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Edited by S.V. Mahadevan and Gus M. Garmel
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An Introduction to Clinical Emergency Medicine

Second edition

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An Introduction to

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Foreword

Although Emergency Medicine is a comparatively young specialty, it already boasts a good number of textbooks, many of which are quite good. There is a real place for the book you are holding, however, not merely because its editors are outstanding educators, or because it's particularly well written, or because it pays careful attention to details (although all of these are true). *An Introduction to Clinical Emergency Medicine, 2nd edition*, is a valuable tool for the right reader because it is addressed to a specific audience, and because of its extremely appropriate complaint-based approach. Before we think more about these two important characteristics, however, we need to reflect a little about the specialty of EM itself.

Some medical specialties are the product of a particular and circumscribed *body of knowledge*. Endocrinology, for example, came into being when new and complex information about human hormones began to be known, leading to a more and more complex understanding of metabolic processes and diseases; some patient problems required a degree of sophistication beyond the scope of generalist practitioners. The same process undoubtedly occurred for most or all of the medical sub-specialties, diagnostic radiology, neurology … and many others. Most surgical specialties, on the other hand (as well as some others, such as interventional radiology), focused less on special knowledge than on special *skills*.

EM is somewhat unique, not merely because it combines both particular knowledge and skills (many other specialties do this as well), but because the set of skills involved is for the most part not procedural, but rather *cognitive*. EM is quintessentially a diagnostic specialty, with *undifferentiated* disease presentation at its core, and the skills required of an EM specialist involve the ability to make crucial (sometimes even "life and death") decisions in the face of a number of rather extraordinary stresses. An emergency physician not only has to establish priorities rapidly in any given patient, she has to do the same *among* a large group of patients. She doesn't have the luxury of undertaking an orderly process comprised of history, then exam, then review of records, then labs or other work-up – as we were all taught in medical school – but often has to *act* entirely out of order, based on brief interactions and rapid assessment, without time to gather much of the information that could be helpful. And she's got to do this with a patient she's never met before, who is likely in pain, or anxious, or confused, or intoxicated, and who furthermore has never met this doctor before either, and so has no reason to trust her competence. Finally, these crucial decisions have to be made, and acted upon, quickly … knowing that other (potentially unstable) patients are waiting!

Learning to be an expert in Emergency Medicine is no easy trick, and – as with any specialty – it is best accomplished through a combination of *training* and *experience*. Residency training takes years, and achieving "mastery" of EM (to the extent that is ever truly possibly) requires as well the ongoing experience that comes from caring for many patients; if my own learning trajectory is any indication, the end of residency is merely the beginning of one's growth, and one continues to get better at this job for *many* years.

An Introduction to Clinical Emergency Medicine is designed primarily for learners at or near the start of a career in EM, and is tailored to such learners in a developmentally appropriate way – because it stresses *how to think as an emergency physician*. Recognizing that the vast majority of our patients present with undifferentiated complaints, this book is organized around an approach to symptoms (rather than diseases). The actual EM approach to diagnostic decision-making is far more complicated than the trendy "worst first" (rule out life threats) approach often cited; while we surely must keep this important consideration in mind, we also need to address a combination of disease *likelihood*, the *potential to intervene* in a way that matters, and an estimate of those circumstances in which *delays* in intervention *would limit effectiveness*. EM also emphasizes (in a way that is different from most other specialties, if not completely unique) the importance of treating acute symptoms (relieving suffering), in addition to the above concerns about identifying and addressing possible threats to life and limb.

While no book can replace the incremental learning obtained during a residency (and afterward), a good book can certainly help. Most books attempt to do so by trying to transmit knowledge; *An Introduction to Clinical Emergency Medicine* also tries to transmit cognitive skills, by focusing on the EM approach to evaluation. Like its first edition, this book is organized around specific complaints (symptoms), and stresses a standardized approach. This both makes for excellent readability, and keeps the focus on residents and senior students who are rapidly developing EM skills. This 2nd edition adds a critically important new element – the "red flag" approach that is the hallmark of how many expert EPs think about patients. For any and every patient presentation ("dizziness," headache, low back pain, shortness of breath, etc.), there are a host of possible etiologies that range from trivial to life-threatening, and from likely to remote. As noted earlier, an organized approach in EM concentrates on identifying (or in many cases, *excluding*) those that not only have potentially important consequences, but are also reasonably probable for the given presentation, *and* are amenable to treatment that can actually limit such adverse consequences, *and* require such treatment acutely if that benefit is to be achieved. Every EP should be able to call to mind the range of diagnoses that meet such criteria, for any given presentation. But that is not enough – because knowing why it is important to diagnose a sentinel subarachnoid bleed is not of much use unless one *also* knows under what circumstances it must be seriously

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considered and investigated (as in a headache that starts suddenly and is maximal at onset), and just importantly when it *shouldn't* be worked up (as in the average unilateral headache of gradual onset and progressive severity). An EP who orders an MRI for most patients with back pain will cause far more harm than good, but one who omits the MRI because he failed to ask about symptoms of cauda equina syndrome, or didn't look at the needle tracks underneath a patient's sleeve, is of course equally dangerous. An expert EP needs to consider PE in a patient who is suddenly short of breath in the setting of active cancer, but the EP who routinely orders a CT angiogram in patients with dyspnea is *not* an expert.

For every patient presentation, there are characteristics from the history and physical examination whose presence raises the likelihood of "do not miss" etiologies, and whose absence makes them much less likely. The expert EP will learn to organize his thinking not merely around such etiologies, but also around the findings that raise or lower the stakes. Most medical schools teach students to do a "complete" exam and take a "thorough" history. EM residencies, on the other hand, teach a "focused" work-up … but they also need to teach *why* one should ask a given question, because the answer (one way or the other) can and should decide your next step. Red flag questions are the most important ones we ask and this book can be an excellent tool to help learners understand when and why to ask them … and what to do with the answers.

Happy reading … and happy learning.

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Foreword to the 1st edition

Emergency Medicine represents the unique combination of rapid data gathering, simultaneous prioritization, and constant multi-tasking in a time-constrained fish bowl –with all decisions subject to second-guessing by others. It is a patient complaint-oriented specialty in which stabilization based on anticipation supersedes lengthy differentials and diagnostic precision.

In light of these unique aspects and attributes of clinical practice, one would expect the textbook-based literature supporting this specialty to be uniquely written and reflective of its singular approach. This has rarely been the case, a fact that has puzzled me for almost thirty years. It is true that sequential prose does not accurately represent the parallel processing necessary to practice effective and efficient Emergency Medicine. Still, it would seem the ideas of priority diagnoses, stabilization, initial assessment, prioritized differential diagnosis, and the rest that follows could be delineated and emphasized within the limitations of the printed word. I am pleased and delighted to find and convey to the reader that this text succeeds in translating this untraditional Emergency Medicine approach into a textbook format.

This text, edited by two academicians, S.V. Mahadevan, MD and Gus M. Garmel, MD from one of the nation's premier academic institutions and leading health care organizations, fulfills what I have longed believed is the correct and necessary pathway to understanding the approach and thought processes that drive clinical decision-making in Emergency Medicine. The focus of the text is appropriately "presenting complaint-oriented," with a thorough coverage of the chief complaints responsible for the majority of emergency department visits. Each chapter is structured in a consistent manner that allows the experienced and uninitiated alike to clearly track the thought process needed to bring one to a successful prioritized conclusion of care, even when a specific diagnosis has not been made.

The range of authorship is excellent, reflecting the talents and capabilities of an entire new generation of emergency physicians trained in the specialty. These authors clearly understand Emergency Medicine's unique principles.

It is a rare gift to witness and participate in the passing of our unique specialties' visions onto the capable hands of those you've had the opportunity to train and know. Because of this textbook's organization and content, I am pleased to finally "rest in peace," at least academically. Drs. Garmel and Mahadevan demonstrate their clear understanding and literary virtuosity in conveying the truth about our specialty to others.

It is my pleasure to congratulate them on a successful venture, to warn them that having started on this path serial additions and subsequent editions will rule their life for as long as they, the publisher, and the sales last, and to express a personal sense of satisfaction and pride in their accomplishment. To the reader, I say enjoy yourself. Take much away from this text and welcome the truth as we currently know it, presented in a manner that accurately reflects the way we practice.

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Drs. Mahadevan and Garmel would like to express appreciation to the American Medical Writers Association (AMWA) for selecting their 1st edition as First Place Winner, Medical Book Awards Competition (Physician Category) in 2006. Nicholas Dunton and his talented staff at Cambridge University Press deserve our gratitude for their continued belief in this ongoing educational project. We would like to acknowledge Rebecca Kerins (Baltimore, MD) and Ken Karpinski (Senior Project Manager, Aptara) for their outstanding production efforts. Steven N. Shpall, MD (The Permanente Medical Group, Mountain View, CA) contributed beautiful dermatologic photographs, and Chris Gralapp, MA, CMI (Medical and Scientific Illustration, Fairfax, CA) contributed phenomenal original artwork to both editions, making important clinical concepts easier to understand.

Drs. Mahadevan and Garmel are especially grateful to their contributors, national and international authorities in emergency medicine, who donated their expertise to this project for the greater good of patients and clinicians. Finally, special mention goes to Jerome Hoffman, MS, MD, who contributed the insightful foreword to this edition, and Glenn Hamilton, MD, MSM, who shared his views in our first edition – thank you both for your invaluable contributions to this enduring project, and for recognizing its importance.

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Preface

Building on the strengths of its award-winning predecessor, the second edition of *An Introduction to Clinical Emergency Medicine* is a must-have resource for individuals training and practicing in this challenging field. This unique text addresses a wide range of clinical topics essential to the practice of emergency medicine. Guided by the patient's presenting complaint, this text emphasizes a methodical approach to patient evaluation, management and problem solving in the Emergency Department. Unlike other textbooks that elaborate on known diagnoses, this extraordinary book approaches clinical problems as clinicians approach patients – without full knowledge of the final diagnosis. This text effectively reveals how to address patients with undifferentiated conditions, ask the right questions, perform a directed physical examination, develop a logical differential diagnosis, and accurately order and interpret laboratory and radiologic tests. Current management and disposition strategies are presented, as well as a summary of pearls, pitfalls and myths for each topic.

Fully revised and updated – including current advanced life support guidelines – the second edition introduces important new chapters on sepsis, bleeding, burns, patient safety, alcohol-related and dental emergencies. The clinically-focused appendix includes new sections on clinical decision rules and focused emergency ultrasound, and improved sections on common emergency procedures and interpretation of emergency laboratory studies. Stunning full-color chapters include high quality images (photographs, ECGs and radiologic studies), detailed illustrations and practical tables. Each chapter in the second edition now contains a critical section on 'red flag' warning signs and symptoms, incorporating the heuristic approach used by successful emergency clinicians.

Written and edited by experienced educators, researchers and clinicians, *An Introduction to Clinical Emergency Medicine, 2nd edition* is certain to remain core reading for medical students and residents, and serve as an important resource for practicing emergency physicians, teaching faculty, and other healthcare providers.

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Dedication

S.V. Mahadevan, MD, FACEP, FAAEM

To my parents, Sarojini and Mahadeva S. Venkatesan: For your incredible sense of duty and continuous sacrifices for the sake of your children and grandchildren.

To my mentors: For teaching me not to follow blindly but to question, investigate and discover. Your encouragement and guidance has shaped my career.

To my fellows, residents and students (at home and abroad): For continually inspiring me with your genuine desire to learn, innovative ideas, and unbridled enthusiasm. It is an honor and privilege to teach, advise, and befriend each one of you.

To Rema, Aditya and Lavanya: For encouraging me to seek out new challenges and fulfill my dreams. You fill me with strength, hope and happiness.

Gus M. Garmel, MD, FACEP, FAAEM

To my parents, siblings, extended family and friends: I am truly blessed by your continued support.

To The Permanente Medical Group, Kaiser Santa Clara Medical Center, Stanford University Division of EM, my talented colleagues in and outside of EM, our amazing nurses, and my patients: Thank you for offering me such wonderful opportunities and for enriching my life.

To the Stanford/Kaiser EM Residency Program, its current residents and alumni: I hope that I have served you well over the past 20 years as an educator, administrator, role model and mentor.

To students and housestaff everywhere: As the future of health care, I encourage you to approach patient care responsibilities and treat each patient with honor and privilege.

And to Laura, my partner and best friend: Through you, I've learned how to appreciate love more than I believed possible.

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