

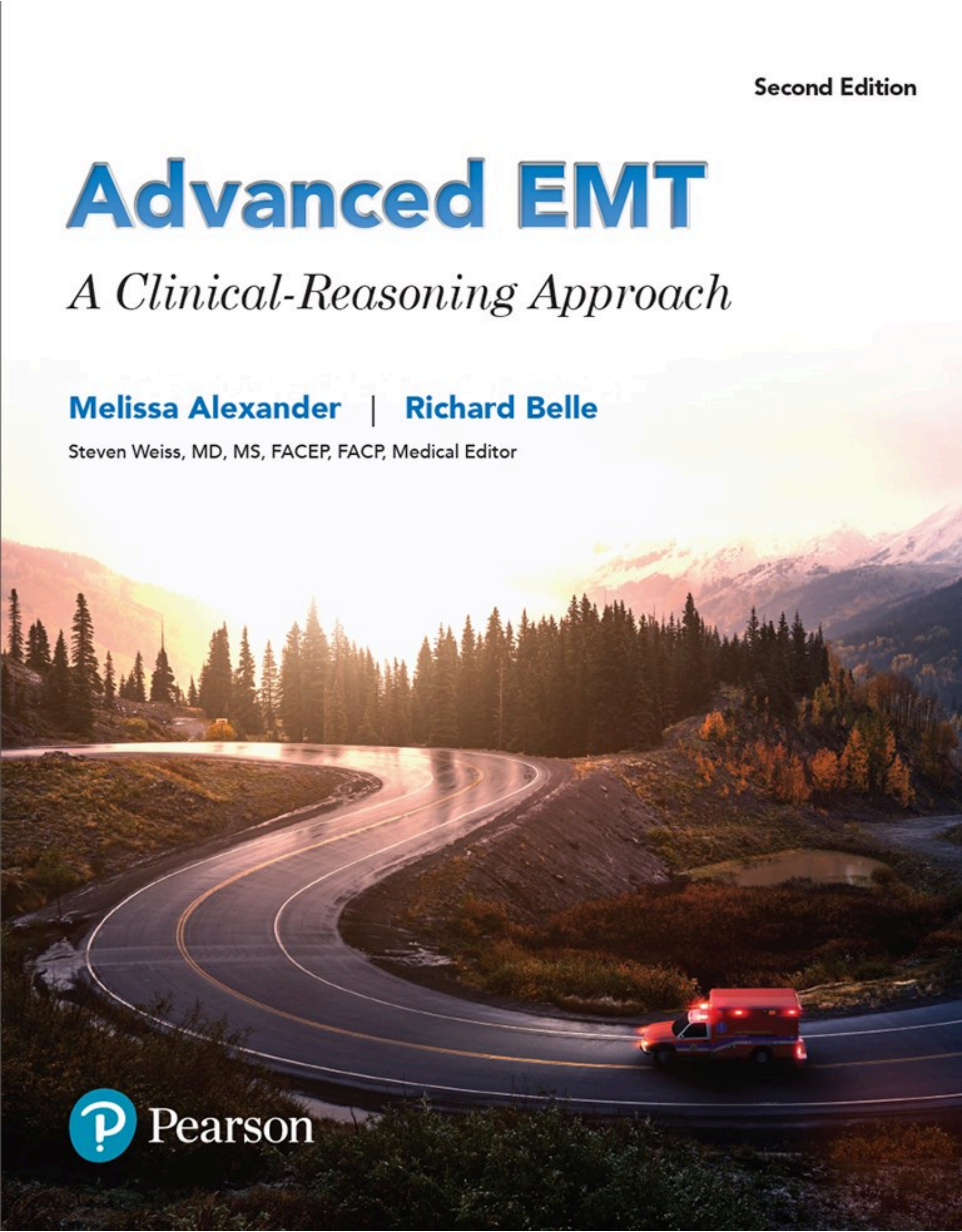
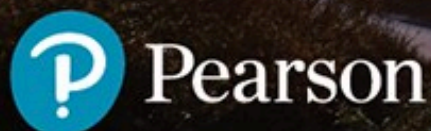
Second Edition

Advanced EMT

A Clinical-Reasoning Approach

Melissa Alexander | **Richard Belle**

Steven Weiss, MD, MS, FACEP, FACP, Medical Editor



Advanced EMT

A Clinical-Reasoning Approach

2nd Edition

Melissa Alexander, EdD, Paramedic

Indiana University School of Medicine, Indianapolis, IN

Richard Belle, BS, NRP

Acadian Ambulance/National EMS Academy, Lafayette, LA

Steven Weiss, MD, MS, FACEP, FACP, Medical Editor

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DEDICATION

Dedicated first and foremost with love to my family for their support and encouragement for this and other projects. To my two older daughters and their families, Lindsay, Chris, Asher, Rhys, and Jasper Giroux; and Brittany, Ethan, and Grant Moore; to my youngest daughter, Eleanor Shook, as she begins her adventure into higher education and the world beyond; and to my two constant companions through all, Benito and Sabrina. With special acknowledgment to our Medical Editor, Steve Weiss, not only for his wisdom and contribution to this text but also for his mentorship, support, encouragement, and advocacy over the past many years; Steve, you are a role model for what academic medicine should be. And, of course, with thanks and gratitude to the many EMS students, instructors, and patients who have inspired me to be at my best in my work, always.

—M.A.

My work is dedicated to those who continue to support and inspire me to be my best. Especially my parents, Jimmy and Sara Belle, who have always been a consistent source of support. To my brother, Bryan Belle, who has taught me more in life than he will ever know. To my in-laws, Harold and Vickie Wilson, for their support. To my best friend and wife, Rhonda, you are my unwavering source of support and encouragement; I love you. Finally, to my children James, Victoria, and Allison for being the best kids I could have ever asked for and the reason I have the title I hold most dear, "Dad."

—R.B.

I want to dedicate my work to my wife Amy, my daughter Natalie, and to the rest of my family whom I have rarely seen over the years because I moved so far away to pursue a career. I want to send my best wishes to our family's next generation: Natalie, Scott, Sara, Max, Oliver, Lucy, and Zack in the often difficult pursuit of careers of their own. I want to thank all of the EMS providers and students who helped and inspired me along the way on this interesting path. I also want to thank Dr. Phil Froman for his invaluable assistance and friendship in my progress toward completion of the EMS boards.

—S.W.

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Letter to Students

Welcome, students!

You are beginning an exciting learning experience, and this textbook will help you. We have designed it to help you learn facts, principles, and concepts in EMS. But we have gone beyond simply presenting facts, principles, and concepts. This textbook contains features that will help you learn critical thinking and problem solving, which are essential skills in the health care professions. The process of using critical thinking to solve patient care problems is called clinical reasoning. The clinical-reasoning process is a cornerstone of safe, excellent patient care, and we have made it a foundation of this textbook.

We, as authors, educators, and clinicians, are excited about the unique focus of our textbook on clinical reasoning. Each chapter begins with a case study that includes problem-solving questions. Each case study frames the material in the chapter in a way that establishes its importance. Beginning each chapter with a specific problem in mind helps you read the chapter for deeper understanding of how the material can be applied in your real-life Advanced EMT practice. After the chapter material is presented, the case study wrap-up with an accompanying clinical-reasoning process helps you understand how the Advanced EMTs in the case study determined and solved the problems. This approach provides you with a model for transferring what you have learned from the classroom to the work environment.

Congratulations on your decision to further your professional development in EMS by becoming an Advanced EMT. We are glad to have you among our peers in the profession. We welcome your questions and correspondence. Please do not hesitate to contact us at the e-mail addresses provided. If you have the opportunity to attend professional conferences, we hope we will have the chance to meet you in person!

Melissa Alexander, EdD, MS, Paramedic



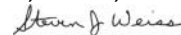
melalexander1@gmail.com

Richard Belle, BS, NRP



rbelle2024@yahoo.com

Steven Weiss, MD, MS, FACEP, FACP



sweiss@salud.unm.edu

Preface

New to This Edition

Advanced EMT: A Clinical-Reasoning Approach, 2nd Edition, was developed to assist you in successfully completing the Advanced EMT course and ultimately obtaining licensure. The National EMS Education Standards serve as the foundation of the text, and special care was taken to ensure that the most up-to-date evidence-based patient care has been included. Specifically, content that has been added or updated for *Advanced EMT: A Clinical-Reasoning Approach, 2nd Edition*, includes the following.

What's New in Section 1: Preparing for Advanced Emergency Medical Technician Practice

New to Chapter 1 is an expanded section on professionalism and social media use, and added emphasis on self-directed learning as a professional characteristic. Chapters 1 and 2 also include new content on mobile integrated health care (MIH) and community paramedicine (CP). Chapter 3 has expanded the information on National Health Goals, and the section on EMS provider mental health now includes shift-work disorder. Chapter 4 now includes an updated concept of decision-making capacity, and physician's orders for life-sustaining treatment (POLST). Chapter 5 now offers updated information on the anticipated replacement of the DOT's specifications for ambulance design.

What's New in Section 2: Human Development, Health, and Disease

In Chapter 8, the In the Field features have been expanded and updated to highlight the importance of understanding anatomy and physiology.

What's New in Section 3: Pharmacology

Chapters 11 and 12 now include discussion of obesity and weight-based medication calculations. Chapter 12 also has new information on medications administered via auto-injector.

What's New in Section 4: Assessment and Initial Management

Chapter 14 expands the first edition's discussion of diagnosis and differential diagnosis in EMS, and it offers updated

field triage guidelines. New to Chapter 15 is information on situational awareness. Both Chapters 15 and 16 include an updated description of the approach to patients with suspected cervical-spine injury. Chapter 17 now offers information on tranexamic acid in hemorrhagic shock and on systemic inflammatory response (SIRS) and the potential role of prehospital serum lactate measurement. It also has expanded information on topical hemostatics, common prescription anticoagulants, teamwork in resuscitation, and end-of-life care terminology related to physician's orders for life-sustaining treatment (POLST). Chapter 18 clarifies the uses and limitations of estimating blood pressure by palpation and pulse oximetry waveform methods, and offers additional information on temporal artery-scanning thermometers. Chapter 19 now includes anatomic and systems-based frameworks in the discussion of the clinical-reasoning approach. Where appropriate, the chapters in this section reflect the newest American Heart Association's 2015 guidelines.

What's New in Section 5: Medical Emergencies

Chapter 20 now includes guidelines for administering oxygen to patients with advanced COPD, and new information on MERS and the importance of obtaining a travel history. Additional emphasis has been added to reflect the importance of pneumococcal vaccine for susceptible populations, and the information on asthma and lung cancer has been updated. Chapter 21 has been reorganized to enhance clinical reasoning, focusing on pertinent positives and negatives for specific cardiovascular emergencies. Chapter 22 now includes an updated list of medications prescribed for neurological disorders. Chapter 23 now includes hyperosmolar hyperglycemic state (HHS) in the discussion on diabetes. Chapter 24 has added information on chronic opioid-induced constipation and on pediatric abdominal pain and foreign body ingestion. Chapter 26 offers an updated list of medications that affect blood clotting. Chapter 28 now provides information on the special concerns related to pregnant women and fetuses, updates the discussion of infectious diseases of global concern, and lists resources for infectious disease information. Chapter 31 adds new emphasis to addiction as a mental illness and now includes information on mental illness among EMS personnel. Chapter 32 provides updated information on the public health crisis related to increased abuse of opiates and opioids, on the use of synthetic cannabinoids and vaping, and on designer drugs.

What's New in Section 6: Trauma

Information on the American College of Surgeons Committee on Trauma Level V Trauma Center has been added to Chapter 33, as has a discussion on the SALT triage system. Chapter 34 now addresses quinary blast injuries. Chapter 40 has been updated to reflect new research on the use of spinal motion restriction and current trends that deemphasize the use of long backboards.

What's New in Section 7: Special Patient Populations

Chapter 43 has been updated with new information on the use of suctioning in the neonate.

What's New in Section 8: Rescue and Special Operations

Chapter 47 now incorporates new information on safety procedures when working with hybrid and electric vehicles.

What's New in the Appendixes

Ketamine has been added to Appendix 4 as a sedative for endotracheal intubation and in patients with excited delirium, and tranexamic acid has been included for reducing internal bleeding in trauma patients.

An Introduction to Your Course of Study

No doubt you are beginning your Advanced EMT course with both excitement and anxiety, as every student does. Students are excited at the prospect of learning new information and skills, meeting new people, having new experiences, being intellectually challenged, and being prepared for a new step in their careers. One of the main sources of anxiety comes from wondering if you will be successful in the course. Being successful means completing the class, having met all of the standards of your program, and being prepared to pass the high-stakes examinations required for licensure. Most of all, successful completion of your Advanced EMT course means having the knowledge, skills, empathy, and confidence it takes to provide emergency care to a wide variety of patients. Most students are willing to put in the tremendous amount of work involved, but they may not use their study time as efficiently and effectively as possible. There are no short cuts: Learning takes time and work. However, there are a number of ways to make sure you are using your time and effort in the best ways possible.

Academic success relies on a number of factors aside from desire and aptitude. In addition to commit-

ting to attending every scheduled class and putting in your clinical experience time, you must be ready to commit substantial time outside class to prepare. You must have good time management and organizational skills. You also must develop learning habits that give the best results for your time and effort. As a general rule for learning required content, students must spend three hours outside class for every hour in lecture. But often students either wait until just before the first exam or, worse, until finding out they did not do well on the exam to ask their instructor, "What is the best way to study for the test?"

The best way to study for any test is not to study for the test but instead to study for understanding. Understanding can only develop incrementally over time, not in the last days and hours before a test. You must spend time every day immersing yourself in the course content in order to build understanding. This is where your excitement comes in: It gives you the motivation and energy required to keep going even when you might feel somewhat discouraged or anxious. Beyond motivation, though, there are a number of concrete actions and tools that will help you organize the content for understanding.

Because time is at a premium for everyone, you should use your study time to your best advantage. The following sections offer you some basic information about how learning occurs; to what degree learning styles play a role in how you should approach studying; and some specific skills, tips, and tools you can use to help yourself acquire the knowledge and problem-solving skills needed to complete your course successfully.

The Nature of Advanced EMT Learning

Whether or not you are taking your course for college credit, the complexity of concepts in Advanced EMT courses are college level. However, the information in most college classes is memorized for a short period of time, regurgitated on a test, and then largely forgotten. As an Advanced EMT, you must maintain and build on the required knowledge in a useful form throughout your career. This requires a different approach than you might have used in other learning situations.

Readiness for Learning

The nature, situation, and experience of each student are different. Those differences have an impact on learning. Whether you are a working professional, a parent, or a college student with other courses to take, you and your fellow classmates have responsibilities outside Advanced EMT class. For some, the load is heavier than for others. It is important that you assess the meaning this class has for you, how it fits with your other

priorities, whether the current time is the right time for you, and how you can allow sufficient time not only to attend class but to commit the time needed outside class in order to succeed. You must bring time and effort to the learning situation. Your instructor cannot provide these for you.

Learning Styles

Learning styles include visual, auditory, and kinesthetic (hands-on). The most important thing to know about them is that they are no more than preferences for the way people take in and process information. In truth, everyone can and does learn by all of those means. The most effective way to learn something has more to do with what is being learned than how people prefer to learn it. Most complex concepts have components that are better learned in one way than another. For example, the concepts behind measuring blood pressure are best learned through reading and lecture, often with accompanying figures and diagrams. However, the skill of taking a blood pressure is best learned by demonstration and hands-on practice.

Study Habits

There are many prescriptions for effective study habits. Some of the key ideas behind them include being organized, planning study time, and having an environment that is conducive to focusing and learning. An example of being organized is making sure that everything you need, such as a pen or pencil, paper, computer, textbook, and perhaps a beverage or snack are readily at hand. This prevents an interruption in your thinking process to retrieve needed items. Commit to study time. Block out specific time in your schedule to study (Figure 1). For the period of time you are taking your Advanced EMT course, consider your study time a necessary appointment with yourself. Depending on your work schedule and lifestyle, the time that works best for you to study may vary. Intervals between classes, or between work and class, or even 20 minutes in the car spent waiting to pick up your child from school can serve as planned study time. Learning occurs best when you study for short periods of time with a small break between

segments. For example, you might study for 20 to 50 minutes and take a five-minute break before resuming study. Take some time to reflect on what study environment works for you. Some people prefer to study with a partner or in a group, while others prefer to study alone. Create a comfortable place as free from distractions as possible. Many of the specifics of these factors depend on individual preference.

The Nature of Learning

Not only must you learn for the short-term goals of testing, but you also must be able to transfer knowledge and skills to the job. This requires learning in three domains: cognitive (facts, concepts, thinking, and problem solving), psychomotor (hands-on skills), and affective (values and professionalism). The main focus of this preface is the cognitive domain.

Knowledge is arranged in hypothetical mental structures called schemas. A schema is a collection of related information that helps in making sense of what we see, hear, read, and experience in other ways. When you can relate new information to an existing schema, learning is easier and more effective. A schema provides a context and framework for interpreting and storing information. Much of the rest of the information in this preface takes advantage of how schemas work and the ideas that learning occurs in small increments over time, and with repetition.

Graphic Organizers

Graphic organizers are learning tools that help arrange information in ways that make it easier for you to process and learn. You are most likely familiar with graphic organizers, even if you have not heard them called by this name. Tables, flowcharts, and Venn diagrams are common types of graphic organizers (Figures 2 and 3). Graphic organizers are powerful learning tools because they allow you to see how information is organized in a way that goes beyond words. By using graphic organizers, you can better understand overall relationships between concepts and ideas.

This textbook contains many graphic organizers to help structure your learning process. However, creating

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<ul style="list-style-type: none"> Review previous class notes Prepare for class (Ch. 4) 	<ul style="list-style-type: none"> Class, 6:00 pm Review & summarize class notes 	<ul style="list-style-type: none"> Review Ch. 4 notes Prepare for class (Ch. 5) 	<ul style="list-style-type: none"> Class, 6:00 pm Review & summarize class notes 	<ul style="list-style-type: none"> Do homework for Ch. 4 & Ch. 5 	<ul style="list-style-type: none"> Study group, 7:00 pm 	

FIGURE 1 Plan your study time.

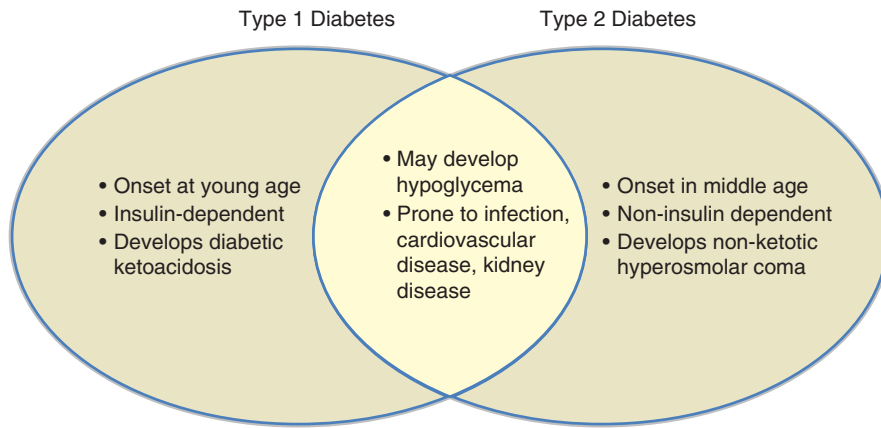


FIGURE 2 Venn diagrams are used to compare and contrast the features of two or three related items. The organization of overlapping circles allows information to be organized according to what features are unique to each item and which features are shared. The example here shows a Venn diagram for type I and type II diabetes.

Feature	Cushing’s Syndrome	Addison’s Disease
Cause	Excess adrenal cortical hormones due to glucocorticoid therapy (steroid medications) or pituitary tumor resulting in increased ACTH.	Insufficient secretion of adrenal cortical hormones due to destruction of adrenal cortex. Adrenal insufficiency may occur due to sudden withdrawal of corticosteroid therapy.
Associated conditions	COPD, asthma, cancer, or inflammatory conditions requiring steroid therapy. Diabetes, infection. Increased risk of cardiovascular disease and stroke.	Inability to respond to stressors such as infection, surgery, trauma, or illness.
Signs and symptoms	Weight gain in the trunk, often with thin extremities. “Moon face” appearance, accumulation of fat in the upper back (“buffalo hump”). Thin, easily bruised skin. Delayed wound healing. Development of facial hair in women.	Hyperpigmentation of the skin and gums, fatigue, weakness, and weight loss.
Emergencies	Increased risk of MI, stroke, and infection.	Adrenal crisis (Addisonian crisis). May be present with hypoglycemia, hypotension, and cardiac rhythm disturbances due to electrolyte abnormalities.

FIGURE 3 Tables can be used to organize and summarize information for side-by-side comparison. This example compares the features of two adrenal-gland disorders.

your own graphic organizers as part of your study process adds even more to your learning power. For example, KWL (know, want, learn) charts are effective because they help identify what you do not yet know (Figure 4). This is critical because learning cannot take place until you recognize the boundaries of your current knowledge. (A variation of a KWL chart is shown in Figure 5.)

A variety of configurations can be used to create mind maps or webs, cause–effect diagrams, processes, time lines, and other ways of summarizing and representing information (Figures 6, 7, and 8). If you prefer to use computer-based tools rather than drawing those structures in your notes, Microsoft Word has a number of graphic organizer templates in its online resources.

KWL Chart: Advanced EMT Chapter 2 EMS Systems		
What I Know About EMS Systems	What I Want to Know About EMS Systems	What I Learned About EMS Systems

FIGURE 4 KWL Chart. KWL stands for know, want, learn. Information is organized by what you already know, what you want to know, and what you then learned.

KWHL Chart: Advanced EMT Chapter 2 EMS Systems	
1. What I Know About EMS Systems	2. What I Want to Know About EMS Systems
<ul style="list-style-type: none"> • History of modern EMS began in 1966 with the White Paper • Much of what is known about prehospital care is based on military experience • The EMS Agenda for the Future outlines goals for EMS system development 	<ul style="list-style-type: none"> • What are the specific goals of the EMS Agenda for the Future?
3. How I Learned About EMS Systems	4. What I Learned About EMS Agenda Goals
<ul style="list-style-type: none"> • National Highway Transportation Safety Administration, The EMS Agenda for the Future at www.ems.gov 	<ul style="list-style-type: none"> • Integration of health services • EMS research • Legislation and regulation • System finance • Human resources • Medical direction • Education systems • Public education • Prevention • Public access • Communications systems • Clinical care • Information systems • Evaluation

FIGURE 5 The KWHL chart is a variation of the KWL chart that includes a “how” section for listing references for information.

Note Taking

Taking notes on both your assigned reading and your instructor’s lectures is a way of creating study materials for later use. An effective method is Cornell note taking, which is explained later in this section (Figure 9). When taking notes in class, do not write word for word what your instructor is saying or what he might

have on a slide. Writing word for word is rote, requires little thinking, and interferes with listening for meaning. Mentally summarizing what is said and writing in your own words helps you develop understanding. Approaching note taking in this way helps you listen for meaning as you translate your instructor’s words into your own.

Vocabulary Sheet Chapter 1		
Vocabulary Term	Definition	Relevance to Chapter
Advanced Emergency Medical Technician (Advanced EMT)	A prehospital emergency care provider who uses basic and limited advanced life support skills to care for acutely ill and injured patients.	1 of the 4 nationally recognized levels of EMS providers.
Advanced life support (ALS)	Complex patient care assessments and interventions that require in-depth training.	Advanced EMTs provide basic and limited advanced life support.

FIGURE 6 Vocabulary sheet.

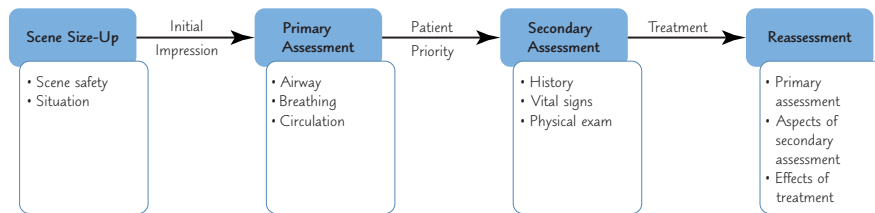


FIGURE 7 A variety of charts and graphs can illustrate the steps in a process, such as a skill, or the steps of a physiological or pathophysiological process. The example here shows the main steps in patient assessment.

Pathophysiology of Asthma			
Inflammation and constriction narrow the bronchioles. It requires more work to move air past the obstruction, especially on exhalation. Oxygen and carbon dioxide exchange are impaired.			
Inspection (See)	Palpation (Feel)	Auscultation (Hear)	Smell
<ul style="list-style-type: none"> Increased work of breathing: use of accessory muscles. Impaired gas exchange: signs of hypoxia, such as cyanosis and increased respiratory rate Decreased oxygen saturation. 	<ul style="list-style-type: none"> Air movement at mouth and nose may be decreased Pulse may be increased. 	<ul style="list-style-type: none"> Patient complaints: difficulty breathing, chest tightness, history of asthma Wheezing breath sounds Chest may be silent in severe attack 	<ul style="list-style-type: none"> None expected

FIGURE 8 A pathophysiology and presentation graphic such as this can be used to show the relationship between disease pathophysiology and the signs and symptoms it causes in the patient.

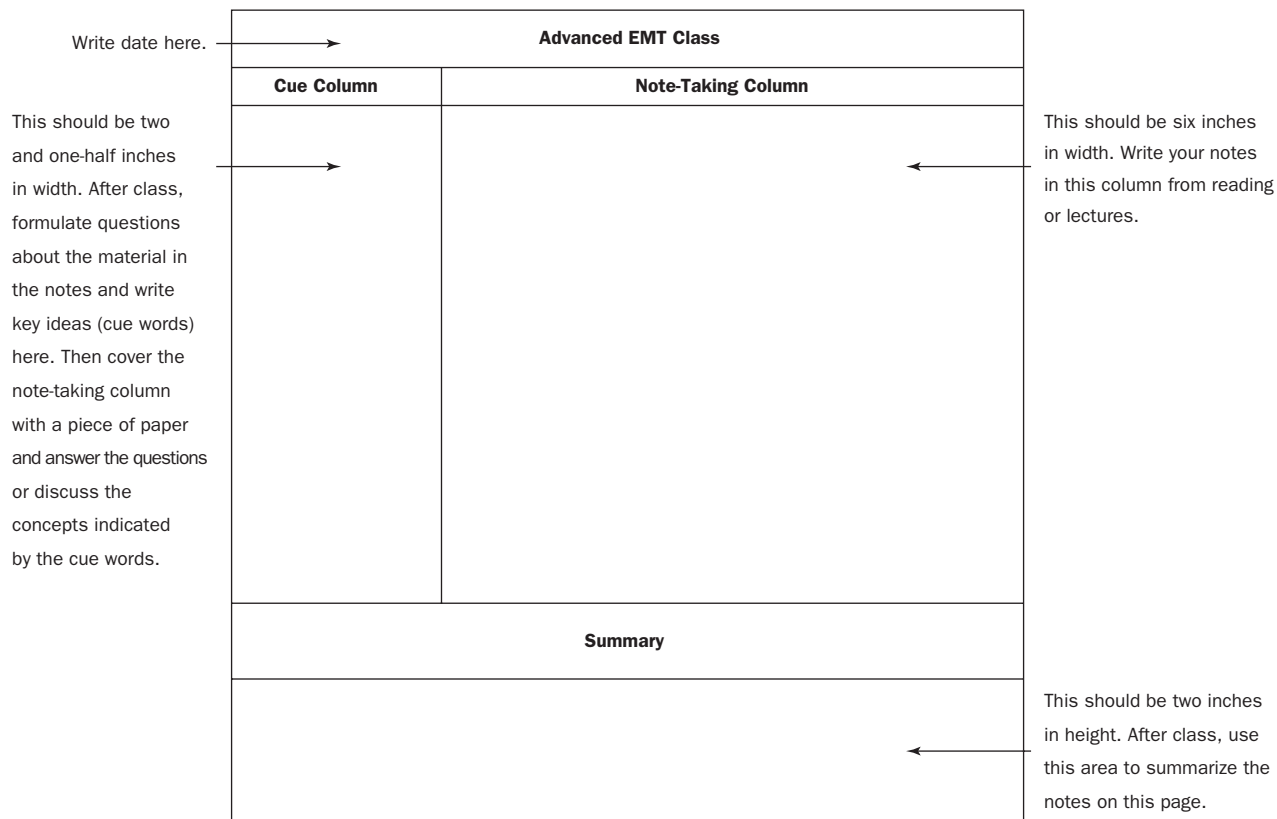


FIGURE 9 Cornell note taking is a system that allows for effective organization of information and recognition of key points.

An effective way of preparing for class is discussed in the following section. As you listen to your instructor, write only what you do not already have in your reading notes, or anything that bears special emphasis. If you have not prepared for class and are being exposed to the material for the first time, you will not be able to determine what to write and will likely attempt to write down everything. Attempting to write down everything causes you to fall behind the pace of the lecture and miss a great deal of information. Don't do it.

Instead, use the Cornell note-taking method. Cornell note taking is a simple, effective and widely used note-taking structure that you can use to take notes while reading and during class. The steps are to divide, document, write, review and clarify, summarize, and study. First, divide your paper as shown in Figure 9. Write the course name and the date at the top of the page. Write your notes in the main section of the paper. Learn to use abbreviations and symbols to help you write your notes more quickly and concisely. (Once you have read Chapter 7, "Medical Terminology," you will have an ample supply of symbols and abbreviations at your disposal.) Review and clarify the notes by pulling out main concepts and key ideas and writing them in the cue column on the left side of the paper. Also write any questions you have in that column. Summarize your notes at the bottom of the page, and then study from the page.

Three Time Frames for Learning Activities

Learning for each concept in the course can be divided into three time frames: preparation for class, time in class, and review and reinforcement after class (Figure 10). None of these three time periods can be sacrificed. The use of all three underscores the importance of repetition in learning. It is rarely possible, even with simpler concepts, to grasp a concept fully on first exposure. Each time you are exposed to the same concept, you will pick up additional understanding of it. Repetition allows you to correct misconceptions, fill in gaps in knowledge, and develop deeper and more sophisticated understanding of concepts.

The variety of different ways in which you are exposed to a concept through repetition also enriches your understanding of it. Just reading about vital signs will not give you a complete understanding. You will learn more by also hearing your instructor talk about vital signs, working on case studies in which patients' vital signs have different meanings, seeing your lab instructor demonstrate the skills, practicing hands-on skills in lab, seeing other health care providers perform the skill, and incorporating the skills into practice scenarios and clinical experience. Being exposed to the same concept in various settings helps you transfer learning from one context to another (such as from in the classroom to on the job).

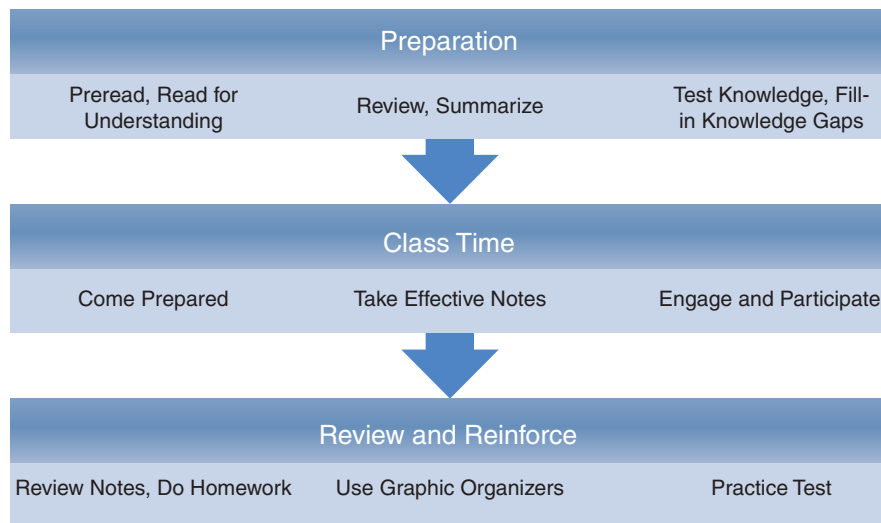


FIGURE 10 Study process.

Prepare for Class

Preparation provides a framework for making sense of the information that will be provided when you are in class (recall the concept of schema introduced earlier). Preparation allows you to be an active and therefore a more effective learner. It also allows you to participate fully, both mentally and in interactions with your instructor and classmates. Coming to class prepared with questions, for example, helps focus your attention during lecture so that you can begin to fill in gaps in understanding. At a minimum, preparation consists of completing assigned reading and reviewing your notes. Effective reading of assigned material requires prereading, reading for understanding, review, summarization, testing to identify gaps in knowledge, and filling gaps in knowledge. The design of this textbook helps you in these activities.

PREREAD THE ASSIGNED TEXT CHAPTER Begin prereading the chapter by reading the chapter introduction and summary. Next, review the objectives, key terms, and subject headings. Each of these chapter features serves as a preview of the content to come and helps you prepare mentally to receive the information. The features are turned into even more powerful learning tools when you phrase each of them as a question to be answered. For example, when you see a chapter learning objective that says “After reading this chapter, you should be able to identify signs and symptoms of stroke,” turn it into a question to be answered in your reading, “What are the signs and symptoms of stroke?” If one of the key terms in the chapter is aphasia, ask yourself, “What is aphasia?” If a subject heading is “Pathophysiology of Type I Diabetes,” turn it into a question, “What is the pathophysiology of type 1 diabetes?” Read each of the chapter review questions to get an idea of the answers you will look for in your

reading. Reading for answers is an effective way of reading for meaning.

READ FOR UNDERSTANDING Begin a chapter by reading the case study. The case studies and questions that accompany them are specifically designed to prime your thinking to read for understanding and problem solving. Read for meaning by looking for material that answers each of the questions posed by the objectives, key terms, and subject headings. Take notes on your reading.

REVIEW AND SUMMARIZE Review the assigned chapter by reading again the introduction, the subject headings, and summary. Then summarize the chapter in your own words. It helps to do this in writing, but you can also do it mentally or by talking with a classmate or mentor.

TEST YOUR KNOWLEDGE AND IDENTIFY LEARNING GAPS Test your knowledge by changing each of the objectives and subject headings into questions and then answering them. Use the review questions at the end of the chapter to test your knowledge further. Identify gaps in knowledge by noting anything that you were not able to answer. Go back and read for the answer. Before class, write any questions you have from your reading in the Cues column of a fresh page of notes to be used in class. Listen for the answers to those questions, and ask for clarification if you do not hear the answers to your questions.

Time in Class

Your time in class allows repetition and explanation of key information and is an opportunity for your instructor to elaborate on concepts and give examples. It is also an opportunity for critical thinking and asking questions. Creating and taking advantage of those opportunities is a joint

responsibility between you and your instructor. To do your part, begin by attending class prepared and well rested. Be ready to focus and engage fully with the instructor, content, and your classmates. An important step in doing this is to avoid distractions. If your instructor does not have a policy regarding phone calls, texting, and Internet use during class, avoid those temptations voluntarily. The ability to multitask effectively is a myth. When two tasks are undertaken simultaneously, both tasks suffer.

Take the perspective of cooperation rather than competition in learning with your classmates. Form working relationships with them because it is important for your learning and theirs. Also form a good working relationship with your instructor. Mutual trust and respect are key components in a successful learning experience. Keep an open mind about the information you receive. Ideas that seem to be in conflict often can be reconciled. At earlier levels of learning, complex concepts can be presented very simply. When presented at a more complex level, there can at first seem to be a contradiction when, in reality, there is not. It is helpful to ask your instructor how your previous understanding of the concept relates to the current explanation.

Review and Reinforcement

After class, while the lecture is still fresh, review or rewrite your notes to fill in any gaps. Use graphic organizers to summarize and clarify information. As you study your notes on a daily basis, focus more and more on the main ideas in the Cues column, moving back to the detailed notes or the text when you are unable to fully explain the main ideas to yourself or a study partner. Prior to quizzes and tests, repeat your prereading of the chapter, answering each of the questions developed from objectives, key terms, and headings. For anything that you are not able to answer, go back and reread that section of the chapter.

Testing and Practice Testing

An effective supplement to your study regimen is frequent practice testing. A number of resources, including the end-of-chapter reviews in this text, allow you to test yourself. Practice testing provides you with feedback on your learning process and guides you to specific areas in which you need more work. Practice testing also helps you prepare for your in-class and licensing exams.

Keep in mind a few strategies when taking graded exams. Everyone experiences some level of anxiety regarding exams. To a point, that anxiety provides motivation that

improves performance. However, performance declines when anxiety levels are high. At high levels of anxiety, you may have difficulty reading and understanding test instructions and test items. You may experience the phenomenon of drawing a blank on a test item, only to remember it as soon as you turn in your test. Some factors that lead to test anxiety are under your immediate control. Understanding the material well enough to recall it when you are under stress is a key way to decrease test anxiety. This kind of understanding develops over time. Putting off reading and studying until the night before the exam is a sure way to increase your anxiety level.

To decrease anxiety during the test, focus on one item at a time. Do not worry about how many questions you have answered or how many questions you still need to answer. Do not entertain thoughts about poor performance on the exam and do not worry about how long it takes other people to finish the exam. There is little correlation between test performance and how long it takes to complete the test. In general, do not change your answers on multiple-choice items. If you are not sure of the answer, stay with your first choice. Change your response only if you mismarked the answer or you misread the question or one or more of the responses to it.

If possible, first answer the questions you find easiest, and then come back to the more difficult ones. This makes the most efficient use of the limited time you have to take a test. However, a drawback is the possibility of skipping a question or mismarking the answer. Whether you answer questions in order or not, take a few minutes at the end of the exam to check your answers. Make sure you have answered all the questions and that you have marked your answer sheet correctly.

Test anxiety is reduced and mental performance is enhanced by taking good care of yourself. Get a full night's sleep prior to the exam. Eat nutritious foods and avoid excess sugar and caffeine.

In Summary

By taking this class, you have set a high but achievable goal for yourself. Achieving any important goal requires planning, time, and work. Being successful in your Advanced EMT class is no different. Study skills provide you with tools that can make the most efficient use of the time you are dedicating to this class. By using them, you will be able to organize the considerable amount of information you are about to receive in ways that make it easier to learn.

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Content Contributors

Becoming an Advanced EMT requires study in a number of content areas ranging from airway to medical and trauma emergencies and to pediatrics and rescue. To ensure that each area is covered accurately and in the most up-to-date manner, we enlisted the help of several expert contributors in the development of the first edition of the text. We are grateful for the time and energy that each put into his or her contribution.

Dan Batsie, BA, NRP, Education Coordinator, North East Maine EMS, Bangor, ME

John Grassham, BS (in EMS), EMS Educator, University of New Mexico School of Medicine, Albuquerque, NM

Patrick Hardy, MSc, LLM, EMT, President, Hytropy, LLC, Baton Rouge, LA

Dustin Hillerson, BS, MD, Internal Medicine Resident, University of Michigan, Ann Arbor, MI

Sean M. Kivlehan, MD, MPH, NRP, Emergency Medicine Resident, University of California–San Francisco, San Francisco, CA

Lt. J. Harold “Jim” Logan, BS, EMT-P I/C, EMS Consequence Management, The Fire Department of Memphis, Memphis, TN

Christopher L. Mixon, AAS, NRP, Education Coordinator, Acadian Ambulance/National EMS Academy, Lafayette, LA

Greg Mullen, MS, NRP, EMS Program Manager, National EMS Academy, Lafayette, LA

Charles “Harry” Murphy, Jr., NRP, CCEMT-P, Education Coordinator, National EMS Academy, Lafayette, LA

Scott Oglesbee, BA, CCEMT-P, Research Coordinator, Department of Emergency Medicine, University of New Mexico, Albuquerque, NM

Phillip T. Sanderson, NRP, BS, MHA, Manager, EMS Operations, Methodist Le Bonheur Healthcare Systems-Methodist University Hospital, Memphis, TN

David J. Turner, BS, NRP, Flight Paramedic, Albuquerque, NM

Steven Weiss, MS, MD, Professor of Emergency Medicine, University of New Mexico, Albuquerque, NM

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Amanda Broussard, AAS, BA, Education Manager, Louisiana Bureau of EMS, LA

Rebecca Carmody, EMT-P, AAS, Master EMS Instructor, College of Southern Nevada, NV

Frank Killebrew, Level III EMS Instructor, Paramedicine Technology Program Director, Ogeechee Technical College, GA

Richard Main, MEd, NRP, Instructor, College of Southern Nevada, NV

Scott Nelson, B.S, NRP, LP, Director, Emergency Medical Science Program, Texas Southmost College, TX

Matthew Ozanich, MHHS, NRP, EMS Coordinator, Trumbull Memorial Hospital, Warren, OH

James D. Turner, BA, MA, JD, EMT, Allan Hancock College, Santa Maria, CA

Walter Webel, BSHS, AS, NRP, Program Director, Savannah Technical College, Savannah, GA

Thomas Craig Williams, NRP, Instructor, South Plains College, Levelland, TX

Donald Woodyard, AAS, BGS, MAML, NRP, Director, Louisiana Department of Health and Hospitals, Bureau of EMS, Baton Rouge, LA

We wish to thank the following reviewers for providing invaluable feedback and suggestions in preparation of the first edition of *Advanced EMT: A Clinical-Reasoning Approach*.

Jeffrey L. Barnes, EMT-P, Instructor, Operation's Manager, Firefighter, Haz Mat Tech, Weatherly, PA
Lauri Beechler, RN, MSN, CEN, EMT, Loyola University Medical Center, Maywood, IL
George Blankinship, EMT-FP, Flight Paramedic, Moraine Park Technical College, Fond du Lac, WI
David Bryant, BS, EMT-P, Associate Professor, Health Related Professions, Northeast State Community College, Blountville, TN
David Burdett, NRP, Training Officer/Clinical Coordinator, Hamilton County EMS and Chattanooga State Community College, Chattanooga, TN
Rebecca Burke, BS, RN, NRP, Wallace Community College, Dothan, AL
Helen T. Compton, NRP, Mecklenburg County Rescue Squad, Clarksville, VA
Steve Creech, BA, MMin (NC), EMT-P, National Director, Nazarene Disaster Response, Lenexa, KS
Lyndal M. Curry, MA, NRP, University of South Alabama, Mobile, AL
Glenn Faught, AAS, BS, MS, Program Chair and Associate Professor, Emergency Medical Technology, SW Tennessee CC, Memphis, TN
James W. Fogal, MA, NRP, EMS Instructor, Opelika, AL
David C. Harrington, AS, NRP, City of Oak Ridge Fire Department, Oak Ridge, TN
James F. Jones, NRP, Program Director, Southeastern Technical College, Vidalia, GA
Kevin F. Jura, NRP, Lead ALS Instructor, DC Fire & EMS, Washington, DC
Deb Kaye, EMT, BS Health Education, Physical Education, Director/Instructor Dakota County Technical College, EMT-Sunburg Ambulance, Lakes Area Rural Responders, Rosemount, MN
Robin Kinsella, NECEM I/C, Mad River Valley Ambulance Service, Waitsfield, VT
Peggy Lahren, NRP, Regional EMS Coordinator, Arizona Bureau of EMS and Trauma System, Phoenix, AZ
Jim Massie, BS, NRP, Instructor, EMS Program, College of Southern Idaho, Twin Falls, ID

M. Allen McCullough, PhD, Fire Chief/Director of Public Safety, Department of Fire and Emergency Services, Fayetteville, GA
Deborah Poskus Medley, RN-BC, MSN, CCRN, Excelsa Health Westmoreland, Greensburg, PA
Elizabeth E. Morgan, EMT, Mt. Hood Community College, Gresham, OR
Tom Nevetral, BS, NRP, ALS Training Coordinator, Virginia Department of Health Office of Emergency Medical Services, Glen Allen, VA
Steve Nguyen, MS, NRP, Tulsa Technology Center, Tulsa, OK
Mark Podgwaite, NREMT-I, NECEMS I/C, Training Coordinator, VT EMS District 6, Berlin, VT
Warren J. Porter, MS, BA, LP, NRP, Director, Clinical and Education American Medical Response-South Region, Arlington, TX
Barry Reed, MPA, RN, EMTP, CCRN, CEN, CCEMTP, EMS, Fire, AHA Programs Director, Northwest Florida State College, Niceville, FL
Douglas P. Skinner, BS, NRP, NCEE, Training Officer, Loudoun County Fire Rescue, Leesburg, VA
Dale Trusty, EMT-P, Paramedic/Instructor, North Georgia Technical College, Clarkesville, GA
Rebecca Valentine, BS, CCEMT-P, I/C, EMS Instructor, Natick, MA
Kelly Weller, MA, GN, LP, EMS-C, EMS Program Coordinator, Lone Star College-Montgomery, Conroe, TX
Randy Williams, NRP, Instructor of Paramedic Technology/EMS Programs Coordinator, Bainbridge College, Bainbridge, GA

Photo Advisors

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About the Authors

Melissa Alexander, EdD, Paramedic



Melissa Alexander became an EMT-A in 1982 and earned a Certificate in Paramedicine from Home Hospital School of Paramedicine in Lafayette, Indiana, in 1984. She has a BA in Community Health Education from Purdue University, an MS in Health Sciences Education from Indiana University, and an EdD

in Human Resources Development from The George Washington University. Dr. Alexander is the Senior Director of Planning, Assessment, and Evaluation for Medical Student Education for Indiana University School of Medicine. She is actively involved in national-level innovations in medical education, including the American Medical Association (AMA) Accelerating Change in Medical Education (ACE) grant and the American Association of Medical Colleges (AAMC) initiative for creating entrustment-based curricula and assessments to ensure medical students' readiness to enter residency.

Dr. Alexander previously served as the Director of the EMS Academy at the University of New Mexico, as an Assistant Professor of Emergency Medicine at The George Washington University, as an Assistant Professor of Criminal Justice, Fire Science, and EMS at Lake Superior State University, and as a paramedic at Wishard Ambulance Service in Indianapolis. She has authored and contributed to several EMS texts and educational products. Dr. Alexander's research interests include assessing and improving clinical-reasoning skills, and creating valid assessments of learning. She has three daughters, Lindsay (Chris) Giroux, Brittany Streuker, and Eleanor Shook; and five grandsons, Asher, Ethan, Grant, Rhys, and Jasper. She enjoys bicycling, spending time with family, organic gardening, and hanging out with her dogs Sabrina and Benito.

Richard Belle, BS, NRP



Richard Belle, a native of New Orleans, Louisiana, began his EMS career in 1996 after completing EMT-Basic and Paramedic training at Nicholls State University in Thibodaux, Louisiana. Richard has worked throughout south Louisiana as a field paramedic, new employee preceptor, student preceptor,

and as a flight paramedic. He has been actively involved in EMS education since 1999. Richard served as Education Coordinator for Acadian Ambulance's southeastern district while he returned to Nicholls State University and earned a bachelor of science degree. After four years of teaching EMT Basic and Paramedic courses, he transferred to Lafayette, Louisiana, to serve as Acadian Ambulance's Continuing Education Coordinator; he was responsible for providing refresher training and continuing education opportunities to medics across Louisiana, Texas, and Mississippi. Currently, Richard works in Lafayette, Louisiana, as Continuing Education Manager for Acadian Ambulance and the National EMS Academy. Richard lives in south Louisiana with his wife Rhonda and their three children, James, Victoria, and Allison.

Medical Editor

Steven Weiss, MD, MS, FACEP, FACP



Dr. Weiss was first drawn to EMS as a working EMT in the mountains of Colorado. After completing medical school, he trained and received board certifications in both Emergency and Internal Medicine at Charity Hospital in New Orleans. He is a fellow of the American College of Emergency

Physicians and the American College of Physicians. In 2016, he became boarded in EMS medicine. His career has spanned a great diversity of emergency medicine and EMS systems including Louisiana, Tennessee, California, and now

in New Mexico. Over 20 years working in EMS, he has been a medical director of numerous EMS services and EMS training programs. During his time in Tennessee, he was the State EMS medical director.

Dr. Weiss has been involved in training residents, physicians, and EMTs in EMS concepts and practice. He has published over 30 articles related to EMS and presented over 20 abstracts at national meetings. He spent four years as the medical director for the EMS Academy in Albuquerque, which trains all levels of EMS providers throughout the state. Most recently, he helped to start the Critical Care Paramedic program with Albuquerque Ambulance and has acted as the program medical director for five years. Presently, Dr. Weiss is a tenured professor of Emergency Medicine at the University of New Mexico, where he works as a research director with the EMS fellows and with the ambulance services. He is on the editorial board of Prehospital and Emergency Care. He is married to Amy Ernst, a fellow emergency physician with an interest in injury prevention and intimate partner violence. His only daughter has worked as an Intermediate EMT and is interested in pursuing a career in health sciences.

A Guide to Key Features

Chapter 14

General Approach to Patient Assessment and Clinical Reasoning



Content Area: Assessment

Advanced EMT Education Standard: Applies scene information and patient assessment findings (scene size-up, primary and secondary assessment, patient history, and reassessment) to guide emergency management.

Learning Objectives

After reading this chapter, you should be able to:

- 14.1** Define key terms introduced in this chapter.
- 14.2** Describe the purpose and goals of patient assessment.
- 14.3** Describe the components of the patient assessment process.
- 14.4** Discuss the decisions that must be made during the patient assessment process.

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14.5 Explain the importance of both a systematic approach and adaptability in patient assessment.

14.6 Explain the importance of various decision-making and problem-solving approaches in the patient assessment and patient care processes.

Key Terms

assessment-based management, p. 328
baseline vital signs, p. 335
chief complaint, p. 336
clinical, p. 327
clinical problem solving, p. 328
critical patients, p. 334
diagnosis, p. 328
differential diagnosis, p. 328
field impression, p. 328
focused physical exam, p. 336
head-to-toe exam, p. 335
level of responsiveness, p. 331
mechanism of injury, p. 328
mental status, p. 333
noncritical patients, p. 334
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reassessment, p. 329
satisficing, p. 339
scene size-up, p. 329
secondary assessment, p. 329

Case Study

Advanced EMTs Julia Payne and Beth Mercer arrive in the 6500 block of East Grant Street where law enforcement has requested a “checkout” of a person in custody. They see the patient is a disheveled man in his 30s with his hands cuffed behind his back. He is struggling with two police officers, cursing, thrashing about, and yelling, “Let me go!”

One of the officers, Lieutenant Avila, tells Julia and Beth that the patient’s supervisor called 911 when the patient became unruly at work. The patient, Brian Nelson, began work only a week ago and his supervisor knows little about him beyond the information from his employment application. Lieutenant Avila called for EMS

because she couldn’t find an explanation for the patient’s sudden change in behavior, and she wants to have the patient checked out by EMS before transporting him to the detention center.

Problem-Solving Questions

1. What can Julia and Beth determine about the patient’s condition with the information they have so far?
2. What information do they need to determine the nature of the patient’s problem?
3. In what order should they collect this information?

Introduction

At its most basic level, the **patient assessment** process involves continually asking, “In what ways does this patient’s presentation differ from a healthy state of functioning?” To answer this question, an Advanced EMT must systematically and thoroughly collect relevant information about the patient and the situation. He or she must then compare those findings to what healthy functioning looks like.

An overview of what normal functioning looks like appears in Chapters 8 and 9. Pathophysiology was introduced in Chapter 10. However, a great deal of study, classroom time, lab practice, and clinical experience are still needed. Each will help you gain confidence in your ability to recognize the many variations of both normal and abnormal patient presentations.

This chapter offers an overview or “big picture” perspective of the patient assessment process. Subsequent

Key Terms

assessment-based management, p. 328
baseline vital signs, p. 335
chief complaint, p. 336
clinical, p. 327
clinical problem solving, p. 328
critical patients, p. 334
diagnosis, p. 328
differential diagnosis, p. 328
field impression, p. 328
focused physical exam, p. 336
head-to-toe exam, p. 335
level of responsiveness, p. 331
mechanism of injury, p. 328
mental status, p. 333
noncritical patients, p. 334
obtunded, p. 332
patient assessment, p. 327
primary assessment, p. 329
rapid medical exam, p. 335
rapid physical exam, p. 335
rapid trauma exam, p. 335
reassessment, p. 329
satisficing, p. 339
scene size-up, p. 329
secondary assessment, p. 329

Key Terms

Important to chapter understanding, key terms are listed with the page numbers where they first appear or are first defined. You will also find them with full definitions in the end-of-book glossary.

Case Study

Framing the chapter is a case study that introduces you to the real-life emergencies Advanced EMTs encounter and guides you through them, all the while modeling the clinical-reasoning process. A Case Study opens each chapter; a Case Study Wrap-up closes each chapter.

In the Field

There has been debate for many years about whether or not EMS providers diagnose medical problems. It was argued that only physicians could diagnose. But diagnosis is simply a term that means defining the nature of a problem. Mechanics, engineers, and information technology professionals all diagnose. Without knowing what the problem is, it is not possible to find the right solution. In patient care, diagnosis takes place at many levels as various levels of providers gain additional information.

Personal Perspective

Insights and reflections on how and what Advanced EMTs learn from their experiences in the field are offered here.



PEDIATRIC CARE

Pediatric patients have a proportionally larger tongue and epiglottis than adults do (Figure 16-4). This can mean increased vulnerability to obstruction because of decreased muscle tone. The laryngopharynx is also more anterior and superior than that of an adult. In an adult, the narrowest point in the airway is the glottic opening. In small children and infants, the narrowest point is just below the glottic opening at the level of the cricoid ring. This causes the airway to be somewhat funnel shaped and prone to the dangers of obstruction and subglottic edema in infection.

Case Study

Advanced EMTs Julia Payne and Beth Mercer arrive in the 6500 block of East Grant Street where law enforcement has requested a "checkout" of a person in custody. They see the patient is a disheveled man in his 30s with his hands cuffed behind his back. He is struggling with two police officers, cursing, thrashing about, and yelling, "Let me go!"

One of the officers, Lieutenant Avila, tells Julia and Beth that the patient's supervisor called 911 when the patient became unruly at work. The patient, Brian Nelson, began work only a week ago and his supervisor knows little about him beyond the information from his employment application. Lieutenant Avila called for EMS

because she couldn't find an explanation for the patient's sudden change in behavior, and she wants to have the patient checked out by EMS before transporting him to the detention center.

Problem-Solving Questions

1. What can Julia and Beth determine about the patient's condition with the information they have so far?
2. What information do they need to determine the nature of the patient's problem?
3. In what order should they collect this information?

Case Study Wrap-Up

CLINICAL-REASONING PROCESS

Advanced EMTs Julia Payne and Beth Mercer are on the scene of a disheveled man in his 30s with his hands cuffed behind his back, struggling with two police officers. The patient is cursing, thrashing about, and yelling, "Let me go!" The patient's supervisor called 911 when the patient, Brian Nelson, became unruly at work. His supervisor knows little about him beyond the information from his employment application.

The patient's ability to speak without difficulty indicates to Julia and Beth that his airway is open, he is breathing, and he has adequate circulation. But the patient's behavior indicates that he has an altered mental status. While the police officers and Brian's supervisor are leaning toward thinking this is some sort of drug-induced or psychiatric problem, Beth and Julia know that a number of serious medical problems might account for the patient's behavior.

Following their customary way of approaching similar calls, Beth talks with Brian's supervisor to get as much information as she can, including an emergency contact number for Brian, so that she can contact Brian's family. Meanwhile, Julia observes that Brian's general appearance is pale and he is sweating profusely. As an Advanced EMT for four years, Julia has seen

a number of similar cases where the cause of the patient's behavior is hypoglycemia. She recognizes this pattern almost immediately.

She knows that there are other potential causes of the patient's presentation, but she wants to check her suspicion about diabetes first, for a couple of reasons. First, it is a very likely explanation for the patient's presentation. And if confirmed, it can easily be treated in the field. The patient's age makes other problems, such as a cardiac event or pulmonary embolism, less likely. Second, untreated hypoglycemia will progress, and the patient's condition may worsen.

Julia asks Beth to find out from Brian's wife if he has a history of diabetes or other medical problems. Julia then asks the police officers if they can help hold Brian still long enough for her to check his blood glucose level. Beth reports that the patient is a diabetic, and the blood glucose level of 40 mg/dL confirms that he is hypoglycemic. Meanwhile, Brian is still uncooperative, but he is becoming more confused and lethargic. With the assistance of law enforcement officers, Julia and Beth place Brian on their stretcher and load him into the ambulance.

While Beth prepares to administer oxygen by nasal cannula, Julia starts an IV of normal saline in Brian's left forearm

In the Field

Helpful hints and tips that usually come only with experience in the field are offered to help you understand how to respond in real-life emergencies.

Personal Perspective

The Role of Experience

Advanced EMT Student Evan Gregory: I was pretty confident in what I had learned in class about patient assessment, and thought I'd done pretty well in practice scenarios. But on my first emergency department clinical shift, I felt tongue-tied when I followed my preceptor in to talk to a 49-year-old male patient complaining of back pain. The patient was pacing around and refused to lie down, despite the fact that he said his back was killing him. My preceptor asked the patient to show her where his back hurt. When he put his hand over the lower ribs on his right side, my preceptor asked the patient if he'd ever had a kidney stone before. That threw me for a loop! I wondered where she came up with that question, but I was even more surprised when the patient answered that he had

had a kidney stone before. Afterward, I asked my preceptor, Barb, what made her ask that question. She told me that the patient fit a pattern she recognized after working as a nurse in the hospital emergency department for three years. "Middle-aged male, good vital signs on his triage note, complaining of flank pain on one side, pacing about and looking extremely uncomfortable. One of the first things you think of is kidney stone," she told me. I learned from Barb that many problems present with what she called classic findings. "Classic findings are useful," she told me. "They help us recognize the way some problems typically present. Just follow through with your history and assessment to make sure there isn't something else going on."

Pediatric Care

Because the assessment and management of pediatric patients can differ from that of adults, the Pediatric Care notes draw your attention to those cases.

Geriatric Care

The differences in the assessment and management of geriatric patients are highlighted for you in the Geriatric Care notes.



GERIATRIC CARE

It is often best to leave the patient's dentures and dental appliances in place. However, remove them if they interfere with airway management and ventilation.



FIGURE 14-6 With teamwork, many components of the patient assessment process can proceed simultaneously.

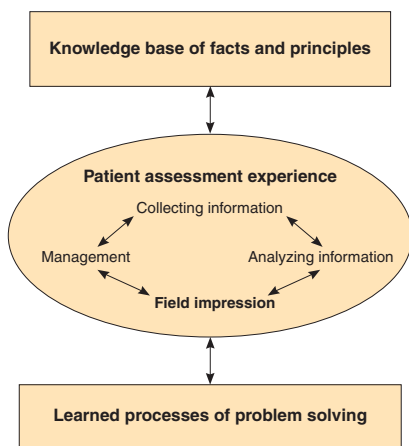


FIGURE 14-8 Model of Clinical Problem Solving. In clinical problem solving, there is a relationship among experience, knowledge base, and learned processes.

Scan 14-1 General Approach to Patient Assessment



1. Perform a scene size-up to determine scene safety, the nature of the situation, the number of patients, and the need for additional resources.



2. Perform a primary assessment for immediately life-threatening problems with the airway, breathing, and circulation.



3. Correct immediate threats to life before proceeding with additional assessment.



4. Make a decision about the patient's priority for transport.

Figures and Scans

An abundance of art and photos, selected to help you visualize key concepts, reinforces content and elaborates on text descriptions and explanations.

Tables

Tables are placed throughout the text to assist you in learning new concepts by organizing, summarizing, and comparing information that is key to chapter content.

Table 16-1 Abnormal Respiratory Sounds

Sound	Description	Significance
Snoring	Harsh, vibrating, rattling sound that may be soft or loud	Partial obstruction of the upper airway by the tongue
Gurgling	Liquid, bubbling sound	Fluid in the upper airway
Stridor	Harsh inspiratory sound	Partial upper airway obstruction; may indicate laryngeal edema, foreign body airway obstruction, or epiglottitis
Coughing	Spasmodic forceful air expulsion that may sound "dry" or "wet"	Irritation of the respiratory mucosa from infection or irritants
Wheezing	Whistling, musical sound of the lower airways, often heard on expiration but can be heard on inspiration	Narrowing of the bronchioles from edema or bronchoconstriction
Crackles (rales)	Fine bubbling, crackling sounds heard in the lower airways	Fluid in the alveoli and lower airways
Rhonchi	Coarse, liquid lower airway sound	Secretions in the bronchi

Chapter Review

Chapter Summary

Now that you have an overview of the patient assessment and clinical decision-making processes, you have a framework for learning the information in subsequent chapters. In practice, many components of assessment, treatment, and preparation for transportation must occur simultaneously. Knowing each component well and engaging in teamwork with good communication will help you with the required multitasking. With so much going on at once,

you must remember your priorities. Always prioritize scene safety, airway management, management of ventilation and oxygenation, and maintaining the patient's circulation. Developing your assessment and problem-solving skills takes background knowledge and experience. Take every opportunity you can to improve your knowledge base and to practice—and get feedback on—your patient assessment and decision-making skills.

Review Questions

Multiple Choice

- The status of a patient's airway should be checked in the:
 - scene size-up.
 - primary assessment.
 - secondary assessment.
 - baseline vital signs.
- Which one of the following factors, on its own, should be considered in making a determination that a patient is critical?
 - Patient complains of severe pain in his fractured ankle.
 - Patient states he has vomited four times this morning.
 - Patient responds only to a painful stimulus, such as pinching his shoulder.
 - Patient tells you he has a history of diabetes.
- Which one of the following best describes the process by which experts typically identify a patient's problem?
 - Long, complicated chains of hypotheticoductive reasoning
 - Testing for every possible problem the patient could have
 - Assuming that each patient has the worst possible problem he could have, based on his signs and symptoms
 - Recognizing patterns of patient presentations made familiar through experience
- You have performed a scene size-up and primary assessment, and you have determined that you have a critical trauma patient. Your next step should be to:
 - load the patient immediately for transport.
 - conduct a rapid trauma assessment.
 - get baseline vital signs.
 - find out the patient's medical history.
- For most medical patients, you will get the most useful information, and will therefore emphasize, which one of the following components of the secondary assessment?
 - Medical history
 - Rapid medical assessment
 - Name of the patient's personal physician
 - Blood glucose level

Critical Thinking

- Explain the purpose of obtaining baseline vital signs.
- How is the mnemonic ABCD applied in the primary assessment?
- For each of the following items, indicate when it is performed. Write "P" for the primary assessment, "S" for the secondary assessment, or "R" for reassessment.

NOTE: Some items may be performed in more than one part of the patient assessment process.

Checking the airway _____
 Taking baseline vital signs _____
 Taking the patient's history _____
 Assessing the effects of treatment _____
 Performing a focused physical examination _____

Chapter Review

Each chapter ends with a summary followed by chapter-specific multiple-choice and critical-thinking questions. Use both to check your recall of concepts and your ability to apply them. An answer key is included at the end of the book.



Image by Christof VanDerWalt

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Section 1

Preparing for Advanced Emergency Medical Technician Practice



- Chapter 1** Introduction to Advanced Emergency Medical Technician Practice
- Chapter 2** Emergency Medical Services, Health Care, and Public Health Systems
- Chapter 3** Workforce Wellness and Personal Safety
- Chapter 4** Ethical and Medical/Legal Considerations in Advanced EMT Practice
- Chapter 5** Ambulance Operations and Responding to EMS Calls
- Chapter 6** Communication and Teamwork

Chapter 1

Introduction to Advanced Emergency Medical Technician Practice



Content Area: Preparatory

Advanced EMT Education Standard: Applies fundamental knowledge of the EMS system, safety/well-being of the Advanced EMT, and medical/legal and ethical issues to the provision of emergency care.



Learning Objectives

After reading this chapter, you should be able to:

- 1.1** Define key terms introduced in this chapter.
- 1.2** Describe the competencies, roles, responsibilities, and professional characteristics of the Advanced EMT.
- 1.3** Describe the scope of practice of the Advanced EMT.
- 1.4** Place the roles and responsibilities of the Advanced EMT in the larger contexts of

emergency medical services (EMS), health care, and public health.

- 1.5** Discuss key issues in the contemporary practice of the Advanced EMT, including

professionalism, the focus on patient safety, research, and evidence-based practice.

Key Terms

Advanced Emergency Medical Technician (Advanced EMT), p. 6

advanced life support (ALS), p. 8

allied health care professionals, p. 8

clinical training, p. 8

community paramedicine (CP), p. 5

Emergency Medical Responder (EMR), p. 6

emergency medical services (EMS), p. 3

Emergency Medical Technician (EMT), p. 6

EMS provider, p. 3

evidence-based practice, p. 10

field training, p. 8

interfacility transportation, p. 4

mobile integrated healthcare (MIH), p. 5

Paramedic, p. 6

physician medical director, p. 8

prehospital, p. 5

profession, p. 4

protocols, p. 8

research, p. 10

responsibilities, p. 8

roles, p. 8

scope of practice, p. 7

self-directed learner, p. 12

standing orders, p. 8

Case Study

Advanced EMTs Jane McFadden and Kevin Breen are enjoying a few minutes of downtime at a city park, watching a soccer game, when their radios sound with a dispatch. “Ambulance 14, respond to 1025 West Bluff Street for difficulty breathing. That’s one-zero-two-five West Bluff Street for difficulty breathing. Coordinates 400 north, 1025 west.” Kevin moves from his position at the front of the ambulance toward the driver’s seat, and pushes the “responding” status button on the front of the radio panel. Jane climbs into the passenger seat, fastens her seat belt, and readies a pair of vinyl gloves.

Three minutes later, as they park along the curb in front of the residence, Kevin pushes the “at scene” status button on the radio panel. This is a quiet, well-kept neighborhood, and the arrival of the ambulance has attracted the attention of some neighbors. Jane and Kevin deliberately scan the house,

yard, and surrounding area. They notice nothing out of the ordinary that could pose a danger to them, so they walk up the steps and onto the porch. Before they can ring the bell, an anxious-looking woman in her late 30s opens the door. “I’m glad you’re here,” she says. “It’s my son, Justin. He’s wheezing and his inhaler isn’t helping. He’s getting worse. This is the second asthma attack he’s had this week. He’s back here, in the kitchen.”

Problem-Solving Questions

1. How should Jane and Kevin proceed?
2. What are their overall goals in managing this situation?
3. What knowledge and skills do you think Jane and Kevin will be calling on?

Introduction

Students, welcome to the ranks of the Advanced Emergency Medical Technician (Advanced EMT)! Reading this chapter marks the beginning of an exciting journey in advancing your status as a health care provider. Taking this step gives you a greater array of career opportunities and settings in

which to care for sick and injured patients. Advanced EMTs are a critical part of the **emergency medical services (EMS)**. As an Advanced EMT, you will provide comfort, emergency medical care, and transportation for a variety of ill and injured patients. While carrying out your roles and responsibilities as an **EMS provider**, you will provide a link between patients and the health care and public health systems.



FIGURE 1-1 Advanced EMTs work in a variety of settings.



EMS and EMS Providers

Advanced EMTs are one of the four nationally recognized levels of health care providers who work in EMS systems. EMS systems were developed to provide essential life-saving care and emergency transportation to critically ill and injured patients. Initially, training focused on treating patients who were injured in motor vehicle crashes (MVCs) and those in cardiac arrest. But over time, the larger health care system and the public have come to rely on EMS in a variety of situations.

EMS providers respond to patients with an assortment of injuries and illnesses in emergency situations. EMS providers also routinely provide **interfacility transportation** for patients with chronic and acute illness. In addition to these roles, EMS providers engage in community health education and promotion efforts, respond to disasters, and work in a variety of settings. Those settings include emergency departments, fire departments, industrial settings, and even movie sets (Figure 1-1).

The scope of knowledge and skills required of EMS providers has changed over time to reflect the diversity of situations in which EMS providers may find themselves. This chapter summarizes the contemporary practice of EMS, the roles of EMS providers, and the practice of Advanced EMTs.

The Contemporary EMS Profession

A **profession** is an occupation or vocation with particular characteristics, and it is defined by a specialized set of knowledge. In EMS, that knowledge is defined in documents published by the National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation (DOT), such as the *National EMS Core Content*, *National EMS Scope of Practice*, and *National EMS Education Standards*. Professions are considered self-regulating. This means that a profession is directed and guided by people who are in the profession rather than by an external group. Professions have codes of conduct or ethics. The EMT Oath (Figure 1-2) and the EMT Code of Ethics

The EMT Oath

Be it pledged as an Emergency Medical Technician, I will honor the physical and judicial laws of God and man. I will follow that regimen which, according to my ability and judgment, I consider for the benefit of patients and abstain from whatever is deleterious and mischievous, nor shall I suggest any such counsel. Into whatever homes I enter, I will go into them for the benefit of only the sick and injured, never revealing what I see or hear in the lives of men unless required by law.

I shall also share my medical knowledge with those who may benefit from what I have learned. I will serve unselfishly and continuously in order to help make a better world for all mankind.

While I continue to keep this oath unviolated, may it be granted to me to enjoy life, and the practice of the art, respected by all men, in all times. Should I trespass or violate this oath, may the reverse be my lot.

So help me God.

Written by Charles B. Gillespie, MD

Adopted by the National Association of Emergency Medical Technicians, 1978.

FIGURE 1-2 The EMT Oath.

(Reprinted with permission of National Association of Emergency Medical Technicians)

The EMT Code of Ethics

Professional status as an Emergency Medical Technician and Emergency Medical Technician-Paramedic is maintained and enriched by the willingness of the individual practitioner to accept and fulfill obligations to society, other medical professionals, and the profession of Emergency Medical Technician. As an Emergency Medical Technician-Paramedic, I solemnly pledge myself to the following code of professional ethics:

A fundamental responsibility of the Emergency Medical Technician is to conserve life, to alleviate suffering, to promote health, to do no harm, and to encourage the quality and equal availability of emergency medical care.

The Emergency Medical Technician provides services based on human need, with respect for human dignity, unrestricted by consideration of nationality, race, creed, color, or status.

The Emergency Medical Technician does not use professional knowledge and skills in any enterprise detrimental to the public well being.

The Emergency Medical Technician respects and holds in confidence all information of a confidential nature obtained in the course of professional work unless required by law to divulge such information.

The Emergency Medical Technician, as a citizen, understands and upholds the law and performs the duties of citizenship; as a professional, the Emergency Medical Technician has the never-ending responsibility to work with concerned citizens and other health care professionals in promoting a high standard of emergency medical care to all people.

The Emergency Medical Technician shall maintain professional competence and demonstrate concern for the competence of other members of the Emergency Medical Services health care team.

An Emergency Medical Technician assumes responsibility in defining and upholding standards of professional practice and education.

The Emergency Medical Technician assumes responsibility for individual professional actions and judgment, both in dependent and independent emergency functions, and knows and upholds the laws which affect the practice of the Emergency Medical Technician.

An Emergency Medical Technician has the responsibility to be aware of and participate in matters of legislation affecting the Emergency Medical Service System.

The Emergency Medical Technician, or groups of Emergency Medical Technicians, who advertise professional service, do so in conformity with the dignity of the profession.

The Emergency Medical Technician has an obligation to protect the public by not delegating to a person less qualified, any service which requires the professional competence of an Emergency Medical Technician.

The Emergency Medical Technician will work harmoniously with and sustain confidence in Emergency Medical Technician associates, the nurses, the physicians, and other members of the Emergency Medical Services health care team.

The Emergency Medical Technician refuses to participate in unethical procedures, and assumes the responsibility to expose incompetence or unethical conduct of others to the appropriate authority in a proper and professional manner.

Written by: Charles B. Gillespie, MD

Adopted by the National Association of Emergency Medical Technicians, 1978.

FIGURE 1-3 The EMT Code of Ethics.

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(Figure 1-3) describe the professional conduct expected of EMS personnel. Finally, professionals are more motivated by the desire to provide service than the desire to achieve a high income.

The self-regulating characteristic of EMS also means that EMS providers have a professional obligation to be aware of the current issues in the profession. EMS providers must be aware of the activities and agendas of the major state and national professional agencies and organizations in EMS (Table 1-1). Those desiring leadership positions in EMS must take an active role in those organizations.

EMS providers constitute a link for patients between the **prehospital** setting and the hospital, and are an important part of the health care team. The roles of EMS providers in public health are still emerging, with the potential for EMS providers to have a significant impact. The *EMS Agenda for the Future* (NHTSA, 1996) envisions EMS providers as playing important roles in health assessment, health education, and health services (Figure 1-4). One way in which EMS is beginning to achieve that vision is through **mobile integrated healthcare (MIH)** and **community paramedicine (CP)**.

Table 1-1 National EMS Agencies and Professional Organizations

Organization	Purpose	Website
National Association of Emergency Medical Technicians	Represents and serves all EMS practitioners through quality education, membership, and national advocacy	www.naemt.org
National Registry of Emergency Medical Technicians	Provides assurance through testing and recertification processes that EMS personnel are competent	www.nremt.org
National Association of State EMS Officials	Provides support in developing EMS policy and oversight and provides vision, leadership, and resources in the development and improvement of state, regional, and local EMS and emergency care systems	www.nasemsd.org
National Association of EMS Physicians	Provides leadership and fosters excellence in prehospital emergency medical services	www.naemsp.org
National Highway Traffic Safety Administration, Emergency Medical Services	Provides background and updates on federal EMS initiatives and programs by way of its website	www.ems.gov

The Vision

Emergency medical services (EMS) of the future will be community-based health management that is fully integrated with the overall health care system. It will have the ability to identify and modify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to treatment of chronic conditions and community health monitoring. This new entity will be developed from redistribution of existing health care resources and will be integrated with other health care providers and public health and public safety agencies. It will improve community health and result in more appropriate use of acute health care resources. EMS will remain the public's emergency medical safety net.

FIGURE 1-4 EMS is developing and growing to include additional components of health care and public health.

(From National Highway Traffic Safety Administration, 1996. *EMS Agenda for the Future*, p. iii)

MIH and CP are emerging concepts in EMS that have been endorsed by key national EMS and emergency physician groups. The intent of MIH is to be fully integrated into the existing health care system, filling gaps in services in a way that meets local community health needs. MIH goals are consistent with Triple Aim, the Institute for Healthcare Improvement (IHI) philosophy of improving patient health care experiences, improving population health, and reducing the cost of health care (IHI, 2015). Initiatives include chronic disease management, preventive care, follow-up after hospital discharge, and referral to appropriate resources. For example, EMS providers may receive additional training to follow up with pediatric asthma patients, with the goal of reducing readmission to the hospital. Although MIH programs are not yet widespread, you should anticipate it becoming a growing trend.

EMS Provider Levels

The four nationally recognized levels of EMS providers are **Emergency Medical Responder (EMR)**, **Emergency Medical Technician (EMT)**, **Advanced Emergency Medical Technician (Advanced EMT)**, and **Paramedic**. Other titles may still exist in some areas as legacies from earlier

national- or state-level definitions of provider levels. For example, EMRs may be called first responders, EMTs may be called EMT-Basics, Advanced EMTs may be called EMT-Intermediates, and paramedics may be called Emergency Medical Technician-Paramedics (EMT-Ps). With time, it is anticipated that there will be greater uniformity in EMS titles across the United States.

Emergency Medical Responder

Emergency Medical Responders (EMRs) are trained in very basic skills. They use minimal equipment to provide immediately lifesaving care to critically ill and injured patients while awaiting the arrival of more highly trained EMS personnel. EMRs also provide basic first-aid measures to less critically ill and injured patients. The basic nature of EMR training makes it possible for rural communities to train EMRs who can arrive quickly at the scene of an injury or illness to provide care while awaiting an ambulance.

EMR training can be completed in 48 to 60 hours. The training is ideal for those who do not want to make a career of EMS but who want to provide a critical service to their communities. Industrial workers may obtain EMR training so they can assist injured coworkers while awaiting help. Law enforcement officers, who are often

Table 1-2 EMS Provider Descriptions and Scopes of Practice

Provider Level	Description	Minimum Psychomotor Skills
Emergency Medical Responder (EMR)	Provides simple, noninvasive treatments to reduce morbidity and mortality from illness and injury while awaiting arrival of more highly trained personnel	Use of simple airway devices designed for placement in the oropharynx Positive pressure ventilation (bag-valve mask) Upper airway suctioning Oxygen administration Self- or peer-administration of nerve agent antidote kit Automatic external defibrillation Manual stabilization of suspected spinal and musculoskeletal injuries Bleeding control Emergency moves
Emergency Medical Technician (EMT)	Provides basic, noninvasive interventions at the scene and during transportation of patients to the hospital	All EMR skills Nasopharyngeal airways Manually triggered and automatic transport ventilators Assisting patients in taking their own medications Oral glucose for hypoglycemia Aspirin for chest pain Pneumatic antishock garment for fracture stabilization
Advanced Emergency Medical Technician (Advanced EMT)	Provides basic and limited advanced skills focused on the acute management and transportation of critical and emergent patients Functions at an emergency scene, en route from an emergency scene to a health care facility, between health care facilities, or in other health care settings	All EMT skills Airways not intended to be placed in the trachea Tracheobronchial suctioning of an already intubated patient Peripheral IVs and administration of nonmedicated IV fluids Intraosseous access in pediatric patients Sublingual nitroglycerin for chest pain Subcutaneous or intramuscular epinephrine for anaphylaxis Glucagon and 50 percent dextrose for hypoglycemia Inhaled bronchodilators for wheezing Narcotic antagonist for suspected narcotic overdose Nitrous oxide for pain relief
Paramedic	Provides basic and advanced skills for acute management and transportation of a broad range of patients Functions at an emergency scene, en route from an emergency scene to a health care facility, between health care facilities, or in other health care settings	All Advanced EMT skills Endotracheal intubation Percutaneous cricothyrotomy Decompression of the pleural space Intraosseous infusion in adults Administration of various approved medications by a variety of routes Maintenance of blood or blood product infusions Synchronized cardioversion, transcutaneous pacing, and manual defibrillation

Source: Data from NHTSA (National Highway Traffic Safety Administration). 2006. National EMS Scope of Practice Model. Washington, DC: Author.

the first to arrive on the scene of injured patients, also may be EMRs.

EMRs can perform simple assessments to identify and manage life threats. They use basic airway management and ventilation skills, cardiopulmonary resuscitation (CPR), automatic external defibrillators (AEDs), and simple methods to control bleeding. EMRs are trained to recognize injuries that require immobilization and other conditions that can be treated in the **EMR scope of practice**. For example, EMRs can provide initial care for patients who have a foreign substance in the eye, and they can treat themselves or peers for nerve agent poisoning, using an antidote auto-injection kit. Advanced

EMTs who interact with EMRs must know the scope of practice of EMRs. (See Table 1-2 for EMS providers' scopes of practice.)

Emergency Medical Technicians

Emergency Medical Technicians (EMTs) provide emergency medical care and transportation to the ill and injured, using the basic equipment supplied on an ambulance. EMTs play a variety of roles in EMS systems. Some EMTs act in a first-response capacity, arriving at the scene prior to more highly trained EMS personnel to provide immediately lifesaving care. Many EMTs provide the primary transporting EMS service in a community. Other

EMTs work for ambulance services that primarily perform interfacility transports. The EMT may work with a partner at the same level, or he or she may work with an Advanced EMT or paramedic partner.

EMTs are trained to assess patients, gather a basic history to identify complaints and symptoms, perform a physical examination to identify signs of illness or injury, and monitor patients for changes in their conditions. Like EMRs, EMTs may work in industry or public safety agencies. Some EMTs work in hospital emergency departments and urgent care centers where they use their skills to assist nursing and medical staff.

In addition to all of the knowledge and skills of the EMR, EMTs are expected to be able to identify a wider range of patient conditions and can administer or assist a patient in self-administering some basic emergency medicines. These wider scopes of knowledge and practice are reflected in a longer course length of 150 to 190 hours. In addition to classroom and skills laboratory components, EMT courses are expected to include hospital emergency department and ambulance experience as part of the educational program.

Advanced EMTs

Your training to be an Advanced EMT will include all of the knowledge and skills of EMRs and EMTs. You will gain a greater breadth and depth of understanding of many of the topics introduced at lower levels of training, and you will be able to provide a limited number of **advanced life support (ALS)** interventions. These interventions are primarily geared toward meeting the needs of critically ill patients who have problems with the airway, breathing, and circulation. Like all EMS providers, you must act within the scope of practice approved by your state and your EMS service **physician medical director**. Understanding Advanced EMT authorization to practice is crucial. (Authorization to practice will be discussed in detail in Chapters 2 and 4.)

Advanced EMTs may be the highest level providers available in some communities, or they may work in conjunction with paramedics. They may work for ambulance services, fire departments, volunteer public safety agencies, hospital emergency departments or urgent care clinics, and industrial or other settings.

Prior EMS training is not a prerequisite for EMRs and EMTs. However, Advanced EMT students either must have completed EMT training or it must be incorporated into their program. Advanced EMT training requires approximately 150 to 250 hours beyond the time required to complete EMT training. Training includes classroom and laboratory education plus **clinical training** and **field training**. By the time you complete Advanced EMT training, you will have completed between 300 and 440 hours of education as a health care provider.

Paramedics

Paramedics are **allied health care professionals** who provide complex assessments and interventions for critical and emergent patients. Paramedic education prepares them to integrate EMS operational knowledge with complex understanding of anatomy, physiology, pathophysiology, and treatment modalities. This knowledge prepares them to assess and manage patients who have a variety of illnesses and injuries.

Because of the depth and breadth of knowledge and skill expected of paramedics, their education programs are often based in institutions of higher education. The Commission on Accreditation of EMS Programs (CoAEMSP) is responsible for reviewing programs and then making a recommendation to the Commission on Accreditation of Allied Health Education Programs (CAAHEP) to either grant or decline accreditation to the program. Program accreditation is granted by CAAHEP. Students should apply only to paramedic programs that are accredited.

The core portion of paramedic programs ranges from about 1,000 to 1,500 hours beyond the EMT level. Many institutions offer associate's degrees for paramedics. Several offer bachelor's degree programs in EMS that include paramedic training. The commitment of time and money required to complete paramedic training means that paramedics are not available in all communities.

Although they are not nationally recognized as a separate provider level, the Critical Care Paramedic (CCP) and the Flight Paramedic (FP) have additional training. Recognition and regulations for CCPs and FPs vary by state (IAFCCP, 2015).

Advanced EMT Roles and Responsibilities

An Advanced EMT's authorization to practice is based on state legislation, employer policies and procedures, and the guidance provided by a physician medical director. Each state has legislation that defines the scope of practice of licensed EMS personnel. Your specific scope of practice as an Advanced EMT is available through your state EMS office. **Protocols** and **standing orders** for your EMS service are available through your employer. You must practice only within the boundaries specified by your state scope of practice and your EMS service medical director, policies, and procedures. However, there are **roles** and **responsibilities** that define Advanced EMT practice, regardless of the specific patient care skills or employer procedures used to carry out these roles and responsibilities.

Emergency Vehicle Readiness and Operations

Before patient care can begin, you and other EMS providers must reach the scene of the emergency safely. This means

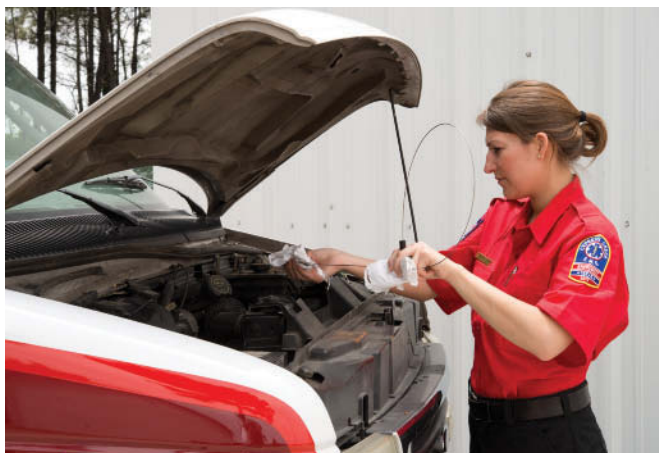


FIGURE 1-5 Advanced EMT responsibilities include making sure equipment and the emergency vehicle are prepared to respond to emergency calls.

that your emergency vehicle must be in good mechanical repair, its warning devices must be working properly, and it must be driven safely for the sake of the EMS crew and the public. If your vehicle is not properly maintained and does not start or breaks down on the way to the scene, you cannot provide emergency care for the patient. Similarly, if you are involved in a vehicle collision, you will not reach the scene. If you and your crew are injured in a collision, additional emergency medical resources will be needed to care for both the original patient and you. Your training as an Advanced EMT includes basic instruction in ambulance operations. Your state and employer will likely have additional specific requirements for emergency vehicle operations training (Figure 1-5).

In addition to performing a daily maintenance check on your vehicle, you will also be responsible for having an adequate amount of required equipment and supplies. Once you arrive at the scene, the equipment and supplies you need to assess, treat, lift, and move your patient must be available in the proper quantities and sizes, be in good repair, and be organized so you can locate them easily.

Safety

EMS providers have substantial responsibility for their own safety, and the safety of coworkers, patients, and others. Your safety and that of your coworkers includes many factors. You must drive safely and avoid dangers at the scene. Such dangers include highway traffic, leaking chemicals, downed power lines, and violent patients and bystanders. You must also avoid exposure to communicable diseases by using Standard Precautions (see Chapter 3), including appropriate personal protective equipment (PPE).

Patient safety involves many considerations. The same scene hazards that pose a threat to you also pose a threat

to your patient. Errors by medical personnel account for between 44,000 and 98,000 patient deaths annually. Tens of thousands of additional patients are harmed by medical errors each year. The costs associated with medical errors are between \$17 billion and \$29 billion annually (IOM, 1999). Decreases in the incidence of key safety indicators targeted for improvement suggest that attention to the causes of errors can improve patient safety but that rates of harm remain high (AHRQ, 2015).

Many medical errors occur in the administration of medications, which points to the importance of the Advanced EMT's adherence to safe medication administration practices. Patients can be harmed in ambulance collisions as well. They can be dropped or improperly handled during lifting and moving. They may be assessed or managed improperly (O'Connor, et al. 2002) (Table 1-3). Harm can also come to patients when there is a miscommunication about a patient's condition and treatment. This text places great emphasis on the knowledge, skills, and attitudes required for safe Advanced EMT practice (Table 1-4).

You must be aware of the safety of the public while operating an emergency vehicle and the safety of others at the scene of an emergency. Family members and bystanders who are distraught or distracted by the emergency may not be aware of any nearby danger. You must provide direction in order to keep them out of harm's way.

Table 1-3 Select EMS Tasks with High Risk for Errors and Patient Injury

- Transferring care from one provider to another at the scene or at the hospital
- Communicating, either in writing or verbally
- Identifying and using medications
- Assessing and managing the airway
- Lifting and moving patients
- Responding and transporting by ambulance
- Assessing the need for and taking spinal precautions

Source: O'Connor, R. E., C. M. Slovis, R. C. Hunt, R. G. Pirallo, and M. R. Sayre. 2002. "Eliminating Errors in Emergency Medical Services: Realities and Recommendations." *Prehospital Emergency Medicine* 6, no. 1: 107–13.

Table 1-4 Ways to Minimize the Risk of Mistakes and Patient Injury

- Maintain current knowledge and competence in skills.
- Make the environment as conducive as possible to quality care (maximize space and light, minimize distractions).
- Have a clear understanding of protocols.
- Organize drugs to minimize mistakes.
- Reflect on actions and question assumptions.
- Obtain feedback on performance.
- Ask for help when needed (contact medical direction, consult with your partner).

Source: O'Connor, R. E., C. M. Slovis, R. C. Hunt, R. G. Pirallo, and M. R. Sayre. 2002. "Eliminating Errors in Emergency Medical Services: Realities and Recommendations." *Prehospital Emergency Medicine* 6, no. 1: 107–13.