

Make sure you know both your school's and the NBME's policies regarding retakes. The total number of attempts an examinee may take per Step examination is four.¹⁸ You may take Step 1 no more than three times within a 12-month period. Your fourth attempt must be at least 12 months after your first attempt at that exam, and at least 6 months after your most recent attempt at that exam.

If you failed, the performance profiles in your score report provide valuable feedback concerning your relative strengths and weaknesses. Study these profiles closely. Set up a study timeline to strengthen gaps in your knowledge as well as to maintain and improve what you already know. Do not neglect high-yield subjects. It is normal to feel somewhat anxious about retaking the test, but if anxiety becomes a problem, seek appropriate counseling.

► If you pass Step 1, you are not allowed to retake the exam.

► TESTING AGENCIES

- **National Board of Medical Examiners (NBME) / USMLE Secretariat**
Department of Licensing Examination Services
3750 Market Street
Philadelphia, PA 19104-3102
(215) 590-9500 (operator) or
(215) 590-9700 (automated information line)
Email: webmail@nbme.org
www.nbme.org
- **Educational Commission for Foreign Medical Graduates (ECFMG)**
3624 Market Street
Philadelphia, PA 19104-2685
(215) 386-5900
Email: info@ecfm.org
www.ecfm.org

► REFERENCES

1. United States Medical Licensing Examination. Available from: <https://www.usmle.org/prepare-your-exam/step-1-materials/step-1-content-outline-and-specifications>. Accessed October 2024.
2. United States Medical Licensing Examination. Performance Data. Available from: <https://www.usmle.org/performance-data>. Accessed October 2024.
3. Prober CG, Kolars JC, First LR, et al. A plea to reassess the role of United States Medical Licensing Examination Step 1 scores in residency selection. *Acad Med*. 2016;91(1):12–15.
4. Roediger HL, Butler AC. The critical role of retrieval practice in long-term retention. *Trends Cogn Sci*. 2011;15(1):20–27.
5. Dunlosky J, Rawson KA, Marsh EJ, et al. Improving students' learning with effective learning techniques: promising directions from cognitive and educational psychology. *Psychol Sci Publ Int*. 2013;14(1):4–58.

6. Larsen DP, Butler AC, Lawson AL, et al. The importance of seeing the patient: test-enhanced learning with standardized patients and written tests improves clinical application of knowledge. *Adv Health Sci Educ.* 2013;18(3):409–425.
7. Panus PC, Stewart DW, Hagemeier NE, et al. A subgroup analysis of the impact of self-testing frequency on examination scores in a pathophysiology course. *Am J Pharm Educ.* 2014;78(9):165.
8. Deng F, Gluckstein JA, Larsen DP. Student-directed retrieval practice is a predictor of medical licensing examination performance. *Perspect Med Educ.* 2015;4(6):308–313.
9. McAndrew M, Morrow CS, Atiyeh L, et al. Dental student study strategies: are self-testing and scheduling related to academic performance? *J Dent Educ.* 2016;80(5):542–552.
10. Augustin M. How to learn effectively in medical school: test yourself, learn actively, and repeat in intervals. *Yale J Biol Med.* 2014;87(2):207–212.
11. Bellezza FS. Mnemonic devices: classification, characteristics, and criteria. *Rev Educ Res.* 1981;51(2):247–275.
12. Dyer J-O, Hudon A, Montpetit-Tourangeau K, et al. Example-based learning: comparing the effects of additionally providing three different integrative learning activities on physiotherapy intervention knowledge. *BMC Med Educ.* 2015;15:37.
13. Chamberland M, Mamede S, St-Onge C, et al. Self-explanation in learning clinical reasoning: the added value of examples and prompts. *Med Educ.* 2015;49(2):193–202.
14. Nesbit JC, Adesope OO. Learning with concept and knowledge maps: a meta-analysis. *Rev Educ Res.* 2006;76(3):413–448.
15. Holtman MC, Swanson DB, Ripkey DR, et al. Using basic science subject tests to identify students at risk for failing Step 1. *Acad Med.* 2001;76(10):S48–S51.
16. Basco WT, Way DP, Gilbert GE, et al. Undergraduate institutional MCAT scores as predictors of USMLE Step 1 performance. *Acad Med.* 2002;77(10):S13–S16.
17. Patino GA, Amiel JM, Brown M, et al. The promise and perils of artificial intelligence in health professions education practice and scholarship. *Acad Med.* 2024. doi: 10.1097/ACM.0000000000005636.
18. Kung TH, Cheatham M, Medenilla A, et al. Performance of ChatGPT on USMLE: potential for AI-assisted medical education using large language models. *PLOS Dig Health.* 2023. doi: 10.1371/journal.pdig.0000198.
19. United States Medical Licensing Examination. Number of attempts and time limits. Available from: <https://www.usmle.org/bulletin-information/eligibility>. Accessed October 2024.

SECTION I SUPPLEMENT

Special Situations

Please visit www.firstaidteam.com/bonus/ to view this section.

- ▶ First Aid for the International Medical Graduate
- ▶ First Aid for the Osteopathic Medical Student
- ▶ First Aid for the Podiatric Medical Student
- ▶ First Aid for the Student Requiring Test Accommodations

SECTION II

High-Yield General Principles

“I’ve learned that I still have a lot to learn.”

—Maya Angelou

“Never regard study as a duty, but as the enviable opportunity to learn.”

—Albert Einstein

“Live as if you were to die tomorrow. Learn as if you were to live forever.”

—Gandhi

“Success is the maximum utilization of the ability that you have.”

—Zig Ziglar

“I didn’t want to just know names of things. I remember really wanting to know how it all worked.”

—Elizabeth Blackburn

“If you do not have time to do it right, how are you going to have time to do it again?”

—Diana Downs

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► HOW TO USE THE DATABASE

The 2025 edition of *First Aid for the USMLE Step 1* contains a revised and expanded database of basic science material that students, student authors, and faculty authors have identified as high yield for board review. The information is presented in a partially organ-based format. Hence, Section II is devoted to the foundational principles of biochemistry, microbiology, immunology, basic pathology, basic pharmacology, and public health sciences. Section III focuses on organ systems, with subsections covering the embryology, anatomy and histology, physiology, clinical pathology, and clinical pharmacology relevant to each. Each subsection is then divided into smaller topic areas containing related facts. Individual facts are generally presented in a three-column format, with the **Title** of the fact in the first column, the **Description** of the fact in the second column, and the **Mnemonic** or **Special Note** in the third column. Some facts do not have a mnemonic and are presented in a two-column format. Others are presented in list or tabular form in order to emphasize key associations.




The database structure used in Sections II and III is useful for reviewing material already learned. These sections are **not** ideal for learning complex or highly conceptual material for the first time.

The database of high-yield facts is not comprehensive. Use it to complement your core study material and not as your primary study source. The facts and notes have been condensed and edited to emphasize the high-yield material, and as a result, each entry is “incomplete” and arguably “over-simplified.” Often, the more you research a topic, the more complex it becomes, with certain topics resisting simplification. Determine your most efficient methods for learning the material, and do not be afraid to abandon a strategy if it is not working for you.

Our database of high-yield facts is updated annually to keep current with new trends in boards emphasis, including clinical relevance. However, we must note that inevitably many other high-yield topics are not yet included in our database.

We actively encourage medical students and faculty to submit high-yield topics, well-written entries, diagrams, clinical images, and useful mnemonics so that we may enhance the database for future students. We also solicit recommendations of alternate tools for study that may be useful in preparing for the examination, such as charts, flash cards, apps, and online resources (see How to Contribute, p. xv).

Image Acknowledgments

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Disclaimer

The entries in this section reflect student opinions on what is high yield. Because of the diverse sources of material, no attempt has been made to trace or reference the origins of entries individually. We have regarded mnemonics as essentially in the public domain. Errata will gladly be corrected if brought to the attention of the authors, either through our online errata submission form at www.firstaidteam.com or directly by email to firstaid@scholarrx.com.

