

# **Using the Advanced Dental Admission Test (ADAT) for Admission Purposes: A Guide for Advanced Dental Education Programs**

**September 2016**

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## Overview

The American Dental Association's (ADA) Advanced Dental Admission Test (ADAT) is designed to provide dental education programs with a means to assess program applicants' potential for success.

The ADA's Department of Testing Services (DTS) implements the ADAT program under the auspices of the ADA's Council on Dental Education and Licensure (CDEL). The ADAT is administered at test centers operated by Pearson VUE.

The ADAT is composed of multiple-choice questions presented in the English language, and is developed according to established test specifications. The ADAT consists of four test sections covering the following areas: Biomedical Sciences; Clinical Sciences; Data, Research Interpretation, & Evidence Based Dentistry; and Principles of Ethics & Patient Management.

This guide is intended to provide advanced dental education programs with information concerning the appropriate use and interpretation of ADAT results. Information is provided in the following areas:

- Utilization of ADAT Results in Admission Decisions
- Evidence Supporting Use of the ADAT
- ADAT Content and Scales
- Administration of the ADAT
- ADAT Results Reporting
- Interpretation of ADAT Results
- Additional Guidelines for Interpreting and Applying ADAT Results

Additional information concerning the ADAT program is available online at [ADA.org/adat](http://ADA.org/adat). The ADAT website contains the ADAT Examination Guide, which provides further details concerning administration of the ADAT Program, as well as a set of practice test questions.

**IMPORTANT NOTE:** The ADAT is a new examination program. This guide provides the best available information as of the date of publication. Additional information will be forthcoming. The ADA reserves the right to make changes to test content, administration, scoring, and reporting in accordance with the ADAT program's purpose.

## Utilization of ADAT Results in Admission Decisions

Use of the ADAT takes place within the context of advanced dental education programs' standard admission procedures. Each program differs in how admission decisions are made, and the specific tools available to support those decisions. The following provides general considerations for using ADAT results in admission decisions.

- Each program must make its own decision concerning how to use ADAT results in 2016 and beyond.
- In making decisions as to how to use admission tools, including ADAT results, programs should carefully consider the following:
  - Program and school requirements
  - The knowledge, skills, abilities, and other characteristics (KSAOs) necessary to succeed in the program. This should also include characteristics and behaviors that can derail students and lead to failure, such as poor study habits and maladaptive traits.
  - Available information to support admission decisions (i.e., admission tools).
  - The strengths and weaknesses of each admission tool, including:
    - information the tool provides relative to program requirements and the identified KSAOs
    - quality and accuracy of the information provided
    - evidence that supports the use of the tool
    - the extent to which information provided by the tool might be affected by factors unrelated to the KSAOs of focal interest
    - the extent to which the tool provides a fair and unbiased evaluation of candidate qualifications
    - legal defensibility of using the tool
    - the extent to which the tool permits the program to meaningfully compare the program relevant skills of candidates with different backgrounds (educational training, etc.)
  - The strengths and weaknesses of the set of admission tools utilized, including:
    - how information from different admission tools is weighted in decision-making
    - how redundancy in the information provided by different tools is handled (e.g., via weighting)
    - any deficiencies that might be present (e.g., helpful or necessary information that may be lacking from the set of tools)
- Programs will differ in how they choose to use the ADAT, particularly in the ADAT's first year of administration (2016).
  - Some programs may—in recognition of current challenges in comparing applicants across dental programs—choose to supplement the information from existing admission tools with ADAT results, in making candidate admission decisions.
  - Some programs may use ADAT results only in certain prescribed situations:
    - Situations where little additional information is available concerning candidate qualifications (e.g., no candidate information is available concerning GPA, class rank, or results from other standardized tests).
    - Situations where candidates are equally qualified, and there is a need to break a tie.

- Some programs may simply collect data on ADAT performance in 2016, without using it to inform individual admission decisions. Programs can then review the information, and decide how best to use ADAT results in future years.
- Programs should not exclusively rely on ADAT results in making admission decisions in 2016 or in subsequent years. The ADAT should be used in conjunction with other admission tools that provide insight into candidate qualifications as they relate to core program requirements.
- Programs should decide on their approach, and then apply that approach consistently, in compliance with school and legal requirements.

## Evidence Supporting Use of the ADAT

The ADA's decision to pursue development of advanced dental admission test was based on the expressed needs of communities of interest. Some of those needs were expressed in published articles (cf. Fagin, Howell, Da Silva, and Park, 2014; Fagin, Howell, and Park, 2015), while others were expressed directly to the ADA.

Many advanced dental education programs communicated they were left in a difficult position when the Joint Commission on National Dental Examinations (JCNDE) transitioned to pass/fail reporting in 2012. The JCNDE had made this decision for a variety of reasons. The NBDE had never been validated for admission purposes, and thus its use within this context was questionable and also posed a threat to NBDE test security. In the absence of NBDE scores, advanced dental education programs had little information available to compare the qualifications of candidates with differing educational backgrounds and experiences. The situation was exacerbated by the movement toward pass/fail grading within certain dental schools. For programs caught in this precarious situation, even during the ADAT's first year of availability, ADAT results may represent a reasonable source of information to inform decision making.

The following available evidence supports use of the ADAT. Programs should carefully consider this information—as well as information and evidence supporting other available admission tools—in determining how best to approach use of the ADAT for admission purposes.

- Use of the ADAT is supported based on content validity evidence. ADAT items were written by dental subject matter experts, and other subject matter experts whose qualifications matched needs dictated by the test specifications.
- The areas to be measured within the ADAT were preliminarily identified through review and analysis of the findings of an Advanced Dental Admission Test Task Force Report submitted to the ADA House of Delegates in September 2010. This report included findings from a survey on the evaluation and selection of applicants for positions in advanced dental education programs. This survey was conducted as part of the ADEA Future of Advanced Dental Education Admissions (ADEA/FADEA) project.
- The test specifications for the ADAT were reviewed and approved by the Council on Dental Education and Licensure (CDEL) (November 2014).
- The ADAT test specifications concerning the Biomedical Sciences, Clinical Sciences, and Principles of Ethics/Patient Management test sections are based on the test specifications for the National Board Dental Examinations (NBDE) Parts I and II. As such, the ADAT relies on the content domain foundation established for these two examination programs (e.g., the practice analysis involving entry-level general dentists conducted for the NBDE Part II). ADAT content within the Biomedical and Clinical Sciences sections is proportionally reduced, relative to the NBDE specifications. Item development concerning Principles of Ethics was further informed by the insight of ADAT TCC members who contributed to this section.
- ADAT test specifications for the Data, Research Interpretation, & Evidence Based Dentistry section were constructed based on TCC member input and guidance from the ADA Science Division and its Center for Evidence-Based Dentistry.
- All ADAT TCC members were reviewed and approved by CDEL.
- A substantial number of ADAT Test Construction Committee (TCC) members also write items for other high stakes examination programs (e.g., the National Board Dental Examinations).

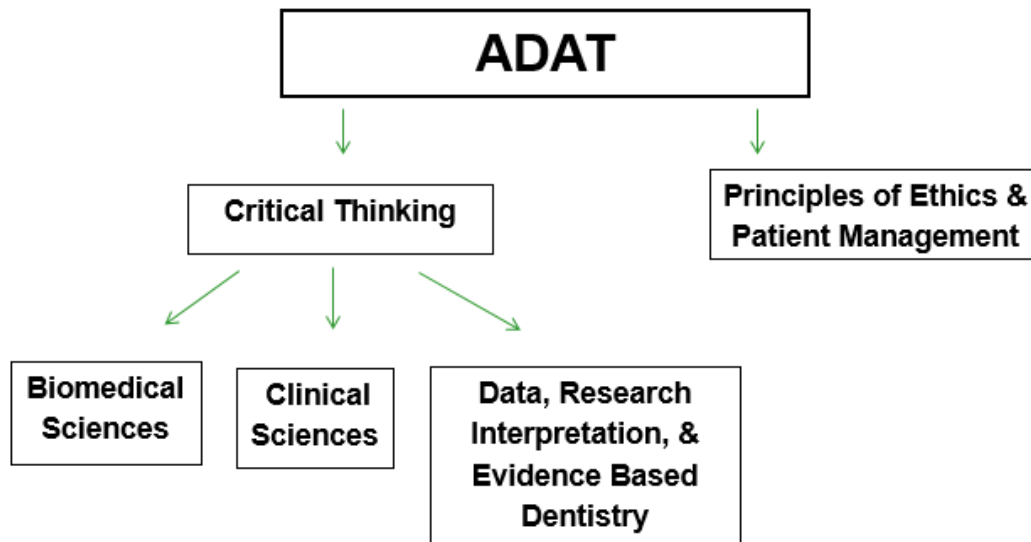
- ADAT TCC members receive extensive training on how to develop valid and reliable items. This includes training on fairness and sensitivity considerations in item writing.
- ADAT administrations occur under standardized testing conditions that are monitored closely. Deviations from standardized testing conditions are reported to the ADA's Department of Testing Services by the test administration vendor (Pearson Vue). Candidates who violate rules and regulations can receive severe penalties that include the voiding of scores and the imposition of mandatory wait periods.
- Window testing and delayed scoring/results reporting are employed in 2016, so that psychometric analyses can identify and address any detected issues with test questions and how the examination performs.
- The practice of employing window testing and delayed reporting of scores is an accepted and valid means of test development, and was in fact pursued by the Joint Commission for decades, prior to the Joint Commission's transition to computer based test administration.
- Through window testing and the delayed reporting of official scores, candidate data will be available on all test items administered before items are actually used in official scoring. Any non-performing items that are identified will be eliminated prior to official scoring and reporting.
- ADAT test development, administration, and scoring are implemented by the ADA's Department of Testing Services (DTS), which employs a professionally trained staff that includes individuals with advanced degrees in Educational Psychology, Industrial/Organizational psychology, Psychometrics, and Leadership.
- DTS has implemented dental high stakes testing programs for decades, including the testing programs of the Joint Commission on National Dental Examinations.
- Due to their high stakes nature, the testing programs under the care of DTS have been subjected to and withstood intense scrutiny over time. All US dental boards currently accept the National Board Dental Examinations (NBDE) and the National Board Dental Hygiene Examination (NBDHE) as valid evidence that a candidate possesses the cognitive skills necessary to safely practice dentistry (NBDE) or dental hygiene (NBDHE).

The following sections provide additional information concerning ADAT content, administration, scoring, and reporting.

## ADAT Content and Scales

ADAT content is broadly structured as depicted in Diagram 1.

Diagram 1: ADAT Content Structure



### ADAT Overall Scale

The ADAT overall scale provides an overall indication of how the candidate performed relative to all of the content areas presented in the ADAT. Descriptions of each of those content areas appears below.

### Biomedical Sciences

This ADAT section focuses on cognitive skills involving the following subject areas:

<b>BIOMEDICAL SCIENCES (80 items)</b>
<b>Anatomic Sciences (20 items)</b>
Gross Anatomy
Histology
Oral Histology
Developmental Biology
<b>Biochemistry and Physiology (20 items)</b>
Biological Compounds
Metabolism
Molecular and Cellular Biology
Connective Tissue
Membranes
Nervous System



Muscle
Circulation
Respiration
Renal
Oral Physiology
Digestion
Endocrines
<b>Microbiology and Pathology (20 items)</b>
General Microbiology
Reactions of Tissue to Injury
Immunology and Immunopathology
Microbiology, Immunology, and Pathology of Specific Infectious Diseases
Systemic Pathology
Growth Disturbances
<b>Dental Anatomy and Occlusion (20 items)</b>
Tooth Morphology
Pulp Cavity Morphology
Calcification and Eruption
Principles of Occlusion and Function
Clinical Considerations – Tooth Morphology and Anomalies

### Clinical Sciences

This section of the ADAT focuses on cognitive skills involving the following disciplines:

<b>CLINICAL SCIENCES</b> (60 standalone and case-based items)
Endodontics
Operative Dentistry
Oral and Maxillofacial Surgery and Pain Control
Oral Diagnosis
Orthodontics and Pediatric Dentistry
Periodontics
Pharmacology
Prosthodontics

## **Data, Research Interpretation, & Evidence Based Dentistry**

This section of the ADAT focuses on concepts taught within the framework of Evidence Based Dentistry. Within this framework, clinicians must know how to critically and systematically review research findings, understand basic methodological issues, and use this information to apply research findings in decision making involving their practice and specific patients. Thus, the focus of this scale rests entirely on methodology, interpretation, and application of research, as opposed to referencing specific findings (e.g., the effectiveness of fluoride in preventing caries) that emerged from this research base. Specific findings would instead be referenced in the Biomedical and Clinical Sciences section of the ADAT.

The following are core concepts in Evidence-Based Dentistry:

- Asking precise, structured clinical questions
- Finding the best evidence using currently available electronic resources
- Reading and critically evaluating research information
- Understanding clinical trial design, such as therapy, diagnosis, and qualitative assessment
- Understanding and interpreting basic statistical information, such as descriptive statistics, odds ratios, risk reduction, and relative risk, to implement Evidence Based Dentistry appropriately in practice settings
- Using evidence based clinical guidelines, recommendations, and systematic reviews
- Implementing best evidence in clinical practice.

This section of the ADAT focuses on cognitive skills involving the following subject areas:

<b>DATA, RESEARCH INTERPRETATION, &amp; EVIDENCE BASED DENTISTRY (30 items)</b>
Study Design
Data Analysis
Result Interpretation
Inference and Implication

## **Critical Thinking**

The ADAT Critical Thinking scale provides an overall assessment of candidate skills with respect to critical thinking in dentistry. This scale includes items from the following sections of the ADAT:

- Biomedical Sciences
- Clinical Sciences
- Data, Research Interpretation, & Evidence Based Dentistry

## Principles of Ethics & Patient Management

This section of the ADAT focuses on cognitive skills involving the following subject areas:

<b>PRINCIPLES OF ETHICS &amp; PATIENT MANAGEMENT</b> (30 items)
Principles of Ethics
Patient Management <ul style="list-style-type: none"><li>• Communication and Interpersonal Skills</li><li>• Anxiety and Pain Control</li><li>• Health Behavior Change</li><li>• Disabled and Medically Compromised</li><li>• Epidemiology</li><li>• Prevention of Oral Diseases</li><li>• Infection Control</li><li>• Materials and Equipment Safety</li><li>• Professional Responsibility and Liability</li></ul>

With respect to ethics, it is important to note that this scale does NOT directly measure professional ethics, or indicate whether a person will behave ethically. Rather, it provides information concerning whether a candidate can, for example, recognize the ethical principles that apply to particular situations, and how those situations could be handled in accordance with those ethical principles.

## Administration of the ADAT

Policies and procedures for administering the ADAT are presented in the ADAT Examination Guide, which is published on an annual basis. This guide is available at the following link: [www.ada.org/adat](http://www.ada.org/adat).

### ADAT Eligibility

Eligibility to take the ADAT is based on the candidates' training and their current status as a student or graduate.

Training	Status	Action Required
<b>CODA Accredited Dental School</b>	<b>Student</b>	School is responsible for approving the candidate's eligibility.
	<b>Graduate</b>	Candidate must send proof of graduation to DTS. Eligibility approved after receipt of reasonable proof.
<b>Non-Accredited Dental School</b>	<b>Student</b>	Candidate requests an Educational Credential Evaluators (ECE) electronic report to certify status as a current dental student.
	<b>Graduate</b>	Candidate requests an ECE electronic report to confirm dental degree.

### ADAT Administration Vendor and Testing Schedule

The ADAT is administered at Pearson VUE test centers in the United States, its territories (including Guam, Puerto Rico and the Virgin Islands), and in Canada. Administration occurs during predefined testing dates indicated in the ADAT Examination Guide.

ADAT Testing Schedule	
Tutorial	15 minutes
<b>Biomedical Sciences</b>	<b>90 minutes</b>
Break (optional)	10 minutes
<b>Data, Research Interpretation, &amp; Evidence Based Dentistry</b>	<b>30 minutes</b>
Break (optional)	10 minutes
<b>Clinical Sciences</b>	<b>70 minutes</b>
Break (optional)	10 minutes
<b>Principles of Ethics &amp; Patient Management</b>	<b>30 minutes</b>
Post Test Survey (optional)	5 minutes
<b>Total Time</b>	<b>4 hours 30 minutes</b>

Time permitting, candidates are prompted to review their answers in each section before taking a break or moving on to the next section. Once a candidate has begun a break, he or she is not allowed to return to the previous section to view questions and change answers.

Partial testing is not permitted. Applicants are required to take all four sections of the ADAT.

In taking the ADAT, candidates agree to adhere to examination rules and regulations, which are described in the ADAT Examination Guide. Candidate behavior is closely monitored during test administration to confirm that rules and regulations are respected. Candidates who violate examination regulations are subject to severe penalties that include the voiding of scores and the imposition of mandatory wait periods.

## ADAT Results Reporting

**Note: The ADAT testing window for 2016 is now closed. The following text concerning ADAT Results Reporting has been preserved in its original format as a reference. As of the date of publication of this guide, the Department of Testing Services anticipates that a similar preliminary results reporting schedule will also be required in 2017.**

### Official ADAT Results

Official ADAT results for all 2016 testing dates are scheduled to be released to candidates, ADEA PASS, and the DTS Hub on September 15, 2016. Official results will be reported as ADAT scale scores, which range from 200 to 800. To assist with interpretation, the ADAT website will be updated on September 15 with a final normative report indicating scale scores and corresponding percentiles with respect to the overall candidate pool.

### Preliminary (Unofficial) ADAT Results

To assist candidates and programs during the first year of availability (2016), preliminary ADAT results are scheduled to be released on the following dates:

- July 15, 2016
- August 12, 2016
- September 9, 2016

**The Preliminary ADAT results shared on the above dates are considered unofficial** and intended to help ADAT candidates and programs understand candidate performance on the examination relative to others who have taken the test to date. Candidates and programs will receive information concerning candidates' percentile standing in each of the following areas:

- Biomedical Sciences
- Clinical Sciences
- Data, Research Interpretation, and Evidence-Based Dentistry
- Principles of Ethics & Patient Management
- Critical Thinking
- Overall ADAT

Percentiles describe how a candidate performed relative to other test-takers in a norm group. Percentiles can be interpreted as the percentage of test-takers in the norm group who scored at or below the candidate's score. **Candidates and programs should expect that candidates' percentile standing will change as more individuals complete the ADAT.** Similarly, the preliminary results reported to candidates and programs will also change at each of the dates indicated above. Candidates can monitor changes by reviewing the "My Account" area of their DENTPIN® accounts. This area will contain candidates' most recently reported results; any previous percentiles reported will be replaced with the newest information. When official results are reported, candidate scale scores will completely replace the preliminary percentiles reported in My Account. Programs will be provided with candidate percentile performance relative to the indicated norm group.

Results will be provided electronically to all programs selected by the candidate. Additionally, if a candidate requests their results be sent to any advanced dental education program, their results will also be made available to ADEA PASS and distributed to all programs that participate in ADEA PASS.

**Example:**

**On July 15, 2016**, preliminary ADAT percentile results will be released to candidates who tested between May 16 and June 30, 2016. For these percentiles, the norm group will consist of candidates taking the ADAT between May 16 and June 30. If a candidate has a percentile of 88 at this stage, for example, he or she performed as well as or better than 88% of candidates taking the ADAT between May 16 and June 30, 2016.

**On August 12, 2016**, percentile results will be released to candidates who tested between May 16 and July 31, 2016. For these percentiles, the norm group will consist of candidates taking the ADAT between May 16 and July 31. For example, candidates in the 80<sup>th</sup> percentile at this stage performed as well or better than 80% of candidates taking the ADAT between May 16 and July 31, 2016.

**On September 9, 2016**, final percentiles will be released to candidates who tested between May 16 and August 31, 2016. For these percentiles, the norm group will consist of candidates taking the ADAT between May 16 and August 31. For example, a candidate in the 82<sup>nd</sup> percentile at this stage performed as well as or better than 82% of candidates taking the ADAT between May 16 and Aug. 31, 2016.

*Note: While the preceding examples could be interpreted as referencing different candidates, the above also could describe the experience of a single candidate who tested in June 2016; the candidate's percentile standing could change from 88 to 80 and then to 82 across the three preliminary reporting periods. A candidate's percentile standing can shift up or down as the normative group changes.*

The following tables summarize the preceding schedule of reporting activity.

<b>PRELIMINARY RESULTS REPORTING SCHEDULE FOR 2016</b>		
<b>2016 Test Administration Periods</b>	<b>Results posted in ADAT Candidate's "My Account"</b>	<b>Results available to Advanced Dental Education Program Directors</b>
May 16 to June 30	July 15	July 15
July 1 to July 31	August 12	August 12
August 1 to August 31	September 9	September 9

<b>OFFICIAL RESULTS REPORTING SCHEDULE FOR 2016</b>		
<b>2016 Test Administration Period</b>	<b>Results posted in ADAT Candidate "My Account"</b>	<b>Results Available for Advanced Dental Education Program Directors and Dental School Deans</b>
May 16 to August 31	September 15	September 15

In subsequent years, candidate percentiles will not be directly provided in the DTS Hub and My Account. This is due to the interpretational challenges associated with percentiles, as indicated above (i.e., their dependence on the sample tested and their inadequacy in providing a fixed skill interpretation). In lieu of this candidate specific information, the ADAT Program will provide overall normative tables that can serve as a reference in understanding the skills of those who tested in a given year, and how candidates compare to each other.

Once a candidate has taken any part of the ADAT, the scores cannot be voided at the candidate's request. If candidates retest, a complete history of testing attempts is reported.



## **Interpretation of ADAT Results**

### **ADAT Scale Scores**

Official ADAT scores are calculated based on a candidate's correct responses to items; applicants are not penalized for guessing. ADAT results are reported in terms of scale scores. These scale scores are not raw scores (number of correct answers). The conversion of raw scores to scale scores is accomplished using sophisticated equating procedures. Using scale scores, it is possible to meaningfully compare the performance of one applicant with the performance of all applicants. The ADAT program does not designate passing or failing scores.

### **Scoring Model and Equating Procedures**

Scale scores for the four ADAT disciplines are calculated using item response theory (IRT) and the three-parameter logistic model (3-PL Model). In providing an estimate of candidate skills, the IRT 3-PL Model takes into account the following:

- The difficulty level of each test item
- The quality of each test item (item discrimination)
- The impact of guessing on item performance

The ADAT does not penalize candidates for guessing. However, it statistically adjusts scores based on an item's susceptibility to guessing. This practice increases the precision and accuracy of skill evaluation.

Each administered ADAT includes questions that enable the Department of Testing Services to place different forms of the test on a common measurement scale, thereby adjusting the forms for differences in difficulty level. Because of this adjustment, scores have the same meaning regardless of the test form that was administered. Some questions on the test are experimental and are not scored. The data collected on unscored questions is used in later test construction procedures.

The boxes in Diagram 1 correspond to scale scores provided in each of the six referenced areas. ADAT scale scores range from 200 to 800. Higher scale scores in a specific area indicate higher cognitive skills in that area. A score of 200 is reported for any assigned test not taken.

### **Composite and Discipline Based Scales**

The ADAT Overall and Critical Thinking scales are referred to as composite scales, because they are calculated using scores from the discipline based scales. The ADAT Overall score is a weighted average of scale scores from all four ADAT disciplines, while the Critical Thinking score is a weighted average of scale scores from the Biomedical Sciences, Clinical Sciences, and Data, Research Interpretation, & Evidence Based Dentistry scales. Weights were proportional to the number of items in each area, and the final score was rounded to the nearest ten.

To the degree possible, to facilitate interpretation the ADA's Department of Testing Services will work to establish the discipline based score scales so that they each have a mean of 500 and a standard deviation of 100. This will be challenging to maintain over time, due to the fact that the population taking the ADAT could change substantially during the first few years of

implementation. In short, as more and more advanced dental education programs use the ADAT, the level of skills of the overall candidate pool will shift based on the skills of those included. Programs should anticipate that recalibration of the score scale may be necessary in future years, as the population taking the ADAT changes.<sup>1</sup>

Interpretation of composite scale scores is slightly different from interpretation of discipline-based scale scores. It is important to note that scores on the ADAT Overall and Critical Thinking scales have narrower ranges than scores on the four discipline scales. This is due to differences in how composite and discipline based scale scores are computed. As noted above, composite scales represent weighted averages of discipline based scales, whereas scale scores for the four ADAT disciplines are based on candidate skill level estimates determined from the aforementioned IRT-3PL scoring model.

An example based on ADAT candidate performance in 2016 may help to illustrate this point. In 2016, the maximum observed scores for the ADAT Overall and Critical Thinking scales were 700 and 720, respectively, while the maximum observed score for each of the four discipline scales was 800. The narrower ranges correspond with lower standard deviations for the ADAT Overall and Critical Thinking scales (approximately 74 and 79, respectively), as compared to the standard deviations associated with the four disciplines (which all approach 100). While higher scores (e.g., 750 to 800) are possible on the ADAT Overall and Critical Thinking scales, such scores are more difficult to achieve and were in fact not observed in the 2016 normative sample. In 2016, a scale score of 620 was associated with the 90th percentile on the Biomedical Sciences scale, while the same score was associated with the 95th percentile on the ADAT Overall scale.

A complete listing of the percentiles associated with ADAT scale scores appears in the *Normative Information* section of this guide.

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<sup>1</sup> Recalibration re-centers the score scale and adjusts the score distribution so it takes on desirable properties. The examination's validity and reliability remains intact.

## Additional Guidelines for Interpreting and Applying ADAT Results

**Note: The ADAT testing window for 2016 is now closed. Portions of the following text contain references to the preliminary results reporting schedule that was implemented in 2016. This text has been preserved in its original format as a reference. As of the date of publication of this guide, the Department of Testing Services anticipates that a similar preliminary results reporting schedule will also be required in 2017.**

The following guidelines may be helpful for interpreting and applying ADAT results:

- Candidates may choose to take the examination more than once. Particularly in 2016 when candidates are experiencing the ADAT for the first time, it is recommended that programs reference the candidate's most recent results to best represent the candidate's skills.
- It is recommended that programs avoid employing cut scores with the ADAT during its first few years of use (e.g., admitting candidates with ADAT scores of "x" or above). Such a practice would be premature until programs have a stronger understanding of the cognitive skills associated with the various ADAT score levels.
- Until the preceding information becomes available, it is recommended that ADAT results be interpreted on a relative basis, as follows:
  - Candidates with higher scores on each scale have demonstrated stronger cognitive skills than candidates obtaining lower scores.
- Candidates with lower percentile standing on the ADAT may still be viable candidates for advanced dental education programs. If, for example, ADAT examinees are more highly skilled on average than those who do not take the ADAT, then their percentile standing within the general dental population may be considerably higher than one might think given their achieved ADAT percentile standing. This may be particularly true in the first years of ADAT availability, when less information is available to compare the pool of ADAT examinees with the total pool of advanced dental education candidates. In short, candidates with lower ADAT percentile standing should not be broadly interpreted as "poor candidates."
- When viewing preliminary results reporting that includes candidate percentiles, programs should be mindful of the fact that percentiles CANNOT be directly compared across test administration periods (i.e., across norm groups). Comparison using percentiles within testing periods (within a given norm group) is useful and appropriate.
- Candidates' percentile standing can and will change across test administration periods, even though a given candidate's performance on the examination remains the same. This is also why ADAT official results are provided in scale scores, which do not change and have the potential to take on fixed interpretations (i.e., a score of 'x' signifies a specific level of cognitive skills with respect to a particular content area of interest).
- When examining and comparing candidate performance, programs should use caution when interpreting differences in percentile standing. Differences in percentile standing communicate differences in candidate relative standing in the population tested, NOT the amount of difference between candidates in their underlying skills. For example, assuming the data are normally distributed, a five percent (5%) difference in percentile standing can correspond to a:
  - small difference in skills for candidates who fall in the middle of the distribution (e.g., 50<sup>th</sup> percentile).
  - large difference in skills for candidates scoring in the tails of a distribution (e.g., 95<sup>th</sup> percentile).
- Use percentiles to understand candidates' relative standing within the population tested.

- Use scale scores to understand candidate skill levels, as well as differences between candidates in their underlying skills.
- ADAT scales containing larger numbers of items (e.g., the ADAT overall scale, Critical Thinking scale) are more reliable than scales containing fewer items (e.g., Principles of Ethics & Patient Management, Data, Research Interpretation, & Evidence Based Dentistry).
- Do NOT overemphasize small differences in test scores.
- Do NOT simply rank order candidates and make selection decisions based on a top-down approach. This approach may disadvantage certain applicant groups.
- As a reminder, in making admission decisions programs should carefully consider a) the full set of KSAOs required for success in a program, in relation to program, school, and legal requirements, and b) the qualifications of candidates.
- Programs should let the above perspective help inform their decisions with respect to individual candidates.

## ADAT Score Reliability

Reliability coefficient estimates for 2016 ADAT scale scores (N= 462) are given in the table below<sup>2</sup>. Reliability coefficients can range from zero to one, with higher values indicating higher reliability.

<b>ADAT Scale Score Reliability Coefficients (2016)</b>	
<b>ADAT Scale</b>	<b>Reliability</b>
ADAT Overall (ADAT)	.83
Critical Thinking (CRT)	.82
Biomedical Sciences (BIO)	.76
Clinical Sciences (CLI)	.63
Data, Research Interpretation, & Evidence Based Dentistry (DRI)	.67
Principles of Ethics & Patient Management (PEPM)	.49

2016 was the first year of administration of the ADAT. As was articulated in interpretational reports issued throughout the 2016 preliminary ADAT Results Reporting cycles, the Department of Testing Services strongly recommends that candidates and programs focus their attention on the ADAT Overall and Critical Thinking scales. These scales contain larger numbers of items and are therefore more reliable than scales containing fewer items. Scale reliabilities are anticipated to increase in future years, as additional performance data become available.

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<sup>2</sup> The reliability coefficients reported in this table are calculated from IRT 3-PL model estimates of candidate skill levels and their standard errors using the methods described by Sireci, Thissen and Wainer (1991) and Childs et al. (2004).

## Normative Information

**ADAT Scale Scores.** Descriptive statistics for the 2016 ADAT scale scores (N= 462) are provided in the table below. Each scale has a mean of approximately 500.

ADAT Scale Score Descriptive statistics (2016)						
Scale Type	Scale	Mean	SD	Min	Max	
Composite	ADAT Overall (ADAT)	500.3	73.7	230	700	
	Critical Thinking (CRT)	500.1	78.9	220	720	
Discipline	Biomedical Sciences (BIO)	500.2	98.7	200	800	
	Clinical Sciences (CLI)	499.8	98.7	200	800	
	Data, Research Interpretation, & Evidence Based Dentistry (DRI)	499.4	97.8	200	800	
	Principles of Ethics & Patient Management (PEPM)	500.0	99.3	210	800	

Frequency distributions for the six ADAT scales are presented in Appendix A. The vertical axis of each figure shows the number of candidates at each scale score, while the horizontal axis shows the scale score.

**ADAT Percentiles.** The percentiles associated with scores on each ADAT scale are presented in Appendix B. The percentiles describe how a candidate performed relative to the 460 candidates attempting the ADAT for the first time in 2016. Percentiles can be interpreted as the percentage of test-takers in the normative group who scored at or below the candidate's scale score. If a candidate has a percentile of 88, for example, he or she performed as well as or better than 88% of candidates taking the ADAT for the first time in 2016.

**Normative Information, by Specialty.** At the time of application to complete the ADAT, candidates indicated the programs to which they would like to send their results. Based on the programs selected, candidates were classified into one or more specialty groups. Candidates who selected programs from multiple specialties were classified into multiple specialty groups. Most candidates (approximately 2/3<sup>rd</sup>) applied to just a single specialty program.

Appendix C contains descriptive statistics for 2016 ADAT scale scores, by specialty. Specialties are shown if 25 or more candidates applied to programs in that specialty.

Appendix D contains frequency distributions for the ADAT Overall scale, by specialty, for those specialties selected by 80 or more candidates. The vertical axis of each figure shows the number of candidates at each scale score, while the horizontal axis shows the scale score.

As the ADAT program grows and additional candidates complete the examination, additional normative breakdown groups will satisfy the criteria indicated above (N≥25 for descriptive statistics, N≥80 for histograms) and will thus be able to be presented.

## Concluding Comments

The American Dental Association is pleased to provide the Advanced Dental Admission Test for consideration by advanced dental education programs and communities of interest. For additional information concerning this examination program, please visit the ADAT website ([www.ada.org/adat](http://www.ada.org/adat)).

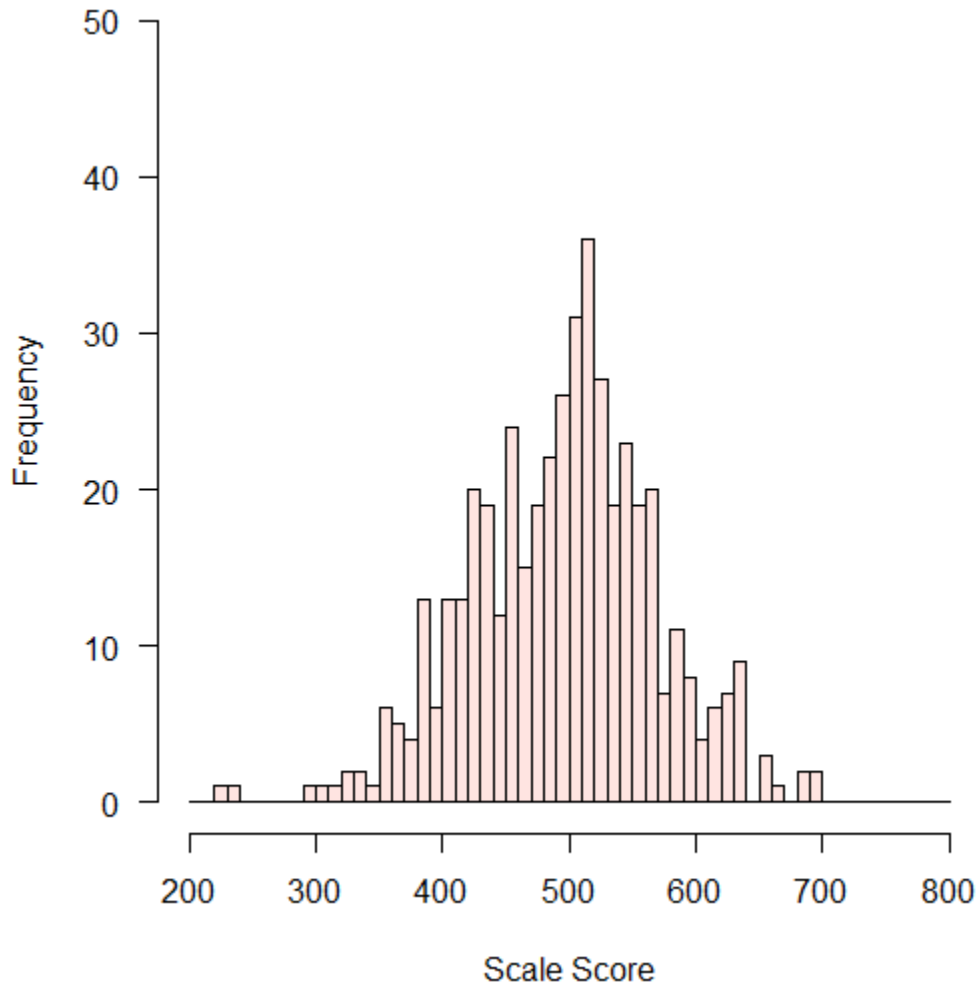
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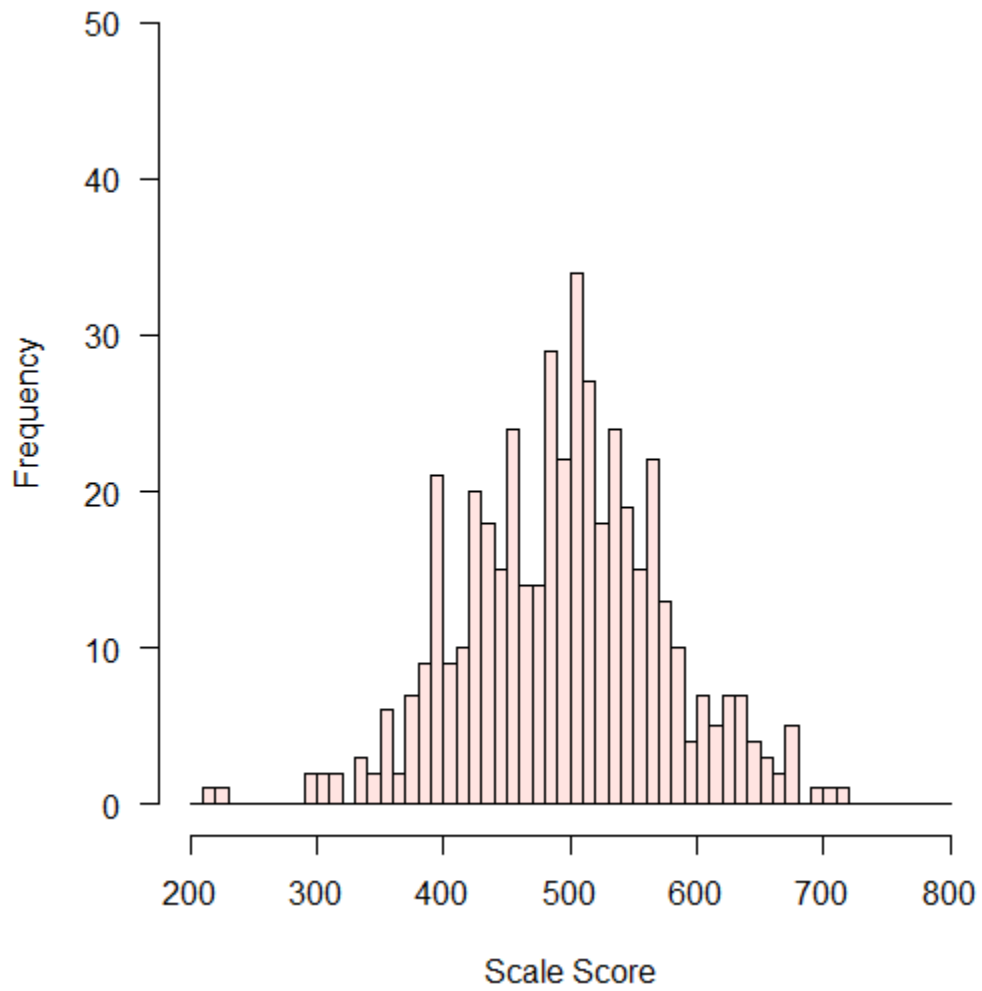


## Appendix A: Frequency Distributions for ADAT Scale Scores (2016)

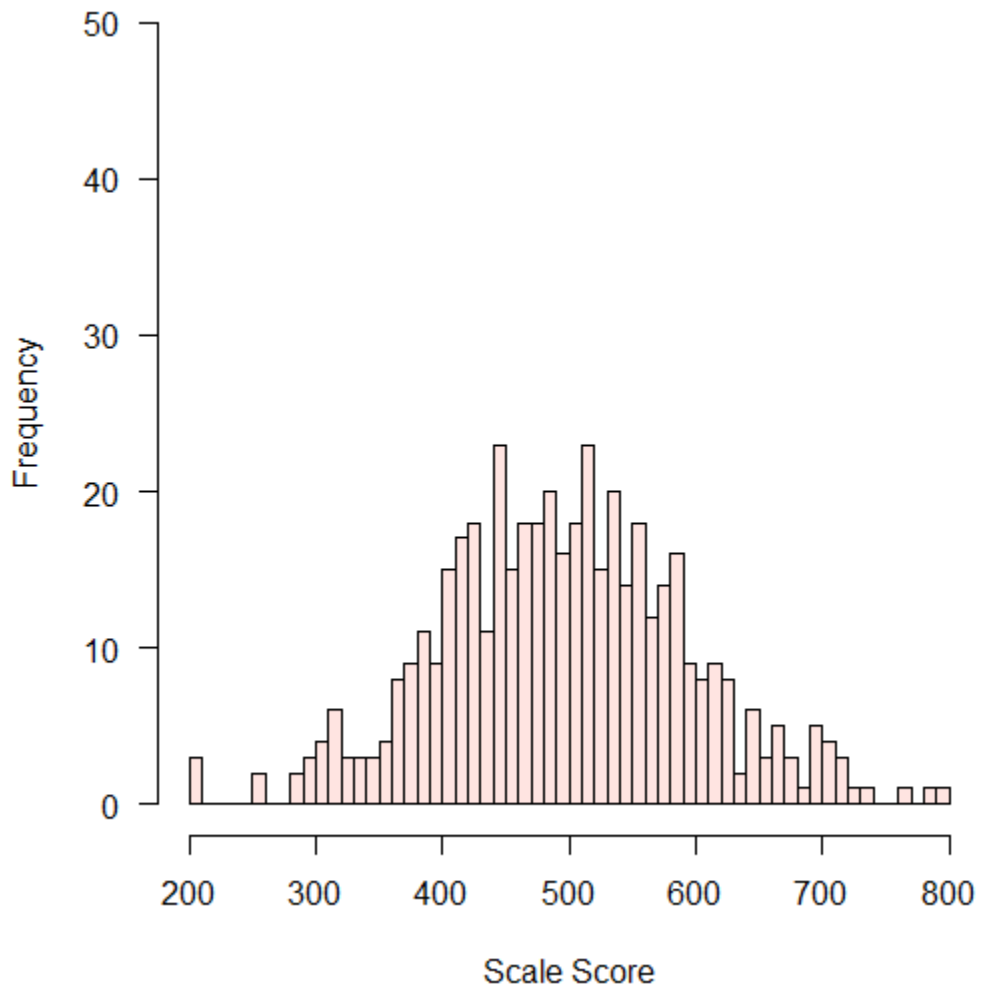
Frequency distribution for the ADAT Overall scale: 2016 (N= 462)



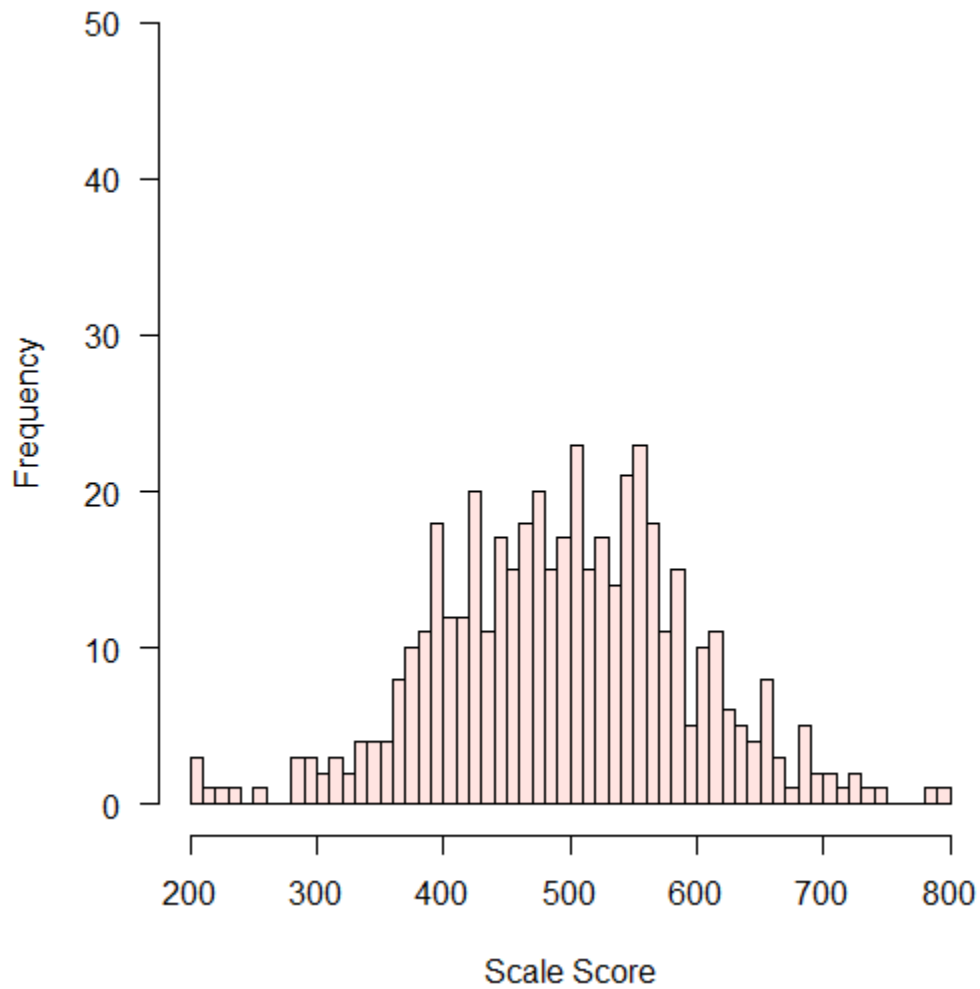
Frequency distribution for the Critical Thinking scale: 2016 (N= 462)



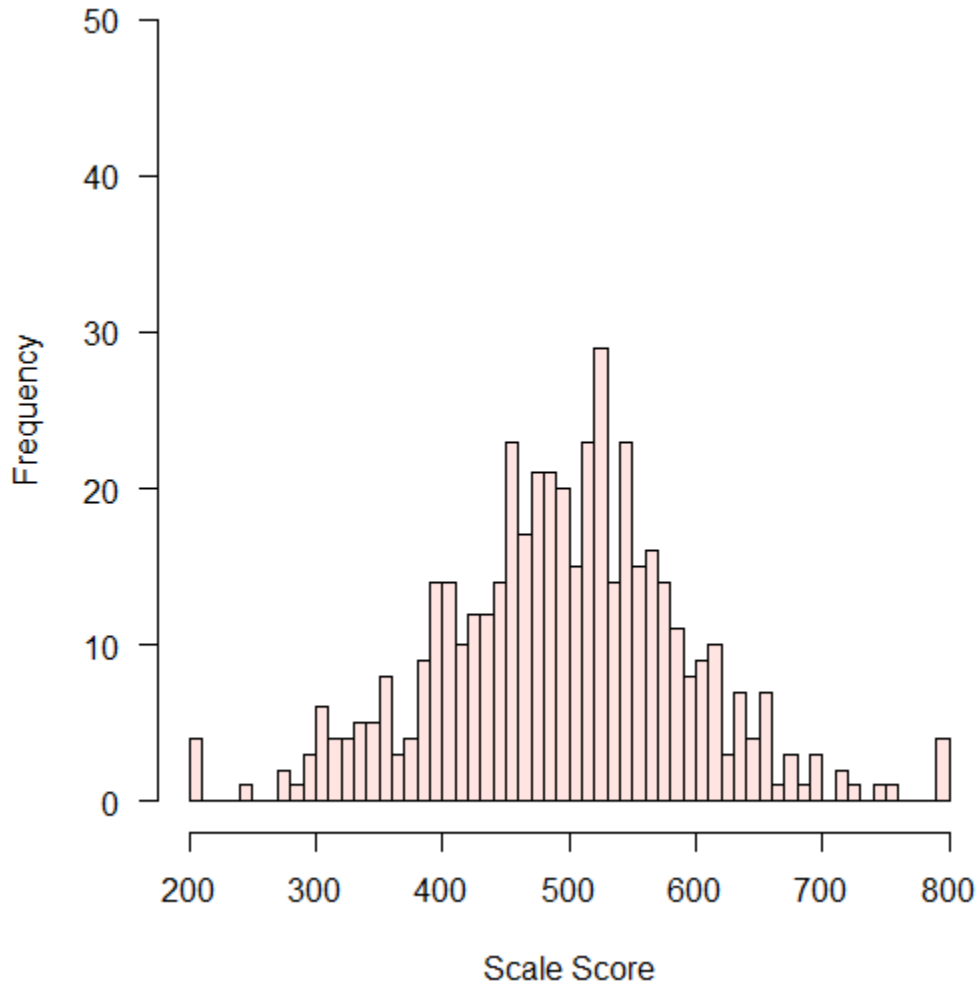
Frequency distribution for the Biomedical Sciences scale: 2016 (N= 462)



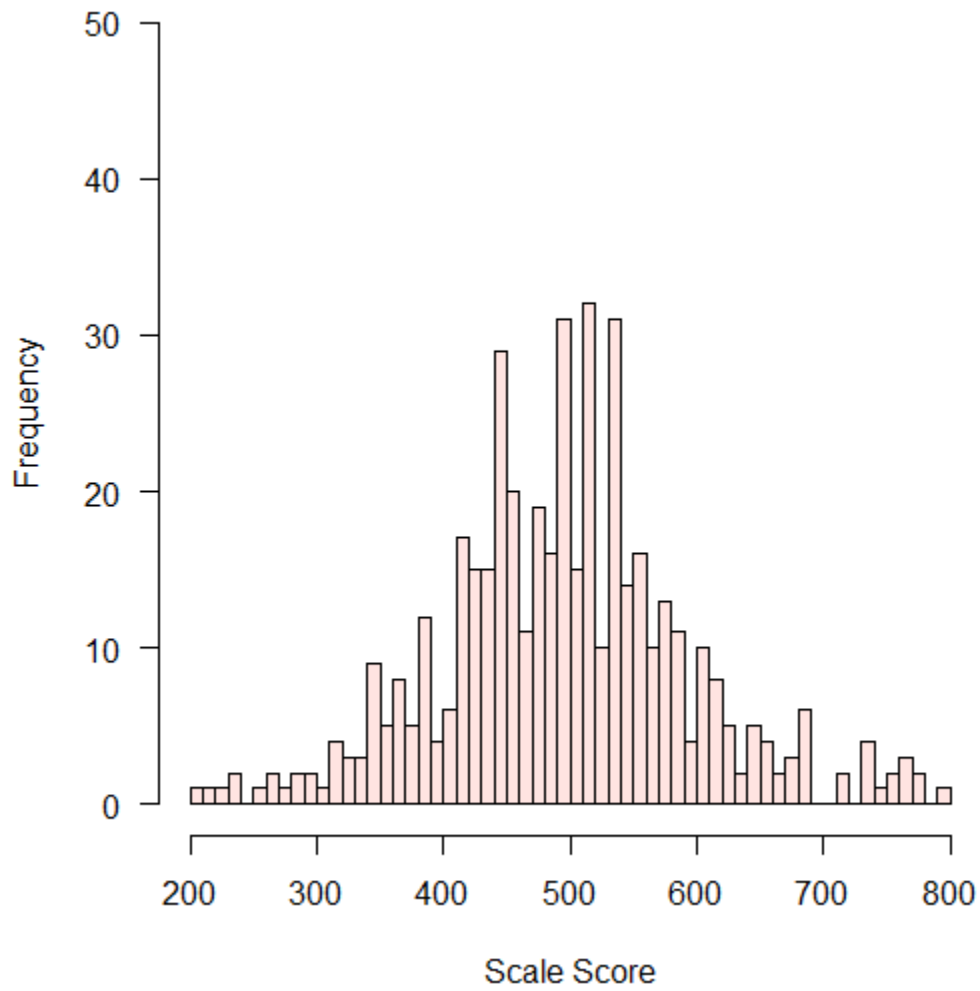
Frequency distribution for the Clinical Sciences scale: 2016 (N= 462)



Frequency distribution for the Data, Research Interpretation, & Evidence Based Dentistry scale: 2016 (N= 462)



Frequency distribution for the Principles of Ethics & Patient Management scale: 2016 (N= 462)



## Appendix B: Percentiles Associated with ADAT Scale Scores (2016)

Normative group: Candidates attempting the ADAT for the first time in 2016 (N=460)

ADAT=ADAT Overall; CRT=Critical Thinking; BIO=Biomedical Sciences; CLI=Clinical Sciences  
 DRI=Data, Research Interpretation, & Evidence Based Dentistry;  
 PEPM = Principles of Ethics & Patient Management

Score	ADAT	CRT	BIO	CLI	DRI	PEPM
800			99	99	99	99
790			99	99	99	99
780			99	99	99	99
770			99	99	99	99
760			99	99	99	99
750			99	99	99	98
740			99	99	99	98
730			99	99	99	97
720		99	99	99	98	97
710		99	98	98	98	97
700	99	99	97	98	98	97
690	99	99	96	98	97	97
680	99	99	96	97	97	95
670	99	98	95	96	97	95
660	99	98	94	96	96	94
650	98	97	94	94	95	93
640	98	96	92	93	94	92
630	96	95	92	92	92	92
620	95	93	90	91	92	91
610	93	92	88	88	90	89
600	93	91	87	86	88	87
590	91	90	85	85	86	86
580	88	88	81	82	84	84
570	87	85	78	79	81	81
560	83	80	76	75	77	79
550	79	77	72	70	74	75
540	74	73	69	66	69	72
530	70	68	64	63	66	65
520	64	64	61	59	60	63
510	56	58	56	56	55	56
500	49	50	52	51	52	53
490	44	46	49	47	47	47
480	39	40	45	44	43	43

<b>Score</b>	<b>ADAT</b>	<b>CRT</b>	<b>BIO</b>	<b>CLI</b>	<b>DRI</b>	<b>PEPM</b>
470	35	37	41	40	38	39
460	32	33	37	36	34	37
450	26	28	33	33	29	32
440	24	25	28	29	26	26
430	20	21	26	27	24	23
420	15	17	22	22	21	20
410	12	15	18	20	19	16
400	10	13	15	17	16	15
390	8	8	13	13	13	14
380	5	6	11	11	11	11
370	5	5	9	9	10	10
360	3	4	7	7	9	8
350	2	3	6	6	8	7
340	2	2	6	5	7	5
330	2	2	5	4	5	5
320	1	2	4	4	5	4
310	1	1	3	3	4	3
300	1	1	2	3	2	3
290	1	1	2	2	2	2
280	1	1	1	2	2	2
270	1	1	1	2	1	2
260	1	1	1	2	1	1
250	1	1	1	1	1	1
240	1	1	1	1	1	1
230	1	1	1	1	1	1
220		1	1	1	1	1
210			1	1	1	1
200			1	1	1	



### Appendix C: Descriptive Statistics for ADAT Scale Scores, by Specialty (2016)

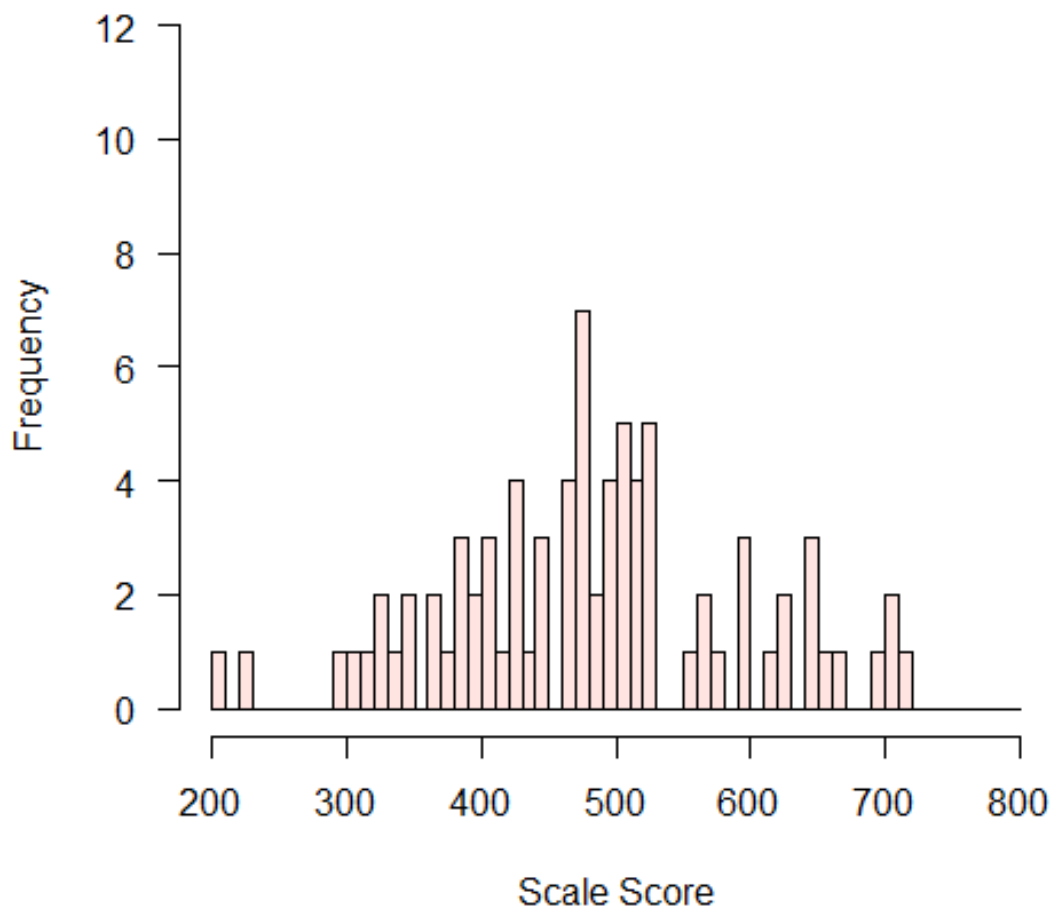
	SPECIALTY	N	ADAT		CRT		BIO		CLI		DRI		PEPM	
			MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
1	<b>AEGD12</b>	80	486.1	110.2	492.4	112.6	503	111.7	491.4	102.1	473.1	110.3	471.3	95.5
2	<b>AEGD24</b>	34	465.3	131.9	480.3	131.9	520.6	121.1	461.8	131.6	429.4	115.5	430.6	100.2
3	<b>ENDO</b>	84	498.9	108.5	501.0	109.1	497.9	116.9	499.2	104.6	503.5	103.9	492.4	101.1
4	<b>GPR12</b>	99	497.1	110.0	499.3	111.8	511.6	110.2	489.7	104.6	488.3	112.3	490.1	94.8
5	<b>GPR24</b>	35	473.7	132.1	484.6	134.2	522.6	121.9	463.4	126.0	439.4	112.5	449.4	94.2
6	<b>OMS</b>	27	506.3	122.8	510.0	123.5	538.1	130.0	474.1	117.5	487.8	104.1	489.3	96.8
7	<b>ORTHODO</b>	133	518.3	99.9	520.0	98.5	520.8	99.6	511.7	94.6	513.4	106.1	499.1	107.5
8	<b>ORTHOPER</b>	47	511.7	112.4	515.1	112.5	539.4	115.5	488.9	98.7	488.9	116.3	488.9	115.4
9	<b>PEDDENT</b>	180	488.9	91.6	486.5	92.9	489.6	98.1	488.6	96.3	488.2	82.2	505.8	92.0

Note. ADAT= ADAT Overall, CRT=Critical Thinking; BIO=Biomedical Sciences; CLI=Clinical Sciences, DRI=Data, Research Interpretation, & Evidence Based Dentistry; PEPM = Principles of Ethics & Patient Management. Norms are presented only for areas where the sample size was 25 or greater..

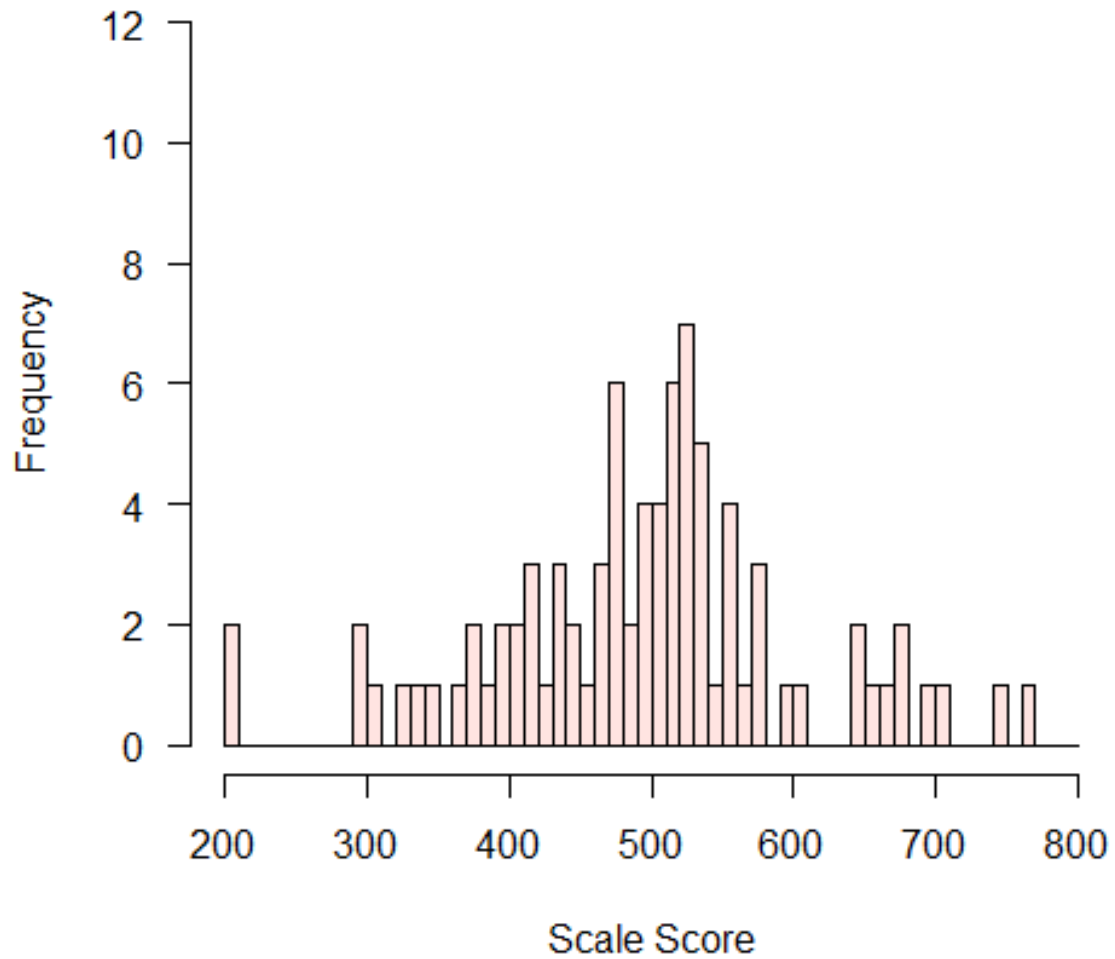
## Appendix D: Frequency Distributions for ADAT Overall Scales, by Specialty (2016)

*Note: Frequency distributions are provided for specialties selected by 80 or more candidates.*

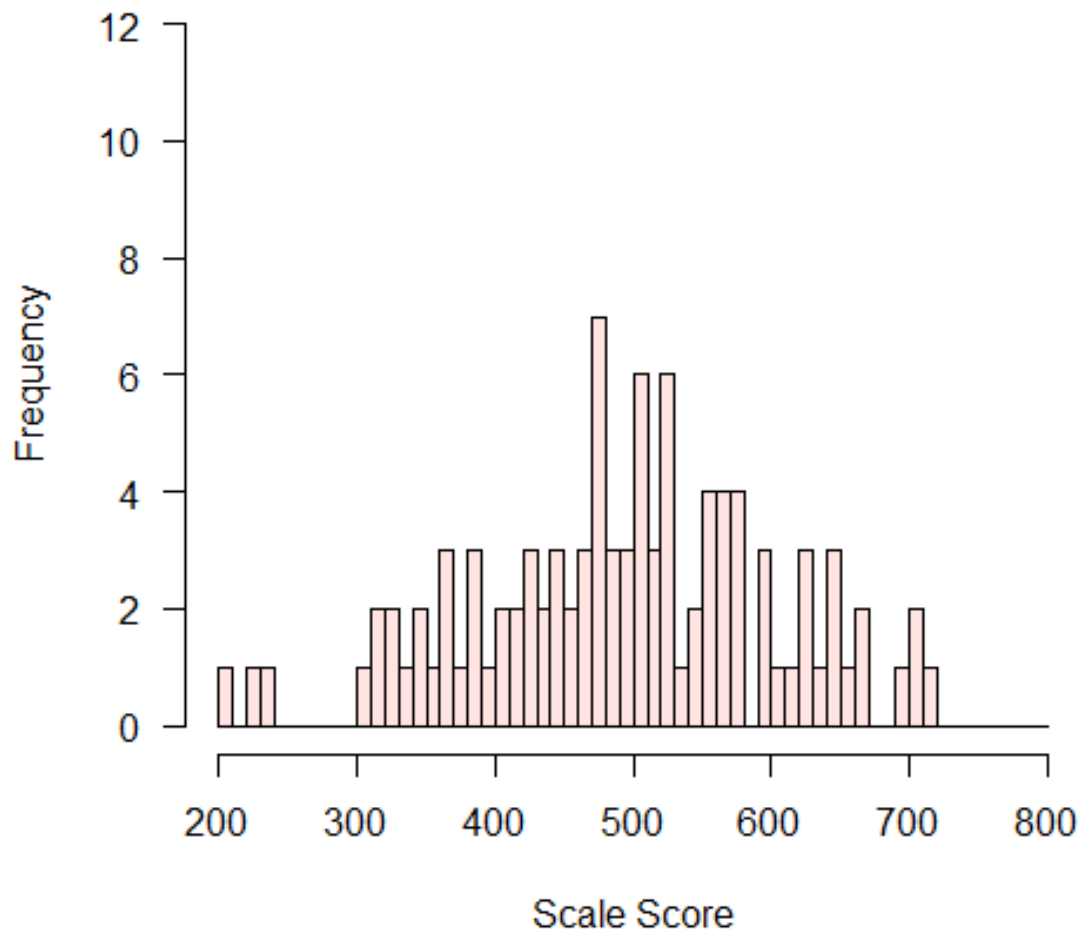
*Frequency distribution for the ADAT Overall scale: AEDG12 (N=80)*



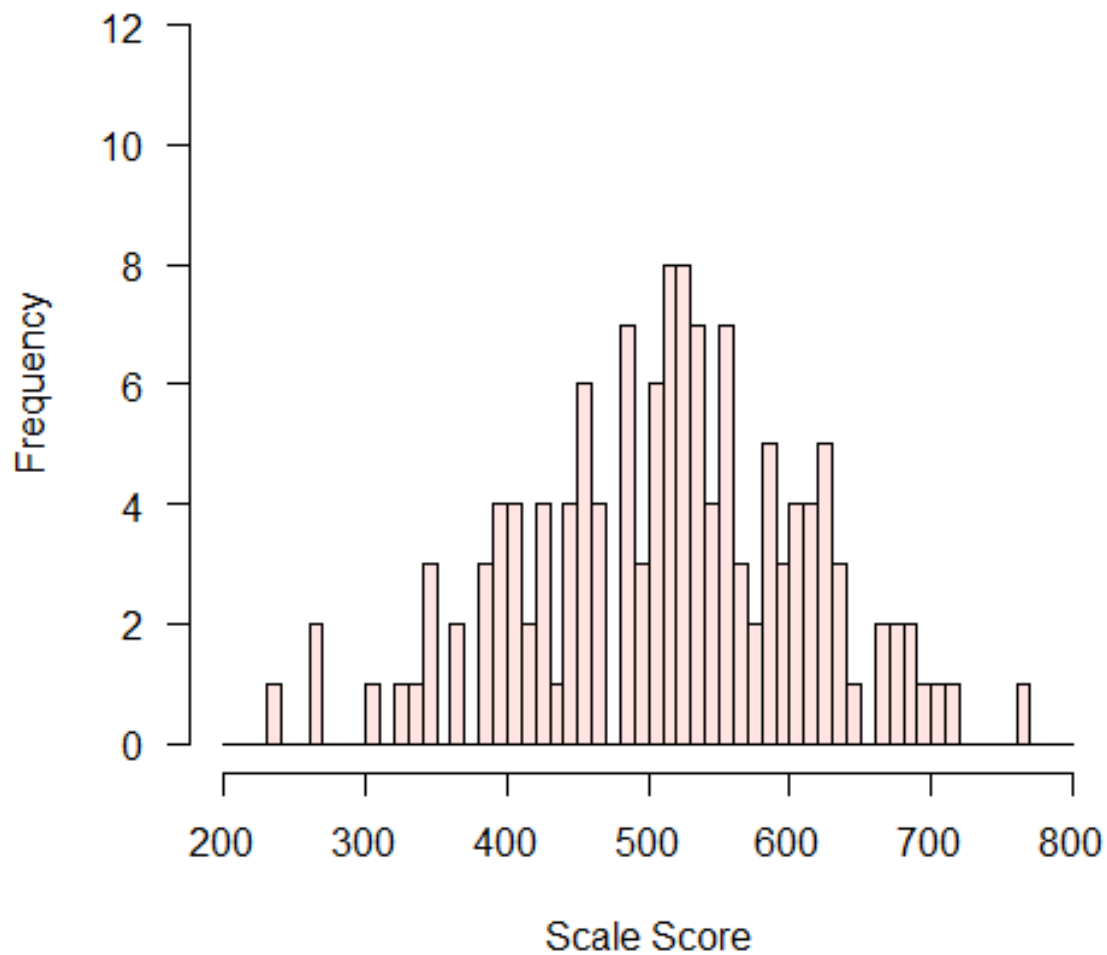
Frequency distribution for the ADAT Overall scale: ENDO (N=84)



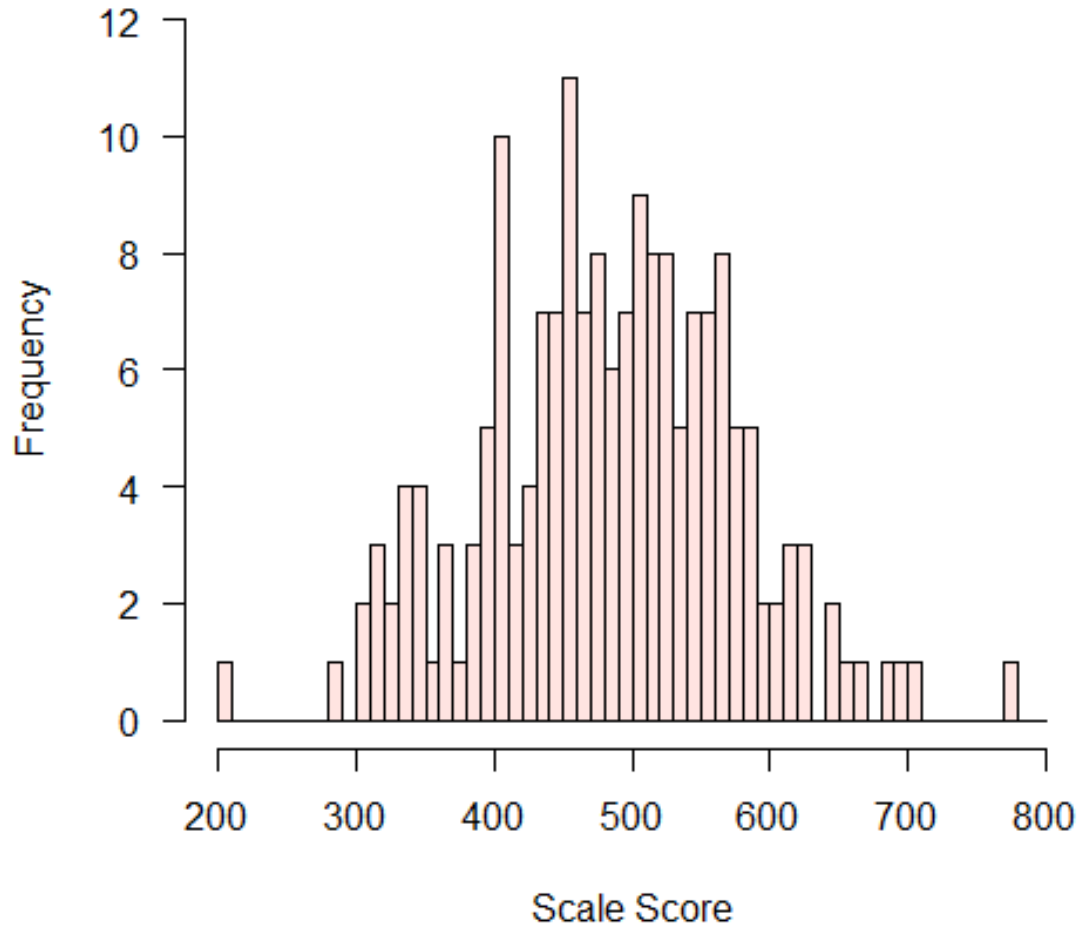
Frequency distribution for the ADAT Overall scale: GPR12 (N=99)



Frequency distribution for the ADAT Overall scale: ORTHODO (N=133)



Frequency distribution for the ADAT Overall scale: PEDDENT (N=180)



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