CHAPTER 2

Crew Resource Management

LESSON OBJECTIVES

- Discuss crew resource management.
- Identify human errors and unsafe actions.
- Model effective communication.
- Demonstrate situational awareness.
- Differentiate leadership and followership responsibilities.

Scenario

You are working the night shift as a field training officer, and your partner is a "newbie." Your unit is dispatched to a patient in respiratory distress. On your arrival at a single-family home, you are directed upstairs where, in the back bedroom, you find a 44-year-old man in severe respiratory distress. The patient is morbidly obese, at over 500 pounds. He is sweating heavily, unable to speak in full sentences, and a quick assessment of his lung sounds shows bilateral crackles.

While you and your partner are having a quick discussion on the best course of treatment and how you are going to move the patient safely to the ambulance, the patient goes into respiratory arrest. You realize there are a dozen things that need to be done immediately, including managing the patient's airway, figuring out how to get him out to the ambulance safely, and dealing with his upset family.

Your partner contacts the dispatcher and requests additional resources. Shortly, a fire engine, two police cars, and another ambulance show up to assist you. An EMS supervisor is en route as well. The fire captain tells you that they are going to bring in a rescue company to move the patient. A member of the ambulance crew argues that the patient should be moved immediately. His partner begins arguing with the patient's mother about which hospital the patient will be transferred to, while the police officers are trying to usher the rest of the family out of the bedroom.

1. What are your primary nonclinical priorities?
2. What is one of the best tools you have at your disposal to manage the scene?
3. How do you deal with conflicting opinions on the best course of treatment?

Introduction

Emergency medical services (EMS) practitioners need to speak up when it comes to safety because poor communication, weak teamwork, and bravado are the top causes of injuries and line-of-duty deaths. So the question is, why don't we, as EMS practitioners, speak up when we see something out of place or have an alternative solution based on previous experience? All too often, EMS has created an environment where the communication path travels in one direction, from the senior authority on down to the trainee. In addition, EMS practitioners may not speak up because of a fear of being wrong, reprisal, and embarrassment. By implementing crew resource management, EMS agencies can ensure that communication paths remain open and that all EMS practitioners at every level of position and experience feel empowered to communicate. The collective goal is safety and for all EMS practitioners to be engaged and responsible for the safety of their partners, their crew, and their patients.

Crew Resource Management

Crew resource management (CRM) is a tool originally instituted by NASA and the airline industry in the 1980s to optimize performance and outcomes by reducing the effect of human error through using all available resources. After the UAL Flight 173 airline crash on December 29, 1978, in a residential area of Portland, Oregon, which killed 10 people, the airline industry developed CRM training for their airline crews (**FIGURE 2-1**). This collision occurred due to human error, and better communications could have prevented it. When the landing gear light failed to illuminate, the pilots delayed landing while working on a solution. In the meantime, they were not monitoring their fuel reserves and they ran out of fuel and crashed!

FIGURE 2-1 Crew resource management was instituted by the airline industry in 1980 after the UAL Flight 173 crash to improve collective situational awareness and communication among the airplane's crew.

The goal of CRM training is to enable high-performance teams, such as airline or ambulance crews, to achieve and maintain collective **situational awareness**. Like the airline industry, mistakes in EMS can be fatal, and thus implementing techniques to reduce risk leads to better outcomes. Situational awareness is the state of being aware of what is happening in order to understand how information, events, and a person's actions will affect his or her goals and objectives, both now and in the immediate future. Although we often equate situational awareness to scene safety, CRM applies to all surroundings, including procedures performed while caring for patients. Although the individual is typically the root cause of errors, processes also need to be examined to ensure that tools are in place (i.e., policies, procedures, and information like hardware/software/humanware) to minimize errors and reduce negative consequences.

CRM has been adopted by many **high-reliability organizations (HROs)**, including EMS, fire services, the Coast Guard, and air medical services, to reduce injuries and accidents and improve patient care. HROs are organizations that operate in high-risk environments, such as those associated with law enforcement, fire and EMS, power and utilities, chemical factories, health care, and air traffic control. A common trait among HROs is that their margin for error is minuscule, and the fallout from an adverse event could be disastrous. Critical HRO components include mindfulness, an inclination toward inquiry and doubt as a means of evaluating and updating standard procedures, attention to the complexities of an emergency incident, commitment to resilience, and a willingness to defer to expertise.

Lessons Learned

CRM lessons learned through incident investigation reveal that errors are not random. In fact, they can be predicted based on previous near misses. Even though most errors are unintentional, errors are nonetheless predictable. Although the contributor to the error may not intend harm to anyone, mistakes in the EMS profession can lead to injury to patients or to our partner. Errors arise from poor communication, poor teamwork, and not paying attention. Tracking of near misses and errors can lead to a better understanding of behavior and lead to solutions. In 2017, it was noted that over 251,000 deaths were a direct result of medical error. We could reduce deaths and injuries by mitigating errors.

For example, checklists, a tactic of CRM, are used to ensure all equipment is present in the ambulance and in working order, thus mitigating equipment failure—or missing equipment—as an error.

In the Field

One of the elements the airline industry developed to combat complacency is the checklist. A pilot may have 10,000 hours in the cockpit with zero adverse events, but before every takeoff and every landing, he or she reviews the proper procedures using a checklist that details the steps that must be completed to ensure a successful takeoff, flight, and landing. This is something that EMS practitioners should adopt when performing high-risk or complicated procedures such as rapid sequence intubation (RSI).

Additional checklists are used for key parts of procedures, complex care bundles, looking for high-risk factors in patient refusal, or in the nontransport of stable patients.

Over the last 20 years, fatal accidents in the airline industry have reduced significantly. Two examples with the presence of CRM include UAL Flight 232 and USA Flight 1549. In the UAL Flight 232 crash on July 19, 1989, the hydraulics system failed, leading the pilots to make an emergency landing in Sioux City, Iowa, at the airport. There were 185 survivors and 112 fatalities. Without the skill, experience, and communication between the crew, the number of survivors would have been zero. In the USA Flight 1549 crash on January 15, 2009, Captain Chesley "Sully" Sullenberger landed in the Hudson River following a bird strike. All 155 passengers and crew survived—a prime example of success through using a checklist, team communication, and situational awareness.

Human Error

Incident investigation finds that errors are not random in EMS. People cause accidents by making errors. Errors arise from poor communication, poor teamwork, and not paying attention. EMS practitioners can reduce deaths and injuries by mitigating errors. One of the basic goals of CRM is to reduce errors, because errors are costly to both an EMS agency and EMS practitioners. In the event of a collision, the EMS agency may lose the use of the vehicle or incur the cost of repairs, lawsuits, and workers' compensation claims. If an ambulance crew member is injured, he or she may suffer lost wages or a permanent disability.

In 1990, British psychologist James Reason created the Swiss Cheese Model (SCM) of accident causation to show how accidents occur (**FIGURE 2-2**). The model is a strategy used to address the risks associated with a systems approach to patient safety. Each slice of cheese is viewed as a plan or safeguard, and the holes

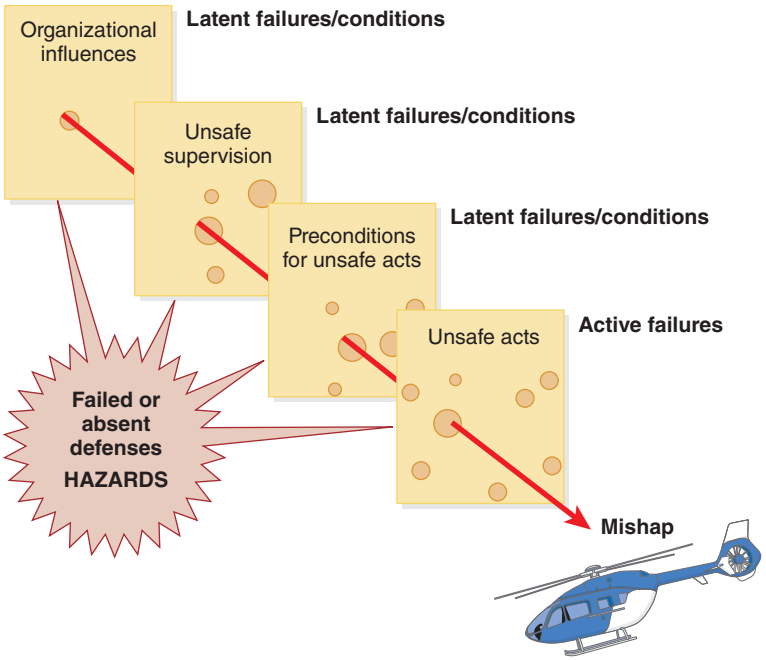

FIGURE 2-2 The Swiss Cheese Model.

Reproduced from Reason J. *Human Error*. Cambridge University Press, Cambridge, UK. 1990.

are examples of hazards or errors that could potentially lead to harm in a patient. Errors could include failing to follow appropriate procedure, individual decision making, or system-wide failures. These layers of "cheese" are staggered and allow an error to get through one hole but be caught by the following mitigation system in place. However, disaster strikes when all the holes align. The use of training, policies, situational awareness, tracking of near misses, checklists, and other recommendations discussed in this chapter will ensure that human error is avoided before a situation ends in patient harm.

In the Field

James Reason's Swiss Cheese Model includes the following "slices":

- Education
- Training
- Policies
- Technology
- Communication
- Checklists

How do these elements align in your agency? Do you see the potential for an error to slip through the holes?

Situational Awareness

Situational awareness has three primary components: (1) an awareness of the surroundings and how individuals are supposed to interact with the surroundings; (2) the reality of the situation; and (3) individual perceptions of the situation. Situational awareness is an internal active evaluation process that goes on constantly, much like scene size-up. EMS practitioners must update their situational awareness constantly by observing their surroundings, evaluating their options, and communicating with those around them.

The dynamic, fluid emergencies that EMS practitioners respond to require that they maintain the absolute highest state of alertness and attention at all times (**FIGURE 2-3**). Because EMS practitioners are human, loss of situational awareness does occur. This loss of situational awareness is common when EMS practitioners perform routine tasks in familiar surroundings. Later, as EMS practitioners gain experience, they often pay less attention to the mundane details of everyday operations. However, these details can become important as a situation becomes complex.

FIGURE 2-3 The chaotic and complex emergencies that EMS practitioners respond to require that they maintain the absolute highest state of alertness and attention at all times.

Maintaining situational awareness is a skill that can be taught. The following essential behaviors help teams maintain situational awareness:

- Asking yourself, "What can go wrong?" This should be a challenging question. What poses the biggest risk? What is the smallest risk? What would happen if either of those things occurred? How would you work with your team to regain control of the situation?
- Reducing the opportunity for unnecessary distraction. On the way to the call, cell phones should be off, and you should be focusing on the information that dispatch has shared (**FIGURE 2-4**).
- Regularly stating the primary mission of the team. Once distracted, a team can head off in a direction that results in a critical loss of situational awareness. This is directly tied to the concept of "Who's flying the plane?" Pilots know that regardless of the number of distractions, their primary mission is still to fly the plane. In a medical context, this can be stated as: "Let's bag the patient. X, A, B, C, let's not forget the basics."

The following are several of the more common factors that lead to distraction or loss of situational awareness. *These* **unsafe actions** *can lead to errors, injuries, death, and destruction!*

- **Ambiguity.** Ambiguity refers to something that can be interpreted in multiple ways. Team members who make ambiguous statements are usually trying to make sense of their surroundings or the situation. They often see something that does not fit, and their statements are designed to express concern without overtly stating that they do not know what is going on. Pay attention to random,

FIGURE 2-4 Emergency vehicle operators should be completely focused on driving, not distractions such as cell phones.

Courtesy of Sunstar Paramedics.

In the Field

Ambiguity can also be a problem when different agencies use different signals, procedures, or terms. Sometimes this can even occur within the same organization. For instance, an EMS practitioner might be asked to "give 10 of Benadryl." Did the sender mean 10 milligrams or 10 milliliters? In most cases, the difference in meaning is significant and needs to be clarified.

The best way to deal with terminology issues is for team members to practice repeating back what they think they heard or what they understand to be correct, not exactly what the person said. "I understand you want 10 milliliters of Benadryl, or 50 milligrams. Is that correct?" For procedural differences, it is best in advance of any incident to collaborate with various agencies to standardize regional practices and procedures, particularly those related to safety.

ambiguous statements and "close the loop" by asking for clarification. "What specifically is your concern? What do you see that is bothering you?" These types of questions help provide clarity and understanding. Ambiguous statements can also include inconsistent terminology, which is why it is vital to use plain text instead of slang when speaking (be clear and concise, avoiding jargon and specialized terminology). Ambiguity in situations must also be brought out and clearly stated. For example, if it is not clear who is responsible for picking up the gear at the end of a call, ask, "Would you like me to pack up?" Clear communications will avoid leaving equipment behind on scene. Another example is protocols with different drug dosages (e.g., dosages that are weight based). Medication errors are extremely common in health care. Effective communication to include clarifying drug dosages (e.g., echo back to medical control) with practitioners could prevent errors. If a statement or situation appears ambiguous, work to provide clarity.

- **Fixation.** Fixation is common when there are multiple distractions. In fact, one method humans use to improve performance is to consciously block out things that are not directly tied to their primary objective. On the other hand, a preoccupation or focus on one item, excluding all others, is often referred to as tunnel vision. In EMS, this can take the form of EMS practitioners paying so much attention to one procedure that they ignore other important cues—for example, treating the bleeding from a knife wound but not considering who stabbed the patient and whether the perpetrator is still present on scene. Another example would be treating a critical patient involved in a motor vehicle collision on a busy highway and not considering the risk posed by continued traffic.
- **Distraction.** Distraction is something that interferes with concentration or takes your attention away from the task at hand. Dealing with distraction is an skill developed over time. EMS practitioners need to regularly ask about the removal of distracting elements. Will removing certain elements reduce their overall situational awareness or contribute to their ability to concentrate on the most important tasks and objectives? For example, while driving, is the emergency vehicle operator distracted by the radio, mobile data terminal (MDT), cell phones, GPS or electronic mapping systems, conversation with a partner, or his or her emotions? Or are they distracted by nontangible things like coworker disputes, financial concerns, and relationship concerns? Failure to handle a distraction effectively could lead to errors. A simple action such as cutting down on excess noise and nonessential conversation (implementing a sterile cockpit) could improve your overall situational awareness or contribute to the ability to concentrate on the most important tasks and objectives. It is easy for EMS practitioners to pull their phone out "just this once" or take their eyes off the road to glance at something on the MDT. However, these distractions, even when only a few seconds, can put the crew and the patient's safety in jeopardy, potentially leading to a fatal crash. In 2018, 3.2% of drivers in the United States reported

using a handheld device while driving. In that same year, distracted driving led to 276,000 injuries from collisions. Does your organization have a policy against using a mobile device while driving? Employers could be held responsible for employees who are distracted or fatigued while driving in some regions.

In the Field

Another concept developed by the airline industry is the "sterile cockpit," which is meant to minimize distractions and help maintain focus on critical tasks. In the sterile cockpit, during key points in the flight, such as takeoff and landing, the sole focus of the pilots' attention should be on the task at hand. To apply this to EMS, when the emergency vehicle operator is driving, his or her focus should be purely on driving the vehicle. The emergency vehicle operator should not be distracted by navigating or radio chatter. This sterile cockpit concept is also employed by many paramedic services when conducting critical procedures such as rapid sequence intubation (RSI) where timing and drug dosing are critical to success. It can also be used for extrication calls or calls with the potential for violence.

- **Cognitive overload.** To overload is to give someone too much work, stress, or other difficulty. Overload can be in the moment, such as a critical patient requiring critical decisions, or over time, with stress building without the perception of support. It is often said that if something needs to be done, give the job to a busy person, but this is a dangerous tactic in EMS. The workload needs to be balanced between team members whenever possible. For example, an emergency vehicle operator should be focused on the road, not talking to dispatch or navigating. Overload might refer to task overload, emotional overload, or information overload. When a person starts to experience information overload, a self-protective mechanism kicks in, and the mind starts shutting down; if the mind is no longer paying attention, details may be overlooked. People can only manage five to seven things at any given time. Think of these as slots in the mind; once they are full and another is added, something is going to drop off. The more we have going on, the more we are likely to forget something or have it drop off our radar. Although we may not always be able to reduce the number of tasks we are juggling, it is worth recognizing that the more things that are going on, the greater the chance of an error occurring. Sometimes a response to overload is a noncaring attitude similar to burnout. When this occurs, it is time to slow down the momentum ever so slightly and prioritize. "Okay, what needs to be done next?"

In the Field

Errors can occur when someone is task overloaded, so constraints must be put in place to prevent this from happening. A simple strategy is to divide the workload into manageable parts. This promotes teamwork, provides an increased margin of safety, and encourages strategies for handling overload. For example, think of the number of items you need to monitor with a critical patient: assessment, cardiac monitor, IV pump/drip, medication administration, patient's family, hospital report, and so on. Consider adding an additional practitioner to help you. Whenever possible, make sure you have the correct resources and necessary personnel.

- **Complacency.** Complacency refers to a sense of satisfaction that is accompanied by an ignorance of potential or present danger or deficits. In EMS, complacency can be understood as a false sense of security or comfort that masks possible risks. Basically, it is the idea that everything is running smoothly, so there is no need to check on things (e.g., all the equipment is usually in the ambulance, so I don't need to check each time). Of course, few people come to work wanting to be labeled as complacent. However, in accident reports, complacency is often listed as a cause. Complacency itself is not an accident cause; it is an effect. It is the effect of having a sense of comfort with certain routine procedures or practices. These procedures or practices are done so often and within the same environment that EMS practitioners often lose sight of their importance (e.g., "pencil whipping" the shift checklist). This is especially evident with safety practices that are allowed to go unchecked, such as seat belt use, appropriate glove use, and use of personal protective equipment.
- **Improper procedures.** Ideally, standard operating procedures (SOPs) are designed to keep EMS practitioners and their patients safe. Vigilance is needed to combat the urge to take shortcuts from those SOPs or do it "my way." Such an attitude not only puts EMS practitioners and the patients at risk for potential injuries but could also put the EMS agency and EMS practitioners at risk of litigation.

In the Field

A tragic example of complacency was NASA's space shuttle orbiter Columbia disaster on February 1, 2003, which killed all seven astronauts aboard the craft. The final report cited NASA's organizational culture as equally responsible for the disaster due to complacency and discouraging dissenting opinions. Although NASA is safety conscious, the constraints of having to meet the busy shuttle mission schedule led to more risk taking. A piece of foam had fallen off the shuttle's external fuel tank during launch. The foam struck the left wing, causing serious damage and ultimately led the craft to disintegrate when reentering the Earth's atmosphere. Pieces of foam had fallen off shuttles on other launches without danger to the crew. Although the occurrence had been raised previously as a safety concern, a sense of complacency was present because of the previous missions' successes.

In EMS, how might complacency apply to getting units back in service, getting back to training, or getting back to dinner or shift change in your organization?

If SOPs are not being followed, does behavior need to be changed or do the SOPs need updating? Policies and procedures spell out what EMS practitioners are expected to do in certain situations, and in some cases, they only provide a framework to achieve a goal or objective.

Remember, policies cannot address all of the subtle differences that occur in emergency situations. Experienced EMS practitioners must determine the best method for implementing procedures that are designed to help them achieve a good outcome and should not be afraid to consult with medical control as needed.

In the Field

In January 2006, David Rosenbaum suffered a critical head injury during a mugging in Washington, D.C. Firefighters and EMTs responded and found him unconscious on the sidewalk. He was quickly assessed and incorrectly assumed to be intoxicated and without associated injury. This complacent assessment and failure to follow protocol resulted in a significant delay in Mr. Rosenbaum's transport and treatment. Mr. Rosenbaum, a prominent *New York Times* reporter, later died of his injuries. The national media took interest in the case because it seemed to highlight the issue of complacency in EMS.

In the Field

One example of not following SOPs was that of a nurse working at Vanderbilt University Medical Center (VUMC) in Nashville, Tennessee, who made a series of inadvertent medication errors resulting in a patient's death and an alleged coverup. The January 2019 Centers for Medicare and Medicaid Services (CMS) Deficiency Report established that the hospital had failed to provide standard hospital-wide safe medication practices that could have detected the medication error and prevented the death. The nurse admitted to accidentally selecting vecuronium instead of Versed (midazolam) from an automatic dispensing cabinet in override mode. This is an example of safety controls that are in place to prevent medication errors, but which can be overridden and still cause harm to a patient. Medications are common in EMS, and safety checks should be implemented to prevent such a tragedy. Policies should include a complete medication safety check before administering medications. Medication dosage accuracy should be determined by doing the math and checking it. As the construction industry would say, "Measure twice and cut once!"

- **Unresolved discrepancies.** EMS practitioners need to pay close attention to managing conflict. In many cases, the conflict is communications based. Conflict can be a normal, helpful part of collective problem solving if it is managed correctly. This means ensuring people are heard, repeating the message back to ensure it was heard correctly, and maintaining respect among team members. If there are conflicting conditions, team members must call attention to the conflicts so that shared understanding of the priorities and goals can develop.
- **Not focused or "no one is flying the plane."** The chief purpose of employing CRM principles is to provide collective situational awareness to the team. Although CRM relies on teamwork, CRM is not team decision making. Every team needs an identified leader who can make decisions. Teams

In the Field

EMS agencies should develop concise procedures for unusual occurrences (**TABLE 2-1**). Having a detailed procedure written ahead of time and staff trained on these procedures reduces the likelihood of deviation and the resultant negative consequences.

TABLE 2-1 Special Situations Requiring SOPs

Helicopter responses	Weapons of mass destruction
Large-scale incidents	Large venues
Special populations	Natural disasters
Improvised explosive device responses	Hazardous materials
SWAT requests	Fires

In the Field

Maintaining situational awareness is a continuous process as the surrounding environment changes. We need to be cognizant of the clues that tell us change is about to happen—a large crowd forming around us as we treat the patient or the changes in the rhythm on the ECG monitor.

without leaders tend to wander among options, with no one person assuming responsibility for the team's actions or the outcome. "No one is flying the plane," occurs when everyone is too busy discussing decisions as opposed to making decisions. A worst-case scenario is when no one is maintaining situational awareness and/or managing resources. The team provides open, honest, respectful input, but the leader decides on the course of action.

Error Reduction Strategies

We have shown that errors are not random in EMS (or any other high-reliability organization) and that people cause accidents through errors. Errors can arise from poor communication, poor teamwork, not following procedures, or not paying attention. Prehospital morbidity and mortality could be reduced by preventing errors.

TABLE 2-2 Error Reduction Strategies

1	Maintain a high level of proficiency.
2	Follow high-quality policies and procedures.
3	Speak up.
4	Minimize distractions.
5	Plan ahead.
6	Maintain situational awareness.
7	Use resources effectively.
8	Practice avoidance.
9	Limit redundancy.

Personal Strategies: Error Reduction

There are personal strategies for error reduction, as listed in **TABLE 2-2**. First, maintain a high level of proficiency in your knowledge and skills. Follow high-quality policies and procedures by training on your protocols and SOPs to avoid discrepancies. If there is any confusion, ask your supervisor or medical director to clarify any protocols you think are vague or confusing. Have open communications and ensure that everyone on the team knows that he or she can call a safety timeout if things are not clear. Do not be afraid to speak up. If you see something wrong, announce it before an error occurs. For example, if a lifting and moving plan is not clear, you should stop before "Ready, one, two, three" is called to clarify your role.

Minimize distractions to allow yourself to focus on the task at hand and use the concepts within CRM to maintain situational awareness. Reduce the noise level, but talk as necessary. Plan ahead by knowing your area as well as your vehicle, and recognize any areas of weakness. Keep two hands on the wheel and your eyes on the road and maintain situational awareness when driving. Always pay attention and have an escape route. Use resources effectively. Wear your safety vest on the scene and block the roadway scene with your apparatus. Use job aids for high-risk/low-frequency tasks and conduct

medication checks on all drugs. Recognize that technology has its limitations, and unless the equipment is properly maintained, it will not function correctly. Practice avoidance by avoiding (known dangerous areas, intersections, blind turns, etc.) as much as possible. Limit redundancy by creating layers of safety precautions as a fail-safe (e.g., drive defensively and always wear seat belts). Finally, accept that most errors are human errors, which is why it is critical to be a high-functioning member of a high-functioning team.

Job Aids

Job aids are critical tools for practitioners and can easily be created or downloaded to fit the service needs. Having a chart in the ambulance could serve as a reference, resulting in more accurate assessments and improvements in care. Consider downloading the following: a table of the Glasgow Coma Scale (GCS) values for adults and children, the rule of nines chart for adults and children, an RSI checklist following your protocols, and a table of drug dosages for specific weights and the amount of fluid that would be drawn up. Most regional or state EMS systems have downloadable protocols as a resource. Having such a resource to refer to helps simplify tasks like weight-based medication calculations when done under the stress of an EMS call or with decreased sleep. Interestingly, the rule of nines is the most-used algorithm employed by healthcare personnel. Despite this, studies report that in patients with burns that are 25% to 35% total body surface area (TBSA), the TBSA is overestimated by 20% by healthcare practitioners when compared to computer-based applications. This overestimate puts patients at risk for volume overload during fluid resuscitation. Multiple studies have also shown that, instead of 1% TBSA, the patient's palm excluding the digits is approximately 0.5% TBSA and 0.8% TBSA when the digits are included.

In the Field

The Glasgow Coma Scale has been reported to have discrepancies in application. A study reported that prehospital and hospital practitioners agree on the same GCS scores in only 32% of patients. The eye component was the most accurate at 74% agreement. The motor component was at 72% agreement, and the verbal component was the least accurate, at 55% agreement.

Data from Gill MR, Reiley DG, Green SM. Interrater reliability of Glasgow Coma Scale scores in the emergency department. *Ann Emerg Med*. 2004;43(2):215–223. doi:10.1016/s0196-0644(03)00814-x

Attitude

Having a good attitude is an overlooked error reduction strategy, even though hazardous attitudes cause catastrophes! EMS practitioners should control their attitudes and should beware the attitudes of others. Red flags for potential problems in this realm include comments like the following:

- "I know what I'm doing."
- "I'm better than anyone else here."
- "I've done it this way many times before, and nothing bad has ever happened."
- "I outrank you."
- "This is the way we have always done it."

Often these comments are made in high-stress environments and have poor outcomes. Anytime a safety concern is raised, it should be addressed. You may find that the action may still take place, or the order may still need to be followed, but when an unsafe action is recognized, it must be noted.

Effective Communications

Communication skills are vital to success in any situation. Communication is like a game of tennis (**FIGURE 2-5**). To be successful, both the sender and receiver have responsibilities.

FIGURE 2-5 Communication can be like a game of tennis, with the tennis ball as the message going back and forth between sender and receiver.

© Talaj/Shutterstock.

Sending the Message

When sending the message, the communication must be clear, concise, and informative. There are many barriers to effective communication. Language, accent, gender, and rank can all play a role in how a message is sent and how it is received.

Receiving the Message

When receiving the message, you must: listen carefully and be receptive, confirm what is being said, and ask for clarification as needed. It is okay to ask, "Can I get clarification on . . ." Finally, observe the speaker's body language. Do not assume that all communication is spoken; nonverbal communication—posture, eye contact—plays an important role in conveying a message.

In the Field

When you are communicating, keep the following questions in mind:

- Did you hear what was said? Can you confirm what is being said?
- Did you listen carefully? Are you being receptive?
- Did you repeat back what was said?
- Are there language barriers?
- Is everyone using the same terminology?
- Are you asking the right questions?
- Are you being passive or aggressive?
- Did you ask clarifying questions?
- Can you provide an update if there is information anyone is not aware of?

Creating a Just Culture

Just culture is a systems approach to accountability. It brings a focus to *what* went wrong, rather than who is at fault. One of the intended consequences of just culture is to develop an environment in which employees feel comfortable speaking up when they notice something wrong or have made an error themselves.

We all need to speak up when it comes to safety. Poor communication, weak teamwork, and bravado are the top causes of line-of-duty deaths and injuries in the field. Most incidents resulting in injuries are predictable and could likely be recognized using a team approach. In later chapters of this book the just culture concept will be expanded and reinforced.

When groups of competent, trained individuals get together to solve problems, they typically define the issue and then deploy a combination of "humanware," software, and hardware to solve the problem. In this context, **software** implementation can be rewriting training manuals or procedures or developing checklists and policies. **Hardware** solutions can take the form of the use of computers, vehicles, tools, medications, or protective equipment. The **humanware** component consists of those people who are part of a team and have been directed to solve a particular problem—for example, a patient in respiratory arrest. EMS agencies with open communication and that embrace respectful and informed feedback as a method for encouraging collective situational awareness develop skills for their humanware to solve complex problems effectively within dynamic environments—for example, an ambulance crew working together to assess and care for a patient in cardiac arrest in the crowded chaos of a county fair. Essentially, EMS agencies that practice CRM build up the communication skills of their EMS practitioners and ingrain these skills into daily practice.

Simply embracing an open communication environment and encouraging collaboration does not address all of the differences in individual behavior and communication styles. An experienced and seasoned EMS practitioner who is part of a problem-solving team understands that he or she will make little progress if the human team members are unable to communicate effectively.

In the Field

The success of CRM depends on its acceptance by the entire EMS agency. To ensure that every EMS practitioner starts and stays on the same page, laying a solid foundation in the tools of CRM is necessary. This foundation includes training personnel in the techniques of open and respectful communication, developing a comprehensive approach to identifying and tracking errors and mistakes, educating and training personnel in conflict management, and instituting regular and recurring critiques so that members can learn from each other.

Situational Awareness

Situational awareness is an internal active evaluation process that goes on constantly, much like size-up. EMS practitioners must update their situational awareness constantly through the following means:

- Observation
- Communication

In the Field

When an EMS agency needs to determine who should be driving the ambulances, the decision should not be made in a vacuum. Safety managers may review existing policies (software), use driver simulation systems (hardware), and review driver performance under direct observation (humanware). They may also look at support agencies for recommendations on how to evaluate a safe driver—for example, an insurance carrier.

FIGURE 2-6 CRM is used by high-performance teams, such as EMS, to reduce injuries and accidents through teamwork and open communication.

- Alertness
- Full attention
- Perpetual vigilance
- Recognition of perception versus reality

Traffic accidents continue to be one of the most dangerous places for the EMS professional. Many agencies dedicate one responder to monitor traffic on scene and alert responders if traffic is getting dangerously close to the scene or if a distracted driver is approaching their workspace. Most crews have a "safe word," which when spoken over the radio is an indication for everyone to seek shelter.

There are three primary components of situational awareness:

- Awareness of the surroundings and how individuals are supposed to interact with the surroundings. A highway incident is a good example where crew are focused on patient care and not on the changing traffic patterns.
- The reality of the situation. You must ask yourself, "What exactly is going on?" Everyone has their safety vest on and the traffic is still flying by.
- Individual perceptions of the situation. Dangers are not just on the roadway! Beware the mundane calls, too. For example, consider a patient in a nursing home who is "altered." Don't assume it is due to dementia, as it could be many other things that might endanger you or the patient.

Teamwork

Within high-performance teams, regular use of CRM to gain a shared understanding continually improves performance (**FIGURE 2-6**). Specifically, when teams practice communication techniques that are designed to share understanding, members have opportunities to build team discipline, broaden the knowledge base of individual team members, and remove boundaries to learning. Additionally, CRM can establish trust and respect within teams, reduce the chance for error caused by distraction, and encourage collective situational awareness.

Because CRM is an interactive process, the roles of each team member must be clearly communicated. It is also vital to know who is leading the team. In CRM, although every team member's voice is important, and each person's role is vital to the team's success, there is one leader.

Team members should understand each other's roles and responsibilities. By "cross-pollinating," team members learn whom to turn to when specific problems arise, reducing the risk of one team member reaching the point of task overload. By sharing what their roles are with each other, team members become more likely to speak out if someone becomes overwhelmed by tasks or if they believe a fellow team member may have missed a cue that is important to his or her individual task and the team's collective success.

Conflict and Respect

Good teams develop a level of trust that goes beyond technical expertise. They actually come to understand the importance of collectively solving problems, and they value the diversity of opinions within the team. Diverse opinions, in any team, lead to some level of conflict. In this context, conflict is not bad. Instead, the success or failure of a team often depends on how the team manages conflict and whether team members are able to benefit from conflict by using it to outline strategic differences.

The trust developed within a team using CRM is based predominantly on the core value of respect. Every team member, when confronting an idea, action, order, or behavior, must exhibit respect for his or her fellow members regardless of rank, position within the team, or level of expertise.

Leadership Skills and Followership Responsibilities

Leaders can become leaders based on a legal statute or position of authority (e.g., EMS chief), or an EMS practitioner can assume a leadership role based on ability. The core behaviors of an effective leader are as follows:

- Envisioning goals and setting clear objectives
- Delegating authority and resources
- Taking responsibility
- Gaining commitment and motivating the team
- Maintaining situational awareness
- Understanding individual and team limitations
- Possessing the ability to adjust to the situation
- Valuing team diversity in experience and ideas
- Having the ability to listen and communicate clearly

In the Field

Knowing the limits or the strengths and weaknesses of the team and its members will allow leaders to capitalize on the team members' strengths and minimize the effects of any weaknesses. Lifting and moving is one example. If one team member has greater upper body strength than another, that will impact the positions that each member takes during a lift.

Most teams are created for a specific purpose—to get something done. The team leader typically needs to consider the number and types of objectives, their clarity, and their priority, with input from team members. Because there are often competing objectives and multiple methods for achieving them, effective leaders communicate what they perceive to be the priorities and then ask for input. They set a direction for the team. This ability requires the following skills:

1. Leaders have to model the actions they expect to see.

   A leader should implement effective resource management and use good communication as well as develop and follow organizational policies and procedures.
2. Leaders must be able to get the team's attention and hold it while distractions occur.

   Gaining and holding the team's attention can be done using hierarchy (the leader's authority position), but a leader usually has more success by employing subtle people skills. For example, some leaders have been very successful in getting and holding the team's attention by using steady eye contact and a quiet, calm tone of voice that requires the team members to listen actively. This method also can help reduce the tension level.
3. Leaders must be able to gain situational awareness, identify goals, and set specific and achievable objectives.

   Strong leaders understand that goals can be identified only after they have a sense of what is happening and what needs to be done. Situational awareness in a team environment requires activating a feedback loop: asking for input, requesting updates, and checking in with each individual. An important point to remember is that leaders should expect to receive unpleasant information if they openly ask for input. The news they receive may not be what they anticipate, yet it is critical that leaders maintain a sense of active curiosity, particularly if they perceive something differently from how a reporting team member perceives it.
4. Leaders must have the ability to ensure that all team members understand the team's stated goals and objectives.

   Misunderstandings are common in team communication. Good leaders desire a shared understanding among team members in which goals and objectives have a common definition. Leaders can achieve shared understanding by asking team members to restate the specific goal or objective. Questions such as "What do you think we need to do now?" help provide clarification, particularly if the goal includes multiple steps or requires the involvement of other teams for a successful outcome.
5. Leaders should share information. Often a decision is based on a lot of participation. However, that is not always known by those who are following, and this can lead to distrust.

Followership is a term for the personnel following a leader. Not everyone can be a leader; some people have to be followers, and this should not be taken as a negative sentiment. All good leaders have high-performance followers. The followers enable the leader to focus on the big picture. Followers also have

FIGURE 2-7 A focus on teamwork is essential for success.

a role to be prepared, engaged, and focused members of the crew. Just as leaders have responsibilities, so do followers, including these actions:

- Ensuring safety
- Accepting and following directions
- Being prepared physically and mentally
- Recognizing limitations of self and others
- Focusing on teamwork
- Having a positive attitude
- Being flexible

Success depends on the entire team, not just the leader (**FIGURE 2-7**). After all, it is the followers who will implement the leader's plans and act as additional eyes and ears.

Look at a typical emergency services organizational structure. There is a chief, and this individual sets the direction for the agency and sets the tone on the importance of safety in the field, with clear preventive policies and procedures. It is the responsibility of the "followers," or the deputy chiefs, to implement the chief's directions via policies and protocols. The field staff, who are also followers, actually ensure that preventive policies and procedures are implemented on a shift-by-shift basis. Without followers, preventive policies and procedures will not succeed.

Remember, a leader without people following is just a person out taking a walk.

Open Communications

The typical CRM model contains several key elements, all of which are integral to gaining a shared understanding in a culture of learning and mutual respect. These elements are inquiry, advocacy, conflict resolution, decision, observe and critique, and discuss options. In a typical incident, these elements are used in a seamless communication process. Once the steps have been practiced, team members often do not consciously walk through each one; instead, they use the process automatically, as part of the fabric of an open communication model that allows a shared understanding among team members.

The first step in the CRM circle of successful communication is inquiry. Good practices during the inquiry phase include aggressive listening skills, allowing an environment in which respectful commentary is accepted, and carefully intervening to ensure that the question is heard correctly.

An inquiry typically comes across in one of the following forms:

- A statement by a team member or the team leader: "This is our objective, to lift this patient up this staircase, and here is how we are going to do it."
- An order from medical control: "Give 50 mg of Benadryl IM."
- An action: A team member, leader or otherwise, performs an action that draws the attention of other team members.

All team members should remember that a statement is declarative. If a statement is made by a superior or someone with more experience or expertise than the team member on the receiving end of the spoken message, the receiver often misunderstands the statement as an order or a demand. However, it is important for team members to understand that statements are simply declarations of fact or observation and that they can still be questioned.

One of the most common errors made at the inquiry stage results from miscommunication associated with coherence. **Coherence** is associated with how well the receiver understands the message. Coherence is possible when the truth of a situation aligns with the words spoken by the sender. In some cases, the sender means one thing and the receiver hears another because the sender may be using terminology that is unfamiliar to the receiver or that has one meaning to the sender and another to the receiver.

In many typical CRM structures, the second step in the communication loop is labeled advocacy. However, advocacy does little to actually describe the process that occurs when a team member feels a disconnect with something he or she has heard or seen in the inquiry phase. Questioning authority is a daunting task. During this step, it is crucial for team members to understand that there are two methods for approving of an action or statement they see or hear, and only one method for providing a **challenge**. The two methods of providing approval for the actions or statements of others are

to verbally state understanding and agreement and to voice no objection at all.

The second method of indicating approval, saying nothing, is all too common—and too commonly misused, as becomes apparent during **post-incident analysis (PIA)**. During critiques, team members might wonder how much understanding was truly shared at the incident. For example, a team member will state that he or she had a concern, or "knew" something was going to happen, but the person typically had a reason for not speaking up. Leaders are often astonished when they hear this. Why didn't the person voice an opinion? Leaders assume that everyone approves after they have asked for input and no one voices an objection.

Conflict Resolution

Few people truly enjoy conflict, yet it is a necessary part of team dynamics and a by-product of bringing together any group of high-performance individuals with experience and strong opinions. Add the components of personal danger, time pressure, and a high-stakes outcome, and it is a recipe for poor performance. However, it is not the absence of conflict that makes a good team but the manner in which team members handle it. The key to conflict resolution revolves around the saying "what is right, not who is right." **Conflict resolution** is a range of processes aimed at alleviating or eliminating sources of conflict; these generally include negotiation, mediation, and diplomacy. It is important to remember that CRM is not team decision making. Most teams using CRM principles are not formed on democratic principles; instead, they have a hierarchy related to training, position, and experience. It is critically important for team members to understand how they should handle conflict when it inevitably occurs.

A cardinal rule in conflict resolution—and one of the most difficult to employ—is for team members to stay focused on the mission or the issue at hand. Therefore, all participants must continually remind themselves to devote all attention to the current source of conflict. Conflict resolution is not the place to address past disputes. Biases need to be put aside. The primary goal is for everyone involved to concentrate all efforts on resolution.

When managing conflict at this stage in the CRM communication loop, it is helpful to understand that complete resolution of the conflict is not likely to occur until after the situation is entirely concluded, and that more time can be spent discussing options. It is important to remember that this loop often takes only seconds to complete in real-time situations. In the midst of any incident, the most anyone can hope for is to achieve an understanding of what the concerns are and why they exist. Sometimes the best that team leaders and decision makers can do, particularly if they are not planning on changing the strategy even after hearing the concern, is to communicate clearly to the individual expressing the concern that they understand what he or she is saying, recognize the potential impact, and value the input.

Decision, Observe and Critique

As indicated, the primary reason to employ CRM principles is to provide a collective situational awareness to the team. There must be an identified leader on every team who can make decisions. Teams without leaders tend to wander among options, with no one person assuming responsibility for the team's actions or the outcome.

One of the duties of a good leader is to take responsibility for team performance. Good leaders are decisive, yet they are also empathetic and careful listeners. A decision should be made when team members get behind the group's efforts, even if one of them does not necessarily agree with the chosen course.

During the next phase of observe and critique, team members need to provide input because the entire team witnesses events unfold after a decision is made. Additionally, leaders must keep in mind that during critical communication events, many decisions are made, and the constant flow of communication is critical. If a leader and the team have reevaluated their strategy and decided to employ a new one, it is imperative that the entire team be aware of this, along with anyone else who may be affected. Decision making carries with it a great responsibility.

After the decision has been made to move forward with a particular strategy, it is important for all team members to carefully observe the process and evaluate progress against the initially stated mission goals. If something appears unsafe, if things are not going according to plan, or if the individuals or equipment chosen for the task do not appear appropriate, a good team engages in critique conversation in which they evaluate the situation on the fly. This should be constructive conversation and should include specifics: What isn't working as expected? Why might the problem exist? What can be done to modify the plan? These brief yet important communications lead to discussing options.

Observation leads to critique, and critique should be an open process because it brings out comments, statements, and questions that lead the team to discuss options, guiding back to the inquiry phase. This is where good leaders shine: They encourage input, particularly when things start to get quiet. If team

members are not commenting on their observations, they are not collectively sharing their understanding of what they see.

As the team members critique their work and its results, they may decide that other options are necessary. In critical situations that develop over a period of time, this duty is often relegated to a planning section. Within the small team environment and during rapidly developing situations, options are often presented as questions that are posed to the group. Options are a necessary part of emergency operations in any dynamic environment. EMS practitioners must recognize that even though a team has determined a course of action, team members must always evaluate other options. In this context, many team leaders start ordering resources and planning logistically to implement one of several alternatives.

Discussing options moves the team back into the beginning phase of the CRM loop: They had a plan, they made a decision on what to do, they evaluated their evolving circumstances, and they proposed options and outlined risk. The new option returns to the beginning of the process and is considered an inquiry ("What do you think of Plan B?"), and team members can openly agree with the idea or probe further to develop any concerns.

Decision Making

Emergency scenes are event-driven scenarios. This means that every situation unfolds in a manner that is relatively unpredictable and that the tempo of events is not entirely under the control of the EMS practitioners. In addition, each person viewing the exact same scene will have a slightly different perspective based in part on that person's area of expertise, level of experience, quality of training, ability to recall applicable procedures, and personal context. Members of any group on an emergency scene do, however, share two significant realities: No one knows exactly how the situation will unfold, and no one knows the outcome.

High-performance teams work best when they have a collective understanding of the situation they face. To ensure every EMS practitioner starts and stays on the same page, laying a solid foundation in the tools of CRM is necessary. This foundation includes: (1) training personnel in open communication techniques, (2) identifying and tracking errors, (3) training personnel in conflict management, and (4) fostering an open learning environment. Effective CRM ensures that every member of the team has an appreciation of the following key points:

- The exact nature of the problem, its cause, and any confounding or complicating factors
- The skills, strengths, weaknesses, and experience of their fellow team members
- An understanding of what is likely to happen based on taking no action
- An understanding of what is likely to happen if the team chooses a specific action
- A shared knowledge of the desired outcome
- A shared strategy, with an understanding of what needs to be accomplished, by whom, and when
- The knowledge that any member of the team, regardless of training, position, or experience, can respectfully question the strategy and/or provide additional cues that will help the team gain a better understanding of the situation as it unfolds

FIGURE 2-8 Unlike in situations where people have the benefit of time, emergency work is extremely dynamic and fast paced.

Only when the team truly knows how to use CRM can it maximize the potential for a successful outcome. Gaining the ability to develop and cultivate a shared vision among team members is a skill that requires practice and knowledge of how the human mind works while under pressure to make a decision. Unlike in situations in which people have the benefit of time and know that an outcome will be the same every time they apply a set of rules and procedures, emergency work is extremely dynamic (**FIGURE 2-8**). EMS practitioners cannot know every factor influencing the emergency situation before they must make a decision, and they must be able to adjust and adapt as the situation unfolds. Team members should know when and how to slightly slow the decision process to gain a better perspective.

Errors Are Not Random

Errors are predictable, and situations that are predictable are preventable. In the 1930s, H. W. Heinrich, an industrial safety pioneer, reported on a study of accidents that he classified according to severity. Heinrich's report showed that for each serious-injury incident,

we could expect to see that the same type of error caused about 29 minor injuries and 300 near-miss or property-damage-only incidents. This is commonly referred to as Heinrich's Law.

When applying the ratios suggested by Heinrich, it has been recommended that the focus of safety programs be on preventing less serious events as an indirect means to prevent a single serious event. Is it always true that serious injuries are caused by the same factors that cause less serious incidents? Many experts believe that this is the case. This is the reasoning behind near-miss reporting. If the factors that led to a near miss can be identified, then policies can be put in place to ensure that those factors do not occur again. Ignoring the lessons of a near miss will eventually lead to a serious-injury incident.

Risk Assessment

Through a risk assessment, EMS practitioners can identify specific work processes and perform a simple evaluation of the associated risk. To conduct a risk assessment, EMS practitioners first need to identify what hazards exist in the workplace. For example, driving with lights and siren, handling contaminated sharps, and loading and unloading patients are all hazardous tasks that EMS practitioners perform on a daily basis. Next, EMS practitioners look at each hazard and determine the potential risks associated with it. For example, with contaminated sharps, EMS practitioners would examine a pathway in which staff were harmed, such as being stuck with a dirty needle. EMS practitioners also need to look at the incidents in which staff are stuck with a clean needle. Next, examine how the needlesticks occurred: Was it during the IV attempt or transference of the needle to the sharps container? Was the ambulance crew provided with the proper education on how to use the device and how to safely dispose of it? Did staff violate the safeguards of the device or violate a policy? Was the device defective? As the cause is investigated, issues can be identified and corrected by revising training, updating policies, or changing the type of needle used.

A constant review by managers of incident reports, lawsuits, customer complaints, workers' compensation reports, biomedical information, fleet reports, and clinical counseling files may indicate patterns or trends that can be used to identify potential fail points. Once issues are identified, they can be corrected by changing a process, piece of equipment, or procedure. The corrective focus should be on those behaviors that can be labeled a high risk. Simply ask: How likely is it to happen, and how bad will it be if it does happen?

In the Field

NAEMT, in collaboration with the Center for Leadership, Innovation and Research in EMS, the National EMS Management Association, and the National Association of State EMS Officials, developed an anonymous system for EMS practitioners to report near-miss, line-of-duty death, and patient safety incidents by answering a series of questions in an online format. This reporting system is called the EMS Voluntary Event Notification Tool (EVENT) and is available on the NAEMT website.

The purpose of the system is to collect and aggregate data that are then analyzed and used in the development of EMS policies and procedures, and for use in training, educating, and preventing similar events from occurring in the future. No individual responses are shared or transmitted to other parties. The aggregated data collected are provided to state EMS offices and the appropriate federal agencies with jurisdiction over EMS on a quarterly and annual basis.

CRM Success Strategies

The success of CRM depends on its acceptance by the entire EMS agency. To ensure every EMS practitioner starts and stays on the same page, laying a solid foundation in the tools of CRM is necessary. This foundation includes training personnel in open communication techniques, identifying and tracking errors, training personnel in conflict management, and fostering an open learning environment.

Effective CRM ensures that every team member has an appreciation of the following key points:

- The exact nature of the problem, its cause, and any confounding or complicating factors
- The skills, strengths, weaknesses, and experience of their fellow team members
- An understanding of what is likely to happen based on taking no action
- An understanding of what is likely to happen if the team chooses a specific action
- A shared knowledge of the desired outcome
- A shared strategy, with an understanding of what needs to be accomplished, by whom, and when
- The knowledge that any member of the team, regardless of training, position, or experience can

respectfully question the strategy and/or provide additional clues that will help the team to gain a better understanding of the situation as it unfolds

TeamSTEPPS®

TeamSTEPPS is a teamwork-based system developed for healthcare professionals by the Agency for Healthcare Research and Quality (AHRQ) and the U.S. Department of Defense. It stands for Team Strategies and Tools to Enhance Performance and Patient Safety. It is an additional model that may be used by EMS agencies and personnel to improve a culture of safety. TeamSTEPPS uses an evidence-based system to increase communication and teamwork skills. It increases safer patient care with higher quality by clarifying team roles and responsibilities and increasing team awareness. It increases information sharing and conflict resolution. TeamSTEPPS, illustrated in **FIGURE 2-9**, includes five principles focused on creating and maintaining a culture of safety. The principles include the following:

1. **Team structure.** Requires coordinated actions of a multisystem team, which includes the patient, core team or contingency teams, coordinating team, ancillary and support services, and administration.

FIGURE 2-9 TeamSTEPPS is a teamwork-based system developed for healthcare professionals by the Agency for Healthcare Research and Quality and the U.S. Department of Defense.

Reproduced from Agency for Healthcare Research and Quality. Pocket guide: TeamSTEPPS. Updated December 2013. https://www.ahrq.gov/teamstepps/instructor/essentials/pocketguide.html

2. **Communication.** Stresses a communication process for all team members using SBAR, call-out, check-back, and hand off. SBAR is an acronym used to address critical information needing immediate attention and action regarding the patient. It stands for situation, background, assessment, and recommendations and request. The call-out is a technique used to communicate critical information to inform all team members of a critical situation. It identifies the team's next steps and directs responsibility to personnel to carry out a specific task. The check-back technique ensures that communication provided by the sender is clear and understood by the receiver. The steps include: sender gives the message, receiver accepts the message and responds with the message received for confirmation, and the sender ensures that the message was received as given. The hand off is the transfer of responsibility and information during care transition. I PASS the BATON is a mnemonic for a strategy developed to ensure a smooth transition of care. It stands for Introduction, Patient, Assessment, Situation, Safety concerns, Background, Actions, Timing, Ownership, and Next.
3. **Leadership.** Excellent leaders have multiple responsibilities to ensure that effective leadership is provided:
   - Organize a team.
   - Provide clear goals.
   - Assign responsibilities and tasks.
   - Monitor and change the plan as needed.
   - Review the team's performance and give feedback.
   - Allocate resources effectively.
   - Facilitate information sharing.
   - Encourage team involvement.
   - Facilitate conflict resolution within the team.
   - Model effective teamwork.
4. **Situation monitoring.** Continuous monitoring of an event is necessary to gain and maintain an understanding of what is happening around you. Situational awareness, as covered previously, is the state of knowing what is happening around you. The shared mental model ensures that team members are aligned with each other through maintaining situational awareness. STEP is a tool that could be used for situational monitoring. It stands for: Status of the patient, Team members, Environment, and Progress toward goal.
5. **Mutual support.** This describes an effective team that will assist all team members with completing their tasks. Everyone should protect each other from work overload.

CHAPTER WRAP-UP

- Crew resource management
  - Helps reduce the inherent risk of EMS
  - Cannot guarantee absolute safety
  - Is only one of many tools that organizations can use to manage errors

SUMMARY

- Crew resource management (CRM) is a tool originally instituted by the airline industry to optimize performance and outcomes by reducing the effect of human error through the use of all available resources. The goal of CRM training is to enable high-performance teams, such as airline or ambulance crews, to achieve and maintain collective situational awareness.
- When groups of competent, trained individuals get together to solve problems, they typically define the issue and then deploy a combination of "humanware," software, and hardware to solve the problem. The humanware component consists of those people who are part of a team and have been directed to solve a particular problem.
- EMS agencies with open communication and that embrace respectful and informed feedback as a method for encouraging collective situational awareness develop skills for their humanware to solve complex problems effectively within dynamic environments.
- Within high-performance teams, regular use of CRM continually improves performance. When teams practice communication techniques that are designed to share understanding, it provides opportunities to build team discipline, broaden the knowledge base of individual team members, and remove boundaries to learning. CRM can establish trust and respect within teams, reduce the chance for error caused by distraction, and encourage collective situational awareness.
- Situational awareness has three primary components: an awareness of the surroundings and how individuals are supposed to interact with the surroundings, the reality of the situation, and individual perceptions of the situation.
- Situational awareness is an internal active evaluation process that goes on constantly, much like size-up. EMS practitioners must update their situational awareness constantly by observing their surroundings, evaluating their options, and communicating with those around them.
- The typical CRM model contains several key elements, all of which are integral to gaining a shared understanding in a culture of learning and mutual respect. These elements are inquiry, advocacy, conflict resolution, decision, observe and critique, and discuss options.
- High-performance teams work best when they have a collective understanding of the situation that they face.
- Incident investigation finds that errors are not random in EMS. People cause accidents by making errors. Errors arise from poor communication, poor teamwork, and not paying attention. By mitigating errors, EMS practitioners can reduce deaths and injuries.
- There are personal strategies for error reduction. First, ensure a high level of proficiency in your knowledge and skills. Understand your policies and procedures. Have open communications and ensure that everyone on the team knows that he or she can call a safety time-out if things are not clear.
- TeamSTEPPS is a useful system developed for healthcare professionals by the Agency for Healthcare Research and Quality and the U.S. Department of Defense. It stands for Team Strategies and Tools to Enhance Performance and Patient Safety.

GLOSSARY

challenge More direct than an alert; when a team member physically moves into the action circle, prepared to take the next step of emergency intervention.

coherence When a message is understood by the receiver.

conflict resolution A range of processes aimed at alleviating or eliminating sources of conflict; generally includes negotiation, mediation, and diplomacy.

crew resource management (CRM) A tool originally instituted by the airline industry in 1980 to optimize performance and outcomes by reducing the effect of human error through the use of all available resources.

hardware Solutions that take the form of computers, vehicles, tools, medications, or protective equipment.

high-reliability organizations (HROs) Organizations that operate in high-risk environments yet strive to maintain a learning atmosphere so as to minimize chances for error.

humanware The people who are part of a team that has been directed to solve a particular problem.

post-incident analysis (PIA) An activity involving team members that takes place after an incident response. It reviews performance of individuals and teams while focusing on learning lessons that can be applied to future incidents.

situational awareness The state of being aware of what is happening around you and recognizing the potential for threats to yourself or others.

software Solutions that take the form of rewriting training materials or procedures or developing checklists or policies.

TeamSTEPPS® A teamwork-based system that stands for Team Strategies and Tools to Enhance Performance and Patient Safety.

unsafe actions Actions that can lead to errors, injuries, death, and destruction.

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