HOW TO PREPARE FOR THE

MEDICAL COLLEGE ADMISSION TEST

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A B C D E

What This Book Can Do For You

The best way to prepare for the MCAT, as for any other test, is to practice on questions that are as similar as possible to those on the actual test. This book contains hundreds of such questions, designed especially to provide the practice you need. Working through these questions and their detailed answers can teach you which subjects you need to study and what kinds of questions to expect on the MCAT. Studying this book can also enable you to:

- enter the exam room relaxed and confident
- earn your "true" score, unaffected by "exam jitters" that might otherwise distract you
- increase your test-taking speed, because you will already be familiar with the format and style of the questions
- pinpoint specific topics that you need to review

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Introduction to the MCAT

About the MCAT

The MCAT is a 6½-hour test given by the American College Testing Program. It is required by almost all U.S. and many Canadian medical schools, and it is taken by virtually every premedical student.

WHEN TO TAKE THE TEST

The MCAT is given twice a year, once in the spring and once in the fall. Provided you have finished your basic science course work, the best time to take the MCAT is the spring of the calendar year before you want to enter medical school. Because scores from the fall test will not arrive until the application season is under way, taking the test in the fall may delay your application and possibly even reduce your chances of admission. In other words, you probably shouldn't take the fall test unless you are either finishing required courses over the summer or are dissatisfied with your spring scores.

HOW AND WHEN TO REGISTER

You can pick up an application in the office of the premedical advisor on your campus or write for one to the following address:

MCAT Registration
The American College Testing Program
P.O. Box 414
Iowa City, Iowa 52243
Phone: 319-337-1276

The application deadline is usually about a month before the test date (or five weeks earlier, if you want to take the exam in a foreign country). For the spring test, you should have your application in the mail by early March at the very latest; for the fall test, by early August.

One problem you want to avoid is missing the deadline because your application got lost in the mail. There are two ways to prevent this:

- Mail your application more than three weeks before the deadline. That way you should receive your Test Center Admission Blank (which confirms your registration) before the application time runs out. If in three weeks you still have not received your admission blank, call the MCAT registra-

tion office in Iowa City to see if your application was received; if not, there is still time to send in another.

- If you mail your application less than three weeks before the deadline, send it "return receipt requested." You will have to pay a bit extra, but the expense is well worth it.

Another reason for registering early is to make sure you are assigned the test center of your choice. Test center requests are filled on a first-come, first-served basis. If your application is late, you may find yourself assigned to a center some distance from your home or school. How far you have to travel could be important since you have to be at the test center by 8 a.m.

SPECIAL TESTING DATES

The spring and fall tests are both given on Saturdays. If you have a religious reason for not wanting to take the test on a Saturday or an unavoidable time conflict, you can request a special test date on the following Sunday. Consult your registration packet for details.

POSTPONING THE TEST AFTER REGISTRATION

If after registering, you do not for any reason take the test, you can reregister for the next regular test date (but only the next one) at no additional cost. (This does not mean, however, that you can register for a special Sunday test if you miss one on a Saturday.) Consult your registration packet for details about reregistration.

Postponing taking the test can be very useful if you are not sure that you will be prepared for it in time. Once you are registered, you can decide as late as the morning of the test whether you want to wait until the next test date.

MAKE-UPS

There are no make-up MCAT exams. You may want to take this fact into account when you decide whether to take the test in the spring or in the fall. Missing a fall test may delay your application to medical school by a year.

Format of the MCAT

The format of the MCAT with the essay pilot project is summarized in the following chart:

Section of Test	Number of Questions	Time Allowed
Part 1: Science Knowledge	109 Questions *of which:* 38 are biology questions 38 are chemistry questions 33 are physics questions	115 minutes
Recess		10 minutes
Part 2: Science Problems	60 Questions (assorted biology, chemistry, and physics questions)	78 minutes
Writing	1 essay	45 minutes
Lunch		60 minutes
Part 3: Skills Analysis: Reading	68 Questions (based on about 12 passages)	85 minutes
Recess		10 minutes
Part 4: Skills Analysis: Quantitative	68 Questions (based on about 12 sets of data)	85 minutes

The format of the MCAT without the essay pilot project, and that followed in this book, is as follows:

Section of Test	Number of Questions	Time Allowed
Part 1: Science Knowledge	125 Questions *of which:* 38 are biology questions 49 are chemistry questions 38 are physics questions	135 minutes
Recess		10 minutes
Part 2: Science Problems	66 Questions (assorted biology, chemistry, and physics questions)	85 minutes
Lunch		60 minutes
Part 3: Skills Analysis: Reading	68 Questions (based on about 12 passages)	85 minutes
Recess		10 minutes
Part 4: Skills Analysis: Quantitative	68 Questions (based on about 12 sets of data)	85 minutes

In either case, the test is about $6\frac{1}{2}$ hours in length; room has been made for the experimental essay section by reducing the number of questions in the Science Knowledge and Science Problems sections preceding the essay section.

A syllabus for the test is published in *The MCAT Student Manual*, which can be obtained from the address given in the section of this book entitled "How to Use This Book."

The Essay Pilot Project

Since 1985, the MCAT has included an essay-writing section. As of the publication of this revision of *How to Prepare for the MCAT*, the essay section is still a pilot project. Students taking the test in 1986 can expect to write an essay; students taking the test in 1987 will very probably be writing an essay as well. Beyond that time, consult your registration packet for the most current information.

DESCRIPTION OF THE ESSAY SECTION

You will be presented with questions concerning one or more quotations from well-known authors, and provided with $4\frac{1}{2}$ pages on which to write your response.

What the Essay Does Not Test. The questions will *not*

- require specialized knowledge on your part to answer
- relate to religious issues
- serve as a means of spotlighting your personal character or morality
- ask you to tell why you want to be a physician

What the Essay Section Does Test. This is the only section of the MCAT that isn't multiple choice; as such, it tests a different set of skills than basic knowledge and problem-solving ability. In writing an essay, you'll show that you can

- respond pertinently to a presented opinion or idea, and develop your response in an organized fashion
- support your response, drawing on the material at hand and from personal experience
- write legibly, in clear sentences, with a minimum of grammatical errors

WHO SEES THE ESSAYS

Essays written during the 1985 tests were not submitted for review to any medical college. Essays written during the 1986 tests will be submitted only to those colleges participating in the essay-writing pilot project. This will hold true for as long as the

essay section continues as a pilot project. You should contact the schools to which you're applying to determine whether or not they are program participants.

PREPARING FOR THE ESSAY SECTION

A comprehensive review for the essay section is provided in the two-volume work, *A Complete Preparation for the MCAT*. A description of this work and how to order it is provided in the next section.

Your MCAT Scores

Except for the essay section, all of the questions on the MCAT are multiple choice. Because there is no penalty for wrong answers, you should never leave an answer blank—you have nothing to lose by guessing.

You'll receive six test scores: (1) Science Knowledge (Biology), (2) Science Knowledge (Chemistry), (3) Science Knowledge (Physics), (4) Science Problems, (5) Skills Analysis (Reading), and (6) Skills Analysis (Quantitative).

Each of the three Science Knowledge scores is derived from the sum of correct answers you scored in each Science Knowledge subsection (i.e., biology, chemistry, and physics) plus your score on the questions in the same discipline in the Science Problems section. For example, your Science Knowledge (Biology) score is derived from the sum of the number of correctly answered Science Knowledge (Biology) questions plus the number of correctly answered biology questions in the Science Problems section. Thus each Science Problems question is counted twice.

HOW THE MCAT SCORES ARE USED

Your MCAT scores constitute only one part of your application. Some other considerations are SAT scores, undergraduate science GPA, your special interest in medicine, and the results of your interview. Medical colleges vary in how much importance is assigned to the total MCAT score, and/or Science Knowledge scores, compared to Skills Analysis (Problem Solving, Reading, and Quantitative) scores. A few medical colleges do not even require the MCAT at all. Nevertheless, it can be said that low scores are probably more of a hindrance than high scores are a help. As to which scores are definitely considered low, all that

can safely be said is that in the past scores of 10 or above (out of 15) in each subject usually have not given applicants much trouble.

The average scores achieved by applicants to the 1986–1987 entering class were as follows:

Science Knowledge (Biology)	8.9
Science Knowledge (Chemistry)	8.7
Science Knowledge (Physics)	8.8
Science Problems	8.7
Skills Analysis (Reading)	8.2
Skills Analysis (Quantitative)	8.1
Total MCAT Score	51.4

The standard deviations are calculated for each nationally averaged MCAT subject score. The standard deviation plays a significant role in assigning your MCAT score above or below the national average. Keep in mind that an estimated standard deviation in each subject is approximately 2.5 and the standard deviation in each subject determines your placement in a percentile rank for that subject.

CANCELLING SCORES

If during the test you decide that you do not want your MCAT scored, you can ask the proctor to void it. Voiding can only be done on the day of the test. Consult your registration packet for details.

RETAKING THE MCAT

Whether or not to retake the test if you are dissatisfied with your scores is often a difficult decision. You should discuss it carefully with your pre-med advisor. In general, people whose first MCAT scores were very low will probably improve them by retaking the test. However, if you think that you will not do better on your second try, or that you might even do worse, you should think hard before deciding to retake the test. Two sets of low scores, or scores that decline from one test to the next, are definitely worse than one set of low scores.

RECHECKING YOUR SCORES

If you feel that there has been an error in your scores, you can ask to have your test rescored. Consult your registration packet for details.

How To Use This Book

The purpose of this book is to help you review for the MCAT as efficiently as possible and to acquaint you with the kinds of questions you will see on the test. It is assumed that you have already taken the basic science courses that you need for the MCAT (biology, physics, general and organic chemistry). What you need now are effective strategies for organizing your review time before the test and for answering questions during the test itself. This book can give you these strategies—and boost your confidence into the bargain!

It is important to understand, however, that this book is not designed to teach you new facts, but rather to help you make the best use of facts you already know. To study efficiently, you will need some textbooks on hand for reference. Here are two invaluable reference works:

1. *The MCAT Student Manual.* This book contains a description of the test, a list of topics covered in each section, sample problems, and a sample test. You can order it by mail by calling or writing to

   Membership and Subscriptions
   Association of American Medical Colleges
   One Dupont Circle, N.W.
   Washington, D.C. 20036
   (202) 828-0548

   Order forms are in the MCAT registration packet.

2. *A Complete Preparation for the MCAT.* Volume I of this 2-volume work is by James L. Flowers. It contains carefully designed review notes on all the topics in the science sections of the MCAT. Unless you want something explained in great detail (in which case consult a regular textbook), this is the book for reviewing MCAT science topics. Volume II is by Beryl Blain, Aftab Hassan, Angelica Blaestrup, Phil Kelleher, and Drew Love. It provides a review of all the skills you need for the reading and quantitative sections of the test, as well as an essay-writing module. You can order both volumes by mail by writing to

   Health Professions Educational Service
   P.O. Box 34629
   Bethesda, Maryland 20817

How To Study For the MCAT

- **Start by looking** at the list of topics and practice questions **in *The MCAT Student Manual*.** Identify subject areas where **your knowledge** is weak.
- **Set up a schedule** to review these weak areas. Stick to it **tenaciously! Remember** that you learn better by studying at **short but frequent** intervals than by cramming everything **into a few marathon sessions.**
- **Use the above-mentioned** books or the appropriate parts of **a textbook to review** your weak areas. Do *not* read entire **textbooks unless** they are especially relevant.
- **Take Practice Test** 1 as soon as you have finished this review.
- **Make sure to simulate** test conditions when you take a practice **MCAT. Work** on the test in a quiet place where you will **not be interrupted,** and stick to the allotted times.
- **After you have finished** all of Practice Test 1, check your **answers against those** in the book. Examine the ones you got **wrong to find out** why you erred. Did you not know the facts, **or was it your approach** that was wrong?
- **Carefully study** the explanations with the answers in the **book. These explanations** are designed to show the correct **train of thought for answering** each particular type of question. **Examine** the answers closely to make sure you understand **how each** problem was solved.
- **Do any further** review that your test results indicate.
- **Take Practice Test** 2 and use it to identify further areas in **need of review.**
- **Repeat this** process with Practice Test 3.
- **Try to space out** the three practice tests so that you have **enough time between** them to review and digest what you **have learned.**
- **Check to see if** you are repeating the same mistakes from one **test to the next.** The cause may be a fundamental error in **your understanding** of the facts. Or your may just be forgetting **the same** fact over and over again. If that is the case, **tack a reminder** to your bathroom wall!
- **Memorize the equations** at the end of this book. As you do **so, make sure** that you think about how the quantities in **each equation behave** in relation to each other. For example, **when you memorize** the formula for the capacitance of a **parallel-plate capacitor** $\left(C = \frac{\varepsilon_o A}{d}\right)$, ask yourself what happens **to the capacitance** when the distance between the plates **is increased.** (*Answer:* The capacitance decreases because d

is in the denominator.) Or for another example, when you see that the chemical rate constant k is given by $k = Ae^{-E_a/RT}$, ask yourself whether k is large or small when E_a is large. (*Answer:* It is small because the exponent is negative.)
- Review the section of this book on test-taking strategy.

MCAT Question Types

The three practice tests in this book will familiarize you with all of the different types of questions on the MCAT. These question types are described below, grouped according to the different sections of the test.

SCIENCE KNOWLEDGE QUESTIONS AND SCIENCE PROBLEMS

The Science Knowledge and Science Problems sections of the MCAT cover the same topics, but the questions in each section are very different.

The Science Knowledge section consists of relatively short, multiple-choice questions grouped into separate subtests of biology, chemistry, and physics. The chemistry subtest includes questions on both organic and inorganic chemistry, with those on organic chemistry usually making up about one third of the total. A suggested time limit is given for each subtest. The questions in the Science Knowledge section usually refer to specific items of knowledge, although sometimes you may be asked to do some calculations, particularly in the chemistry and physics subtests. For each question there are from three to five answer choices (although the answer sheet will always show five spaces). The questions come in a variety of types. Some require numerical answers, others ask for explanations of some described phenomenon, and still others ask you to select a statement that is false or that does not apply. One type of question you may not have seen before describes an experiment and draws a conclusion from it. You are then asked if the conclusion is supported, contradicted, or neither supported nor contradicted by the experiment.

In the Science Problems section the questions come in groups of three, preceded by some data or information. These questions are much more likely to relate to medicine and may include information you have not previously seen. Do not panic! You will not be required to know anything more than what is taught in introductory courses; any advanced knowledge you will need (such as chemical formulas) will be given to you. For the most

part, each group of problems refers to only one of the three sciences on which you are being tested. But some questions ask about, say, the chemistry of a biological hormone, so you should be prepared to combine concepts from more than one field.

You should also note that some of the information presented in these problems (particularly in the introductory paragraph) may be irrelevant. There may also be times when you will not be given enough information to reach a conclusion. When you are unfamiliar with the subject of a question, read through the given data *carefully*—the facts you need are usually there somewhere. If one of the answer choices does not seem obviously correct, try to distinguish between conclusions that are inevitable, given the data, and those that just seem likely. Whenever you have difficulty with one of these problems, carefully read over the explanation in the Explanatory Answers section and make sure that you understand it.

READING QUESTIONS

In the Reading section you are given a series of prose passages, each of which is followed by four to eight questions. Although some passages may be on scientific or medical subjects, you will not be asked for any outside knowledge. Everything you need to know will be in the passage.

What may be new will be the style of the questions. Many questions will ask you to decide whether certain statements are supported, contradicted, or neither supported nor contradicted by the passage. Others will ask you to read about an experiment and then decide whether certain statements are an assumption of the researcher's or a conclusion of the research.

The questions in the Reading section are designed to elicit judgments, not facts, from you. So as you read, think about what you can and cannot conclude from the passage and try not to let personal opinions or prior knowledge affect your judgment.

QUANTITATIVE QUESTIONS

The format of the Quantitative section is very similar to that of the Reading section, but in place of the prose passages there are graphs, tables, or charts. Each is followed by four to eight questions. You will again often be asked whether certain statements are supported, contradicted, or neither supported nor contradicted by the data. You will usually be required to interpret