

# **The Impact of the Elimination of the Use of Human Subjects in the Clinical Licensure Examination Process by 2005 from the Dental and Dental Hygiene Licensure Communities' Perspective\***

## **A Position Statement of the American Association of Dental Examiners in Response to ADA Resolution 64H**

### **Abstract:**

The evolution of the clinical licensure process for entry into dental and dental hygiene practice over the last few years has been unprecedented. Examiners, educators and testing measurement specialists have labored over the development of new standards of reliability and validity. There are those who seek to eliminate not only the utilization of live patients from the clinical licensure process, but also circumvent the entire clinical portion of the licensure exam. While the use of clinical simulations has been proposed as an alternative to the utilization of live patients, among those seeking these substitutions, much is poorly understood regarding the feasibility of the concept. A realistic timetable for implementation, based on present and anticipated technology, is elusive. Discussion relative to the utilization of live patients in the licensure process, and critical concerns relative to the impact of their termination is offered.

### **Introduction**

The 141st session of the American Dental Association House of Delegates adopted Resolution 64H, which calls for the elimination of the use of human subjects from the clinical licensure examination process by 2005. Although the adopted resolution passed the House of Delegates by a clear majority, it is questionable if the discussion of the merits of this issue originally advocated by the American Student Dental Association (ASDA) in their strategic plan reflected any genuine understanding of the complexities and ramifications involved.

The utilization of patients as part of the examination process has been the backbone of assessment and qualification of dentists and dental hygienists for initial licensure for many decades. State Boards, in fulfilling their mandate to protect the public and assure competence, operate under the realization that the profession of dentistry has its own unique skill sets to master. Clinical proficiency in these skill sets are best assessed by observing the performance and application of those proficiencies in a true clinical setting, utilizing human subjects.

Recently, the traditional licensure examinations have been placed under increased scrutiny. Some prefer that entry level examinations not be conducted at all. This opposition to exams has reached a new level of expression, fueled by contemporary social and political concerns, such as access to care and the portability of the dental license. With the possibility that technology may provide a satisfactory replacement for the live patient, the opposition has crystallized and redrawn the argument to redefine new standards, which eliminate the use of patients. Computer-based and interactive or simulated manikin-based exercises are being offered as viable alternative instruments for licensure competency assessment. From a technological, expense and regulatory framework perspective, the use of these simulations raises important concerns.

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## **Technology**

There is little argument that the rapid advances in computer technology will redefine how students will be educated. The instructive process now includes the semantics of distance learning, interactive education and computer-based simulation. Terms that were once futuristic are becoming commonly used in everyday discussion among educators and professional testing agencies. The development and the implementation of these technologies must occur within a time frame that recognizes the difficulties inherent in weaving the desired intent into practical reality.

Where current technology stands in its ability to fulfill educational and licensing criteria is debatable. While we may be supportive of the opportunity that new technology presents, so must we recognize that the implementation of this technology must be able to perform all the tasks for that which it is intended to replace.

Technology is, at present, a useful adjunct to the traditional mechanisms of education and licensure. The effective use of that technology to completely replace existing modalities has not been proven. The issue, then, is not a question of the present but of the future. Is it prudent to mandate implementation when products upon which the mandate is based are non-existent, nor have been shown to demonstrate the fidelity, the validity and reliability necessary to replace the human patient?

## **Economics**

Those familiar with the prominent vendors in clinical simulation technology admit to costs involving investment in the hardware alone, to approach the \$60,000 range per unit. The ancillary costs associated with this technology such as software maintenance, software updates, training and additional space requirements, are staggering. The number and type of clinical simulation units that may be required to adequately move into clinical testing simulation technology for licensure presents complex problems. The cost estimate is enormous.

Clinical licensure examinations for any group or state are currently structured to be conducted and completed within a relatively short time frame, usually two to a maximum of four days. The number of candidates examined at any one session can vary from as few as twenty to as many as several hundred and, in the case of the regional boards, at multiple sites concurrently. There are no existing protocols yet established to delineate how a clinical simulation examination might occur from either a protocol standpoint, or a breadth of clinical experience standpoint. It would be difficult to ascertain how clinical simulation examination might be conducted as to time and/or numbers of simulation equipment entities. The investment will be huge, as well as the replacement cost for an emerging technology, which surely will become obsolete year by year. Additionally, clinic time in school for simulation training will take away from live patient care learning experiences.

The agencies presently conducting licensure examinations fall broadly into two categories, regional testing agencies and state or independent testing agencies. It is unlikely that either would invest heavily in the technological hardware required for clinical simulation due to economic constraints. So, not only schools, but licensure candidates may find the economics of simulation prohibitive. If simulation is mandated, the economic burden may depend upon government funding.

The trend for increasing costs to the student for an education is already apparent. The impact that computer simulation will have on that trend could be untenable. The revenue required to fund computer clinical simulation will have to come in part from increases in student tuition and fees, adding to the already burdensome educational debt that students carry.

### **Computer Simulation Limitations**

The evaluation of the dental and dental hygiene student through the licensure process has been the result of years of refinement. Recent efforts assure that principles of validity and reliability are strongly documented in the licensure process.

Present computer simulation technologies have not evolved sufficiently to test the broad array of skills inherent to dental practice. While the leading available technologies purport to have assessment capabilities to measure restorative dentistry tooth preparations, they presently lack the capability to assess caries recognition and removal as well as the final restoration of those preparations. Educational models of computer simulation as well as licensure models which might utilize computer simulation, must have the capability to measure the candidate's ability to properly restore teeth to a mechanical, functional and esthetic standard. Until that capability exists in computer simulation, as a technology it falls short of meeting clinical licensure requirements and assuring the public that the licensee, having completed such a simulation examination, is competent.

As to testing the broad scope of services rendered by dentists and dental hygienists, a modality does not exist to assess periodontal clinical skills. Measurements of operative cavity preparations alone are not a sufficient indicator of candidate preparedness to enter the general practice of dentistry. Many simulations and so called interactive "patient-based" exercises measure candidates' ability to know what to do, but do not evaluate the candidate's ability to actually perform the motor skills necessary to satisfy the treatment demands that must accompany competent decision making.

### **Standardization and Calibration**

One of the main concerns of the computer simulation doctrine involves the issues of calibration and standardization. The clinical licensure community is diligently defining and refining the standards by which candidates should be assessed. It is the sovereign right of each state to establish the standards by which practitioners will be judged competent and allowed licensure. Presumably the standards of critical competency, minimal clinical competency, or safe beginner skill sets will be consistent between educational institutions and the licensing agencies. Demonstration and recognition of standards for computer simulation on an intra-educational level, and an inter-educational level is prerequisite in the process of broad based computer simulation implementation. The issues of standardization and calibration in the

clinical licensure examination process, and the recognized accomplishments in that area, must be in place for computer simulation as well, prior to its implementation. Scoring mechanisms and the criteria upon which they are based must be analyzed for content, bias and a multitude of other parameters. The methodology and criteria of computer simulated scoring must meet the scoring standards that currently exist in patient based clinical examinations.

### **Security and Variability of Examination Materials**

A host of concerns need to be addressed prior to the implementation of computer simulation as a viable replacement to the live patient clinical licensure process. One of the main concerns will center on security. The programs utilized for educational purposes and the programs utilized for licensure purposes will have similarities and differences. While educational programs may be structured to instruct interactively, the licensure process will be more structured toward assessment of skill sets without instructional prompting. Safeguards are needed to insure that the program materials unique to the licensing community are secure. The ability to secure computer based programs from unauthorized use is only as good as the most recent firewall, and is equally fragile to the next generation of computer hackers. Entry or access to computer based technology prior to an examination session could invalidate that session's results for all candidates taking the examination, and require immediate reprogramming and restructuring of examination materials. Failure of technology to remain secure will impact all candidates. During the traditional patient clinical examination process, each candidate's performance is independent of another candidate's effort. Failure of the overall patient based clinical examination is unlikely as each candidate demonstrates proficiency on his/her own patient. Breach of security and integrity of computer program material could indeed have catastrophic results for all candidates at an examination site or for the entire examination at all sites.

The potential for breach of security is not the only issue in test construction. Another equal concern will be familiarity of exam content and dissemination. As candidates take the simulation exercises, either from site to site (inter-site) or from day to day within one site (intra-site), the program material, test construct, and scenario of case presentation will become increasingly disseminated. In a patient-based clinical examination, this issue is minimized as candidates are graded upon how criteria were applied to their patient. The ability of simulation to create the diversity found in the patient may become problematic. The simulation of today may quickly lose its challenge to test candidate performance as the "game" is learned and information regarding "game performance" is transferred from candidate to candidate.

The patient-based examination endures time. It is not a simulation which requires continued maintenance and evolution. It is the essence of what practitioners do on a daily basis in its purest form. It does not attempt to construct anything. Variances in the patient are not failures of technology but presentations of reality of private practice and the "real world".

## **Perceptions and Misconceptions**

The politics of patient use in testing has vastly outpaced the technology of simulation. The arguments presented for simulation have been endorsed by those who speak to portability of the dental license, constitutional right to freedom of movement, and economic concerns rather than concern with public protection and quality assurance. It is the duty and mandate of the licensure community to assure the public that dental care is at least minimally clinically competent.

It has been stated that to use a patient during the licensure process is “barbaric” and equates the candidate performance during the licensure process as “to experiment on live human subjects”. Recent state legislation ventures further to state “the dental licensing examination still requires live human beings to be used as guinea pigs for the people taking the examination”. The verbiage of “abuse” and “experimenting on a human being” continues as a theme in these discussions.

It is irresponsible and inappropriate for these comments to be applied to the candidate sitting for clinical licensure examinations. Candidates have been certified by the Dean of the dental school they attended as having successfully completed an accredited program of dental education and training. They have performed clinical procedures daily for two to three years as part of that educational process, and further that they are certified as ready for graduation and will receive their degree in a matter of days. The clinical licensure examination performed on patients by these individuals is neither experimental nor abusive. The candidate has spent years of study preparing for entrance into their life long profession and have just completed a clinical course of instruction that will serve as the foundation to a life-long learning experience. To classify these individuals as barbarians is unjust and does a tremendous disservice to the educational process.

There are many individuals who graduate from educational facilities who fail to pass licensure examinations upon multiple attempts. It is a reality that clinically unprepared individuals can find their way through the current dental educational system and graduate.

The licensing boards through the clinical licensure process have served as the fail-safe mechanism to the educational process. Educators, concerned practitioners, and the public presently can be comforted that licensure safeguards are in place to address the issue of competence and identify the truly unprepared.

The rationale for elimination of the patient-based clinical licensure examination, or for complete elimination of any type of clinical examination, is that graduates of the American Dental Association (ADA) accredited schools, are by virtue of their education, competent, qualified and capable practitioners. It remains the objective of licensure examinations to identify those in need of remediation and additional training, prior to those individuals being allowed to practice unsupervised on the general public. There must be an independent assessment of the end product of the educational experience, i.e., an outcome assessment which is carried out by agencies apart from the school program.

What best protects the public good and assures that only competent and qualified individuals may enter the practice of dentistry is of paramount importance. These new professionals bring

with them agendas and demands well demonstrated in their published goals. Freedom of movement and freedom from licensure examination, as agenda items have moved from the strategic plan and website of the American Student Dental Association (ASDA) to the forefront of the ADA agenda. Membership recruitment may well be shaping the political posture of the ADA and appears to have taken on a role of primary importance.

The American Association of Dental Examiners (AADE) has, for over one hundred years, served as the national representative body of the members of state boards of dentistry as well as others who have a role in regulation, licensing and discipline. The authority granted to each state board of dental examiners, by that individual state's legislature, focuses and mandates those boards to protect the citizens of the state. This mandated duty of public protection and service to the citizens is carried out under oath. At times, however, the duties contrast sharply with the efforts of the dental profession at large who are not under the constraints of any such official duty. There are also many times when the needs of the profession are consistent with the licensing agencies' mandate of protection of the public, which allows beneficial effort to take place in harmony for the greater good of all. There are, unfortunately, other situations where interest groups other than state government, move in directions which serve to diminish public protection. The basic right of the citizens of each state to be assured that dental professionals are competent and qualified, must be protected and maintained.

Not all practitioners are perfect in every regard, in every procedure, every day. Having a bad day in the dental office can seriously impact a professional's stability, emotionally and economically. This is demanding of student and seasoned practitioner alike. Dentists are expected to perform consistently to a recognized standard of care. Licensing examinations are designed to test to the "safe beginner level" often described as "minimal clinical competency." Actually, candidates for licensure are assessed as to "critical" competency, i.e. whether the candidate has a basic understanding and the requisite skill to do no harm to his/her patient in situations encountered in the daily practice of dentistry. Failure to satisfactorily pass an examination based on minimal ("critical") clinical competency seems to make a clear identification of candidate unreadiness.

Every student and every practitioner should be continuously practicing at least at a minimal or critical level of competency. However, the proponents for elimination of the use of patients use as one of their main thrusts the argument that mandated candidate malpractice insurance for licensing exams is an admission of the dangerous jeopardy that patients are being exposed to, and subject to unreasonable risk. There are no risk management experts who would even consider that in today's world practitioners should treat any patient without having suitable professional liability protection. Licensed dental professionals are, as a group, overwhelmingly ethical and competent. Yet none would think to practice without insurance coverage. Having or requiring such protection on exams is certainly not an admission of substandard care.

Furthermore, dental licensing examinations have evolved by eliminating a number of tasks required on patients. Tests utilize non-live simulation wherever possible, presently up to three-fourths of the examination exercise content. Only those tasks which are not able to be replicated by inanimate material are performed on patients.

Failing efforts in periodontal exercises involve faulty diagnosis and the failure to remove calcareous tooth deposits, certainly not a damage to the patient during the test. Most

restorative failures involve remediable cavity preparation errors, including failure to recognize and remove caries, which is also remediable.

Patients are well aware that the exercises being performed on them are not guaranteed to be complete treatment, nor are they assured that the care being rendered will not need to be augmented. For instance, in the periodontal exercises, the patient is advised that only a small portion of their necessary scaling will be carried out during the examination. Fully signed, informed consent for treatment during the licensing exam is certainly ethical and within the same parameters as all patient treatment during the educational process.

Patients volunteer to assist candidates in their efforts to complete the examination exercises. Attacks on the examination process leveling complaints of seriously inconveniencing patients are unfair. The patients are fully informed as to the process and potential expectations.

### **Summary**

In their present state of development, manikins and computer based simulations serve a useful purpose for pre-clinical training of the dental and dental hygiene student. They are seriously inadequate, however, as assessment tools to evaluate competency to treat patients. The American Association of Dental Examiners (AADE) continues to advocate a realistic and responsible approach in assessing competency for licensure. The time may come, as technology evolves, when clinical simulation utilizing a new generation of manikins and other computer based methodologies will provide a viable alternative to the use of patients in licensure examinations. The dental and dental hygiene licensing community does not believe that time has arrived, and that no mandates can alter that fact. The examination and licensing community continues to monitor all developments in simulation for applicability, efficacy and affordability. At such time as new methodologies emerge for the valid, reliable measure of competency, they will be incorporated into the calibration, standardization and scoring protocols for testing and become an integral part of the dental and dental hygiene clinical licensure examinations.

Attachments – CRDTS’ Position  
NERB’s Position  
SRTA’s Position  
WREB’s Position

10/12/01

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### **Position Statement on Patient-Based Testing**

Many elements of organized dentistry and dental hygiene are currently considering a resolution or have taken a position in support of a resolution propagated by the American Student Dental Association (ASDA) to eliminate patients from assessments of clinical competence for licensure. In the controversy that has surrounded this issue, political expediencies have predominated rather than informed discussion of principles of assessment. Because the mission of Central Regional Dental Testing Service (CRDTS) is to provide to its participating State Boards expertise and methodologies for the valid and reliable assessment of competence to practice dentistry or dental hygiene, it is incumbent upon CRDTS to speak to this issue from the testing perspective. In doing so, it must be recognized that the ASDA resolution to eliminate patients from Board examinations does not fully disclose their actual objective. Based on their website, their ultimate goal is to eliminate clinical licensure examinations altogether; the 'elimination of human subjects in clinical licensure examinations' is one of seven subordinate objectives related to that goal.

CRDTS has a lengthy history of seeking innovative testing methodologies that expand the content of its clinical examinations to represent as large a sample as possible of the domain of dental competencies. In 21 years, no new patient-based requirements have been introduced. On the contrary, the requirement for a casting on a patient has been eliminated within the last decade. Indeed, CRDTS made the change in 1995 to require fixed prosthetics on a manikin instead of a patient in response to the concerns about patient availability. In addition, a manikin-based endodontic procedure was added to the exam so that for the last six years, forty to fifty percent of CRDTS' restorative procedures have been manikin-based. Although our surveys reveal that candidates strongly support manikins in lieu of having to find patients, the overwhelming majority do not like working on them. Candidates are highly critical of inconsistent occlusion, contact, and lack of fidelity to enamel and dentin. Both candidates and examiners agree that treating manikins does not provide an adequate simulation of patient treatment.

New testing methodologies are developed based on experience, professional expertise, available resources, and solid statistical evidence. Until such time as a realistic, affordable alternative is available that simulates the essential competencies required for patient treatment, CRDTS will not entertain a proposal to eliminate patient-based treatment from examination for licensure.

CRDTS' position is unequivocally supported by the following documentation.

Clinical licensure examinations have changed dramatically in the last twenty to twenty-five years. Throughout the 1960's and 70's, the hue and cry from both dental educators and students was that Board examinations were neither valid nor reliable and should therefore be eliminated. The use of patients in board examinations was also challenged at that time. With the resources and expertise made available through the formation of regional boards, the ensuing years have brought many revolutions in testing. Gone are the 'good ole boy' exams conducted in prisons or the basements of courthouses. In their place are clinical examinations conducted in modern clinical facilities with an administrative protocol that is founded on accepted and psychometrically sound principles of clinical evaluation. These principles include candidate anonymity, comprehensive candidate manuals, pre-determined performance criteria, well-calibrated examiners, standardized assessment procedures, standardized sampling of performance, patient variables equalized or controlled, appeals procedures and comprehensive statistical analysis. With these changes, dental testing agencies have moved to the forefront of experience and expertise in methodologies for the valid and reliable assessment of clinical competence.

For 25 years, CRDTS has been taking a systematic and scientific approach to the development and revision of its examinations. As a foundation for a complete revision of its dental examination in 1980, CRDTS commissioned two position papers on the future direction of clinical licensure examinations. The two consultants submitting papers were Richard S. Mackenzie, DDS, PhD of the University of Florida School of Dentistry, and Samuel S. Dworkin, DDS, PhD of the University of Washington School of Medicine. As part of their comprehensive recommendations, both these consultants addressed the role of patients in Board examinations, recognizing the obvious advantages to validity as well as the potential threat that patient differences pose to reliability. Recognizing that there is no acceptable substitute for or simulation of patients, they endorsed the continuation of patient-based testing with the caveat that the evaluation of patient-based procedures should focus on those essential competencies that are unique to patient treatment. This would include such treatment skills as pain control, moisture control, caries removal, soft-tissue management, patient health education, protection of the pulp chamber, periodontal management, etc. In addition, they urged CRDTS to explore other testing methodologies that would facilitate the assessment of decision-making skills such as diagnosis/treatment planning and clinical judgment, as well as dental disciplines that had not historically been part of the content of Board examinations.

Indeed, CRDTS has pursued such innovative directions for the last twenty years. A multiple-branching clinical judgment examination was introduced in the 1980's using typodonts with prepared treatment problems and latent image technology. This methodology was costly, confusing to candidates, and difficult to administer. It was ultimately abandoned in favor of case-based diagnosis and treatment-planning examinations in periodontics and removable prosthodontics. While quite reliable, this methodology was eliminated in 1997 to avoid redundancy when National Boards had completed its conversion of Part II to a case-based examination. Ever in pursuit of innovative ways to assess problem-solving skills, in the late

1980's CRDTS launched an effort to develop an interactive, computer-based examination to assess clinical judgment and treatment management skills. When funding could not be secured, this effort ultimately evolved into DISC. It was hoped that a broad-based organization of dental testing agencies and professional organizations could provide the expertise and attract the funding to develop this new methodology. But it must be recognized that an interactive,

computer-based examination was never intended, by CRDTS or any other clinical dental testing agency, to replace patient-based clinical examinations. It was intended to be an adjunct to the assessment of patient treatment skills, testing an essential part of the domain of dental skills that has heretofore not been specifically measured in Board examinations.

CRDTS made the change in 1995 to require fixed prosthetics on a manikin instead of a patient in response to the concerns about patient availability, time for lab work, and the demands of having patients return two days in a row, etc. In addition, a manikin-based endodontic procedure was added to the exam. From 1995 to 2000, porcelain-fused-to-metal and full-cast-crown preparations were required along with an interim restoration on a manikin. In order to assess an indirect procedure without the need for lab work, the candidate was required to fabricate an acrylic resin interim restoration. Although in practice assistants frequently fabricate interim restorations, this procedure proved to be the most difficult requirement of the entire examination; that is, it had the highest failure rate of all eight restorative procedures. In order to assess contour, contact and marginal integrity, it was CRDTS' intention to grade the interim restoration as if it were gold. However, just as typodonts are no substitution for patients, acrylic resin is no substitute for gold. In 1999, CRDTS concluded that the interim restoration was not a satisfactory testing methodology and resolved to return to a patient-based casting. This announcement precipitated such vitriolic responses from dental educators that a compromise was ultimately reached to require a finished casting on a prepared manikin tooth. Although surveys conducted by CRDTS reveal that candidate strongly support manikins in lieu of having to find patients, the overwhelming majority are highly critical of the inconsistent occlusion, contact, lack of fidelity to enamel and dentin in cutting a preparation, displacement of the gingival shroud, breakability, etc. Both candidates and examiners agree that treating manikins does not provide an adequate simulation of patient treatment.

The year before CRDTS introduced manikins into the examination, two field tests were conducted to assess the proposed scoring system and the logistics of managing the manikins. At that time, the four manikin-based and four patient-based procedures were partitioned into two separate freestanding sections of a four-part examination. The field test at Site I was conducted at a school in the northeast region which had a new, high-tech manikin laboratory; Site II was a school in the central region which had no manikin training in its curriculum but had a history of very strong clinical performance in restorative dentistry. At Site I, the failure rate on the patient-based restorative examination was 61.6% compared to a failure rate of 18.2% at Site II. In the manikin-based simulated clinical examination, the failure rate at Site I was 22.1% compared to 50.7% at Site II. This data strongly suggests one cannot generalize that competent clinical performance on a manikin assures equally competent patient treatment. The reverse is also true - practitioners who provide competent care of patients do not necessarily perform well on a manikin. Luckily, to date no one has applied for licensure to treat manikins.

In 1988, CRDTS commissioned a psychometric review of all its examination, scoring, and analysis practices. This review was conducted by John Littlefield, PhD, of the University of Texas Health Science Center at San Antonio, and John Norcini, PhD, Sr. Vice-President of the American Board of Internal Medicine. These two measurement specialists endorsed the use of manikins because of the potentially greater standardization, a position also espoused by the ASDA. Drs. Littlefield and Norcini suggested that in CRDTS' annual analysis the standard deviation between patient-based and manikin-based procedures should be compared; the

hypothesis being that manikin procedures should have a lower standard deviation because all patient variables were eliminated. However, the data did not validate this hypothesis. In 1999, CRDTS found that the four patient-based restorative procedures had an average standard deviation of 1.45 while the four manikin-based procedures had an average deviation of 1.71. Although the disparity between standard deviations was less in 2000, the trend was the same.

As further documentation of the impact of patient variables on examination results, CRDTS has monitored and analyzed such variables for 25 years. When treatment selections are approved, CRDTS' examiners record the tooth number, the type of lesion, its relative size, whether an existing restoration is present, and any special notes about access, occlusion, etc. All these classifications are analyzed for differences in failure rates for each procedure and for the entire examination. The only statistically significant difference that has emerged occasionally, but inconsistently, has been a difference between molars and premolars with molars appearing to be more difficult. However, when an in-depth analysis is done of the differences between molars and premolars, no consistent variable can be isolated such as depth of caries, location, 2-surface vs. 3-surface, etc. The data consistently indicates that variables between patients do not negatively impact examination results. Patient variables should be continually monitored and can be readily controlled by reasonable patient acceptability criteria and scoring compensations whenever statistically significant differences may be identified. For a number of years, CRDTS applied scoring compensations in its periodontal and dental hygiene examinations. That approach has since been abandoned in favor of more specific patient acceptability criteria. It should also be noted that, as inadequate as typodonts are as a testing medium for restorative skills, those inadequacies are multiplied many times when manikins are used for periodontal treatment. Not only is a simulation of the dentition required, but a replication of the entire periodontium. Manikins are grossly inadequate for such a simulation.

At their current state of development, manikins are useful for preclinical training, but are seriously inadequate for assessments of competence to treat patients. As technology evolves, better clinical simulations are being developed and will surely continue to emerge in the future. CRDTS will continue to monitor these developments for applicability and affordability. At such time as new methodologies are appropriate for the valid and reliable assessment of clinical competence, they will be incorporated into the examination.

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Resolution 64H was adopted by the American Dental Association House of Delegates in 2000. Resolution 64H adopts as ADA policy that the Association supports the elimination of the use of human subjects in the clinical licensure examination process by 2005.

The licensing jurisdictions are charged by their respective empowering statutes with the duty to protect the health, welfare and safety of the public. Specific dental licensure requirements vary among the different jurisdictions, but all have three common requirements: an educational requirement, a written (theoretical) examination requirement and a clinical examination requirement.

The educational requirement accepted by all licensing jurisdictions is graduation from a school accredited by the Commission on Dental Accreditation of the ADA. Additionally, this requirement can be met by individual programs approved for licensure purposes by an individual licensing jurisdiction solely for its own licensees. The educational requirement is intended to assure the public that the candidate for licensure has successfully completed a structured, formalized course of study, comprehensive in nature and over a substantial period of time, as set forth in the Commission on Dental Accreditation's standards.

The written (theoretical) examination requirement is meant to assure the public that not only did the potential licensee attend a comprehensive, formalized course of study, but that the candidate successfully assimilated the theoretical knowledge of the basic biomedical and dental sciences taught in such institutions. The National Board Dental Examinations, developed by the Joint Commission on National Examinations of the ADA, are intended to fulfill or partially fulfill the written (theoretical) examination requirement. These examinations are designed to assist the State dental boards in determining whether or not a graduate of an accredited or approved dental school has individually assimilated the theoretical basis of biomedical and dental science taught in those schools to a level of competency that protects the health, welfare and safety of the public.

The clinical examination requirement is meant to assure the public that a candidate for licensure demonstrates independently, to those charged solely with the protection of the public, the critical clinical knowledge, skills and abilities necessary to safely practice dentistry. Fulfillment of this requirement usually occurs subsequent to the attainment of the previous two requirements for licensure and just prior to the candidate's entry into the independent practice of dentistry.

The North East Regional Board of Dental Examiners, Inc. *Complete Clinical Examination in Dentistry* consists of four separate and distinct clinical performance assessments, each identified as critical to the health, welfare and safety of the public by the participating jurisdictions. Each assessment area must be satisfactorily completed to demonstrate and gain the status of competence in these critical, clinical areas. The four critical assessments include: the Restorative Exercise, the Periodontal Exercise, the Simulated Patient Treatment Clinical Exercise (includes Endodontics and Fixed Prosthodontics) and the Dental Simulated Clinical Exercise (DSCE). The Restorative and Periodontal Exercises are performed on live patients.

The NERB has always made a concerted effort to eliminate the use of the live patient in its licensure examinations without compromising the validity, reliability and fidelity of the assessment process. Two-thirds of the current NERB clinical examination in dentistry is accomplished through valid and reliable patient simulations. Certain aspects of the clinical demonstration of the knowledge, skills and abilities of prospective licensees as to Endodontics and Fixed Prosthodontics are currently assessed on the Simulated Patient Treatment Clinical Exercise. The clinical demonstration of knowledge, skills and abilities in performing the art and science of diagnosis and treatment planning is currently assessed on the Dental Simulated Clinical Examination. As recently as September, 2000, the leadership of the NERB solicited specific written recommendations and assistance from members of the American Dental Education Association for any suggested change in the examination content and process that would assist in the evaluation of candidates without compromising our duty to participating licensing jurisdictions.

The Dental Simulated Clinical Exercise (NERB DSCE) is developed and administered by the NERB as a part of its complete clinical examination for licensee. As part of its complete clinical examination in dentistry, the NERB utilizes the NERB DSCE as a standardized, computer-simulated exercise in diagnosis and treatment planning. The purpose of this format is the uniform evaluation of critical, clinically specific proficiencies in diagnosis and treatment planning necessary for the protection of the public.

The NERB DSCE has recently been recognized through the efforts of the ADA, JCNDE and the NERB in an independent study<sup>1</sup> conducted by Knapp and Associates International, Inc. as a reliable clinical performance sequel to the National Board Dental Examinations. The study noted that the NBDE Part II is a comprehensive achievement examination in the theory of dentistry and is a prelude to clinical performance examinations that may be conducted on live patients as well as on simulated patients such as the NERB DSCE.

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<sup>1</sup>The NBDE Part II and the NERB DSCE Examinations: A Comparability Study. Knapp & Associates International, Inc., June, 2001

The NERB DSCE has been identified as an integral part of the complete NERB Clinical Examination in Dentistry. Simulations of actual patients are utilized through computer-enhanced photographs, radiographs, optical images of study and working models, laboratory data and other clinical digitized reproductions. The NERB DSCE is divided into three sections, each designed to assess more complex levels of diagnosis and treatment planning knowledge, skills and abilities.

- The DOR Section is designed to assess the examinee's abilities to recognize critical clinical conditions or situations encountered daily in the general practice of dentistry.
- The CTP section is designed to assess the examinee's abilities to not only recognize critical clinical conditions or situations encountered daily in the general practice of dentistry, but also to identify the appropriate treatment options required for the clinical condition or situation depicted in single issue simulations.
- The PPMC Section is designed to assess the examinee's abilities to recognize critical clinical renditions or situations encountered daily in the general practice of dentistry and to formulate appropriate treatment options in a more integrated fashion than in the CTP Section.

The purpose of the NERB DSCE is to provide a standardized examination exercise in areas of clinical diagnosis and treatment planning and the primary focus of the exercise is clinically-specific, critical proficiency.

The purpose of the NERB DSCE cannot be taken out of the context of the complete NERB Clinical Examination series of which it is a part. The independent study cited above shows that the simulated items on the NERB DSCE are clearly assessing the application and synthesis of clinical knowledge to practice-related situations and tasks. Furthermore, the remaining exercises in the clinical series are based on the actual performance of clinical tasks and attempt to assess the application of skills beyond those that would be considered cognitive and, therefore, not amenable to a multiple-choice test format (e.g. digital dexterity). Thus, the NERB Clinical Examination in Dentistry, in total fulfills the purpose of the program: "to determine the clinical eligibility of candidates for dental licensure."

The NERB DSCE is devoted to assessing whether the dentists can take the building blocks (clinical knowledge) attained in dental school and apply them to specific and somewhat complex, practice-related situations that attempt to assess diagnosis and treatment planning. Further, when the NERB DSCE is evaluated within the context of the NERB Clinical Examination sequence, it is clear that all the NERB assessments are practice-related, as they should be since this examination is the "final test" in the credentialing sequence in 15 licensing jurisdictions.

These jurisdictions have an obligation to protect the health, welfare and safety of the public. The examining community has a corresponding duty to provide licensing jurisdictions with evidence that confirms the competence attested to by educational institutions of those to be licensed. The examining community relies on the certification of the dean and faculty of the dental school or dental hygiene program that senior students who are taking the clinical examinations have achieved a sufficient level of competence prior to permitting the individuals to participate in the licensure assessment on live patients. Some of these individuals, identified as having achieved a sufficient level of competence to treat live patients in an unsupervised manner, still cannot recognize dental caries, excessive depth of tooth preparation encroaching on pulpal tissue, or actual pulp exposures.

Traditionally, clinical licensure examinations in dentistry have been performed on live patients. Many of these clinical skills and abilities that are amenable to simulation are currently being tested on other than live patients where the resultant judgments necessary for the safety of the public are valid, reliable and accurate. Currently however, the technology does not exist to test all critical clinical knowledge, skills and abilities on a typodont, manikin or computer-simulation. The NERB will continue to utilize the least intrusive methods available in its testing procedures, including consideration of technological advances as alternatives to the use of live human subjects, to provide its participating jurisdictions with valid, reliable and accurate clinical assessments to assist those entrusted with assuring the health, welfare and safety of the public.

## **Southern Regional Testing Agency, Inc.**

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May 4, 2001

ATTN: All Concerned Parties

RE: Southern Regional Testing Agency, Inc. (SRTA) response to ADA 64H-2000

ADA Resolution:

*“64-H 2000: Resolved, that the Association supports the elimination of the use of human subjects in the clinical licensure examination process by 2005, and be it further*

*Resolved, that the Association transmit this policy to all clinical testing agencies.”*

SRTA is opposed to Resolution 64-H and will not support the elimination of human subjects completely from its clinical licensure examination. This position is based on the following:

1. There are currently no simulated modalities which measure the skills *required for licensure* of candidates in certain specific areas of dental practice. Among these areas are periodontic treatment and diagnosis, including scaling and root planing, adequate removal of decay from a prepared tooth, variables of tooth form and pulp chamber location in young versus older patients, patient management and pain control for routine dental procedures, etc.
2. SRTA is in compliance of item 4 of the Agenda for Change developed at the Invitational Conference for Dental Clinical Testing Agencies (March 4, 1997), which states:

*“4. Minimize the use of human subjects in clinical licensure examinations, but where human subjects are used, ensure that the safety and protection of the patient is of paramount importance and that the patients are procured in an ethical manner.”*

Forty percent (40%) of the current SRTA examination is simulation-based. At this time, there are *no means* to replace the remaining patient-based sections, which would give our states *accurate* information in determining the minimal competency level required for licensure. Patient procedures are carefully monitored by the Clinical Floor Coordinator (CFC) and examiners in the scoring area. The protocol is

in place which provides for immediate cessation of patient procedures where improper treatment is contemplated or being performed. Candidates are *required* to have licensed practitioners of record who will treat the incomplete or emergency procedures on their patients.

3. No positive correlation between available simulated performance on a mannequin or other device compared to the performance on a human subject has ever been scientifically demonstrated. In fact, there have been indications to the contrary. A comparative study of simulated (mannequin) versus patient-based performance of candidates at two Midwestern schools indicated a significant result. Students whose training relied heavily on simulated-based procedures performed very well on a simulation only examination, but performed poorly on a patient-based examination. Conversely, candidates from another school whose clinical training was heavily patient-based performed very well on a patient-based examination, but poorly on a simulation-based examination. Currently, simulation performance does not translate to an accurate representation of patient-based treatment or assessment.
4. Patient-based portions of licensure examinations work, and therefore should continue to be used until a *suitable and representative* replacement can be developed. Would it likewise be equally absurd to remove the patient from the dental school environment? At what point is it appropriate to have a dental student perform treatment on a real human subject, for a pilot in training to actually fly a plane, a surgical resident to operate on a real live patient, and so on? 'Me acceptable performance of all of the above must be demonstrated prior to being licensed to perform their services for the public. *Should not the patient of a newly licensed dentist have the assurance that his/her dentist has passed an entry level, patient-based examination, rather than a simulation-only examination?*

In conclusion, considering present technology, the replacement of the human subject portion of the SRTA examination is not a viable option. The Southern Regional Testing Agency, Inc. is committed to administer licensure examinations which accurately reflect the level of candidate competence that is required for licensure in the member and participating states. As previous members and current members of the State Boards of Dentistry/Dental Examiners, each individual SRTA examiner has been sworn to an oath to protect and serve the citizens of the state they represent. We feel that our SRTA examination allows the examiner(s) to be confident that it does serve to protect the public as intended. Therefore, at this time, we will not participate in, nor endorse, the development of a simulation-only examination for dental licensure.

Sincerely,

Stephan F. Holcomb, DMD  
President, Southern Regional Testing Agency, Inc.

## **Western Regional Examining Board, Inc.**

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### **WREB Position on the Use of Live Patients for Clinical Examinations**

The Western Regional Examining Board (WREB) is a not for profit testing agency whose purpose is to provide clinical licensing examinations for its member states. WREB is under an obligation to provide examinations that are, per contract with member states, "sufficiently comprehensive and realistic as to fairly and reasonably test and reveal the clinical knowledge and competence of the candidates for licensure as Dentists or Dental Hygienists". WREB believes that the primary purpose of licensure testing is to protect the public, although the interests of all stakeholders in the licensure process are considered when making testing decisions.

The clinical examinations developed and administered by WREB rely heavily upon the use of patients to evaluate candidates for licensure. This allows for many of the tasks tested on patients to be the same patient tasks that are required of the candidates when they begin their professional practice. Testing these tasks on patients provides the maximum realism and validity in the use of test results when making the decision to license candidates based upon candidates' test performance.

When developing examinations and determining what tasks should be evaluated, WREB considers relevance to practice and the ability to effectively evaluate each task. As in most testing situations, a WREB examination is a sample of the tasks from the domain of the tasks performed in practice. WREB tests candidates on performance of tasks on patients that are performed in practice whenever possible in order to maximize the validity of licensing decisions. When tasks cannot be evaluated using patients during the tests, substitutes are used, such as extracted teeth for endodontic treatment. Some professional tasks are not tested because methodologies for testing are not available.

WREB watches the progress in the development of typodonts and simulated oral tissue which could provide an opportunity to obtain measures of candidate performance. Review of new technologies for many years has not provided WREB viable options for replacing human patients or for significantly decreasing the number of tasks that require patients. The board believes that the models reviewed to date are inadequate to provide measures of candidate performance that are suitable to replace live patients.

Although WREB acknowledges the philosophical concerns with using live patients for licensing tests, WREB does not believe that using live patients at WREB tests is more damaging to patients than treatment they might receive elsewhere. Candidates are under considerably more scrutiny than a dentist or dental hygienist in practice. WREB examinations are supervised by floor examiners who observe infection control practices and the conduct of clinical operations. In extreme cases, candidates may be removed from the examination for improper actions. Candidates are under pressure to accomplish the best work possible, since obtaining their licenses depends upon the treatment they give.

WREB recognizes that candidates perceive that differences in their performance are sometimes related to patient selection. WREB has worked diligently to define acceptance criteria, scoring criteria, and passing standards to minimize the effect on candidate scores that results from patient differences. WREB has developed a schedule for testing activities that allows candidates flexibility to resolve unexpected concerns. WREB understands that candidate scores may be affected by patients who do not appear for the examination or who must leave the examination because of unforeseen events. WREB tests allow for back-up patients which reduces the effect of this problem. WREB will continue to pursue new methodologies and technologies that could further reduce the impact of patient availability.

In summary, WREB does not unequivocally oppose a reduction of testing on live patients, but has not been able to find technology or methods to allow elimination of their use. The importance of the validity of the licensing decisions that result from the test scores must be a primary concern since the licensing test is presently the best measure of a candidate's ability to practice on patients. WREB constantly reviews the testing process and regularly updates the tests it administers. When alternatives are developed that have a demonstrated ability to provide the same validity as testing that uses human patients, WREB will be ready to consider adoption of those technologies or methodologies.