

**National Athletic Trainers Association Board of Certification  
Annual Report on the National Certification Examination  
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The National Athletic Trainers Association Board of Certification (NATABOC) provides a national certification program for professional athletic trainers. Most states recognize NATABOC certification as a requirement for employment as an athletic trainer, and the credential is a requirement for employment throughout the United States. NATABOC holds accreditation from the National Commission for Certifying Agencies, a not-for-profit body whose standards are designed to ensure quality protection for the public and fairness for certificants and individuals seeking certification.

Among the eligibility criteria that candidates for certification must meet in order to achieve NATABOC certification is successful performance on a three-part examination. The examination is designed to assess competence in athletic training in such a way as to ensure that only those individuals who are competent to provide safe and effective service to athletes and other members of the public receive the credential. All parts of the examination are based on the Role Delineation Study for Athletic Trainers which NATABOC completed in 1994.

Columbia Assessment Services (CAS), a professional testing company that specializes in the development and administration of licensure and certification tests, works with NATABOC to develop and score the certification examination.

### **The Written Examination**

NATABOC uses the written portion of the test to assess whether or not candidates possess sufficient understanding of the principles, practices, and science underlying the practice of athletic training. The written portion of the examination includes 150 multiple-choice questions. NATABOC develops two equated versions of the written test each year, linking the test to a content outline developed as part of the Role Delineation Study and establishing the score candidates must achieve to pass the test with the Angoff Modified Technique, a criterion-referenced procedure.

Each question on the examination is written by experts in athletic training who have been trained in how to meet the requirements for high quality multiple-choice questions. Each question is then reviewed and edited by other experts in athletic training who focus on the accuracy of the question, the correctness of the keyed response, the plausibility but incorrectness of the distractors, and the clarity and fairness of the question. CAS then conducts a review to ensure that standards governing the development of multiple-choice questions are satisfied and that grammatical conventions are met. Each question must then be referenced to a published resource in athletic training and validated for importance, criticality, and relevance to practice. After passing each of these requirements, the question is added to NATABOC's item bank.

Examination assembly then occurs, including a careful review of an analysis of the statistical performance of each question on the examination. The purpose of this review is to verify that the questions are fair and appropriate for candidates and to determine if modifications are necessary to enhance the psychometric quality of the questions. It is during the annual test assembly meetings that NATABOC selects questions in accordance with specifications from the Role Delineation Study that will be used on the new versions of the test.

### **The Written Simulation Examination**

Not only must athletic trainers possess an adequate base of knowledge, but they must use sound professional judgment in rehabilitating and managing athletic injuries. The written simulation portion of NATABOC's examination is designed to assess whether or not candidates for certification make decisions appropriately. To achieve this purpose, each version of the test (two each year) presents eight problems linked to the 1994 Role Delineation Study by means of a Simulation Validation Study which NATABOC completed in 1996. As for the written test, NATABOC employed criterion-referenced procedures to establish the score candidates must achieve in order to pass the written simulation. Scores are scaled and reported on a range from 200 to 800, and all versions of the test are equated.

Another panel of experts in athletic training writes the problems under the direction of CAS. Systematic review and discussion of the problems then takes place to ensure their accuracy and clarity and to adhere to psychometric requirements for this type of examination. After additional review by CAS and by the panel experts some time later, problems are validated and approved for the item bank.

Then, following the specifications of the Validation Study, NATABOC assembles the written simulation examination. The panel evaluates the statistical performance of existing problems and incorporates appropriate modifications, reviewing the content and logic of the problems again before approving them for use on the test.

### **The Practical Examination**

Athletic trainers must employ a wide variety of techniques correctly in providing competent service to athletes. The purpose of the practical examination is to assess whether candidates for certification demonstrate the necessary level of skill. In the test, candidates are required to engage in a variety of procedures and techniques that athletic trainers rely on in their jobs. Test development for the practical examination is informed by the Role Delineation Study and linked logically to it.

Development of the practical test is achieved with essential input from experts in athletic training. An expert panel writes the problems, which include a statement of the procedure to be performed as well as criteria for scoring performance. Scoring criteria, called tasks, are used by examiners to ensure that scores are based only on the essential elements of correct performance. They are designed so that examiners can look for the essential elements of correct performance and record their observations accurately.

After problems are written, the panel of experts evaluates the statement of required performance given to the candidates as well as the scoring criteria by performing the problems a number of times. This critical process maximizes the validity and accuracy of this examination. Problems are then validated and added to the item bank. As with the other parts of the test, CAS reviews the problems and works closely with the panel to ensure that the test conforms to standards for non-written examinations.

Each year NATABOC assembles the practical examination by reviewing the statistical performance of the test and fulfilling specifications governing its content. NATABOC monitors the ongoing performance of this part of the examination by collecting essential data and evaluating the comments of examiners, candidates, and experts in athletic training.

### Summary Statistical Analysis

CAS calculates a variety of statistics in order to monitor the performance of the examination. One of the statistics (internal consistency reliability) indicates the degree to which items (questions, problems, or scoring criteria) assess competence in athletic training in a consistent manner. The reliability estimate used in the NATABOC examination (Kuder-Richardson 20) ranges from 0 to 1, where coefficients close to 0 are interpreted as being unreliable and coefficients close to 1 are interpreted as being highly reliable. Standards for interpreting the internal consistency statistic indicate that the estimates should exceed .70 in order to say that a test is adequately reliable.

Another important statistic estimates the accuracy in scores. This coefficient, the standard error of measurement, describes the true score distribution, or the range within which a candidate's score should be interpreted. The standard error of measurement is usually very close to 5 on tests with 150 questions and strong internal consistency.

Table I reports internal consistency estimates for the practical examination. In addition, NATABOC calculates interrater reliability coefficients to estimate agreement between examiners on the practical. CAS reports interrater reliability for each test date and site in a separate report.

**Table I. Examination Reliability and Standard Error of Measurement**

	Written		Simulation		Practical			
<b>Form</b>	256	257	262	263	258	259	260	262
<b>KR-20</b>	.79	.77	.93	.93	.73	.75	.72	.72
<b>SEM</b>	5.05	4.97	9.42	9.37	2.96	3.02	2.97	2.98

### Summary Information about Candidate Performance

A total of 4580 written examinations were taken in the testing year ending in February 1998, including new and repeat candidates. 4057 written simulation tests were administered in the year, and 3812 practical tests were given. 32% of the candidates passed the test on the first attempt. Candidate pass/fail information is provided in Table II.

**Table II. All Candidates**

	<b>Total Sitting</b>	<b># Pass</b>	<b>% Pass</b>	<b># Fail</b>	<b>% Fail</b>
<b>Written</b>	4580	2268	49.52%	2312	50.48%
<b>Simulation</b>	4057	2232	55.02%	1825	44.98%
<b>Practical</b>	3812	2213	58.05%	1599	41.95%

NATABOC requires candidates to take all three parts of the test at the first sitting after meeting all other certification requirements. Candidates completing programs approved by the National Athletic Trainers Association are often referred to as curriculum candidates, and those qualifying for certification by taking a specified set of courses and completing an internship are referred to as internship candidates. There were 2388 first-time candidates in 1997. Of these, 883 were curriculum candidates and 1505 were internship candidates. Overall, 31.7% of the first-time candidates passed all three parts of the test on the first attempt. Table III reports the performance of first-time candidates and provides an analysis separately for curriculum and internship candidates.

**Table III: Candidates Taking the Examination for the First Time**

	<b>Total Sitting</b>	<b>Total Pass/%</b>	<b>Total Fail/%</b>	<b>Total Curric*</b>	<b># Curric Pass/%*</b>	<b># Curric Fail/%*</b>	<b>Total Intern</b>	<b># Intern Pass/%</b>	<b># Intern Fail/%</b>
<b>Written</b>	2388	1398/58.5	990/41.5	883	590/66.8	293/33.2	1505	808/53.7	697/46.3
<b>Simulation</b>	2388	1297/54.3	1091/45.7	883	510/57.8	373/42.2	1505	787/52.3	718/47.7
<b>Practical</b>	2387	1397/58.5	990/41.5	883	597/67.6	286/32.4	1504	800/53.2	704/46.8

*\*Refers to undergraduate curriculum candidates only*

The performance of candidates who were unsuccessful on any or all parts of the test in 1997 or previous years is reported in Table IV for the instances in which they retook needed parts. The table shows the information for all retake candidates together and for curriculum and internship candidates separately.

**Table IV: Candidates Retaking the Examination**

	<b>Total Sitting</b>	<b>Total Pass/%</b>	<b>Total Fail/%</b>	<b>Total Curric*</b>	<b># Curric Pass/%*</b>	<b># Curric Fail/%*</b>	<b>Total Intern</b>	<b># Intern Pass/%</b>	<b># Intern Fail/%</b>
<b>Written</b>	2192	870/39.7	1322/60.3	581	255/43.9	326/56.1	1611	615/38.2	996/61.8
<b>Simulation</b>	1669	935/56.0	734/44.0	543	351/64.6	192/35.4	1126	584/51.9	542/48.1
<b>Practical</b>	1425	816/57.3	609/42.7	386	256/66.3	130/33.7	1039	560/53.9	479/46.1

*\*Refers to undergraduate curriculum candidates only*

Descriptive statistics about candidate performance on the test are reported in Table V. The scores are equated to the anchor version of the test, which NATABOC introduced in 1996, and the data reported in the table are equated scores. The highest score achieved by any candidate on the written examination was 140 out of 150, and the lowest score was 48. The average score was 104.8, and 10.6 was the standard deviation. The distribution of scores indicates that the test challenges the most knowledgeable candidates and that the least knowledgeable candidates achieve scores that are considerably higher than those that would result from random guessing.

The highest score on the written simulation during the year was 736 out of 800. Several candidates received a score of 200, the lowest possible. The overall average score was 501.38, with a standard deviation of 96.7. Like that for the written, the distribution observed for the written simulation shows that candidates with the greatest decision-making ability are challenged by the test. Candidates receiving 200 either earn the score by making inappropriate choices in the examination or failing to complete large sections of the examination.

The maximum number of points on the practical portion is 50, and the highest score achieved was 49. The lowest score on the practical was 12 while the lowest possible score is 0. On average, candidates scored 35.13, with a standard deviation of 6.2. The test appears to challenge candidates at an appropriate level.

### Updating the Role Delineation Study

Plans for updating NATABOC's Role Delineation Study began in 1997 with the appointment of a committee of experts in athletic training to plan the study. CAS met with the committee in December for the purpose of providing an overview of the purpose and role delineation process and determining an appropriate timetable. Discussion focused also on the contribution members of the committee might make in reviewing current literature on the practice of athletic training. CAS anticipates that the literature review will be valuable in identifying the performance domains around which athletic training services are organized.

**Table V. Descriptive Statistics of Candidate Performance.**

	<b>Written</b>		<b>Written Simulation</b>		<b>Practical</b>	
<b>High Score</b>	140		736		49	
<b>Low Score</b>	48		200		12	
<b>Average Score</b>	Overall	104.8	Overall	501.4	Overall	35.1
	Curriculum	107.1	Curriculum	513.7	Curriculum	36.6
	Internship	103.7	Internship	494.7	Internship	34.4
<b>Std. Dev.</b>	10.6		96.7		6.2	

The Role Delineation Study for athletic trainers will be conducted in two phases, the first of which is planned for October 1998, and the second for winter, 1999. The first phase will use the literature review as the point of departure for development of the domains, tasks, and knowledge and skill statements. The study will specify clearly elements of the outline that involve knowledge, decision making, and practical skill, so as to facilitate the content validation of the three-part examination.

The literature review will be edited by CAS prior to its approval and included in the final report after the validation study has been completed.

## **Examiner Training**

NATABOC also undertook the development of a new program through which examiners for the practical part of the test will be trained in their role and procedures for scoring. CAS consulted in the planning of the program and expects to be involved throughout its development. In providing leadership for the project, CAS relied on an approach based on Instructional Systems Design which is appropriate when the training program covers a broad geographic region and will be implemented with a variety of media. Fundamental to the training program is a job analysis for examiners which the Test Site Administrator Committee conducted in December 1997.

The Test Site Administrator Committee and the Practical Test Committee will work together to plan specific components of the training program and establish criterion standards to which examiners must conform in order to qualify for service.

## **Summary**

NATABOC invests considerable effort in developing and implementing its examination to ensure validity and reliability. An annual cycle of meetings involving subject matter experts in athletic training helps to achieve NATABOC's objectives for quality. The development cycle also helps NATABOC to build an adequate supply of questions and problems enabling the tests to sample the content specifications in a representative manner.

Candidate performance on the examination was reported for all parts of the examination, as was internal consistency reliability analysis. This information described the number of candidates taking the test overall and in various groups, such as first-time candidates, retake candidates, curriculum candidates, and internship candidates. The information also described average performance, the range of scores, and distributional statistics for each part of the test.

## **Recommendations**

CAS encourages NATABOC to continue planning efforts for the new Role Delineation Study. Since the educational community in athletic training uses the study to support curriculum development, it is critical that the validated study reflect current practice and understanding as they define the practice of athletic training.

CAS further encourages the development of the examiner training program in order to ensure valid and accurate decision making on the basis of candidate performance on the practical examination. Examiner training is the best way to address issues in scoring the test that present threats to valid and accurate scores.