American Board of Applied Toxicology
Policies, Procedures and Guidelines

Last updated: September 12, 2008

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EXAMINATION PREPARATION COMMITTEE

Committee Purpose: The committee is a standing committee of ABAT which creates, grades and evaluates the examination given to Board-eligible candidates who sit for the ABAT examination.

Committee Responsibilities:

1. Establish a table of specifications for the examination that is representative of the knowledge expected of an ABAT Diplomate.

2. Prepare an examination that is consistent with the table of specifications.

3. Grade the examinations.

4. Establish guidelines for a passing grade.

5. Review performance on the exam and perform an item analysis (frequency distribution for correct and incorrect responses for each question).

6. Inform eligible candidates of the specifications and elements of the exam by providing a published summary and study guide.

Composition of the Committee: The committee shall be comprised of all members of the Board of Directors of ABAT. The committee will be co-chaired by the President, President-Elect, and past-President. The President and President-Elect are primarily responsible for the multiple item examination and the past President is primarily responsible for the problem solving examination. The President is responsible for coordinating both portions of the exam and assuring that a suitable proctor and materials are on site for the examination.

Reporting to the Board and Others: The committee co-chairs shall prepare a written report of the committee’s activities and submit it to the Board at the annual meeting. Verbal reports shall be provided upon request during Board meetings held between annual meetings of the Board. Upon final determination of passing grades, the roster of candidates that passed will be ratified by the ABAT Board. Thereafter the President of ABAT will inform the Secretary-Treasurer of AACT of the names of the successful candidates and ask the names be forwarded to the AACT office. Upon notification to the AACT, the President will inform all candidates of the results. Candidates will be allowed 30 days to appeal the results. In Fall 2003, the AACT Board of Trustees indicated that the AACT Trustees need not ratify the results of the examinees.
**Retention of Records:** The exams of the candidates shall be retained for a period of 60 days following notification of the candidate of the test results. The summary scores and outcomes for all candidates shall be retained in the perpetual records of ABAT. These records shall be retained by the President for the term of office and transferred to the President-Elect upon assumption of the Office of the President. Copies of blank exams with answers will be retained for 5 years after exam date.

**Procedures for Problem Solving Questions**

The nature of this section of the exam is one of short answer and essay responses to progressively revealed cases or scenarios. It is typically administered on the first day during the time period of 12:30 to 6 pm. Three clinically-oriented problem solving cases are geared to assess the ability of the candidate to assess a patient scenario provided in a time layered pattern (with no regression to an earlier section), providing a diagnostic, stabilization, and therapeutic plan to work the problem through to resolution. Another type of problem serves as the fourth question and will assess the candidate’s ability to evaluate toxicology literature.

**Specifications for the Problem Solving Section**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Number of Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinically oriented problems</td>
<td>3</td>
</tr>
<tr>
<td>Literature evaluation</td>
<td>1</td>
</tr>
</tbody>
</table>

**Question Development:** The following must be followed for each problem solving question:

- Between 2 and 4 parts
- Approximately 40 facts each (38-42 acceptable range)
- Approximately 70-75% of facts must be mandatory
- Deductions for “fatal errors” should be included as appropriate

Each fact is worth one point only. (Note: ½ points may be awarded during the grading process.)

**Literature evaluation question:** Authors may elect to remove the discussion section of the article for the copy the candidates receive. The majority of the questions should relate directly to the article; i.e., information from the article is necessary in order to answer the question. Although a couple of short-answer questions on general literature review principles may be appropriate, the focus of the questions should be related to the critical analysis of the article.

**Grading:** Each exam question is graded by a team of two Board members (usually the two Board members who wrote the question) who independently grade each question based on an agreed upon set of responses. An alternate is assigned prior to the exam in case one of the assigned team is unavailable or has a conflict of interest (e.g., one of their staff members is an examinee). The overall grade for each question must agree within 2 points of the other grader. The two scores are then averaged to obtain the final score for that question. If the difference is greater than 2 points, the two graders will discuss variances and come to a consensus so that each of the grades is within 2 points of one another for the question. In the event that it is not resolvable, a third Board member (usually the alternate assigned to that question) will be asked to review the question and the average of all three graders will be considered the grade for the individual.
Grading Instructions (See Appendix F):

- The President splits up exams into individual questions and examinees (e.g., Question 1 [Examinee xx], Question 1 [Examinee xy], etc.). The President makes sure that only candidate numbers and no candidate names appear on the examination answer books.

- If there are a large number of examinees, to optimize work flow, graders should try to work on the same question and examinee simultaneously. This will allow for the comparison phase to be completed in a staggered fashion to allow for timely data entry of the scores.

- Scoring system.
  - Each question has a number of possible points “facts” available with some designated as “mandatory”.
  - Full credit for a question cannot be granted unless all mandatory facts are provided. Example: A question has 6 facts, 2 of which are mandatory. Examinee provides 6 correct facts, which include only 1 of the mandatory facts. The maximum points available to this examinee on this question are 5 of the possible 6.
  - If the examinee provides none of the mandatory facts, points can be awarded for the correct non-mandatory facts up to the total of non-mandatory facts available.
  - Half value points can be given for any fact answer. (e.g., 1 point: can give ½ point; ½ point can give ¼ point, etc.)

- Scores should be listed on the back of the blue book in three columns by the graders.
  - Question # (1, 2, 3, etc.)
  - Grader 1 scores
  - Grader 2 scores

  Note: The second grader should write his/her scores on a separate piece of paper and then transfer the scores to the back of the blue book after the entire question has been graded. This is to prevent seeing the other grader’s scores until grading is complete.

- After the scores for each part have been confirmed, they are turned into the President who enters the individual question scores into the Excel spreadsheet.

- All pieces of paper used in the scoring process and all answer keys should be turned into the Secretary at the completion of the grading session. The Secretary will make sure that all materials are shredded.

### Procedures for Multiple Item Questions

These questions measure the candidate’s ability to recall general facts about specific agents within the following categories. It is typically administered on the second day during the time period of 8 am to 1 pm.

### Specifications for the Multiple Item Questions (see Attachment 1 for definitions)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Number of Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biologics</td>
<td>15</td>
</tr>
<tr>
<td>Chemicals</td>
<td>35</td>
</tr>
<tr>
<td>Drugs</td>
<td>40</td>
</tr>
<tr>
<td>Environmental/Occupational</td>
<td>15</td>
</tr>
<tr>
<td>General</td>
<td>10</td>
</tr>
</tbody>
</table>
### Theory

<table>
<thead>
<tr>
<th></th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>125</strong></td>
</tr>
</tbody>
</table>

**Item Analysis:** Within 30 days of the grading of the examination, the co-chairs will perform an item analysis of each question to determine whether there was a high or low passing rate for each of the questions. This item analysis will help guide decisions whether a question is retained for future use.

For the multiple choice portion of the examination, examinees complete an optical scan answer sheet in addition to filling in the correct answers in writing on the multiple choice exam. After the Annual Meeting, the scan sheets are read in order to facilitate the item analysis. If there is any discrepancy between what the examinee wrote in the answer booklet, and the bubble filled in on the optical scan sheet, the written answer will be the answer that is counted.

**Turnover of Questions:** For each exam offering, a minimum of 10% and maximum of 24% of the questions shall be replaced with new or revised questions.

**Review of Questions:** In preparation for the exam, problematic questions identified through item analysis will be sent to members of ABAT for review and determination of the need for revision of the question. Problematic questions are usually identified as ones that either everyone got wrong, everyone got right or questions that only 1-2 persons got correct, but one answer seemed to standout as the distractor picked by most examinees. This typically involves sending one question to one ABAT member by e-mail and asking for a response by e-mail with any documentation that may be needed to support the answer (Attachment 2).

**Testing Format:** The test questions will observe the guidelines proposed by psychometric consultants who advised the American Board of Applied Toxicology in 1998 (Attachment 3).

**Grading:** The Board of Directors grade the multiple-item exam at the annual board meeting. Each test is graded by one board member while another board member calls out the correct response. This process is repeated after the exam is given to another board member for the second round of grading. Any discrepancies in the grading between the two individuals will be resolved and a final count of correct responses will be determined.

**General Procedures for Exams**

**Blinding of Exams:** Both portions of the exam will be blinded so that the graders will not know the individuals’ name. Typically, a three-digit value will be assigned by the President before the day of the exam and it will only be known by the President during the time of the exam and grading. Typically it is the final digit of the year and then a two-digit sequence of the number of exams administered in that particular year. For example, the fifth candidate to take the exam in 2003 would have a candidate identification code of 305.

**Weighting of Exam Sections:** The percentage scores for the multiple-item questions and those of the problem-solving questions will be given equal weight. In other words, the final maximum score of 100 is represented by 50 total achievable points for each section.
Passing Score: On June 17, 2003, the ABAT Board approved a policy to establish a passing score on the exam based on the following considerations: 1) the past five years of exam scores to review break points of passing scores, 2) the overall difficulty of the exam, and 3) the desire to assure competence in both portions of the exam. As a result, the following threshold was established. The score for passing the exam is an overall grade of 60% or greater with a score of at least of 50% in the multiple-item section and in the problem-solving section.

Appeals: Candidates will be allowed 30 days from the date of notification to appeal the examination results. Information on the right to appeal will be included in the notification letter. The outcome of the appeals process will be made by the President and communicated to the candidate within 60 days of notification of the appeal. The outcome of the appeals process is final.
1. Candidates may appeal the examination if their overall grade is less than 60% and only one of the individual sections is less than 60%.
2. Appeals of the multiple item section will be limited in scope to the accuracy of grading. The President or designee will regrade the examination for accuracy only.
3. Appeals of the problem solving section will require regrading the entire problem solving section by one member of the board appointed by the President who was not involved in the original grading of the problem solving section. The third grader’s scores will be averaged with the original two scores for the final score.

Instructions: Instructions to the examinees are distributed at the beginning of each section of the exam as appropriate. (see Attachment 4 for exam instructions and publicly available instructions to candidates).

SI Units: Where applicable in both exam formats, the equivalent SI unit for laboratory values should be stated. (see Attachment 5 for a conversion table of common laboratory results).

Names for Biologicals: When a biological item, such a plant or animal, is named, the common name and the scientific name should both be stated.

Timeline:

<table>
<thead>
<tr>
<th>Activity</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administer and grade exams</td>
<td>Board meeting</td>
</tr>
<tr>
<td>Item analysis of questions</td>
<td>Within 30 days</td>
</tr>
<tr>
<td>Notification of passing candidates transmitted to AACT Secretary-Treasurer for information and transmission to ACCT office.</td>
<td>Within 60 days</td>
</tr>
<tr>
<td>Written notification of candidates by President of ABAT</td>
<td>Upon notification of AACT</td>
</tr>
<tr>
<td>Deadline for appeal of decision by candidates</td>
<td>Within 30 days of notification</td>
</tr>
<tr>
<td>Deadline for response to candidates for appeal</td>
<td>Within 30 days of notification of appeal</td>
</tr>
<tr>
<td>Mailing of certificates of new Diplomates by President</td>
<td>Within 90 days of notification</td>
</tr>
<tr>
<td>Event</td>
<td>Date</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Identification of questions for turnover</td>
<td>January 15</td>
</tr>
<tr>
<td>Agreement on problem solving cases and assignment to Board members</td>
<td>March 1</td>
</tr>
<tr>
<td>Distribution of multiple-item questions to be reviewed by Diplomates or request for new questions</td>
<td>April 15</td>
</tr>
<tr>
<td>Distribution of first draft of problem solving cases</td>
<td>May 1</td>
</tr>
<tr>
<td>Chair of the Credentialing Committee submits the names and addresses of all applicants and the recommendation regarding eligibility to sit for the exam to the President. The names and addresses of any carry over candidates are also communicated to the President at this time.</td>
<td>May 1</td>
</tr>
<tr>
<td>Receipt of new multiple-item materials from Diplomates</td>
<td>June 1</td>
</tr>
<tr>
<td>Revision of problem solving cases and distribution of additional drafts</td>
<td>June 1</td>
</tr>
<tr>
<td>Finalization of multiple-item exam</td>
<td>August 1</td>
</tr>
<tr>
<td>Finalization of problem-solving exam</td>
<td>August 1</td>
</tr>
<tr>
<td>Preparation of exam materials</td>
<td>10 days prior to exam</td>
</tr>
</tbody>
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Approved: September 10, 2004
Revised and Approved: May 12, 2008; September 12, 2008
Attachment 1. Definitions for Topics Used for Multiple-item Questions

DRUGS:
- Non-prescription and prescription medications
- Iron (if used therapeutically as a mineral)
- Nutraceuticals (e.g., herbal products)
- Laboratory questions specifically about drugs

CHEMICALS:
- Chemicals
- Alcohols (including ethanol)
- HazMat law
- Pure chemical exposure at work

ENVIRONMENTAL / OCCUPATIONAL:
- Hydrogen sulfide/carbon monoxide
- Heavy metals
- Occupational law
- General occupational questions

THEORY:
- Mechanism of action questions
- Toxicokinetics / pharmacokinetics
- Drug interactions
- General laboratory questions
- Statistics
- Expert witness

BIOLOGICALS:
- Plants, mushrooms, seafood poisoning, food poisoning, all bites, vaccines, viruses, infections

GENERAL:
- Antidotes/chelators
- History
- Poison prevention
- General diagnosis
- Mixed biological/chemical weapons of mass destruction
- Radiation

* Classification made after reviewing the questions and the stems to determine the main primary intent of the question. For example, if it is a question about a specific drug and just one stem relates to an antidote or just one stem relates to a toxic mechanism, the question is classified as Drug. If all stems relate to a mechanism of action, the question is Theory, even if the question relates to just one drug.
Attachment 2. Multiple-Choice Question Writing Assignments

It is time to prepare the multiple choice portion of the ABAT examination to be given this Fall. To accomplish this, all ABAT Diplomates, with the exception of those working on the essay portion of the examination, are being asked to: **Review, write, or fix a multiple choice question.**

**If you are reviewing or re-writing a question, you need to provide the letter of the stem you believe is the correct answer. If you are writing a new question, provide the answer.**

**Use the following instructions.** Questions will be returned for re-writing if writing instructions are not followed.

1. Keep this e-mail and all of your work on this project CONFIDENTIAL to ensure the integrity of the exam.

2. Make any changes to the question you are reviewing using the “track changes” feature on Microsoft Word. (If the changes are numerous, you may re-write the question instead of using the track changes feature.)

3. DO NOT write “all of the following are true except” type questions.

4. DO NOT write “which of the following is FALSE” type questions. All questions must be written in the positive “which of the following is CORRECT”.

5. All multiple choice questions require five stems “a), b), c), d), and e)”. Please place stem responses in alphabetical order. Avoid the use of “always”, “never”, “all”, and “none” in the options.

6. Give the reference(s) (including page number) used to write the question or write a justification for the correct and incorrect answers and state the reference(s) used.

**The Due Date is:** Date

Please send your written questions, via e-mail in an attached Microsoft Word file, to ______________
Most Frequent Mistakes to Avoid

1. Not following instructions and writing “all of the following are true except” type questions or “which of the following is false” type questions.

2. Making the question too broad. For example, writing a question and stems that cover everything about a topic instead of writing a question and stem on just one aspect of the topic.

3. Making the question too easy.

4. Making the question too hard.

5. Forgetting to include references with the question
Attachment 3. Recommendations of Psychometric Consultants

Guidelines: Writing Test Questions for The American Board of Applied Toxicology's (ABAT) Certification Examination

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It is our understanding that ABAT wishes to redesign its certification examination based, in part, on recommendations we made in 1995. Specifically, ABAT will begin using 1) a more traditional (and defensible) multiple choice examination format, and 2) a common set of problem-solving questions that will be answered by all candidates without offering candidates a choice of which questions to answer. The intent of the test is to identify candidates who have the requisite knowledge and skills for certification (diplomate status) as Applied Toxicologists. The guidelines in this document are presented with that goal in mind. Following these guidelines should help to produce examinations that will help to distinguish between candidates who have the requisite knowledge and skills from those who do not.

In 1995, no formal table of specifications was in place to describe the examination and to assure that candidates would be tested over the same content whenever they take the test. Such a table of specifications should be developed (preferably based on a job analysis) to facilitate the preparation of annual tests that are comparable to each other in terms of their content coverage. An example of a table of specifications is included in Appendix A.

Using the table of specifications, a decision may be made regarding the number, or percent, of items of each type: multiple choice or problem solving, in each topic or content area (and, if applicable, level of cognitive functioning). The individuals responsible for writing items can be advised regarding which cells in the table of specifications (i.e., the specific content and level of cognitive functioning) their items will be used to fill.

The remainder of this document contains guidelines for writing test questions. It begins with a set of definitions of terms used in item writing. These definitions are followed by a general description of four different formats for writing multiple choice questions. It continues with a discussion of a set of guidelines for writing multiple choice questions. Several of the less obvious guidelines are illustrated with examples of good and poor practice. These are followed by a set of summary suggestions related to developing multiple choice or short answer questions. An appendix contains a checklist and a form that may be used to evaluate items based on the guidelines.

Following the guidelines for writing multiple choice items is a set of guidelines for writing problem-solving items. These guidelines include suggestions for both writing and scoring items.
Writing Multiple Choice Test Questions

Multiple-choice items represent an item type that can be used to obtain a substantial amount of information about an examinee’s knowledge and skills within a reasonable time frame. Even though often (but inaccurately) considered limited in their scope, multiple choice items can be used to assess at many cognitive levels of complexity. Although most multiple choice items tend to reflect only recall or recognition types of cognitive behavior, this is more often a limitation of the item writer’s skills than of the item form.

Multiple choice items can be difficult to write effectively. The multiple-choice portion of a test may be considered to be the “front-end” load because the writing of the items takes substantial time and effort. That is, the examiner’s workload is heaviest before the candidate takes the test. The constructed response questions on the test, also called problem-solving or performance questions, require the candidate to produce an answer, and usually take less time to write, but much more time and effort to score. Thus, constructed response questions may be considered the “back-end” load because the majority of the examiner’s work occurs after the test has been taken.

Terminology for multiple choice items

Before listing and discussing different formats and guidelines for writing multiple choice items, some definitions are provided. The following terms are defined: items stem, response choice, keyed response, and distractor. The item stem is the question or problem the candidate is to answer or solve. Response choices are the options provided the candidate. One response choice is the keyed response (the best, or correct, answer). The remaining response choices are the distractors.

Types of Multiple choice items

There are several types of multiple choice item formats that may be used in a test. Different types of items may be used to assess different levels of cognitive functioning. All of the multiple choice item formats we recommend are structured in such a way that a candidate can cover the response choices and still understand the problem to be solved. A response can be formulated by the examinee and the response choices then scanned to see if the formulated response can be matched with one of the choices provided. This is also a clue to writing good multiple choice questions. The item writer should use the same strategy to investigate the appropriateness of the item. Often, in workshops where several item writers are being trained in the task, the item stem will be copied and given to others in the workshop who will generate a “correct” or best answer and suggest distractors. This provides a way to judge the quality of the stem, the keyed response, and the distractors provided by the original item writer.

The most often used format for writing multiple choice questions is the closed-stem format. In this format the stem presents a complete problem to the candidate and ends with a question mark. This type of question helps the examinee to use effective test-taking strategies rather than being confronted with an ambiguous situation that may lead to unfair response errors. An example of a closed-stem item is shown below.
Closed-Stem Question: Asks a complete question in the stem and ends with a question mark.

What is the product of 3 times 4?

a. 1
b. 7
c. 12
d. 34

A second item format is the sentence completion format. In this format the problem is stated in the stem, but there is a blank in the sentence that needs to be completed by the examinee. The response choices provide options for completing the blank. This item type is usually most effective when the blank is at the end of the stem. These types of items should be used sparingly. A risk to avoid when using this item format is copying directly from text materials and simply leaving a word, or phrase, that is in the text as the blank. This is not good practice as it requires memorization of text material and does not reinforce learning principles or generalities. An example of this type of item is shown below.

Sentence Completion Question: There is a blank in the stem that may be completed by one of the response options (the blank is usually at the end of the question).

The product of 3 times 4 is ________.

a. 1
b. 7
c. 12
d. 34

A third format for multiple choice questions is a having best, or most correct, answer (as compared to an exactly correct answer as in the computation example shown above). This item type often requires the examinee to make an inference from the information given in the stem. If the examinee is unable to make the correct inference immediately, then each response option must be evaluated and accepted or rejected based on the logic of the stem. An example of the Best/Most Correct format is shown below.

Best / Most Correct Question: A question in which the examinee must choose the best, or most appropriate response.

What is the most common type of flower sold on Valentine’s Day?

a) daisies
b) lilies
c) roses
d) violets

The fourth type of multiple choice question we discuss is the Roman Numeral format. This type of question is used most often to have the candidate put a set of operations into a sequence. The stem establishes the basis for the sequence, the steps in the sequence are provided in a scrambled order, each step being identified with a Roman numeral. The candidate selects the response choice that has the Roman numerals in the correct (or best) order. An example of the Roman numeral format is shown below.
Roman Numeral Question: A question in which the examinee must choose the correct order of a set of events.

The following actions are required to withdraw money from an ATM machine.

I. Take your money from the machine  
II. Enter your identification code  
III. Insert your bankcard into the machine  
IV. Remove your bankcard and receipt from the machine  
V. Specify the amount of money you want to withdraw.

Which of the following is the correct sequence of steps?

a) I, II, III, IV, V  
b) III, V, I, IV, II  
c) V, IV, III, II, I  
d) III, II, V, I, IV

There are other formats used to write multiple choice questions that are not discussed. The four broad types of questions described above will cover the vast majority of item-writing situations that are likely to be needed in the ABAT examination. Note that some types of items are special cases of multiple choice questions as described above. These include dichotomous, or alternate, choice items (e.g., true/false), and matching items that may be used to examine a knowledge of relationships (such items would have several different stems with the same response options from which the candidate would select the best, or correct, choice).

Item writing guidelines: Multiple choice

The guidelines discussed and illustrated below are based on the work of Haladyna and Downing (1989a)\(^1\). Their “rules” have been consolidated and simplified in this discussion. Haladyna and Downing (1989a) reviewed 46 books that provide advice on how to write multiple-choice test items. As a result of their review they identified 43 rules that, if followed, should result in multiple choice items of high quality. Of these 43 rules, 32 were empirically testable, that is, the utility of the rule could be tested to determine if following the rule would make a difference in the psychometric characteristics of the test. The remaining rules represented value statements that are not testable empirically.

The Guidelines we advocate for writing multiple choice items are listed and discussed briefly below. Each guideline is discussed briefly and some are illustrated with good and bad examples. They are divided into several sections, first focusing on general principles, followed by guidelines specific to each component of the multiple choice question (stem, response options).

**General Item Writing Guidelines:**

1. Each item measures an important/significant critical skill: For the most part it is poor practice to assess trivial knowledge. First, it makes the test unnecessarily difficult and second, it renders the score meaningless. When trivial content is assessed the score reflects the extent that nonessential knowledge is present, but it does not indicate the presence of important knowledge or the ability to perform at higher cognitive levels than simple recall.

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2. No item is intentionally misleading or deceiving: Intentionally misleading or deceiving items are sometimes called “trick” questions. The use of such questions is more a test of reading ability than of the substantive knowledge and skills that are of real interest. Questions that challenge the candidate because they require subtle distinctions or that represent real-life situations that are not clear cut are not the same as trick questions that intentionally mislead all except the candidates who “catch” the trick.

3. Each item is independent from other items; no item cues the correct response to another item. Each item should stand alone. Cueing may occur when multiple item writers work independently and their items are variations on the same theme such that the information in the stem of one item includes information that may cue the answer to another item. This can also occur when there is a set of items related to the same body of information (e.g., a situation is presented and the candidate must answer several questions about the situation), or when the problem requires several steps and answering later steps correctly is dependent on getting the correct answers to earlier steps.

This guideline has two distinct foci. The first, cueing, is illustrated by the following set of items.

Item 1: A multiple choice test question can be broken down into three distinct parts. What are the names of these three parts?
   a. Stem, petal, stamen
   b. Stimulus, response, reaction
   c. Stem, foil, key
   d. Stem, keyed response, distractor

Item 2: The terms homogeneity and plausibility refer to which component of a test question?
   a. Stem
   b. Reactions
   c. Keyed response
   d. Distractors

Clearly a candidate who might not be able to answer item 1 correctly will receive considerable assistance from item 2, if both items were on the same test.

The second foci is illustrated by the two items below:

Item 1. Given the data set provided, calculate the sum of squares.
   DATA: 1, 2, 3, 4, 5
   The sum of squares equals ________.
   a. 1.414
   b. 2
   c. 10
   d. 15

Item 2. Using the above data set, the standard deviation equals ___.
   a. 1.414
   b. 2
   c. 10
   d. 15
If the candidate miscalculates the value in item 1, then item 2 will also be missed, thus making a correct response to item 2 conditional on obtaining a correct response to item 1. Similarly, if the candidate miscalculates item 1 and can not find a response choice in item 2 that fits his/her calculations, then some confusion and frustration may occur that could affect later test performance. A better strategy for determining if a candidate understands the relationship between the two steps is to provide necessary information in subsequent steps. A revised item 2 is shown below.

Item 2 revised: If the sum of squares from another data set with 5 observations were equal to 9, what would be the standard deviation of that set of data?

a. 1  
b. 1.34  
c. 1.41  
d. 2

By providing a value for the sum of squares, and asking the candidate to use that value correctly, it can be determined if the candidate can perform the required task without relying on the examinee having correctly responding to a previous item.

4. Neither item stems or response choices should contain words like “always”, “never”, “none”, or “all” (called specific determiners). These specific determiners are usually clues to the keyed response or indicators that a response choice is clearly incorrect.

5. All items should have good grammar, punctuation and spelling. These guidelines are to avoid cues that might lead the examinee to select or reject a response choice for the wrong reasons. An examinee may believe that an item writer would proof read the keyed response more carefully than the distractors, thus a typographical or grammatical error may lead to rejecting a response choice.

6. Items should not use textbook verbatim phrasing. This is discussed above in the fill-in-the-blank item format. This strategy distracts examinees from learning general concepts and principles and puts the emphasis on memorization of textbook information.

   **Stem Construction:**

7. The item stem contains single clearly formulated problem. The focus of this guideline is to minimize ambiguity in the stem. The examinee should be clear on what is required to formulate a response without confusion due to awkward wording or ambiguous questions. This can often be avoided by not using fill-in-the-blank formats. An example of an unfocused stem is:

   “Food such as oranges, apples, and tangerines are __“

Almost anything could follow the blank. The examinee is not provided a clearly formed problem and must rely on the response choices to clarify the situation.

A better stem is:

   “Oranges, apples, and tangerines belong to which food group?”

Now the examinee can decide what response is being sought and formulate an answer to the question.

8. Each item stem contains a single, central idea. This admonition is related to the previous guideline and is included to reinforce the need for clarity in the item stem.
9. The item stem contains simple, clear language (no excess verbiage/irrelevant material; use recognizable vocabulary). The idea is for the test to be a test of the desired content, not a reading test. This does not necessarily mean that complex language or technical vocabulary should not be used, but such complexity should be restricted to appropriate uses rather than as a way to confuse examinees.

10. The item stem is worded positively. Most items are worded in this manner, thus leading to an expectation for identifying the single best answer. Examinees may be confused when asked to select the response choice that is a “wrong” answer or is false (when all other choices are true and represent correct courses of action). Negative items take more time to answer and are often missed for the wrong reasons.

11. If negative wording (e.g., words like not, except) is used in the item stem, it is emphasized. This is a follow-up guideline to the previous one. If negative wording is used (e.g., There are three method most often used to report variation in a set of data. Which of the following is NOT one of the three most popular measures of variation?) the emphasis on the negative should be clear. This item type is NOT recommended, however, for the reasons given in guideline 10.

Response Option Development:

12. There should be only one correct, keyable answer to a posed question. The answer key should be checked carefully and verified that there is only one keyable response choice.

13. Distractors should represent common errors. One way to accomplish this is to pilot test the stem as a short answer question (without response choices provided). Incorrect responses provided by examinees can be used as distractors. When this is not possible, then other logical strategies for determining what might constitute common errors should be used.

14. Response options avoid using phrases like “all of the above” or “none of the above”. The choice “all of the above” should never be used. The reason for this is when the examinee knows there is only one keyable choice and finds that two of the response choices can be seen to fit the requirements of the stem, then “all of the above” is the only keyable choice. Thus, the examinee need not have to know that all the response choices are possible, only that two of them are. The “none of the above” choice may be used sometimes, provided that it is sometimes used as the keyed choice. If it is never used as a keyed choice, then examinees will know to ignore it and try to identify the keyed choice from among the remaining response option.

15. Wording is minimized in all response options. As noted in discussing the value of parsimony in the stem, the test is not a reading test, thus any unnecessary reading load should be held to a minimum.

16. All response options should be similar in content. Response choices should be homogeneous. Mixing response options reduces the value of the “odd” choices because they will either incorrect and can be eliminated by most examinees or they will be correct and the examinee will consider the remaining choices implausible. All response choices should be plausible.

17. All response options are approximately the same length. Often the keyed response is the one that is most detailed and is stated in the most technically correct and precise terms. To the uninformed examinee, length and level of technical precision are often indicators of the keyed response. When all responses are of approximately equal length this clue is not available.

18. All response options are grammatically consistent with item stem and should be ordered in a logical and consistent manner. Avoid providing examinees with the keyed choice because it is the only
one that follows grammatically from the stem when a fill in the blank type of item is used. For example,

Iodine is a medicine that is used as a
a. anti-inflammatory.
b. cure for ringworm.
c. disinfectant.
d. pain reliever.

Note that choice “a” does not fit grammatically with the stem, thus it can be eliminated as a possible correct answer immediately. Also note that all choices begin with lower case letters and end with a period, thus completing the sentence. Finally, the response choices are ordered, in this case alphabetically by the first letter. This is not the only possible ordering strategy, but whatever strategy is used, it should be consistently throughout the entire test. When using numbers in response options, the order should not be random, but should be always from low to high (or high to low) for the entire test.

19. Response options are phrased positively. The reasons for this parallel the reasons for not using negatives in the stem.

20. All response options for an item are at the same technical level. This is an expansion of the guideline related to having all the response options homogeneous in content and of the same length.

21. Response options are free of humor. The test is to be taken seriously by the examinees, thus the use of humor is not appropriate. Moreover, a humorous response choice that is not keyed is a waste of the examinee’s time to read and it does not contribute to the ability of the item to discriminate between examinees who have the requisite knowledge and those who do not.

**Aids in using these guidelines for writing multiple choice items**

Several appendices are provided to assist in using the above guidelines. Appendix B consists of a listing of the guidelines that may be used as a checklist for item writers to use for each item. Appendix C is a spreadsheet that may be used by independent item reviewers (individuals who have not written the items, but who will serve as independent reviewers or editors). Appendix D consists of a form that may be used by item writers and editors to both display the item and keep track of its use on different tests. This form may be used for either multiple choice or short answer items. The components of the form are explained in the appendix. A similar form is provided for problem-solving items in a later appendix.

**Writing Constructed Response Test Questions**

Unlike multiple choice questions that permit the examinee to select a response, a constructed response test item requires the examinee to supply an answer. Constructed response questions are perceived as being more authentic and more amendable than multiple choice for tapping into higher levels of thinking. They are also permit assessment at deeper and more complex levels of knowledge and skills. In many ways they are faster and easier to construct than are multiple choice items, but the scoring is substantially more complex, it takes more time, and is often difficult to do as reliably as can be done with multiple choice questions.
Many of the guidelines for writing stems for multiple choice questions apply equally well to constructed response questions. Because the examinee supplies the answer instead of selecting it, the guidelines for scoring constructed-response questions must take into account the variability that can be expected from examinees. Thus, the guidelines that follow are divided into two parts: guidelines for writing stems (or prompts) and guidelines for scoring.

This section begins with a description of the terminology used in the guidelines. The definitions are followed by the guidelines, which are discussed briefly. Several appendices are also included that parallel the appendices related to writing multiple choice items.

**Terminology for constructed response items**

As with multiple choice questions the various parts of the constructed response question have special designations. Before listing and discussing the guidelines for writing constructed response items, some definitions are provided. The following terms are defined: prompt, response requirements, response elements, and rubric. The prompt, sometimes called the stem or problem set up, is the question, problem, or topic that is the intended focus of the examinee’s response. In addition to the prompt, the examinee is usually provided with any response requirements. Response requirements are the specific aspects of the item that direct the examinee how to respond (e.g., specifying units of measurement).

Two different types of scoring strategies may be used to evaluate answers to constructed response questions. These two methods are analytic and holistic scoring. Analytic scoring means that there are specific aspects of the answer that are to be scored (e.g., correctness of calculations, correctness of process). When holistic scoring is used, scoring is accomplished using a rubric. A rubric defines the means for assessing an answer and assigning value to the overall quality of the answer. Holistic scoring means the response is taken “as a whole” and evaluated rather than assessing the individual elements of the answer, as is the case in analytic scoring. Metaphorically, analytic scoring is looking at a forest and evaluating each tree individually. Holistic scoring is stepping back and looking at all the trees at the same time and evaluating the overall forest.

The guidelines for writing constructed response items are divided into three categories. The first are general guidelines for the use of constructed response questions. The remaining categories relate to the different scoring strategies: analytic and holistic.

**General Guidelines:**

Some of the guidelines for writing multiple choice stems also apply to writing prompts for constructed response questions. That is, it is important that the question or problem be clear and concisely stated and so on. In addition to the guidelines for multiple choice questions that may be applied, the following guidelines apply specifically to constructed response questions.

1. Verify that constructed response is a better way to respond than a more objective response format. Because having some constructed response questions as part of an assessment is often important, the constructed response questions used are not always optimal in terms of what is being measured. Try recasting the question as a multiple choice or short answer question and evaluate what is different about the two alternative formats. If the answer is essentially nothing, or simply the difference between selecting an answer versus formulating an answer (at a basic recall level or low level of application such as a simple calculation), then the use of constructed response may not be appropriate.
2. Insure that the expected behavior being solicited is specified in the desired outcomes in the test specifications. As with multiple choice items, constructed response items should be written such that they represent elements of the Table of Specifications. Each question should be “mapped” onto the Table of Specifications to insure that all elements of the Table are covered on the test, and that each test is comparable to other tests that cover the same Table of Specifications.

3. Insure that the examinee knows what is expected in the answer. The examinee has the right to know what is expected in the response. If the use of a specific chemical formula is desired, and its use demonstrated, then the examinee should be advised of this and told to show the formula used. The item writer must decide what is to be tested and then design the question, and the information provided to the examinee, such that the question and the scoring guide are focused on what is being tested. Essentially the basis for scoring should be known to the examinee. For example, if a particular type of answer could result in a zero score for the question, the examinee should know that certain types of answers may result in automatically failing the item. In some tests a process or action might result in product failure or human disaster (in medical examinations a medicine or treatment that would result in the patient’s death) might automatically result in a zero score for the item, even if other things are correct. Decision rules such as these should be known to the examinee when (or before) taking the test. If an answer calls for a listing of some sort (e.g., give the three best ways to ease the symptoms of the common cold), the examinee must be advised of how many reasons will be read by the scorers. If only the first three responses are counted, even if the examinee provides four or five possibilities, the examinee should be told of this policy in advance (and the policy must be adhered to for all examinees). Other conditions of responding must also be made explicit to the examinee (e.g., if examinees must show their work).

Guidelines for Analytic Scoring:

Analytic scoring is usually used for items that have specific components of a right answer that can be delineated. When analytic scoring is used then a scoring guide can be developed that provides for various options the examinee may offer. Sometimes examinees may offer a creative response that was unanticipated at the time the question was prepared. When that happens, the scoring guide may be revised and all tests scored up to the point of revising the scoring guide should be rescored using the new scoring guidelines.

1. Specify (outline or list) all elements that are possible to include in the answer.

2. Specify the weights associated with different elements (if any) of the answer. Sometimes different elements of the answer are of different levels of importance, thus some elements may be given more than others. Elements should not be given negative weight (but note the possibility of some responses receiving automatic zeros).

3. Indicate how to deal with incorrect information (or bad logic) when combined with elements of a correct response (e.g., the examinee includes all the required elements, but includes additional elements that are incorrect). This is always a difficult decision. Whatever the decision, the score for that item should not result in a value that is less than zero. That is poor performance on one question should not result in the total score by an amount greater than the weight assigned to that item. The exception is when an error is so egregious that if the examinee actually did such a thing in practice it would be catastrophic and the decision is made to fail the examinee on the entire test.
Rubric Guidelines for Holistic Scoring:

Holistic scoring is often used when the responses can be sorted into quality categories. These categories correspond with the number of score points on the holistic scoring scale. Most holistic rating scales range from a low of one to a high of four, five, or six. Thus, each holistically scored question may count for up to the maximum number of points defined in the rubric. As a general rule, all constructed response questions that require similar levels of effort should be scored on the same scale. That is, if the total of the constructed response questions is to be 50 points and there are five questions, then the rubric may have score values ranging from 0 to 5 and each question may be scored independently by two scorers with the examinee’s score on each item being the sum of the scores from each scorer. Alternatively the rubric may have score values ranging from zero to 10 (or some other value and each item may be weighted by a constant multiplier, so that the total score for all constructed response items equals 50. The same rubric would be applied to all constructed response questions (assuming all the questions can be considered to be approximately the same in terms of difficulty and effort).

1. Indicate the total overall point value assigned to the question.

2. For each possible score point indicate the extent of “perfection” or lack of perfection required (i.e., what constitutes the qualitative rating). When the number of points in the rubric exceeds about six, this may become quite difficult. Often a score of zero is reserved for an examinee who fails to respond to the question, thus only scores of one and higher need to be defined. The rubric should indicate how the quality of the answers needs to differ at each score point. The descriptions should be sufficiently detailed that different scorers will understand the differences and will assign essentially the same score after a period of training.

3. Define a zero and any other response value (e.g., unscored, or no attempt). Rubrics typically define score points so that the value of one is the lowest score associated with an attempt to respond. Thus a zero score is given for a no response. In some instances, a descriptor other than no attempt may be desired (still resulting in a zero contribution to the total score). Examples of such cases include a) responses in a language other than English, when the test directions require that all responses be written in the English language, or b) responses that are not legible.

These guidelines will help to produce tests that are fair to examinees and that will minimize random errors that may result from ambiguity in the test questions or scoring strategies. We have not discussed the importance of scorer training, pilot testing multiple choice items, verifying the scoring guidelines, or other aspects of a testing program that go beyond writing the test questions.

Aids in using these guidelines

Appendix E contains a form that may be used by individuals who are charged with the responsibility of writing constructed response questions.
APPENDIX A

ILLUSTRATION OF TABLE OF SPECIFICATIONS
TABLE OF SPECIFICATIONS

A table of specifications is a way to describe the general content of a test. The table may be simply a listing of the categories of content that are covered and the number (or percentage) of test questions that are to be included in each category. In other cases, the table of specifications includes, for each content category, levels of intellectual functioning and the number (or percent) of items at each level within each category. Finally, a table of specifications may be constructed around learning outcomes or job requirements that may, or may not, also specify the level of intellectual functioning for each objective or outcome.

An example of the simplest kind of table of specifications is shown below.2

<table>
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<tr>
<th>TOPIC</th>
<th># OF QUESTIONS</th>
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<td>Drugs</td>
<td>45</td>
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<tr>
<td>Household Products</td>
<td>25</td>
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<tr>
<td>Chemicals/Metals</td>
<td>13</td>
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<tr>
<td>General Management/Antidotes/Calculations</td>
<td>10</td>
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<tr>
<td>Biologicals</td>
<td>9</td>
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<td>Pesticides</td>
<td>8</td>
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<td>Total</td>
<td>110</td>
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2 Taken from the 1991 AAPCC Certification Examination for Specialists in Poison Control Information.
APPENDIX B

MULTIPLE CHOICE ITEM WRITING CHECKLIST
FOR ITEM WRITERS
MULTIPLE CHOICE
ITEM WRITING CHECKLIST³

General Item Writing

___ Item measures important/significant critical skill
___ Item is not misleading/deceiving
___ Item is independent from other items, no cueing
___ Item does not contain words ‘always’, ‘never’, ‘none’, or ‘all’
___ Item has good grammar, punctuation, spelling
___ Item avoids textbook, verbatim phrasing

Stem Construction

___ Item stem contains single clearly formulated problem
___ Item stem contains a single, central idea
___ Item stem contains simple, clear language (no excess verbiage/irrelevant material, uses recognizable vocabulary)
___ Item stem is worded positively
___ If negative wording is used in the item stem, it is emphasized

Response Option Development

___ Only one keyable answer
___ Distractors represent common errors
___ Response options avoid using ‘all of the above’ or ‘none of the above’
___ Wording is minimized in all response options
___ All response options are homogeneous in content
___ All response options are approximately the same length
___ All response options are grammatically consistent with item stem
___ Response options are phrased positively
___ All response options for an item are at the same technical level
___ Response options are free of humor

³ This checklist is intended to be used by item writers to insure that psychometrically sound procedures have been followed in the production of each item. A separate check sheet is provided for item reviewers to use in their examination of items.

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APPENDIX C

MULTIPLE CHOICE ITEM WRITING CHECKSHEET
FOR ITEM REVIEWERS
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<td>Options are homogeneous</td>
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<td>Options are free of humor</td>
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</tbody>
</table>
APPENDIX D

ITEM WRITING FORM FOR MULTIPLE CHOICE OR SHORT ANSWER QUESTIONS
Item Writing Form - MC or Short Answer

Item Writer’s Name: __________________________  Category/Objective: ____________
Passage reference (where did the item come from - response key verification)

Stem: ________________________________________

_____________________________________________

_____________________________________________

Keyed Answer (MC & SA version):

_____________________________________________

Distractor 1: __________________________________

_____________________________________________

Distractor 2: _________________________________

_____________________________________________

Distractor 3: _________________________________

_____________________________________________

For short answer version: Additional correct responses (if any - use reverse side of page for additional possible correct responses, if needed)

1: __________________________________________

2: __________________________________________

Comments by item reviewers regarding needed changes or suggested improvements:

<table>
<thead>
<tr>
<th>Validity Ratings:</th>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>Relevancy: To objective</td>
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<td>1</td>
<td>2</td>
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<td>4</td>
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</tr>
<tr>
<td>Importance: To objective (nontrivial)</td>
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<td>1</td>
<td>2</td>
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<tr>
<td>Discrimination: Novice/Expert</td>
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<td>3</td>
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**Final Item:**

Stem

a)  
b)  
c)  
d)

Keyed choice:

Use history/status (Expand as needed)

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<th>(P_{Q2})</th>
<th>(P_{Q3})</th>
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<th>(P_b)</th>
<th>(P_c)</th>
<th>(P_d)</th>
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</tbody>
</table>

Status:  
- **A** = Active  
- **E** = Equating “Anchor” item  
- **P** = Pilot item—being tried out for possible use on future form  
- **I** = Inactive, pending use again  
- **R** = Retired, not to be reused, may be released.

\[ P_{Q1...Q5} = \text{Proportion of examinees in the 1}^{\text{st}}\text{ quartile responding correctly} \]
\[ (\text{similarly for the 2}^{\text{nd}}, 3^{\text{rd}}, \text{and 4}^{\text{th}} \text{ quartile}). \]

\[ P_{A...D} = \text{Proportion of all examinees who selected choice a....d} \]
Explanation of Item Writing Form

Page 1

Item writer’s name: Included so that if there are questions about the item the originator can be asked to clarify.

Category/Objective: This is the element of the Table of Specifications the item is intended to address.

Passage reference: This is included as a way to verify that the information was included in the general body of knowledge examinees to which examinees have been exposed. This also serves as a way to verify the keyed response. It is not necessary, however, that the keyed response is given exactly in the reference, but the keyed response should be able to be inferred from the named source.

Stem: The stem proposed by the item writer (this may be edited or revised later).

Keyed Answer: For multiple choice or short answer versions, this is what the examinee will either select or be expected to say to get credit for answering correctly. When the item is put on the finished version of the test, the keyed response will be mixed in with the distractors to insure that it is in a logical order (if one exists) and the distribution of keyed responses is approximately equal across all four options when the test is considered as a whole.

Distractors 1 – 3: These are the most plausible response choices for which no credit is given if selected.

Addition correct responses for short answer (SA) version: Sometimes there may be nuances or alternative correct responses that are acceptable when the item is in a short answer format (such choice would not be included in the multiple-choice version of the item).

Comments by item reviewers: The item reviewer may suggest changes or revisions in the stem, keyed response, or distractors. Suggestions taken may be reflected in the final version of the item that appears on the second page of this form. Note that any changes may require checking the passage reference to insure that it is still accurate.

Validity Ratings: At some point the item should be reviewed independently to indicate the extent that the item is assessing the component of the Table of Specifications it was intended to assess, that the item content is an important (non trivial) dimension of what it is assessing, and that the item, if answered correctly, will discriminate between those who are “experts” and those who are “novices” in the topic being assessed.

An estimate of the difficulty of the item is appropriate so that the overall difficulty of the test can be considered before the final test is constructed. This assumes that there has been no field test of the item, thus the difficulty data for examinees is not available.

The readability estimate is to insure that item reviewers are sensitive to the potential use of technical or other language skills that may be higher than necessary.
Final Item: After review and revisions, the final item that will appear on the test should be written here unless a new form is completed with the revised item on page 1.

Use history/status: An item may appear on the test over the course of several years. The status codes are defined below the table. The Test Form boxes may be used if more than one form of the test is active at the same time. The Date Used, is self-explanatory. N is the number of examinees who responded to the item on the particular form and date. The proportions are helpful to discern whether the “expert” candidates (those who score high on the test) are the ones who are answering correctly more often than those who are “novices” (those who score lower on the test). The intent is to have test questions that differentiate between experts and novices.
APPENDIX E

ITEM WRITING FORM FOR
CONSTRUCTED RESPONSE QUESTIONS
Item Writing Form - Constructed Response

Item Writer’s Name: _________________________ Category/Objective: ________

Passage reference (if the item is associated with a separate reading passage)

________________________________________________________________________

Prompt: _________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Directions to examinee: ____________________________________________________
________________________________________________________________________
________________________________________________________________________

Elements of a correct response for analytic scoring (use reverse side if needed):
1: _______________________________________________________________________
2: _______________________________________________________________________
3: _______________________________________________________________________
4: _______________________________________________________________________
5: _______________________________________________________________________  

Comments by item reviewers regarding needed changes or suggested improvements:


Validity Ratings:

<table>
<thead>
<tr>
<th>Relevancy: To objective</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<td>Discrimination: Novice/Expert</td>
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</tr>
<tr>
<td>Difficulty Estimate: 1=Easy 5=Hard</td>
<td>1</td>
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<td>3</td>
<td>4</td>
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</tr>
<tr>
<td>Readability: OK or Not OK</td>
<td>OK</td>
<td>Not OK</td>
<td></td>
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</tbody>
</table>

Page 7
Final Item:
Additional elements of correct response: Guideline answer or Rubric

Use history/status (Expand as needed)

<table>
<thead>
<tr>
<th>Item Status</th>
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<th>N</th>
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</tbody>
</table>

Status: A = Active
P = Pilot item -- being tried out for possible use on future form
I = Inactive, pending use again
R = Retired, not to be reused, may be released.

\( \text{PQ} \text{Q}_{1...5} = \) Average score of candidates in the 1st quartile responding correctly (similarly for the 2nd, 3rd, and 4th quartile).
APPENDIX F

INSTRUCTIONS FOR CANDIDATES AND FORMS

A. Candidate Verification Form (Day 1)
B. Instructions for Problem-solving Questions
C. Candidate Verification Form for Multiple-item Questions (Day 2)
D. Instructions for Multiple-item Questions and Cover Sheet
E. Example of Summaries of Problem Solving Questions
F. Example of Problem Solving Questions Examination Log
G. Instructions for Exam Proctor
H. Example of Grading Assignments and Question Weighting
I. Grading Instructions for Problem Solving Examination
J. Example of Scoring Grid
K. Information for Candidates Posted on Website About the Examination
Candidate Verification Form (Day 1)

Please make any necessary corrections or additions to the information below:

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>City, State Zipcode</td>
<td></td>
</tr>
<tr>
<td>Terminal degrees</td>
<td></td>
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<tr>
<td>Phone number</td>
<td></td>
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<tr>
<td>E-mail:</td>
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</tbody>
</table>

Print your name in this box as you would want it to appear on the certificate. Typically, degrees and other certifications are not printed on the certificate.

Your personal candidate identification number for both days of the exam:__________

By signing below, I attest that I am the individual named above on this sheet and that I have been notified that I qualify to sit for this Board-certification Examination by a representative of the American Board of Applied Toxicology. I agree to maintain the confidentiality of the contents of the exam and I will not discuss specific questions with others outside of the exam area. A breech of this confidentiality may be considered to be ethical misconduct that could disqualify me from consideration for Diplomate status or lead to revocation of my Diplomate status once awarded.

_____________________________________________  __________________________
Signature                                                                 Date

The test proctor will collect this form before you start the exam.
AMERICAN BOARD OF APPLIED TOXICOLOGY

Instructions and Guidelines for Problem-solving Questions

The nature of this section of the exam is one of short answer and essay responses to progressively revealed cases or scenarios. Three clinical problem solving cases are intended to assess your ability to assess and manage a patient scenario that is provided in a time-layered pattern. Another type of problem serves as the fourth question and will assess your ability to evaluate toxicology literature.

1. Verify that you know your candidate identification number with the Proctor. It will be used to identify your responses on multiple parts of the exam.

2. There are 4 problem-solving questions that have multiple parts that build on the preceding part. You will only be able to respond to one part at one time. You cannot go back to a previous part.

3. The Summaries of Problem Solving Questions describes the 4 topics covered by each questions. You must complete all 4 questions, but you can choose to take them in any order. Once a choice is made, you must complete all parts of the question before proceeding to the next question.

4. You may keep the previous and all portions of each question as you work on that individual question. You must submit your answer booklets in sequence for each part before you are given the next part of the question. When a question is completed, all papers and booklets must be checked in before you can begin a new question.

5. The Proctor will coordinate your test taking sequence. Be sure every response sheet is labeled with your candidate identification number, the question number and the question part number.

6. Each question has mandatory facts that should be in your response and other facts that are also important. We are primarily interested in the most likely or characteristic feature or answer and we are secondarily interested in some of the other possibilities. For example, if you are asked to list the typical symptoms that may be observed with a certain type of poisoning, do not list as the only response “nausea” unless it is characteristic and the only symptom of this type of poisoning.
7. If a question asks for a list, please make a list. You do not need to write complete sentences in this situation.

8. If a question asks for an explanation or description beyond a simple list of items, please use complete sentences so your thoughts are clearly stated and interpretable.

9. If there is a controversial or alternative answer, feel welcome to state the situation as such and explain your rationale for the response you chose to give.

10. Make sure your answer the question. However, each question does not require a “memory-dump” of all the information you know on the topic when it is not relevant to the question.

11. Remember that the members of the Board will read your writing. Use legible writing. Avoid unconventional abbreviations. Strike-through or erase words you do not want considered as part of your answer. You may use pencils or pens to write your responses.

12. Organize your thoughts for clarity and completeness. If drawings, tables or algorithms help you in expressing your response, please use them. However, be sure that they make sense independent of your text, add meaning or clarity in conveying your answer, and can be comprehended by another person as presented.

13. You may take as many breaks of 10 minutes or less out of the exam room as you desire, but observe these rules.
   a. Do not discuss the test with anyone outside of the exam area;
   b. Do not call anyone for assistance with the test;
   c. Do not use references to assist in taking the test;
   d. Only one person can leave the exam room at one time;
   e. You will be required to turn in your exam at the end of the exam period, regardless of the time you spend on breaks.

14. You can ask the Proctor questions regarding procedural aspects of the exam, but do not expect clarification of questions or responses.

15. You may use calculators. It is prohibited to share calculators with other candidates. Please ask the Proctor for a calculator to use during the exam if you do not have one. No personal digital assistants, laptop computers, electronic memory devices, or cell phones may be used, even if they have a calculator feature. Please turn off the audible tones of cell phones and pagers.

16. Please take your time and be thorough in your responses. There should be ample time to satisfactorily complete the exam. You will have until 6:00 p.m. to finish the exam.

17. You must submit all test materials to the Proctor before you leave the exam area.
CANDIDATE VERIFICATION FORM (Day 2)

Candidate ID Number: _______________________________

Candidate’s Signature: _______________________________

The test proctor will collect this form before you start the exam.
This portion of the test has 125 multiple item questions.

1. Verify that the top sheet is your correct candidate identification number and sign the verification sheet that will be collected by the Proctor before you start the exam.

2. The test has ## numbered pages, excluding the cover sheet. Please check that all pages are present before submitting the exam.

3. There is only one (1) correct answer for each question. If you think there are no or multiple answers for a question, you may write a comment next to the question for the examiners to consider.

4. You may use calculators. It is prohibited to share calculators with other candidates. Please ask the Proctor for a calculator to use during the exam if you do not have one. No personal digital assistants, laptop computers, electronic memory devices, or cell phones may be used.

5. You may use pencils or pens to mark your responses. Please clearly write the letter corresponding to your answer choice directly on the exam in the space provided to the left of the question number. Please use capital letters (A, B, C, D, E). This is considered your response to the question and will be the only official source for grading.

6. If you need to change an answer, completely erase or strike-through any mismarked responses.

7. You may write anywhere on the exam, however, the letter you write in the space provided for the answer is the only response that will be considered as your answer for the question. Choices not entered on the answer line will be considered as “no response.”
   a. Also fill in the Optical Scan Sheet with the correct answer using the supplied #2 pencil.
   b. Completely erase any incorrect answers. Note that the scan sheet is only used for analysis of test questions and not for grading of an individual candidate’s exam.
   c. If there is a difference between the answer written on the examination and the answer “bubbled” in on the scan sheet, the answer on the examination will be used.

8. You may take as many breaks of 10 minutes or less out of the exam room as you desire, but observe these rules.
   a. Do not discuss the test with anyone outside of the exam area;
   b. Do not call anyone for assistance with the test;
   c. Do not use references to assist in taking the test;
   d. Only one person can leave the exam room at one time;
e. You will be required to turn in your exam at the end of the exam period, regardless of the time you spend on breaks.

9. You can ask the Proctor questions regarding procedural aspects of the exam, but do not expect clarification of questions or responses.

10. Please take your time in your responses. There should be ample time to satisfactorily complete the exam. You will have until 1:00 p.m. to finish the exam. You must submit all test materials.
AMERICAN BOARD OF APPLIED TOXICOLOGY

20## EXAMINATION

MULTIPLE ITEM SECTION

Date
City, State

Candidate ID Number: ###

DIRECTIONS: Please clearly write the letter corresponding to your answer choice in the space provided to the left of the question number. Use block capital letters A, B, C, D, E. Choices not entered on the answer line will be considered to be not answered. Completely erase any mismarked answers. There is one answer for each question.

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American Board of Applied Toxicology
Summaries of Problem Solving Questions

Question 1 involves a 74-year-old male brought to the emergency department after being found disoriented and combative at home. [Composed of 4 parts, 12 individual questions].

Question 2 involves a 2-year-old male with an elevated blood lead concentration. [Composed of 3 parts, 10 individual questions].

Question 3 involves an 88-year-old woman who is brought to the emergency department with weakness and confusion. [Composed of 4 parts, 12 individual questions].

Question 4 involves the evaluation of a paper related to a study of multiple-dose activated charcoal use. [Composed of 1 part, 11 individual questions].
## ABAT Problem Solving Questions
### Examination Log

**Date**

**Candidate ID Number:** ________

<table>
<thead>
<tr>
<th>Question Number/Part</th>
<th>Part handed out (check)</th>
<th>Part returned (check)</th>
<th>Answer sheet submitted (check)</th>
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</table>

**Signature of Proctor:** ________________________________
AMERICAN BOARD OF APPLIED TOXICOLOGY
ABAT Examination 20##

Instructions for Proctor, Problem Solving Questions
12:30 pm to 6:00 pm  Date

Candidates may keep the previous and all portions of each question as they work on that individual question.

They must submit their answer booklets in sequence for each part before they are given the next part of the question.

When a question is completed, all papers and booklets must be checked in before they can begin a new question.

Once the answer booklet has been turned it may not be returned to the examinee for any reason.

Log the time each part of each question is taken and returned on the log sheet prepared for each examinee.

Please announce the time remaining hourly for the first 3 hours and every 30 minutes thereafter.

Collect any remaining exams and answer books at 6:00 pm.

Instructions for Proctor, Multiple-item Questions
8:00 am to 1:00 pm  Date

Distribute the exam, instructions and verification form.

Candidates should complete the verification form and submit to you before starting the exam.

Ask candidates to read the instructions.

When a candidate is finished with the entire exam, all papers must be submitted.

Once the exam has been turned it may not be returned to the examinee for any reason.

Please announce the time remaining hourly for the first 3 hours and every 30 minutes thereafter.

Collect any remaining exams at 1:00 pm.
Normalizing factors to make each problem solving question equal to 100 points as the maximum score. Each question is equally weighted for maximum score.

<table>
<thead>
<tr>
<th>Question Number</th>
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- Calculated as 100 divided by the **Number of facts**.
ABAT Problem Solving Examination

INSTRUCTIONS FOR GRADING

General Principles

1. Each exam question is graded by a team of two Board members (usually the two Board members who wrote the question) who independently grade each question based on the agreed upon set of responses. An alternate is assigned prior to the exam in case one of the assigned team is unavailable or has a conflict of interest (e.g., one of their staff members is an examinee).

2. The overall grade for each question must agree within two (2) points of the other grader. The two scores are then averaged to obtain the final score for that question. If the difference is greater than 2 points, the two graders will discuss variances and come to a consensus so that each of the overall grades is within 2 points of one another. In the event that it is not resolvable, a third Board member (usually the alternate assigned to that question) will be asked to review the question and the average of all three graders will be considered the grade for the individual.

Grading Details:

1. The President splits up exams into individual Questions and examinees (e.g., Question 1 [Examinee xx], Question 2 [Examinee xy], etc.). The President makes sure that only candidate numbers and no candidate names appear on the examination answer books.

2. If there are a large number of examinees, to optimize work flow, graders should try to work on the same question and examinee simultaneously. This will allow for the comparison phase to be completed in a staggered fashion to allow for timely data entry of the scores.

3. Scoring system.

   a. Each question has a total number of possible points “facts” available with some designated as “mandatory”.

   b. (Total # points for a given question) – (# of mandatory points for that question) = maximum # number of non-mandatory points that can be given.

      For example: Question # 7 has 6 facts, 2 of which are mandatory. The examinee provides 6 correct facts, only 1 of which was a mandatory fact. The examinee should be awarded 5 points. (6 total points – 2 mandatory fact points = maximum of 4 non-mandatory points possible. This examinee gets credit for 4 non-mandatory fact points plus 1 mandatory fact point for a total of 5 points.)
c. If the examinee provides none of the mandatory facts, points can be awarded for the correct non-mandatory facts up to the total of non-mandatory facts available.

d. Half value points can be given for any fact answer if the grader deems appropriate.

e. If applicable, deductions for “fatal errors” are subtracted from the total score for that question (as per the agreed upon set of responses for that question)

4. Scores should be listed on the back of the examination answer book in three columns by the grader:
a. Question # (1, 2, 3, etc.)
b. Grader 1 scores
c. Grader 2 scores

Note: The second grader should write his/her scores on a separate piece of paper and then transfer the scores to the back of the blue book after the entire question has been graded. This is to prevent seeing the other grader’s scores until grading is complete.

5. After the scores for each part have been confirmed, they are turned into the President who enters the individual question scores into the Excel spreadsheet.

6. All pieces of paper used in the scoring process and all answer keys should be turned into the Secretary at the completion of the grading session. The Secretary will make sure that all materials are shredded.
Example of Scoring Grid
A spreadsheet is created for each exam offering.

American Board of Applied Toxicology
20xx Examination

<table>
<thead>
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<th>Case No.</th>
<th>Part</th>
<th>Question</th>
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**Totals***

|          | **0.00** | **0.00** |

*Note: Total scores based on 100%

Multiple-item

American Board of Applied Toxicology
20xx Final Scores

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**Total for Problem-solving questions**

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Case weights = 0.125 each case
Score must be 50% or greater for passing

**Multiple-item questions**

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Multiple-item weight = 0.5
Score must be 50% or greater for passing

**TOTAL FOR BOTH SECTIONS**

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Score must be 60% or greater for passing
Information for Candidates About the Examination
Posted on ABAT Website (www.clintox.org), accessed on September 1, 2004

ABAT Certification Examination Information

Only those individuals who are credentialed to take the ABAT certification examination may do so. Credentialed applicants must take the examination within two examination cycles. ABAT is committed to providing an examination once per year, but may elect to skip a year if not enough applicants are ready to sit for the exam. A decision is made on or before May 15th of the fall preceding the next examination session whether to proceed with the examination process for that year. The examination is prepared according to a table of specifications. The examination is given over two days prior to the start of the NACCT meeting. The first day/session involves a written response to case scenarios or situations that would assess the applicant's problem solving skills. The second day/session is comprised of a 100-150 multiple choice answer examination. The Board of Directors grade all examinations. The examinee will usually hear from the President within 4-6 weeks after the close of the NACCT meeting on the results of the examination. A study guide may guide preparation for the examination.

ABAT Exam Table of Specifications

### Specifications for the Short Answer Questions

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<th>Topic</th>
<th>Number of Questions</th>
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<td>Drugs</td>
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<td>Chemicals</td>
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<tr>
<td>Environmental/Occupational</td>
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<tr>
<td>Theory (eg: toxicokinetics, interactions, laboratory)</td>
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<td>Biologicals</td>
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<td>General (eg: antidotes, history)</td>
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The questions will measure the candidate’s ability to recall certain general facts about specific agents within the above categories. More importantly, the candidate will apply this basic factual knowledge to make clinical decisions presented within the framework of the questions.

### Specifications for the Problem Solving Section

<table>
<thead>
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<th>Topic</th>
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The clinically-oriented problem solving cases (3) are geared to assess the ability of the candidate to assess a patient scenario provided in a time layered pattern (with no regression to an earlier section), providing a diagnostic, stabilization, and therapeutic plan to work the problem through to resolution. A second type of problem (1) will assess a more non-clinical role in addressing a forced literature evaluation [11-28-07]
Once a candidate has successfully completed the credential review process for the American Board of Applied Toxicology (ABAT), in order to become a Diplomate of ABAT, one must pass the ABAT examination. The ABAT examination is offered annually at the North American Congress of Clinical Toxicology (NACCT) typically held during September or October.

The examination is administered in two sections over two days. The first section is comprised of four multi-part, written, problem-solving case studies. These case studies cover a variety of topics including acute and chronic exposures, environmental or occupational toxicology, clinical study design and evaluation, or the toxicology laboratory. The second is comprised of up to 125 short answer (multiple-choice) questions covering a variety of toxicology topics. These questions are meant to measure diversity of knowledge rather than trivia.

The attached list of topics and references provide some direction as to what types of topics are usually tested. While this list may seem exhaustive, it truly reflects the wide knowledge base required of ABAT Diplomates.

Please contact the President of ABAT if you have any additional questions.

February 26, 2003
Acetaminophen
Air pollution (indoor and outdoor)
Agricultural-related poisonings
Alcohols
Aminoglycosides
Analytical methodology
Anion gap metabolic acidosis
Anthrax
Antiarrhythmics
Anticholinergics
Anticoagulants - warfarin, superwarfarins
Anticonvulsants
Antidotes
Antihistamines
Arsenic
Aspirin and salicylates
Barbiturates
Benzene
Benzodiazepines
Beta-adrenergic agonists
Beta-adrenergic blockers
Biological warfare agents
Bites, human and animal
Blood levels of toxic substances
Borates
Botulism
Bromides
Cadmium
Caffeine
Calcium channel blockers
Camphor
Cancer promoters and carcinogens
Carbon monoxide
Cardiac toxicity of poisons
Cathartics
Caustics, corrosives (acid and alkali)
Chemical warfare agents
Chlorates
Chlorinated hydrocarbons
Chlorine and chloramine gas
Chromium
Ciguatera fish poisoning
Clonidine
Cocaine
Colchicine
Copper
COX-2 inhibitors
Cyanide
Cyclic antidepressants
Decongestants
Dermal toxicology
Dermatologic reactions
Designer drugs
Digoxin and digitalis-like compounds
Dioxin (TCDD)
Disk batteries
Disulfiram - alcohol reactions
Drug induced illness
Drug interactions
Drugs and chemicals of abuse
Enhancing elimination
Envenomations, bites and stings
Epidemiologic study design and interpretation
Epidemiology of poisonings
Ergot alkaloids
Essential oils
Ethylene glycol and glycol ethers
Evidence-based medicine approaches
Extracorporeal drug removal
Extrapolation of animal data to humans
Fetal toxicity of xenobiotics
First aid for poisonings
Fluoride
Food poisoning - all types
Foreign body ingestions and exposures
Formaldehyde
Gamma hydroxybutyrate
Gastric decontamination procedures
Hazardous materials hazardous spills/waste
Heavy metals
Hepatotoxicity, toxin-induced
Herbal products
Herbicides
Heroin
High pressure injection injuries
History of toxicology
Household products
Hydrocarbons
Hydrofluoric acid
Hydrogen sulfide
Hyperbaric oxygen therapy
Industrial exposures
Inhalation toxicity – gases, fumes, vapors
Insulin and hypoglycemic agents
Iron
Isocyanates
Isoniazid
Lab analysis of toxins
Lead
Lithium
Local anesthetics
Monoamine oxidase inhibitors
Marijuana
Methylenedioxymethamphetamine
Mercury, elemental and organic
Metal fume fever
Methamphetamine
Methanol
Methemoglobinemia
Multiple chemical sensitivity syndrome
Mushrooms
Mutagenesis
Neonatal drug withdrawal
Neonatal transplacental toxicity
Nephrotoxicity of toxins
Neuroleptic malignant syndrome
Neuropathies, toxin-induced
Nicotine
Nitrogen dioxide
Nonprescription drugs
Nonsteroidal antiinflammatory drugs
Occupational cancer risk
Occupational exposure theory
Opioid analgesics
Oral hypoglycemics
Organophosphates
Pharmacokinetics
Pesticides
Phencyclidine
Phenothiazines
Plant toxicology (North America)
Poison prevention
Pulmonary toxicity of toxins
Radiation – ionizing
Riot control agents
Risk communication
Risk evaluation
Rodenticides
Scombroid fish poisoning
Scorpions
Sedative/hypnotic drugs
Selective serotonin reuptake inhibitors
Serotonin syndrome
Sick building syndrome
Skeletal muscle relaxants
Snakes of North America
Solvent inhalation abuse
Solvents
Spiders of North America
Statistics and experimental study design
Study design
Supportive care
Teratogens and teratogenicity
Terrorist threats, biological and chemical
Thallium
Theophylline
Therapeutic drug monitoring
Thyroid products
TLVs and other occupational exposure limits
Toxic oil syndrome
Toxicokinetics
Toxidromes
Venomous marine life of North America
Vitamins and minerals
Withdrawal syndromes
There are many excellent references that are useful in preparing for the ABAT examination. This short list should provide some guidance.


Ellenhorn MJ; Schonwald S; Ordog G; Wasserberger J. *Ellenhorn’s medical toxicology: diagnosis and treatment of human poisoning.* Baltimore: Williams & Wilkins; Current edition.


## Attachment 5. Common Laboratory Values and Conversion to Système International (SI) Units

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<tr>
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<th>System</th>
<th>Present Reference Intervals</th>
<th>Present Unit</th>
<th>Conversion Factor</th>
<th>SI Reference Intervals</th>
<th>SI Unit</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alanine aminotransferase (ALT)</td>
<td>Serum</td>
<td>5–40</td>
<td>U/L</td>
<td>1.00</td>
<td>5–40</td>
<td>U/L</td>
<td></td>
</tr>
<tr>
<td>Albumin</td>
<td>Serum</td>
<td>3.9–5.0</td>
<td>mg/dl</td>
<td>10</td>
<td>39–50</td>
<td>g/L</td>
<td></td>
</tr>
<tr>
<td>Alkaline phosphatase</td>
<td>Serum</td>
<td>55–110</td>
<td>U/L</td>
<td>1.00</td>
<td>35–110</td>
<td>U/L</td>
<td></td>
</tr>
<tr>
<td>Aspartate aminotransferase (AST)</td>
<td>Serum</td>
<td>5–40</td>
<td>U/L</td>
<td>1.00</td>
<td>5–40</td>
<td>U/L</td>
<td></td>
</tr>
<tr>
<td>Bilirubin</td>
<td>Serum</td>
<td>0–0.2</td>
<td>mg/dl</td>
<td>17.10</td>
<td>0–4</td>
<td>μmol/L</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Serum</td>
<td>0.1–1.2</td>
<td>mg/dl</td>
<td>17.10</td>
<td>2–20</td>
<td>μmol/L</td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td>Serum</td>
<td>8.6–10.3</td>
<td>mg/dl</td>
<td>0.2495</td>
<td>2.15–2.57</td>
<td>mmol/L</td>
<td></td>
</tr>
<tr>
<td>Carbon dioxide, total</td>
<td>Serum</td>
<td>22–30</td>
<td>mEq/L</td>
<td>1.00</td>
<td>22–30</td>
<td>mmol/L</td>
<td></td>
</tr>
<tr>
<td>Chloride</td>
<td>Serum</td>
<td>98–108</td>
<td>mEq/L</td>
<td>1.00</td>
<td>98–108</td>
<td>mmol/L</td>
<td></td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Serum</td>
<td>Age &lt;20 yr</td>
<td>mg/dl</td>
<td>0.02586</td>
<td>&lt;5.15</td>
<td>mmol/L</td>
<td></td>
</tr>
<tr>
<td>Complete blood count</td>
<td>Blood</td>
<td>Age 30–39 yr</td>
<td>mg/dl</td>
<td>0.02586</td>
<td>&lt;5.80</td>
<td>mmol/L</td>
<td></td>
</tr>
<tr>
<td>Hematocrit</td>
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<td>Age &gt;40 yr</td>
<td>mg/dl</td>
<td>0.02586</td>
<td>&lt;6.35</td>
<td>mmol/L</td>
<td></td>
</tr>
<tr>
<td>Age &gt;50 yr</td>
<td></td>
<td></td>
<td>mg/dl</td>
<td>0.02586</td>
<td>&lt;6.85</td>
<td>mmol/L</td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>Blood</td>
<td>42–52</td>
<td>%</td>
<td>0.01</td>
<td>0.42–0.52</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>Blood</td>
<td>37–47</td>
<td>%</td>
<td>0.01</td>
<td>0.37–0.47</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Red cell count</td>
<td></td>
<td>4.6–6.2 x 10^6</td>
<td>/mm^3</td>
<td>10^6</td>
<td>4.6–6.2 x 10^12/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White cell count</td>
<td></td>
<td>4.2–5.4 x 10^6</td>
<td>/mm^3</td>
<td>10^6</td>
<td>4.2–5.4 x 10^12/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platelet count</td>
<td></td>
<td>4.5–11.0 x 10^3</td>
<td>/mm^3</td>
<td>10^6</td>
<td>4.5–11.0 x 10^9/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platelet count</td>
<td>Serum</td>
<td>150–500 x 10^3</td>
<td>/mm^3</td>
<td>10^6</td>
<td>150–500 x 10^9/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cortisol</td>
<td>Serum</td>
<td>5–25</td>
<td>μg/dl</td>
<td>27.59</td>
<td>140–690</td>
<td>mmol/L</td>
<td></td>
</tr>
<tr>
<td>Fbg</td>
<td>Serum</td>
<td>3–13</td>
<td>μg/dl</td>
<td>27.59</td>
<td>80–360</td>
<td>mmol/L</td>
<td></td>
</tr>
<tr>
<td>Cortisol</td>
<td>Urine</td>
<td>20–90</td>
<td>μg/24 hr</td>
<td>2.759</td>
<td>55–250</td>
<td>mmol/24 hr</td>
<td></td>
</tr>
<tr>
<td>Creatine kinase</td>
<td>Serum</td>
<td>50–250</td>
<td>U/L</td>
<td>1.00</td>
<td>50–520</td>
<td>U/L</td>
<td></td>
</tr>
<tr>
<td>High CK group (black men)</td>
<td>Serum</td>
<td>55–345</td>
<td>U/L</td>
<td>1.00</td>
<td>35–345</td>
<td>U/L</td>
<td></td>
</tr>
<tr>
<td>Intermediate CK group</td>
<td>Serum</td>
<td>25–145</td>
<td>U/L</td>
<td>1.00</td>
<td>25–145</td>
<td>U/L</td>
<td></td>
</tr>
<tr>
<td>Low CK group (nonblack women)</td>
<td>Serum</td>
<td>&gt;5</td>
<td>%</td>
<td>0.01</td>
<td>&gt;0.05</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Creatine</td>
<td>Serum</td>
<td>0.4–1.5</td>
<td>mg/dl</td>
<td>88.40</td>
<td>35–115</td>
<td>μmol/L</td>
<td></td>
</tr>
<tr>
<td>Red cell count</td>
<td>Serum</td>
<td>0.4–1.1</td>
<td>mg/dl</td>
<td>88.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dihydroxyindoxyl sulfate</td>
<td>Serum</td>
<td>32–36</td>
<td>%</td>
<td>0.01</td>
<td>0.32–0.36</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Erythrocyte indices</td>
<td>Serum</td>
<td>Mean corpuscular volume (MCV)</td>
<td>Blood</td>
<td>80–100</td>
<td>1.00</td>
<td>80–100</td>
<td>10^9/L</td>
</tr>
<tr>
<td>Mean corpuscular hemoglobin (MCH)</td>
<td>Serum</td>
<td>27–31</td>
<td>P8</td>
<td>1.00</td>
<td>27–31</td>
<td>P8</td>
<td></td>
</tr>
<tr>
<td>Mean corpuscular hemoglobin concentration (MCHC)</td>
<td>Serum</td>
<td>32–36</td>
<td>%</td>
<td>0.01</td>
<td>0.32–0.36</td>
<td>1</td>
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</tr>
</tbody>
</table>

(continued)
### Examples of Conversions to Systéme International (SI) Units (Continued)

<table>
<thead>
<tr>
<th>Component</th>
<th>System</th>
<th>Present Reference Intervals</th>
<th>Present Unit</th>
<th>Conversion Factor</th>
<th>SI Reference Intervals</th>
<th>SI Unit Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferritin</td>
<td>Serum</td>
<td>29-438</td>
<td>ng/ml</td>
<td>1.00</td>
<td>29-438</td>
<td>µg/L</td>
</tr>
<tr>
<td>Women</td>
<td>Serum</td>
<td>9-219</td>
<td>ng/ml</td>
<td>1.00</td>
<td>9-219</td>
<td>µg/L</td>
</tr>
<tr>
<td>Folate</td>
<td>Serum</td>
<td>2.5-20.0</td>
<td>ng/ml</td>
<td>2.256</td>
<td>6-46</td>
<td>mmol/L</td>
</tr>
<tr>
<td>Follicle-stimulating hormone (FSH)</td>
<td>Children</td>
<td>12 or &lt;</td>
<td>mIU/ml</td>
<td>1.00</td>
<td>12 or &lt;</td>
<td>IU/L</td>
</tr>
<tr>
<td>Men</td>
<td>Serum</td>
<td>2.0-10.0</td>
<td>mIU/ml</td>
<td>1.00</td>
<td>2.0-10.0</td>
<td>IU/L</td>
</tr>
<tr>
<td>Women, follicular</td>
<td>Serum</td>
<td>3.2-9.0</td>
<td>mIU/ml</td>
<td>1.00</td>
<td>3.2-9.0</td>
<td>IU/L</td>
</tr>
<tr>
<td>Women, midcycle</td>
<td>Serum</td>
<td>3.2-9.0</td>
<td>mIU/ml</td>
<td>1.00</td>
<td>3.2-9.0</td>
<td>IU/L</td>
</tr>
<tr>
<td>Women, lateal</td>
<td>Serum</td>
<td>2.0-6.2</td>
<td>mIU/ml</td>
<td>1.00</td>
<td>2.0-6.2</td>
<td>IU/L</td>
</tr>
<tr>
<td>Gases, arterial</td>
<td>Blood</td>
<td>80-95</td>
<td>mm Hg</td>
<td>0.1353</td>
<td>10.7-12.7</td>
<td>kPa</td>
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<tr>
<td>Pco₂</td>
<td>Serum</td>
<td>37-43</td>
<td>mm Hg</td>
<td>0.1353</td>
<td>4.9-5.7</td>
<td>kPa</td>
</tr>
<tr>
<td>Glucose</td>
<td>Serum</td>
<td>52-110</td>
<td>mg/dl</td>
<td>0.05551</td>
<td>3.4-6.1</td>
<td>mmol/L</td>
</tr>
<tr>
<td>Iron</td>
<td>Serum</td>
<td>50-160</td>
<td>µg/dl</td>
<td>0.1791</td>
<td>9-29</td>
<td>µmol/L</td>
</tr>
<tr>
<td>Iron-binding capacity</td>
<td>Serum</td>
<td>230-410</td>
<td>µg/dl</td>
<td>0.1791</td>
<td>41-73</td>
<td>µmol/L</td>
</tr>
<tr>
<td>TIBC</td>
<td>Serum</td>
<td>120-300</td>
<td>U/L</td>
<td>1.00</td>
<td>120-300</td>
<td>U/L</td>
</tr>
<tr>
<td>Lactic dehydrogenase</td>
<td>Serum</td>
<td>4.9-15.0</td>
<td>mIU/ml</td>
<td>1.00</td>
<td>4.9-15.0</td>
<td>IU/L</td>
</tr>
<tr>
<td>Leutinizing hormone</td>
<td>Serum</td>
<td>5.0-25</td>
<td>mIU/ml</td>
<td>1.00</td>
<td>5.0-25</td>
<td>IU/L</td>
</tr>
<tr>
<td>Magnesium</td>
<td>Serum</td>
<td>1.2-1.9</td>
<td>mEq/L</td>
<td>0.4114</td>
<td>0.50-0.78</td>
<td>mmol/L</td>
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<tr>
<td>Creatinine</td>
<td>Serum</td>
<td>78-230</td>
<td>mEq/kg</td>
<td>1.00</td>
<td>278-800</td>
<td>mmol/kg</td>
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<tr>
<td>Urinalysis</td>
<td>Urine</td>
<td>None defined</td>
<td>mEq/kg</td>
<td>1.00</td>
<td>None defined</td>
<td>mmol/kg</td>
</tr>
<tr>
<td>Phosphoribosyl, therapeutic</td>
<td>Serum</td>
<td>15-40</td>
<td>µg/ml</td>
<td>4.306</td>
<td>65-175</td>
<td>µmol/L</td>
</tr>
<tr>
<td>Phosphoribosyl, therapeutic</td>
<td>Serum</td>
<td>10-20</td>
<td>µg/ml</td>
<td>3.954</td>
<td>40-80</td>
<td>µmol/L</td>
</tr>
<tr>
<td>Phosphate (phosphorus, inorganic)</td>
<td>Serum</td>
<td>2.5-4.1</td>
<td>mg/dl</td>
<td>0.3229</td>
<td>0.75-1.35</td>
<td>mmol/L</td>
</tr>
<tr>
<td>Potassium</td>
<td>Serum</td>
<td>3.7-5.1</td>
<td>mEq/L g/ml</td>
<td>1.00</td>
<td>3.7-5.1</td>
<td>mmol/L</td>
</tr>
<tr>
<td>Protein, total</td>
<td>Serum</td>
<td>6.5-8.3</td>
<td>g/dl</td>
<td>10.0</td>
<td>65-83</td>
<td>g/L</td>
</tr>
<tr>
<td>Sodium</td>
<td>Serum</td>
<td>134-142</td>
<td>mEq/L</td>
<td>1.00</td>
<td>134-142</td>
<td>mmol/L</td>
</tr>
<tr>
<td>Theophylline, therapeutic</td>
<td>Serum</td>
<td>5-20</td>
<td>µg/ml</td>
<td>5.550</td>
<td>28-110</td>
<td>µmol/L</td>
</tr>
<tr>
<td>Thyroid-stimulating hormone (TSH)</td>
<td>Serum</td>
<td>0-5</td>
<td>µIU/ml</td>
<td>1.00</td>
<td>0-5</td>
<td>mIU/L</td>
</tr>
<tr>
<td>T3-Uptake ratio</td>
<td>Serum</td>
<td>0.88-1.19</td>
<td>1</td>
<td>1.00</td>
<td>0.88-1.19</td>
<td>1</td>
</tr>
<tr>
<td>Triiodothyronine (T3)</td>
<td>Serum</td>
<td>70-235</td>
<td>ng/ml</td>
<td>0.01596</td>
<td>1.1-3.5</td>
<td>nmol/L</td>
</tr>
<tr>
<td>Triiodothyronine (T3)</td>
<td>Serum</td>
<td>70-235</td>
<td>ng/ml</td>
<td>0.01596</td>
<td>1.1-3.5</td>
<td>nmol/L</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>Serum</td>
<td>50-200</td>
<td>mg/dl</td>
<td>0.01289</td>
<td>0.55-2.25</td>
<td>mmol/L</td>
</tr>
<tr>
<td>Urate (uric acid)</td>
<td>Serum</td>
<td>2.9-8.5</td>
<td>mg/dl</td>
<td>59.48</td>
<td>170-510</td>
<td>µmol/L</td>
</tr>
<tr>
<td>Women</td>
<td>Serum</td>
<td>2.2-6.5</td>
<td>mg/dl</td>
<td>59.48</td>
<td>130-390</td>
<td>µmol/L</td>
</tr>
<tr>
<td>Urea nitrogen</td>
<td>Serum</td>
<td>6-25</td>
<td>mg/dl</td>
<td>0.3570</td>
<td>2.1-8.9</td>
<td>mmol/L</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>Serum</td>
<td>250-1000</td>
<td>pg/ml</td>
<td>0.7378</td>
<td>180-740</td>
<td>pmol/L</td>
</tr>
</tbody>
</table>

American Board of Applied Toxicology
Policies, Procedures and Guidelines

CREDENTIALING COMMITTEE

Purpose: To describe the actions to be taken by the Credentialing Committee during the credentialing process to include committee membership, committee deadlines, solicitation of candidates, guidelines for applicants, application form, evaluation instruments and scoring, notification of applicants and storage of records.

Committee Chair Responsibilities
- Oversee credentialing process and maintain necessary documentation
- Establish and publish guidelines for applicants
- Establish and publish an application for credentials review and examination
- Establish and publish guidelines for scoring credentialing applications
- Serve as a point of contact for potential applicants.
- Triage applications to evaluate individual applicant's credentials for completeness and meeting minimum eligibility criteria.

Committee Membership
- The Chair of the Credentialing Committee shall be appointed by the President of ABAT from the Board of Directors to serve a two year term. It is desirable that the Chair of the Credentialing Committee have prior experience on the Credentialing Committee.
- The Credentialing Committee shall be composed of at least four Diplomates of ABAT.
- The remaining members of the Committee are selected annually from the membership by the Chair of the Credentialing Committee.

Committee Deadlines (for examination in the same year).
- Receipt of completed applications: On or around March 1st
- Notification of ABAT President of applicant evaluations: May 1st
- Applicant notification of credentialing results: June 1st

Solicitation of Candidates
Applicants will be solicited through
- Word of mouth
- Announcements in appropriate professional journals
• Announcements soliciting applicants should be published for a three month period six months prior to the application deadline.

Guidelines for Applicants (see ABAT website http://www.clintox.org/ABAT_Certification.cfm)
• Written guidelines for applicants should be developed and periodically reviewed. Changes in the guidelines shall be approved by the ABAT Board of Directors.
• Guidelines for applicants should include the following information:
  o Objectives of the American Board of Applied Toxicology.
  o A description of the application process including who are eligible applicants, application fee, rights of credentialed and non-credentialed candidates, and certification process for ABAT Diplomate status.
  o A description of the criteria to be met to become a candidate for credentialing.
  o A description of the credentials review process including notification deadlines, description of the domains to be evaluated in the application and the relative weighting of each domain in the credentialing process.
  o Examination information including length, frequency, brief description and re-examination options.
  o Address for applications and method of submission.
  o Names of ABAT members in the applicant’s general vicinity should be provided to the applicant as a resource for assistance in completing the application when the application is sent to the applicant.

Application for Credentials Review and Examination
• An application form that solicits information in the four domains areas of professional activity: practice, education, research and leadership shall be developed and distributed via AACT’s website.
  o (See website http://www.clintox.org/ABAT_Certification.cfm)
• It should be periodically reviewed by the committee. Changes in the application shall be approved by the ABAT Board of Directors. Changes in contact information for new committee chairs can be made without the approval of the board.
• A fee of $500 will be submitted with the application. This will cover the $200 application fee and the $300 examination fee. If the candidate does not successfully credential they will receive a refund of $300.
• General information collected should include:
  Name, contact information; education; licensure; number of years in clinical toxicology; professional positions; formal and/or informal training in clinical toxicology; percentage of
time spent practice, education, research, and administration; and brief description of present activities related to clinical toxicology.

- **Information on practice** should include the following areas:
  Monitoring and/or advice on the therapy of poisoning victims; written therapeutic consultations on toxicology problems; education on poisoning to members of the lay community; expert witness testimony in legal matters dealing with poisons or poisonings; and advice to governmental agencies, industry, or others on the regulatory aspects of toxicology issues.

- **Information on education** should include the following areas:
  Preceptor or major professor for clinical toxicology students, post graduate trainees or visiting scientists; didactic and/or clinical responsibilities for teaching clinical toxicology to health professionals or health professional students; editor, editorial board member, or referee for health care or toxicology related publications; referee for abstracts submitted to toxicology related conferences; presentations (platform or poster) at professional meetings; and authorship of non-research publications on toxicology practice or toxicology related matters.

- **Information on research** should include the following areas:
  Design, review, implementation, or monitoring of clinical toxicology or practice related research and authorship of research reports on clinical toxicology related matters.

- **Information on leadership activities** should include the following areas:
  Honors or awards; establishment of new toxicology services, education or research programs; membership, committee work and offices in local, state, national or international health care, scientific or toxicology organizations; consultations to organizations on toxicology related matters; and toxicology related committees in work, community, national or international organizations.

- The names of three references to the applicant's professional activities should be requested in the application.

**Guidelines for Scoring Credentials Applications**

- A standard method of scoring applications will be developed and periodically reviewed. Changes in the application scoring shall be approved by the ABAT Board of Directors.

- Guidelines for point assignment and maximum points allowed for each scored question on the application will be developed prior to evaluation of applicants.
• Minimum point totals for each major section of practice, education, research and leadership will be established to set an overall minimal point total for successful credentialing.

• Application Scoring

• Applications will not be blinded. All information supplied in an application shall be held confidential by committee members and not released without ABAT authorization.

• Each application will be prescreened by the Chair of the committee for completeness and returned to the applicant if necessary for clarification.

• Each application will be evaluated according to the scoring guidelines by each member of the credentials committee plus a separate subjective evaluation for credentialing status will be made by each member.

• Committee members should excuse themselves from evaluating any candidate in which they feel that there may be a conflict of interest. In this event, the Chairman of the Credentialing Committee will appoint one or more other Diplomates to review that applicant.

• Scores from each committee member will be averaged to arrive at a final score for each applicant credentialing.

• References will be contacted in cases in which the Committee feels further input on the applicant's professional activities is needed.

• Recommendations for candidates to be credentialed will then be forwarded to the President of ABAT in writing by May 1st of the year.

Notification of Applicants

• Notification of an applicant's credentialing status will be made by the President of ABAT in writing by June 1st of the year.

• Notification for unsuccessful applicants should suggest areas that the candidate should improve in to attain credentialing status.

Expiration of Credentials

• Once credentialed, an applicant's credentials will be valid for a period that encompasses three examination cycles.
  o Candidates may request extensions for medical issues or personal hardships. Such requests will be reviewed on a case by case basis and are subject to the discretion of the board.

• The examination fee will be charged for each subsequent attempt.

• If an applicant fails to pass the examination within three offerings, their credentials to sit for the examination will be revoked. In order to become credentialed again they must develop and complete an improvement plan that is approved by the board of directors before being able to submit a new application.
Grievance Procedure
• The purpose of the grievance procedure is to provide for due process in the evaluation and mediation of grievances concerning the credentialing process.
• Grievances may concern, but are not limited to, scoring of the application, and/or interpretation of the applicant's experience.
• A written complaint or grievance should be submitted to the Chair of the Credentialing Committee. The Chair of the Credentialing Committee, in consultation with the Credentialing Committee, will attempt to resolve the grievance of the complainant.
• If the initial response is unsatisfactory to the complainant, the matter will be referred to the ABAT Board of Directors. The Board may ask for additional evidence, up to and including a personal appearance from the complainant in their consideration of the matter.
• The ruling of the Board of Directors will be final.

Storage Requirements
All records of the credentialing process shall be maintained in accordance with ABAT bylaws.

1. Approved: September 10, 2004
Revised and Approved: January 2007; May 12, 2008; September 12, 2008
ABAT Certification Examination Credentialing Information

Obtaining an application for American Board of Applied Toxicology Certification Examination

Thank you for your interest in the American Board of Applied Toxicology certification examination. The following information will acquaint the prospective applicant with some basic introductory guidelines utilized by ABAT to assess applications. If the applicant meets these qualifications, the applicant is invited to submit an application that will be reviewed in detail by the ABAT Credentialing Committee to ascertain final credentialing status. You must be credentialed to sit for the ABAT Certification Examination. A link to a downloadable application follows the guidelines.

Applicants must meet the following initial criteria to become a candidate for examination:

1. A graduate of a college or university with an earned doctoral degree in a biomedical discipline. Applicants without doctoral degrees must possess a baccalaureate degree in a health science discipline, such as pharmacy or nursing, followed by a minimum of five years of full-time professional experience in applied clinical toxicology. Scholastic coursework is not considered to be professional experience.

2. Completion of at least 12 months of post-doctoral training (i.e., residency or fellowship) in clinical toxicology or a closely related field. Applicants without post-doctoral training must have a minimum of at least three years of professional experience related to applied clinical toxicology after completion of their doctoral degree. To be prepared for the examination, candidates should have considerable clinical experience and an understanding of the clinical and environmental factors associated with various types of toxicological problems. Examples of activities related to the practice of applied clinical toxicology include consulting with medical personnel on patient care issues, administrative responsibility for a poison control center with consultative responsibilities, rendering opinions on product toxicity, teaching clinical toxicology to students, practitioners or colleagues, collaborating with medical toxicologists, and research in applied clinical toxicology.

Because the American College of Medical Toxicology and the American Board of Veterinary Toxicology are responsible for certification in their respective areas, applicants holding the Doctor of Medicine, Doctor of Osteopathy, or Doctor of Veterinary Medicine degree are not eligible to sit for the ABAT examination.
3. Applicants must demonstrate experience in all the areas of clinical, research and teaching activities, and leadership. An abundance of experience in one area will not substitute for lack of experience in another.

4. Applicants holding a degree in a health care profession in which licensing is required must be in good standing with the appropriate jurisdictional board and must be eligible for, or possess, a valid, unrestricted license to practice. A copy of the license must accompany the application.

5. Applicants must be members in good standing of the American Academy of Clinical Toxicology at the time of their application.

**Credentialing Committee Review**

Following receipt of the completed application and application fee, the candidate's submission is reviewed by the Credentialing Committee. The Committee uses a standardized credential review document among the application reviewers. A formal letter from the President of ABAT will inform the candidate of the committee's decision, and if required, will list areas of improvement the committee felt would allow the candidate to successfully pass credential review on a subsequent submission. Once credentialed, an applicant must take the exam within two examination cycles.

**Application Fees**

A combined application and testing fee of $500, made payable to the American Board of Applied Toxicology, must accompany the application. If credentialing is denied for any reason, the $300 examination fee will be refunded.

Click here for [ABAT Certification Examination Application (MSWord97 format)]

**Application Deadlines**

The deadline for submitting your electronic application is March 1. The paper application and accompanying check for application/examination fees are due March 5.

**Application Questions**

If you have any questions or problems, please contact the Credentialing Committee Chair at the email address or phone number listed below:

Lee Cantrell, PharmD, DABAT  
Chair, Credentialing Committee  
California Poison Control System – San Diego  
University of California San Diego Medical Center  
200 West Arbor Drive  
San Diego, California 92103-8925  
Phone: 858-715-6303
Fax: 858-715-6323
E-mail: fcantriel@ucsd.edu
Attachment 2. Application for Credentials Review and Examination

American Board of Applied Toxicology
Application for Credentials Review and Examination

Instructions: Please type all information. A completed electronic version of this document in MS Word 97 format is due March 1. Submit 1 signed copy of this application to the Chair of the Credentialing committee by March 5. A combined application and testing fee of $500 US dollars, made payable to the American Board of Applied Toxicology, must also accompany the application. If credentialing is denied for any reason, the $300 examination fee will be refunded.

Mail to: Lee Cantrell, PharmD, DABAT
California Poison Control System – San Diego
University of California San Diego Medical Center
200 West Arbor Drive
San Diego, California 92103-8925
fcantrel@ucsd.edu

Name: ___________________________________________ Surname First Middle

Corresponding Address: ________________________________________________________________

Institution

Street or Post Office Box

City State Zip

Telephone: ________________________________________________________________ Work Home

Formal Education:

<table>
<thead>
<tr>
<th>Degree(s)</th>
<th>Institution</th>
<th>Field of Study</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td></td>
<td></td>
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<tr>
<td>Pharm.D.</td>
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<tr>
<td>M.Sc.</td>
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<tr>
<td>B.Sc.</td>
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<td></td>
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<tr>
<td>Other</td>
<td></td>
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</tbody>
</table>

Licensure:

State/Province Profession License Number

State/Province Profession License Number

Number of Years in Clinical Toxicology Practice/Education/Research: _______
Current Professional Position(s). (Include position, title and institutional affiliation):
This detailed application must be completed thoroughly. This information will be used to evaluate your credentials and determine if you are qualified to sit for the examination of the American Board of Applied Toxicology (ABAT). Applications are reviewed using a uniform scale which assigns points for aspects of the applicant's contributions to or activities in clinical toxicology practice, education, research and professional leadership. Based upon the review of this application, an applicant is recommended for approval as a candidate for examination. Acceptance as a candidate does not commit ABAT to a specific examination date.

A scoring sheet is attached at the end of this application to allow the candidate to score themselves. All applicants MUST score at least a total of 40 points to even be considered for credentialing purposes. It is not necessary to provide a response to all questions. Descriptions of professional activities need to be specific and detailed enough so that a fair evaluation can be performed.

Read the entire application before attempting to complete it. Include all documentation in the application. Where needed, extra pages may be added to the application. Type your name at the top of each page.

1. Describe or list the type, length and preceptors for your formal training in clinical toxicology for your a.) degree program, b.) residency, c.) fellowship and d.) postgraduate training program.

2. Describe or list the type, length, and preceptors for your informal training in clinical toxicology.

3. Indicate the percentage distribution of your time spent annually in clinical toxicology in each of these areas:

Practice ____%   Education ____%   Research ____%   Administration ____%

4. Briefly describe (250 words or less) your present activities as they relate to clinical toxicology.
PRACTICE:

5. Maximum = 8. Do you **routinely** monitor and provide advice on the therapy of poisoning victims (e.g. poison center cases, manufacturer’s input to a poisoning case, part of a multidisciplinary health care team, direct patient contact), or have you done so in the past? Please provide documentation to support your activities.

___ Yes    ___ No    If Yes, describe:

Instructions for scoring: If the candidate is clearly involved in the routine assessment and care of poisoned patients via **direct** patient contact, participating in a multidisciplinary health care team, handling poisoning or overdose cases, score **6 points**.

If the candidate is only sporadically involved in assessment and care of poisoned patients via **direct** patient contact, participating in a multidisciplinary health care team, award **3 points**.

If the applicant is involved in reviewing completed cases or is a member of a multidisciplinary team only for his contribution to student or staff teaching and not patient care, award **3 points**.

If the applicant’s primary patient evaluation and consultation activity is as only as a poison specialist, the maximum award is **1 point**.

If the applicant personally provides written consults/progress notes on a **routine** basis, award an additional **2 points**.

If the applicant personally provides written consults on an occasional basis, award an additional **1 point**.

**NOTE**: In order to achieve the MAXIMUM points in this section, the applicant MUST be involved in the routine assessment of poisoning patients via direct patient contact AND provide written consults/progress notes to document those interactions.

If the applicant’s primary patient evaluation and written consultation activity is as a poison specialist, the **maximum** score they may achieve for question # 5 is **1 point**.

6. Maximum = 2. Do you routinely provide education on poisoning to members of the lay community, or have you done so in the past (e.g. poison prevention education or individual counseling)? Please provide documentation to support your activities.

___ Yes    ___ No    If yes, describe:

Instructions for scoring: If the applicant communicates **directly** (this does NOT include telephone contact) with individual patients about poison prevention, award **1 point**.

If the applicant participates in community education programs, or develops educational materials, award **1 point**.

If the applicant only attends health fairs or hands out materials, award **0 points**.
7. Maximum = 5. Do you provide expert witness testimony (i.e. testify at a trial or give a sworn deposition), in legal matters dealing with poisons or poisonings, or have you done so in the past? Please provide documentation to support your activities.

___ Yes  ___ No  If Yes, describe:

Instructions for scoring: If the applicant has provided expert witness testimony to civil, criminal or appeals courts and has been recognized by the courts as an expert on more than three occasions, award 5 points.

If the applicant has provided expert witness testimony on less than three occasions, award 3 points.

If the applicant has produced reports for legal matters, but has not been recognized by the court as an expert witness (i.e. reviewing records but not testifying at trial or giving a sworn deposition), award 1 point.

8. Maximum = 5. Do you provide advice to governmental agencies (e.g. FDA, EPA, etc.), industry, or others on the regulatory aspects of toxicology issues (e.g. product labeling, material safety data sheets, toxicity testing), or have you done so in the past? Please provide documentation to support your activities.

___ Yes  ___ No  If Yes, describe:

Instructions for scoring: If the applicant has provided written opinions to governmental agencies (e.g. FDA, EPA) for regulatory purposes on more than three occasions, award 5 points.

If the applicant has provided written opinions to governmental agencies (e.g. FDA, EPA) for regulatory purposes on less than three occasions, award 3 points.

If the applicant has provided written reports to drug or chemical manufacturers on more than three occasions, award 3 points.

If the applicant has provided written reports to drug or chemical manufacturers on less than three occasions, award 1 point.

If the applicant provides only oral reports, provide 0 points.

EDUCATION:

9. Maximum = 2. Do you serve as formal program director or major professor for one (or more) clinical toxicology residents, post graduate trainees or visiting scientists, or have you done so in the past? Please provide documentation to support your activities.

___ Yes  ___ No  If Yes, describe:

Instructions for scoring: If the applicant serves as a formal director for a residency/fellowship program or serves as a major professor for one (or more) clinical toxicology resident/fellow, post graduate trainee or scientist, award 2 points. NOTE: this criterion does NOT include precepting students or residents. Please see the section below for capturing precepting experience.
10. Maximum = 6. Do you have or have you had didactic and/or clinical responsibilities for
the teaching of clinical toxicology to health professionals or health professional students?
Please provide documentation to support your activities.

___ Yes     ___ No        If yes, describe

Instructions for scoring: If the applicant developed and conducts more than three
advanced toxicology didactic courses (or modules) on the graduate level, award 4 points.

If the applicant developed and conducts less than three advance toxicology didactic
courses (or modules), award 2 points.

As above but on a B.S. level, award either 3 or 1 points.

If the applicant serves as a formal clinical clerkship teacher or preceptor for students
(including role model practice), award 4 points.

If the applicant has contact with students but not as the formal teacher or preceptor, award
1 point.

11. Maximum = 3. Do you serve as an editor, editorial board member, or referee for health
care or toxicology related publications, or referee for abstracts submitted to a toxicology
related conference, or have you done so in the past? Please provide documentation to
support your activities.

___ Yes     ___ No        If Yes, describe:

Instructions for scoring: Editor or editorial board member of national – international
publication award 2 points.

Editor or editorial board member of state publication, award 2 points

Editor or editorial board member of local publication, award 1 point

Referee for leading toxicology, biomedical or scientific journals, award 1 point

Abstract reviewer for scientific meeting, award 0.5 point.

12. Maximum = 4. Have you made any presentations (platform or poster) at professional
meetings on subjects pertinent to clinical toxicology (including continuing education
programs)? Please provide documentation to support your activities.

___ Yes     ___ No        If Yes, list the title, meeting, location and date:

Instructions for scoring: For every national or international presentation, award 1 point.

For every two state or regional meetings, award 1 point.

For every four local presentations (platform or poster) at professional meetings (CE or
otherwise), award 1 point.
13. Maximum = 5. Have you authored publications on toxicology practice or toxicology related matters? NOTE: Please do not include research publications at this time.

___ Yes       ___ No

If Yes, indicate as follows:

A. Indicate the number of the following types of publications either previously published or currently in press (manuscripts submitted for publication and in preparation should not be included).

1. Books

2. Book chapters

3. Journal review articles, case reports

4. Letters to the editor or other scholarly activities

5. Other categories (newsletters, monographs, manuals, etc.)

B. Provide a complete list of the publications for categories 1-5 using standard National Library of Medicine (please see http://www.ashp.org/public/pubs/ajhp/procforsub.html for specific information on formatting) format. Precede each reference with the category number to which it applies. Indicate with the letter "R" which publications are refereed.

Instructions for scoring: For each book, book chapter, journal review article, or case report (NOTE: case reports are NOT considered research in the subsequent section) published in a national or international refereed clinical or scientific journal, award 1 point. For each editorial, letter to the editor or article published in a non-refereed journal, award 0.5 points.

For newsletters and monographs award 0.5 points.

NOTE: The maximum score that can be obtained from publications of newsletters or monographs or other non-refereed publications is 2 points.

RESEARCH:

14. Maximum = 6. Are you, or have you been involved with the design, review, implementation, or monitoring of clinical toxicology or practice related research? Please provide documentation to support your activities.

___ Yes       ___ No

If Yes, list each protocol and describe your role (e.g. Principal investigator, Collaborating Investigator, Reviewer, etc.) Indicate which protocols were funded.

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Role</th>
<th>Funded Y/N</th>
</tr>
</thead>
</table>

Instructions for scoring: Award 2 points for each protocol designed and implemented if the applicant was a principal investigator or project leader.

Award 1 point if co-investigator.
Add 0.5 point for each funded protocol.

15. Maximum = 14. Have you authored research reports on clinical toxicology related matters? Please provide documentation to support your activities.

___ Yes      ___ No

If Yes, indicate as follows:

A. Indicate the number of the following types of research reports:

1. Research reports published in a scientific or clinical journal
2. Research abstracts published
3. Research reports prepared for a sponsoring or funding agency

B. On a separate sheet provide a complete list of the research reports for categories 1-3. Precede each report with the number to which it applies.

Instructions for scoring: For each research paper published in a national or international refereed clinical or scientific journal, award 1 point if applicant is first author, 0.5 point if co-author.

For each research abstract published from any national or international clinical or scientific meeting, award 0.5 point if first author or co-author.

Award 1 point for each research report for a sponsoring agency. NOTE: this does NOT include standard reports to sponsoring agency.

LEADERSHIP:

16. Maximum = 5. Have you received any professional honors or awards? NOTE: Awards do not necessarily have to relate to toxicology but the award should relate to the applicants professional activities. Please provide documentation to support your activities.

___ Yes      ___ No

If Yes, describe:

Instructions for scoring: Award 2 points for each national-international professional honor-award

Award 1 point for each state or regional award

Award 0.5 point for each local award.

17. Maximum = 5. Are you or have you been responsible for the establishment of a new toxicology service, education or research program? Please provide documentation to support your activities.

___ Yes      ___ No

If Yes, describe:

Instructions for scoring: Award 2 points for each new and innovative service, research or education program initiated by applicant. (The mere employment of the applicant by an institution would not alone constitute establishment of a new service).
18. Maximum = 3. Are you a member of any local, state, national or international health care, scientific or toxicology organizations? Please provide documentation to support your activities.

___ Yes ___ No  
If Yes, list the organizations and indicate committees that you have served on or offices that you have held in these organizations.

Instructions for scoring:  Award 0.5 point for membership in each national, international, state or local health care organization.

Award an additional 1 point for serving as an elected officer for any state, international or national organization.

Award 0.5 point for elected officer on local level and 0.5 point for committee member at any level.

19. Maximum = 2. Do you serve as a consultant to organizations on toxicology related matters, or have you done so in the past? Please provide documentation to support your activities.

___ Yes ___ No  
If Yes, describe:

Instructions for scoring:  Award 1 point if applicant has served as a formal toxicology-related consultant to state, national or international organizations.

Award 0.5 point for local organizations.

20. Maximum = 5. Do you serve or have you served on any toxicology related committees? Please provide documentation to support your activities.

___ Yes ___ No  
If Yes, describe your involvement and responsibilities on committees in your: 

A. Place of work:

B. Community:

C. National or international organizations of which you are not a member (e.g. serving as a member of a task force by invitation):

Instructions for scoring:  Award 1 point for each state, national or international committee.

Award 0.5 point for each committee in place of work or community.
REFERENCES:

Provide the name, address and telephone number for three individuals who are familiar with your professional experience:

1. _________________________________________________________________________________
   _________________________________________________________________________________
   _________________________________________________________________________________

2. _________________________________________________________________________________
   _________________________________________________________________________________
   _________________________________________________________________________________

3. _________________________________________________________________________________
   _________________________________________________________________________________
   _________________________________________________________________________________

I declare that the information contained in this application, and any attachments, is true and correct to the best of my knowledge and belief. I provide permission to the American Board of Applied Toxicology to verify any information included in this application and attachments and to contact the individuals listed as references.

__________________________________________________  _________________________
Signature of Applicant                                    Date

End of application
February 2000

APPLICATION_00_rev.doc
## Attachment 3. Guidelines for Scoring Credentials Applications

### American Board of Applied Toxicology

**Summary of Credentials Review**

**Applicant's Name:**

<table>
<thead>
<tr>
<th>Evaluation Criterion</th>
<th>Maximum Points</th>
<th>Applicant's Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Practice:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Practice management</td>
<td>8</td>
<td></td>
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<tr>
<td>6. Community education</td>
<td>2</td>
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<tr>
<td>7. Expert testimony</td>
<td>5</td>
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<tr>
<td>8. Regulatory advice</td>
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<td></td>
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<tr>
<td><strong>Educational Activities:</strong></td>
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<tr>
<td>9. Program Direction</td>
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<tr>
<td>10. Didactic/Preceptorship</td>
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<tr>
<td><strong>Presentations/Publications:</strong></td>
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<td></td>
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<tr>
<td>11. Editorial duties</td>
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<tr>
<td>12. Presentations</td>
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<td>13. Non-research publications</td>
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<td><strong>Research:</strong></td>
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<tr>
<td>14. Protocols</td>
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<td>15. Research publications</td>
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<td><strong>Leadership:</strong></td>
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<td>16. Honors</td>
<td>5</td>
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<tr>
<td>17. Innovations</td>
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<tr>
<td>18. Organizations</td>
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<tr>
<td>19. Invited consultations</td>
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<tr>
<td>20. Committees</td>
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### Point Summary:

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<tr>
<th></th>
<th>Maximum Allowed</th>
<th>Minimum Required per section to pass</th>
<th>Applicant's Score</th>
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<tr>
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<tr>
<td>Education</td>
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<td>2</td>
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<tr>
<td>Publications/presentations</td>
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<td>6</td>
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<tr>
<td>Research</td>
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<td>6</td>
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<td>Leadership</td>
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<td>Minimum Passing Score</td>
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CERTIFICATION RENEWAL COMMITTEE

**Purpose:** This committee is a standing committee of ABAT. This committee shall develop policy, criteria and evaluation procedures for recertification of Diplomates, which will be presented to the Board for approval. The committee shall also perform the evaluation of those Diplomates to be recertified and make recommendations to the Board regarding the continued certification of these diplomates.

**Composition of the Committee:** The committee shall consist of no fewer than three (3) members who shall be diplomates of ABAT. Members of the committee whose renewal applications are under review in a particular year shall recuse themselves from discussing their application and voting on their application. The President shall appoint a committee chair at the time of the annual meeting of the ABAT Board. The chair of the committee shall identify the additional members of the committee from the active ABAT membership. These members shall comprise a cross section of the membership when possible.

**Reporting to the Board:** The committee chair shall prepare a written report of committee activities and provide this to the Board at the annual meeting. Verbal reports shall be provided upon request during any Board meetings held between annual meetings of the Board.

**Time line for activities:**

<table>
<thead>
<tr>
<th>Activity (will be performed electronically where possible)</th>
<th>When</th>
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</thead>
<tbody>
<tr>
<td>Notification of Diplomates due for recertification</td>
<td>Annual Meeting</td>
</tr>
<tr>
<td>Reminder to Diplomates due for recertification</td>
<td>January 15</td>
</tr>
<tr>
<td>Distribution of recertification materials to Diplomates due for recertification</td>
<td>February 15</td>
</tr>
<tr>
<td>Reminders to Diplomates</td>
<td>4/1, 5/1, 6/1</td>
</tr>
<tr>
<td>Date by which a Diplomate must submit a request for a hardship delay (If approved, the late application will be accepted without a penalty fee. The application must be received by August 8th in order to be reviewed at the Annual Meeting.)</td>
<td>June 7th</td>
</tr>
<tr>
<td><strong>Due date for receipt of completed re-certification materials from Diplomates</strong></td>
<td>July 1st</td>
</tr>
<tr>
<td>Distribution of recertification application materials to committee members</td>
<td>July 5th</td>
</tr>
<tr>
<td>Receipt of evaluations from committee members along with any requests for additional documentation or clarification</td>
<td>August 1st</td>
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<tr>
<td>Receipt of late applications ($75.00 late fee) – immediate distribution to committee members</td>
<td>July 1st until August 1st</td>
</tr>
<tr>
<td>Receipt of late application evaluations (for applications received July</td>
<td>2 weeks from</td>
</tr>
<tr>
<td>Event Description</td>
<td>Date/Time</td>
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<tr>
<td>----------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
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<tr>
<td>Receipt of late applications ($150.00 late fee) – immediate distribution to</td>
<td>August 2nd through August 8th</td>
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<td>committee members along with requests for additional information or clarification</td>
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<tr>
<td>Receipt of late application evaluations (for applications received from August 2nd</td>
<td>2 weeks from receipt</td>
</tr>
<tr>
<td>through August 8th) from committee members along with requests for additional</td>
<td></td>
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<tr>
<td>information or clarification</td>
<td></td>
</tr>
<tr>
<td>Receipt of late applications ($300.00 late fee) – immediate distribution to</td>
<td>After August 8th but before Annual Meeting</td>
</tr>
<tr>
<td>committee members</td>
<td></td>
</tr>
<tr>
<td>These applications will not be voted on by the Board until after the Annual</td>
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<tr>
<td>meeting. Voting will take place on or before December 31st.</td>
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<tr>
<td>Receipt of late application evaluations (for applications received after August 8th)</td>
<td>October 31st</td>
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<td>from committee members along with requests for additional information or</td>
<td></td>
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<tr>
<td>clarification</td>
<td></td>
</tr>
<tr>
<td>Receipt of late applications ($300.00 late fee) – immediate distribution to</td>
<td>After Annual Meeting</td>
</tr>
<tr>
<td>committee members</td>
<td></td>
</tr>
<tr>
<td>These applications will not be voted on by the Board until the next Annual</td>
<td></td>
</tr>
<tr>
<td>Meeting (these applications will be reviewed by the committee along with the</td>
<td></td>
</tr>
<tr>
<td>next year’s applicants).</td>
<td></td>
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<tr>
<td>Recommendations to the ABAT Board and ABAT Board vote.</td>
<td>Annual Meeting</td>
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<tr>
<td>If a penalty fee has been imposed, the Board will not vote on the application</td>
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<td>unless the fee has been paid prior to the Annual Meeting.</td>
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<tr>
<td>President of AACT notified of those who successfully recertified.</td>
<td>Within 15 days following the completion of the Annual Meeting</td>
</tr>
<tr>
<td>Diplomates notified in writing (by ABAT President) of the results of the</td>
<td>Within 30 days following the completion of the Annual Meeting</td>
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<tr>
<td>recertification process by certified mail.</td>
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</table>
**Recertification application materials:** The application for recertification will mirror the certification application gathering information about all aspects of applied toxicology practice, educational endeavors, professional development and professional and community service performed by the Diplomate during the evaluation period. A copy of this application is attached.

**Guidelines for Scoring Applications:** A standard method of scoring applications will be developed and periodically reviewed by the committee. Changes in the guidelines for scoring will be recommended to the Board of ABAT for action and adoption. A scoring tool is currently under development.

**Recommendations:** The committee may recommend that the applicant be awarded continued Diplomate status or Diplomate, Inactive status

**Diplomate reinstatement:** Non-voting and Inactive Diplomates may be considered for active membership status by contacting the chair of the recertification committee of the intent, completing the application process and pay all outstanding fees.

**Appeals:** the Diplomate may appeal the decision using the appeal process already established in the by-laws of ABAT (section 5 paragraph 3).

**Records Storage:** Applications and recommendations for each individual Diplomate shall be retained for one renewal cycle as defined in the Bylaws (currently 5 years) and thereafter they will be destroyed. These records shall remain in the possession of the current Committee Chair and transferred upon appointment of a new Chair. Committee members shall treat all files as confidential and destroy all files received upon completion of the evaluation process.

**Approved:** September 10, 2004
**Revised and Approved:** September 12, 2008
American Board of Applied Toxicology  
Policies, Procedures and Guidelines

NOMINATING COMMITTEE

**Purpose:** This committee is a standing committee of ABAT. This committee shall prepare a slate of candidates for all offices; conduct the election process; and develop policy and procedure for the nominating and election procedure.

**Composition of the Committee:** A Director may be selected by the Directors to serve a one (1) year term as Chairperson of the Nominating Committee. A Co-Chairperson may also be selected to become Chairperson the next election cycle. The Chairperson shall appoint at least two other members with approval of the President. If a member of the Nominating Committee is nominated and accepts the nomination, the member will be removed from the committee and replaced with another member by the Chairperson of the Committee.

**Reporting to the Board:** The committee chair shall prepare a written report annually to the Board describing the activities during the previous year. The committee chair shall also provide verbal updates of activities during any Board meetings held between the annual meetings. A verbal report shall be given during the annual meeting of the ABAT membership.

**Time line for activities:**

<table>
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| At the North American Congress of Clinical Toxicology Annual Meeting (usually in September or October) | Board of Directors selects Nominating Committee Chair during Board Meeting  
At Business Meeting, nominations from the floor are solicited. |
| By 1st Friday in November         | 1. Current committee list from ABAT President obtained by Nominating Committee Chair.  
2. At least two ABAT members have been selected as members of the Nominating Committee and have agreed to serve.  
3. Chair contacts Committee members to discuss other potential candidates. Nominating Committee decides who will contact potential nominees to urge them to become candidates.  
4. Email distribution list for ABAT members and list of current members with contact information obtained from Secretary-Treasurer. |
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<tr>
<th>WHEN</th>
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<tr>
<td>By 2nd Friday in January</td>
<td>Nominating Committee Chair e-mails “Call for Nominations” letter to ABAT membership. Includes:</td>
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<tr>
<td></td>
<td>1. List of open positions and their terms of office;</td>
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<td></td>
<td>2. Brief description of position responsibilities;</td>
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<td></td>
<td>3. List of current officers;</td>
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<td>4. List of ABAT members with contact information (using current list obtained from Secretary-Treasurer);</td>
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<td>5. Reminder that candidate must agree to run and that candidates can be self-nominated;</td>
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<td>6. Reminder that all active ABAT members are eligible for every office unless they have served maximum terms allowed by Bylaws;</td>
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<td>7. Reminder of the dates the election will open and close.</td>
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<tr>
<td>By 2nd Friday in February</td>
<td>Nominations close</td>
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<td>Chair to contact Nominating Committee and ABAT President to inform them of final slate.</td>
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<tr>
<td>By 2nd Friday in March</td>
<td>Notify ABAT members, by mail or e-mail, of final slate of nominees (must occur 60 days prior to election)</td>
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<tr>
<td></td>
<td>Chair e-mails requests for biographical sketches to nominees. Includes:</td>
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<tr>
<td></td>
<td>1. Name as it should appear on ballot;</td>
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<td>2. Affirmation that candidate is a member in good standing of AACT and ABAT;</td>
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<td>3. Current positions;</td>
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<td>4. Other activities relevant to ABAT;</td>
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<td>5. Platform/first person statement about why candidate wishes to be elected.</td>
</tr>
<tr>
<td>By 2nd Friday in April</td>
<td>Biographical sketches due to Chair from nominees</td>
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<tr>
<td>By 2nd Friday in May</td>
<td>Notice of election sent to ABAT members eligible to vote.</td>
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<td>Notice to Include:</td>
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<td>1. Instructions for voting;</td>
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<td>2. Dates Internet election site will be available for voting</td>
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<tr>
<td></td>
<td>3. URL to Internet election site;</td>
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<tr>
<td></td>
<td>4. Specific PIN and password for the individual voter (ABAT member)</td>
</tr>
<tr>
<td>1st Friday in June</td>
<td>Election closes</td>
</tr>
<tr>
<td>During June</td>
<td>1. Results are of election are presented to Nominating Committee Chair from AACT office.</td>
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<tr>
<td></td>
<td>2. Nominating Committee Chair reports results to President.</td>
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<td>3. In the event of a tie vote for one of the open positions, a run off election will be</td>
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<td>held for that open position. The runoff election shall include the candidates that</td>
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<td>obtained the tie vote. The winner of this second election shall be accepted as the winner</td>
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<td>for the open position.</td>
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<tr>
<td>By 4th Friday in June</td>
<td>President of ABAT officially notifies nominees of election results.</td>
</tr>
<tr>
<td>July - August</td>
<td>ABAT President will notify membership of election results.</td>
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<tr>
<td></td>
<td>Nominating Committee Chair prepares summary report of committee to present to the ABAT</td>
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<td>Board of Directors at their next meeting/conference call.</td>
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**Electronic Voting Using the Internet:**

1) All announcements concerning the election and balloting will be provided to the email address provided to ABAT by the ABAT member.
2) The subject line of the email announcing the election will state “ABAT ELECTION”. The body of the email will include the dates the web election site will be open for voting, a link to the URL for the web election site, and a unique PIN and password for each ABAT member.
3) Candidate bios and platforms will be provided on the election web site for review by ABAT members.
4) A running tally of votes will be kept by the managers of the Web site and provided to AACT office and the Nominating Committee Chair. Final results will be provided to the Nominating Committee Chair at the close of voting. Results of how an individual voted
can NOT be tracked. However if there is a concern about the process, verification of IF an individual has voted can be tracked. The web site does NOT allow for an individual member to vote twice.

5) Reports on the results from the election will kept in an electronic folder until after the next annual meeting of the membership following the election.

Approved: September 10, 2004
Revised and Approved: September 10, 2005 (added policy regarding electronic ballots)
Revised and Approved: May 12, 2008 (changed policy regarding Internet voting, added tie procedure)
Revised and Approved: September 12, 2008 (miscellaneous wording changes)
APPENDIX
OFFICER AND DIRECTOR DESCRIPTIONS

The affairs and business of ABAT are conducted by the Directors. The Directors of ABAT consists of the Officers, the immediate Past-President, and a maximum of six (6) Directors elected by the membership. The Officers of ABAT consist of the President, President-Elect and Secretary-Treasurer.

President
The President is the principal Officer of ABAT and, in general, supervises the business and affairs of ABAT. The term of the President is two (2) years. The President presides at all meetings of ABAT and of the Directors, and is a Member of all standing committees of ABAT. The President directly oversees the preparation of the annual examination of credentialed candidates in consultation and collaboration with the President-Elect.

The President appoints ABAT committee chairpersons and members, except as proscribed the bylaws. The President conducts correspondence; supervises the maintenance and use of all property of ABAT; employs and discharges employees, if any; and presents the budget to the Directors at its annual meeting or at any other meeting. The President has authority to appoint Examiners on an emergency basis. The President has the power to fill the unexpired term of an Officer, subject to Directors approval, or to assign duties as needed to other Directors. Upon completion of a two (2) year term the President assumes the duties and title of Past-President.

President-Elect
The President-Elect serves a two (2) year term and, with the President, develops and prepares the annual examination of credentialed candidates. In the absence or disability of the President, the President-Elect performs the duties of the President, and when so acting, shall have all of the powers and authority of the President. He/she performs such other duties as may from time to time be assigned by the President or Directors. Upon completion of a two (2) year term the President-Elect assumes the duties and title of President.

Past-President
The Past-President serves a two (2) year term to assist the President and President-Elect in the preparation of the examination of credentialed Candidates. The Past-President is a member of the Directors. The Past-President performs such other duties as may be assigned by the President or Directors.

Secretary-Treasurer
The Secretary-Treasurer serves at least a two (2) year term and:
   a) Prepares minutes and record in books kept for the purpose, all votes and proceedings of the members and of the Directors at their meetings;
   b) Keeps accurate records of existing members;
   c) Keeps full and accurate accounts of receipts and disbursements;
   d) Deposit all funds and other valuable effects, in the name and to the credit of the ABAT through the accounting functions and agents of the Academy; in such depositors as shall be designated by the Directors;
e) Disburses the funds of ABAT as ordered by the Directors, taking proper vouchers for such disbursements and processing such disbursements through the Academy and its fiscal agents;
f) Maintains all official records.
g) Promptly renders such accounts, statements and reports, as may be, from time to time, required by the Directors or the President. In the absence of the President and the President-Elect, the Secretary-Treasurer presides at meetings of the members or Directors.
h) Perform other related duties as assigned by the President.

Directors
Directors serve three (3) year terms. No Director can serve more than two (2) consecutive terms or a total of more than twelve (12) non-consecutive years unless such provisions(s) is waived by a two-thirds (2/3) vote of all Directors. The Directors conduct the business and manage the affairs of ABAT. The Directors set membership dues and fees for credentialing, examination, and recertification. The directors actively assist the President in the preparation and marking of the examination. The Directors have the power to fill vacancies of the unexpired term of office of a Director. Directors are expected to attend the annual board meeting (where among other activities, marking of the examination takes place), participate in each of the scheduled conference calls during the year and chair or participate in an assigned ABAT committee.
American Board of Applied Toxicology
Policies, Procedures and Guidelines

REIMBURSEMENT / PAYMENT OF EXPENDITURES
FOR ABAT BUSINESS PURPOSES

Policy Summary: The ABAT will reimburse Board Members and ABAT Members, as well as speakers or other individuals who are not ABAT Board Members or Members, for reasonable expenses associated with the performance of ABAT-related business. This policy includes expenditures for speakers at the Northern American Congress of Clinical Toxicology (NACCT) ABAT Symposium.

Policy Statements:
1) ABAT may reimburse one night of lodging expenses for each day of ABAT business.
   a) This will include:
      i) Room
      ii) Internet access
      iii) Reasonable fee for use of exercise facilities
   b) This will not include:
      i) Greens fees
      ii) Laundry
      iii) Salon fees
      iv) Entertainment, such as movies
2) ABAT may reimburse up to one day of meals for each day of ABAT business.
   a) The amount of allowable reimbursement for meals and incidental expenses will be obtained from the most current year available on the United States General Services Domestic Per Diem Travel Rates website:
      http://www.gsa.gov/Portal/gsa/ep/contentView.do?programId=9704&channelId=-15943&ooid=16365&contentId=17943&pageTypeId=8203&contentType=GSA_BASIC&programPage=%2Fep%2Fprogram%2FgsaBasic.jsp&P=MTT
   b) The suggested meal reimbursement split is 20% for breakfast, and 40% each for lunch and dinner.
   c) Food expenses will be reimbursed from the day of first travel to and inclusive of the day of departure.
3) Transportation:
   a) ABAT will not reimburse transportation expenses for ABAT Board members to attend the Annual Board Meeting held in conjunction with the NACCT.
   b) ABAT may reimburse transportation expenses when travel is required for other authorized ABAT business.
   c) ABAT may reimburse transportation expenses for speakers at the NACCT ABAT Symposium who are not ABAT members or are members of AACT, ACMT, EAPCCT, AAPCC, or CAPCC who would not otherwise be attending NACCT.
d) Travel must be pre-approved by the ABAT Executive Committee in advance of expenditure, and may include reasonable rates for:
   i) Plane, rail or rental car. Airfare or other transportation will be obtained by the lowest available rate.
   ii) Necessary taxi, shuttle service or other ground transportation

4) For speakers at the ABAT Symposium at NACCT
   a) Registration at NACCT at the lowest possible registration fee will be provided for those who would not have otherwise registered. Please note that this reimbursement will not pertain to ABAT diplomates. If the speaker is an active member of AACT, ACMT, EAPCCT, AAPCC, or CAPCC, it would be highly unusual for ABAT to pay the registration fee.
   b) An honorarium of up to $500.00 may be offered if approved by the ABAT Executive Committee.

5) This policy can be waived on action of the ABAT Board of Directors or Executive Committee as needed to conduct ABAT business.

Procedures:
1) Request pre-approval of the ABAT Executive Committee through the Secretary/Treasurer.
2) Use the AACT Check Request form.
3) Provide original receipts (for all expenses other than gratuity) and a completed AACT Check Request form in hard copy to the Secretary/Treasurer in person or by mail.

Approved: September 12, 2008
American Board of Applied Toxicology
Policies, Procedures and Guidelines

RECORDS RETENTION

Accounting: Year-end accounting reports shall be retained for the life of ABAT. Upon its dissolution, records will be transferred to the American Academy of Clinical Toxicology. Periodic accounting reports will be made part of the minutes of Board or Annual meetings wherein they were presented. These records shall remain in the possession of the current Secretary – Treasurer of ABAT and transferred upon election of a new officer.

Bylaws: Official versions of the Bylaws shall be retained for the life of ABAT. Upon its dissolution, records will be transferred to the American Academy of Clinical Toxicology. These records shall remain in the possession of the current Secretary – Treasurer of ABAT and transferred upon election of a new officer.

Minutes of Board Meetings and Annual Meeting of Diplomates: Official minutes of Board or Annual meetings shall be retained for the life of ABAT. Upon its dissolution, records will be transferred to the American Academy of Clinical Toxicology. These records shall remain in the possession of the current Secretary – Treasurer of ABAT and transferred upon election of a new officer.

President’s communications: Actions and official communications of the President shall be retained by the President for the term of office and transferred to the President-Elect upon assumption of the office of the President. The records shall be retained by the new President for his or her two-year term and then discarded at the end of the term of the new President except for those records that are to be retained in the perpetual records of ABAT as indicated by prevailing policy.

Committee reports and materials: Consult the policies, procedures and guidelines of the specific committee for specifications. Ad hoc committees will observe the specifications outlined by the President.

Physical form of records: Records may be in either a printed or electronic form. If records are retained in electronic form, the computer programs should be one that is generally recognized as a widely used program that will operate across prevailing standard operating systems. In so far as possible, electronic records are preferred.

Destruction of records: Records that are no longer necessary to be retained shall be destroyed by the person in possession of the records by shredding or some other suitable means of destruction to render the information unintelligible or unusable. A report shall be made to the Board of Directors of the nature of the records destroyed and the date of destruction.

Approved: September 10, 2004