



REVIEW OF THE WESTERN REGIONAL EXAMINING BOARD
(WREB) DENTAL EXAM

STATE OF CALIFORNIA



DEPARTMENT OF CONSUMER AFFAIRS

DENTAL BOARD OF CALIFORNIA

REVIEW OF THE WESTERN REGIONAL EXAMINING BOARD (WREB) DENTAL EXAM



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EXECUTIVE SUMMARY

Licensing boards and bureaus within the California Department of Consumer Affairs (DCA) are required to ensure that examination programs used in the California licensure process comply with psychometric and legal standards. The Dental Board of California (Board) requested that DCA's Office of Professional Examination Services (OPES) complete a comprehensive review of the Western Regional Examining Board (WREB) Dental Exam. The purpose of the OPES review was to evaluate the suitability of the WREB Dental Exam for continued use in California licensure.

The WREB Dental Exam consists of three required sections and two elective sections. The three required sections are: Comprehensive Treatment Planning (CTP), a written, computer-based authentic simulated clinical simulation (ASCE); Operative, a clinical section; and Endodontics, also a clinical section. The two elective sections are both clinical: Periodontics and Prosthodontics. These elective sections are used by states that have these examination sections as a statutory requirement for licensure. The California Dental Board under the California Business and Professions Code (B&P) § 1630 requires that "the examination of applicants for a license to practice dentistry . . . shall include assessing competency in the areas of diagnosis, treatment planning, and restorative, endodontic, periodontic, and prosthetic dentistry." Additionally, the California Dental Board under B&P Code § 1632 (c)(2) requires that candidates pass a written and clinical examination administered by WREB.

OPES, in collaboration with the Board and WREB, received and reviewed the *WREB Practice Analysis General Dentist report – September 2019 (2019 WREB PA)* and the *WREB 2018 Dental Examination Technical Report – October 2019 (2019 WREB Report)*, as well as other documents provided by WREB. Follow-up emails and phone communications were exchanged to clarify the procedures and practices used to develop and validate the WREB Dental Exam. OPES performed a comprehensive evaluation of the documents to determine whether the following test program components met professional guidelines and technical standards: (a) occupational analysis, (b) examination development, (c) passing scores and passing rates, (d) test administration, (e) examination scoring and performance, and (f) test security procedures.

OPES found that the procedures used to establish and support the validity and defensibility of the above test program components of the WREB Dental Exam meet professional guidelines and technical standards outlined in the *Standards for Educational and Psychological Testing (2014) (Standards)* and in B&P § 139. Additionally, OPES found that the use of the WREB Dental Exam for licensure in dentistry meets the requirements of the Dental Board of California under B&P Code §§ 1630 and 1632.

In addition to reviewing documents provided by WREB, OPES convened a panel of licensed dentists to serve as subject matter experts (SMEs) to review the content of the WREB Dental Exam. The SMEs were selected by the Board based on their geographic location, experience, and practice specialty. The purpose of the review was to compare the content of the WREB

Dental Exam with the California dentist examination outline resulting from the 2018 California Dentist Occupational Analysis (2018 California Dentist OA) performed by OPES.

Specifically, the SMEs performed a comparison by linking the task and knowledge statements of the 2018 California Dentist examination outline to the content of the WREB Dental Exam sections: CTP, Operative, Endodontics, Periodontics, and Prosthodontics. The linkages were performed to identify whether there were areas of California dentistry practice not measured by the WREB Dental Exam.

The results of the linkage study indicate that all but two topic areas were linked to the WREB Dental Exam: California law and ethics. Overall, the SMEs concluded that the content of the required sections of the WREB Dental Exam adequately assesses what a California dentist is expected to have mastered at the time of licensure, with the exception of law and ethics. These areas should continue to be tested on the California Dentistry Law and Ethics Examination.

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CHAPTER 1 | INTRODUCTION

PURPOSE OF THE COMPREHENSIVE REVIEW

Licensing boards and bureaus within the California Department of Consumer Affairs (DCA) must ensure that examination programs used in the California licensure process comply with psychometric and legal standards. The public must be confident that an individual passing a licensing examination has the requisite knowledge and skills to competently and safely practice in the profession.

The Dental Board of California (Board) requested that DCA's Office of Professional Examination Services (OPES) complete a comprehensive review of the Western Regional Examining Board (WREB) Dental Exam, which is administered by WREB and Prometric.

The WREB Dental Exam consists of: one required written, computer-based section, Comprehensive Treatment Planning (CTP), which is an authentic simulated clinical examination (ASCE)¹; two required clinical sections, Operative and Endodontics; and two optional clinical sections, Periodontics and Prosthodontics. The two optional sections are used in states that have these examination sections as a statutory requirement for licensure. The California Dental Board under the California Business and Professions Code § 1630 requires that “the examination of applicants for a license to practice dentistry . . . shall include assessing competency in the areas of diagnosis, treatment planning, and restorative, endodontic, periodontic, and prosthetic dentistry.” Additionally, the California Dental Board under the B&P Code § 1632 (c)(2) requires that candidates pass a written and clinical examination administered by WREB.

The OPES review had four purposes:

1. To evaluate the suitability of the WREB Dental Exam for continued use in California.
2. To determine whether the WREB Dental Exam meets the professional guidelines and technical standards outlined in the *Standards* and in B&P Code § 139.
3. To determine whether the WREB Dental Exam meets the Dental Board of California's examination requirements under B&P Code §§ 1630 and 1632.
4. To identify any areas of California dentistry practice that the WREB Dental Exam does not assess.

OPES, in collaboration with the Board and WREB, requested documentation from WREB to determine whether the following WREB test program components met professional guidelines and technical standards outlined in the *Standards* and in B&P Code § 139: (a) occupational

¹ An authentic simulated clinical examination (ASCE) is a performance-based, open-ended constructed response examination graded by examiners. An ASCE may be used to assess clinical competency under the requirements of B&P Code §§ 1630 and 1632.

analysis (OA),² (b) examination development, (c) passing scores,³ (d) test administration, (e) examination scoring and performance, and (f) test security procedures.

WREB conducted the most recent occupational analysis task analysis in 2019. OPES used two reports for this review: the *WREB Practice Analysis General Dentist*, report – *September 2019 (2019 WREB PA)*, and the *WREB 2018 Dental Examination Technical Report – October 2019 (2019 WREB Report)*.

CALIFORNIA LAW AND POLICY

California B&P Code § 139 states:

The Legislature finds and declares that occupational analyses and examination validation studies are fundamental components of licensure programs.

It further requires that DCA develop a policy to address the minimum requirements for psychometrically sound examination validation, examination development, and occupational analyses, including standards for the review of state and national examinations.

DCA Licensure Examination Validation Policy OPES 18-02 specifies the *Standards* as the most relevant technical and professional standards to be followed to ensure that examinations used for licensure in California are psychometrically sound, job-related, and legally defensible.

FORMAT OF THE REPORT

The chapters of this report provide the relevant standards related to the WREB Dental Exam and describe the findings and recommendations that OPES identified during its review.

² An occupational analysis is also known as a job analysis, practice analysis, or task analysis.

³ A passing score is also known as a pass point or cut score.

CHAPTER 2 | OCCUPATIONAL ANALYSIS

STANDARDS

The following standard is most relevant to conducting OAs for licensure examinations, as referenced in the *Standards*.

Standard 11.13

The content domain to be covered by a credentialing test should be defined clearly and justified in terms of the importance of the content for credential-worthy performance in an occupation or profession. A rationale and evidence should be provided to support the claim that the knowledge or skills being assessed are required for credential-worthy performance in that occupation and are consistent with the purpose for which the credentialing program was instituted (pp. 181-182).

The comment following Standard 11.13 emphasizes its relevance:

Typically, some form of job or practice analysis provides the primary basis for defining the content domain. If the same examination is used in the credentialing of people employed in a variety of settings and specialties, a number of different job settings may need to be analyzed. Although the job analysis techniques may be similar to those used in employment testing, the emphasis for credentialing is limited appropriately to knowledge and skills necessary for effective practice... In tests used for licensure, knowledge and skills that may be important to success but are not directly related to the purpose of licensure (e.g., protecting the public) should not be included (p. 182).

California B&P Code § 139 requires that each California licensing board, bureau, commission, and program report annually on the frequency of its occupational analysis and the validation and development of its examinations. DCA Policy OPES 18-02 states:

Generally, an occupational analysis and examination outline should be updated every five years to be considered current; however, many factors are taken into consideration when determining the need for a shorter interval. For instance, an occupational analysis and examination outline must be updated whenever there are significant changes in a profession's job tasks and/or demands, scope of practice, equipment, technology, required knowledge, skills and abilities, or laws and regulations governing the profession (p. 4).

FINDINGS

WREB conducted the OA for the WREB dental program. The results of the study are documented in the *2019 WREB PA* report.

Occupational Analysis – Methodology and Time Frame

The purpose of the OA was to collect and analyze information on current, important, and frequently performed professional dental practices, and to document these practices to inform the content domains assessed by the WREB Dental Exam (*2019 WREB Report*, p.1). The OA occurred in two stages. The first stage of the OA process used three data sources to review and gather information on procedures performed by dentists: (1) the United States Dental Procedures Frequency Data (2013-2015), (2) the Dental School Survey of Procedures Taught to Competency (2015), and (3) the WREB 2015 Examiner Practitioner Survey of Dental Practices. The second stage of the OA included an additional survey, the WREB-Central Regional Dental Testing Service (CRDTS) 2018 Practitioner Survey of Dental Practices.

Finding 1: The OA began in 2015 and was completed in 2019. The OA was conducted within a longer than usual time frame; however, it appears that the extra time was necessary to collect sufficient data. Given the circumstances, the time frame is reasonable and legally defensible.

Occupational Analysis – Survey Instruments

In 2015, during the first stage of the OA process, WREB collected data through multiple survey instruments. The Dental School Survey of Procedures Taught to Competency was used to survey deans at dental schools across the United States. Deans were asked to identify which of the 72 dental procedures listed were taught to competence in their school. They were also asked to list any procedures that were being added or removed from their curriculum.

Additionally, a large-scale practitioner survey was developed to measure the frequency and importance of performing 24 dental procedures. The 24 dental procedures were condensed from the 72 procedures in the Dental School Survey of Procedures Taught to Competency. The initial sampling plan for the survey consisted of sending invitation emails to approximately 20,000 active dentists throughout the United States. WREB contracted with a company that claimed to have access to a nationwide database of dentists' email addresses. However, after sending out the survey through this company, no responses were received. Ultimately, the effort was unsuccessful for unknown reasons after much investigation (*2019 WREB PA*, p. 62).

To supplement this effort, the WREB 2015 Examiner Practitioner Survey of Dental Practices was developed. This survey was modeled after the large-scale practitioner survey and asked WREB examiners to rate the frequency and importance of the same 24 dental procedures.

In 2018, during the second stage of the OA process, WREB came together with CRDTS to form the 2018 CRDTS and WREB Joint Practice Analysis Committee. As a result, the WREB-CRDTS 2018 Practitioner Survey of Dental Practices was developed. This 2018 Practitioner Survey was

large-scale and asked practitioners to rate the frequency and importance of 38 dental procedures. The 38 dental procedures were condensed from the 72 procedures in the Dental School Survey of Procedures Taught to Competency.

Finding 2: The procedures used by WREB to develop the four survey instruments appear to meet professional guidelines and technical standards.

Occupational Analysis – Sampling Plans

The Dental School Survey of Procedures Taught to Competency was sent by email invitation to 58 deans of dental schools throughout the United States, asking them to complete the survey. Deans from 35 schools responded, which was a response rate of 60% (35 of 58). Of the 35 respondents, 19 were from the Midwest and the western regions of the United States (2019 WREB PA, p. 10).

The WREB 2015 Examiner Practitioner Survey of Dental Practices was sent by email invitation to all active WREB dental board examiners, asking them to complete the survey. Of the 147 examiners emailed, 98 responded. This was an overall response rate of 67% (98 of 147) (2019 WREB PA, p. 10).

The WREB-CRDTS 2018 Practitioner Survey of Dental Practices was sent by email invitation or conventional mail to over 13,000 dentists throughout the United States. An additional 3,400 practitioners had access to the survey through a web link or were forwarded the survey by their state board. Of the 1,400 email respondents, 1,238 completed the survey with enough suitable data to be included in the analysis, which was an overall response rate of 8.3%. The response rate for conventional mail respondents was 3.3%. This brought the overall response rate to 7.6% (2019 WREB PA, p. 11). Of the 1,238 respondents, 36% were from the western region of the United States, with 1% (17) from California.

Finding 3: The intent of the sampling plans was reasonable and appears to meet professional standards. WREB made a noteworthy effort to gather data by using multiple surveys.

Occupational Analysis – Survey Results

After administering the surveys, WREB collected the data and analyzed the survey results.

Finding 4: The respondents to the WREB 2015 Examiner Practitioner Survey of Dental Practices had an average of 16 or more years in practice. This high level of experience was expected because of the population sampled. The majority of respondents were general practice dentists (86.7%).

Finding 5: The respondents to the WREB-CRDTS 2018 Practitioner Survey of Dental Practices were dentists from throughout the United States. Close to half of the respondents (46%) had been practicing fewer than 7 years. The majority of respondents were general practice dentists (78.1%).

Occupational Analysis – Decision Rules and Final Examination Outline and Contents

The 2015 WREB Practice Analysis Committee comprised eight SMEs. These SMEs were required to have “extensive state licensing board experience, board examiner experience, and/or current experience as educators in college dentistry” (2019 WREB PA, p. 6). Additionally, they represented a range of years of experience and were from various regions of the United States. Under the guidance of WREB’s psychometrician, the SMEs worked together to review the results of the Dental School Survey of Procedures Taught to Competency and the results of the WREB 2015 Examiner Practitioner Survey of Dental Practices. In addition, the SMEs compared the results of the two surveys to the United States Dental Procedures Frequency Data. This data source captures the frequency of performance of 271 dental procedures from 12,750 general dentists throughout the United States, with an average of 199 dentists per state. The purpose of the comparison was to add support to the results.

The 2018 CRDTS and WREB Joint Practice Analysis Committee comprised a panel of eight SMEs. There were four from each agency. These SMEs were required to meet the same experience criteria as the 2015 group and also represented a range of years of experience and were from various regions of the United States (2019 WREB PA, p. 6). Under the guidance of CRDTS and WREB staff, the SMEs worked together to review the results of the Dental School Survey of Procedures Taught to Competency, the results of the WREB 2015 Examiner Practitioner Survey of Dental Practices, and the WREB-CRDTS 2018 Practitioner Survey of Dental Practices. Again, the SMEs compared the results of the three surveys to the United States Dental Procedures Frequency Data.

Both the 2015 and 2018 SMEs were presented with an overview of the current WREB Dental Exam and the 2007 WREB Practice Analysis for General Dentist report. They were also given an orientation on examination validation, testing standards, and the OA process. The SMEs were then charged with evaluating and considering all of the data collected to complete the following tasks: reviewing current practice frequencies and changes in school curricula; considering how any changes to practice and curricula are reflected in the current examination; recommending immediate, gradual, or no changes to the examination; and identifying areas for further or future exploration (2019 WREB PA, p. 8). The findings and recommendations of the two committees were presented to the WREB Dental Exam Review Board.

The examination content outlines for the Comprehensive Treatment Planning (CTP), Operative, Endodontics, Periodontics, and Prosthodontics sections are linked to the important and frequently performed entry-level dental practices confirmed by the OA.

Finding 6: The linkage between critical clinical dental practices required by entry-level dentists and the major content areas of the examination sections demonstrates a sufficient level of validity, thereby meeting professional guidelines and technical standards.

CONCLUSIONS

Given the findings, the OA conducted by WREB appears to meet professional guidelines and technical standards. Additionally, the development of the examination outline for the WREB Dental Exam is based on the results of the OA and appears to meet professional guidelines and technical standards.

CHAPTER 3 | EXAMINATION DEVELOPMENT

STANDARDS

Examination development includes many steps within an examination program, from the development of an examination outline to scoring and analyzing items after the administration of an examination. Several specific activities involved in the examination development process are evaluated in this section. These activities include item writing, linking items to the examination outline, and developing both the scoring criteria and examination forms.

The following standards are most relevant to examination development for licensure examinations, as referenced in the *Standards*.

Standard 4.7

The procedures used to develop, review, and try out items and to select items from the item pool should be documented (p. 87).

Standard 4.12

Test developers should document the extent to which the content domain of a test represents the domain defined in the test specifications (p. 89).

FINDINGS

Examination Development – Subject Matter Experts

The WREB Dental Exam sections are developed by examination committees made up of SMEs who represent the 39 WREB member states. The SMEs are required to be experienced licensed dentists who either serve or have served on a state board or are educators at accredited dental schools. Each committee includes at least one educator because of their familiarity with the curricula and the candidate population. Additionally, most SMEs have been or are WREB examiners. In order to ensure regional diversity, SMEs are rotated regularly (2019 *WREB Report*, p. 9).

Finding 7: While the criteria used to select SMEs for item and test development are mostly consistent with professional guidelines and technical standards, OPES does not recommend that educators participate in certain examination development activities because of potential conflict of interest.

Finding 8: SMEs participating in item and test development are required to sign confidentiality agreements and are instructed about examination security, which is consistent with professional guidelines and technical standards.

Examination Development – Linkage to Examination Outline

For the computer-based section of the WREB Dental Exam, Comprehensive Treatment Planning (CTP), test items are based on three patient cases of varying complexity. Items are developed by examination committees to reflect the relevant areas of the respective content outlines. The cases include patient information, medical history, radiographic images, intraoral and extraoral photographs, dental and periodontal charts, and clinical findings.

Finding 9: The SMEs develop, review, and construct CTP items in alignment with the examination outline, which is consistent with professional guidelines and technical standards.

For the clinical sections of the WREB Dental Exam, Operative, Endodontics, Periodontics, and Prosthodontics, linkage to the respective examination content outlines consists of describing the clinical procedures to be evaluated, developing the grading criteria by which candidate performance is assessed, and ensuring that test components reflect the relative weighting of each criterion. The clinical procedures are based on the results of the OA and their respective scoring criteria and reflect different levels of ability in performing the clinical procedures employed in actual dental practice.

Finding 10: Content development of the clinical examination sections meets professional guidelines and technical standards.

Examination Development – Item Pilot Testing

The WREB Dental Exam sections are pilot tested before regular test administrations. They are pilot tested by either students or examiners acting as candidates. After pilot testing, the results are analyzed and reviewed by an examination committee. Additionally, when new sections are released, results are held until a sufficient amount of data is collected to ensure that the section is functioning as expected (WREB, 2020).⁴

Finding 11: The procedures used to develop, review, pilot test, and select examination content appear to meet professional guidelines and technical standards.

Examination Development – Examination Forms

The clinical WREB Dental Exam sections are based on the clinical procedures to be evaluated and the grading criteria by which candidate performance is assessed. SME consensus is used to develop the scoring weights for each clinical test. The scoring criteria are based on objective and observable outcome measures of ability related to completing the respective clinical procedure successfully. Scoring criteria are developed for five levels of ability scored 1 through 5, with 1 representing unacceptable performance, 3 representing minimal competency, and 5 representing optimal performance.

⁴ (WREB, 2020) refers to WREB email communication on March 31, 2020.

The CTP section consists of three patient cases of varying complexity, including one pediatric patient. The content of each case reflects the content and weights of the examination outline. The cases have been pretested using dental students or examiners acting as candidates (WREB, 2020). In addition, linear equating or Rasch model equating is used to address variations in form difficulty (*2019 WREB Report*, p. 8).

Finding 12: The criteria applied to create new examination forms meet professional guidelines and technical standards.

Finding 13: Given the procedures used by WREB test developers, tests capable of differentiating between minimally competent and incompetent candidates for licensure should result from examination development activities. Based on WREB test developers' examination development activities, the results of WREB exams should discriminate between minimally competent and incompetent candidates for licensure.

Examination Development – Size of Item Banks

WREB recognizes the importance of having a sufficient number of items within their item banks and maintains a sufficient number of items to select from (*2019 WREB Report*, p. 8).

Finding 14: The number of items maintained within the item banks is consistent with professional guidelines and technical standards.

CONCLUSION

Given the findings, the examination development activities conducted by WREB mostly meet professional guidelines and technical standards regarding the use of SMEs for item development and examination construction, the linkage of each item to the content outline, the pilot testing of new items, and the development of new examination forms.

CHAPTER 4 | PASSING SCORES AND PASSING RATES

STANDARDS

The passing score (i.e., cut score or cut point) of an examination is the score that represents the level of performance that divides those candidates for licensure who are minimally competent from those who are not competent.

The following standards are most relevant to passing scores for licensure examinations, as referenced in the *Standards*.

Standard 5.21

When proposed score interpretations involve one or more cut scores, the rationale and procedures used for establishing cut scores should be documented clearly (p. 107).

The comment associated with Standard 5.21 emphasizes its relevance:

Chapter 5 of the *Standards*, “Scores, Scales, Norms, Score Linking, and Cut Scores,” states that the standard-setting process used should be clearly documented and defensible. The qualifications of the judges involved and the process of selecting them should be part of the documentation. A sufficiently large and representative group of judges should be involved, and care must be taken to ensure that judges understand the process and procedures they are to follow (p. 101).

Standard 11.16

The level of performance required for passing a credentialing test should depend on the knowledge and skills necessary for credential-worthy performance in the occupation or profession and should not be adjusted to control the number or proportion of persons passing the test (p. 182).

The comment associated with Standard 11.16 emphasizes its relevance:

Chapter 11 of the *Standards*, “Workplace Testing and Credentialing,” states that the focus of tests used in credentialing is on “the standards of competence needed for effective performance (i.e., in licensure this refers to safe and effective performance in practice)” (p. 175). Chapter 11 further states, “Standards must be high enough to ensure that the public, employers, and government agencies are well served, but not so high as to be unreasonably limiting” (p. 176).

FINDINGS

Passing Scores – Process, Use of SMEs, and Methodology

The process of establishing passing scores for licensure examinations relies on the expertise and judgment of SMEs.

Passing scores for the WREB Dental Exam sections are based on standards of minimum competence developed by the examination committees and incorporated into the scale point definitions of the rating scales (1–5) used by the examiners, with the scale point 3 representing minimum competency. The minimum competence standards are determined by SMEs and reflect standards of professional behavior and performance in relation to the clinical procedures being completed by the candidates. The 6-10 members of the respective examination committee determine the standards initially, and the WREB Examination Board reviews and approves the standards. The performance standards defining the levels of ability in completing the clinical procedures range from 1, “unacceptable performance” to 5, “optimal performance.” The performance standards are written as objective and observable behavior and results.

Finding 15: The methodology used to establish the passing scores for the WREB Dental Exam sections is consistent with professional guidelines and technical standards.

Finding 16: The use of SMEs to review each criterion and performance level of the WREB Exam sections meets professional guidelines and technical standards. However, OPES recommends rotating SMEs rather than using a committee for examination development, including when establishing passing scores. This strategy helps to ensure fairness and validity.

Passing Rates – WREB Dental Exam Sections

Finding 17: OPES reviewed the first-time passing rates for the 2018 WREB Dental Exam sections. OPES found that the passing rates meet expectations for similar examinations for the dentistry profession.

CONCLUSION

Given the findings, the passing score methodologies conducted by WREB demonstrate a sufficient degree of validity to meet professional guidelines and technical standards.

CHAPTER 5 | TEST ADMINISTRATION

STANDARDS

The following standards are most relevant to standardizing the test administration process for licensing examinations, as referenced in the *Standards*.

Standard 3.4

Test takers should receive comparable treatment during the test administration and scoring process (p. 65).

Standard 4.15

The directions for test administration should be presented with sufficient clarity so that it is possible for others to replicate the administration conditions under which the data on reliability, validity, and (where appropriate) norms were obtained. Allowable variations in administration procedures should be clearly described. The process for reviewing requests for additional testing variations should also be documented (p. 90).

Standard 4.16

The instructions presented to test takers should contain sufficient detail so that test takers can respond to a task in the manner that the test developer intended. When appropriate, sample materials, practice or sample questions, criteria for scoring, and a representative item identified with each item format or major area in the test's classification or domain should be provided to the test takers prior to the administration of the test, or should be included in the testing material as part of the standard administration instructions (p. 90).

Standard 6.1

Test administrators should follow carefully the standardized procedures for administration and scoring specified by the test developer and any instructions from the test user (p. 114).

Standard 6.2

When formal procedures have been established for requesting and receiving accommodations, test takers should be informed of these procedures in advance of testing (p. 115).

Standard 6.3

Changes or disruptions to standardized test administration procedures or scoring should be documented and reported to the test user (p. 115).

Standard 6.4

The testing environment should furnish reasonable comfort with minimal distractions to avoid construct-irrelevant variance (p. 116).

Standard 6.5

Test takers should be provided appropriate instructions, practice, and other support necessary to reduce construct-irrelevant variance (p. 116).

Standard 8.1

Information about test content and purposes that is available to any test taker prior to testing should be available to all test takers. Shared information should be available free of charge and in accessible formats (p. 133).

Standard 8.2

Test takers should be provided in advance with as much information about the test, the testing process, the intended test use, test scoring criteria, testing policy, availability of accommodations, and confidentiality protection as is consistent with obtaining valid responses and making appropriate interpretations of test scores (p. 134).

FINDINGS

Test Administration – Candidate Registration

Candidates register to take the WREB Dental Exam sections through their online candidate profiles. The 2020 Application Process page found on WREB’s website provides instructions and information regarding:

- Application process overview
- Candidate photo requirements
- Proof of qualifications documents
- Online application process
- Paying for an examination
- Wait-list status
- Re-examination

For the CTP section, once registration and payment have been processed, candidates receive an email with instructions on how to contact Prometric, the testing vendor, to schedule the examination. For the clinical examination sections, candidates register through their online profile by selecting the examination date and dental school. Candidates can refer to the WREB website for the list of examination dates and participating dental schools.

Finding 18: WREB’s registration process appears straightforward. The information available to candidates is detailed and thorough. The candidate registration process appears to meet professional guidelines and technical standards.

Test Administration – Accommodation Requests

WREB approves accommodation requests under the Americans with Disabilities Act. Candidates requesting accommodation must submit a Request Form and documentation at least 45 days before the exam.

Finding 19: WREB’s accommodation procedure appears to meet professional guidelines and technical standards.

Test Administration – Test Centers and Test Sites

Candidates take the CTP exam section at a Prometric test center. Prometric test centers are located throughout the United States and run by trained proctors. Candidates take the clinical exam sections at various dental schools on specified dates throughout the year.

Finding 20: Candidates have access to various Prometric test centers with trained proctors and standardized testing conditions.

Finding 21: Candidates have access to various participating dental schools with trained examiners and standardized testing conditions.

Test Administration – Directions and Instructions to Candidates

The WREB website provides information about the WREB Dental Exam. The two candidate manuals provided by WREB, the 2018 Comprehensive Treatment Planning Exam Candidate Guide (2018 CTP CG) and the 2018 Dental Exam Candidate Guide (2018 CG), provide detailed information to candidates about:

- Exam overview and exam procedures for each section
- Malpractice insurance requirements
- Exam materials and instruments
- Patient selection
- Reporting to the test center and test site
- Candidate exam guide
- Test center and test site procedures
- Security procedures
- Standards of conduct
- Infection control requirements
- Exam scoring criteria

Finding 22: The directions and instructions provided to candidates appear straightforward. The information available to candidates is detailed and thorough.

Test Administration – Standardized Procedures and Testing Environment

WREB administers each of its clinical exam sections 34 times per year. The clinical exam sections are administered on 30 dental school campuses throughout the United States. The CTP section is administered by Prometric at its test centers located throughout the United States.

Finding 23: WREB, using dental school campuses and Prometric facilities, provides candidates access to test centers across the United States with trained proctors and examiners.

CONCLUSION

Given the findings, the test administration protocols put in place by WREB appear to meet professional guidelines and technical standards.

CHAPTER 6 | EXAMINER TRAINING, SCORING, AND PERFORMANCE STANDARDS

STANDARDS

The following standards are most relevant to examiner training, test scoring, and performance for licensing examinations, as referenced in the *Standards*.

Standard 2.3

For each total score, subscore, or combination of scores that is to be interpreted, estimates of relevant indices of reliability/precision should be reported (p. 43).

Standard 4.10

When a test developer evaluates the psychometric properties of items, the model used for that purpose (e.g., classical test theory, item response theory, or another model) should be documented. The sample used for estimating item properties should be described and should be of adequate size and diversity for the procedure. The process by which items are screened and the data used for screening, such as item difficulty, item discrimination, or differential item functioning (DIF) for major examinee groups, should also be documented. When model-based methods (e.g., IRT) are used to estimate item parameters in test development, the item response model, estimation procedures, and evidence of model fit should be documented (pp. 88-89).

Standard 4.20

The process for selecting, training, qualifying, and monitoring scorers should be specified by the test developer. The training materials, such as the scoring rubrics and examples of test takers' responses that illustrate the levels on the rubric score scale, and the procedures for training scorers should result in a degree of accuracy and agreement among scorers that allows the scores to be interpreted as originally intended by the test developer. Specifications should also describe processes for assessing scorer consistency and potential drift over time in raters' scoring (p. 92).

Standard 4.21

When test users are responsible for scoring and scoring requires scorer judgment, the test user is responsible for providing adequate training and instruction to the scorers and for examining scorer agreement and accuracy. The test developer should document the expected level of scorer agreement and accuracy and should provide as much technical guidance as possible to aid test users in satisfying this standard (p. 92).

Standard 6.8

Those responsible for test scoring should establish scoring protocols. Test scoring that involves human judgment should include rubrics, procedures, and criteria for scoring. When scoring of complex responses is done by computer, the accuracy of the algorithm and processes should be documented (p. 118).

FINDINGS

Examiner Selection and Training

WREB examiners are typically state board members and dental educators, who are licensed and in good standing. Each examiner is required to complete an 8–10-hour training and self-assessment. In addition, examiners attend orientation and calibration before each examination. The calibration process requires examiners to practice scoring until their judgments reach an acceptable level of agreement. After an examination, examiners are given feedback on their performance. “Examiners with low percentages of agreement, high percentages of harshness or lenience, or erratic grading patterns are counseled, remediated and monitored to ensure increased understanding of definitions. Continued lack of agreement may result in dismissal from the examination pool” (2019 WREB Report, p. 33).

Finding 24: The selection and training of examiners for the WREB Dental Exam appears to meet professional guidelines and technical standards. OPES typically does not support the use of board members and educators in examination development, administration and scoring activities because of potential conflict of interest. However, after further discussions with WREB, OPES accepted use of board members and educators because of the following findings: (a) graders and candidates do not interact and are not identified by name; (b) conflict of interest forms are signed; (c) three graders are involved in the scoring process; (d) extensive calibration training is provided; (e) a psychometrician is employed to ensure testing standards are applied; and (f) the examination process is transparent and clearly articulated in the candidate guide.

Examination Scoring

Three grading examiners score each of the WREB Dental Exam sections. The median score is used to determine an individual score for each exam section, and those scores are then combined for a final conjunctive score. Grading examiners have no interaction with candidates “to provide total anonymity to remove possible bias from the scoring of candidate work” (2018 CG, p. 12). The 2019 WREB Report provides more detailed information about the scoring process.

Finding 25: The scoring criteria are applied equitably to ensure the validity and reliability of the examination results and are evaluated often. The test scoring process meets professional guidelines and technical standards.

Examination Performance

Classical item analysis statistics are calculated and reviewed for each examination section. Rasch analysis of the results of the rating process are also performed for each of the examination sections. For the Comprehensive Treatment Planning (CTP) section, scores are scaled to account for differences in form difficulty. The purpose of scaled scores is to account for form difficulty, to ensure that scores across forms hold the same meaning, and to ensure fairness among candidates (*2019 WREB Technical Report, p. 30*).

Finding 26: The use of scaled scores, examination-level statistics, item-level statistics, decision consistency reliability, and examiner agreement are consistent with professional guidelines and technical standards.

CONCLUSIONS

The steps taken by WREB to score the WREB Dental Exam appear to provide for a fair and objective evaluation of candidate performance. The steps taken by WREB to evaluate examination performance appear to meet professional guidelines and technical standards.

CHAPTER 7 | TEST SECURITY

STANDARDS

The following standards are most relevant to test security for licensure examinations, as referenced in the *Standards*.

Standard 6.6

Reasonable efforts should be made to ensure the integrity of test scores by eliminating opportunities for test takers to attain scores by fraudulent or deceptive means (p. 116).

Standard 6.7

Test users have the responsibility of protecting the security of test materials at all times (p. 117).

Standard 8.9

Test takers should be made aware that having someone else take the test for them, disclosing confidential test material, or engaging in any other form of cheating is unacceptable and that such behavior may result in sanctions (p. 136).

Standard 9.21

Test users have the responsibility to protect the security of tests, including that of previous editions (p. 147).

FINDINGS

Test Security – The WREB Dental Exam Clinical Sections

WREB has implemented test site and examination security policies and procedures for the clinical exam sections. The 2018 Dental Exam Candidate Guide outlines for candidates what constitutes improper and unethical conduct on the part of candidates and the consequences of such actions. Additional information about what is expected at the examination can be found on the WREB website: 2020 Important Exam Information.

Finding 27: The examination security protocols pertaining to test administration of the clinical examination sections meet professional guidelines and technical standards.

Test Security – WREB and Prometric Testing Vendor

Candidates take the CTP exam section at a Prometric test center via computer in a secure testing room. They must bring two forms of personal identification with them to the test center (one with a photo, both with a signature). Candidates are prohibited from bringing any personal items into the secure room. Candidates are monitored during testing by Prometric proctors. Prometric test center administrators receive enhanced security training on test delivery, test center communications, check-in and check-out procedures, managing in-test questions and issues, and monitoring the testing room. Other test safety measures taken by Prometric include metal detection wands to scan for prohibited devices, digital video recordings of the testing area, and various ID management verifications.

Finding 28: Prometric, through its internal test administration and security protocols, provides a robust framework of test site and examination security policies and procedures.

CONCLUSION

Given the findings, the test security policies, procedures, and protocols meet professional guidelines and technical standards.

CHAPTER 8 | COMPARISON OF THE CALIFORNIA DENTIST EXAMINATION OUTLINE WITH THE WREB EXAMINATION OUTLINE AND EXAMINATION CONTENTS

PARTICIPATION OF SUBJECT MATTER EXPERTS

OPES convened a two-day meeting on February 27-28, 2020 to critically evaluate and compare the following items:

- The task and knowledge statements of the California dentist examination outline resulting from the 2018 California Dentist OA.
- The examination outline and examination contents of the WREB Dental Exam, CTP section.
- The examination outline and examination contents of the WREB Dental Exam – Operative, Endodontics, Periodontics, and Prosthodontics sections.

The Board, with direction from OPES, recruited eight dentists to participate as SMEs.

The SMEs represented both northern and southern California. Two of the SMEs had been licensed for 5 years, three had been licensed 6–10 years, and three had been licensed 11–19 years. All SMEs worked as dentists in various settings.

WORKSHOP PROCESS

First, the SMEs completed OPES' security agreement, self-certification, secure area agreement, and personal data (demographic) forms. The OPES test specialist explained the importance of security during and outside the workshop, and explained security guidelines. The SMEs were then asked to introduce themselves.

Next, the OPES test specialist gave a PowerPoint presentation about the purpose and importance of occupational analysis, validity, reliability, test administration standards, examination security, and the role of SMEs. The OPES test specialist also explained the purpose of the workshop.

The SMEs were then asked to review the parts of the B&P Code and the California Code of Regulations (CCR) relating to the scope of practice, qualifications, and examination requirements for dentists. They were informed that the purpose of reviewing these documents was to acquire an understanding of California's examination requirements, and they were asked to use this understanding when assessing the WREB Dentist Exam examination outline and examination contents.

After reviewing the B&P Code and the CCR, the SMEs were instructed to evaluate and link each task and knowledge statement of the California dentist examination outline to the WREB Dentist Exam examination outline and examination contents.

The OPES test specialist then split the eight SMEs into 4 groups. The first group of SMEs was assigned content areas 1–4 of the California dentist examination outline. The second group of three SMEs was assigned to content areas 5–8 of the California dentist examination outline. The third group of two SMEs was assigned to content areas 9–12 of the California dentist examination outline. The fourth group of two SMEs was assigned to content areas 13–16 of the California dentist examination outline. Each group was also assigned the examination contents of the WREB Dental Exam sections to link to the California examination outline.

The SMEs performed their linkages within their independent groups. Each group worked separately to document their linkages on an electronic spreadsheet. They were provided with only the task and knowledge statements of the content areas assigned to them. The groups were instructed to flag statements that they had questions about or could not find a related task or knowledge statement for.

Once all four groups completed their respective linkages, each group evaluated the linkages of another group. The purpose of this secondary verification was to provide additional validation evidence. Again, the groups were instructed to flag statements if they had questions about them, could not find linkages to them, disagreed with the linkages made for them by the previous group, or wanted them discussed by the entire group.

After completing the linkages, the SMEs reconvened as one group and discussed all the statements that had been flagged. The SMEs also reviewed the linkages of the five exam sections. Task and knowledge statements that were linked by two or more groups were considered validated linkages. If only one group indicated a linkage, then that task or knowledge statement was reviewed and evaluated.

The content domains of the WREB Dental Exam examination outline are provided in Tables 1 through 5. Table 6 provides the content areas of the 2018 California dentist examination outline.

TABLE 1 – COMPREHENSIVE TREATMENT PLANNING SECTION

Restorative Treatment
Removable Prosthodontics
Periodontal Treatment
Endodontics Treatment
Surgery
Prescription Writing
Follow-up/Prognosis/Maintenance
Diagnosis, Etiology and Treatment Planning

TABLE 2 – OPERATIVE SECTION

Direct posterior Class II amalgam (MO, DO or MOD)	
Direct posterior Class II composite restoration (MO, DO or MOD)	At least one II Class procedure required
Indirect posterior Class II cast gold restoration (up to and including a $\frac{3}{4}$ crown)	
Direct Class III composite restoration (ML, DL, MF, DF)	Optional, if combined with a Class II

TABLE 3 – ENDODONTICS SECTION

Anterior Tooth: Access, Instrumentation, Obturation
Posterior Tooth: Access

TABLE 4 – PERIODONTICS SECTION

Scaling and Root Planing (minimum eight qualifying surfaces)

TABLE 5 – PROSTHODONTICS SECTION

Preparation of Anterior Tooth for Full Coverage Crown

Preparation of Two Abutments for Posterior Three-unit Partial Denture Prosthesis

TABLE 6 – CONTENT AREAS OF THE 2018 CALIFORNIA DENTIST EXAMINATION OUTLINE

Content Area	Content Area Description	Weight
1. Patient Evaluation	This area assesses the candidate's ability to conduct a medical and dental evaluation to develop a comprehensive dental treatment plan for the patient.	13%
2. Endodontics	This area assesses the candidate's ability to diagnose the patient's endodontic condition, develop a treatment plan, and perform endodontic therapy.	6%
3. Indirect Restoration	This area assesses the candidate's ability to diagnose the patient's restorative needs, develop a treatment plan, and perform an indirect restoration.	7%
4. Direct Restoration	This area assesses the candidate's ability to diagnose the patient's restorative needs, develop a treatment plan, and perform a direct restoration.	7%
5. Preventative Care	This area assesses the candidate's ability to perform prophylactic, preventative procedures, and provide oral hygiene instructions to patients.	5%
6. Periodontics	This area assesses the candidate's ability to diagnose the patient's periodontal condition, develop a treatment plan, and perform periodontal therapy.	4%
7. Fixed Partial Dentures	This area assesses the candidate's ability to diagnose the patient's restorative needs, develop a treatment plan, and prepare a fixed partial denture.	6%
8. Removable Partial Dentures	This area assesses the candidate's ability to diagnose the patient's restorative needs, develop a treatment plan, and design and deliver a removable partial denture.	4%
9. Complete Dentures	This area assesses the candidate's ability to diagnose the patient's restorative needs, develop a treatment plan, and design and deliver a complete denture.	4%

Content Area	Content Area Description	Weight
10. Implant Restoration	This area assesses the candidate's ability to diagnose the patient's restorative needs, develop a treatment plan, and deliver an implant restoration.	3.5%
11. Oral Surgery	This area assesses the candidate's ability to diagnose the patient's oral condition, develop a treatment plan, and perform oral surgical procedures.	5%
12. Teeth Whitening	This area assesses the candidate's ability to perform teeth whitening procedures on a patient.	2%
13. Occlusal Splint Therapy	This area assesses the candidate's ability to determine a patient's need for occlusal splint therapy and to perform occlusal splint therapy procedures.	3%
14. Safety and Sanitation	This area assesses the candidate's ability to prevent injury and the spread of diseases in dental services by following Board regulations on safety, sanitation, and sterilization.	10.5%
15. Ethics	This area assesses the candidate's ability to comply with ethical standards for dentistry, including scope of practice and professional conduct.	7%
16. Law	This area assesses the candidate's ability to comply with legal obligations, including patient confidentiality, professional conduct, and information management.	13%
Total		100%

FINDINGS

The SMEs performed a comparison between the task and knowledge statements of the 2018 California dentist examination outline and the examination outline and examination contents of the WREB Dental Exam sections. The SMEs concluded that all except two topic areas were congruent in assessing the general knowledge required for entry-level dentistry practice in California.

Finding 29: All except two content areas were congruent in assessing the general knowledge required for entry-level dentistry practice in California.

The two content areas that could not be fully linked to the WREB Dental Exam were:

- Content Area 15 Ethics
- Content Area 16 Law

Finding 30: During the workshop, the SMEs also discussed the use of patients versus the use of non-patients such as simulated teeth, full mouth models, or manikins for each of the examination sections. The group discussed the benefits of both methods but did not come to consensus that one method was clearly superior.

CONCLUSIONS

Overall, the SMEs concluded that the content of the WREB Dental Exam assesses what a California dentist is expected to have mastered at the time of licensure. The two content areas not fully assessed were California law and ethics. Because California already administers a law and ethics examination, OPES recommends continued development and administration of this California-specific examination.

CHAPTER 9 | CONCLUSION

COMPREHENSIVE REVIEW OF THE WREB DENTAL EXAM

OPES completed a comprehensive analysis and evaluation of the documents provided by WREB. The procedures used to establish and support the validity and defensibility of the WREB Dental Exam (i.e., OA, examination development, passing scores and passing rates, test administration, examination scoring and performance, and test security) were found to meet professional guidelines and technical standards outlined in the *Standards* and B&P Code § 139. Additionally, the use of the WREB Dental Exam for licensure in dentistry in California was found to meet the requirements of the Dental Board of California under B&P Code §§ 1630 and 1632.

Based on SME evaluation, OPES believes that the content of the WREB Dental Exam is congruent with entry-level California dentistry practice with the exception of California law and ethics. If the Board continues to use the WREB Dental Exam for licensure in California, the Board should also continue requiring candidates to pass the California Dentistry Law and Ethics Examination.

CHAPTER 10 | REFERENCES

American Educational Research Association, American Psychological Association, National Council on Measurement in Education, and Joint Committee on Standards for Educational and Psychological Testing. (2014). *Standards for educational and psychological testing*.

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