

Workplace Medical Emergency Responders

An EMT License Is Not an Advanced First-Aid Card

By Cameron Helikson and Scott Gunderson

No one saw the incident but everyone in the area heard the scream and the crashing sounds. Heads turned to see an employee on the factory floor, entangled in broken process piping. The fall arrest lanyard trailed away from him, limp and unattached. The investigation would have to determine whether the employee selected a poor anchor or simply failed to connect the lanyard before he fell, but right now the immediate issue was a serious medical emergency.

The first employee on scene, trained in basic first aid, directed others to call 9-1-1 and to activate the site medical response team. She verified no immediate hazards to herself, and approached the fallen employee as she pulled nitrile gloves from a belt pouch and put them on her hands. She touched his shoulder and asked if he could hear her. When he did not answer, she listened for breathing, which she heard and felt on her ear. She held his head to prevent further movement and possible spinal injury.

The second responder, a member of the site medical response team and a

licensed emergency medical technician (EMT), arrived and asked the first responder what she knew about the incident and the injured employee. Also donning nitrile gloves, he checked the injured employee's airway and pulse to verify breathing and circulation, then performed a rapid head-to-toe assessment, seeing no obvious bleeding or trauma.

Taking a first set of vital signs, he discovered normal blood pressure but elevated pulse and respiration rates, indicating potential onset of shock. Pulling a pulse oximeter from his response kit, he verified oxygen saturation at 92% and directed a third responder, also a licensed EMT, to place a nonrebreather mask attached to a portable oxygen tank on the injured employee's mouth and nose.

The second responder paused to see that the first responder continued to properly hold the injured employee's head, and asked to confirm that 9-1-1 had been called before performing a more detailed patient assessment. Using blunt-point trauma shears to cut away the fall protection harness and outer clothing, he reassessed for obvious bleeding and trauma. He saw some knee swelling and abrasions with minor bleeding, not a priority at this time. He also saw significant abdominal bruising indicating possible internal trauma that could only be treated in the hospital.

IN BRIEF

- **Workplace emergency medical responders can operate under various levels of training, from basic first aid to emergency medical technician (EMT).**
- **Companies whose programs include EMTs must comply with several requirements, including licensing, registration and medical direction that are not required for programs with only basic first-aid responders.**
- **This article introduces these requirements and discusses the decision criteria and program development issues associated with a workplace emergency medical response program with EMTs.**

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At this point, he directed the third responder to continue monitoring respiration rate and quality as he led two additional responders through complete spinal immobilization, including placement of a cervical collar and backboard as they carefully removed the injured employee from the remaining broken process piping. As he recorded a second set of vital signs, the responder heard the sirens of the arriving ambulance that would transport the injured employee to the hospital.

Workplace emergency medical response programs and employee training typically end at the level of basic first aid, including CPR and AED, relying instead on local emergency medical services (EMS) for advanced response and transportation of sick and injured employees. However, some organizations, primarily those with significant hazards, long EMS response times and long transportation times to the nearest appropriate hospital, can realize the benefits of higher capabilities by integrating the skills of EMTs on site. (See “Medical Response Team Profiles” on p. 34 for additional information.)

EMTs can provide a significantly higher level of skill and patient care than employees with basic first-aid training. However, these higher levels of training and the more advanced scope of practice introduce additional requirements, including licensing of individual EMTs, potential registration by the organization with local and state agencies, development of preapproved standing orders and medical direction by a physician.

These last three requirements are not common knowledge outside the EMS profession, and the authors have personal experience with three examples of misunderstandings about the role of an EMT:

1) A colleague at another organization reported dissatisfaction with a workplace emergency medical response, and asked one of the authors about attending EMT school for advanced first-aid training.

2) One author was at lunch with another colleague, and when both heard sirens nearby, the colleague asked whether the author had medical and trauma bags in the trunk of his car to provide emergency medical care when needed.

3) Finally, one author was asked by his employer if he would be willing to provide telephone consultations to sites in other states and other countries to determine whether injured employees required medical care beyond basic first aid.

These situations reflect a common misperception that an EMT works as an individual, not as a licensed prehospital re-

sponder operating under a physician’s direction. EMTs work within a jurisdiction-specific emergency medical system such as a fire department or ambulance service. In most U.S. jurisdictions, this remains true even for EMTs in an occupational or private setting.

This article addresses the issue of EMTs in workplaces as part of an emergency response team or a focused medical response team, expanding on previous work by the authors (Gunderson & Helikson, 2011). This article does not address EMTs who serve in fire departments, ambulance services or other agencies such as law enforcement responding to public emergencies. It also excludes occupational health nurses and other allied health professionals engaged in nonemergency activities such as preemployment physical exams, post-injury case management, hearing tests, respirator qualifications and drug screens.

In this article, the term *EMT* refers to all levels of prehospital care responders including emergency medical responders, emergency medical technicians, advanced emergency medical technicians and paramedics (NHTSA, 2006a, b). The scope of practice varies widely and increases in complexity from the initial level of emergency medical responder to the highest level of paramedic, as does the level of initial training, continuing education, and equipment and medications authorized for use by the EMT on patients (Table 1). Additionally, some states offer midlevel EMT licenses outside the current NHTSA national model, such as EMT-intermediate, EMT-cardiac and EMT-critical care. A definitive comparison of these levels is outside the scope of this article.

This article addresses the issue of EMTs in workplaces as part of an emergency response team or a focused medical response team.

Table 1
EMT Level Summary

Level	Scope of practice	Initial training	Continuing education
Emergency medical responder	Airway management including suction and simple adjuncts; oxygen delivery; unit dose autoinjectors; manual stabilization of cervical spine and extremity fractures; bleeding control; basic cardiac life support including automated external defibrillation; emergency patient moves	56 hours	12 hours every 2 years
Emergency medical technician	Above scope; airway management including nasopharyngeal adjuncts; assisting patient with their medications; oral glucose; aspirin; pneumatic antishock garment; spinal immobilization; patient transportation	140 hours	24 hours every 2 years
Advanced emergency medical technician	Above scope; airway management excluding tracheal intubation; intravenous access and nonmedical intravenous fluid therapy; additional pharmacological interventions	300 hours	36 hours every 2 years
Paramedic	Above scope; airway management including tracheal intubation and needle-puncture access; pharmacological interventions including intravenous medications; advanced cardiac life support including manual defibrillation	1,200 hours	48 hours every 2 years

Note. Scope of practice, and initial and continuing education may vary depending on state, regional and local requirements.

Medical Response Team Profiles

Qorvo

Semiconductor manufacturing is a chemical-intensive industry, and the emergency response team at Qorvo in Hillsboro, OR, trains for both HazMat and medical response. EHS engineer Kiley Ross identifies quick-response and a tightly coupled bridge to EMS as advantages to having EMTs on the team in addition to employees with basic first-aid training. Approximately 800 employees work at the Hillsboro location. Each of the four shifts has a team of approximately 20 responders to provide emergency coverage 24 hours per day. Approximately four to six team members are EMTs, typically at the EMR level. Most program elements are drawn from the local fire department, including protocols and continuing education. Medical direction is provided through the company's occupational health provider, who approved hardware for the team, such as a cyanide antidote kit. According to Ross, continuing education is critical, because most medical calls are simple in nature, such as nonwork-related illnesses, and advanced medical calls are rare for the teams.

SP Fiber Technologies

Emergency responders at SP Fiber Technologies in Newberg, OR, have been called to incidents involving 150 employees on site, but their core mission has a tighter focus: confined space rescue. The plant manufactures pulp and paper, and safety manager Grant Rider describes downtime as potentially costing hundreds of dollars per minute. Sixteen EMTs on various shifts provide rapid availability and eliminate the expense of waiting for a contract rescue team to arrive. Employees can lockout, enter, repair, exit and return the plant to operation quickly and safely.

Employees are not dedicated responders, meaning their confined space rescue assignment is in addition to their normal duties. Team members are drawn from all areas of the plant, and include production, supervisory and professional employees. Most already had EMT licenses when recruited, serving periodic shifts as volunteer firefighters. Those without EMT licenses initially earned them at the local community college or the local fire department.

Rider describes the team as harmonious with the local fire department, using the same protocols and working under the same medical director. The company has no paramedics, and protocols and equipment use remain within the scope of practice of the employees with either EMR or EMT licenses. "Our biggest challenge," Rider says, "is showing them enough gratitude for the flexibility they provide to our business model. We keep the message going to them how important they are."

Yamhill County Search & Rescue

While not providing workplace emergency medical response, the volunteer organization of the Yamhill County Search and Rescue illustrates the use of EMTs instead of wilderness first aid for remote operations. The team (one of the authors is a member) is affiliated with the Yamhill County Sheriff's Office. It interacts directly with the local ambulances and uses the same written protocols and medical direction as the largest transporting EMS agencies in the county.

The key benefit of having members who can provide care is that a large number of searchers are in a remote area. Should a searcher have an emergency event while in the remote area, the medical responder can provide immediate care in an area where it may take 30 minutes or longer for an advanced life support ambulance to arrive.

Wilderness first aid is basic first aid in extreme conditions and often requires moving a patient over rough terrain. Students are taught to improvise and make the best use of limited resources. However, wilderness first aid does not cover the scope of practice of EMTs, such as airway management and authorized medications. Search-and-rescue EMTs offer these skills and, thus, can provide a more comprehensive level of care before it is transferred to a transporting EMS unit. Although courses exist for use in remote areas, they have limited application because the team is generally located relatively close to transporting ambulance and no improvisation is needed.

Applicability Study & Hazard Assessment

OSH professionals considering advanced workplace emergency medical response capabilities, including use of EMTs in their organization, should begin with a review of several issues with stakeholders, including an assessment of hazards and the availability of resources (Figure 1). Severe hazards define the first criterion of an applicability study. Injuries following exposure to hazards such as machinery, powered industrial trucks, work at heights and hazardous materials will likely be serious and potentially life-threatening. Several sources urge organizations to tailor their first-aid training and equipment to meet the foreseeable emergencies within the workplace (ASTM, 2009; OSHA, 2006).

But traumatic injuries, such as arterial bleeding from a deep laceration or amputation, internal trauma following impact from falls to the next level, and chemical or thermal burns, will likely require immediate care beyond basic first aid. Immediate care is a relative term, because EMTs do not provide definitive care, but their interventions, when performed rapidly and properly, can provide critical temporary life support during the "golden period" when the patient can still survive if quickly transported from the emergency scene to the hospital (Salamone & Pons, 2007).

Low-hazard settings such as offices may not require the advanced response skills of EMTs in the workplace. Medical emergencies such as heart attack, stroke and diabetic episodes can occur in any workplace, because employees, contractors and visitors bring their personal medical histories with them, but basic first-aid training, when effective, typically provides adequate knowledge in medical emergency recognition and timely communication to EMS for prehospital treatment and transportation to definitive care (Markenson, Ferguson, Chameides, et al., 2010). However, this assumes that timely EMS response follows timely communication. Employees at remote locations, even without severe hazards, may benefit from the skills EMTs can bring in the event of a long wait for EMS to arrive or a long trip to a hospital.

Finally, OSH professionals and stakeholders must critically and honestly review the organization's resources and capabilities. Developing and sustaining a workplace emergency medical response program with EMTs requires significant effort and attention. Dedicated, full-time EMTs on site will represent a major overhead line on the balance sheet of a large organization. Regular full-time employees trained to respond to emergencies as EMTs will spend much time training instead of performing core production or support responsibilities for small- and medium-size organizations. Furthermore, regular full-time employees may not gain adequate experience with patients, and individuals and whole teams with little experience outside

training can become overwhelmed during an actual emergency with seriously injured patients.

Organizations with high hazards and long EMS response times that are unable to maintain such a program internally may contract with outsourced services, either full-time or as needed. These services include stand-by rescue teams for permit-required confined space entry, or posted and crewed ambulances accompanying remote utility or mining operations.

Program Development

If the applicability study and hazard assessment indicate that a workplace emergency medical response program with EMTs is appropriate, and if stakeholders agree that the organization can provide the resources needed to build and maintain a program, program development begins (Figure 2, p. 36).

A comprehensive review of the liabilities and potential insurance requirements for such a program is outside the scope of this article. Organizations relying on basic first aid for initial response typically rely on Good Samaritan laws to manage their responders, who can respond with some individual liability protections, provided they satisfy basic requirements during a response. Good Samaritan requirements can vary between states, but typically include obtaining consent if a victim is conscious; acting in good faith; not abandoning the victim once care is started; and avoiding reckless or deliberately negligent care. Basic first-aid responders can essentially avoid liability if they consistently remain within the limits of their training (Gundersen & Helikson, 2011).

EMTs are held to a higher standard due to more advanced training and also due to holding licenses as prehospital care providers. However, provided they act strictly within their scope of practice, EMTs in some states operate under individual legal protections, with the employer as the responsible party (Nagorka & Becker, 2005). However, higher-level EMTs, including advanced EMTs and paramedics, can perform significant prehospital procedures including administration of certain medications, which present higher levels of exposure to liability for the sponsoring organization. For organizations considering workplace emergency medical response programs with EMTs, the authors recommend consulting with legal counsel for liability review, and risk management professionals for appropriate insurance coverage.

Organizations may have some latitude in establishing risk and liability protections, but they will need to strictly comply with the administrative requirements of their state or local authorities (Table 2, p. 37). These requirements may include registration and annual fees, possibly including registering the organization as a private EMS agency even if response will remain within its property lines.

While organizations using basic first-aid responders may operate with no formal outside notification about their activities, an organization using EMTs may have to formally integrate its program within the state, regional or local EMS framework; this will specify how the organization will interact with fire departments, ambulance services and hospitals.

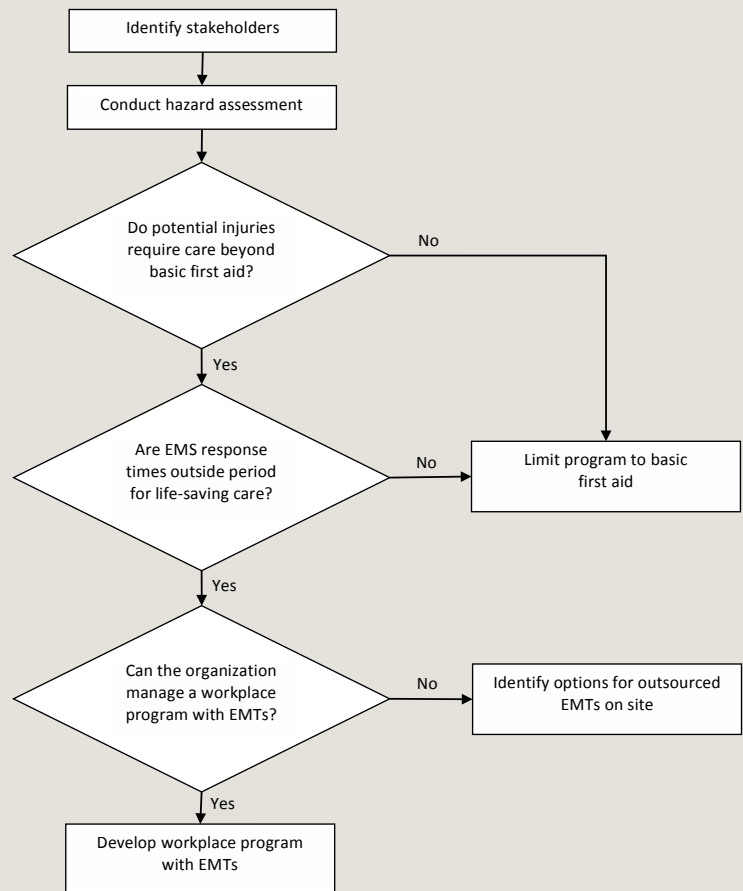
Within this framework, workplace emergency medical response programs will have many elements in common with large-scale EMS programs (e.g., fire departments). According to National Association of EMS Physicians, typical elements include medical direction, preapproved standing orders, continuing education for EMTs, patient care documentation and a quality review program.

Medical direction may be one of the most significant differences between a basic first-aid responder program and a program with EMTs. While EMTs may be the boots on the ground responding to workplace medical emergencies and the face of the program to employees, contractors and visitors, these EMTs cannot practice independently. It is the medical director near the top of the program's organization chart who lets EMTs practice as EMTs. The medical director authorizes response protocols, often in the form of standard operating procedures known as preapproved standing orders.

Such orders provide a foundation for training and practice, and relieve the EMTs from having to request verbal approval for preapproved tasks such as oxygen delivery and spinal immobilization. These

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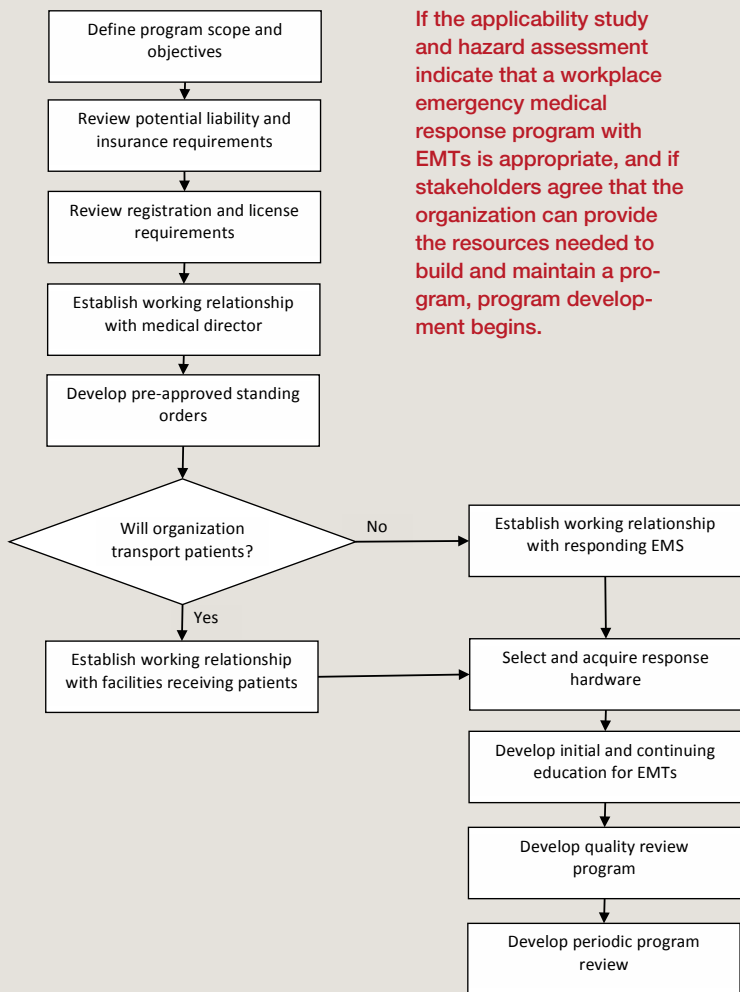
Figure 1
Applicability Study & Hazard Assessment Flowchart



Developing and sustaining a workplace emergency medical response program with EMTs requires significant effort and attention.



Figure 2
Program Development Flowchart



orders also relieve the medical director from continuous on-call duty to authorize routine response actions. The medical director does not have to personally write these protocols, but can adopt local EMS or other protocols permitted by state or local laws (see "Preapproved Standing Orders" on p. 37).

In addition to developing procedures prior to response, the medical director reviews response documentation such as patient care reports for ongoing quality review (Figure 3, p. 38). The medical director need not be an employee of the organization; s/he can be a consulting physician from a private practice, an occupational health practice or a hospital. At a minimum, the medical director must meet the state, regional or local qualifications for medical direction.

Other key issues during program development include patient transportation, hardware selection and maintenance, and initial and continuing EMT education. The decision to transport patients involves more than selecting vehicles. This may require additional licensing and registration, as well as coordination with hospitals receiving patients and ambulance services potentially involved in mid-transport rendezvous and patient transfer. Exclusive franchise agreements may be in place for ambulance services within regional or local jurisdictions, so patient transportation by the organization may require advanced approval. Patient transportation adds a significant layer of complication to a workplace emergency medical response program, and other than this brief mention, is largely outside the scope of this article.

Emergency medical response hardware is a critical program element, one tightly coupled with responder training and certification levels (Gunderson & Helikson, 2011). The authors recommend alignment of hardware with training to prevent use of any device beyond the responders' skill and authorization. Improper use of medical equipment can cause serious harm to patients. In addition to basic first-aid supplies, EMTs will need equipment to assess and record vital signs (e.g., stethoscopes, blood pressure cuffs).

Other basic life support equipment may include airway management hardware (e.g., oropharyngeal airways—tubes that keep the airway open by lifting the tongue off the back of the throat), bag valve masks, oxygen delivery systems and suction devices. Advanced life support equipment for advanced EMTs and paramedics may include advanced airways for intubation, manual defibrillators and needles for intravenous access to deliver fluids, and medications authorized under medical direction.

Training is the one area in which an organization has some flexibility during program development, provided some employees have existing EMT licenses. Examples of such employees include volunteer firefighters, reserve military or members of the National Guard, and employees involved in ski patrols and volunteer wilderness search and rescue. Otherwise, the organization will need to recruit employees who are willing to complete the initial training.

The hours required for initial training and continuing education depend on the license level,

Table 2
State & Local EMS Agency Examples

Area	Jurisdiction	Agency
East Coast U.S.	State: Florida	Florida Department of Health EMS Advisory Council (Florida, 2014)
East Coast U.S.	State: New York	New York State Department of Health Bureau of EMS (New York, 2014)
Central U.S.	State: Illinois	Illinois Department of Public Health Emergency Medical Systems and Highway Safety (Illinois, 2014)
Central U.S.	State: Texas	Texas Department of State Health Services EMS—Trauma Systems (Texas, 2014)
West Coast U.S.	State: California	California Emergency Medical Services Authority (California, 2014)
West Coast U.S.	State: Oregon	Oregon Health Authority EMS and Trauma Systems (Oregon, 2014)
West Coast U.S.	Local: Washington County Oregon	Washington County Oregon Emergency Medical Services (Washington County, 2014)

Note. Not a comprehensive list. Examples selected for geographic diversity, population size and authors' professional experience. The authors recommend verification of all state and local requirements.

from 56 initial training hours and 12 continuing education hours every 2 years for emergency medical responders, to 1,200 initial training hours (minimum) and 48 continuing education hours every 2 years for paramedics. Just as training time is not trivial, neither are the additional training resources required, such as qualified instructors, equipment for hands-on practice, manikins and/or other employees volunteering as patients, and safe but realistic locations for dynamic drills and exercises. The authors do not recommend relying exclusively on classroom lectures and Power-Point presentations.

Finally, the organization must have a quality review system in place to periodically assess the program. Quality review occurs after a response event and involves medical direction to verify no issues and confirm that protocols, hardware, training or other program elements are operating as expected.

An organization has much flexibility in developing this program. For example, responses to significant medical emergencies such as cardiac arrests or major trauma can be reviewed as soon as possible, while responses to minor medical emergencies or false alarms can be scheduled for review at a later time. In addition to assessing response events, the

organization should periodically review the program to verify changes in program registration or license requirements, registration renewal and fee payment, licensing and continuing education of EMTs, and inspection and maintenance of response hardware.

Conclusion

Basic first aid provides a minimally acceptable level of response for workplace medical emergencies, provided the trained employee responds timely, correctly and safely, and also if EMS is available for timely intervention and transportation to definitive hospital care. Experience shows,

Preapproved Standing Orders: Adopting Local EMS Patient Treatment Protocols

Multnomah County Oregon EMS provides an example road map that an organization can adapt for patient treatment protocols. This group organizes more than 100 protocols into seven primary subject categories:

1) Treatment. This section includes both illness and traumatic injuries. Examples include protocols for burns, cardiac arrest, crush injury, respiratory distress and shock.

2) Drugs. This section includes medications permitted for use by EMRs (e.g., oxygen, oral glucose). It also includes medications required for advanced cardiac life support by paramedics.

3) Procedures. This section provides decision criteria and instructions for use of hardware such as airway devices and spinal immobilization equipment.

4) Communications. This category encompasses dispatch (e.g., 9-1-1 call center to EMS) and EMS communications to hospitals.

5) Operations. This section covers scene activities, such as crime scene response, mass casualty incident response and HazMat response.

6) Trauma protocol. This category includes patient evaluation for transportation to designated trauma centers.

7) Special operations. This section includes eye emergencies, hydrogen cyanide treatment and hydrogen fluoride treatment.

These protocols are wide-ranging and are written for fire and ambulance services responding to emergencies in the community. Rather than adopting all local protocols, organizations and medical directors can selectively adopt protocols based on workplace hazards, program goals and objectives, and certification levels and scope of practice of the responding EMTs.

Several factors influence the selective approach. For example, it would be inappropriate to adopt the local protocol for morphine if the organization has no paramedics or advanced EMTs who are licensed by state or local regulations to administer this medication. Other local protocols that may not be applicable to the workplace or that an organization elects not to practice should also be omitted (e.g., helicopter operations, sports equipment removal, Taser barb removal). If the organization and medical director elect to adopt some local protocols but not others, it is best to document the decision criteria as part of program development and periodic program review.

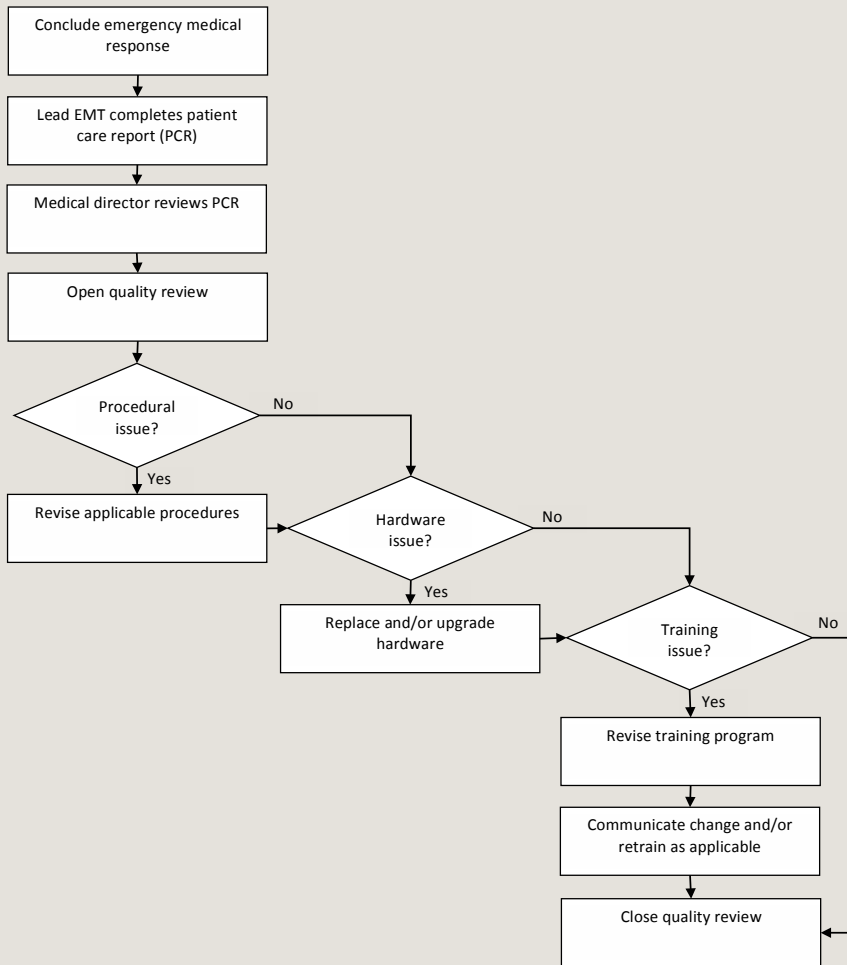
however, that few organizations fully develop their workplace medical emergency responders, and often consider a program in place once the first-aid/CPR/AED cards are issued.

EMTs have the additional training and skill to recognize and respond to the subtle symptoms of illness and injury such as allergic reaction, heart attack, stroke or onset of shock. Such emergencies often cause great confusion, leading to fragmented information, and the patient's condition can change quickly, leading to hesitation and error by the basic first-aid responder with little experience.

EMTs can add a significant level of knowledge to a workplace emergency medical response program. While they do not replace physicians and other healthcare professionals, their rapid response can stabilize victims and improve the probability of survival in cases involving serious medical emergencies and trauma. An organization that thoroughly assesses the hazards of its operations and develops and supports a program with EMTs can realize world-class response capabilities and provide the best possible emergency care for its employees and visitors. **PS**

Quality review occurs after a response event and involves medical direction to verify no issues and confirm that protocols, hardware, training or other program elements are operating as expected.

Figure 3 Quality Review Flowchart



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