUTHORIZES DISMANTLING TYPODONT**  
Coordinator Receives Typodont for Evaluation  
Coordinator Collects Progress Form

Examiner#1	Examiner #2	Examiner #3

**FINAL EVALUATION DENTAL HYGIENE PROCEDURES**

**GENERAL INFORMATION:** ALL QUESTIONS SHOULD BE DIRECTED TO THE CRDTS HYGIENE COORDINATOR.

**BEGINNING THE EXAMINATION:**

- Check-In (proper ID required) with the CRDTS Hygiene Coordinator and pick-up your Examination Materials.
- Prepare to take Oral Assessment Exam.
- After Oral Assessment portion of exam, prepare/set-up your cubicle.
- Once all candidates are set-up and ready to begin, the Coordinator will announce the start of the exam.

**TREATMENT:**

- **Extra/Intra Oral Assessment OSCE:** Candidates will answer questions related to Extra/Intra Oral Assessment OSCE for this section of the examination.
- **Calculus Detection:** On the Progress Form, candidates should record a Y or N to indicate the presence (Y) or absence (N) of calculus on the 12 assigned surfaces in the maxillary arch.
- **Periodontal Probing:** On the Progress Form, candidates should record the pocket depths (to include six sulcular measurements to the nearest millimeter) for each of the 2 assigned probing teeth.
- **Calculus Removal:** Candidates are expected to remove all calculus from ALL surfaces of ALL teeth listed in their assigned mandibular quadrant.

**FINISHING THE EXAMINATION:**

When done with treatment:

- Notify the Coordinator who will initial your Progress Form, collect your typodont, Progress Form and ID badge.
- Clean and set-up the cubicle for the next candidate.
- Complete your candidate Feedback Form and place in the envelope provided at Coordinator's Desk.
- Check out with the site coordinator (if required).