Technical Manual for the RN Comprehensive Predictor® 2019
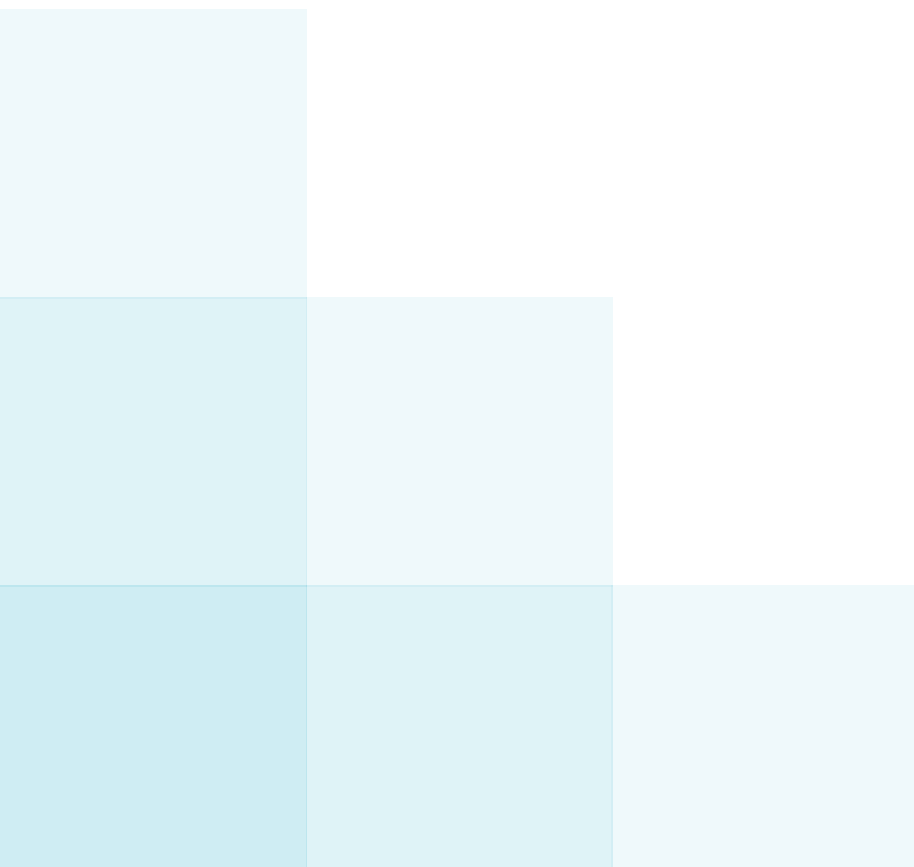
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Executive Summary

The RN Comprehensive Predictor[®][1] 2019 is the sixth version of Assessment Technologies Institute's (ATI) RN Comprehensive Predictor. The assessment contains 150 scored items and is intended to measure a student's readiness for the NCLEX-RN[®]. The intended population for the test is any student at or near the completion of the coursework necessary for the RN nursing degree. The purpose of the ATI RN Comprehensive Predictor 2019 is twofold: first, to provide students and educators with a numeric indication of the likelihood of passing the NCLEX-RN at the student's current level of readiness; second, to guide remediation efforts based on the exam content missed.

This report analyzes data from the all-attempt scores of examinees who completed the RN Comprehensive Predictor 2019. The findings in this report provide evidence in support of the reliability and validity of the Comprehensive Predictor scores. Other aspects of validity are also discussed, including efforts made to promote content validity and to investigate construct irrelevant variance. Details regarding demographic information, item analyses, and test development are included. All released RN Comprehensive Predictor 2019 items underwent a judgmental and empirical bias review process. Details of these analyses are provided in this report as well.

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[1] RN Comprehensive Predictor[®] is a registered trademark of Assessment Technologies Institute.

I. Introduction

This report is organized by chapter to specifically address the issues cited by the APA, AERA, and the NCME *Standards for Educational and Psychological Testing* (2014) as most critical in validation documentation for a test. According to the *Standards,* "Claims by test developers or test users that a test, manual, or procedure satisfies or follows the standards in this volume should be made with care. It is appropriate for developers or users to state that efforts were made to adhere to the *Standards*, and to provide documents describing and supporting those efforts" (p. 7). Accordingly, this technical report makes no claim to meet the *Standards* as a whole or to address all 240 published standards. Specific standards judged by the report author to be most relevant to the topic at hand are quoted; however, this does not imply that they are fully met or that unquoted standards are disregarded.

II. Purpose and Intended Use

Standard 1.1 – The test developer should set forth clearly how test scores are intended to be interpreted and consequently used. The population(s) for which a test is intended should be delimited clearly, and the construct or constructs that the test is intended to assess should be described clearly.

Standard 1.2 – A rationale should be presented for each intended interpretation of test scores for a given use, together with a summary of the evidence and theory bearing on the intended interpretation.

ATI is responsible for the development and scoring of the RN Comprehensive Predictor 2019 assessment, while the client institutions using the exam are responsible for the decisions based on the test scores. In order for institutions to properly interpret these scores and make sound decisions, it is first necessary to understand the nature and intended use of the Comprehensive Predictor. The purpose of the ATI RN Comprehensive Predictor 2019 is twofold: to provide students and educators with a numeric indication of the likelihood of passing the NCLEX-RN at the student's current level of readiness and to guide remediation efforts based on the exam content missed. Recommendation for remediation is achieved by providing a list of topics related to missed items in the individual and group score reports. To provide the numeric indication of NCLEX-RN readiness, ATI conducted a statistical projection of student performance on the RN Comprehensive Predictor 2019 and actual NCLEX-RN first attempt pass/fail status. Table 1 displays the results of this process, which is described in more detail later in this report. Each student's individual score, expressed as a percent correct, is associated with a probability of passing the NCLEX-RN. The relationship between Comprehensive Predictor scores and probability of passing the NCLEX-RN rests on these assumptions:

The students taking the assessment are at or near completion of an RN nursing program and are about to sit for the NCLEX-RN. Students who still require a significant amount of instruction before taking the NCLEX-RN may be expected to under-perform on the Predictor.

The probability of passing the NCLEX-RN exam refers to students' first NCLEX-RN attempt after taking the Predictor. After repeated attempts, it is expected that most students will eventually pass the NCLEX-RN, but these attempts are outside the realm of the Predictor.

The typical expectations of students taking a standardized test are met (e.g., students are motivated to perform, no cheating has occurred, the test is given under standardized conditions in a proctored environment).

To the extent that these assumptions are not met, the validity of the prediction and of the test scores themselves may be in question. More details on the predicted probability of passing are discussed in Chapter V.

Table 1

Expectancy Table of Individual Percent Correct Scores and Predicted Probability of Passing NCLEX-RN

RN Comprehensive Predictor® 2019 Individual Score	Predicted Probability of Passing the NCLEX-RN®
80.7% - 100.0%	99%
78.7% - 80.0%	98%
75.3% - 78.0%	96% - 97%
74.0% - 74.7%	94% - 95%
72.0% - 73.3%	92% - 93%
70.0% - 71.3%	88% - 90%
68.7% - 69.3%	84% - 86%
67.3% - 68.0%	80% - 82%
65.3% - 66.7%	73% - 78%
62.7% - 64.7%	60% - 70%
57.3% - 62.0%	33% - 57%
0.0% - 56.7%	1% - 30%

III. Test Development Process

Standard 1.11 – When the rationale for test score interpretation for a given use rests in part on the appropriateness of test content, the procedures followed in specifying and generating test content should be described and justified in reference to the intended population to be tested and the construct the test is intended to measure or the domain it is intended to represent. If the definition of the content sampled incorporates criteria such as importance, frequency, or criticality, these criteria should also be clearly explained and justified.

Standard 4.1 – Test specifications should describe the purpose(s) of the test, the definition of the construct or domain measured the intended examinee population, and interpretations for intended uses. The specifications should include a rationale supporting the interpretations and uses of test results for the intended purpose(s).

Standard 4.6 – When appropriate to documenting the validity of test score interpretations for intended uses, relevant experts external to the testing program should review the test specifications to evaluate their appropriateness for intended uses of test scores and fairness for intended test takers. The purpose of the review, the process by which the review is conducted, and the results of the review should be documented. The qualifications, relevant experiences, and demographic characteristics of expert judges should also be documented.

Standard 4.7 – The procedures used to develop, review, and try out items, and to select items from the item pool should be documented.

Test Specifications

The RN Comprehensive Predictor is meant to mirror the NCLEX-RN to the greatest extent possible, and as such, the Comprehensive Predictor's test specifications are directly based on those of the NCLEX-RN (see Table 2). The NCLEX-RN 2019 detailed test plan (NCSBN, 2019) is based on the results of a nationwide practice analysis conducted by the National Council of State Boards of Nursing (NCSBN) in 2017 (NCSBN, 2018). The NCLEX-RN is a computer adaptive test and allows for some fluctuation in the percentage of items a given candidate may receive across the major Client Needs categories. The Comprehensive Predictor is a fixed length test of 150 scored items and 30 unscored pretest items. The number of scored items in each major client needs category was determined by finding the median percentage within the NCLEX-RN range. For example, the NCLEX-RN test specifications stipulate that 6% to 12% of the items a candidate receives be in the Health Promotion & Maintenance category; therefore, 9% of the Comprehensive Predictor scored items are in this category (14 of 150 items).

Like the NCLEX-RN, each item on the Comprehensive Predictor is written to assess mastery of one of the more than 500 nursing job tasks on the NCLEX-RN detailed test plan. Each of these tasks falls under one of the major Client Needs categories. Given that there are more than 500 tasks on the NCLEX-RN detailed test plan, it is not feasible for any given administration of the NCLEX-RN or the Comprehensive Predictor to have an item assigned to each task. Accordingly, both tests sample from the domain of available tasks in order to ensure representative coverage.

Table 2

NCLEX-RN and ATI RN Comprehensive Predictor 2019 Test Specifications

NCLEX-RN® Client Need Category	2019 NCLEX-RN® Focus Percentage of Items from Each Category or Subcategory	Scored Items
Safe and Effective Care Environment		
Management of Care	17-23% (20%)	30
Safety & Infection Control	09-15% (12%)	18
Health Promotion & Maintenance	06-12% (09%)	14
Psychosocial Integrity	06-12% (09%)	13
Physiological Integrity		
Basic Care & Comfort	06-12% (09%)	13
Pharmacological & Parenteral Therapies	12-18% (15%)	23
Reduction of Risk Potential	09-15% (12%)	18
Physiological Adaptation	11-17% (14%)	21
	100%	150

Item Formats

The RN Comprehensive Predictor 2019 contains standard four-option multiple choice items and six of the seven alternate item types currently used on the NCLEX-RN. The six alternate item types are multiple response, fill-in-the-blank calculation, hot spot, chart/exhibit, drag and drop/ordered response, and graphic options (see the NCSBN website at https://www.ncsbn.org for a full description of each alternate item type). Audio items are the seventh alternate item type currently used on the NCLEX-RN. Audio items are not currently available on the RN Comprehensive Predictor 2019. The NCLEX-RN does not have an established percentage of alternate items required for any given administration of the test. Similarly, the RN Comprehensive Predictor has no required percentage of alternate items, although each administration of the exam will contain at least five alternate items.

Item Writer Training

The items on the RN Comprehensive Predictor 2019 were written by internal and external RN nurse educators. The RN nurse educators held MSN or PhD degrees and had teaching or practical experience in the specific content areas (e.g. adult medical-surgical, mental health). Educational role, geographic location, and experience developing and selecting curriculum were considered when selecting qualified item writers. Prior to developing items for the RN Comprehensive Predictor, item writers receive training about interpreting and using NCLEX-RN test blueprints and constructing balanced and task-specific test items. All internal RN nurse educators had previously completed this training. Internal RN nurse educators must also complete additional training, which involves multiple iterations of feedback/revisions for newly written items.

Item Writing

Item writing for the Comprehensive Predictor was completed on a continual basis. To ensure that all test items met the requirements as outlined by the detailed test plan and tested concepts applicable to the specific level of knowledge and instruction, item writers were asked to consider the following elements as each item was written.

Alignment to the NCLEX-RN Test Plan: Item writers were instructed to write items to specific tasks on the NCLEX-RN test plan to assess the candidates' knowledge of specific tasks.

Appropriate Program Type, Item Context, and Assumed Student Knowledge: Item writers were asked to consider the conceptual and cognitive level of each item. They were asked to consider whether the item was designed to sufficiently measure a candidate's understanding of a concept necessary to demonstrate competency.

Multiple-Choice Item Options and Distractors: Item writers were instructed to write items that had only one correct option and distractors that were plausible, but inarguably incorrect. To ensure content validity, item writers were asked to validate item content using approved references. Item writers cite a reference and page number for each option (correct option and each distractor).

Classification of Cognitive Levels: Item writers were instructed to review each item for cognitive complexity and determine whether or not each item aligned with a cognitive level, as defined by the NCLEX-RN test plan. The model for classifying thinking into cognitive levels of complexity applied in NCLEX-RN test plan (NCSBN, 2019) is Bloom's Taxonomy (Bloom, et al., 1956; Anderson & Krathwohl, 2001). ATI breaks down Bloom's taxonomy further by presenting cognitive complexity in two different categories: foundational thinking and critical thinking. Items were classified as foundational thinking if they were written at the "remember" or

"understand" level of Bloom's taxonomy. Items written to any of the higher cognitive levels of Bloom's taxonomy (apply, analyze, evaluate, or create) were classified as critical thinking.

Readability: Writers and test developers were instructed to pay careful attention to the readability of each item to ensure that the focus was on the concepts; not on reading comprehension of the item.

Grammar and Structure for Item Stems and Item Options: All items were written to meet technical quality, including correct grammar, syntax, and usage in all items, as well as parallel construction and structure of text associated with each multiple-choice item.

The item writer who initially submits the item specifies the NCLEX-RN task, and subsequent reviewers validate or change the task assignment.

Item Review

Standard 3.2 – Test developers are responsible for developing tests that measure the intended construct and for minimizing the potential for tests' being affected by construct-irrelevant characteristics, such as linguistic, communicative, cognitive, cultural, physical, or other characteristics.

Item Review Meetings: All newly written items were reviewed in item review meetings. Item review meetings consisted of two RN nurse educators with teaching or practical experience in the particular content area and a test developer with an editorial background. The test developer facilitated the meeting by navigating an internal item banking system to review specific items in order to fulfill an objective or item requirement specified on the test plan. The primary purpose of the item review meetings was to evaluate items with regard to quality and content classification. The test developer ensured that the correct grammar, punctuation, and spelling were used, and that each item conformed to the ATI Style Guide. They also provided input on how to address item writing guidelines. The nurse educators were asked to verify the item's alignment with the NCLEX-RN task assignment, outcome categories, such as thinking skills (i.e., foundational or critical thinking), priority setting, and nursing process. Item content was validated using approved references and supported by indicating the applicable ATI review module chapter.

Editorial Review: Following initial review and approval during the item review meeting, new items undergo multiple editorial reviews. During the editorial review, the Test Developer checks for correct grammar, punctuation, and spelling, as well as clarity of phrasing. The Test Developer also ensures items adhere to the ATI Style Guide. Additionally, an ATI nurse educator checked for item cueing, which was conducted through a review of a cosine similarity index (CSI) report.

Bias Review: An item can be biased if it contains material that is unfamiliar to an examinee subgroup; thus, inadvertently making the item more difficult for this subgroup (Holland & Thayer, 1988; Zieky, 1993). For example, an item can be biased if it uses terminology that is not commonly used across ethnic groups. An item may also inadvertently cause an emotional reaction, which may impact a candidate's ability to interpret or answer an item correctly.

ATI's bias review committee is composed of an independent and diverse panel of individuals representing a cross-section of historically affected groups with regards to ethnicity, gender, and age. ATI bias review committee members typically do not have nursing or medical backgrounds, because their role is to identify potential bias and not to address the actual nursing content of the items.

Item bias reviews were conducted by ATI's bias review committee. The bias review committee was given a training session on item bias and the committee's role in the review process. The committee then read all newly written items and indicated which items they considered potentially biased due to offensive, demeaning, emotionally disturbing, or culturally biased material. If the reviewer determined that an item was potentially biased, the item, along with the reviewer comment, was given to an ATI nurse educator to revise.

Enemy Items: In some cases, it may not be appropriate to include certain items on the same assessments. This could be because the items are extremely similar or because the text for one item helps determine the correct answer for another item. In order to ensure that enemy items are not included on the same assessments, an additional review is conducted to determine enemy item sets. This process involves using an algorithm, CSI, to compare text similarity of item pairs. The CSI is used to streamline this process. The RN nurse educators determine which item pairs are enemies by comparing the text of all item pairs with a CSI value above a certain threshold.

Pretesting: The new items were then placed on existing operational tests as unscored items to gather performance data. Items that failed to satisfy predetermined statistical criteria were flagged and designated for further revisions. Psychometricians provided statistical interpretation and consultation for these flagged items to inform subsequent item reviews. Revised items re-entered the development process as new items. Items were reviewed, revised, and pretested until a sufficient number of statistically sound items were collected to complete the test according to the test specifications.

Test Administration

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.

The Comprehensive Predictor is administered directly by the client institutions that have purchased the exam. ATI provides clients with extensive guidelines regarding test security and proctoring under standardized conditions.

Comprehensive Predictor is a 180-item fixed-length test and students are provided 3 hours to read, consider, and respond to test items. The Comprehensive Predictor is used to provide an indication of readiness for the NCLEX-RN and to guide student remediation efforts. In order to fulfill both of these mandates, the Comprehensive Predictor mirrors the NCLEX-RN test specifications, but provides a uniformly high number of items (180) for all students. This high number of items allows students to experience a broad range of potential questions from the same domain of tasks the NCLEX-RN is based on. Institutions have the ability to review their group results and make remediation decisions for a class based on the same test questions. There are also practical considerations in that institutions often have limited time and facilities available for testing.

IV. Item Calibration and Test Equating

Generally, item calibration is the process of assigning a difficulty-parameter estimate to each item on an assessment so that all items are placed onto a common scale. This chapter briefly introduces the Rasch model, reports the results from evaluations of the adequacy of the Rasch assumptions, summarizes Rasch item statistics, and briefly describes the process of test equating.

The Rasch rating scale model was used to calibrate the Comprehensive Predictor items (Rasch, 1960; Wright & Panchapakesan, 1969). According to the Rasch model, the probability of answering an item correctly is based on the difference between the ability of the student and the difficulty of the item. Rasch model has several advantages over classical test theory, so it has become the standard procedure for analyzing item response data in applied testing programs. However, IRT models make a number of strong assumptions related to dimensionality, local independence, and model-data fit. Resulting inferences derived from any application of IRT rests strongly on the degree to which the underlying assumptions are met.

Checking Rasch Assumptions

This section evaluates the dimensionality of the data, local item independence, and item fit. It should be noted that only operational items were analyzed since they are the basis of student scores.

Unidimensionality: Rasch models (Rasch, 1960; Wright & Panchapakesan, 1969) assume that one dominant dimension determines the difference among students' performances. Principal Components Analysis (PCA) can be used to assess the unidimensionality assumption. The purpose of the analysis is to verify whether any other dominant component(s) exist among the items. If any other dimensions are found, the unidimensionality assumption would be violated.

Table 3 presents the PCA results including the eigenvalues and the percentage of variance explained for the other five components with eigenvalues greater than one. The primary dimension for Comprehensive Predictor explained about 13.6% of the total variance. The eigenvalue of the second dimension is 2.2, accounting for only 1.3% of the total variance. Overall, the PCA suggests that there is one clearly dominant dimension for the assessment.

Table 3 *PCA Results*

Component	Eigenvalue	Explained Variance
1	23.5	13.6%
2	2.2	1.3%
3	1.9	1.1%
4	1.7	1.0%

Local Independence (LI): No relationship should exist between examinees' responses to different items after accounting for the abilities measured by a test. Many indicators of LI are framed by the form of local independence proposed by McDonald (1979) that the conditional covariances of all pairs of item responses, conditioned on the abilities, are required to be equal to zero.

Residual item correlations provided in WINSTEPS for each item pair were used to assess local dependence among the Comprehensive Predictor items. The default "standardized residual correlation" in WINSTEPS was used for these analyses. The residual correlation essentially corresponds to Yen's $Q3$ index, a popular LI statistic. The expected value for the $Q3$ statistic is approximately $-1/(k-1)$ when no local dependence exists, where k is test length (Yen, 1993). Thus, the expected $Q3$ values should be approximately -0.007 for the test (since it has 150 items). Index values that are greater than 0.07 indicate a degree of local dependence that probably should be examined by test developers (Chen & Thissen, 1997). Table 4 shows the summary statistics—mean, SD, minimum, maximum, and several percentiles (P10, P25, P50, P75, P90)—for all the residual correlations for the test. The total number of item pairs (N) and the number of pairs with the residual correlations greater than 0.07 are also reported in this table. The vast majority of the correlations were very small, suggesting local item independence generally holds for the assessment.

Table 4 *Summary of Item Residual Correlations*

N	Mean	SD	Minimum	P10	P25	P50	P75	P90	Maximum	>0.07
11,175	-0.01	0.02	-0.17	-0.02	-0.02	-0.01	0.00	0.01	0.19	8

Item Fit: To evaluate whether the data fit the model, WINSTEPS Infit and Outfit MnSq values are used because it is more oriented toward practical significance (Linacre, 2009). Rules of thumb regarding "practically significant" MnSq values vary. More conservative users might prefer items with MnSq values that range from 0.8 to 1.2. Others believe reasonable test results can be achieved with values from 0.5 to 1.5. In the results below, values outside of 0.7 to 1.3 are given practical importance.

Table 5 presents the summary statistics of infit and outfit mean square statistics including the mean, SD, and minimum and maximum values. The number of items within the range of [0.7, 1.3] is also reported in Table 5. As can be seen, the mean values for both fit statistics were close to 1.00 for all tests. Most of the items had infit and outfit values falling in the range of [0.7,1.3]. Overall, these results indicate that the Rasch model fits the Predictor item data well.

Table 5 *Summary of Fit Statistics*

Item Fit Stats	N	Mean	SD	MAX	MIN	[0.7, 1.3]
Infit Mean Square	150	1.03	0.15	1.62	0.69	147/150
Outfit Mean Square	150	1.02	0.16	1.51	0.59	143/150

Calibration and Equating

Standard 5.13 – When claims of form-to-form equivalence are based on equating procedures, detailed technical information should be provided on the method by which equating functions were established and on the accuracy of equating functions.

Standard 5.15 – In equating studies that employ an anchor test design, the characteristics of the anchor test and its similarity to the forms being equated should be presented, including both content specifications and empirically determined relationships among test scores. If anchor items are used in the equating study, the representativeness and psychometric characteristics of anchor items should be presented.

During the pretesting study, new test items were imbedded in the operational item set without accounting for student test scores. Then the pretesting items were calibrated to the scale of the operational item set using the WINSTEPS 8.1.0 computer program. The item pool was then updated with the item statistics. The Rasch model expresses item difficulty in units referred to as *logits* rather than on the percent-correct metric. Large negative logits represent easier items while large positive logits represent more difficult items. Table 6 summarizes the Rasch logit difficulties of the operational items on each test. The minimum and maximum values and standard deviations suggest that the Predictor items covered a relatively wide range of difficulties.

Table 6 *Summary of Rasch Item Difficulties*

N	Mean	SD	Min	Max
150	0.00	0.91	-2.04	2.02

To ensure comparable scores and equivalent passing standards, total scores from RN Comprehensive Predictor 2019 were equated to a base set of items using a one-parameter Item Response Theory (IRT) procedure (Bond & Fox, 2001; Kolen & Brennan, 2014; Linacre, 2008). To ensure that scores for different sets of items are comparable, the content balance of each group of items is carefully matched to a test blueprint to ensure all students taking the test are demonstrating their knowledge of the relevant content for the measure. The person ability parameter estimates for each possible raw test score were calculated from the item calibration. By matching the nearest ability parameter for a given raw score, the conversion of RN Comprehensive Predictor 2019 scores to the base metric was determined. This resulted in a set of fully comparable scores between the two

sets of items. ATI adopted this pre-equating design due to the necessity of have scoring tables prior to test administration.

The statistical equating procedure makes sure that students are not given an unfair advantage or disadvantage because the particular group of items they took is easier or harder than other sets of items taken by other students. In other words, the total score is equated to adjust for slight differences that may exist across different groups of items making up a test. Consequently, a reported total score is a comprehensive indicator of student performance on the content measure.

V. Interpretation of Scores

Standard 1.2 – A rationale should be presented for each intended interpretation of test scores for a given use, together with a summary of the evidence and theory bearing on the intended interpretation.

Standard 5.1 – Test users should be provided with clear explanations of the characteristics, meaning, and intended interpretation of derived scale scores, as well as their limitations.

Score Interpretations

ATI provides two different ways to interpret the RN Comprehensive Predictor 2019 assessment test scores. Norm-referenced data provides examinees with the ability to compare their score with others taking the exam nationwide. ATI provides normative data for the RN Comprehensive Predictor 2019 assessment on the score report, namely means and percentile ranks. Criterion-referenced data provides examinees with the ability to compare their performance with the actual test objectives and not with others who have taken the exam. The "ATI Predicted Probability of Passing NCLEX-RN on the First Attempt" value is an example of a criterion-referenced interpretation of a test score.

Score Reporting

All items on the RN Comprehensive Predictor 2019 assessment are scored as correct or incorrect, with no partial credit awarded on any item and no penalty for guessing. Appendix A contains a sample of the score report and accompanying explanation page students receive after completing the test. In order to make sure students' total test scores are comparable from one testing experience to another, ATI carefully controls two characteristics of each group of items students are given. First, the content balance of each set of items is carefully matched to a test blueprint to ensure all students are being tested on the relevant content for the measure. Second, the total score is equated to adjust for slight differences that may exist across different groups of items making up a test. The reported total score is called "Adjusted Individual Total Score" on the score report. It can be interpreted as the percentage of items answered correctly on the whole test. The equating adjustment makes sure that students are not unfairly advantaged or disadvantaged based on the particular group of items they are administered relative to other students. A reported total score is a comprehensive description of student performance on the whole test. It is provided along with both norm-referenced data (means and percentile ranks) and criterion-referenced data (probability of passing the NCLEX-RN based on the total score). "National Mean" is the average percent correct score of all individual test takers in a national sample of RN program students. The way to interpret "National Percentile Rank" is to think of it as a comparison to the national sample of RN students. For example, if a student's "National Percentile Rank" is 32, then they have scored the same as or better than 32% of the RN students nationwide who also took the test.

Raw percent correct scores are reported for each of the eight NCLEX-RN major client need categories and subcategories. Corresponding normative data are also reported, provided that each section comprises at least five items. Unlike the total score, the sub-scale scores are not equated. They are simply a function of the number of questions answered correctly divided by the number of scored questions on that sub-scale. Subscores are most useful for diagnostic purposes within a group to demonstrate how students who took the same set of items performed on that section. A list of topics to review is provided with a topic descriptor and an ATI review module chapter for each incorrectly answered item. Percent correct scores are also provided for other outcome categories, such as thinking skills, priority setting, nursing process, and clinical topics.

Summary of Test Scores

The RN Comprehensive Predictor 2019 assessed students across the United States, Canada, and US territories. Table 7 summarizes descriptive statistics of test scores by program type, gender, ethnicity, primary language, and region for students who attempted one of the assessments. The table shows that 24,642 students took the assessment. Of those students, over half are BSN students, followed by ADN and Diploma students. Among the students, the majority are female, Caucasian, and English speakers. The proportion of student key demographics is similar to that reported by National League for Nursing (NLN, 2014). Totals do not add to 100% of the sample because not all students chose to provide demographic information. The table also presents the means and standard deviations of test scores across the groups of students. Overall, the mean score is 72.21% with a standard deviation of 8.47%. The score distribution for this sample is displayed in Figure 1 on page 20.

Table 7

Demographic Summary for Students Completing the Exam between April 3, 2019, and April 2, 2020

Variable	Group	N	%	Mean*	SD
Program Type	BSN	15209	51.5	71.8	8.94
	ADN	13941	47.2	72.45	8.12
	Diploma	397	1.3	71.18	6.81
Gender	Females	23726	80.3	72.27	8.47
	Males	3984	13.5	70.93	8.85
Ethnicity	African-American	3224	10.9	69.66	9.28
	Asian	1851	6.3	70.06	9.78
	Caucasian	17409	58.9	72.85	8.06
	Hispanic	2887	9.8	71.42	8.5
	Native American	119	0.4	71.31	7.61
	Other	525	1.8	70.79	9.61
Primary Language	English	26363	89.2	72.2	8.47
	Spanish	298	1	71.05	9.12
	French	79	0.3	67.06	9.11
	Other	499	1.7	69.01	10.09
Region	Northeast	6130	20.7	70.24	8.86
	Midwest	8377	28.4	71.04	8.59
	South	10615	35.9	73.41	7.95
	West	4142	14	73.62	8.65
Region	1. CT, ME, MA, NH, RI, VT	2315	7.8	69.96	8.28
	2. NY, NJ, PR, VI	2217	7.5	69.07	9.82
	3. DE, MD, PA, VA, WV, DC	2667	9	72.39	8.06
	4. AL, FL, GA, KY, MS, NC, SC, TN	5866	19.9	73.2	7.94
	5. IL, IN, OH, MI, MN, WI	6173	20.9	70.81	8.62
	6. AR, LA, NM, OK, TX	3773	12.8	73.93	7.81
	7. IA, KS, MO, NE	1817	6.1	71.38	8.56
	8. CO, MT, ND, SD, UT, WY	1336	4.5	72.09	7.78
	9. AZ, CA, HI, NV	2729	9.2	74.49	8.87
	10. AK, ID, OR, WA	390	1.3	72.39	8.41
Total		29547	100	72.1	8.54

*Totals do not add to 100% of the sample because not all students chose to provide gender, ethnicity, or primary language information.

Figure 1 *Score Distributions of RN Comprehensive Predictor 2019*

N	29547
Mean	72.1
Std Dev	8.5
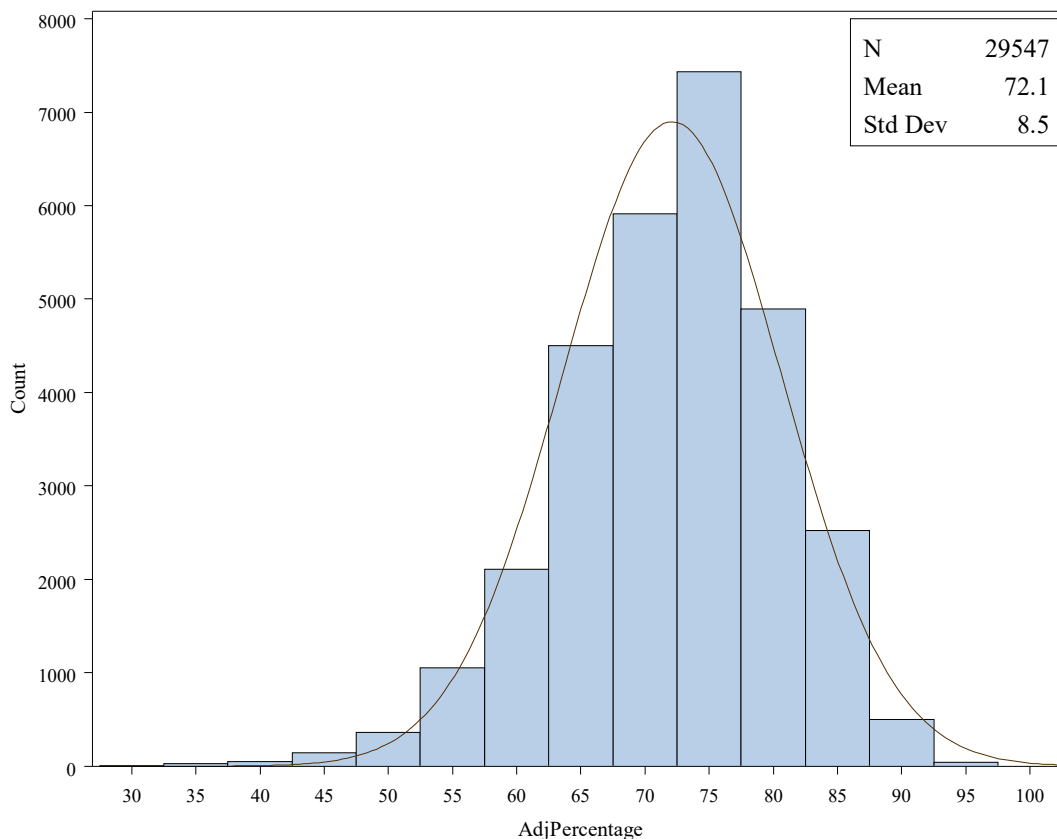
Predicted Probability of Passing

Standard 1.10 – When validity evidence includes statistical analyses of test results, either alone or together with data on other variables, the conditions under which the data were collected should be described in enough detail that users can judge the relevance of the statistical findings to local conditions. Attention should be drawn to any features of a validation data collection that are likely to differ from typical operational testing conditions and that could plausibly influence test performance.

Standard 1.18 – When it is asserted that a certain level of test performance predicts adequate or inadequate criterion performance, information about the levels of criterion performance associated with given levels of test scores should be provided.

Given that the first purpose of the test is to provide a numeric indication of the likelihood of passing NCLEX-RN, the Predicted Probability of Passing is considered the most important score, and users are cautioned that decisions regarding student performance should be based on the predicted probability rather than the normative data. The expectancy table relates directly to the purpose of the test, while normative data only provides information concerning relative standing against other students taking the test.

To follow best practice specified in the Standards for Educational and Psychological Testing (2014), for the RN Comprehensive Predictor 2019 assessment, the expectancy table was updated to remain current with the possible shifts in test population, curriculum focus, or practice change. Starting from the winter of 2018, ATI collected NCLEX-RN pass status data and updated the expectancy table for RN CP 2019 assessment. The expectancy table, provided in Table 1 in Chapter II, was developed from a final sample of 4,082 participants using a statistical procedure called logistic regression. Unlike standard regression, this procedure is specifically designed to deal with the case of a continuous predictor variable (RN Comprehensive Predictor® score) and a categorical outcome variable (NCLEX-RN® pass/fail status) (Thompson, 2006). For this sample a statistically significant relationship was found between Predictor scores and NCLEX-RN® pass/fail status (Model $X2 = 524.7$, df $= 1$, p $< .001$). This finding of statistical significance indicates there is a high likelihood that a relationship exists between Predictor scores and NCLEX-RN® results in the greater population of nursing students.

VI. Test Reliability and Validity

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.

Analyses of the test data for the RN Comprehensive Predictor 2019 assessment were conducted with all students attempts taking the assessments from April 3, 2019, through April 2, 2020.

Reliability and Item Difficulty Analysis

The number of items, means, standard deviations, reliability coefficients, and standard errors of measurement (SEM) for the total test score and each of the client need major categories and subcategories are shown in Table 8. The means, standard deviations, and SEMs are reported in the percent correct units. Results show a fairly high reliability index in the mid-0.90s at the total score level, which indicates that the RN Comprehensive Predictor 2019 total score is reliable for the population.

Table 8

Number of Items, Means, Standard Deviations, Reliability Coefficients and Standard Errors of Measurement for Total Test Score and For Each of the Eight Client Need Major Categories and Subcategories

NCLEX-RN® Client Need Major Category and Subcategory	# of Items	Mean*	SD	Reliability	SEM
TOTAL	150	72.1	8.54	0.96	1.71
Safe and Effective Care Environment – Management of Care	30	79.48	11.28	0.75	5.64
Safe and Effective Care Environment – Safety & Infection Control	18	61.68	14.49	0.77	6.93
Health Promotion & Maintenance	14	71.16	14.72	0.71	7.94
Psychosocial Integrity	13	72.32	13.76	0.7	7.47
Physiological Integrity – Basic Care & Comfort	13	66.93	13.21	0.87	4.8

NCLEX-RN® Client Need Major Category and Subcategory	# of Items	Mean*	SD	Reliability	SEM
Physiological Integrity – Pharmacological & Parenteral Therapies	23	78.6	11.61	0.75	5.76
Physiological Integrity – Reduction of Risk Potential	18	71.6	13.21	0.84	5.23
Physiological Integrity – Physiological Adaptation	21	73.24	10.64	0.88	3.63

*The sample size was 29,547.

The distributions of item difficulty (*p*-value) and discrimination (point biserial) statistics are shown in Table 9. The difficulty of an item corresponds to the proportion of students that correctly answered an item; therefore, the higher the difficulty value index, the easier the item. The discrimination index represents the point biserial correlation, or the Pearson product-moment correlation between the dichotomous score on an individual item (correct or incorrect) and a student's total test score. The higher the discrimination index, the more the item differentiates or discriminates between upper and lower ability examinees. In the pretesting process, items with *p*-value less 0.3 or greater than 0.95 and items with point biserials less than 0.1 are flagged for further review by test developers. Table 9 shows that one item had a *p*-value below 0.30. Sixty-six items had a point biserial below 0.20. Although point biserials of 0.20 or greater and p-values above 0.30 are ideal, these lower performing items were reviewed by content experts, deemed valid from a content perspective, and added to the overall reliability of the test score.

Table 9 *Distribution of Item Difficulty and Discrimination Indices for the RN Comprehensive Predictor*

Statistic Range	p-value	Point Biserial
0.90-1.00	19	0
0.80-0.89	20	0
0.70-0.79	56	0
0.60-0.69	33	0
0.50-0.59	5	0
0.40-0.49	10	0
0.30-0.39	6	7
0.20-0.29	1	73
0.10-0.19	0	69
0.00-0.09	0	1
below 0	0	0
TOTAL	150	150
	N = 29,229	

Conditional Standard Errors of Measurement

Standard 2.14 – When possible and appropriate, conditional standard errors of measurement should be reported at several score levels unless there is evidence that the standard error is constant across score levels. Where cut scores are specified for selection or classification, the standard errors of measurement should be reported in the vicinity of each cut score.

Conditional standard error of measurement (CSEM) calculated at various scores allows the test user to gauge the expected stability of scores at the levels of greatest interest. The CSEM at eight Probability of Passing NCLEX-RN levels was calculated using a formula derived by Woodruff (1990) and is displayed in Tae 10. Note that as scores deviate from the mid-range score (i.e., 50% Individual Score), the CSEM decreases.

Table 10 *CSEM at Various Score Levels*

Probability of Passing (Associated Individual Score)	Interval Sample Size	CSEM
99% Probability (80.7%)	982	1.25%
97% Probability (78.0%)	1,394	1.24%
95% Probability (74.7%)	1,513	1.23%
90% Probability (71.3%)	1,277	1.22%
82% Probability (68.0%)	1,099	1.24%
73% Probability (65.3%)	908	1.21%
62% Probability (60.7%)	631	1.24%
53% Probability (58.7%)	403	1.27%

Validity

As defined in the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 2014), validity refers to "the degree to which evidence and theory support the interpretation of test scores entailed by proposed uses of tests" (p. 9). The validity process involves the collection of a variety of evidence to support the proposed test score interpretations and uses. This entire technical report describes the technical aspects of the Comprehensive Predictor test in support of its score interpretations and uses. Each of the previous chapters contributes important evidence components that pertain to score validation: test development, test scoring, item analysis, Rasch calibration, equating, and reliability. This section summarizes and synthesizes the evidence based on the framework presented in *The Standards*.

Evidence Based on Test Content

Content validity addresses whether the test adequately samples the relevant material it purports to cover. Test content validity of the RN Comprehensive Predictor rests greatly on establishing a link between each piece of the assessment (i.e., the items) and what the students should know and be able to do as required by the test plan. The RN Comprehensive Predictor is a criterion-referenced assessment. The criteria referenced are the NCLEX-RN test plan. Evidence supporting the alignment among the RN Comprehensive Predictors tasks and the NCLEX-RN test plan should be provided.

For the RN Comprehensive Predictor test, strong content validity evidence is derived directly from the test construction process. Each item was based on and was directly aligned to the NCLEX-RN test plan to ensure good content validity. The item development and test construction process, described above, ensures that every item aligns directly to one of the content category. Ascend Learning selected qualified item writers and provided training to help ensure they wrote high-quality items. This alignment is foremost in the minds of the item writers and editors. As a routine part of item selection prior to an item appearing on a test form, the review committees check the alignment of the items with the test plan and make any adjustments necessary. Meanwhile, the test development team established detailed test and item development specifications and ensured the items were sufficient in number and adequately distributed across content and levels of cognitive complexity and difficulty. Items were also submitted to bias review for issues related to diversity, gender, and other pertinent factors. Items passing all the prior hurdles were tried out in a pretesting event. Several statistical analyses were conducted on the pretesting data. Items flagged by the statistical criteria were sent to content specialists for further evaluation. The result is consensus among the content specialists that the assessment does in fact assess what was intended.

Evidence Based on Internal Structure

As described in the *Standards* (2014), internal-structure evidence refers to the degree to which the relationships between test items and test components conform to the construct on which the proposed test interpretations are based.

Item-Test Correlations: Item-test correlations are reviewed in Table 9. All values are positive and of acceptable magnitude.

Item Response Theory Dimensionality: Results from principle components analyses are presented earlier. The Comprehensive Predictor test was essentially unidimensional, providing evidence supporting interpretations based on the total scores for the test.

Category Correlations: Correlations and disattenuated correlations between category scores are presented below. This data can also provide information on score dimensionality that is part of internal-structure evidence. As noted earlier, the test has eight categories and subcategories (see Table 11).

Pearson's correlation coefficients between these categories are reported in Table 12. The intercorrelations between the categories are positive and generally range from moderate to high in value.

Table 11 *NCLEX-RN Category Code*

NCLEX-RN Category	Code
Safe and Effective Care Environment – Management of Care	MC
Safe and Effective Care Environment – Safety & Infection Control	SI
Health Promotion & Maintenance	HPM
Psychosocial Integrity	PSI
Physiological Integrity – Basic Care & Comfort	BC
Physiological Integrity – Pharmacological & Parenteral Therapies	PP
Physiological Integrity – Reduction of Risk Potential	RR
Physiological Integrity – Physiological Adaptation	PA

Table 12 *Correlations between NCLEX-RN Categories and Subcategories*

NCLEX-RN Category	MC	SI	HPM	PSI	BC	PP	RR	PA
MC								
SI	0.43							
HPM	0.37	0.34						
PSI	0.4	0.31	0.31					
BC	0.36	0.3	0.27	0.29				

NCLEX-RN Category	MC	SI	HPM	PSI	BC	PP	RR	PA
PP	0.44	0.39	0.37	0.36	0.33			
RR	0.39	0.32	0.31	0.32	0.29	0.44		
PA	0.46	0.39	0.38	0.36	0.34	0.52	0.44	

The correlations in Table 12 are based on the observed scores. These observed-score correlations are weakened by existing measurement error contained within each category. As a result, disattenuating the observed correlations can provide an estimate of the relationships between categories if there is no measurement error. The disattenuated correlation coefficients can be computed from the observed correlations (reported in Table 12) and the reliabilities for each category (Spearman, 1904, 1910). Table 13 shows the corresponding disattenuated correlations. Given that none of these categories has perfect reliabilities, the disattenuated correlations are higher than their observed score counterparts. The correlations between categories are moderate yet distinct. This suggests that each category provides unique information about the strengths or weaknesses of students, yet measuring essentially the same general nursing construct.

Table 13 *Disattenuated Correlations between NCLEX-RN Categories and Subcategories*

NCLEX-RN Category	MC	SI	HPM	PSI	BC	PP	RR	PA
MC								
SI	0.53							
HPM	0.45	0.45						
PSI	0.5	0.42	0.42					
BC	0.46	0.42	0.37	0.41				
PP	0.51	0.48	0.45	0.46	0.42			
RR	0.48	0.43	0.41	0.43	0.39	0.54		
PA	0.53	0.49	0.47	0.47	0.45	0.61	0.56	

Evidence Related to the Use of the Rasch Model

Since the Rasch model is the basis of all calibration and equating analyses associated with the RN Comprehensive Predictor, the validity of the inferences from these results depends on the degree to which the assumptions of the model are met as well as the fit between the model and test data. As discussed at length in earlier sections, the underlying assumptions of Rasch models were essentially met for all the Comprehensive Predictor data, indicating the appropriateness of using the Rasch models to analyze the data.

In addition, the Rasch model was also used to link different operational sets of the test. The accuracy of the linking also affects the accuracy of student scores and the validity of score

uses. The Ascend psychometric team conducted verifications to check the accuracy of the procedures, including item calibration, and conversions from the raw score to the Rasch ability estimate.

Test Speededness

Standard 4.14 – For a test that has a time limit, test development research should examine the degree to which scores include a speed component and evaluate the appropriateness of that component, given the domain the test is designed to measure.

The NCLEX-RN and the Comprehensive Predictor are designed to measure the knowledge of an examinee without regard to response speed. According to Lu and Sireci (2007), "When speededness is unintended, it introduces construct-irrelevant variance into the test scores and thus changes the construct the test intends to measure" (p. 31). The presence of test speededness may undermine the test reliability and validity because a portion of the examinees' scores is not solely a result of their ability. As mentioned previously, the NCLEX-RN does provide more time per question than the Comprehensive Predictor. Given that the Comprehensive Predictor is intended to mirror the NCLEX-RN as closely as possible, it is important to examine the degree to which test speededness might have contributed to construct irrelevant variance. The analyses described below were conducted to verify that speededness was not a significant source of construct irrelevant variance on the Comprehensive Predictor.

Swineford (1974) presented a rule stating that if 80% of students answer the last item and all students answer at least 75% of the items, then the test can be considered unspeeded. As can be seen from Table 14, the Comprehensive Predictor appears to have met this standard. Stafford (1971) proposed a "speededness quotient (SQ)" based on a simple ratio of the number of unreached items to total number of incorrect items, to include wrong, unreached, and omitted items. A purely speeded test would have an SQ of 1. Table 14 shows the Comprehensive Predictor to have a low SQ, indicating that the proportion of total errors due to speededness is quite low. The Gulliksen (1950) formula compares the standard deviation of the number of unreached items to the standard deviation of total number incorrect items, with ratios below 0.25 considered indicative of an unspeeded test (Swineford, 1974). The results from all three methods indicate a very low likelihood that student Comprehensive Predictor scores are impacted in a meaningful way by the amount of time allowed.

Table 14 *Test Speededness Analyses for the RN Comprehensive Predictor*

N	% of students answering the last item	% of students answering at least 75% of items	Speededness Quotient (SQ)	Standard Deviation of Unreached Items/Standard Deviation of All Not Correct Items
29,695	99.80%	100.0%	0.000	0.042

VII. Appropriate and Inappropriate Test Use

Standard 1.3 – If validity for some common or likely interpretation for a given use has not been evaluated, or if such an interpretation is inconsistent with available evidence, that fact should be made clear and potential users should be strongly cautioned about making unsupported interpretations.

Standard 12.8 – When test results contribute substantially to decisions about student promotion or graduation, evidence should be provided that students have had an opportunity to learn the content and skills measured by the test.

Standard 12.10 – In educational settings, a decision or characterization that will have major impact on a student should take into consideration not just scores from a single test but other relevant information.

The Comprehensive Predictor was designed and built to provide students and educators with a numeric indication of the likelihood of passing the NCLEX-RN at the student's current level of readiness, and to guide remediation efforts based on the exam content missed. It is marketed as a low to moderate stakes test. ATI tests are not designed for high stakes purposes, such as a graduation requirement, and it is not recommended that they be used in this manner. High stakes uses are not completely precluded, but the validation effort required of the test user to justify the ATI Comprehensive Predictor or any other standardized test as an "exit" examination is extremely high. Under no circumstances is it recommended that the Comprehensive Predictor be used as a sole criterion for graduation or any other high stakes decision. A test is considered a "sole criterion" if failure is possible based on test performance, regardless of how the student performs on other measures.

Regardless of stakes, ATI recommends that all content of its tests be covered somewhere in the program curriculum. To the degree that a test contains material that students have not been taught, there is error or "noise" in the test scores. All of the scores reported on the Comprehensive Predictor (e.g., Probability of Passing NCLEX-RN, percentile ranks) are based on the assumption that students taking the test have had a fair chance to learn the content. At a high stakes level, ATI recommends institutions formally document exactly where in the program the nursing content required by NCLEX-RN test plan is covered. ATI also recommends that faculty review the alignment of the material covered in the coursework with the NCLEX-RN test plan to ensure that students have a fair chance to correctly answer each question. ATI does not believe there is any legitimate way to adjust test scores to account for content that is not covered. ATI believes it would be extremely difficult to defend the validity of any test score when part of the test is based on material the student cannot be reasonably expected to know.

It is ATI's position that if a student is at risk of failing a high stakes test in a nursing program, it should be made clear to both the student and the faculty well before the examination. If failure occurs on a high stakes test, it should not come as a surprise to the student or the faculty. No student who is at risk of failure should get

through a nursing program without the "at-risk" status being made clear to the student. Measures in addition to ATI assessments should be used throughout the program to help identify and remediate at-risk students.

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Individual Performance Profile
RN Comprehensive Predictor 2019

ati

Individual Name: **AT CUT**	**Adjusted Individual Total Score:** **75.3%**
Student Number:	**Predicted Probability of Passing**
Institution: **ATI Practice ADN**	**NCLEX-RN® on the First Attempt:** **96%**
Program Type: **ADN**	National Mean: **71.2%**
Test Date: **1/3/2020**	Program Mean: **71.6%**
# of Questions: **150**	National Percentile Rank: **67**
	Program Percentile Rank: **67**

Individual Performance in the Major Content Areas

Sub-Scale	# Items	Individual Score	Mean National	Mean Program Type	Percentile Rank National	Percentile Rank Program Type	Individual Score (% Correct)
Management of Care	30	100.0%	76.6%	76.7%	99	99	▲ (100)
Safety and Infection Control	18	100.0%	66.5%	67.3%	99	99	▲ (100)
Health Promotion and Maintenance	14	100.0%	68.3%	68.5%	99	99	▲ (100)
Psychosocial Integrity	13	100.0%	71.5%	71.0%	99	99	▲ (100)
Basic Care and Comfort	13	100.0%	70.4%	70.6%	99	99	▲ (100)
Pharmacological and Parenteral Therapies	23	100.0%	71.7%	72.5%	99	99	▲ (100)
Reduction of Risk Potential	18	11.1%	69.8%	70.7%	1	1	▲ (~11)
Physiological Adaptation	21	0.0%	71.7%	72.1%	1	1	▲ (0)

Topics To Review

Reduction of Risk Potential (16 items)

Diagnostic Tests (1 item)

Coagulation Disorders: Expected Laboratory Test for a Client Who Has Petechiae and Ecchymoses (Active Learning Template - Basic Concept, RM AMS RN 10.0 Chp 42)

Laboratory Values (3 items)

Medications for Bipolar Disorders: Monitoring Lithium Levels (RN QSEN - Patient-centered Care, RM MH RN 10.0 Chp 23, Active Learning Template - Medication)

Polycystic Kidney Disease, Acute Kidney Injury, and Chronic Kidney Disease: Expected Laboratory Findings (Active Learning Template - System Disorder, RM AMS RN 10.0 Chp 59)

Rheumatoid Arthritis: Findings to Report (RN QSEN - Patient-centered Care, Active Learning Template - System Disorder, RM AMS RN 10.0 Chp 88)

Potential for Alterations in Body Systems (1 item)

Musculoskeletal Trauma: Assessment of Tissue Perfusion (RN QSEN - Safety , Active Learning Template - System Disorder, RM AMS RN 10.0 Chp 71)

Topics To Review

Potential for Complications of Diagnostic Tests/Treatments/Procedures (1 item)

Cardiovascular Diagnostic and Therapeutic Procedures: Actions to Take for a Client Who Had a Cardiac Catheterization (Active Learning Template - Diagnostic Procedure, RM AMS RN 10.0 Chp 27)

Potential for Complications from Surgical Procedures and Health Alterations (1 item)

Invasive Cardiovascular Procedures: Nursing Assessment Following Aortofemoral Bypass (RN QSEN - Patient-centered Care, Active Learning Template - Therapeutic Procedure, RM AMS RN 10.0 Chp 30)

System Specific Assessments (5 items)

Fractures: Cast Care (RN QSEN - Safety , Active Learning Template - Therapeutic Procedure, RM NCC RN 10.0 Chp 27)

Head Injury: Assessing Neurologic Status (Active Learning Template - Diagnostic Procedure, RM AMS RN 10.0 Chp 14)

Nursing Care of Newborns: Manifestations of Hypoglycemia (Active Learning Template - System Disorder, RM MN RN 10.0 Chp 24)

Postoperative Care: Caring for a Client Who Has Delayed Wound Healing (Active Learning Template - System Disorder, RM AMS RN 10.0 Chp 96)

Pressure Ulcers, Wounds, and Wound Management: Identifying a Stage III Pressure Injury (Active Learning Template - Nursing Skill, RM FUND 9.0 Ch 55)

Therapeutic Procedures (4 items)

Amputations: Evaluating Teaching (RN QSEN - Patient-centered Care, Active Learning Template - Therapeutic Procedure, RM AMS RN 10.0 Chp 69)

Arthroplasty: Planning to Position a Client Following Total Hip Arthroplasty (Active Learning Template - Therapeutic Procedure, RM AMS RN 10.0 Chp 68)

Cancer Disorders: Preoperative Teaching for a Client Who Is Scheduled for a Modified Radical Mastectomy (RN QSEN - Patient-centered Care, Active Learning Template - Therapeutic Procedure, RM AMS RN 10.0 Chp 92)

Preoperative Nursing: Reducing the Risk of Complications Intraoperatively (Active Learning Template - Nursing Skill, RM AMS RN 10.0 Chp 95)

Physiological Adaptation (21 items)

Alterations in Body Systems (8 items)

Acute and Infectious Respiratory Illnesses: Caring for an Infant Who Has Respiratory Syncytial Virus (Active Learning Template - System Disorder, RM NCC RN 10.0 Chp 17)

Angina and Myocardial Infarction: Plan of Care Following Acute Myocardial Infarction (RN QSEN - Patient-centered Care, Active Learning Template - System Disorder, RM AMS RN 10.0 Chp 31)

Cancer and Immunosuppression Disorders: Teaching a Client Who Is Undergoing Radiation Therapy (RN QSEN - Patient-centered Care, Active Learning Template - Basic Concept, RM Nutrition 6.0 Chp. 16)

Cancer Treatment Options: Adverse Effects of Radiation Therapy (Active Learning Template - Therapeutic Procedure, RM AMS RN 10.0 Chp 91)

Cancer Treatment Options: Caring for a Client Who Is Receiving Brachytherapy (RN QSEN - Safety , Active Learning Template - Therapeutic Procedure, RM AMS RN 10.0 Chp 91)

Electrolyte Imbalances: Assessing a Client Who Is Immediately Postoperative Following a Subtotal Thyroidectomy (Active Learning Template - Medication, RM AMS RN 10.0 Chp 44)

HIV/AIDS: Teaching About Transmission Prevention (RN QSEN - Safety , Active Learning Template - System Disorder, RM AMS RN 10.0 Chp 87)

Nursing Care of Newborns: Preventing Heat Loss Through Conduction (RN QSEN - Safety , Active Learning Template - Basic Concept, RM MN RN 10.0 Chp 24)

Fluid and Electrolyte Imbalances (1 item)

Medical Conditions: Providing Teaching to a Client Who Is Experiencing Preterm Contractions (Active Learning Template - Basic Concept, RM MN RN 10.0 Chp 9)

Hemodynamics (1 item)

Heart Failure and Pulmonary Edema: Manifestations of Pulmonary Congestion (Active Learning Template - System Disorder, RM AMS RN 10.0 Chp 32)

Illness Management (5 items)

Acute and Chronic Gastritis: Performing Gastric Lavage (Active Learning Template - Nursing Skill, RM AMS RN 10.0 Chp 50)

Chronic Obstructive Pulmonary Disease: Dietary Teaching (RN QSEN - Patient-centered Care, Active Learning Template - System Disorder, RM AMS RN 10.0 Chp 22)

Hematologic Disorders: Interventions for a Child Who Has a Sickle Cell Crisis (Active Learning Template - System Disorder, RM NCC RN 10.0 Chp 21)

Topics To Review

Lupus Erythematosus, Gout, and Fibromyalgia: Evaluating Client Understanding of Teaching (RN QSEN - Patient-centered Care, Active Learning Template - System Disorder, RM AMS RN 10.0 Chp 87)

Peripheral Vascular Diseases: Priority Finding to Report Following an Arterial Thrombectomy (Active Learning Template - System Disorder, RM AMS RN 10.0 Chp 35)

Medical Emergencies (3 items)

Burns: Priority Action for a Client Who Has a Burn Injury (RN QSEN - Safety , Active Learning Template - System Disorder, RM AMS RN 10.0 Chp 75)

Burns: Priority Action for a Toddler Who Has Burns (RN QSEN - Patient-centered Care, Active Learning Template - System Disorder, RM NCC RN 10.0 chp 32)

Hematologic Disorders: Manifestations of Acute Chest Syndrome (RN QSEN - Safety , Active Learning Template - System Disorder, RM NCC RN 10.0 Chp 21)

Pathophysiology (2 items)

Fluid Imbalances: Interpreting Laboratory Results (Active Learning Template - Basic Concept, RM AMS RN 10.0 Chp 43)

Hepatitis and Cirrhosis: Monitoring for Fluid Volume Excess (Active Learning Template - System Disorder, RM AMS RN 10.0 Chp 55)

Unexpected Response to Therapies (1 item)

Medical Conditions: Magnesium Sulfate Toxicity (RN QSEN - Patient-centered Care, Active Learning Template - Medication, RM MN RN 10.0 Chp 9)

Outcomes

Nursing Process	No of Items	Individual Score	Description
RN Assessment	17	52.9%	The assessment step of the nursing process involves application of nursing knowledge to the collection, organization, validation and documentation of data about a client's health status. The nurse focuses on the client's response to a specific health problem including the client's health beliefs and practices. The nurse thinks critically to perform a comprehensive assessment of subjective and objective information. Nurses must have excellent communication and assessment skills in order to plan client care.
RN Analysis/Diagnosis	25	76.0%	The analysis step of the nursing process involves the nurse's ability to analyze assessment data to identify health problems/risks and a client's needs for health intervention. The nurse identifies patterns or trends, compares the data with expected standards or reference ranges and draws conclusions to direct nursing care. The nurse then frames nursing diagnoses in order to direct client care.
RN Planning	24	83.3%	The planning step of the nursing process involves the nurse's ability to make decisions and problem solve. The nurse uses a client's assessment data and nursing diagnoses to develop measureable client goals/outcomes and identify nursing interventions. The nurse uses evidenced based practice to set client goals, establish priorities of care, and identify nursing interventions to assist the client to achieve his goals.
RN Implementation/Therapeutic Nursing Intervention	69	79.7%	The implementation step of the nursing process involves the nurse's ability to apply nursing knowledge to implement interventions to assist a client to promote, maintain, or restore his health. The nurse uses problem-solving skills, clinical judgment, and critical thinking when using interpersonal and technical skills to provide client care. During this step the nurse will also delegate and supervise care and document the care and the client's response.
RN Evaluation	15	66.7%	The evaluation step of the nursing process involves the nurse's ability to evaluate a client's response to nursing interventions and to reach a nursing judgment regarding the extent to which the client has met the goals and outcomes. During this step the nurse will also assess client/staff understanding of instruction, the effectiveness of interventions, and identify the need for further intervention or the need to alter the plan.

Priority Setting in Nursing	No of Items	Individual Score	Description
	13	76.9%	Ability to demonstrate nursing judgment in making decisions about priority responses to a client problem. Also includes establishing priorities regarding the sequence of care to be provided to multiple clients.

Thinking Skills	No of Items	Individual Score	Description
Foundational Thinking in Nursing	18	88.9%	Ability to recall and comprehend information and concepts foundational to quality nursing practice.
Clinical Judgment/Critical Thinking in Nursing	132	73.5%	Ability to use critical thinking skills (interpretation, analysis, evaluation, inference, and explanation) to make a clinical judgment regarding a posed clinical problem. Includes cognitive abilities of application and analysis.

NCLEX®	No of Items	Individual Score	Description
RN Management of Care	30	100.0%	The nurse coordinates, supervises and/or collaborates with members of the health care to provide an environment that is cost-effective and safe for clients.
RN Safety and Infection Control	18	100.0%	The nurse uses preventive safety measures to promote the health and well-being of clients, significant others, and members of the health care team.
RN Health Promotion and Maintenance	14	100.0%	The nurse directs nursing care to promote prevention and detection of illness and support optimal health.
RN Psychosocial Integrity	13	100.0%	The nurse directs nursing care to promote and support the emotional, mental and social well-being of clients and significant others.
RN Basic Care and Comfort	13	100.0%	The nurse provides nursing care to promote comfort and assist client to perform activities of daily living.
RN Pharmacological and Parenteral Therapies	23	100.0%	The nurse administers, monitors and evaluates pharmacological and parenteral therapy.
RN Reduction of Risk Potential	18	11.1%	The nurse directs nursing care to decrease clients' risk of developing complications from existing health disorders, treatments or procedures.
RN Physiological Adaptation	21	0.0%	The nurse manages and provides nursing care for clients with an acute, chronic or life threatening illness.

Clinical Areas	No of Items	Individual Score	Description
Fundamentals	21	100.0%	Ability to apply fundamental nursing principles and skills to basic needs of clients. Topics include foundational client care concepts (ie: medical and surgical asepsis, infection control, physical assessment, therapeutic communication, medication administration, pain management integral to the delivery of safe, ethical, and legal nursing practice.
Adult Medical-Surgical	40	35.0%	Ability to apply medical-surgical nursing knowledge to clinical problems experienced by adults. Topics include care of clients with cardiovascular, hematologic, gastrointestinal, neurosensory, endocrine, fluid and electrolyte, integumentary, lymph/immune/infectious, renal and urinary, musculoskeletal, reproductive, and respiratory disorders as well as topics relevant to perioperative nursing care and emergency care/triage.
Maternal Newborn	15	73.3%	Ability to apply nursing knowledge to perinatal nursing care. Topics include antepartum, intrapartum, and postpartum nursing care as well as care of the newborn.
Mental Health	15	93.3%	Ability to apply nursing knowledge to the care of clients with mental health disorders. Topics include foundational mental health concepts (e.g., therapeutic communication, therapeutic milieu, legal/ethical issues), care of clients experiencing psychobiologic disorders or psychiatric emergencies, and care of clients receiving traditional nonpharmacological and psychopharmacological therapies.
Nursing Care of Children	15	66.7%	Ability to apply nursing knowledge to clinical problems experienced by children. Topics include basic concepts (e.g., medication administration, physical assessment, nutritional needs), care of children with various system disorders, care of children experiencing pediatric emergencies (e.g., accidental poisoning, respiratory arrest), and care of children with psychosocial disorders.
Leadership	17	100.0%	Ability to manage the care of a caseload of clients and nursing care team while using principles of management and supervision. Topics include leadership skills (ie: interdisciplinary collaboration, advocacy, prioritization, delegation), performance improvement, continuity of client care, and principles of case management while ensuring safe client care and efficient utilization of human and material resources.
Community Health	6	100.0%	Ability to apply concepts related to public and community health. Topics include primary, secondary, and tertiary interventions, health screening, health related education, home health and injury prevention, disaster planning, and cultural diversity.
Pharmacology	16	100.0%	Ability to apply concepts related to the pharmacodynamics and pharmacotherapeutics of commonly prescribed medications for clients with physical and mental health disorders. Topics include principles of medication administration and dosage calculation, side/adverse effects, drug/food interactions, contraindications, and nursing implications integral to the safe administration of medications to clients across the lifespan.
Nutrition	5	80.0%	Ability to apply nursing knowledge to normal nutrition and diet therapy. Topics include the collection of data regarding nutritional status; implementation of actions to promote normal nutrition or dietary modification in response to illness; and evaluation of the client's response to diet therapy.

QSEN	No of Items	Individual Score	Description
Safety	38	81.6%	The minimization of risk factors that could cause injury or harm while promoting quality care and maintaining a secure environment for clients, self, and others.
Patient-Centered Care	39	71.8%	The provision of caring and compassionate, culturally sensitive care that is based on a patient's physiological, psychological, sociological, spiritual, and cultural needs, preferences, and values.
Evidence Based Practice	56	66.1%	The use of current knowledge from research and other credible sources to make clinical judgments and provide client-centered care.
Informatics	6	100.0%	The use of information technology as a communication and information gathering tool that supports clinical decision making and safe, scientifically based nursing practice.
Quality Improvement	3	100.0%	Care-related and organizational processes that involve the development and implementation of a plan to improve health care services and better meet the needs of clients.
Teamwork and Collaboration	8	100.0%	The delivery of client care in partnership with multidisciplinary members of the health care team, to achieve continuity of care and positive client outcomes.

NLN Competency	No of Items	Individual Score	Description
Human Flourishing	29	75.9%	Human flourishing is reflected in patient care that demonstrates respect for diversity, approaches patients in a holistic and patient-centered manner, and uses advocacy to enhance their health and well-being.
Nursing Judgment	80	71.3%	Nursing judgment involves the use of critical thinking and decision making skills when making clinical judgments that promote safe, quality patient care.
Professional Identity	15	100.0%	Professional identity reflects the professional development of the nurse as a member and leader of the health care team who promotes relationship-centered care, and whose practice reflects integrity and caring while following ethical and legal guidelines.
Spirit of Inquiry	26	73.1%	A spirit of inquiry is exhibited by nurses who provide evidence based clinical nursing practice and use evidence to promote change and excellence.

BSN Essentials	No of Items	Individual Score	Description
Liberal Education for Baccalaureate Generalist Nursing Practice	17	64.7%	The need for an education that exposes nurses to multiple fields of study providing the foundation for a global perspective of society as well as high level thinking and acquisition of skills that can be applied to complex patient and system-based problems.
Basic Organization and Systems Leadership for Quality Care and Patient Safety	11	90.9%	The need for nurses to be able to understand power relationships and use decision-making and leadership skills to promote safe practice and quality improvement within health care systems.
Scholarship for Evidence-Based Practice	59	69.5%	The need for nurses to be able to understand the research process and base practice and clinical judgments upon fact-based evidence to enhance patient outcomes.
Information Management and Application of Patient Care Technology	5	100.0%	The need for nurses to be able to use computer-based information management systems and patient care technology in the provision of client care.
Healthcare Policy, Finance, and Regulatory Environments	2	100.0%	The need for nurses to be able to understand the role of regulatory agencies in relation to the development of health care policies and their effect on patient care services, access to care, financial reimbursement, and scope of nursing practice.
Interprofessional Communication and Collaboration	9	100.0%	The need for nurses to be able to function as a member of the healthcare team while promoting an environment that supports interprofessional communication and collaboration with the goal of providing patient-centered care.
Clinical Prevention and Population Health	31	67.7%	The need for nurses to be able to identify health related risk factors and facilitate behaviors that support health promotion, and disease and injury prevention, while providing population-focused care that is based on principles of epidemiology and promotes social justice.
Professionalism and Professional Values	2	100.0%	The need for nurses to be able to practice nursing in a professional manner while providing patient-centered care that is caring, respects diversity, and is governed by legal and ethical tenets.
Baccalaureate Generalist Nursing Practice	14	85.7%	The need for nurses to be able to practice as a generalist using clinical reasoning to provide care to patients across the lifespan and healthcare continuum and to individuals, families, groups, communities, and populations.

ADJUSTED INDIVIDUAL TOTAL SCORE

To adjust for possible differences in difficulty among the forms of this assessment, the raw score (the total number of items correct) is converted to the adjusted individual total score through a process known as equating. The adjusted individual total score is on a scale of 0% to 100%.

PROBABILITY OF PASSING NCLEX-RN® ON THE FIRST ATTEMPT

The purpose of the "Predicted Probability of Passing NCLEX-RN on the First Attempt" is to provide a numeric indication of the likelihood of passing the NCLEX-RN at the student's current level of readiness. For example, a student who has a score of 71.3% correct would be expected to have a 90% chance of passing the NCLEX-RN on the first attempt. Although this is a high probability of success, it is not a guarantee. The table below summarizes student performance on this assessment as it relates to NCLEX success.

RN COMPREHENSIVE PREDICTOR® EXPECTANCY TABLE

RN Comprehensive Predictor Individual Score	Predicted Probability of Passing the NCLEX-RN
80.7% to 100%	99%
78.7% to 80.0%	98%
75.3% to 78.0%	96% to 97%
74.0% to 74.7%	94% to 95%
72.0% to 73.3%	92% to 93%
70.0% to 71.3%	88% to 90%
68.7% to 69.3%	84% to 86%
67.3% to 68.0%	80% to 82%
65.3% to 66.7%	73% to 78%
62.7% to 64.7%	60% to 70%
57.3% to 62.0%	33% to 57%
0% to 56.7%	1% to 30%

NATIONAL MEAN

This is the average score of all examinees.

PROGRAM MEAN

This is the average score of all examinees within your specified program type.

NATIONAL PERCENTILE RANK

This is the percentage of examinees who scored at or below your score.

PROGRAM PERCENTILE RANK

This is the percentage of examinees within your program type who scored at or below your score.

TOPICS TO REVIEW

Based on the questions missed on this assessment, a listing of content areas and topics to review is provided. A variety of learning resources can be used in the review process, including content, images, animations and videos in ATI's Content Mastery Series® Review Modules, online practice assessments, and a focused review that is individualized to the questions missed.

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