First Revision No. 19-NFPA 450-2019 [Global Input]

Please add new chapter 9 and re-number all subsequest chapters thereafter, starting at the current chapter 9.

Chapter 9 Stakeholder Relations

9.1 General.

9.1.1

The organizations operating an EMS system should create a collaborative communications network between its management personnel and impacted organizations.

9.1.2

For purposes of this document, stakeholder groups are divided into four categories: internal, external, regulatory, and payers. System management should identify and work collaboratively with all stakeholders in these groups to ensure that the needs of the community are met.

9.2 EMS System Goals.

The authority having jurisdiction (AHJ) leading the EMS system should assess the needs of the community, identify gaps in care and services, and develop a draft for the types of services needed. Ideally, this should be done in a collaborative community forum.

9.3* Internal Stakeholder Relations.

Before changes to an EMS system begins, internal stakeholders should be included in the process. Internal stakeholders need to be engaged and committed for the change process to be successful.

A.9.3

Presenting information and potential benefits specific to each stakeholder group will help them understand how the EMS system could not only improve patient care, but help them achieve their own goals.

Table A.9.3 lists likely major internal stakeholders as well as the significant role they would play in the development and implementation of the EMS system and the expected outcomes from their participation.

Table A.9.3 Internal Stakeholders

Stakeholder	Role	Participation Contributions
Command staff/Management	Provide direction to the agency	Benefits to patients served
	Approve resources	Benefits of increased value in health care system
		Benefits of enhanced public image
		Potential revenue stream from contracted services
Agency communications center	Coordinates resources and requests for services	Benefits to patients served

Stakeholder	Role	Participation Contributions
	Allocate additional resources	Benefits of increased value in health care system Benefits of enhanced public image Potential revenue stream from contracted services
Medical director	Develop/approve medical protocols Interface with health care community Ensure quality assurance and improvement management	Benefits to patients served Benefits of increased value in health care system Benefits of enhanced public image
Labor union/Workforce	Politically support implementation Engage workforce	Benefits to patients served Potential for enhanced staffing and union positions Enhanced community perception of the workforce/labor union for supporting system development
City/County or district board/Local leadership	Politically support implementation Engage workforce Approve the system's mission and vision Approve budget	Benefits to patients served Enhanced community perception of the workforce/labor union for supporting system development

9.4* External Stakeholder Relations.

External stakeholders include entities outside of the system's participants that are impacted by, or could impact, the success or failure of any change or development.

A.9.4

Examples of external stakeholders include, but are not limited to, hospitals, social service organizations, home health agencies, nursing associations, emergency physician groups, skilled nursing centers, hospice organizations, senior care organizations, public health, separate EMS agencies, and primary care physicians. These stakeholders share goals and seek opportunities to work collaboratively with organizations in your community.

Table A.9.4 lists likely major external stakeholders as well as the significant role they would play in the development and implementation of the EMS system and the expected outcomes from their participation.

Table A.9.4 External Stakeholders

Agency	Role	Participation Outcomes
Social service agencies	Connect patients to necessary services	Relationship built as a referral source for nonmedical needs
	Deliver services to patients	Development of access to services through county or private social service agencies (e.g., Council on Aging, United Way) or similar organizations
Hospitals	Provide primary health care to community	Collaboration in developing patient care strategies and protocols
	Provide care for common patients	Leveraged financial incentive for hospitals to reduce visits and readmissions
	Provide clinical education	Quality care improvement measures
	Potentially fund system components	
Non-EMS out-of-hospital health care	Provide home health nursing, skilled nursing facilities, home hospice agencies, and assisted living facilities	Defined boundaries of service
	Consist of accountable care organizations	Development of referral patterns that are mutually supportive
Other medical professionals	Provide emergency care, primary care, outpatient clinic care, independent practice care, behavioral health resources, pharmaceutical support, and addiction recovery resources	Identification of opportunities and threats
		Development of referral patterns
		Access to training resources and opportunities to improve care
		Medication reconciliation
		Opportunities for medical direction
Public health departments	Collect data	Identification of training needs for staff
	Perform community needs assessment	Identification of community health care needs
	Provide public access health clinics and immunization centers	Preparedness planning
Insurance industry	Primary payer of health care services	Development of relationships with organizations that are potential funding sources

Agency	Role	Participation Outcomes
	Provide commercial and government-run programs	Positive financial impact
		Development of sources of outcome data

9.5* Regulatory Stakeholders Relations.

Engaging early with regulatory agencies is essential to success.

A.9.5

It is imperative to engage regulatory agencies and providers at the beginning and throughout the process as a way to clarify roles, address concerns, and develop strategies that make optimal use of all provider types. Scope of practice regulations impact the ability of EMS personnel to deliver health care services.

Table A.9.5 lists likely major regulatory stakeholders as well as the significant role they could play in the development and implementation of the system and the expected outcomes from their participation.

Table A.9.5 Regulatory Stakeholders

Agency	Role	Participation Outcomes
State department of health	Provide regulatory framework	Development of a regulatory framework that provides oversight
	Provide educational and training requirements	Enforcement of state regulations and standards
State office of EMS	Provide agency direction	Development and implementation of strategies governing medical training and scope of practice
	Develop/approve medical protocols	Enforcement of approved medical policies and protocols
	Provide educational and training requirements	Training according to state standards
	Interface with the health care community	
	Provide quality assurance and improvement management	
Local or regional EMS authority	Provide direction to the system	Development and implementation of strategies governing medical training and scope of practice
	Develop/approve medical protocols	Enforcement of approved medical policies and protocols
	Establish educational and training requirements	Training according to state standards
Local or regional public health	Provide direction to the system	Development and implementation of strategies to integrate with public health

Agency	Role	Participation Outcomes
agencies		
	Integrate with public health role and goals	Access to resources and integration
	Establish educational and training requirements	Training according to state standards

9.6 Payer Stakeholder Relations.

Potential payers should be included in the planning and development stages of the EMS system as early as possible to build valuable partnerships that yield sustainable revenue. *(See Chapter 5.)*

9.7 Achieving Stakeholder Relations Success.

To be successful in obtaining and maintaining relationships with stakeholders, EMS systems should focus on objectives, including, but not limited to, the following:

(1) Always keep the patients at the center of the system

(2) Engage all stakeholders early in the process

(3) Engage internal stakeholders first

(4) Keep system sustainability in mind from the start

(5) Consider regulatory agencies as partners, not competitors

Supplemental Information

File Name	Description	Approved
New_Chapter_Will_be_Chapter_9.docx	Please use this for the new information. For staff use.	

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Committee Statement: Stakeholder relationship guidance has been added as stakeholders play a large role in EMS systems.

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Please add New Annex B and Make the current Annex B, Annex C now.

Annex B Time Intervals and Components

This annex is not a part of the recommendations of this NFPA document but is included for informational purposes only.

B.1 Essential EMS System Analysis Components.

B.1.1

The nature of time presents a classic problem in semantics: The same term can have different meanings to different people. Additionally, tradition and unique EMS system design have created a language of time incomparability. The NFPA 450 EMS time template, shown in Table B.1.1, is an attempt to solve this problem with consensus terms. The key to this time template is to differentiate clearly between discrete points versus intervals of time. Column A represents discrete points in time or time stamps that occur during an EMS call. Columns B and C mark the elapsed time or intervals between the time stamps.

Table B.1.1 Essential EMS System Analysis Components

Column A Discrete	Column B	Column C
.	.	.
Time Stamps	**Functional Intervals**	**Process Intervals**
(1) Incident or onset time	(1) Recognition interval (1 to 2)	(1) Event activation (1 to 4)
(2) Time of discovery of event	(2) System access interval (2 to 3)	(2) Citizen reaction (2 to 4)
(3) Call for help	(3) Switching interval (3 to 4)	(3) Call processing (4 to 11)
(4) First PSAP call time	(4) Answer interval “A” (4 to 5)	(4) System response (4 to 14)
(5) Phone “off-hook” (answered in first PSAP)	(5) Routing interval (5 to 6)	(5) Unit response (11 to 14)
(6) Secondary dispatch phone rings — secondary PSAP (if appropriate)	(6) Answer interval “B” (6 to 7)	(6) Patient management (14 to 19)
(7) Secondary dispatch phone “off-hook” answered (if appropriate)	(7) Interrogation interval (5 or 7 to 8)	(7) Event to treatment (1 to 15)
(8) Interview ends	(8) Resource selection interval (8 to 9)	(8) Scene management (13 to

Column A Discrete	Column B	Column C
.	.	.
Time Stamps	**Functional Intervals**	**Process Intervals**
		17)
(9) Response resources are identified	(9) Alert interval (9 to 10)	(9) Unit cycle (11 to 20)
(10) Dispatch time	(10) Acknowledgment interval (10 to 11)	
(11) Unit acknowledgment	(11) Turn-out interval (11 to 12)	
(12) Unit en route	(12) Travel interval (12 to 13)	
(13) Unit arrived on scene	(13) Patient access interval (13 to 14)	
(14) Arrived at patient (patient contact)	(14) Initial treatment interval (14 to 15)	
(15) First intervention time	(15) Initial result interval (15 to 16)	
(16) Time of result of first intervention	(16) On-scene patient care interval (16 to 17)	
(17) Unit left scene	(17) Transport interval (17 to 18)	
(18) Arrived at destination	(18) Care transfer interval (18 to 19)	
(19) Transfer of care	(19) Unit-ready interval (19 to 20)	
(20) Available for service		

B.1.2

The lists in Table B.1.1 are not exhaustive but represent typical core points in time and common operational situations. It is not expected that every time stamp be reported. Depending on the EMS system's complexity and level of technology, it is understood that a function interval may be long or instantaneous. However, when reporting EMS system performance, these consensus terms should be used.

B.2 Discrete Time Stamp.

The term *time stamp* refers to the historical tradition in EMS during which call events were recorded by stamping a card that printed the hour and minute that was displayed at that moment on that clock. Today, times are often recorded automatically by computerized

dispatch systems in hours, minutes, and seconds and are synchronized using the U.S. Naval Observatory's atomic clock. These time stamps define discrete moments at which certain events occur, recorded in hour:minute:second [hh:mm:ss] format. Discrete time stamps, collected in this way, allow the user to measure the interval between events. The EMS system must have the ability to capture time stamps in a reliable, consistent, and accurate manner. Not all time stamps are available or collectible, while others are reported with varying degrees of accuracy. Sharing time stamp data across EMS system components and synchronizing time recording devices are critical to establishing an accurate and reliable measurement process.

B.2.1 Function Intervals.

An interval is the elapsed time between two discrete time stamps. Function intervals are the intervals between consecutive time stamps. The function interval describes the activity occurring at the task level of a single call. Function intervals allow analysis of each function that is taking place throughout the continuum of the event. Certain groups of consecutive functions describe processes.

B.2.2 Process Intervals.

A process interval is made up of multiple, consecutive function intervals. A process interval is used to describe the elapsed time required to complete the agency's or EMS system's objective. The process interval allows decision makers to establish baselines, monitor changes, benchmark to other EMS systems, and create long-term plans.

B.3 Reporting EMS System Data.

When decision makers compare EMS systems to benchmark performance, they must use consistent language and data to describe the function and process intervals. For example, the term *response time* is commonly used but not commonly defined. Therefore, caution must be exercised to ensure that the term describes the identical functions or processes. Yet even when common definitions are used, response times may not be accurately compared. For example, some EMS systems report "average" response times, which fail to adequately describe performance. Comparisons should therefore be based on "fractile" reporting, which, for example, may describe time performance with 90 percent reliability.

B.4 Table B.1.1 Definitions.

B.4.1 Column A Definitions.

The definitions in B.4.1.1 through B.4.1.20 are listed to match the order as shown in Column A of Table B.1.1.

B.4.1.1 Incident or Onset Time.

The time the incident occurred or the time that the symptoms developed. *(See 3.3.68.1.)*

B.4.1.2 Time of Discovery of Event.

The time that a third party or the patient becomes aware of the need for assistance. *(See 3.3.68.2.)*

B.4.1.3 Call for Help.

The time that a request for service or assistance is initiated *(See 3.3.68.3.)*

B.4.1.4 First PSAP Call Time.

The time the telephone (or other notification device or mechanism) activates in the first public safety answering point (or other designated entity). *(See 3.3.68.4.)*

B.4.1.5 Phone "Off-Hook" (answered in first PSAP).

The time that the telephone is answered in the first PSAP center. *(See 3.3.68.5.)*

B.4.1.6 Secondary Dispatch Phone Rings—Secondary PSAP. (Reserved)

(See 3.3.68.6)

B.4.1.7 Secondary Dispatch Phone "Off-Hook" Answered (if appropriate).

The time that the second PSAP or second dispatcher answers the phone, begins the interview, collects caller data, and begins prearrival instructions. *(See 3.3.68.7.)*

B.4.1.8 Interview Ends.

The time that the PSAP telecommunicator completes the interview with the caller. (This time stamp may occur before or after resources are identified, or before or after resources arrive on the scene.) *(See 3.3.68.8.)*

B.4.1.9 Response Resources Are Identified.

The time at which resources are identified to meet the needs of the call. For example, the telecommunicator might identify ambulance, fire apparatus, quick-response vehicles, police vehicles, specialty vehicles, or other appropriate resources. In some EMS systems this could be automated based on call nature or geographic location. *(See 3.3.68.9.)*

B.4.1.10 Dispatch Time.

A discrete time stamp that represents unit notification. *(See 3.3.68.10.)*

B.4.1.11 Unit Acknowledgment.

The time that the response resource acknowledges that they have received the notification. *(See 3.3.68.11.)*

B.4.1.12 Unit en Route.

The time that the resource first begins moving toward the scene. *(See 3.3.68.12.)*

B.4.1.13 Unit Arrived on Scene.

The time that the resource comes to a complete stop at the scene. *(See 3.3.68.13.)*

B.4.1.14 Arrived at Patient (Patient Contact).

The point at which personnel has made patient contact. *(See 3.3.68.14.)*

B.4.1.15 First Intervention Time.

The time that the first emergency medical services (EMS) skill intercession (e.g., starting an IV, defibrillation, CPR, or extrication) is begun. *(See 3.3.68.15.)*

B.4.1.16 Time of Result of First Intervention.

The time that the responder first identifies results of the first intervention. (For example, when extrication occurred, when return of spontaneous circulation occurred, and so forth.) *(See 3.3.68.16.)*

B.4.1.17 Unit Left Scene.

The time that the resource first begins moving from the scene. *(See 3.3.68.17.)*

B.4.1.18 Arrived at Destination.

The time that the patient arrived at the hospital, an approved alternate destination, or transfer point. *(See 3.3.68.18.)*

B.4.1.19 Transfer of Care.

The time that responsibility for treatment was transferred from an out-of-hospital provider to another provider (e.g., when the hospital personnel physically take over care of the patient). *(See 3.3.68.19.)*

B.4.1.20 Available for Service.

The time the emergency service resource is available for response. *(See 3.3.68.20.)*

B.4.2 Column B Definitions.

The definitions in B.4.2.1 through B.4.2.19 are listed to match the order as shown in Column B of Table B.1.1.

B.4.2.1 Recognition Interval (1 to 2).

The elapsed period starting with (1), Incident or onset time, and ending at (2), Time of discovery of event.

B.4.2.2 System Access Interval (2 to 3).

he elapsed period starting with (2), Time of discovery of event, and ending at (3), Call for help.

B.4.2.3 Switching Interval (3 to 4).

The elapsed period starting with (3), Call for help, and ending at (4), First PSAP call time.

B.4.2.4 Answer Interval "A" (4 to 5).

The elapsed period starting with (4), First PSAP call time, and ending at (5), Phone "off-hook" (answered in first PSAP).

B.4.2.5 Routing Interval (5 to 6).

The elapsed period starting with (5), Phone "off-hook" (answered in first PSAP), and ending at (6), Secondary dispatch phone rings—secondary PSAP.

B.4.2.6 Answer Interval "B" (6 to 7).

The elapsed period starting with (6), Secondary dispatch phone rings—secondary PSAP, and ending with (7), Secondary dispatch phone "off hook" answered.

B.4.2.7 Interrogation Interval (5 or 7 to 8).

The elapsed period starting with (5), Phone "off-hook" (answered in first PSAP), or (7), Secondary dispatch phone "off hook" answered, and ending with (8), Interview ends.

B.4.2.8 Resource Selection Interval (8 to 9).

The elapsed period starting with (8), Interview ends, and ending with (9), Response resources are identified.

B.4.2.9 Alert Interval (9 to 10).

The elapsed period starting with (9), Response resources are identified, and ending with (10), Dispatch time.

B.4.2.10 Acknowledgment Interval (10 to 11).

The elapsed period starting with (10), Dispatch time, and ending with (11), Unit acknowledgment.

B.4.2.11 Turn-out Interval (11 to 12).

The elapsed period starting with (11), Unit acknowledgment, and ending with (12), Unit en route.

B.4.2.12 Travel Interval (12 to 13).

The elapsed period starting with (12), Unit en route, and ending with (13), Unit arrived on scene (wheels stopped).

B.4.2.13 Patient Access Interval (13 to 14).

The elapsed period starting with (13), Unit arrived on scene, and ending with (14), Arrived at Patient (patient contact).

B.4.2.14 Initial Treatment Interval (14 to 15).

The elapsed period starting with (14), Arrived at Patient (patient contact), and ending with (15), First intervention time.

B.4.2.15 Initial Result Interval (15 to 16).

The elapsed period starting with (15), First intervention time, and ending with (16), Time of result of first intervention.

B.4.2.16 On-Scene Patient Care Interval (16 to 17).

The elapsed period starting with (16), Time of result of first intervention, and ending with (17), Unit left scene.

B.4.2.17 Transport Interval (17 to 18).

The elapsed period starting with (17), Unit left scene, and ending with (18), Arrived at destination.

B.4.2.18 Care Transfer Interval (18 to 19).

The elapsed period starting with (18), Arrived at destination, and ending with (19), Transfer of care.

B.4.2.19 Unit-Ready Interval (19 to 20).

The elapsed period starting with (19), Transfer of care, and ending with (20), Available for service.

B.4.3 Column C Definitions.

The definitions in B.4.3.1 through B.4.3.9 are listed to match the order as shown in Column C of Table B.1.1.

B.4.3.1 Event Activation (1 to 4).

The elapsed time between the event and when the telephone first rings in the first PSAP. This process includes the recognition interval, the system access interval, and the switching interval, and is intended to measure a EMS system's ability—using education, technology, or other means—to recognize that an emergency exists and to take immediate steps to access assistance.

B.4.3.2 Citizen Reaction (2 to 4).

The citizen reaction process begins when an event is first discovered and ends when the telephone rings in the first PSAP. The citizen reaction process is intended to measure the system access interval and the switching interval. The process measures the EMS system's ability to reinforce certain citizen behaviors and provides the means for those citizens to make appropriate access.

B.4.3.3 Call Processing (4 to 11).

The call processing interval is the process that begins when the telephone first rings at the first PSAP and ends when responding units acknowledge that they are aware of the event. The processing interval includes the time required to appropriately answer the telephone in the PSAP, triage and route the call, interview the caller, provide instructions, identify and alert resources, and recognize that the alert has been received. This interval is intended to measure the EMS system's ability to quickly process a request for assistance and notify the appropriate responding units.

B.4.3.4 System Response (4 to 14).

The system response interval is the process that begins when the telephone first rings at the first PSAP and ends when the responders arrive at the patient's side. The system response interval is intended to measure the EMS system's performance in responding to a call for assistance by considering the call processing interval, as well as the turnout, travel, and patient access intervals.

B.4.3.5 Unit Response (11 to 14).

The unit response interval is the process that begins when the individual unit acknowledges that a response is required and ends with patient contact. The unit response interval is intended to measure an individual unit's performance in responding to a call for assistance by considering the turnout, travel, and patient access intervals.

B.4.3.6 Patient Management (14 to 19).

The patient management interval is the process that begins when responders first make contact with the patient and ends when responsibility for the patient is transferred to another

medical provider. The patient management interval is intended to measure the time committed by the EMS system to meet the needs of the patient and reflects the EMS system's ability to manage and monitor resources.

B.4.3.7 Event to Treatment (1 to 15).

The event to treatment interval is intended to measure the EMS system's ability to initiate treatment once an event exists. This interval is intended to measure the process that begins when the event occurs and ends when the first treatment is provided. This process may measure the time that responders, dispatchers, citizens, or others intervene as part of an organized EMS system design.

B.4.3.8 Scene Management (13 to 17).

The scene management interval begins when the first vehicle stops at the scene of an event, and ends when the last patient leaves the scene. The interval is intended to measure the time required to manage the logistics of accessing the patient, providing initial treatment, packaging for transport, and leaving the scene.

B.4.3.9 Unit Cycle (11 to 20).

The unit cycle process reflects the cycle time of an individual unit from activation to availability. The unit cycle process measures the time that a unit is assigned to an event and unavailable for other assignments.

Supplemental Information

File Name	Description	Approved
New_Annex_B.docx	New Annex. For staff use	

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First Revision No. 1-NFPA 450-2019 [Section No. 1.2]

1.2 Purpose.

The purpose of this document is to provide guidelines, resources, and recommendations to assist those interested or involved in EMS system design. Provision ~~of~~ or development ~~and/or pre~~ of out-of -hospital care requires the coordination and cooperation of disparate elements. This document also provides a framework for designing ~~and/~~ or evaluating a comprehensive EMS system. ~~The foundation of this document is based on multiple references, including the *EMS Agenda for the Future*~~ .

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Committee Statement

Committee Statement: The EMS Agenda for the Future is now outdated and has been replaced by the EMS Agenda 2050. The purpose was changed to reflect the current EMS system environments.

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First Revision No. 2-NFPA 450-2019 [Chapter 2]

Chapter 2 Referenced Publications

2.1 General.

The documents or portions thereof listed in this chapter are referenced within this guide and should be considered part of the recommendations of this document.

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

~~NFPA 1071, *Standard for Emergency Vehicle Technician Professional Qualifications,* 2016 edition.~~

~~NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems,* 2016 edition.~~

NFPA 1451, *Standard for a Fire and Emergency Service Vehicle Operations Training Program,* ~~2013~~ 2018 edition.

NFPA 1500™, *Standard on Fire Department Occupational Safety, Health, and Wellness Program,* 2020 edition.

~~NFPA 1561, *Standard on Emergency Services Incident Management System and Command Safety,* 2014 edition.~~

NFPA 1581, *Standard on Fire Department Infection Control Program,* 2015 edition.

~~NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments,* 2016 edition.~~

~~NFPA 1720, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments,* 2014 edition.~~

NFPA 1917, *Standard for Automotive Ambulances,* ~~2016~~ 2019 edition.

~~NFPA 1999, *Standard on Protective Clothing for Emergency Medical Operations,* 2013 edition.~~

2.3 Other Publications.

~~**2.3.1** FEMA Publications.~~

~~Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20402.~~

~~*Civil Preparedness Guide (CPG)* , 1992.~~

~~*National Fire Incident Reporting System (NFIRS)* , 2011.~~

~~**2.3.2** NEMSIS Publications.~~

~~P.O. Box 581289, Salt Lake City, UT 84158-1289.~~

~~NEMSIS National Elements Subsets, 2014.~~

~~**2.3.3** NHTSA Publications.~~

~~National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, DC 20590.~~

~~Delbridge, T. R., et al., *Emergency Medical Services: Agenda for the Future.* August 1996. DOT HS 808-441, NTS-42.~~

~~*Emergency Medical Services Performance Measures: Recommended Attributes and Indicators for System and Service Performance.* Dec. 2009.~~

~~**2.3.4** NIH Publications.~~

~~National Institutes of Health, 9000 Rockville Pike, Bethesda, MD 20892.~~

~~Pub. No. 93-3304, *Staffing and Equipping EMS Systems: Rapid Identification and Treatment of Acute Myocardial Infarction,* National Heart, Lung, and Blood Institute, September 1993.~~

2.3.1 US Government Publications.

US Government Publications. U.S. Government Printing Office, Washington DC 20402.

Title 29, Code of Federal Regulations, Part 1910.1030, *Bloodborne Pathogens*.

2.3.2 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Advisory Sections. (Reserved)

~~NFPA 79, *Electrical Standard for Industrial Machinery,* 2015 edition.~~

~~NFPA 402, *Guide for Aircraft Rescue and Fire-Fighting Operations,* 2013 edition.~~

~~NFPA 901, *Standard Classifications for Incident Reporting and Fire Protection Data,* 2016 edition.~~

~~NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program,* 2013 edition.~~

~~NFPA 1521, *Standard for Fire Department Safety Officer Professional Qualifications,* 2015 edition.~~

~~NFPA 1561, *Standard on Emergency Services Incident Management System and Command Safety,* 2014 edition.~~

~~NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments,* 2016 edition.~~

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Committee Statement: Revised to meet newest editions. NFPA 1500 is now referenced in the main body of the document.

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First Revision No. 4-NFPA 450-2019 [Section No. 3.3]

3.3 General Definitions.

3.3.1 Address.

A number or other code and the street name identifying a location.

3.3.2 Alarm.

A signal or message from a person or device indicating the existence of an emergency or other situation that requires immediate action.

3.3.3 Ambulance.

A vehicle designed, equipped, and operated ~~for~~ by approved personnel trained in the treatment ~~and~~ of the sick or injured that responds to urgent, unscheduled requests for aid or transport of ~~ill and~~ sick or injured ~~persons~~ patient(s) .

3.3.4 Ambulance Service.

An organization that ~~exists to provide patient~~ utilizes approved personnel trained in the treatment or transportation ~~by ambulance~~ (to an appropriate medical facility) of the sick or injured .

3.3.5 American College of Emergency Physicians (ACEP).

A national organization of emergency ~~medical~~ physicians committed to advancing emergency care and preparedness through continuing education, research, advocacy, and public education .

~~**3.3.6** Arrival.~~

~~The point at which a vehicle is stopped on the scene of a response destination or address.~~

3.3.6 Automated Vehicle Locator (AVL).

A computerized mapping system used to track the location of vehicles.

3.3.7 Bloodborne Pathogens.

Microorganisms ~~that are present in human blood and~~ and other potentially infectious material (OPIM) present in blood that can cause diseases in humans.

3.3.8 Call.

A request for assistance or resources to which equipment and personnel are deployed.

3.3.9 Call Intake.

The procedure for answering the phone or other device that is used to receive a signal or message from a person or device indicating the need for medical assistance or resources , learning the nature of the ~~emergency~~ request , and verifying the address ~~of the emergency~~ .

3.3.10 Call Processing.

The interval from call intake by the ~~unit~~ dispatching agency to the time of unit or personnel notification, including answering the phone (alarm), gathering vital information, and initiating a response by dispatching the appropriate unit(s) or personnel .

3.3.11* Chain of Survival.

A metaphor to communicate the interdependence of a community's emergency response ~~to cardiac arrest~~ .

3.3.12 Compliance.

Adherence or conformance to laws, regulations, and standards.

3.3.13 Cross-Trained/Dual Role (CT/DR).

An emergency service that allows personnel trained in two service functions~~, such as~~ (e.g., fire suppression and emergency medical care~~,~~) to function in either role.

3.3.14 Defibrillation.

The delivery of an electrical shock to the heart intended to reverse abnormal electrical activity.

3.3.15 Defibrillator.

3.3.15.1 Automated External Defibrillator (AED).

A portable electronic device that ~~administers an electric shock~~ diagnoses life-threatening arrhythmias and is able to treat them through ~~the chest wall to the heart using built-in computers to assess the patient's heart rhythm and defibrillate as needed.~~ defibrillation.

3.3.15.2 Manual Defibrillator.

A portable electronic device that delivers an electric shock through the chest wall to the heart and that requires operation by trained medical personnel.

3.3.16 Deployment.

The procedures by which resources are distributed. ~~throughout the service area.~~

3.3.17 Dispatch.

To send ~~out emergency response~~ resources ~~promptly~~ to an address or incident location for a specific purpose.

3.3.17.1 Computer-Aided Dispatch (CAD).

A dispatching method or process ~~in which a computer and its associated terminal(s) are used~~ to provide relative dispatch data to the ~~concerned~~ telecommunicator.

3.3.17.2 Dispatch Time.

The time the responding unit or personnel was notified by the telecommunicator.

3.3.17.3 Emergency Medical Dispatch.

~~The receipt and management of requests for emergency medical assistance in the emergency medical services (EMS) system.~~ A systematic program of handling medical requests.

3.3.18 Documentation.

The process of gathering, classifying, and storing information.

3.3.19 Emergency.

A condition or situation in which ~~an individual~~ a prudent layperson perceives a need for immediate response.

3.3.20 Emergency Medical Dispatcher (EMD).

~~EMS personnel~~ Personnel specifically trained and certified in interviewing techniques, pre-arrival instructions, and call prioritization.

3.3.21 Emergency Medical Services (EMS).

~~Providing~~ A coordinated system providing the full spectrum of out-of-hospital patient services that ~~might~~ includes the provision of assessment, treatment, referrals, ~~such as first aid, CPR, BLS, ALS, and other pre-hospital procedures, including ambulance~~ or transportation of patients.

3.3.22 Emergency Medical Services for Children (EMS-C).

~~A national initiative to reduce child and youth disability and death from severe illness or injury~~ A federally funded program that addresses the reduction of infant, child, and adolescent morbidity or mortality .

3.3.23 Emergency Medical System Providers.

3.3.23.1 Advanced Emergency Medical Technician (AEMT).

Provides out-of-hospital basic and limited advanced emergency medical care for patients who access the EMS system.

3.3.23.2 Emergency Medical Responder.

Provides out-of-hospital, immediate life-saving care to patients who access the EMS system.

3.3.23.3 Emergency Medical Technician (EMT).

~~A term for any pre-hospital provider trained and certified at the EMT-Basic level or higher.~~ Provides out-of-hospital medical care and transportation for patients that access the EMS system.

~~**3.3.28.1** Emergency Medical Technician — Basic (EMT-B).~~

~~A pre-hospital basic life support (BLS) provider with training based on the National Highway Traffic Safety Administration (NHTSA) National Standard Curriculum.~~

~~**3.3.28.2** Emergency Medical Technician — Intermediate (EMT-I).~~

~~A pre-hospital provider trained according to the National Highway Traffic Safety Administration (NHTSA) National Standard Curriculum to intermediate levels.~~

3.3.23.4 ~~Emergency Medical Technician —~~ Paramedic ~~(EMT-P)~~ .

~~A pre-hospital provider trained according to National Highway Traffic Safety Administration (NHTSA) National Standard Curriculum to advanced levels~~ An allied health professional whose primary focus is to provide out-of-hospital advanced medical care for patients who access the EMS system .

3.3.24 Emergency Operations.

Activities of the emergency responders relating to rescue, fire suppression, emergency medical care, and special operations.

3.3.25 Emergency Service Resources.

Personnel, vehicles, or other resources available to respond to requests for assistance.

3.3.26 Employee. (Reserved)

3.3.27* Employee Assistance Program (EAP).

An EAP is an employer-sponsored service designed for personal or family ~~problems, including mental health, substance abuse, various addictions, marital problems, parenting problems, emotional problems, or financial or legal~~ concerns.

A.3.3.27 Employee Assistance Program (EAP).

Some examples of personal or family concerns an EAP could be designed for include, but are not limited to, mental health, substance abuse, various addictions, marital problems, parenting problems, or financial or legal concerns.

3.3.28 Employee Illness and Injury.

A work-related illness or injury requiring evaluation or medical follow-up.

3.3.29 Employee Turnover.

Termination of employment with the organization for any reason.

3.3.30* EMS Agency.

EMS agencies are composed of the personnel, vehicles, equipment, and facilities used to deliver emergency and nonemergency care to individuals outside a hospital.

A.3.3.30 EMS Agency.

Key services of an EMS agency include public access through a coordinated communications system, public safety and EMS response, and patient transportation.

3.3.31 Fire Suppression.

The activities involved in controlling and extinguishing fires. [~~**1500,** 2013~~]

3.3.32 First Responder ~~(EMS)~~ .

~~Functional provision of initial assessment (i.e., airway, breathing, and circulatory systems) and basic first-aid intervention, including CPR and automatic external defibrillator (AED) capability. [**1710,** 2016]~~ A common term to describe public safety personnel not trained as an emergency medical services provider that might respond to emergencies or other incidents.

~~**3.3.40** GSA KKK Specifications.~~

~~A set of federal specifications relating to purchasing requirements for ambulance design and manufacture.~~

3.3.33 Hazard.

A source of possible injury or damage to health. [~~**79,** 2015~~]

3.3.34 Hazardous Material.

A substance that presents an unusual danger to persons due to toxicity, chemical reactivity, decomposition, corrosiveness, explosion or detonation, etiological hazards, or similar properties.

3.3.44 ~~Health Care Financing Administration (HCFA).~~

~~The former name of the Center for Medicare and Medicaid Services (CMS).~~

3.3.45 ~~Health Maintenance Organization (HMO).~~

~~An organized system of health care that provides or arranges for a range of basic and supplemental health care services to a voluntarily enrolled group of persons under a prepayment plan.~~

3.3.35 Incident Location.

The address or other identifiable area of an event.

3.3.36* Incident Management System.

A system that defines the roles and responsibilities to be assumed by responders and the standard operating procedures to be used in the management and direction of emergency incidents and other functions. [**1561,** ~~2014~~]

A.3.3.36 Incident Management System.

The system is also referred to as an incident command system (ICS).

The implementation of HSPD-5 led to the development of the National Incident Management System (NIMS). The NIMS is a system mandated by HSPD-5 that provides a consistent nationwide approach for federal, state, local, and tribal governments; the private sector; and nongovernmental organizations to work effectively and efficiently together to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity. To provide for interoperability and compatibility among federal, state, local, and tribal capabilities, the NIMS includes a core set of concepts, principles, and terminology. HSPD-5 identifies these as the ICS; multi-agency coordination systems; training; identification and management of resources (including systems for classifying types of resources); qualification and certification; and the collection, tracking, and reporting of incident information and incident resources.

In addition to the NIMS, the process also incorporates the National Response Plan.

3.3.37 Interval.

The distance as measured in time between two time stamps.

3.3.37.1 Fractile Response Interval.

A method of describing response intervals that uses frequency distribution as its basis for reporting.

3.3.37.2* Turnout Interval.

The time beginning when units acknowledge notification of the emergency to the ~~beginning point~~ movement of ~~response time~~ resources .

A.3.3.37.2 Turnout Interval.

This interval includes personnel and equipment preparation for response, ~~boarding~~ and the ~~responding apparatus/vehicle, placing the apparatus/vehicle in gear for response, and wheels rolling~~ movement of resources toward the ~~emergency scene~~ incident .

3.3.38 Lead Agency.

An organization ~~assigned to organize the interagency~~ responsible for oversight of the day-to-day ~~conduct of policy related to a particular~~ operation of the EMS system .

3.3.39 Life Support.

3.3.39.1* Advanced Cardiac Life Support (ACLS).

A nationally recognized curriculum to teach advanced methods of treatment for cardiac, stroke, and other emergencies.

A.3.3.39.1 Advanced Cardiac Life Support (ACLS).

The American Heart Association ACLS and the American Red Cross ALS provider programs are examples of nationally recognized programs.

~~3.3.53.2~~ ~~Advanced Life Support (ALS).~~

~~Emergency medical treatment beyond basic life support level as defined by the medical authority having jurisdiction. [**1500,** 2013]~~

3.3.39.2 Basic Life Support (BLS).

Emergency medical treatment at a level as defined by the medical authority having jurisdiction. ~~[**1500,** 2013]~~

3.3.39.3 Critical Incident Stress Management (CISM).

A program designed to reduce acute and chronic effects of stress related to job functions.

~~3.3.40~~ ~~Management.~~

~~3.3.54.2~~ ~~Total Quality Management (TQM).~~

~~A management system fostering continuously improving performance at every level of function and focusing on customer satisfaction.~~

3.3.40* Medical Authority.

The person or structure responsible for patient care oversight.

A.3.3.40 Medical Authority.

Individual agencies in the system could have medical directors that provide agency-specific or program-specific oversight. This may be a single physician or group of physicians, but there are some examples of different authority modalities around the world.

3.3.41 Medical Direction and Oversight .

The granting of authority to an EMS system or agency and its providers in the delivery and improvement of EMS ~~pre~~ out-of -hospital care.

3.3.41.1* Off-Line (Indirect) Medical Direction.

The medical ~~direction~~ oversight that consists of standing orders, training, protocol development, and supervision that are authorized by the medical director.

A.3.3.41.1 Off-Line (Indirect) Medical Direction.

All EMS providers should follow the protocols developed ~~and/~~ or implemented by the medical director of their EMS agency.

3.3.41.2* ~~On-Line~~ Online (Direct) Medical Direction.

The medical direction provided to out-of-hospital providers by the medical director or designee, ~~generally in an emergency situation,~~ either on-scene or by real-time communication.

A.3.3.41.2 ~~On-Line~~ Online (Direct) Medical Direction.

The mechanism for this contact can be radio, telephone, telehealth, or other means as technology develops, but it should include person-to-person communication of patient status ~~and~~ , orders to be carried out, and assistance in coordination of care .

3.3.41.3* Medical Director.

A physician trained in emergency medicine, designated as a medical director for the local EMS agency.

A.3.3.41.3 Medical Director.

Ideally, this physician would be subspecialty trained and board certified in EMS.

3.3.41.4* Medical Oversight.

The supervision and administration of the medical aspects of an EMS system or agency and its providers.

3.3.42* Mobile Integrated Healthcare (MIH).

The provision of healthcare through EMS systems using patient-centered, mobile resources in the out-of-hospital environment. ~~including, but not limited to, services such as providing telephone advice to 9-1-1 callers instead of resource dispatch; providing community paramedicine care, chronic disease management, preventive care, or post-discharge follow-up visits; or transport or referral to a broad spectrum of appropriate care not limited to hospital emergency departments.~~

A.3.3.42 Mobile Integrated Healthcare (MIH).

Patient-centered, mobile resources include, but are not limited to, services such as providing telephone advice to 9-1-1 callers instead of resource dispatch; providing community paramedicine care, chronic disease management, preventive care, or post-discharge follow-up visits; or transport or referral to a broad spectrum of appropriate care not limited to hospital emergency departments.

~~**3.3.59** Multiple Casualty.~~

~~Injury or death of more than one individual in an incident.~~

3.3.43 Mutual Aid.

Reciprocal assistance by emergency services under a prearranged plan. [**402**, ~~2013~~]

3.3.44 National Association of EMS Physicians (NAEMSP).

A national organization of ~~emergency medical~~ EMS physicians and other professionals who focus on providing leadership and fostering excellence in EMS .

3.3.45* National EMS Information Systems (NEMSIS).

The national data standard and repository ~~that will be used to potentially store~~ of EMS data. ~~from every state in the nation.~~

3.3.46 National Highway Traffic Safety Administration (NHTSA).

The agency under the United States Department of Transportation that is responsible for preventing motor vehicle injuries and deaths and which provides national guidance on emergency medical services and systems .

3.3.47 National Institutes of Health (NIH).

An agency of the Public Health Service of the Department of Health and Human Services, responsible for promoting the nation's health and providing medical research .

3.3.48 National Response Plan.

A plan mandated by HSPD-5 that integrates federal domestic prevention, preparedness, response, and recovery plans into one all-discipline, all-hazards plan.

3.3.49* Next Generation (NG) 911.

NG9-1-1 is an Internet Protocol (IP)–based system made up of managed emergency services IP networks (ESInets), functional elements (i.e., applications), and databases that replicate traditional E9-1-1 features and functions and provide additional capabilities.

A.3.3.49 Next Generation (NG) 911.

NG9-1-1 is designed to provide access to emergency services from all connected communications sources and provide multimedia data capabilities for public safety answering points (PSAPs) and other emergency service organizations.

3.3.50 Nontraditional Providers.

Providers that might or might not be licensed/certified but who provide services (e.g., social and health education) necessary to meet patients' needs.

3.3.51 Outcome.

The result, effects, or consequences of ~~an emergency system encounter on the health status of the~~ services provided to a patient.

~~**3.3.67** Patient Contact.~~

~~The time that responding personnel first arrived at the patient's side.~~

3.3.52 Patient Transportation Provider.

Organizations or individuals that offer emergency, nonemergency, or prescheduled medical transportation.

3.3.53 Protocol.

~~Protocols define the pre~~ A defined out-of -hospital care management procedure. ~~of specific patient problems.~~

3.3.54 Provider/Practitioner.

Individuals that are licensed or certified to provide healthcare services, transportation, coordination, or referrals.

3.3.55 Public Safety Answering Point (PSAP).

A facility in which 9-1-1 or other emergency calls are answered, either directly or through rerouting.

~~**3.3.71** Quality Assessment (QA).~~

~~An assessment of the performance of structure, processes, and outcomes within the EMS system and their comparison against a standard.~~

3.3.56 Quality Assurance Management (QAQM) .

The activities undertaken to establish confidence that the products or services available maintain the standard of excellence set for those products or services.

3.3.57 Quality Improvement (QI) .

The activities undertaken to continuously examine ~~and~~ the performance of structure, processes, and outcomes within the EMS system and their comparison against a standard to improve the products and services.

3.3.58 ~~In-Service~~ Resource Utilization Ratio/Unit Hour Utilization (UHU) .

An efficiency ratio that divides the ~~cumulative unit-elapsed intervals~~ time spent on assignment by the total time ~~that~~ the ~~unit~~ resource is ~~on duty~~ available for assignment .

3.3.59 Response.

The deployment of ~~an emergency service~~ resources to an incident. [~~**901,** 2016~~]

3.3.60 Response Time Interval.

The time when an initial request for resources has been received to the time resources have made patient contact.

3.3.61* Secondary Dispatch Phone Rings (if appropriate).

The time the telephone begins to ring in the second public safety answering point (or the call screener).

3.3.62 Staffing.

The number and the level of training of personnel ~~deployed on an emergency call~~ .

3.3.63 Standard Operating Procedure.

A written organizational directive that establishes or prescribes specific operational or administrative methods to be followed routinely for the performance of designated operations or actions. [~~**1521,** 2015~~]

3.3.64 Standing Orders.

A direction or instruction for delivering patient care without ~~on-line~~ online medical ~~oversight~~ direction backed by authority of the system medical director.

3.3.65 System.

3.3.65.1 EMS System.

A comprehensive, coordinated arrangement of resources and functions that are organized to respond in ~~a timely, staged~~ an appropriate manner to ~~medical emergencies regardless of their cause~~ out-of-hospital healthcare needs facilitated by an EMS service .

3.3.65.2 Geographic Information System (GIS).

A system of computer software, hardware, data, and personnel to describe information tied to a spatial location.

3.3.66 Telecommunicator.

The individual tasked by a public safety agency ~~as the first of the first responders~~ whose primary responsibility is to receive, process, transmit, ~~and/~~ or dispatch emergency and nonemergency calls for law enforcement, fire, emergency medical, and other public safety services via telephone, radio, and other communication devices.

3.3.67 Telemedicine.

Two-way real-time interactive communication between the patient and the physician or provider at the distance site.

3.3.68 Time Stamps .

3.3.68.1 Incident or Onset Time.

The time the incident occurred or the time that the symptoms developed.

3.3.68.2 Time of Discovery of Event.

The time that a third party or the patient becomes aware of the need for assistance.

3.3.68.3 Call for Help.

The time that ~~a third party or the patient first attempts to contact outside assistance~~ request for service or assistance is initiated .

3.3.68.4 First PSAP Call Time.

The time the telephone ~~begins to ring~~ (or other notification device or mechanism) activates in the first public safety answering point (or other designated entity).

3.3.68.5 Phone “Off-Hook” (answered in first PSAP).

The time that the telephone is answered in the first PSAP center.

3.3.68.6 Secondary Dispatch Phone Rings — Secondary PSAP. (Reserved)

3.3.68.7 Secondary Dispatch Phone “Off-Hook” Answered (if appropriate).

The time that the second PSAP or second dispatcher answers the phone, begins the interview, collects caller data, begins prearrival instructions.

3.3.68.8* Interview Ends.

The time that the PSAP telecommunicator completes the interview with the caller. ~~This time stamp can occur before or after resources are identified, or before or after units arrive on the scene.~~

A.3.3.68.8 Interview Ends.

This time stamp can occur before or after resources are identified, or before or after ~~units~~ resources arrive on the scene.

3.3.68.9* Response Resources Are Identified.

The time at which resources are identified to meet the needs of the call. ~~that the PSAP telecommunicator, through computer-aided dispatch or other means, identifies the appropriate resources to send to the scene of the emergency.~~

A.3.3.68.9 Response Resources Are Identified.

For example, the telecommunicator might identify ambulance, fire apparatus, quick-response vehicles, police vehicles, specialty vehicles, or other appropriate resources. In some systems this could be automated based on call nature or geographic location.

3.3.68.10 Dispatch Time.

A discrete time stamp that represents unit notification.

3.3.68.11 Unit Acknowledgment.

The time that the response ~~unit(s)~~ resource acknowledges that they have received the notification.

3.3.68.12 Unit en Route.

The time that the ~~vehicle~~ resource first begins moving toward the scene.

3.3.68.13 Unit Arrived on Scene.

The time that the ~~vehicle~~ resource comes to a complete stop at the scene.

3.3.68.14 Arrived at Patient (Patient Contact).

The point at which personnel has made patient contact.

3.3.68.15 First Intervention Time.

The time that the first ~~intervention, such as~~ emergency medical services (EMS) skill intercession (e.g., starting an IV, defibrillation, CPR, or extrication~~, and so on,~~) is begun.

3.3.68.16* Time of Result of First Intervention.

The time that the responder first identifies results of the first intervention. ~~For example, when extrication occurred, when return of spontaneous circulation occurred, and so forth.~~

A.3.3.68.16 Time of Result of First Intervention.

For example, when extrication occurred, when return of spontaneous circulation occurred, and so forth.

3.3.68.17 Unit Left Scene.

The time that the ~~vehicle~~ resource first begins moving from the scene.

3.3.68.18 Arrived at Destination.

The time that the ~~responding unit~~ patient arrived at the hospital, an approved alternate destination, or transfer point.

3.3.68.19 Transfer of Care.

The time that responsibility for treatment was transferred from ~~a pre~~ an out-of -hospital provider to another ~~—~~ provider (e.g., when the hospital personnel physically take over care of the patient) .

3.3.68.20 Available for Service.

The time the ~~unit was~~ emergency service resource is available for response.

3.3.68.21 Turnout Activation.

Personnel preparation, boarding the vehicle, starting the vehicle, placing the vehicle in gear, and moving the vehicle toward the emergency scene.

3.3.69 Unit.

A staffed and equipped emergency response vehicle.

Supplemental Information

File Name	Description	Approved
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Committee Statement:	This section has been revised to provide more accurate definitions based on today's environment and for ease of use. For example, the dispatch time stamps have been taken out of alphabetical order and all put under the header "Time Stamps."
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First Revision No. 5-NFPA 450-2019 [Section No. 4.1]

4.1 General.

System regulation and policy is fundamental to providing emergency medical services and is the basis for effective system design. Consistent with this recognition is the core principle that a single entity ~~has~~ should have system oversight and responsibility for the effective coordination of system elements. This entity ensures that the EMS system components are clearly articulated and defined. Furthermore, appropriate mechanisms are instituted to ensure participation of system stakeholders in developing policies and regulations. This chapter ~~of the guide~~ outlines the core elements of an effective process for developing and implementing EMS system regulations and policies.

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First Revision No. 6-NFPA 450-2019 [Section No. 4.8]

4.8 Planning.

The lead agency should provide planning for EMS system design. ~~The lead agency should ensure that the EMS system design is based on a systematic planning process. While planning processes may vary significantly between EMS systems, the lead agency should ensure that the process occurs in a manner consistent with identified needs.~~

4.8.1

The lead agency should ensure that the EMS system design is based on a systematic planning process.

4.8.2

The planning process begins by conducting an assessment of the EMS system's needs, resources, and capabilities.

4.8.3

While planning processes ~~may~~ might vary significantly between EMS systems, the lead agency should ensure that the process occurs in a manner consistent with identified needs.

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4.11* Participation in Policy Development.

Representatives of user groups and system stakeholders should be involved in designing expectations and developing system policy. The lead agency should identify appropriate participants for system design and policy development. ~~For example, stakeholders may include consumers or users of EMS services, health care providers, hospitals, public health agencies, nursing homes, special populations, educators, governmental officials, and payers.~~

A.4.11

For example, stakeholders may include consumers or users of EMS services, health care providers, hospitals, public health agencies, nursing homes, special populations, educators, governmental officials, and payers.

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First Revision No. 8-NFPA 450-2019 [Chapter 5]

Chapter 5 EMS System Analysis and Planning

5.1 Introduction.

5.1.1

Virtually all communities have some form of ~~emergency medical services (~~ EMS~~)~~ system. For any one community, the *components* of the EMS system and the *level of service* should be tailored to the needs and wants of that community. ~~While an EMS system is unique to the jurisdiction, the industry recognizes a standard approach to assessing local needs and meeting those needs with specific service elements.~~ This chapter ~~of the guide~~ outlines a systematic approach for evaluating and analyzing a jurisdiction's existing EMS system or for determining the EMS system design for a jurisdiction without a dedicated EMS system in place.

5.1.2

~~As specified in T. R. Delbridge, et al., *Emergency Medical Services: Agenda for the Future* , "Before creating an EMS system or implementing any EMS system design changes, a~~ A community should conduct a comprehensive community analysis that considers available resources, customers, geography, demographics, political conditions, and other unique and special needs of the EMS system. ~~This analysis should focus on these areas, identifying their potential impact on the effectiveness of EMS system components including human resources, medical direction, legislation and regulation, education systems, public education, training, communications, transportation, prevention, public access, communications systems, clinical care, information systems (data collection), and evaluation."~~

5.1.3

~~This~~ A comprehensive community analysis should focus on ~~these~~ the areas stated in 5.1.2 , identifying their potential impact on the effectiveness of EMS system components including human resources, medical direction, legislation and regulation, education systems, public education, training, communications, transportation, prevention, public access, communications systems, clinical care, information systems (i.e., data collection), and evaluation.~~"~~

5.2 Analysis of System Resources.

The EMS system should analyze the resources available, ~~to serve the system,~~ including financial ~~resources~~ , equipment and facilities, providers, and ~~participants in the system~~ stakeholders .

5.2.1 Finances.

5.2.1.1 Comprehensive Financial Analysis.

The financial status of the community and its capacity to support the EMS system should be evaluated. The analysis includes the financial status of all the entities within the EMS system based on generally accepted accounting principles. *(See Chapter 6.)*

5.2.1.2 Solvency.

~~The provider(s) of each~~ Each EMS system component should be financially solvent by maintaining the financial resources to allow the uninterrupted delivery of ~~essential~~ services.

5.2.1.3 Funding Stability.

Funding for each component may be through a variety of sources, such as municipal budget/taxes, fee for services, subscription programs, grants, or private donations. Each component should be self-supporting, with adequate reserves to continue to function if the primary funding mechanism is temporarily interrupted or if operating costs exceed available funding.

5.2.1.4 Budget.

~~The~~ Each system component should ~~evaluate both an~~ maintain annual operating ~~budget~~ and ~~a~~ capital budgets consistent with generally accepted accounting principles.

5.2.2 Providers.

The EMS system should identify the roles, responsibilities, staffing requirements, and training levels of each provider ~~required~~ needed for the EMS system to ~~function~~ meet its objectives .

~~**5.2.2.1** Provider Resources.~~

~~EMS systems are composed of the personnel, vehicles, equipment, and facilities used to deliver emergency and nonemergency care to individuals outside a hospital. Key services of an EMS system include public access through a coordinated communications system, public safety and EMS response, and patient transportation. Resources of other nonconventional agencies such as nonemergency ambulance and municipal mass transportation services should be considered.~~

5.2.2.1 Role Description.

Each type of service within the EMS system should be clearly defined and fully described ~~in the system design~~ (e.g., the response system may be different from the transportation system).

5.2.2.2 Role Definition.

~~Based on the needs and wants~~ Each ~~of the~~ community~~, several~~ defines the different types and levels of providers that may be required. ~~Roles and responsibilities for each type and level of provider should be identified in order to ensure that the desired level of care is delivered continually and effectively.~~ Examples of provider types are described in 5.2.2.2.1 through 5.2.2.2.6.

5.2.2.2.1* Telecommunicators.

Telecommunicators provide verification of the incident address and notification of closest EMS system provider. Emergency medical dispatchers (EMDs) provide verification of the incident address; triage the call to identify which resources are needed to best meet the needs of the caller; notification of the closest, most appropriate provider; and prearrival patient care instructions.

A.5.2.2.2.1

Resources that telecommunicators may use include a nurse advise line.

5.2.2.2.2 Emergency Medical Responders.

The role of emergency medical responder is as referenced by the NHTSA Office of EMS.

5.2.2.2.3 Basic Life Support.

The role of basic life support responder is as referenced by the NHTSA Office of EMS.

5.2.2.2.4 Advanced Life Support (ALS).

The role of ALS responder is as referenced by the NHTSA Office of EMS.

5.2.2.2.5 Mobile Integrated Healthcare (MIH).

The role of each MIH provider should be clearly defined by the AHJ over the MIH system.

5.2.2.2.6 Patient Transportation Provider(s).

Patient transportation providers may offer emergency, nonemergency, or prescheduled medical transportation. ~~The role of each provider type should be clearly defined by the AHJ over the EMS system.~~ Resources of other nonconventional agencies such as nonemergency ambulance and municipal mass transportation services should be considered.

5.2.3 ~~Participants~~ System Response Models .

The EMS system ~~identifies~~ should identify the roles and responsibilities of each organization type needed for the EMS system to function. How those organizations fulfill them is determined by the needs of the community.

5.2.3.1 Structure.

The ~~provider types listed in~~ ~~5.2.2.3~~ system response model may be ~~supplied~~ delivered by a single organization or through the combined efforts of multiple organizations, including, but not limited to, those described in 5.2.3.1.1 through 5.2.3.1.6.

5.2.3.1.1 Fire Department~~–~~ Based.

~~The~~ A response and patient transportation system that uses ~~cross-trained/dual~~ multi -role firefighters or supplemental single-role EMS providers .

5.2.3.1.2 Fire Department–Based Oversight.

The response and patient transportation system uses EMS personnel who are not cross-trained as fire suppression personnel.

5.2.3.1.3 Public Single-Role EMS System.

The response and patient transportation system utilizes single-role public employees.

5.2.3.1.4 Private Ambulance Provider System.

The response and patient transportation system uses nongovernmental staff.

5.2.3.1.5 Combined System.

Some other combination of public and private resources is used to provide out-of-hospital care.

5.2.3.1.6 Additional Provider Types.

Additional provider types such as police based, hospital based, wilderness, public corporation, military, nonprofit, and others may provide services independently or in combination with other provider types.

5.2.3.2 Participant Roles.

The roles and responsibilities for each participant should be organized in a manner that ensures that every component of the EMS system contributes to the effectiveness of the EMS system as a whole, without conflict. ~~s in roles and responsibilities.~~

5.3 Community Needs Analysis.

5.3.1

While an EMS system is unique to the jurisdiction, a standardized approach should be established for assessing local needs and meeting those needs with specific service elements. The EMS system plan ~~identifies~~ should identify the medical needs of the community for patient care and transport.

5.3.2 Retrospective Evaluation.

5.3.2.1 Existing Systems.

For existing EMS systems, community needs and system components should be established based on response data, patient care records, and other information, including the following:

(1) Demographic data

(2) Historical patient data and call history

(3) Unique geographical or environmental conditions

(4) Local hazards

(5) Call/incident severity

(6) Other local data resources as appropriate

5.3.2.2 No Existing Systems.

For areas without an existing EMS system, system design should be based on established industry standards.

5.3.2.3 Service Levels.

Service levels should be linked to community needs and expectations.

~~**5.3.2** Prevention Targets.~~

~~The system plan should identify vulnerable population groups that would benefit from prevention programs. The community should include primary illness- and injury-prevention programs for age-related hazards, special needs, or special hazard groups, based on an analysis of the community's population.~~

~~**5.4** System Goals and Objectives Analysis.~~

~~System goals and objectives determine service levels as a function of community needs identified through EMS system evaluation and analysis and community needs assessments.~~

~~**5.4.1** System Design.~~

~~System design should be dynamic and based on continual evaluation of the EMS system according to defined indicators and performance measures.~~

~~**5.4.2** Cost/Benefit.~~

~~System design should consider both the costs and benefits of service delivery options.~~

~~5.4.3~~ ~~Prevention Efforts.~~

~~Illness and injury prevention and education efforts should be linked to community needs and resource availability.~~

5.4 System Design Analysis.

5.4.1 Data Collection and Evaluation.

The EMS system should be examined in detail over time using indicators set forth in existing industry standards, guidelines, or specific performance measures.

5.4.2 Existing Industry Standards and Regulations.

5.4.2.1 Existing Regulatory Standards.

~~Community~~ EMS agencies should comply with local, ~~and~~ state, provincial, tribal, ~~ordinances~~ and federal laws, rules, and regulations. ~~State and local regulations typically regulate local authority, ambulance services and equipment, EMTs, scopes of practice, training, and certification or licensing requirements.~~

5.4.2.2 Consensus-Based Industry Standards.

EMS agencies should comply with applicable consensus-based industry standards.

5.4.2.3 Evidence-Based Guidelines.

EMS systems and agencies should use evidence-based guidelines for resource deployment and management of patient care.

~~5.4.2.2~~ ~~NFPA 1710.~~

~~NFPA 1710 is an industry standard on which fire department–based EMS system design analysis may be based. This voluntary standard contains minimum requirements relating to the organization and deployment of emergency medical operations to the public by "substantially all career fire departments."~~

~~5.4.2.3~~ ~~Existing EMS Guidelines.~~

~~NFPA 1720 is an industry standard on which fire department–based EMS system design analysis may be based. This voluntary standard contains minimum requirements relating to the organization and deployment of emergency medical operations to the public by voluntary fire departments.~~

~~5.4.2.4.1~~ ~~First Response Unit Guidelines.~~

~~The National Institutes of Health has recommended guidelines for first response units. *(See NIH 93-3304, Staffing and Equipping EMS Systems: Rapid Identification and Treatment of Acute Myocardial Infarction.)* These guidelines or others may be applied to local EMS systems.~~

~~5.4.2.4.2~~ ~~Early Defibrillation Guidelines.~~

~~The International Liaison Committee on Resuscitation (ILCOR) has recommended guidelines for early defibrillation. These or other guidelines may be applied to local EMS systems. For people in cardiac arrest, rapid defibrillation in less than 5 minutes is a high-priority goal.~~

~~5.4.2.4.3~~ ~~Advanced Life Support (ALS) Unit Deployment Guidelines.~~

~~The National Institutes of Health has recommended guidelines for ALS response units. *(See NIH No. 93-3304, Staffing and Equipping EMS Systems: Rapid Identification and Treatment of Acute Myocardial Infarction.)* These guidelines or others may be applied to local EMS systems.~~

~~5.4.2.4.4~~ ~~Personnel Deployment Guidelines.~~

~~ILCOR has recommendations for personnel deployment. These or other guidelines may be applied to local EMS systems.~~

~~5.4.2.4~~ ~~Chain of Survival.~~

~~The concept *chain of survival* is used to describe the following five EMS system components critical to the survival of cardiac arrest victims:~~

- ~~Immediate recognition of cardiac arrest and activation of the emergency response system~~
- ~~Early CPR with an emphasis on chest compressions~~
- ~~Rapid defibrillation~~
- ~~Effective advanced life support~~
- ~~Integrated post–cardiac arrest care~~

5.4.3 Performance and Quality Measures as System Design Features.

5.4.3.1*

EMS systems and agencies should use performance measures as a framework for operational improvement. ~~EMS system performance measures are designed to function as a framework for a new system design or as a tool through which a community may monitor the performance of the existing EMS system. Several indicators serve as system design data collection points. Through the continuous measurement of a system's structure, processes, and outcomes using designated indicators and performance measures, EMS system planners may identify areas of the system design that require modification or enhancement.~~

A.5.4.3.1

EMS system performance and quality measures are designed to function as a framework for a new system design or as a tool through which ~~a~~ community may monitor the performance of the existing EMS system. Several indicators serve as system design data collection points. Through the continuous measurement of a system's structure, processes, and outcomes using designated indicators and performance measures, EMS system planners may identify areas of the EMS system design that require modification or enhancement.

5.4.3.2 Agency Accreditation.

EMS systems and agencies should consider accreditation as a means of developing and maintaining verifiable performance and quality measures.

~~**5.4.3.2**~~

~~If subsequent data show that the original goals and objectives of the EMS system are not being met, modification of the EMS system design should be made. Data collection and evaluation is required to assess the EMS system modification and ensure that the system continues to be effective.~~

~~**5.4.3.2.1** NHTSA.~~

~~The National Highway Traffic Safety Administration (NHTSA) has published the document, *EMS Performance Measures: Recommended Attributes and Indicators for System and Service Performance,* using a consensus process to develop performance measures for EMS. The document contains indicators and attributes that EMS practitioners identified as critical for performance measurement and evaluation of any emergency medical services system. This resource describes the sources of required data, the formulas or questions necessary to examine critical components, as well as other evaluation criteria parameters.~~

~~**5.4.3.2.2** Other Measurement Methods.~~

~~Organizations such as the Commission on Fire Accreditation International (CFAI), the Commission on Accreditation of Ambulance Services (CAAS), the International Association of Fire Fighters (IAFF), and others have published measurements and criteria for EMS systems.~~

5.5 Continual Risk Assessment and Planning.

~~The~~ EMS systems and agencies should have in place a comprehensive process~~, articulated in a risk assessment plan and overall system design that provides continual analysis and mitigation of risk. The primary risk management processes include risk assessment (internal and external), risk elimination, risk avoidance and prevention, risk control, and loss control.~~ to assess and manage external and internal risks.

5.5.1 Internal System Liabilities Risks.

Internal system liabilities place individual agencies or the EMS system at risk. Examples of such risks include workplace violence, financial improprieties, discrimination, and harassment.

5.5.2 External-Community Risks.

External system liabilities place community members at risk. Examples include risks to the community from provider negligence, inappropriate vehicle operation, lack of compliance with training standards, improper maintenance, and inadequate quality assurance processes.

5.5.3 Risk Control.

Measures should be taken to guard against and protect personnel from potential exposures to risks.

5.5.4 Loss Control.

Measures should be taken to limit losses through processes such as early-return-to-work programs.

~~**5.6** Essential System Analysis Components.~~

~~The nature of time presents a classic problem in semantics: The same term can have different meanings to different people. Additionally, tradition and unique EMS system design have created a language of time incomparability. The NFPA 450 EMS time template, shown in Table 5.6 , is an attempt to solve this problem with consensus terms. The key to this time template is to differentiate clearly between discrete points versus intervals of time. Column A represents discrete points in time or time stamps that occur during an EMS call. Columns B and C label uniquely the elapsed time or intervals between the time stamps.~~

~~Table 5.5 Essential System Analysis Components~~

~~Column A~~ ~~Discrete Time Stamps~~	~~Column B~~ ~~Functional Intervals~~	~~Column C~~ ~~Process Intervals~~
~~(1) Incident or onset time~~	~~(1) Recognition interval (1 to 2)~~	~~(1) Event activation (1 to 4)~~
~~(2) Time of discovery of event~~	~~(2) System access interval (2 to 3)~~	~~(2) Citizen reaction (2 to 4)~~
~~(3) Call for help~~	~~(3) Switching interval (3 to 4)~~	~~(3) Call processing (4 to 11)~~
~~(4) First PSAP call time~~	~~(4) Answer interval "A" (4 to 5)~~	~~(4) System response (4 to 14)~~
~~(5) Phone "off-hook" (answered in first PSAP)~~	~~(5) Routing interval (5 to 6)~~	~~(5) Unit response (11 to 14)~~
~~(6) Secondary dispatch phone rings — secondary (PSAP) (if appropriate)~~	~~(6) Answer interval "B" (6 to 7)~~	~~(6) Patient management (14 to 19)~~
~~(7) Secondary dispatch phone "off-hook" answered (if appropriate)~~	~~(7) Interrogation interval (5 or 7 to 8)~~	~~(7) Event to treatment (1 to 15)~~
~~(8) Interview ends~~	~~(8) Resource selection interval (8 to 9)~~	~~(8) Scene management (13 to 17)~~
~~(9) Response resources are identified~~	~~(9) Alert interval (9 to 10)~~	~~(9) Unit cycle (11 to 20)~~
~~(10) Dispatch time~~	~~(10) Acknowledgment interval (10 to 11)~~	-
~~(11) Unit acknowledgment~~	~~(11) Turn-out interval (11 to 12)~~	-
~~(12) Unit en route~~	~~(12) Travel interval (12 to 13)~~	-
~~(13) Unit arrived on scene (wheels stopped)~~	~~(13) Patient access interval (13 to 14)~~	-
~~(14) Patient contact~~	~~(14) Initial treatment interval (14 to 15)~~	-
~~(15) First intervention time~~	~~(15) Initial result interval (15 to 16)~~	-
~~(16) Time of result of first intervention~~	~~(16) On-scene patient care interval (16 to 17)~~	-
~~(17) Unit left scene (wheels turning)~~	~~(17) Transport interval (17 to 18)~~	-
~~(18) Arrived at destination~~	~~(18) Care transfer interval (18 to 19)~~	-
~~(19) Transfer of care~~	~~(19) Unit-ready interval (19 to 20)~~	-
~~(20) Available for service~~	-	-

~~**5.5.1**~~

~~The lists in Table 5.6 are not exhaustive but represent typical core points in time and common operational situations. It is not expected that every time stamp be reported. Depending on the EMS system's complexity and level of technology, it is understood that a function interval may be long or instantaneous. However, when reporting EMS system performance, these consensus terms should be used.~~

5.5.3 Reporting System Data.

When decision makers compare systems to benchmark performance, they must use consistent language and data to describe the function and process intervals. For example, the term *response time* is commonly used but not commonly defined. Therefore, caution must be exercised to ensure that the term describes the identical functions or processes. Yet even when common definitions are used, response times may not be accurately compared. For example, some systems report "average" response times, which fail to adequately describe performance. Comparisons should therefore be based on "fractile" reporting, which, for example, may describe time performance with 90 percent reliability.

5.5.4

The terms defined in 5.6.4.1 through 5.6.4.3 are used in Table 5.6 .

5.5.4.1 Column A Definitions.

Incident or onset time . The time the incident occurred or the time that the symptoms developed.

Time of discovery of event . The time that a third party or the patient becomes aware of the need for assistance.

Call for help . The time that a third party or the patient first attempts to contact outside assistance.

First PSAP call time . The time the telephone begins to ring in the first public safety answering point (or other designated entity).

Phone "off-hook" (answered in first PSAP) . The time that the telephone is answered in the first PSAP center.

Secondary dispatch phone rings — secondary PSAP (if appropriate) . The time the telephone begins to ring in the second public safety answering point (or the call screener). Many systems will not use secondary dispatch centers.

Secondary dispatch phone "off-hook" answered (if appropriate) . The time that the second PSAP or second telecommunicator answers the phone, begins the interview, collects caller data, and begins prearrival instructions.

Interview ends . The time that the PSAP telecommunicator completes the interview with the caller. This time stamp may occur before or after resources are identified, or before or after units arrive on the scene.

Response resources are identified . The time that the PSAP telecommunicator, through computer-aided dispatch or other means, identifies the appropriate resources to send to the scene of the emergency. For example, the telecommunicator may identify ambulance, fire apparatus, quick-response vehicles, police vehicles, specialty vehicles, or other appropriate resources.

Dispatch time . The time the responding unit was notified by the telecommunicator.

Unit acknowledgment . The time that the response unit(s) acknowledged that they have received the notification.

Unit en route . The time that the vehicle first begins moving toward the scene.

Unit arrived on scene . The time that the vehicle comes to a complete stop at the scene.

Patient contact . The time that responding personnel first arrived at the patient's side.

First intervention time . The time that the first intervention, such as an IV, defibrillation, CPR, extrication, and so on, is begun.

Time of result of first intervention . The time that the responder first identifies results of the first intervention, such as when extrication occurred, when return of spontaneous circulation occurred, and so forth.

Unit left scene . The time that the vehicle first begins moving from the scene.

Arrived at destination . The time that the responding unit arrived at the hospital or transfer point.

Transfer of care . The time that responsibility for treatment was transferred from a pre-hospital provider to another — when the hospital personnel physically take over care of the patient.

Available for service . The time the unit was available for response.

~~5.5.4.2~~ ~~Column B Definitions.~~

~~*Recognition interval (1 to 2).* The elapsed period starting with (1), Incident or onset time, and ending at (2), Time of discovery of event.~~

~~*System access interval (2 to 3).* The elapsed period starting with (2), Time of discovery of event, and ending at (3), Call for help.~~

~~*Switching interval (3 to 4).* The elapsed period starting with (3), Call for help, and ending at (4), First PSAP call time.~~

~~*Answer interval "A" (4 to 5).* The elapsed period starting with (4), First PSAP call time, and ending at (5), Phone "off-hook" (answered in first PSAP).~~

~~*Routing interval (5 to 6).* The elapsed period starting with (5), Phone "off-hook" (answered in first PSAP), and ending at (6), Secondary dispatch phone rings.~~

~~*Answer interval "B" (6 to 7).* The elapsed period starting with (6), Secondary dispatch phone rings, and ending with (7), Secondary dispatch phone "off hook" answered.~~

~~*Interrogation interval (5 or 7 to 8).* The elapsed period starting with Phone "off-hook" answered in primary or secondary PSAP and ending with (8), Interview ends.~~

~~*Resource selection interval (8 to 9).* The elapsed period starting with (8), Interview ends, and ending with (9), Response resources are identified.~~

~~*Alert interval (9 to 10).* The elapsed period starting with (9), Response resources are identified, and ending with (10), Dispatch time.~~

~~*Acknowledgment interval (10 to 11).* The elapsed period starting with (10), Dispatch time, and ending with (11), Unit acknowledgment.~~

~~*Turn-out interval (11 to 12).* The elapsed period starting with (11), Unit acknowledgment, and ending with (12), Unit en route.~~

~~*Travel interval (12 to 13).* The elapsed period starting with (12), Unit en route, and ending with (13), Unit arrived on scene (wheels stopped).~~

~~*Patient access interval (13 to 14).* The elapsed period starting with (13), Unit arrived on scene (wheels stopped), and ending with (14), Patient contact.~~

~~*Initial treatment interval (14 to 15).* The elapsed period starting with (14), Patient contact, and ending with (15), First intervention time.~~

~~*Initial result interval (15 to 16).* The elapsed period starting with (15), First intervention time, and ending with (16), Time of result of first intervention.~~

~~*On-scene patient care interval (16 to 17).* The elapsed period starting with (16), Time of result of first intervention, and ending with (17), Unit left scene (wheels turning).~~

~~*Transport interval (17 to 18).* The elapsed period starting with (17), Unit left scene (wheels turning), and ending with (18), Arrived at destination.~~

~~*Care transfer interval (18 to 19).* The elapsed period starting with (18), Arrived at destination, and ending with (19), Transfer of care.~~

~~*Unit-ready interval (19 to 20).* The elapsed period starting with (19), Transfer of care, and ending with (20), Available for service.~~

5.5.4.3 Column C Definitions.

Event activation (1 to 4). The elapsed time between the event and when the telephone first rings in the first PSAP. This process includes the recognition interval, the system access interval, and the switching interval, and is intended to measure a system's ability — using education, technology, or other means — to recognize that an emergency exists and to take immediate steps to access assistance.

Citizen reaction (2 to 4). The citizen reaction process begins when an event is first discovered and ends when the telephone rings in the first PSAP. The citizen reaction process is intended to measure the system access interval and the switching interval. The process measures the system's ability to reinforce certain citizen behaviors and provides the means for those citizens to make appropriate access.

Call processing (4 to 11). The call processing interval is the process that begins when the telephone first rings at the first PSAP and ends when responding units acknowledge that they are aware of the event. The processing interval includes the time required to appropriately answer the telephone in the PSAP, triage and route the call, interview the caller, provide instructions, identify and alert resources, and recognize that the alert has been received. This interval is intended to measure the system's ability to quickly process a request for assistance and notify the appropriate responding units.

System response (4 to 14). The system response interval is the process that begins when the telephone first rings at the first PSAP and ends when the responders arrive at the patient's side. The system response interval is intended to measure the system's performance in responding to a call for assistance by considering the call processing interval, as well as the turnout, travel, and patient access intervals.

Unit response (11 to 14). The unit response interval is the process that begins when the individual unit acknowledges that a response is required and ends with patient contact. The unit response interval is intended to measure an individual unit's performance in responding to a call for assistance by considering the turnout, travel, and patient access intervals.

Patient management (14 to 19). The patient management interval is the process that begins when responders first make contact with the patient and ends when responsibility for the patient is transferred to another medical provider. The patient management interval is intended to measure the time committed by the system to meet the needs of the patient and reflects the system's ability to manage and monitor resources.

Event to treatment (1 to 15). The event to treatment interval is intended to measure the system's ability to initiate treatment once an event exists. This interval is intended to measure the process that begins when the event occurs and ends when the first treatment is provided. This process may measure the time that responders, dispatchers, citizens, or others intervene as part of an organized EMS system design.

Scene management (13 to 17). The scene management interval begins when the first vehicle stops at the scene of an event, and ends when the last patient leaves the scene. The interval is intended to measure the time required to manage the logistics of accessing the patient, providing initial treatment, packaging for transport, and leaving the scene.

Unit cycle (11 to 20). The unit cycle process reflects the cycle time of an individual unit from activation to availability. The unit cycle process measures the time that a unit is assigned to an event and unavailable for other assignments.

5.6 Call Processing.

System analysis considers call processing the manner in which calls are processed, as well as evaluation of the intervals required to complete the call and notify appropriate providers.

5.6.1 Call Processing Method.

Community needs should dictate the way that resources are assigned and prioritized.

5.6.2* Call Processing Time Interval Standards.

Call processing performance objectives should comply with existing standards. For example, NFPA 1221 has established a standard that 95 percent of all emergency calls must be answered in 30 seconds. Dispatch of emergency response aid should be made within 60 seconds of the completed receipt of an emergency alarm.

A.5.6.2

For example, NFPA 1221 has established a standard that 95 percent of all emergency calls must be answered in 30 seconds. Dispatch of emergency response aid should be made within 60 seconds of the completed receipt of an emergency alarm.

5.6.3* Turnout (Activation) Interval.

Turnout interval performance objectives should comply with existing standards. System analysis should consider the provider turnout interval, or the interval from response unit notification to movement of that unit to the location of the incident. ~~For example, NFPA 1710 establishes turnout time objectives of no more than 60 seconds.~~

A.5.6.3

For example, NFPA 1710 establishes turnout time objectives of no more than 60 seconds.

5.7 Geography.

System analysis should consider geography and the implications of local geography on service delivery.

5.7.1 Geographic Response Tools.

A geographic information system (GIS) may be used as a tool to model existing service delivery for each EMS system component, such as first response, BLS or ALS care, or patient transportation services. Response capabilities for each mobile system component based on desired travel intervals can be modeled using a GIS system, identifying underserved areas of a jurisdiction, for either current or planned system designs.

5.7.2 Travel Interval.

Travel interval objectives examined by a GIS analysis should parallel standards as established by the lead agency.

5.7.3 Geographic Barriers.

A GIS model may also identify potential barriers to delivery of care (~~for example~~ e.g. , interruption of the road network by construction, flooding, or railroad crossings).

5.7.4 Distribution of Demand.

A GIS may also identify the distribution of calls in a community and areas undergoing development that would require the expansion of services in the future.

5.8 First Response.

The AHJ should establish response intervals for the EMS system that are appropriate for the community. The standards should be suitable for the local demographics, resources, medical needs, and geography. The intervals should be systematically monitored for compliance with the local standard.

5.9 Demographics.

The EMS system analysis should consider local demographics and the implications of those demographics on service requirements for a range of constituency groups.

5.9.1 Age.

Age-related injuries and illnesses (~~for example,~~ e.g., pediatric, adolescent, or geriatric) should be considered.

5.9.2 Socioeconomics.

A community's socioeconomic structure and its associated injuries and illnesses (e.g., violent crime, lack of prenatal care, or neglect) should be considered.

5.9.3 Gender.

Gender-related injuries and illnesses (e.g., disease rates and treatment plans) should be considered.

5.9.4 Culture and Ethnicity.

Language, cultural diversity, and ethno-specific disease processes should be considered.

5.9.5 Local Industry.

Industrial area injuries and illnesses (e.g., exposure to hazardous materials, injuries from machinery) should be considered.

5.10 Regulatory Environment.

The EMS system should monitor the political and regulatory environments to analyze impacts on operations, funding, and personnel.

5.11 Additional System Needs.

The EMS system analysis should consider other features unique to the EMS system, such as special hazards, needs, and conditions that will affect service delivery.

5.12 Disasters.

The potential for disasters as a function of unique jurisdictional features, characteristics, and risks should be considered.

5.12.1 Disaster Planning.

The EMS system should ensure that a plan is available to manage response to and recovery from natural and human-caused disasters.

5.12.2 Disaster Preparedness.

5.12.2.1

The EMS system should coordinate with hospitals, public health, PSAPs, law enforcement, emergency management, and other public safety and healthcare partners to ensure that citizens are prepared.

5.12.2.2*

The EMS system should maintain a continuity of operations plan for any natural, man-made, or accidental disaster.

A.5.12.2.2

NFPA 1600 provides guidance for continuity of operations plans.

5.13* Medical Center Resources.

The EMS system analysis should consider resources available through local hospitals. ~~(e.g., frequency of hospital "diversion" status, resource hospital training, resupply of disposables and medications, ALS quality assurance).~~

A.5.13

Examples of resources could include frequency of hospital "diversion" status, resource hospital training, resupply of disposables and medications, and ALS quality assurance).

5.14 EMS System ~~Planning~~ Risk Reduction .

Based on the comprehensive system analysis and the identified system priorities, the EMS system should ~~develop~~ include a plan for ongoing system ~~design~~ analysis and improvements. ~~Plan development should include the components specified in 5.13.1 through 5.14.1.5~~ .

~~**5.13.1** Roles.~~

~~Identification should be made of the roles and responsibilities of each position type needed for the EMS system to function, based on the needs and wants of the community.~~

~~**5.13.2** Financing.~~

~~Annual operating budgets and capital budgets consistent with generally accepted accounting principles should be established.~~

~~**5.14.1** Provider Support.~~

~~The system plan should address and consider methods to support individual providers in the system.~~

~~**5.14.1.1** Provider Training.~~

~~Provider training and support programs should ensure that providers receive training sufficient to meet local needs and support to ensure their continued participation.~~

~~**5.14.1.2** Provider Safety.~~

~~The following provider safety programs should be in place to reduce the amount and severity of injuries incurred by providers:~~

~~Equipment~~

~~Training~~

~~Accountability systems~~

~~**5.14.1.3** Occupational Exposure to Atypically Stressful Events.~~

~~Programs designed to address the effects of the exposure to atypically stressful events should be established.~~

~~**5.14.1.4** Wellness.~~

~~Health and wellness programs should be in place to monitor and support the overall wellness of providers.~~

~~**5.14.1.5** Emergency Management.~~

~~Disaster preparedness programs should be in place to meet the unique needs of providers during catastrophic events.~~

5.15 Resource Allotment.

Resources should be allocated appropriately between agencies in the EMS system.

5.16 Master Planning/Forecasting.

A master plan should be available that ensures that the necessary resources are available to the EMS system and will meet the needs of future system requirements.

~~**5.13.5** Disaster/Catastrophe Planning.~~

~~The system should ensure that a plan is available to manage overwhelming or catastrophic events, including coordinating activities between and among providers.~~

5.17* Public Education and Injury/Illness Prevention.

The EMS system plan should include components ~~required to prevent~~ designed to enhance the quality of life and reduce the need for emergency responses.

A.5.17

~~Traditional illness~~ Illness and injury prevention programs such as ~~CPR and~~ Stop the Bleed; Drop, Cover, and Hold; CPR; and ~~"~~ Stop, Drop, and Roll~~"~~ should be available and regularly provided to citizens. ~~in the system.~~

~~**5.17.1** Traditional Programs.~~

~~Traditional illness and injury prevention programs such as CPR and "Stop, Drop, and Roll" should be available and regularly provided to citizens in the system.~~

5.18 Other Programs.

The prevention and public education plan should include an analysis of the environment and an analysis of the need for special prevention programs.

~~**5.17.1** Disaster Preparedness.~~

~~The system should coordinate with emergency management programs to ensure that citizens are prepared.~~

5.19 Public Health.

The EMS system should coordinate with public health programs to ensure that the citizens are integrated into the health care system.

5.20 EMS Quality Measures.

The EMS system should capture data that meets state reporting requirements and NEMSIS inoperability standards.

5.21 ~~System Assessment Cycle.~~

~~The system should have a process in place to continually review and analyze the EMS system using an assessment cycle that includes the following components:~~

~~Data collection~~

~~Evaluation~~

~~Analysis~~

~~Proposing~~

~~Planning~~

~~Implementation~~

5.22 ~~Current Conditions.~~

~~System data should be used to identify current conditions and trends.~~

5.22.1 ~~Changing Needs.~~

~~The data should consider the nature of a changing geography over time, population distribution, and the alteration of the transportation network.~~

5.22.1.1 ~~Changes in Transportation.~~

~~Transportation network changes should be monitored and considered.~~

5.22.1.2 ~~Changing Political Boundaries.~~

~~The plan should include new annexations and the effect of such annexations on service provision or system financing.~~

5.22.1.3 ~~Regional Changes.~~

~~Regional changes (e.g., changing regional disaster risk areas, financial trends affecting entire regions) should be monitored, evaluated, and planned for.~~

5.22.2 ~~Changing Demographics.~~

~~The regular review should, at a minimum, re-evaluate the changing demographic trends in the system.~~

5.22.2.1 ~~Short-Term Changes.~~

~~Individual events, such as concerts and sporting events, may cause short-term demographic shifts.~~

5.22.2.2 ~~Long-Term Changes.~~

~~Long-term changes (such as an aging population) should be considered when re-evaluating the plan.~~

5.22.3 ~~Changing Public Health Conditions.~~

~~The system should conduct external environmental scans to anticipate or identify new public health threats in order to prepare the EMS system to respond to such threats.~~

5.22.4 ~~Unique Local Needs.~~

~~Unique features and hazards should be monitored when the EMS system plan is updated.~~

5.23 ~~Data Element/Collection/Analysis/Reporting.~~

~~Regular analysis of system component data should be conducted to determine dynamic needs.~~

5.23.1 ~~Regular Re-evaluation of Data.~~

~~EMS system performance measure data should be reviewed at least annually to evaluate the specific components within the system. Each component should be evaluated more often based on the original intent of the system and established protocols.~~

5.23.2 ~~Data Sharing.~~

~~System data should be shared, as legally appropriate, among agencies and medical facilities in the system.~~

~~**5.23.3** NEMSIS.~~

~~The National Emergency Medical Services Information Systems (NEMSIS) was developed to create a single national EMS data dictionary and EMS data exchange standard as well as to ensure that EMS data has a central repository for review, analysis, and dissemination.~~

~~**5.24** Feedback Loop.~~

~~A feedback mechanism should be in place to ensure that proposed and implemented changes in the system result in the desired improvements and meet the goals and objectives identified by EMS system planners.~~

Supplemental Information

File Name	Description	Approved
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Committee Statement

Committee Statement: this chapter has been revised for clarity, MOS, and to meet the needs of today's EMS systems. All public input information was incorporated into the revision. Operational and dispatch information was removed and placed in other chapters. Dispatch time stamp table was placed in new annex B.

Response Message: FR-8-NFPA 450-2019

Public Input No. 7-NFPA 450-2018 [Section No. 5.5.2.1]

Public Input No. 4-NFPA 450-2017 [Section No. 5.2.2.3.4]

Public Input No. 8-NFPA 450-2018 [Section No. 5.5.2.4]

Public Input No. 6-NFPA 450-2018 [Section No. 5.2.2.3.5]

Public Input No. 5-NFPA 450-2018 [Section No. 5.2.2.1]

First Revision No. 9-NFPA 450-2019 [Section No. 6.1]

6.1 Determining Cost of an EMS System.

~~The system plan~~ EMS system and agency financial plans should include a method for determining costs. Methodologies have been specified to identify all costs associated with EMS elements or components. Different methods exist for determining costs for public and private organizations; costing of services may have different applications. Therefore, a number of national organizations have developed cost allocation methods, each with its own applications, benefits, and shortcomings.

6.1.1 Specification and Categorization of Direct Costs.

The ~~EMS system~~ financial plan should be able to define the direct costs of each EMS system element.

6.1.1.1

Direct operating costs should be established for each phase of operations. The direct costs are those that can be assigned directly to a particular component of the operation, and should include start-up and ongoing costs. ~~The EMS system should be able to understand and recognize the nature of the costs required to start up a new phase of operations and perpetuate those operations.~~

6.1.1.2

~~The system~~ EMS systems and agencies should identify the start-up costs of the operation. At a minimum, the ~~system~~ financial plan should be able to identify and calculate the start-up costs for the following:

(1) Emergency medical and other equipment

(2) Vehicles

(3) Fuel

(4) Supplies and materials

(5) Facilities

~~Primary personnel~~

~~Direct labor~~

(6) ~~Support personnel~~ Personnel

(7) Training, including certification and licensing fees

(8) Communications

6.1.1.3

~~The system~~ EMS systems and agencies should identify the ongoing or continuous costs of delivering EMS services.

6.1.1.4

At a minimum, the ~~system~~ financial plan should be able to identify and calculate and, if appropriate, allocate the ongoing replacement and maintenance costs for the following:

(1) Emergency medical and other equipment

(2) Vehicles

(3) Fuel

(4) Supplies and materials

(5) Facilities

(6) ~~Ongoing personnel~~ Personnel

~~Primary personnel costs, including salaries and all associated pay-related costs~~

~~Personnel benefits~~

~~Support personnel~~

~~Ongoing communications system~~

~~Ongoing training, including certification and licensing fees~~

(7) Training, including certification and licensing fees

(8) Communications

(9) Personal protective equipment (PPE)

6.1.2 Specification and Categorization of Indirect Costs.

~~The EMS system~~ EMS systems and agencies should be able to identify the fixed and variable indirect cost of each EMS system element. ~~The indirect cost should be allocated based on the level of effort required to perform different types of work. Some examples~~ Examples of such costs include the following:

(1) Insurance non-covered expenses

(2) Legal services and consultation

(3) Medical oversight

(4) Contract services

(5) Regulatory compliance

(6) Billing services

(7) Information management

Submitter Information Verification

Committee: EMS-AAA

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Committee Statement

Committee Statement: section revised for clarity. Additional system cost evaluation points were added to reflect today's EMS environment.

Response Message: FR-9-NFPA 450-2019

First Revision No. 10-NFPA 450-2019 [Sections 6.2, 6.3, 6.4]

6.2 Method for Anticipating EMS System Funding Sources.

The EMS system should be able to identify and predict the revenue sources available to support a viable EMS system. Given the diversity of funding sources for EMS systems, the EMS system should take into consideration the following potential funding sources:

(1) Fee-for-service resources such as the following:

(a) Private pay

(b) Third-party pay

(c) Bad debt or contractual allowances based on uncollected revenues

(2) Government reimbursement, such as the following:

(a) Medicare

(b) Medicaid

(c) Military/government and dependent care

(3) Contractual agreements such as the following:

(a) Capitated agreement

(b) Contract service

(c) Special event

(4) Public and private grants

(5) Public funding, such as the following:

(a) Taxes

(b) EMS operating levies

(c) Bond levies

(6) Statutory revenue

(7) Corporate funding, if available

(8) Civic group funding

(9) Public and private donations

(10) Subscription programs

(11) Investment revenues

(12) Other subsidies

(13) Foundations

6.3 ~~Use of~~ Revenue and Cost Analysis.

~~System~~ Financial planning should use revenue and cost analyses to establish EMS system priorities, goals, and objectives, and allow the EMS systems and agencies to predict future financial capabilities.

6.4 Financial Plans.

A financial plan should be developed that ~~reflects sound analysis and planning of~~ includes short- and long-term operating needs . ~~While financial planning at the system level may not be achievable for all types of systems, all EMS systems should be concerned about the financial ability of agencies to ensure ongoing operations.~~

6.4.1* Short-Term. ~~Financial Plan.~~

~~A short~~ Short -term ~~financial~~ plans ~~should be created for providing~~ provide for on- going services and include a mechanism for responding to unanticipated costs . ~~Short-term financial planning should be represented through annual operating and capital budgets.~~

A.6.4.1

An operating budget ~~should be~~ is an example of a short-term plan that is prepared~~,~~ and approved~~,~~ annually and reviewed regularly.

~~**6.4.1.1**~~

~~An operating budget should be prepared, approved, and reviewed regularly.~~

~~**6.4.1.2**~~

~~A capital budget should be prepared, approved, and reviewed regularly.~~

6.4.2* Long-Term. ~~Plan.~~

A long-term financial plan should be developed to forecast long-term capital needs, potential changes in revenue streams, and potentials for new or alternate methods of providing services. The following are considerations for long-term EMS system and agency financial planning: ~~for EMS systems:~~

(1) ~~The potential for~~ Potential new services

(2) ~~The potential for changes in reimbursement structures~~ Potential revenue changes

(3) ~~Development of a contingency plan for unknown~~ Unknown or unanticipated expenditures

(4) Justification for resources and requirements

(5) ~~A cash~~ Cash- flow forecasts

(6) ~~A revenue~~ Revenue projections

(7) Capital replacement

A.6.4.2

A capital budget is an example of a long-term plan that should be prepared, approved, and reviewed regularly.

Submitter Information Verification

Committee: EMS-AAA

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Committee Statement

Committee Statement: Section updated with additional detail and an example of a capitol budget.

Response Message: FR-10-NFPA 450-2019

First Revision No. 11-NFPA 450-2019 [Chapter 7]

Chapter 7 Medical Oversight

7.1* General.

~~Effective medical oversight ensures that physicians have appropriate clinical oversight of the emergency medical system. This includes, for example, oversight of on- and off-line medical direction, protocol development, clinical quality assurance and improvement, understanding of emergency operations, and field observations. There are documents that are either in print or in development that should be used to assist those physicians who are involved in medical direction and oversight.~~ The necessity and value of effective and engaged medical oversight cannot be overstated. The provision of healthcare outside the hospital is a practice of medicine. Therefore, the designated medical director should be an appropriately board-certified, licensed physician who understands how out-of-hospital medical care is delivered in the community. This physician(s) should have appropriate clinical oversight of the emergency medical services (EMS) system that is utilized for the provision of health care.

A.7.1

There are documents available to assist those physicians who are involved in medical direction and oversight of out-of-hospital health care delivery systems. Topics covered in such documents include, but are not limited to, online and off-line medical direction, evidence-based protocol development, clinical quality assurance and improvement management, understanding of emergency operations, understanding of longitudinal health care objectives, and field experience.

7.2 ~~Single~~ Medical Authority.

The EMS system should have ~~in place~~ a single medical authority~~,~~ (i.e., the medical director) or medical authority structure~~,~~ — with the medical director serving as its leader — in place that is responsible for patient care oversight. ~~and responsibility.~~ Individual agencies in the EMS system may have medical directors ~~that~~ who provide agency-specific or program-specific oversight.

7.3 System Support of Medical Authority.

~~The system should provide the resources necessary to ensure that the medical authority can fulfill his or her obligations. Some examples may include physical infrastructure, staff support, communications, and liability coverage.~~

7.3.1

The EMS system should ensure that the medical authority tasked with overseeing the EMS system has an opportunity to provide input and direction in the initial planning, design, and implementation of the EMS system.

7.3.2*

The EMS system should ensure that the medical director has the resources necessary to optimize obligation fulfillment.

A.7.3.2

Examples of such resources include, but are not limited to, financial support, physical infrastructure, authorization and support of the agency's command staff, clerical and staff support, communications, malpractice insurance, and liability coverage.

7.4 Medical ~~Authority~~ Director Role.

The medical director provides medical oversight for the EMS system. Because every system is unique, medical authorities may be different physicians with subject matter expertise specific to the goals and objectives of their programs. In such instances, the physician medical director of the participating agency should ensure that medical care, whether emergency or nonemergency, provided by their crew members falls under the oversight of the EMS system's single EMS medical director's authority. ~~The medical authority should provide oversight for the EMS system; however, the medical authority, in some cases, can be the same person as the medical director. The role of the medical authority for the system should be clearly defined and should include the following responsibilities:~~

~~Recommending certification, recertification, and decertification of nonphysician pre-hospital personnel to the appropriate certifying agency~~

~~Establishing an EMS advisory committee to review system medical issues~~

~~Providing direction and authorization for the development and revision of systemwide protocols, policies, and procedures for all patient care activities from dispatch through triage, treatment, and transport~~

~~Establishing criteria for the provider training level of initial emergency response~~

~~Establishing criteria for determining the most appropriate patient destination~~

~~Ensuring the competency of personnel who provide direct medical oversight to pre-hospital personnel including, but not limited to, physicians, EMTs, and nurses~~

~~Establishing the procedures or protocols under which nontransport of patients is permitted~~

~~Providing direction and authorization for educating and testing to the level of proficiency approved for different certification levels within the EMS system~~

~~Providing direction for an effective systemwide quality improvement program~~

~~Providing direction, authorization, and credentialing for personnel eligibility to provide patient care~~

~~Removing authorization for personnel eligibility to provide patient care for due cause, using an approved review and appeals mechanism~~

~~Establishing functional criteria for equipment used in patient care~~

7.5 Medical Authority Role.

The role of the medical authority for the EMS system should be clearly defined and should include the following responsibilities:

(1) Ensuring patient-centered care

(2) Recommending credentialing, recredentialing, and decredentialing of out-of-hospital providers to the appropriate certifying or licensing agency

(3) Establishing an advisory committee consisting of stakeholders to review community needs and the effectiveness, safety, and value of the EMS system

(4) Providing direction and authorization for the development and revision of the EMS system's protocols, policies, standing orders, and procedures for all patient care activities

(5) Establishing criteria for providers to be trained and certified or licensed, if applicable, and credentialed to function within the EMS system

(6) Establishing criteria for determining the most appropriate patient destination

(7) Ensuring that personnel who provide direct medical oversight are familiar with the out-of-hospital environment and capabilities of responders

(8) Establishing the procedures or protocols for the EMS system

(9) Providing direction and authorization for the education and testing of practitioners to ensure competency

(10) Providing direction for, and participating in, an effective quality management (QM), quality assurance (QA), and continuous quality improvement (CQI) program

(11) Establishing methods to coordinate applicable and appropriate stakeholders (e.g., medical home/primary care physicians, specialty care physicians, referring physicians, hospitals, pharmacists, nursing staff, home health, respiratory therapy, case managers, public health, legislators, government officials, payers)

(12) Establishing criteria for equipment used in patient care (e.g., functional, effective, evidence based)

7.6 Medical Director Responsibilities.

7.6.1

The primary ~~responsibility~~ responsibilities of the ~~agency's~~ program's medical director should be ~~to ensure~~ ensuring quality patient care~~, from EMS system access to transfer to definitive~~ and overseeing all patient care activities . ~~In addition, the physician(s) should perform the following:~~

7.6.2

If the EMS system's medical director is different from the agency's medical director, the physicians should work collaboratively to do the following:

(1) Serve as patient advocates

(2) Set and ensure compliance with patient care standards, including communication standards and medical protocols

(3) Provide direction and authorization for the development and revision of systemwide protocols, policies, and procedures for all patient care activities ~~from dispatch through triage, treatment, and transport~~

(4) Develop and implement the process for the provision of ~~direct~~ online medical oversight, if needed

(5) Establish the appropriateness of initial qualifications of ~~pre~~ out-of- hospital personnel involved in ~~patient care and emergency medical dispatch~~ the EMS system

(6) ~~Ensure that the qualifications of pre-hospital personnel involved in patient care and emergency medical dispatch are maintained~~ Ensure maintenance of qualifications, education, training, and competency of out-of-hospital personnel involved in patient care

(7) Provide direction for effective ~~quality improvement programs for continuous system and patient care improvement~~ QA and CQI/QM

(8) Promote ~~EMS~~ research, evaluation, and contributions to medical literature

(9) Maintain liaison ~~with the medical community, including, but not limited to, hospitals, emergency departments, physicians, pre-hospital providers, and nurses~~ stakeholders

(10) Interact with local, regional, state, and ~~local EMS~~ federal authorities (as applicable) ~~authorities~~ to ensure ~~that standards, needs, and requirements are met and~~ resources are optimized and all compliance and regulatory requirements are fulfilled

(11) ~~Participate in planning activities such as mutual aid, disaster planning and management, and hazardous materials response~~ Plan and participate in regularly scheduled continuing education activities for the participating providers to help them maintain the highest levels of awareness, training, and education in medicine

(12) Promote ~~public~~ patient education ~~consistent with system goals~~ to engage them as stakeholders in their own care

(13) Maintain knowledge levels appropriate for ~~an EMS~~ a physician medical director through ~~continued education~~ appropriate continuing medical education (CME) activities

(14) Actively participate in direct, on-scene ~~activities with appropriate training~~ medical care to bolster understanding of the EMS system and the challenges inherent in the delivery of out-of-hospital care

7.7 ~~On-Line~~ Online and Off-Line (Direct and Indirect) Medical Direction.

Medical directors can provide ~~direct and indirect (on-line~~ online and off-line~~)~~ medical oversight.

7.7.1

During ~~direct~~ online medical direction, the medical director, ~~(~~ or designee~~) should provide~~ , provides voice, video, or other real-time communication to the ~~practitioner~~ provider .

7.7.2

~~Indirect~~ Off-line medical ~~direction~~ oversight includes standing orders, prospective, ~~medical oversight~~ and retrospective medical evaluation.

7.7.2.1

Prospective methods can include participating in the training, testing, and certification of providers; protocol development; operational policy and procedures development; and legislative activities.

7.7.2.2

Retrospective activities should include participation in ~~a medical audit and review of care~~ CQI/QM .

7.7.2.3

Various aspects of prospective and retrospective medical oversight can be handled by individuals or committees functioning under the medical director with representation from appropriate ~~medical and EMS personnel~~ stakeholders .

7.7.3

~~Standards~~ Policies should be established for the certification, training, and monitoring of other system physicians, if applicable .

7.8* Medical Director Qualifications.

~~To optimize medical oversight of all pre-hospital EMS, physicians should have the following qualifications as described by the American College of Emergency Physicians (ACEP), United States Fire Administration (USFA), and National Association of EMS Physicians (NAEMSP):~~ To optimize medical oversight of EMS systems, physicians who have medical oversight authority and a license to practice within the EMS system's boundaries should ideally possess American Board of Medical Specialties (ABMS) board certification in EMS medicine. If not, they should have specialized knowledge of EMS, including the following:

~~License to practice medicine or osteopathy within the system's boundaries~~

(1) Familiarity with the design and operation of ~~pre-hospital~~ an EMS systems and EMS scope of practice

(2) Experience or training in ~~pre-hospital emergency care~~ longitudinal health care/chronic disease management

(3) Experience or training in medical direction/oversight of ~~pre-hospital emergency units~~ out-of-hospital personnel

(4) ~~Active participation in the emergency department management of the acutely ill or injured patient~~ An active practice of medicine in an emergency or hospital setting

(5) Experience or training in the instruction of ~~pre~~ out-of -hospital personnel

(6) Experience or training in the ~~EMS quality improvement process~~ QA and CQI/QM processes

(7) Knowledge of ~~EMS~~ laws and regulations pertaining to out-of-hospital care providers' practices and principles

(8) Knowledge ~~of EMS dispatch and communications~~ and coordination of local medical resources and stakeholders key to the effective delivery of out-of-hospital care

~~Knowledge of local mass casualty and disaster plans~~

~~Preferred board certified in emergency medicine: American Board of Emergency Medicine (ABEM); American Osteopathic Board of Emergency Medicine (AOBEM)~~

~~Preferred completed fellowship training in EMS~~

~~Preferred subspecialty as an EMS-certified physician through NAEMSP and ACEP~~

A.7.8

For outside of the United States, physicians should be board certified in medical practice by that country's equivalent of the ABMS.

Supplemental Information

File Name	Description	Approved
New_Chapter_7_medical_oversight_for_FR.docx	Please use the attached document for the new chapter 7, it has undergone a top to bottom revision. For staff use.	

Submitter Information Verification

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Committee Statement

Committee Statement:	This chapter has been revised to match today's EMS environment. some changes include updated naming descriptions, additional roles of outside of EMS physicians, and new licensure naming.
Response Message:	FR-11-NFPA 450-2019

First Revision No. 12-NFPA 450-2019 [Chapter 8]

Chapter 8 Quality Management, Clinical Quality, and Data Reliability

8.1 Quality Management Program.

A defined quality management program should ~~be developed. The program should identify areas for improvement, evaluate system performance, prioritize development, establish system controls, monitor performance indicators, and re-evaluate system impact.~~ establish mechanisms to monitor compliance with accepted clinical and industry standards, guidelines, and quality measures to provide innovative high-quality care to the out-of-hospital community, and ensure provider welfare.

8.1.1

The quality management program should have the capability to develop, test, and field quality measures based on local system priorities.

8.1.2

A quality management officer should be identified who is knowledgeable in performance improvement techniques and science. The quality management officer should report to the medical director on identified performance indicators.

8.2 ~~Performance~~ Objectives.

A defined quality management program should establish performance objectives based on accepted industry standards and guidelines.

8.2.1 Performance Objectives.

Patient care objectives should be developed system-wide based on your community's needs ~~and expectations,~~ utilizing local resources to achieve desired patient outcomes. ~~, and local resources. Appropriate medical destinations should be incorporated as part of the patient care objectives. Compliance with established protocols should be monitored. Customer satisfaction and feedback should be incorporated into the system.~~

8.2.1.1

Objectives should cover appropriate medical destinations, protocol compliance, and patient experience and feedback.

8.2.1.2

Objectives should meet accepted out-of-hospital clinical guidelines and quality measures to ensure patient-centered outcomes.

8.2.2 Clinical and Operational System Evaluation.

~~System~~ Clinical and operational system evaluation should be integrated into the quality management program.

8.2.2.1

~~Performance~~ Quality measures should be established and data collected ~~consistent with the NEMSIS data dictionary. *(See 5.5.3 through 5.5.3.2.2.)*~~ that is of sufficient quality to ensure that quality measures can be calculated.

8.2.2.2

A system for case and process review should be established.

8.2.2.3

Case reviews should be conducted in a non-punitive manner to promote participation and improve future policies, procedures, and so forth.

8.2.2.4

The system should measure both resources and availability for the following:

(1) ~~Defibrillator~~ Public-access defibrillator locations

~~Extrication tool(s)~~

(2) Ancillary ~~resources~~ EMS, fire, rescue, air medical, and hazmat services

(3) ~~Medical facilities for availability~~ Hospitals—identifying specialty destinations and diversion policies and procedures

(4) Alternative destination facilities (e.g., urgent care, medical offices)

(5) Public health and social services—national, state, and local)

(6) Unit availability and allocation

(7) Designated disaster facilities and procedures

8.2.2.5

Staffing and ~~deployment objectives~~ resource allocation should be monitored and ~~appropriate for the system~~ consistent with a community-based needs assessment .

8.2.2.6

Standard operating procedures and guidelines should be established, ~~periodically~~ regularly reviewed, and updated.

8.2.2.7 Training Program.

8.2.2.7.1

~~Training should be evaluated for continuity and content based on industry guidelines and desired system performance.~~ A training program should be established and regularly evaluated to ensure delivery of the most up-to-date content.

8.2.2.7.2

The training program should include the following topics, if appropriate:

(1) Children and special needs populations

(2) Personal health and safety

(3) Infection control

(4) Facility operations and safety

(5) Vehicle operations

(6) Patient care protocols

(7) Equipment

(8) Clinical performance indicators (CPIs)

8.2.2.8

Staff turnover should be evaluated for causes and effects to evaluate retention opportunities and system improvement .

8.2.2.9

Equipment maintenance should be monitored and ~~appropriate for the system~~ maintained based on manufacturer recommendations .

8.2.2.10

System design and changes should be evaluated ~~using a~~ regularly, incorporating patient outcomes, provider health and safety, and cost~~/~~ - benefit ~~analysis~~ information .

8.2.2.11

The communications system should be regularly evaluated based on industry performance guidelines.

8.2.2.12

Interagency relationships and agreements should be developed and regularly reviewed ~~periodically~~ for effectiveness ~~and~~ to meet system needs.

8.2.3 Data Capture.

The EMS system should use uniform data element definitions. The EMS system should identify and capture appropriate data points. ~~A uniform pre-hospital patient care record should be used throughout the EMS system. A method should be in place to capture and review data at the system, agency, and individual provider level.~~

8.2.3.1

A uniform pre-hospital patient care record that aligns with NEMSIS should be used throughout the EMS system.

8.2.3.2

A method should be in place to ~~capture~~ collect and ~~review~~ analyze data at the state, system, agency, and individual provider level.

8.2.3.3*

The EMS system should use a uniform data set. ~~Examples of data sets are available through NHTSA, *National Fire Incident Reporting System (NFIRS)* , and others.~~

A.8.2.3.3

Examples of data sets are available through NHTSA, *National Fire Incident Reporting System (NFIRS)*, CARES, and others.

8.2.3.4 Data Sharing.

8.2.3.4.1

~~The data~~ Data should be available for inclusion in the NEMSIS data repository.

8.2.3.4.2

The EMS director should regularly review data sets to ensure that all electronic patient care reporting systems meet federal and state standards for inoperability and privacy.

8.3 Public Health Clinical Outcome Parameters.

Public health clinical outcome parameters should be developed and regularly reviewed for each performance objective through the use of benchmarking, if possible.

8.3.1

Public health and social service partnerships should be developed within the EMS system to minimize overuse and misuse of services and improve patient outcomes.

8.3.2

Standardized outcome measures should be specified based on contemporary professional standards and should evaluate the entire continuum of care .

8.3.3

~~U.S. Public Health Service outcome models, which include the measurement of the reduction of discomfort, disability, death, destitution, dissatisfaction, and disease, should be referenced.~~ EMS agency directors should incorporate clinical outcome models that address injury and illness prevention, patient centered outcomes, provider wellness, and access to care and health equity to the populations served by the EMS system .

8.3.4

A system should be in place to share information between system participants, including patient care facilities, and to obtain outcome information from outside databases, such as, but not limited to, the following:

(1) Health information exchange

(2) Medical examiner reports

(3) Hospital records

(4) Trauma registry

(5) Cardiac arrest registry (CARES)

(6) Stroke registry

(7) Transport registry reports

(8) Discharge data

(9) Computer-aided dispatch

(10) Other appropriate databases

8.3.4.1

All information shared should have a defined and agreed-upon process.

8.3.4.2

This process should be compliant with existing information security and privacy regulations.

8.4 Physician and EMS Leadership Participation.

A quality management program should include active EMS leadership and physician ~~participation~~ oversight to support and advance the clinical practice of the EMS system .

8.5 Patient Confidentiality.

All data management programs should maintain patient confidentiality, at a minimum, in accordance with federal, state, and local regulations.

8.6 Injury/Illness Reduction and Prevention.

The quality management program should incorporate standards directed at reducing injuries and illnesses ~~in the community based on the system data~~ and align with regional, state, or system injury prevention strategic plans .

8.7 Complaints.

A consistent process should be in place to address complaints.

8.7.1

Quality management programs should have a formal complaint-handling process in place to address complaints.

8.7.2

Customer satisfaction surveying can be used as a mechanism to receive and process complaints.

8.7.3

EMS systems should solicit customer input to improve customer satisfaction, identify opportunities for service enhancement, and reduce system cost.

8.8 Participation in Studies and Research.

The EMS system participants may develop relationships with academic institutions ~~and/~~ or researchers to take an active role in studies and research using system data as follows:

(1) Establish credible data collection process

(2) Identify research issues

(3) Provide linkage (to other studies)

(4) Identify research funding sources

(5) Publish study results in recognized peer-reviewed journals

(6) Develop relationships with academic institutions or researchers to identify and promote evidence-based EMS research

8.9 System Review.

All quality management systems should be reviewed on a regular basis for effectiveness.

8.10 Documentation.

The EMS system should be able to provide documentation of its quality management program, including quality assessment and improvement methods, provider training programs, prevention strategies, loop closure, and system performance measures.

8.11* Multiple Clocks Within a System.

Most EMS systems use one clock to record certain events, while other clocks record time stamps for other events. When more than one clock is used, time discrepancies are much more likely. ~~For example, a 9-1-1 center dispatch clock may not be synchronized with the clock used by a responding agency.~~ Therefore, when multiple clocks are used in a system to record discrete time stamps, all efforts should be made to synchronize those clocks.

A.8.11

For example, a 9-1-1 center dispatch clock may not be synchronized with the clock used by a responding agency.

8.12 System Transformation.

8.12.1

EMS systems should participate in regional, state, and national initiatives that will drive performance in line with the triple aim.

8.12.2

Systems should provide care at the right place and time to improve patient health and reduce cost.

Supplemental Information

File Name	Description	Approved
New_Chapter_8_Quality_Management_for_FR.docx	Please use the attached file as the content for chapter 8. For staff use.	

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Committee Statement

Committee Statement: This chapter had undergone significant revision to match today's EMS systems. It has transitioned from "quality assurance" to "Quality Management. This change and the additional detail is designed to provide guidance for holistic quality management programs that incorporates data collection, outcomes, feedback, medical review, and more into the program.

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Public Input No. 10-NFPA 450-2018 [Section No. 8.2 [Excluding any Sub-Sections]]

Public Input No. 16-NFPA 450-2018 [Section No. 8.7]

Public Input No. 9-NFPA 450-2018 [Section No. 8.1]

Public Input No. 22-NFPA 450-2018 [Section No. 8.2.2.9]

Public Input No. 32-NFPA 450-2018 [Section No. 8.9]

Public Input No. 14-NFPA 450-2018 [Section No. 8.2.2.6]

Public Input No. 25-NFPA 450-2018 [Section No. 8.3 [Excluding any Sub-Sections]]

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Public Input No. 24-NFPA 450-2018 [Section No. 8.2.3]

Public Input No. 21-NFPA 450-2018 [Section No. 8.2.2.8]

Public Input No. 23-NFPA 450-2018 [Section No. 8.2.2.10]

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Public Input No. 27-NFPA 450-2018 [Section No. 8.3.2]

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Public Input No. 33-NFPA 450-2018 [New Section after 8.8]

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Public Input No. 29-NFPA 450-2018 [Section No. 8.6]

Public Input No. 31-NFPA 450-2018 [Section No. 8.9]

Public Input No. 13-NFPA 450-2018 [Section No. 8.2.2.1]

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Public Input No. 26-NFPA 450-2018 [Section No. 8.3.1]

Public Input No. 18-NFPA 450-2018 [Section No. 8.2.2.2]

Public Input No. 30-NFPA 450-2018 [Section No. 8.8]

First Revision No. 13-NFPA 450-2019 [Chapter 9]

Chapter 10 ~~Public Information, Education, and Relations (PIER)~~ Community Education and Risk Reduction

10.1 ~~Public~~ Community Education.

The local EMS system should take steps to establish a coordinated program of ~~public~~ community education, information, and relations.

10.1.1

Education efforts should be coordinated to ensure ~~public~~ community awareness of EMS system access ~~in the education efforts~~ . The participants in the EMS system should work collaboratively to ensure that the telephone number for appropriate EMS system access is ~~properly~~ promoted.

10.1.2*

~~Education efforts should ensure coordinated delivery systems for PIER activities. The education~~ Education messages delivered by EMS system providers should be coordinated to ensure consistency. Education messages should use appropriate delivery methods. ~~of delivery (e.g., print media, electronic media, television, radio) that are consistent among providers.~~

A.10.1.2

Delivery methods can include, but are not limited to, print media, electronic media, television, radio, and social media.

10.1.3

Education efforts should be coordinated to ensure public awareness of injury and illness prevention programs. ~~Education efforts should attempt to reduce the incidence of injuries and illness. Providers should work together to design programs that focus on preventing injuries and illnesses by analyzing local or regional data, researching methods of intervening, and implementing the most appropriate methods.~~

10.1.3.1

Education efforts should attempt to reduce the incidence of injuries and illness.

10.1.3.2

Providers should work together to design programs that focus on preventing injuries and illnesses by analyzing local or regional data, identifying populations for outreach, researching methods of intervening, and implementing the most appropriate methods.

10.1.3.3

Education efforts should teach community members to become immediate responders to health threats.

10.1.4

Messages should be delivered according to the diverse needs of ~~constituent~~ community groups.

~~**10.1.5**~~

~~Community and bystander response principles should be included in education efforts. Education efforts should be designed to evaluate opportunities for bystander and community intervention.~~

10.2 ~~Public~~ Community Education ~~System~~ Goals.

~~The participants in the system should evaluate the existing system and plan for improvements *(see 5.7.6 through 5.7.6.3)* . Such efforts should address public access, recognition, and intervention to improve patient outcomes.~~ The EMS system should focus on providing opportunities and education to empower community members to participate in a healthier community.

10.2.1

The ~~participants in the~~ EMS system should evaluate the existing ~~system~~ community education process and plan for improvements. ~~*(see 5.7.6 through 5.7.6.3)*~~ .

10.2.2

~~Such~~ Improvement efforts should address public access, recognition, and intervention to improve patient outcomes~~.~~ , and include the following:

(1) Focus on teaching illness or injury prevention

(2) Citizen disaster preparation

(3) Earlier identification of illness or injury and proper use of the EMS system

(4) Educating the community to become immediate responders to illness or injury (e.g., AED use, hands-only CPR, Stop the Bleed, and so on)

10.3 Personnel Qualifications. ~~of Personnel for PIER Activities.~~

Specialized skills are required to provide effective public communications. ~~The~~ This is an essential component of an EMS system, and each agency should have at least one ~~or more~~ such ~~personnel~~ person skilled in public communications .

10.4 ~~PIER~~ Community Education Activities.

The participants in the EMS system should ~~work together to~~ develop a working group of public education specialists. ~~The PIER~~ Activities should be chosen to ensure the best outcomes and ensure consistent messaging. The community education group should include EMS personnel, educators, and public information specialists, as well as local or national experts on specialized topics~~.~~ with experience with the following:

(1) Teaching classes

(2) Holding seminars

(3) Working with national and local media outlets

(4) Using social media platforms

(5) Developing print and electronic media for education

(6) Developing practice drills (e.g., fire drills)

(7) Participating in health fairs and other public events

~~**10.5** PIER Activities Related to Mass Gatherings.~~

~~**10.5.1**~~

~~Methods for accessing EMS may differ during mass gatherings, and participants at mass gatherings may travel from other areas.~~

~~**10.5.2**~~

~~Planning for mass gatherings should be conducted uniformly throughout the system. The participants in the system should collaborate to effect planning for mass gatherings that could be different from EMS system planning. Planning methods should include providing information to patrons about locating and accessing emergency medical assistance.~~

~~**10.5.2.1**~~

~~Information should be provided during the event. Emergency medical resources should be easily identified and accessed by patrons, and known to all event workers.~~

~~**10.5.2.2**~~

~~After the event, PIER personnel should participate in evaluating the event, focusing on improving communication for future gatherings. That evaluation should consider the ability of patrons to locate and access medical resources.~~

~~**10.6** PIER Activities.~~

~~PIER activities should be directed at the general public, EMS personnel, and medical personnel. Public education personnel in the system should target activities to ensure the best outcomes. EMS and medical personnel should be included in the public education efforts so that messages are consistent.~~

~~**10.7** EMS Agenda for the Future.~~

~~PIER activities should be targeted to parallel the *EMS Agenda for the Future* . Local EMS agencies should consider the agenda for the future as a fundamental building block of public information programs for EMS.~~

~~**10.8** Disaster Education.~~

~~Disaster education should be provided according to system goals. The local EMS PIER personnel, in cooperation with emergency management agencies, should provide plans for preparing for, responding to, and recovering from catastrophic events.~~

~~**10.9** Collaborative Efforts.~~

~~The EMS system should develop plans for mutual aid, cooperation, collaboration, and coordination of PIER activities. Not only should the system create those collaborative efforts, but it should also develop plans for individual organizations such as pre-hospital providers, fire agencies, hospitals, public safety agencies, emergency management organizations, local governments, law enforcement agencies, public health, and other public and private entities.~~

~~**10.10** Identification of Available Public Media Resources.~~

~~PIER planning personnel should identify the media resources that are available to the system and the appropriate information that may be provided. Resources may include print and electronic media and printed and audio/visual publications.~~

10.5 Identification of Funding Resources.

The EMS system should identify funding sources and partners to ensure stable funding for ~~PIER~~ community education activities.

10.6 Community Risk Reduction.

10.6.1 Community Risk Assessment (CRA).

Community risk assessments can identify the needs or risks within the community.

10.6.2 Risk Reduction Plan Development and Implementation.

Based on risks identified in the CRA, risks should be prioritized according to their probability, and impact as well as community needs and expectations, resource availability, and legal requirements.

10.6.2.1 Addressing Root Causes.

The risks and root causes identified in the CRA should be identified to determine the best risk-reduction strategies.

10.6.2.2 Identifying Strategic Partners.

The CRA and root cause evaluations should be used to identify possible strategic partners, which can be selected based on common interests, available resources, and skill sets, to formulate goals, objectives, and strategies.

10.6.2.3 Establishing Goals and Objectives.

Goals and objectives should be developed based on the prioritized risks, the root causes, and the resources and skill sets of the strategic partners.

10.6.2.4 Developing Strategies.

Strategies to accomplish goals and objectives should be created as follows:

(1) Designating individuals, strategic partners, and agencies responsible for accomplishing each strategy

(2) Determining an overall timeline to accomplish the goals, objectives, and strategies

10.6.2.5 Obtaining Administrative Approval.

A lead person or organization should be chosen to submit a recommended plan for administrative approval.

10.6.3 Plan Review.

A periodic review should be conducted to evaluate whether the activities achieved the intended goal(s). This may include repeating the CRA, developing new strategies, and implementing a revised plan.

Supplemental Information

File Name	Description	Approved
New_Chapter_9_Community_Education_and_Risk_Reduction_for_FR.docx	Please us this file for the complete revision of this chapter. For staff use	

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Committee Statement

Committee Statement: PEER has changed as a concept to Community Risk Reduction (CRR). In EMS CRR has been growing as a concept especially with the advent of community healthcare programs.

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Public Input No. 3-NFPA 450-2017 [Section No. 9.1.1]

First Revision No. 14-NFPA 450-2019 [Chapter 10]

Chapter 11 Health Information Technology (HIT) and Communications Technology

11.1* Interoperability in Health Care Information and Management Systems.

A.11.1

Further information on interoperability and integration with multiple patient care systems can be found on the Healthcare Information and Management Systems Society (HIMSS) website at www.himss.org. Additionally, interoperability roadmaps are available in downloadable PDF format at www.healthit.gov.

11.1.1* General.

EMS systems should incorporate integration with multiple patient care systems (i.e., interoperability). Interoperability in the health care industry is the ability of HIT systems of various health care providers, facilities, organizations, and ancillary services to seamlessly collaborate and share information to advance the effective delivery of health care for individuals and communities.

A.11.1.1

HIT systems in laboratories and pharmacies are two examples of interoperable systems in the health care industry.

11.1.2 Delivering HIT.

11.1.2.1*

Organizations should investigate emerging and existing technologies and determine the best options for transmitting HIT in various forms (e.g., voice, data, video). Options for transmitting HIT data include, but are not limited to, radio wireless technology (e.g., Wi-Fi, cellular, and satellite technology).

A.11.1.2.1

One concern with wireless technologies is the hacking of security systems to obtain patient health or personal identification information, which can be used for identify theft.

11.1.2.2* First Responder Network Authority (FirstNet) Allows for Wireless Prioritization.

A.11.1.2.2

The Middle Class Tax Relief and Job Creation Act of 2012 created FirstNet as an independent authority within the U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA). FirstNet provides emergency responders with a nationwide, high-speed, broadband network dedicated to public safety. FirstNet's mission grew out of the public safety community's commitment to, and advocacy, for a dedicated network to address communication challenges it faced on 9/11, during Hurricane Katrina, and during similar incidents and events.

11.1.3 Interoperability Types.

There are three levels of HIT interoperability — foundational, structural, and semantic.

11.1.3.1 Foundational Interoperability.

Foundational interoperability allows data exchange from one HIT system to be received by another HIT system. The receiving HIT system does not require the ability to interpret the data.

11.1.3.2 Structural Interoperability.

11.1.3.2.1

Structural interoperability is an intermediate level that defines the syntax (i.e., structure or format) of data exchange where there is uniform movement of health care data from one HIT system to another such that the clinical or operational purpose and meaning of the data is preserved and unaltered.

11.1.3.2.2

Structural interoperability ensures that data exchanges between HIT systems can be interpreted at the data field level.

11.1.3.3 Semantic Interoperability.

11.1.3.3.1

Semantic interoperability is a high level that allows two or more systems or elements to exchange and use information by taking advantage of both the structuring of the data exchange and the codification of the data, including vocabulary, so that the receiving HIT system can interpret the data.

11.1.3.3.2

Semantic interoperability supports the electronic exchange of patient summary information among caregivers and other authorized parties via potentially disparate electronic health record (EHR) systems and other systems and improves quality, safety, efficiency, and efficacy of health care delivery.

11.2 Patient Care Record Accessibility.

EMS systems should be able to access and utilize electronic HIT systems, such as the following:

(1) Electronic medical records (EMRs)

(2) Electronic health records (EHRs)

(3) Electronic patient care records (ePCRs)

11.2.1*

Records, which can help providers make decisions about a patient's care when accessed, automate and streamline provider workflow and can contain, but are not limited to, the following information:

(1) Pertinent medical or surgical history

(2) Medications

(3) Treatment plans

(4) Immunization dates

(5) Allergies

(6) Imaging

(7) Laboratory

(8) Electrocardiograms

(9) Physician documentation

A.11.2.1

One of the key features of an EHR is that health information can be created and managed by authorized providers in a digital format capable of being shared with other providers across more than one health care organization. EHRs are built to share information with other providers and organizations, including laboratories, specialists, medical imaging facilities, pharmacies, emergency facilities, hospitals, health information exchanges, and school and workplace clinics, and contain information from all clinicians involved in a patient's care.

11.2.2

Records should be integrated and interchangeable. This will allow providers to access the most up-to-date information and reduce duplication of efforts and treatments.

11.3 Data Security.

11.3.1

Data security should be addressed, with privacy protections in place and current cyber security methods and systems provided.

11.3.2

Topics to be addressed should include, but not be limited to, the following:

(1) Privacy risks and controls, HIPAA protections

(2) Risk assessment for data security risks

(3) Security controls

(4) General requirements for data protection in telehealth

(5) Primary authority for telehealth privacy and security oversight

(6) Data breach protocols

11.4 Communications.

11.4.1 Introduction.

Communications centers serve as the entry point to access ~~pre~~ out-of -hospital response. In addition, communications systems provide the infrastructure and operational support for responders to link resources for EMS activities. Policies and procedures should ensure that access and use of all components comprising communication system resources are in place and ensure efficient and effective delivery of service. The organization should conduct an assessment to determine its communications needs.

11.4.2 Access of Emergency Services.

A single number (enhanced 9-1-1 is optimal) should be used to access emergency services. The 9-1-1 emergency number is the preferred access number because it is a nationally recognized emergency telephone number. The nature of 9-1-1 calls necessitates responding directly to the caller with minimal delay even when the caller cannot provide information to the public safety answering point (PSAP).

11.5 Emergency Access Number.

Policies and procedures should be established to differentiate the emergency access number (9-1-1) from advertised nonemergency access numbers.

11.5.1 Automatic Number Identification (ANI).

ANI displays the phone number of the party calling 9-1-1. The data displayed should be verified with the caller.

11.5.2* Automatic Location Identification (ALI).

ALI should be available and should display the phone number, name, current location or address, and appropriate agencies for response for the telephone that was used to call 9-1-1. ALI serving a single-line, multiline, or wireless telephone system should associate a location with the caller's telephone number and location . Additional information such as apartment number, space number, building hazards, unique access requirements, phone location in the building, and pre-existing medical conditions should be displayed.

A.11.5.2

Facilities or systems that have voice over IP (multinational/multistate business/local businesses with multiple locations) or Internet-based telephone lines should be aware that addresses displayed are often inaccurate.

11.5.3 Access to Nonemergency Services.

When other nonemergency help lines exist (~~such as~~ e.g., 2-1-1, 3-1-1, and other numbers), policies and procedures should be in place to ensure that emergency calls received by alternative systems are immediately directed to the appropriate PSAP.

11.5.4 Multilanguage Interpretation.

The system should provide multilingual interpretation for non-English-speaking people through established linguistic services.

11.5.5 Hearing Impaired Telephone Services.

Services for the hearing impaired, such as telephone devices for the deaf (TDD), should be available and used in the system.

11.6 Lead Agency.

A single lead agency should be responsible for coordinating EMS communications. The lead agency is the agency, usually a public agency, that has the principal responsibility, assigned by the AHJ.

11.6.1 Communication Center Coordination.

~~The communication~~ Communication centers should incorporate EMS system goals and objectives into center operations. The communication centers should have a defined administrative structure.

11.6.2 User Agencies.

A user agency is any agency other than the lead agency having a specific interest in EMS communication in the jurisdiction it serves. User agencies should be represented within the communication center governing structure.

11.7 Centralized Communication Plan.

A system-wide communication plan should be in place that functionally consolidates dispatch centers.

11.7.1* Planning Coordination.

Communication centers should be part of other EMS system planning efforts.

A.11.7.1

Other EMS system planning efforts could include special events, active shooters, specialty team responses, and so forth.

11.7.2 Plan Outcomes.

The EMS system should describe methods to optimize administrative costs, improve administrative services, lower economic costs of service, and improve service benefits from the communication infrastructure. The communication plan should articulate how these benefits will be achieved.

11.7.3 Communication Relationships.

The EMS communication plan should describe and define the communication relationships between system agencies. Such relationships may include managing emergency information, providing a unified communication control system, transferring or handling (without duplicating) event information, and ensuring compatibility of communication devices.

11.8 Computer-Aided Dispatch.

The system should include computer-aided dispatch (CAD), which allows for reference location information such as location of previous incidents, duplicate incidents, or premise/hazard information. The CAD system should provide a method of selecting appropriate response units.

11.8.1

Automatic vehicle locaters (AVL), when used, will assist the CAD system in selecting the closest appropriate unit.

11.8.2

Mobile data computers (MDCs) allow the CAD system to automatically gather and report appropriate response information.

11.8.3 Additional Data and CAD Elements.

11.8.3.1 CAD Interface Capabilities.

The CAD should be able to interface with other dispatch computers within the EMS system.

11.8.3.2 Data Retrieval.

The CAD system should ensure ease of data input and retrieval.

11.8.3.3 Data Capture and Reporting Elements.

The communications system should, at a minimum, be able to capture and report on the following data elements:

(1) Response intervals

(2) ~~E~~ 9-1-1 system access

(3) Call processing interval

(4) Dispatch time

(5) Turnout interval

(6) Travel interval

(7) Patient contact time

(8) En route to hospital (or other facility) time

(9) Arrival at hospital time

(10) Unit available for service

11.8.3.4 National Fire Incident Reporting System (NFIRS).

The CAD system should be able to capture and report information according to the requirements of *NFIRS*.

11.8.3.5 National ~~Highway Traffic Safety Administration (NHTSA)~~ EMS Information System (NEMSIS) .

The CAD should be able to capture essential data elements recommended by ~~NHTSA~~ NEMSIS .

11.8.4* ~~Data Integration.~~

A system of integrating and reporting data should be available for all responders and stakeholders in the system.

A.11.8.4

For example, data between EMS and hospital systems.

~~**11.9** Capture of Key Data Elements.~~

~~The communications system should capture key data elements and report performance.~~

11.9 Quality Management.

A system should be in place to monitor the quality of the communications system. Communications improvements should be made based on quality evaluations and technological advancements.

11.10 Communications Equipment.

The age and reliability of equipment should be monitored regularly.

11.10.1 Equipment Maintenance.

An equipment maintenance plan should be developed and followed.

11.10.2 Financial Plans.

Financial plans should anticipate repair and maintenance needs. Funding methodologies should be established that minimize the impacts of capital expenditures for new or replacement equipment.

11.11 Operability.

The communications system should allow communications between all providers in all operating environments.

11.11.1 Operating Security.

The system should ensure that secured or dedicated frequencies are available that are not affected by private users (especially cellular telephone users) and should ensure the physical and electronic security of communication resources.

11.11.2 Tactical Frequencies.

Tactical operating frequencies should be available to reduce high-traffic radio communications and for use during multiagency events.

11.11.3 Disaster Operations.

Disaster communication frequencies should be available and used during disasters, mass casualty incidents, and other multiple-patient scenes according to the standards of the system.

11.11.3.1

The disaster communication process should be dependable to minimize loss of service.

11.11.3.2

Backup systems should be in place in case of the primary system's interruption.

11.11.3.3

High incident response levels (HIRL) should support major events and minimize dispatch volumes. Primary dispatch activities should be limited to emergent incidents; routine calls should be managed by local jurisdiction on an “as available” assignment.

11.12 Criteria-Based Dispatch.

Criteria-based dispatch (CBD) protocols should be used to prioritize requests for service and dispatch resources according to pre-established criteria.

11.12.1 Pre-Arrival Instructions.

The dispatch center should establish standards for providing medically approved pre-arrival instructions.

11.12.2 Protocols.

Dispatch system protocols should address, but not be limited to, the following:

(1) Dispatching systems

(2) Online medical direction systems

(3) Nonemergency systems

(4) Nurse lines

(5) Insurance referrals

(6) Primary care physicians

(7) Scheduling systems

11.12.3 Quality Assurance.

The system should use quality assurance measures, such as outcome, comparison, and validation information, to ensure continuous improvement.

11.13 Training.

Call receivers/dispatchers should participate in and complete a nationally recognized and accepted emergency medical dispatch certification program and should receive on-the-job, site-specific training. Call receivers/dispatchers should regularly participate in continuing education.

11.14 Direct Medical Control.

The EMS system should ensure that direct medical control is available for all field responders.

11.15 Nonemergency Services.

Methods should be in place to provide alternative medical services for those requests that do not require emergency medical responses.

11.16* Telemedicine.

Telemedicine utilizes technology to link a treating or consulting physician or nurse practitioner/physician assistant with a patient in real time, which is especially helpful and potentially life-saving if the patient is in a remote location. Telemedicine can include, but is not limited to, remote biometric monitoring of the following:

(1) Blood pressure

(2) Heart rate and rhythm

(3) Respiratory rate and rhythm

(4) Temperature

(5) Fetal heart rate

A.11.16

For more information on telemedicine, see the American Telemedicine Association's website at www.americantelemed.org. Also, see "Telemedicine Liability: Texas and Other States Delve into the Uncertainties of Health Care Delivery via Advanced Communications Technology," in *The Review of Litigation* .

11.17* Telehealth.

The term *telehealth* is often used interchangeably with telemedicine. While telemedicine refers to the practice of medicine over a distance using communication technologies, telehealth refers to health-related activities such as, but not limited to, the following:

(1) Continuing education for health care providers

(2) Administration of health care service

(3) Medical and bio-scientific research

(4) Public health activities

A.11.17

For more information on telehealth, see "An Information Technology Framework for Strengthening Telehealthcare Service Delivery," in the *Journal of Telemedicine and e-Health.*

Supplemental Information

File Name	Description	Approved
New_Chapter_10_Health_Information_Technology_for_FR.docx	Please us this file for the complete revision of the chapter. For staff use	

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Committee Statement

Committee Statement: Chapter has been updated to include health information technology, data exchange, and the latest information regarding communications. A reserved section has been added for FirstNet information. The TC seeks input as to what to include regarding this changing landscape.

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First Revision No. 15-NFPA 450-2019 [Chapter 11]

Chapter 12 Equipment and Facilities

12.1 Standard for First Response and Ambulance Transportation.

The EMS system should have a standard for first response and ambulance transportation equipment. The EMS system should have a standard or method to determine the equipment and related specifications needed in the EMS system for all patients. The method could permit individual agencies to make equipment determinations.

12.1.1 Vehicles.

The EMS system should create specifications for first response and transport vehicles used within the EMS system. A part of the vehicle standard may include allowing individual agencies to make purchasing decisions within the restrictions established by the EMS specification or by state or national standards, such as NFPA 1917.

12.1.1.1

EMS systems should have policies and procedures in place to ensure the appropriate locking and security of vehicles.

12.1.1.2

Vehicles should have systems that are able to disable functions to avoid misuse or theft of the vehicle (i.e., a kill switch).

12.1.2 Biomedical Equipment.

The EMS system should ~~create~~ follow minimum specifications for first response and transport of biomedical equipment used within the EMS system.

12.1.3 Durable Equipment.

The EMS system should ~~create~~ follow minimum specifications for first response and transport of durable equipment used within the EMS system.

12.2 Replacement and Maintenance Plan.

A replacement and maintenance plan should be developed at the time the equipment is purchased, based on the life expectancy of each equipment type.

12.3 Response Vehicle Licenses.

EMS system equipment should be licensed according to local or ~~statewide emergency medical~~ state regulations.

12.4 Inspecting Emergency Equipment.

~~The EMS system should develop plans for inspecting equipment and inventory carried aboard emergency response vehicles. Regular inspections should be conducted every shift, every day, every week, and every month by on-duty personnel. EMS system regulators should conduct announced and unannounced inspections on a regular basis. Inspection lists should be developed based, at a minimum, on manufacturers' recommendations.~~ Equipment inventory and inspection lists should be developed.

12.4.1

The EMS system should develop plans for inspecting equipment and inventory carried aboard emergency response vehicles. Regular inspections should be conducted. ~~every shift, every day, every week, and every month by on-duty personnel.~~

12.4.2

It is understood that EMS system regulators can conduct announced or unannounced inspections.

12.5 Personnel Education and Training.

All personnel should receive the training necessary to ensure ~~that~~ they can effectively operate ~~emergency~~ vehicles they are expected to operate in the course of their duties . ~~In addition to driver training, the training courses should include basic inspection requirements for ambulances and other emergency vehicles meeting~~ NFPA 1451 ~~.~~

12.5.1

In addition to driver training, the training courses should include basic inspection requirements for ~~ambulances and other emergency vehicles meeting~~ ~~NFPA 1451~~ . vehicles personnel are expected to operate in the course of their duties.

12.5.2

Personnel should receive driver training courses that meet or exceed the minimum requirements of NFPA 1451 .

12.5.3

Training programs should be customizable based on local needs.

12.5.4

Personnel should receive training on procedures for appropriately securing vehicles, medications, and equipment.

12.5.5 ~~Maintenance of Driving Licenses.~~

~~Periodic~~ The EMS system should perform periodic records checks ~~should~~ to ensure that driver's licenses are in place and not suspended, ~~or~~ revoked, or restricted in any other way .

12.5.6 ~~Operator Assessment.~~

The EMS system should have processes in place to identify and address at-risk vehicle operators. ~~and should develop measures to ensure safe vehicle operation.~~

12.6 Maintenance Plans.

~~The maintenance program should have plans in place that provide a schedule for maintenance and carefully articulated maintenance plans for all major equipment used in the system, including vehicles, biomedical equipment, or other medical equipment. The plans should include a replacement schedule and plans to provide reserve equipment or equipment "on loan" during repair periods.~~ An equipment inspection and maintenance program should be developed.

12.6.1

The maintenance program should have plans in place that provide a schedule for maintenance and carefully articulated maintenance plans based, at a minimum, on manufacturers' recommendations for all major equipment used in the EMS system, including vehicles, biomedical equipment, or other medical equipment.

12.6.2

The maintenance plans should include a replacement schedule and plans to provide reserve equipment or equipment "on loan" during repair periods.

12.7 Maintenance Personnel for Emergency Equipment.

The maintenance program should ~~provide~~ use specially trained personnel to conduct vehicle, biomedical, and hardware maintenance. ~~using specially trained personnel. The EMS system should adopt policies to ensure that maintenance personnel are appropriately trained for that maintenance.~~ ~~*(See NFPA 1071 .)*~~

12.7.1*

The EMS system should adopt policies to ensure that maintenance personnel are appropriately trained for that maintenance. ~~*(See NFPA 1071 .)*~~

A.12.7.1

For vehicle maintenance qualifications, see NFPA 1071 .

12.7.2

Biomedical equipment should be maintained in accordance with manufacturers' recommendations.

12.8* Response Facilities.

~~Ambulance and other responders' facilities should be located based on analysis of demand and/or risk-hazard evaluation. Agencies should participate in joint efforts to cooperatively determine the best location for facilities.~~ Ambulance and other response facilities should be designed consistent with system demands ~~and~~ , community needs, existing standards, and the potential for use in community healthcare and should be located based on demand analysis or risk-hazard evaluation. These facilities should have adequate safety and security measures .

A.12.8

Some existing standards that can be used in the design of response facilities include the following:

(1) NFPA 1

(2) NFPA *101*

(3) *NFPA 72*

(4) NFPA 1500

(5) NFPA 1584

(6) *International Building Code*

~~**12.8.1**~~

~~EMS facilities may be available (designed) for other medical or clinical services. If appropriate to the local jurisdiction, the EMS participants should consider enhancing facilities for use in advanced medical services.~~

~~**12.8.2**~~

~~Ambulance and other response facilities should be designed consistent with system demands and community needs.~~

~~**12.8.3**~~

~~The EMS system should designate receiving facilities based on capability, capacity, and location.~~

Supplemental Information

File Name	Description	Approved
New_Chapter_11_Equipment_and_Facilities_for_FR.docx	Please use the attached word file for the significant revision of this chapter. For staff use.	

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First Revision No. 16-NFPA 450-2019 [Chapter 12]

Chapter 13 Human Resources

13.1 Introduction.

~~Human resources are important to both individual agencies and to the broader EMS system. As such, while~~ EMS system planners and regulators should ensure that minimum standards exist in the EMS system for monitoring, managing, and ensuring appropriate staff performance. ~~, they also must ensure that individual agencies have appropriate personnel management structures in place.~~

13.2 Recruitment.

~~The~~ EMS systems and agencies should recruit according to ~~its~~ their needs, as determined by ~~system~~ analysis, design, and planning.

13.2.1 Selection.

The EMS system should have a process for candidate/member selection. ~~that includes procedures for hiring or membership.~~

13.2.2 Wages/Benefits.

~~The plan for any compensation~~ Plans for wages or benefits should be clearly ~~spelled out in system documents~~ outlined and documented .

13.3 Education/Training/Certification.

13.3.1

The EMS system should ensure that personnel maintain required certification ~~and/~~ or licensure as mandated by law .

13.3.2

Personnel education/training/certification records should be maintained by the EMS system.

~~**13.3.3** Training Program.~~

~~The system should have a comprehensive training plan.~~

~~**13.3.3.1**~~

~~The training plan should provide uniform curricula based on established standards.~~

~~**13.3.3.2**~~

~~The training program and instructors should be regularly monitored and evaluated.~~

~~**13.3.4** Certification.~~

~~Certification standards should be appropriate and uniform throughout the system.~~

~~**13.3.4.1**~~

~~System requirements for recertification should be disseminated to personnel.~~

~~**13.3.4.2**~~

~~The system should include the capability to track individual certification/licensure and the need for renewal thereof.~~

~~**13.3.4.3**~~

~~The system should ensure that the training programs necessary for certification and recertification are available in or to the system.~~

13.4 ~~Training~~ Professional Development Program.

13.4.1

The EMS system should have a comprehensive ~~training~~ professional development plan.

13.4.2 Educational Opportunities.

Educational opportunities should be made available to personnel in the EMS system.

~~**13.3.6** Training/Education Records.~~

~~Personnel training and/or education records should be maintained by system administrators.~~

13.5* Retention.

~~The~~ EMS systems ~~or region should take steps to encourage continued participation of~~ and agencies are responsible for retaining personnel. ~~Programs should be appropriate to the local area but may include the following:~~

~~Length of service award programs (LOSAPs)~~

~~Incentive plans~~

~~Recognition plans~~

~~Educational/training opportunities~~

~~Job advancement/advancement opportunity programs~~

~~Provider support~~

A.13.5

Programs should be appropriate to the local area but may include the following:

(1) Length of service award programs (LOSAPs)

(2) Incentive plans

(3) Recognition plans

(4) Educational/training opportunities

(5) Job advancement/advancement opportunity programs

(6) Provider support

13.6 Personnel.

EMS systems and agencies should have effective employment or membership processes.

~~**13.6.1** Processes.~~

~~The system should have one or more processes in place to ensure effective working relationships between working groups and agencies.~~

13.6.1 Employee/Member.

~~The lead agency~~ EMS systems and agencies should ensure that a regularly scheduled, objective personnel evaluation process is in place and followed .

~~**13.6.1.2**~~

~~Levels of training should be appropriate to meet service needs.~~

~~**13.6.1.2**~~

~~The agency should use the criteria covered by 13.5.2.4.1 and 13.5.2.4.2 .~~

~~**13.6.1.3.2**~~

~~Quality assurance and improvement programs should be in place for each agency participating in the system.~~

13.6.2 Duties Specifications.

Jobs ~~specifications~~ /duties should be clearly defined.

13.6.3 Service Delivery.

~~Agencies in the system~~ EMS systems and agencies should have appropriate staffing and scheduling methods to ensure adequate delivery of services. ~~based upon the community needs assessment.~~

13.6.4 Credentials.

~~The system~~ EMS agencies should ensure that personnel have ~~agency and provider level~~ a current identification card that displays affiliation and licensure/certification level .

13.6.5 Records.

EMS agencies should maintain personnel records.

13.7 Rules and Regulations.

~~Rules~~ EMS agencies should have rules and regulations ~~should be~~ structured to provide for ~~uniform~~ equitable management of personnel in the EMS system.

~~**13.7.1**~~

~~The system should have established rules and regulations for acceptable behavior, activities, and actions.~~

~~**13.7.2**~~

~~The system should have established minimum operational policies and guidelines.~~

13.7.1

~~The system~~ EMS agencies should have a process in place to manage discipline, appeals, grievances, and other personnel actions.

13.7.2

~~The system~~ EMS agencies should have a process in place to ensure compliance with occupational safety regulations.

13.8 Health and Safety.

~~The system~~ EMS agencies should ensure that each agency has and implements a written comprehensive health and safety plan.

13.8.1

Personal protective equipment meeting applicable NFPA standards such as NFPA 1500 and NFPA 1999 should be ~~available~~ provided to all personnel ~~and should be used according~~ as mandated by law, to system standards, and manufacturer recommendations.

13.8.2

Health and wellness programs should be in place to prevent participant illness and injury.

13.8.3

These health and wellness programs should include training on bloodborne pathogens meeting NFPA 1581 and 29 CFR 1910.1030. ~~, *Bloodborne Pathogens* .~~

13.8.4

A program to address occupational exposure to atypically stressful events should be in place.

13.8.5

An employee assistance program (EAP) should be in place.

Supplemental Information

File Name	Description	Approved
New_Chapter_12_Human_Resources_for_FR.docx	Please use this file for the complete revision of chapter 12. For staff use.	

Submitter Information Verification

Committee: EMS-AAA

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Committee Statement

Committee Statement: This chapter has been updated with additional data sets. It include information on employee recruitment, retention, health and safety, and more.

Response Message: FR-16-NFPA 450-2019

First Revision No. 17-NFPA 450-2019 [Chapter 13]

Chapter 14 Operations

14.1 Implementation of System Design (Operations).

~~The EMS system operations include the coordination of multiple system elements. That is why each component should be considered not only in the context of its operational application but also in relationship to other factors within the~~ The leadership of EMS systems and agencies should consider operational components both individually and as part of a coordinated system.

14.2 System and Agency Preparation.

EMS operations should be implemented based on EMS system and agency planning, analysis, and financial capability.

14.3 Communications Coordination.

14.3.1

EMS communications should be coordinated based on EMS system and agency design and available local resources.

14.3.2

EMS systems and agencies should ensure communication interoperability with surrounding systems and agencies.

14.4 Response Coordination.

~~Plans for first or initial~~ EMS systems and agencies should have written plans outlining first response, ambulance ~~response and~~ transport, ~~and~~ alternate methods of transport ~~should be in place~~ , definitive care locations, and alternative care destinations as determined by ~~EMS~~ system analysis and planning. ~~, including the availability of additional resources as required by system demands.~~

14.5 Incident Management.

~~The~~ EMS systems and agencies should have written plans detailing the function of incident management, ~~is the overall management and~~ coordination of efforts, , and accountability for~~,~~ all responding ~~personnel and~~ resources.

14.5.1

The incident management system (IMS) as described in NFPA 1561 should be consistent throughout all agencies that can be expected to interact.

14.5.2

The ~~system~~ IMS should be based on a strategy of efficient and effective utilization of resources. ~~It should address chain of command, including transfer of authority of any officer or position. It should provide for delineation of responsibilities and authority for all involved response personnel and agencies.~~

14.5.3

~~It~~ The IMS should address chain of command, including transfer of authority of any officer or position.

14.5.4

~~It~~ The IMS should provide for delineation of responsibilities and authority for all involved response personnel and agencies.

14.6 Treatment Guidelines.

Patient care should be consistent with AHJ guidelines, evidence-based treatments, industry standards, medical oversight, and established protocols. ~~, and desired patient outcomes.~~

14.7 Patient Destination (Transport).

14.7.1

Patient destination guidelines should be consistent with AHJ guidelines, evidence-based treatments, medical oversight, and established protocols. ~~, and desired patient outcomes.~~

14.7.2

EMS systems, agencies, hospitals, and alternative-care destinations should have written plans to address patient destinations during a multi-casualty event.

14.8 Functional Capabilities of Health Care Facilities.

The EMS system, in concert with the local medical community, should ~~create standards for~~ maintain a summary of the functional capabilities of health care facilities and determine the types of patients who should be delivered to those facilities.

14.8.1

The ~~functional information~~ summary should be disseminated to emergency care personnel. ~~The system should have a plan in place to provide functional information to emergency personnel, and the plan should be monitored to ensure that patients are transported to the appropriate facility.~~

14.8.2

EMS systems, agencies, hospitals, and alternative-care destinations should have written plans to address hospital diversion.

14.8.3*

Heath care facilities should have evacuation plans that are created in coordination with the EMS system.

A.14.8.3

Model systems are utilizing their healthcare coalitions to achieve a coordinated and unified evacuation plan.

~~**14.8.4**~~

~~The system should define medical center capabilities for the following:~~

- ~~Primary, secondary, and tertiary medical facilities~~
- ~~Alternate health care facilities~~
- ~~Hospice~~
- ~~Specialized care facilities, such as trauma, burn, pediatric, cardiac, hyperbaric, psychiatric, obstetric, spinal cord, and sexual assault~~
- ~~Other facilities appropriate to the local system~~

~~**14.8.5**~~

~~The pre-hospital triage program and destination policies should provide for transport to appropriate facilities and for backup plans for facilities that are on diversion.~~

14.9 Coordinated Medical Oversight.

~~A plan~~ EMS systems and agencies should ~~be implemented~~ have a written plan that ~~allows for~~ outlines direct and indirect medical oversight, coordinating ~~acute~~ medical care, developing patient care protocols, ~~development, and additional components of the~~ and a quality management program.

~~**14.10** Quality Management/Documentation.~~

~~All EMS activities including patient care, transport, training, and research documentation should be included in the implementation of a quality management program.~~

14.10 Logistics.

~~Systemwide supply and equipment programs such as the following should be implemented to standardize equipment selection and to facilitate interagency supply and equipment use and sharing:~~ EMS systems and agencies should have a written plan that outlines logistics for operations such as the following:

(1) ~~Restocking of materials~~ Materials , disposables, and consumables restocking

(2) ~~Decontamination of equipment and vehicles~~ Equipment, clothing, and vehicle decontamination

(3) Equipment repair and replacement

(4) Data collection and management

(5) ~~Support for extended~~ Extended- duration incident operations support

(6) Vehicle fueling

14.11 Staff Management.

Staff recruitment, development, evaluation, education, training, and retention programs should be in place to ensure that sufficient numbers and types of qualified providers are available based on EMS system design.

14.12 Public Information, Education, and Relations.

A program should be in place to allow for an information interface with the community, including EMS access information, public education, and system public relations. ~~, and incident information management.~~

14.13 Regulatory Compliance.

~~The~~ EMS systems and agencies should ensure ~~that systemwide~~ operations comply with local, state, provincial, tribal, and federal regulations and laws. ~~, including, but not limited to, state-mandated reporting, federal health and safety regulations, certification requirements, financial reporting, communicable disease reporting, and communications component authorization.~~

14.14 Automatic and Mutual Aid.

~~Automatic~~ EMS systems and agencies should maintain automatic and mutual aid agreements. ~~should provide for system and backup responses.~~

~~**14.16** Alternative Patient Transport.~~

~~A plan for alternative patient transport should be in place.~~

~~**14.15** Training.~~

~~EMS agencies within a region should jointly train and prepare for emergency responses.~~

~~**14.15.1** Training Requirements.~~

~~Each EMS agency and jurisdiction should establish training requirements and should develop and utilize a training program based on the needs assessment of the community.~~

~~**14.15.2** Training for Disasters and Multicasualty Incidents.~~

~~EMS personnel at all levels within their respective organizations should be trained to meet their responsibilities in the course of a multicasualty incident.~~

14.15 Coordinated Training Plan.

~~The plan should be a coordinated interagency effort. Appropriate agencies should have regular interaction.~~ EMS systems and agencies should have a coordinated training plan that prepares responders for daily operations as well as large-scale incident responses.

14.16 Emergency Response Planning.

14.16.1

Participants in the local EMS system should be familiar with local emergency management agencies'local annexes and emergency operation plans as defined ~~in~~ by the Federal Emergency Management Agency (FEMA). ~~publication *Civil Preparedness Guide (CPG)* .~~

14.16.2

The EMS system should ensure that each agency ~~or jurisdiction~~ has a plan to meet its own needs within its capabilities.

~~**14.16.3**~~

~~The system should encourage each EMS agency or jurisdiction to enter into mutual aid agreements with other local or regional jurisdictions.~~

14.16.3

System and agency plans should ensure that performance expectations and obligations agreed to under local emergency management plans are met.

14.17 Nonconventional Resources.

Resources of other nonconventional agencies such as nonemergency ambulance and municipal mass transportation services should be considered in cases of patient surge.

14.18 System Goals and Objectives Analysis.

System goals and objectives determine service levels as a function of community needs identified through EMS system evaluation and analysis and community needs assessments.

14.18.1 System Design.

System design should be dynamic and based on continual evaluation of the EMS system according to defined indicators and performance measures.

14.18.2 Cost/Benefit.

System design should consider both the costs and benefits of service delivery options.

14.18.3 Prevention Efforts.

Illness and injury prevention and education efforts should be linked to community needs and resource availability.

14.18.4 Prevention Targets.

14.18.4.1

The EMS system plan should identify vulnerable population groups that would benefit from prevention programs.

14.18.4.2

The prevention programs should include the following:

(1) Primary illness- and injury-prevention programs for age-related hazards

(2) Special needs or special hazard groups, based on an analysis of the community's population

~~**14.19** Joint Coordination and Planning.~~

~~Participants in the local EMS system should be involved in planning, needs assessment, training, integration, coordination, mutual aid, provision of resources, and evaluation of the response of a local EMS organization to a multiple-patient incident.~~

~~**14.19.1**~~

~~The EMS system's plan should conform to appropriate regional and state plans.~~

~~**14.19.2**~~

~~The plan should be a coordinated interagency effort. Responsible participants should have regular interaction in order to facilitate working relations during an incident.~~

~~**14.20** Research and Development.~~

~~The system should participate in research-based evaluation of all system components and should use objective criteria to evaluate, develop, and purchase equipment.~~

Supplemental Information

File Name	Description	Approved
New_Chapter_13_Operations_for_FR.docx	Please use the attached for revisions to chapter 13. For staff use.	

Submitter Information Verification

Committee: EMS-AAA

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Committee Statement

Committee Statement: Chapter 13 has been revised to provide additional detail and data sets that will reflect best practices and support quality management programs.

Response Message: FR-17-NFPA 450-2019

Public Input No. 2-NFPA 450-2017 [New Section after 13.4]

First Revision No. 18-NFPA 450-2019 [Section No. B.2.1]

C.2.1 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM F1031, *Standard Practice for Training the Emergency Medical Technician (Basic),* 2013.

ASTM F1086, *Standard Guide for Structures and Responsibilities of Emergency Medical Services Systems Organizations,*~~2002~~ 2016 .

ASTM F1149~~-93~~ , *Standard Practice for Qualifications, Responsibilities, and Authority of Individuals and Institutions Providing Medical Direction of Emergency Medical Services*, 2013.

~~F1177, *Standard Terminology Relating to Emergency Medical Services,* 2009.~~

ASTM F1220, *Standard Guide for Emergency Medical Services System (EMSS) Telecommunications,* 2014.

ASTM F1221, *Standard Guide for Interagency Information Exchange,* 2014.

~~F1224, *Standard Guide for Providing System Evaluation for Emergency Medical Services,* 2004 e1.~~

ASTM F1229, *Standard Guide for the Qualification and Training of EMS Air-Medical Patient Care Providers,*~~2001~~ 2016 .

~~F1255, *Standard Practice for Performance of Prehospital Automated Defibrillation,* 2008.~~

ASTM F1256, *Standard Guide for Selection and Practice of Emergency Medical Services Instructor for Basic Life Support/Emergency Medical Technician (BLS/EMT) Training Programs,* 2013.

ASTM F1257, *Standard Guide for Selection and Practice of Emergency Medical Services Instructor for Advanced Life Support/Emergency Medical Technician (ALS/EMT) Training Programs,* 2013.

ASTM F1258, *Standard Practice for Emergency Medical Dispatch,*~~2004~~ 2014 .

ASTM F1268, *Standard Guide for Establishing and Operating a Public Information, Education, and Relations Program for Emergency Medical Service Systems,* 2012.

ASTM F1285, *Standard Guide for Training the Emergency Medical Technician (Basic) to Perform Patient Examination Techniques,* 2013.

~~F1286, *Standard Guide for Development and Operation of Level 1 Pediatric Trauma Facilities,* 2009.~~

ASTM F1287, *Standard Guide for Scope of Performance of First Responders Who Provide Emergency Medical Care,* 2012.

~~F1288, *Standard Guide for Planning for and Response to a Multiple Casualty Incident,* 2003.~~

ASTM F1339, *Standard Guide for Organization and Operation of Emergency Medical Services Systems,*~~2003~~ 2016 .

ASTM F1453, *Standard Guide for Training and Evaluation of First Responders Who Provide Emergency Medical Care,*1992, reapproved 2012.

ASTM F1493, *Standard Guide for Financing and Financial Accountability of Medical Transportation Systems,* 2008. (withdrawn)

ASTM F1517, *Standard Guide for Scope of Performance of Emergency Medical Services Ambulance Operations,*~~2007~~ 2014 .

ASTM F1552, *Standard Practice for Training Instructor Qualification and Certification Eligibility of Emergency Medical Dispatchers,*~~2009~~ 1994, reapproved 2016 .

ASTM F1555, *Standard Guide for Characteristics for Extremity Splints*, ~~2007~~ 2015 .

ASTM F1556, *Standard Guide for Spinal Immobilization and Extrication (Spined) Device Characteristics,*~~2007~~ 2015 .

~~F1557, *Standard Guide for Full Body Spinal Immobilization Devices (FBSID) Characteristics,* 2007.~~

ASTM F1558, *Standard Guide for Characteristics for Adjunct Cervical Spine Immobilization Devices (ACSID),*~~2007~~ 2015 .

ASTM F1559, *Standard Guide for Characteristics for Cervical Spine Immobilization Collar(s) (CSIC),*~~2007~~ 2015 .

ASTM F1560, *Standard Practice for Emergency Medical Dispatch Management,* 2014.

ASTM F1616, *Standard Guide for Scope of Performance of First Responders Who Practice in the Wilderness or Delayed or Prolonged Transport Settings,* ~~2009~~ 2016 .

~~F1629, *Standard Guide for Establishing Operating Emergency Medical Services and Management Information Systems, or Both,* 2007.~~

~~F1651, *Standard Guide for Training the Emergency Medical Technician (Paramedic),* 2009.~~

~~F1652, *Standard Guide for Providing Essential Data Needed in Advance for Prehospital Emergency Medical Services,* 2007.~~

ASTM F1653, *Standard Guide for Scope of Performance of Triage in Prehospital Environment,* 2012.

ASTM F1654, *Standard Guide for Training and Evaluation of Individuals Who are Responsible for or Perform Triage in Prehospital Environment,* 2012.

ASTM F1655, *Standard Guide for Training First Responders Who Practice in Wilderness, Delayed, or Prolonged Transport Settings,* 2013.

ASTM F1705, *Standard Guide for Training Emergency Medical Services Ambulance Operations,* 2012.

ASTM F1949, *Standard Specification for Medical Oxygen Delivery Systems for EMS Ground Vehicles,* 2013.

~~F2020, *Standard Practice for Design, Construction, and Procurement of Emergency Medical Services Systems (EMSS) Ambulances,* 2009.~~

ASTM F2076, *Standard Practice for Communicating an EMS Patient Report to Receiving Medical Facilities,* 2014.

~~F2171, *Standard Guide for Defining the Performance of First Aid Providers in Occupational Settings,* 2009.~~

Submitter Information Verification

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Committee Statement

Committee Statement: Referenced current national consensus standard editions.

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Public Input No. 35-NFPA 450-2018 [Section No. B.2.1]