

Volume

1

INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS

INTERNATIONAL ASSOCIATION OF FIRE CHIEFS

EMS System Performance Measurement

Operations Manual

IAFF/IAFC EMS SYSTEM PERFORMANCE MEASUREMENT

•Operations Manual

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Forward

In today's health care environment, the demand for objective comparative information about the performance of health care organizations and providers has created a need for data driven evaluation processes. National organizations and federal agencies have established quality indicators, created tools to measure performance according to those indicators, and issued report cards for both providers and health care organizations.

As a part of the health care environment, prehospital emergency medical services (EMS) systems are no different in their need for objective comparative system information to assist government officials at all levels to establish relevant policy, select appropriate system design, and monitor system quality and effectiveness. Governmental decision-makers, payors, and consumers are demanding objective evidence that they are receiving value and quality for the price they pay for EMS. EMS system administrators also require objective feedback about performance that can be used internally to support improvement efforts and externally to demonstrate accountability to the public and other stakeholders.

Across the United States and Canada, citizens have come to demand high quality prehospital emergency medical care as part of routine public services. Although the demand for emergency medical services is great, citizens and their government leaders lack experience in effectively evaluating their existing EMS system, determining additional needs, or making informed choices regarding system design or competing providers.

In a time when local governmental budgets are tight and available monetary resources are not readily expended without exhibited necessity, EMS system administrators are continually asked to justify system resources and the associated costs. Threats of station closure, reduction in the number of apparatus deployed, and staffing cuts haunt fire chiefs and EMS officials. Therefore, it is imperative that detailed information regarding the quality and performance of system components be assessed and reported. Proof of value for dollars expended is necessary to maintain appropriate emergency response capabilities in local communities. Mayors, city managers, city councils, or county commissions no longer accept rhetoric that plays on basic human fears to justify dollars expended.

A likely solution to these dilemmas is EMS system performance measurement. Performance measurement according to precisely defined quality indicators in EMS systems will provide evidence of the systems value to the community.

Beginning in 1997, the International Association of Fire Fighters expended necessary resources to identify and define indicators of quality performance in fire-based EMS systems and to develop measures for those indicators. The International Association of Fire Chiefs joined the effort during field testing and finalizing the performance indicators and measures. The pages that follow provide a synopsis of the measurement instrument developed, field tested, and edited based on the field test. The IAFF/IAFC are now engaged in developing a web-based data collection and reporting system for use by local EMS systems based on these indicators and measures. The chapters that follow first provide direction in the web database and reporting system followed by a reference chapter on each indicator and associated measure.

Questions regarding the EMS System Indicators and Performance Measures may be directed to Dr. Lori Moore @ Lmoore@iaff.org or by calling (202) 824- 1594.

Logging In

Online registration

In order to use this system you must request a registration number from the International Association of Fire Fighters. Once you have a valid registration number you can create logins for your department.

Logging into the system

The website is currently located at <http://www.iaff.org/spm/login.asp> . This is the development version of the website and a VPN connection is required for this page to function.

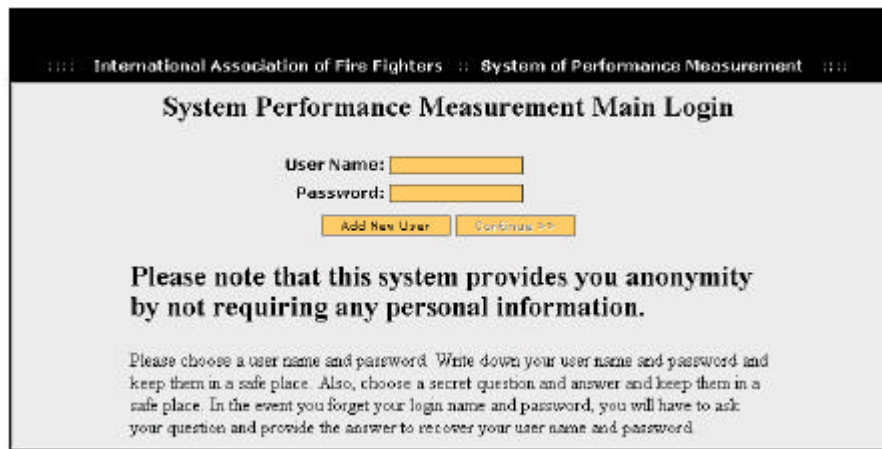


FIGURE 1: Example of the login page.

Enter your User Name and your Password and click the Continue >> button to log into the system.

Creating a new user

In order to create a new login you must have a valid registration number. Registration numbers are provide to each department and can be obtained by contacting the IAFF.

Once you have your registration number, navigate to the web site and add new logins as explained below.

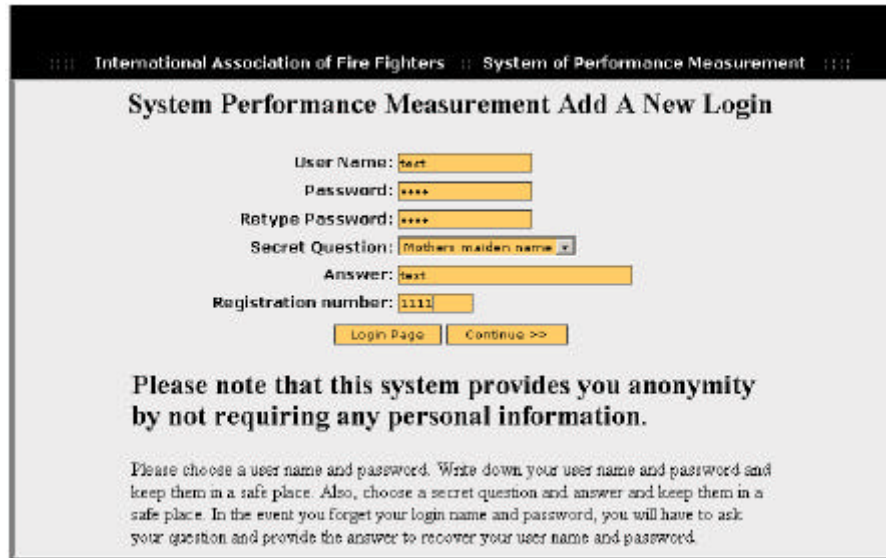


Figure 2: This diagram shows the 'add a new user' form.

To add a new login, completely fill out the form as displayed in figure 2. Replace the registration number '1111' with the registration number you were given from the IAFF.



Figure 3: Example of the success process of creating a new login.

Once you have successfully created a new login, continue to the login page and use your new login to get into the system.



Figure 4: Example of what will happen if you try to create the same login name more than once.

The system will not allow the same login name to be used more than once. Since the system has a broad range of users, you have to be creative when selecting a user name. User names are NOT case sensitive. One standard practice is to use your 1st initial,

middle initial and last name for a login name. If they have already been used, try adding a number to your login name: wsjones2 for example.

Login specifications

- Any of these characters will be stripped out of your login name or password.
 - `~!@#\$\$%^_)"
- Each field required must be at least 3 characters long.
- The user name and password can be no longer than 20 characters.

Navigation buttons



- [System Resources](#)
- [System Attributes](#)
- [Incident Data Entry](#)
- [Report](#)
- Logout

System Resources

International Association of Fire Fighters System of Performance Measurement

System Resources System Attributes Incident Data Entry Report Search By Incident Logout

System Resources

Check here if this Fire Department has GIS Analytic Capability

Jurisdictional Miles

Enter the number of each type of vehicle you have at this Fire Department by clicking below

Vehicle Type	BLS	ALS
Engines	<input type="text" value="4"/>	<input type="text" value="4"/>
Trucks/Ladders	<input type="text" value="3"/>	<input type="text" value="3"/>
EMS/Rescue (Non Transport)	<input type="text" value="2"/>	<input type="text" value="2"/>
EMS Ambulance (Transport Capable)	<input type="text" value="1"/>	<input type="text" value="1"/>

Submit Changes Refresh

Enter the information requested about your overall system. This information will allow the software to calculate and customize your performance reports.

Figure 5: System resources

GIS Capability vs. Non GIS Capability

GIS Capable:

Check here if this Fire Department has GIS Analysis Capability

First Responder Reading

Transport Capable Reading

Figure 6

If you have this capability, check the box. Enter the percentage of road coverage readings for your First Responder and Transport Capable vehicles respectively (50 = 50%). As you update your GIS mapping analysis you should also update these readings. Each incident will apply the current GIS readings to that incident and the average of those readings will be used when reporting over extended time periods encompassing multiple assessment readings.

Non GIS Capable:

If you do not have GIS mapping capability in your department, leave the box unchecked as in figure 5. Enter the square miles of the jurisdiction for which you are responsible. Each time you record an incident this miles reading is applied to that record. If your jurisdiction changes or you later implement a GIS mapping system, the reporting system will compute the average of all incidents in the spanned date range of the report.

System Resources:

Enter the number of each type of vehicle you have at this Fire Department by clicking the appropriate box for BLS or ALS for engines, trucks/ladders, EMS/Rescue (non transport), EMS Ambulance (transport capable).

System Attributes

These measures are not used on a per incident basis. Enter information and update these records only when the need for a recorded change occurs. All reports will contain information for these measures.

Measure 2.12 – Employee Turnover

Measurement 2.12 - Employee Turnover
Most recent record date - 2/1/2003

EMT Capacity	<input type="text" value="10"/>
EMT Current	<input type="text" value="10"/>
EMT Losses	<input type="text" value="0"/>
Paramedics Capacity	<input type="text" value="10"/>
Paramedics Current	<input type="text" value="9"/>
Paramedics Losses	<input type="text" value="1"/>

Month and year for measure 2.12 record

Figure 7: Tracks the number of employee losses the system encounters. Data should be entered as personnel changes occur.

Measure 2.13 – Quality Program

Measurement 2.13 – Quality Program
 Most recent record date - 12/01/00 AM

Total Quality Management (TQM) - Management system fostering continuously improving performance at every level of function, focusing on customer satisfaction. Assumes that most problems result from the inability of the system to perform rather than the individual.

TQM in an EMS System requires three elements:

- 1) absolute commitment from top leaders
- 2) identification of measurable and accurate indicators of quality
- 3) involvement of workers in all quality improvement efforts

Check here if your department has a TQM program

Continuous Quality Improvement (CQI) - The sum of all activities undertaken to examine and improve the products and services continuously, including using system performance measures to compare the system to itself over time.

Check here if your department has a CQI program in place

Quality Assessment (QA) - the performance measurement of structure, processes, and outcomes within the EMS system and their comparison against a standard.

Check here if your department has a QA program in place

Field Observation - the act of practice of noting or recording facts and events of an EMS call.

Check here if your department utilizes direct field observation

Month and year for measure 2.13 record: January 2003

Update/Add Measure 2.13 records

Figure 8: Check the appropriate options that apply to your department.

Measure 2.14 – System User Opinion

Measurement 2.14 – System User Opinion
 Most recent record date - 1/1/2003

Check here if you have conducted a public opinion survey

Positive responses: 100

Negative responses: 10

Check here if you have conducted a user opinion survey

Positive responses: 90

Negative responses: 10

Check here if you have conducted some other type of survey

Positive responses: 80

Negative responses: 40

Month and year for measure 2.14 record: January 2003

Update/Add Measure 2.14 records

Figure 9: Check the option(s) that apply to a survey you have conducted. Enter the response values and save your information.

Measure 2.15 - Multi Casualty Event Response Plan

Measurement 2.15 - Multi Casualty Event Response Plan
Most recent record date - 1/1/2003

Check here if you have a multiple casualty response plan in place

How often does the department conduct training drills on the plan? Monthly

Month and year for measure 2.15 record January 2003

Update/Add Measure 2.15 records

Figure 10: Select the appropriate information and save your record.

Incident Data Entry

Each incident can contain data to be entered for up to 11 measures. An incident may or may not use all 11 measures. The process for adding an incident, the minimum data required and what each field represents, is presented below.

The incident page

International Association of Fire Fighters :: System of Performance Measurement

System Resources System Attributes Incident Data Entry Report

Search By Incident Logout

Incident Data Entry

Incident Number

Method of call handling

ALS

BLS

Other

Call Dates and Times

Date Baseline	Date/Time	2003/02/20	Select Date	01	52	05	PM
		<input type="button" value="Set All Dates and Times"/>					
Call Received	Date/Time	2003/02/20	Select Date	01	52	05	PM
Dispatch Sent	Date/Time	2003/02/20	Select Date	01	52	05	PM
Wheels Rolling	Date/Time	2003/02/20	Select Date	01	52	05	PM

GIS Capable

First Responder Sent

ALS Unit Sent

Transport Unit Sent

Patient Information

Was the documentation adequate to assess first contact?

Was the documentation adequate to assess the patient following the EMS encounter?

Employee Illness and Injury

Did EMS call result in: Injury?

Did EMS call result in: Exposure?

Did EMS call result in: Illness?

Did EMS call result in another type of illness, exposure or injury? Please explain:

Figure 11: The incident page is dynamic in that it will change depending on the option you choose for various responses. Above is a standard form as it opens for the first time.

Page Outline

- Call Status
- Call Dates and Times
- Patient Information
- Employee Illness and Injury

Call Status

Call Status

Incident Number

Method of call handling

ALS

BLS

Other

Figure 12: Call status area of an incident

Enter an incident number. The incident number is a required field. Then select the method of call handling. If this is an ALS type call, click the ALS option box to check that option.

ALS call type

ALS

More than 2 paramedics

BLS

More than 2 paramedics

Two paramedics

One paramedic

No paramedics

Other

When the ALS option is selected, you must also select the number of paramedics that were sent. If Two paramedics or One paramedic are sent, you must also specify from where they were sent.

Two paramedics

Fire department

Fire department

Fire department/One Paramedic other agency

Two paramedics other agency

When other is selected, there will be a text box available to enter a brief description of

ALS

Other

who was sent.

BLS call type

BLS

More then 2 EMTs

More then 2 EMTs

Two EMTs

One EMT

No EMTs (First responder only)

Paramedic sent

Other

When the BLS option is selected, you must also specify who was sent from the dropdown.

Other call type

Other

Select the other option if this call type is different than the options listed.

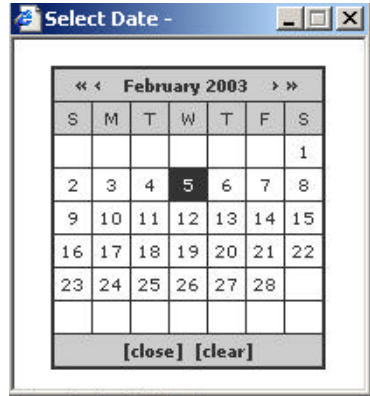
A single incident may have multiple options selected above.

Call Dates and Times

Date Baseline	Date/Time	2003/02/05	Select Date	01	45	49	PM
Set All Dates and Times							

Figure 13: The baseline date can be used to set the initial date and time of the call.

When you're adding an incident, you may want to set the baseline date from which all other dates and times will start. Click the Select Date link to display the calendar and select the date of the incident.



The calendar can be used to properly set dates in any field where the Select Date link can be found. Use your mouse to navigate the calendar and click the date of the incident.

Using the time dropdowns you can select the incident call time. The format for the time dropdown is HH (Hour) MM(Minute) SS(Seconds) AM/PM. Seconds are required so that incident measures can be evaluated properly.

Once you have selected the date and time of the incident call, click the Set All Dates and Times button to populate all the date and time values to the baseline date and time.

Call Received	Date/Time	2003/02/05	Select Date	01	45	49	PM
Dispatch Sent	Date/Time	2003/02/05	Select Date	01	45	49	PM
Wheels Rolling	Date/Time	2003/02/05	Select Date	01	45	49	PM

As you enter the times for Call Received, Dispatch Sent and Wheels Rolling, you need to only update the minutes and seconds. If a call comes in around midnight, you may have to adjust the date to show that the measure has spanned over into the next day. Click the Select Date link next to the appropriate box to change that items date. If you click directly on the orange text box, the date in the baseline will be applied to that box.

GIS Capable

GIS Capable Check this option if you have a GIS system at your department.

First Responder

GIS Capable

First Responder Sent First Responder GIS Percent Measurement 000% ▾

Wheels Rolling - Date/Time 2003/02/08 [Select Date](#) 01 ▾ 45 ▾ 24 ▾ PM ▾

Arrival - Date/Time 2003/02/08 [Select Date](#) 01 ▾ 45 ▾ 24 ▾ PM ▾

Figure 14: In this example the GIS Capable option has been selected. This will allow you to enter the % value from the GIS system.

If a First Responder was sent, check the box, enter the Wheels Rolling and Arrival Date and Time.

ALS Unit

ALS Unit Sent

Wheels Rolling - Date/time 2003/02/08 [Select Date](#) 01 ▾ 45 ▾ 24 ▾ PM ▾

Arrival - Date/Time 2003/02/08 [Select Date](#) 01 ▾ 45 ▾ 24 ▾ PM ▾

Enter the Wheels Rolling and Arrival Date and Time of the ALS unit.

Transport Unit

Transport Unit Sent Road Miles 01 ▾

Wheels Rolling - Date/Time 2003/02/06 [Select Date](#) 05 ▾ 29 ▾ 46 ▾ AM ▾

Arrival - Date/Time 2003/02/06 [Select Date](#) 05 ▾ 29 ▾ 46 ▾ AM ▾

Figure 15: In this example the GIS option was not selected. In this case enter the miles from the drop down rather than the GIS system reading.

Enter the Wheels Rolling and Arrival Date and Time of the Transport Unit.

Patient Information

Patient Information

Was the documentation adequate to assess first contact?

Was the documentation adequate to assess the patient following the EMS encounter?

This area of the application will change depending upon what you have selected in earlier parts of the form. The basic questions here are listed above. Check the appropriate boxes for each incident.

For ALS or BLS type calls there are more options to choose from.

ALS or BLS type calls

Patient Information

Patient Primary Complaint: - Select a complaint -

Was the correct protocol selected?

Was the documentation adequate to assess first contact?

Was the documentation adequate to assess the patient following the EMS encounter?

Did EMS call result in injury?

Emplo

- Select a complaint -

- Trauma
- Breathing Difficulty
- OD/Poisoning
- Neonatal/PED/OB
- Cardiac
- Seizure
- Diabetic
- Other

With the ALS or BLS call type option selected, you can also select the Patient Primary Complaint. Trauma and Cardiac selections have extended questions associated with them.

Trauma

Patient Information

Patient Primary Complaint: Trauma

Was the correct protocol selected?

Extrication performed?

Which Unit was dispatched with Extrication Tool? Engine

Extrication Unit Dispatch Time Date/Time: 2009/02/06 Select Date 07 09 36 AM

Extrication Unit Arrival Time Date/Time: 2009/02/06 Select Date 07 09 36 AM

Was the documentation adequate to assess first contact?

Was the documentation adequate to assess the patient following the EMS encounter?

Figure 16: Example of a Trauma type incident

Check all the appropriate options that apply to the incident.

Patient Information

Patient Primary Complaint: Trauma

Was the correct protocol selected?

Extrication performed?

Extrication Tool was on First Responder?

Which Unit was dispatched with Extrication Tool? Engine

Extrication Unit Dispatch Time Date/Time: 2003/02/06 Select Date 07 09 56 AM

Extrication Unit Arrival Time Date/Time: 2003/02/06 Select Date 07 09 56 AM

Was the documentation adequate to assess first contact?

Was the documentation adequate to assess the patient following the EMS encounter?

Figure 17: Example of a Trauma type incident where the Extrication Performed option has been checked. With this option selected the Extrication Tool was on First Responder option is also available. You should also enter the Unit Dispatch and Unit Arrival Date and Time.

Patient Information

Patient Primary Complaint: Trauma

Was the correct protocol selected?

Extrication performed?

Extrication Tool was on First Responder?

Was the documentation adequate to assess first contact?

Was the documentation adequate to assess the patient following the EMS encounter?

Figure 18: When the Extrication Tool was on First Responder option is selected, there is no time and date field available. The time and date will be taken from the First Responder time and date. Make sure you enter the time and date for the First Responder when this option has been selected.

Cardiac

Patient Information

Patient Primary Complaint: Cardiac

Was the correct protocol selected?

Was Defibrillation Used?

Was the documentation adequate to assess first contact?

Was the documentation adequate to assess the patient following the EMS encounter?

Figure 19: When cardiac is selected there are defibrillation options for you to select.

Patient Information

Patient Primary Complaint: Cardiac

Was the correct protocol selected?

Was Defibrillation Used?

Who delivered First Shock? Police

Was shock delivered prior to Fire Department arrival? Police

Shock Time Date/Time: Date 07

Figure 20: When the Defibrillation option is checked, you can select Who delivered the first shock. You should also enter the Shock Date and Time. (The shock date and time are hidden under the Who Delivered First Shock options in the diagram above)

Patient Information

Patient Primary Complaint: Cardiac

Was the correct protocol selected?

Was Defibrillation Used?

Who delivered First Shock? Fire Department

Which unit had the defibrillator? First Responder

Shock Time Date/Time: Date 07

Figure 21: If the Fire Department delivered the first shock, select which unit had the defibrillator.

Patient Information in general

Patient Information

Patient Primary Complaint: OD/Poisoning

Was the correct protocol selected?

Was the documentation adequate to assess first contact?

Was the documentation adequate to assess the patient following the EMS encounter?

Patients status following care by EMS personnel: Improved

Did EMS call result in: Injury?

Figure 22: For all primary complaint types there are basic options to fill out. When the Adequate Documents to assess first contact AND Adequate Documents to assess the patient following the EMS encounter options are selected, you can then choose an option as to the patient's status following care by EMS personnel.

Employee Illness and Injury

Employee Illness and Injury

Did EMS call result in: Injury?

Did EMS call result in: Exposure?

Did EMS call result in: Illness?

Did EMS call result in another type of illness, exposure or injury? Please explain:

Figure 23: Check the appropriate options or fill in the other text area. If any of the options above are selected the text area is not available.

Searching for Incidents

Call Received *	Incident Number
2002/08/01 09:03:02 AM	12345
2002/08/01 09:03:02 AM	12345
2002/08/08 06:53:40 AM	011
2002/08/09 01:26:19 AM	12350
2002/08/09 10:21:51 AM	1234-02
2002/08/10 01:50:33 AM	12345
2002/08/10 08:02:03 AM	1237-02
2002/08/10 09:10:37 AM	1234-02
2002/08/10 09:25:09 AM	1235-02A
2002/08/10 09:25:24 AM	1235-02
2002/08/10 09:46:31 AM	0.
2002/08/10 11:25:21 AM	1236-02
2002/08/10 01:19:19 PM	12348
2002/08/10 01:19:19 PM	12350
2002/08/11 07:30:00 AM	123435456
2002/08/11 10:07:43 AM	11
2002/08/11 01:09:19 PM	4444
2002/08/11 01:09:19 PM	4444
2002/08/11 01:09:19 PM	4445
2002/08/11 01:19:19 PM	12347
2002/08/11 01:19:19 PM	12347
2002/08/12 05:12:12 PM	021766
2002/08/13 07:00:33 AM	1234
2002/08/13 07:08:33 AM	1235
2002/08/13 12:22:03 PM	1902-02
2002/08/13 12:30:44 PM	12456
2002/08/28 08:15:00 AM	1604-02
2002/08/28 02:12:01 PM	444444
2002/09/17 10:07:05 AM	1

By default, incidents are sorted in date order ascending. To sort by incident number, click the incident number button.

To sort by call received time click the call received button. To pull up an old incident, click the blue link and the incident will populate in measure 1 through 12.

Reporting

When you click the report button from any available location, the report setup window will display. This window will display in a new window while your other information remains in the previous window.

Figure 24: Reports are done by month or range of months. Select the starting month and year and the ending month and year and click the Get Report button to produce the report.

The Report

Measure 2.1 - Dispatch time in 90 seconds or less	
Incidents found:	31
# of incidents meeting the measurement:	29
# of incidents below the measurement:	2
Desired Goal:	95
Your score:	93.55%

This might be an area where there could be some improvement. score = 93.55 Goal = 95

Figure 25: On the report you will find today's date at the top right. Just under that is the date range you selected from the report setup page. Then, each measure is listed in order from 1 to 15. Most measurements are similar in that incidents are counted and the percentage of incidents that meet the goal is figured and displayed.

IAFF/IAFC EMS System Performance Measurement Instrument



Indicator Profile and System Measures

Indicator 2.1

CALL PROCESSING

Definition- time from call intake by unit dispatching agency until unit notification including answering the phone (alarm), gathering vital information, and initiating a response by dispatching appropriate unit(s).

KEY TERMS -

Alarm – A signal or message from a person or device indicating the existence of a medical emergency

Emergency Medical Dispatch - Reception and management of requests for emergency medical assistance in an EMS system

Emergency Medical Dispatcher - EMS personnel specifically trained and certified in interrogation techniques, pre-arrival instructions and call prioritization with a minimum of 24 hours training including techniques of airway and hemorrhage control, CPR, Heimlich maneuver, and childbirth

Dispatch Life Support- Knowledge, procedures, and skills used by trained EMD's in providing care through pre-arrival instructions to callers, consisting of those basic and advanced life support principles that are appropriate to application by medical dispatchers

Dispatch – to send out emergency response resources promptly to an address or incident location for a specific purpose

Call – a summons for emergency medical assistance in which equipment and personnel are deployed to mitigate the incident

Unit – an EMS equipped response vehicle

Call Intake – answering the phone or other device used to receive a signal or message from a person or device indicating the need for medical assistance, learning the nature of the emergency, and verifying the address of the emergency

Minute – 60.0 seconds

Nature of the call – type of emergency indicated or described by the person or device notifying the call intake point.

Address discrepancy – difference, inconsistency, or lack of agreement between the address given by the caller and the address used to dispatch responding emergency resources

Rationale – Communication and Dispatch component plays a major role in the efficiency and overall system deployment and response. Thus the communications component must be measured to assess the quality of its individual operation.

Established Standard - NFPA 1221 = 95% of all alarms {emergency calls} must be answered in 30 seconds. Dispatch of emergency response aid shall be made within 60 seconds of the completed receipt of an emergency alarm.

Measure Type - Process

Measure Status - Core

Measure – total time from call intake by unit dispatching agency to response unit notification. This will include answering the phone, asking call intake questions (e.g., What is your emergency?), address verification, asking primary EMD questions, and communication of the address and nature of the call to the responding unit (dispatch).

Goal - 95% of calls processed in less than 90 seconds

Measure 2.1

What percentage of all EMS calls is processed by the agency actually dispatching the responding unit in 90 seconds or less?

Related Information

- 1) Does your department receive calls directly from the public or from a 911 public service answering point?

Directly from citizens
911 PSAP
Both direct and 911
Other

- 2) In what percentage of EMS calls does the dispatch system fail to process an EMS request? _____
- 3) In what percentage of EMS calls did an address discrepancy occur? (A unit responded to an address different from that given by the caller)
- 4) Does the system have an operational EMD pre-arrival instruction program?
Yes No
- 5) If yes to question 4 (above), does the EMD program have medical oversight?
Yes No

Data Element Sources – Dispatch log, recorded communication archives, Dispatch administrator.

Indicator 2.2**TURNOUT TIME**

Definition- Time from response unit notification to vehicle wheels rolling toward the incident location. This includes personnel preparation for response, boarding the responding apparatus/vehicle, placing the apparatus/vehicle in gear for response, and wheels rolling toward the emergency scene.

KEY TERMS -

Turnout – includes personnel preparation, boarding the vehicle, starting the vehicle, placing the vehicle in gear, and moving the vehicle toward the emergency scene

Unit – an EMS equipped response vehicle

Wheels rolling – vehicle in gear and wheels in motion moving the vehicle toward the incident location

Station – fixed structure used for housing mobile emergency response resources

Response – reaction of the EMS system, operating under specified conditions, to a request for emergency medical assistance

Personnel preparation – includes donning appropriate attire and safety equipment

Enroute – vehicle staffed with personnel moving toward a destination

Rationale – The time from alert to wheels turning provides an indication of the state of readiness of personnel. Minimizing this time is crucial to an immediate response.

Established Standard – NFPA 1710

4.1.2.1.1 (1) - The time objective for turnout shall be 1 minute (60 seconds).

Measure Type - Process

Measure Status - Core

Measure – total time from response unit notification to wheels rolling toward the incident location.

Goal – 90% of all calls turned out in less than 60 seconds.

Measure 2.2

What percentage of all EMS calls is turned out in 60 seconds or less?

Related Information

- 1) Does each station have designated personnel on unit notification watch?
Yes No

Data Element Sources – Dispatch logs, Response Unit Station log, Recorded Communication Archives, Call reports.

Indicator 2.3

TRAVEL TIME

Definition- time from responding vehicle wheels rolling toward the address/ incident until the arrival of the vehicle on scene at that address/ incident location.

KEY TERMS -

Travel – responding vehicle moving on a given path to the address or incident location of a medical emergency

Response time – the time from call intake until on scene arrival of responding emergency vehicles including call processing, turnout, and travel time increments

Responding vehicle – a vehicle enroute to the scene of a medical emergency

Address – a number or other code and the street name identifying the location of a medical emergency

Incident location – the address or other identifiable area of a medical emergency

On scene – emergency response resources at the address or incident location to which they were dispatched

AED- A device that administers an electric shock through the chest wall to the heart using built-in computers to assess the patient's heart rhythm and defibrillate as needed. Audible and/or visual prompts guide the user through the process

BLS- Generally limited to airway maintenance, ventilation (breathing) support, CPR, hemorrhage control, splinting of fractures, management of spinal injury, protection and transportation of the patient with accepted procedures

ALS- All basic life support measures, plus invasive medical procedures including intravenous therapy, cardiac defibrillation, administration of medications and solutions,

use of ventilation devices, and other procedures by state law and performed under medical control.

Fractile time- Fractile time reporting is the method preferred to time averaging. For fractile reporting, list response times by length of time in ascending order, then take a frequency distribution of the times (e.g., travel time is less than 4 minutes, 90% of the time).

Arrival – wheels stopped and brakes engaged.

Rationale – this measure is indicative of the system’s capability to adequately staff, locate, and deploy response resources. It is also indicative of responding personnel’s knowledge of the area or dispatcher instruction for efficient travel.

Established Standard – NFPA 1710

Section 4.1.2.1.1 (3) The fire department shall establish the following response time objectives...

(3) Four minutes (240 seconds) or less for the arrival of a unit with first responder or higher-level capability at an emergency medical incident and **Section 4.1.2.1.1(4)** eight minutes (480 seconds) or less for the arrival of an advanced life support unit at an emergency medical incident where the services is provided by the fire department.

Section 4.1.2.1.2. The fire department shall establish a performance objective of not less than 90 percent for the achievement of each response time objective specified in 4.1.2.1.1. (above).

Section 5.3.3.4.2- The fire department’s EMS resources for providing first responder with AED shall be deployed to provide for the arrival of a first responder company with AED capability within a 4-minute response (travel) time to 90 percent of incidents as established in chapter 4.

Section 5.3.3.4.3 – When provided, the fire department’s EMS resources for providing ALS shall be deployed to provide for the arrival of an ALS company within an 8-minute response time to 90 percent of incidents as established in chapter 4.

Measure Type - Process

Measure Status - Core

Measure - time elapse from vehicle wheels turning to arrival of apparatus/vehicle at response address/incident location. This is one time component of overall response time.

Goal – (a) first responder with minimum of BLS capability = 90% in 4 minutes

(b) Transport capable vehicle = 90% in 8 minutes.

(c) ALS capability = 90% in 8 minutes

Measure 2.3

What percentage of all EMS calls achieve first responding unit travel time of 4 minutes 0 seconds or less?

What percentage of all EMS calls achieve transport unit travel time of 8 minutes 0 seconds or less?

What percentage of all EMS calls achieve ALS unit travel time of 8 minutes 0 seconds or less?

Related Information

1) What reasons were documented for longer times travel times?

2) Does your department document time from scene arrival to patient access?

Yes No

a) If Yes, what is the 90% fractile time from scene arrival to patient access?

Data Element Sources – Dispatch logs, Response Unit Station log, Computerized/Recorded Communication Archives, Call documentation reports.

Indicator 2.4**STAFFING**

Definition- The indicator includes both the number and level of training of personnel deployed on an emergency call.

KEY TERMS -

BLS – Generally limited to airway maintenance, ventilation (breathing) support, CPR, hemorrhage control, splinting of fractures, management of spinal injury, protection and transportation of the patient with accepted procedures

ALS – All basic life support measures, plus invasive medical procedures including intravenous therapy, cardiac defibrillation, administration of medications and solutions, use of ventilation devices, and other procedures by state law and performed under medical control

Paramedic – Emergency Medical Technician-Paramedic (EMT-P) - A prehospital provider trained according to the NHTSA National Standard Curriculum to advanced levels, including all ALS procedures

EMT – Emergency Medical Technician-Basic (EMT-B) - A prehospital BLS provider with approximately 110 hours of training based on the NHTSA National Standard Curriculum

Staffing pattern – a description of the number and the level of training of emergency response personnel deployed to deliver emergency medical assistance

Rationale – The level of training of personnel deployed is indicative of the quality of the services delivered and therefore the system. Anecdotally, two or more advanced personnel are considered higher quality than one.

Established Standard – NFPA 1710

Section 5.3.3.3.1 On-duty EMS units shall be staffed with the minimum numbers of personnel necessary for emergency medical care relative to the level of EMS provided by the department.

Section 5.3.3.3.2 EMS Staffing requirements shall be based on the minimum levels needed to provide patient care and member safety.

Section 5.3.3.3.2.1 Units that provide emergency medical care shall be staffed at a minimum with personnel that are trained to the first responder/AED level.

Section 5.3.3.3.2.2 Units that provide BLS transport shall be staffed and trained at the level prescribed by the state or provincial agency responsible for providing emergency medical services licensing.

Section 5.3.3.3.2.3 Units that provide ALS transport shall be staffed and trained at the level prescribed by the state or provincial agency responsible for providing emergency medical services licensing.

Section 5.3.3.4.4 Personnel deployed to ALS emergency responses shall include a minimum of two members trained at the emergency medical technician – paramedic level and two members trained at the emergency medical technician – basic level arriving on scene within the established response time.

Measure Type - Process

Measure Status - Core

Measure – the staffing pattern for ALS level responses

Goal – Compliance with state regulations for staffing ALS transport units. Compliance with NFPA 1710 standards for staffing ALS response units.

Measure 2.4

What percentage of ALS level calls receives a response including two EMTs and two paramedics within 8 minutes?

Note: The paramedics do not have to arrive on the same vehicle

What percentage of BLS level calls receives a response including two EMTs within 4 minutes?

Related Information

- 1) What is the average on-scene time for an EMS call?
Cardiac Arrest _____
Difficulty Breathing _____
Medical Call (other than Cardiac Arrest or Difficulty Breathing) _____
MVA _____
Penetrating Trauma _____
Other _____
Overall Average (All calls) _____
- 2) Does your system deploy paramedic (ALS) engine companies as first responders?
Yes No
 - a) If yes, how are the companies staffed? Each engine is typically staffed with:
Fire Fighters = ____
Fire Fighter/EMTs = ____
Fire Fighter/ Paramedics = ____
Other = _____

Total Paramedic(s) per ALS Engine =

- 3) What is the minimum number of paramedics dispatched to an ALS level call? _____
- 4) If the minimum is more than one paramedic responding to an ALS call, do paramedics arrive on the scene in the same vehicle? Yes No
- 5) How does the system staff an ALS transport unit?
Two Paramedics
One Paramedic and one EMT
One Paramedic and one EMT-Intermediate
Other (Explain) _____

Data Element Sources – Standard Operating Procedures, Departmental policy, Daily Staffing records.

Indicator 2.5

DEPLOYMENT

Definition- mobile response units staffed and equipped to respond immediately to a request for emergency medical assistance.

KEY TERMS -

Call – a documented request for emergency medical assistance in which appropriate mobile resources are dispatched

Unit – a designated EMS vehicle staffed and equipped for emergency medical response at either the ALS or BLS level

Request – any call for emergency medical assistance requiring the dispatch of mobile resources to assess and mitigate the potential emergency

Immediate- without delay

Call Queuing - Stacking of calls waiting to be processed in order of priority.

Call Screening - A process whereby requests for service are quickly assessed and referred to other providers or assigned BLS units for response

Rationale – It is imperative that public service agencies responsible for emergency response adequately deploy mobile units to travel to the incident location because early intervention in mitigation is more effective. Additionally, it is essential that those units deployed are adequately staffed and equipped to handle the situation once they arrive on the scene of the incident.

Established Standard - none

Measure Type - Structure

Measure Status - Developmental

Measure – Percentage of calls in which units are available to respond immediately. This lack of available units may be due to excessive call volume or other resource depleting situations and may cause a deviation from standard deployment procedures..

Goal – 0% of calls without resources immediately available.

Measure 2.5

Percentage of EMS calls in which an EMS unit is immediately available to be dispatched.

Related Information

- 1) What alternative deployment mechanisms are in place to compensate for inadequate resource deployment?

Mutual Aid
Automatic Aid
First responders or other resources sent
Overtime (call back)
Call stacking (queuing)
Other

- 2) What are the typical causes of complete resource depletion? (mark all that apply)

Call volume
Long transport distances
Hospital diversion
Other

Data Element Sources – Dispatch log, recorded communication archives, Dispatch administrator, call log, response time data.

Indicator 2.6**ROAD STRUCTURE COVERAGE CAPABILITY**

Definition– the capability to provide equality of response to all features of the road structure (street network) within the jurisdiction. **Note:** The interest in this indicator is the proportion of the population that can be reached, however, due to data limitations for population distribution, road structure coverage is used as a proxy.

KEY TERMS

Road structure-- the systematic arrangement of interrelated roads that compose a jurisdiction's transportation network

Jurisdiction – the department's territorial range of authority as provided by the local government

Coverage – the amount of road miles or extent to which the road structure is covered equally by the emergency response resources deployed

Geographic Information System (GIS) - a system of computer software, hardware, data, and personnel to manipulate, analyze, and present information tied to a spatial location; GIS includes: Spatial location (usually a geographic location); information (visual analysis of data); and system (linking software, hardware, data)

Equality of Response – equal or uniform response to all road structures within the jurisdiction

Rationale - This indicator is relevant to the effectiveness of resource deployment. It is dependant on the origin and the number of resources within an EMS system. Resources include staffing, apparatus, and personnel. This indicator is expected to interact with the response time and the staffing indicators.

Established Standard – none

Measure Type -- Structure

Measure Status – Developmental

Measure – this measure is intended to determine whether the department has optimized the location of fixed assets from which mobile assets are deployed. Measurement is typically via a recognized computer software model --- Geographic Information System (GIS) Analysis /ARCVIEW. ARCVIEW is industry standard software from the Environmental Systems Research Institute (ESRI). This measurement model considers road type, impedance, and travel speed in its measure. Measurement may also be conducted via the hand-tracking of addresses on a standard road map. Departments may utilize addresses from historical responses to estimate road coverage capability.

Goal – 90% jurisdiction coverage within the travel times designated in measure 2.3.

Measure 2.6

What percentage of jurisdiction road miles has projected coverage by a first due response unit within specified response time frames?

- a) First responder = 5 minutes 0 seconds (1 minute turnout time and 4 minute travel time)
- b) Transport capable unit = 9 minutes and 0 seconds (1 minute turnout time and 8 minute travel time)

Related Information

- 1) To track response capability, do you have...?
 - GIS software

- Hard Maps
- Both GIS and hard maps
- Neither (go to question 3)
- Other (explain) _____

2) How frequently do you map response capabilities?

- Annually
- Quarterly
- Monthly
- Irregularly
- Other (explain) _____

3) Are the travel times to addresses throughout the jurisdiction within the range of acceptable times in measure 2.3?

- Greater than 90% of all responses
- Between 50% - 89% of all responses
- Less than 50% of all responses

Data Element Sources – Department profile, GIS system software, digital mapping software data, street map used for plotting response zones.

Indicator 2.7**PATIENT CARE PROTOCOL COMPLIANCE**

Definition – EMS-trained personnel operated or performed according to established protocol for patient care.

KEY TERMS -

Protocol - Protocols define the total prehospital care plan for management of specific patient problems. Prehospital personnel may be authorized in advance, and in writing, to perform portions of a protocol without specific online instruction from a physician. These pre-authorized treatments within a protocol are referred to as standing orders.

Compliance – obeying, following, or operating in accordance with protocols

Documentation – the collecting, abstracting, or coding of printed or written emergency call information for future reference.

Rationale – compliance with established patient care protocols is intuitively related to the quality of the care delivered in the EMS system. The quality of care then relates to the overall quality of the system.

Established Standard – none

Relevant References

National Standard Curriculum (NSC) Paramedic – Conceptual and technical competence are the main focus areas of the paramedic NSC. The paramedic must be a confident leader who can accept the challenge and high degree of responsibility entailed in the position. The paramedic must have excellent judgment and be able to prioritize decisions and act quickly in the best interest of the patient, must be self-disciplined, able to develop patient rapport,

interview hostile patients, maintain safe distance, and recognize and utilize communication unique to diverse multicultural groups and ages within those groups. The paramedic must be able to function independently at optimum level in a non-structured environment that is constantly changing. The paramedic must have the ability to make accurate independent judgments while following oral directives.

National Standard Curriculum (NSC) EMT – The EMT-Basic curriculum is a core of minimum required information intended to prepare a medically competent EMT to operate within a prehospital emergency medical services system. Basic EMT characteristics described in the curriculum include a thorough knowledge of theoretical procedures and ability to integrate knowledge and performance into practical situations.

Guide for Preparing Medical Directors (NAEMSP & ACEP, 2001)- this program is designed to provide all physicians, regardless of specialty training, with the general knowledge base to move into the role of EMS Medical Director or other roles in medical oversight activities. To function effectively, the medical director must work closely and cooperatively with the system administrators and field personnel. By law, paramedics and EMTs function under the supervision of the physician medical director.

Measure Type - Process

Measure Status – Developmental

Note: Data for this measure is not collected in many departments; therefore, it may not be readily available in some cases. However, it is obtainable from existing records.

Measure – compliance with established patient care protocol. The data is to be collected through comparison of patient care documentation with established written (recognized) patient care protocol. This indicator is to be measured by the medical director, Quality Assurance or similarly designated/assigned officer.

Goal - 90% patient care protocol compliance

Measure 2.7

What percentage of ALS calls did the paramedic(s) follow appropriate recognized protocol?

What percentage of BLS calls did the EMT(s) follow appropriate recognized protocol?

Related Information

- 1) In what percentage of ALS calls is call documentation present?

- 2) In what percentage of BLS calls is call documentation present?

- 3) In what percentage of ALS calls is the documentation adequate?

- 4) In what percentage of BLS calls is the documentation adequate?

- 5) In what percentage of ALS calls was the right thing done based on patient chief complaint? _____
- 6) In what percentage of BLS calls was the right thing done based on patient chief complaint? _____
- 7) Are reasons for protocol deviation recorded?
Yes No (go to question 11)
- 8) Which of the following is ever mentioned as a reason for protocol deviation?
Medical direction
Patient initiated deviation (e.g. due to allergy)
Patient refusal of care
Other _____
- 9) How do paramedics receive orders for advanced patient care?
Standing orders
Online medical direction
Other

10) What are the overall success rates for clinical procedures listed below?

a) Oral endotracheal intubation

Success/Attempts Ratio = _____

b) Peripheral IV _____

Success/Attempts Ratio = _____

11) Percentage of patient encounters in which medication was called for and not given? _____

12) Percentage of patient encounters in which medication was given and not called for? _____

13) Percentage of patient care documents on which patient allergy information recorded? _____

14) What percentage of transports was diverted from the original hospital destination? _____

15) What percentage of transports followed appropriate transport destination protocols? _____

16) What percentage of non-transports was due to each of the following situations?

Patient treated and released _____

No treatment/patient did not need or want treatment _____

Patient refused treatment and transport against medical advice _____

No emergency found _____

Other (explain)

17) What percentage of EMS calls dispatched resulted in non-transport?

18) What mechanism is used to document non-transports? (mark all that apply)

Patient or responsible party signature on run report (noted as against medical advice)

Patient or responsible party signature on run report (noted as treat and release)

Online medical director approval

Other situations noted on run report _____

21) In what percentage of calls was radio communication available throughout the call with:

_____ Department Communications

_____ Medical Control

_____ Receiving Hospital

Data Element Sources – Dispatch log, recorded communication archives, call reports, patient care documentation, Quality Improvement Reports.

Indicator 2.8**PATIENT OUTCOME**

Definition- the resultant patient status following prehospital treatment and/or care relative to the patient's signs and symptoms.

KEY TERMS-

Outcome – the effects of EMS system encounter, including patient, care on the health status of the patient

Standing orders – direction or instruction for delivering patient care without online medical direction backed by the authority of the system medical director

Protocol - Protocols define the total prehospital care plan for management of specific patient problems. Prehospital personnel may be authorized in advance, and in writing, to perform portions of a protocol without specific online instruction from a physician. These pre-authorized treatments within a protocol are referred to as standing orders.

Documentation – the collecting, abstracting, or coding of printed or written emergency call information for future reference.

Rationale – Patient outcome (patient status) can be a byproduct of the overall quality and effectiveness of an EMS system and therefore should be measured as an indicator of quality within the system.

Established Standard – none

Note: The National Fire Incident Reporting System (NFIRS) EMS Module contains a data point “patient status” defined as the description of the patient's status when they were transferred to another agency for care as compared to their status when the fire department began treatment. The Categories for this data point include: improved, remained same, and worsened.

Note: The Joint Commission on Accreditation of Hospital Organizations (JCAHO) measure performance for patient encounters in the emergency department noting whether the patient was admitted, discharged home, or other notable circumstance.

Measure Type - Outcome

Measure Status- Developmental

Measure – Measure the patient’s status following EMS encounter relative to patient status upon initial contact by EMS personnel. Measure instrument may be located on patient care report or documentation form. Information reported by attending EMS professional considering patient feedback and signs and symptoms. Note, this measure excludes obvious death upon EMS scene arrival when no treatment is given.

Goal - 80% positive (Improved, no change)

Measure 2.8

In what percentage of EMS calls was documentation adequate to assess patient status at first contact and following EMS encounter?

- What percentage of patients encountered improved following care by EMS personnel?
- What percentage of patients encountered had no change following care by EMS personnel?
- What percentage of patients encountered got worse or died in EMS care?

Related Information

- 1) What percentage of cardiac arrests witnessed by EMS personnel had been resuscitated and had a pulse upon arrival at hospital? _____
- 2) What percentage of patients with each of the following improved following an encounter with EMS personnel?
 - a. Chest pain _____
 - b. Shortness of breath _____
 - c. Seizures _____
 - d. Penetrating trauma _____
 - e. Blunt trauma _____
 - f. Diabetics _____
 - g. Pain (e.g. fractures) _____

Data Element Sources –recorded communication archives, patient care run reports, quality improvement records.

Indicator 2.9

DEFIBRILLATION AVAILABILITY

Definition– defibrillator trained emergency response personnel and a defibrillator available for use within 5 minutes of call intake by unit dispatching agency.

KEY TERMS -

Defibrillation - The delivery of a very large electrical shock to the heart that stops the abnormal activity and allows the heart to restart normally on its own. Defibrillation reverses certain types of cardiac arrest and restores functional cardiac activity when applied soon after the onset of cardiac arrest.

Automatic External Defibrillator (AED) - A device that administers an electric shock through the chest wall to the heart using built-in computers to assess the patient's heart rhythm and defibrillate as needed. Audible and/or visual prompts guide the user through the process.

Manual defibrillator - A device that administers an electric shock through the chest wall to the heart requiring manual operation by a paramedic or other medical personnel trained to assess cardiac arrhythmia and determine the need for defibrillation.

Arrhythmia – any irregularity in the rhythm of the heart's beating

Shock – see defibrillation above

Front Line Vehicle – vehicle staffed and equipped to be an initial respondent in an emergency incident occurring within its response jurisdiction.

Rationale – Early defibrillation is now a “Standard of Care” for patients with cardiac arrhythmias or cardiac arrest therefore, defibrillation availability is indicative of EMS system quality.

Established Standard –

NEPA 1710

Section 5.3.2.2 – The minimal level of training for all fire fighters that respond to emergency incidents shall be to the first responder/AED level. The authority having jurisdiction shall determine if further training is required.

Section 5.3.3.4.2- The fire department’s EMS resources for providing first responder with AED shall be deployed to provide for the arrival of a first responder company with AED capability within a 4-minute response (travel) time to 90 percent of incidents as established in chapter 4.

Other relevant information:

New Guidelines for Cardiopulmonary Resuscitation and Emergency Care (JAMA, March 14, 2001 – Vol. 285, no.10) – An out-of-hospital goal of early defibrillation within 5 minutes of a telephone call is recommended.

Healthy People 2010 (Objective 12-5) – Increase the proportion of eligible persons with witnessed out-of-hospital cardiac arrest who receive their first therapeutic electrical shock within 6 minutes after collapse recognition.

Utstein Style Reporting for Cardiac Arrest- The Utstein template data fields include: estimated time of collapse, time call received in dispatch center, time vehicle stopped on scene, time EMS crew arrived at patient’s side, estimated time CPR started, and time first shock delivered.

Measure Type - Process

Measure Status - Core

Measure – Percentage of first shocks delivered within 5 minutes of collapse.

“Defibrillator” includes automated external defibrillators (AED) as well as manual defibrillators.

Note: Time of collapse is approximated by time of call intake by unit dispatch agency.

Note: Defibrillator clocks should be regularly synchronized with dispatch agency clocks.

Goal – 50% of first shocks delivered in 5 minutes 0 seconds or less.

Measure 2.9

What percentage of calls that needed defibrillation had first shock delivered within 5 minutes from the time of collapse?

Related Information

- 1) In what percentage of calls was a defibrillator needed?

- 2) In what percentage of calls needing a defibrillator was one available? _____
- 3) What was the average time for defibrillator arrival on scene?

- 4) What was the average time for defibrillator arrival at patient side? _____
- 5) What percentage of calls needing a defibrillator had one available in less than 5 minutes from the time of call intake? _____
- 6) What percentage of front line vehicles are defibrillator equipped?

- 7) What percentage of response personnel are trained to defibrillate?
 - a) AED _____
 - b) Manual _____

Data Element Sources – Dispatch log, recorded communication archives, first responder unit reports, patient care reports.

Indicator 2.10**EXTRICATION CAPABILITY**

Definition– extrication tool available for rescue of victims of illness or injury trapped or confined in an area from which they cannot readily be removed.

KEY TERMS -

Extrication tool – hydraulic spreader, hydraulic cutter, “Hurst tool,” “jaws-of-life,” or equivalent tool

Extrication – to disentangle or release from an entrapment

Front Line Vehicle – vehicle staffed and equipped to be an initial respondent in an emergency incident occurring within its response jurisdiction

Rationale – Hydraulic tools are often necessary to facilitate the extrication of victims trapped following motor vehicle crashes or other traumatic events. The availability of a tool when needed is indicative of the preparedness of the system and thus its quality.

Established Standard – none

Proxy standard (s) – NFPA 1710

Section 5.2.3.1.1 The fire department’s fire suppression resources shall be deployed to provide for the arrival of an engine company within a 4-minute response time (travel time) and/or the initial full alarm assignment within an 8-minute response time (travel time) to 90% of the incidents as established in chapter 4.

Section 5.2.3.2.2 The initial full alarm assignment shall provide for the following:

(8) establishment of an initial rapid intervention crew that shall consist of a minimum of two properly equipped and trained personnel.

Section 5.4.1 – Special Operations shall be organized to ensure the fire departments special operations capability includes personnel, equipment, and resources to deploy the initial arriving company and additional alarm assignments providing such services. The

fire departments shall be permitted to use established automatic mutual aid or mutual aid agreements to comply with the requirements of Section 5.4

Measure Type - Structure

Measure Status – Developmental

Measure – Percentage of calls requiring an extrication tool having one delivered to the scene within 8 minutes of call dispatch.

Goal – delivery of an extrication tool to the scene of 90% of calls requiring the device in 8 minutes 0 seconds or less.

Measure 2.10

What percentage of calls that needed a hydraulic extrication tool for extrication of an ill or injured person had a tool available on scene within 8 minutes of initial responding unit notification?

Related Information

- 1) In what percentage of calls was a hydraulic tool needed?

- 2) What was the average time frame for hydraulic tool arrival?

- 3) What percentage of front line vehicles are equipped with a hydraulic extrication tool?

- 4) What percentage of response personnel are trained and supplied with protective equipment to use a hydraulic extrication tool?

- 5) How is the need for an extrication tool determined?
 Caller
 Dispatch information
 On scene responders
 Other _____

Data Element Sources – Dispatch log, recorded communication archives, rescue unit reports, patient care reports.

Indicator 2.11**EMPLOYEE ILLNESS AND INJURY**

Definition- employees becoming ill or injured as a result of participating in an EMS encounter including employee exposures requiring evaluation or medical follow-up (i.e., needle sticks, blood or body fluid exposure to broken skin or mucous membranes, infectious aerosol exposures in unmasked personnel, and inhaled or dermal hazardous material exposure requiring medical evaluation).

KEY TERMS -

Illness - not healthy, normal, or well; being sick or having a disease

Injury - physical harm or damage to a person

Airborne Infectious Agents - Microbial aerosols produced by coughing, sneezing or talking that can enter a suitable portal of entry, usually the respiratory tract, and cause disease. Airborne infectious agents include, but are not limited to, Mycobacterium tuberculosis and meningococcal meningitis.

Blood Borne Pathogens - Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV).

Contaminated - The presence or the reasonably anticipated presence of blood, body fluid or other potentially infectious materials on an item or surface.

Fire/EMS Reportable Exposure - A direct introduction of a potentially infectious agent from a patient into the Fire/EMS worker's body. These exposures include:

- Percutaneous - A percutaneous event occurs when blood or body fluid is introduced through the skin. Examples: needle stick with a bloody needle; sustaining a cut by a sharp object contaminated with blood; entrance of blood or body fluids through an open wound, abrasion, broken cuticle, or chapped skin.

- Mucocutaneous - A mucocutaneous event occurs when blood or body fluids come in contact with the mucous membranes of the eye, mouth, or nose.
Example: blood or body fluid is splashed or sprayed into the eye, nose, or mouth.
- Airborne - An airborne exposure means direct contact with an individual with suspected or confirmed airborne disease or air that may contain aerosolized airborne disease.

Exposure - Contact with infectious agents, such as body fluids, through inhalation, percutaneous inoculation, or contact with an open wound, non-intact skin, or mucous membrane or other potentially infectious materials that may result from the performance of an employee's duties.

Hospital Reportable Exposure - (unsuspected exposure): A hospital reportable or unsuspected exposure occurs if Fire/EMS employees treat or transport a patient who is later diagnosed as having a serious communicable disease that could have been transmitted by the respiratory route. Hospital reportable diseases include tuberculosis and meningococcal meningitis.

Not Reportable Blood Borne Exposures:

- Blood on intact skin
- Blood on clothing or equipment
- Being present in the same room as an infected person
- Touching an infected person
- Talking to an infected person

Potentially Infectious Material - The following human body fluids: semen, vaginal secretions, cerebrospinal fluids, synovial, pleural fluids, pericardial fluids, peritoneal fluids, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids.

Regulated Waste - Liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing materials during handling;

contaminated sharps; and, pathological and microbiological waste containing blood or other potentially infectious materials.

OJI – “on-the-job-injury” -- Injury or illness during or due to work activity

Call – a summons for emergency medical assistance in which equipment and personnel are deployed to mitigate the incident.

Rationale – Engineering and procedural precautions against such employee exposures are required by federal regulation. The health and safety of employees is fundamental to the quality of an EMS system. Rescuers who become ill or injured can not rescue or care for a member of the public.

Established Standard –

29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response) – This statute covers clean-up operations involving hazardous substances and emergency response operations for threats or releases of hazardous substances, unless the employer can demonstrate that the operation does not involve employee exposure or the reasonable possibility for employee exposure to safety or health hazards.

29 CFR 1910.1030 (Bloodborne Pathogens)- This statute applies to all occupational exposure to blood or other potentially infectious materials defined as pathogenic microorganisms that are present in the human blood and can cause disease in humans. These pathogens include but are not limited to, hepatitis B virus, and human immunodeficiency virus. The final rule states, “Where there is an occupational exposure, the employer shall provide at no cost to the employee, ‘appropriate’ personal protective equipment, such as, but not limited to, gloves, gowns, laboratory coats, face shields or masks, eye protection, mouthpieces, resuscitation bags, pocket masks, or other ventilation devices. ‘Appropriate’ means it does not permit blood or other potential infectious materials to pass through to or reach the employee’s work clothes, street clothes,

undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used.”

NFPA 1561 (Standard on Emergency Services Incident Management System)- This standard is intended to provide structure and coordination of the management of emergency incident operations, in order to provide for the safety and health of emergency services organization personnel and other persons involved in those activities.

NFPA 1581 (Standard on Fire Department Infection Control Program) – This standard contains minimum requirements for a fire department infection control program. The purpose of the standard is to provide minimum criteria for infection control in the fire station, in the fire apparatus, during procedures at an incident scene, and at any other area where fire department members are involved in routine or emergency operations.

NFPA 1999 (Standard on Protective Clothing for Emergency Medical Operations) – This standard specifies the minimum documentation, design criteria, performance criteria, and test methods for new single-use and new multiple-use emergency medical protective clothing, including gloves and face protection devices, designed to provide a minimum level of protection to emergency medical services personnel from contact with liquid-borne pathogens during emergency medical operations.

Ryan White Law - This law (P.L. 101-381) requires notification of emergency response personnel who have documented exposure to infectious diseases while attending, treating, assisting, or transporting a victim.

Measure Type - Outcome

Measure Status - Core

Measure – percentage of employees acquiring an illness or injury as a result of participating in an EMS call.

Goal – 0% of employees becoming ill or injured as a result of their participation in an EMS call.

Measure 2.11

What percentage of EMS calls resulted in reported employee injury, illness, or exposure?

Related Information

- 1) Percentage of employees who are off duty as a result of a line-of-duty illness or injury? _____
- 2) What is the average number of duty days lost as a result of a single line-of-duty illness or injury? _____
- 3) What health and safety equipment is provided and available on scene to employees?

Protective Clothing (bunker gear, turnout gear, etc.)
Work gloves
Latex gloves
Face splash-guards
Respirator Masks
Goggles
Gowns
Heavy boots or work shoes
Other

- 4) What health and safety related operating procedures are in place?

Procedures for Universal blood-borne precautions
Procedures for lifting and moving patients
Procedures for dealing with violent patients (or family members)
Other

Data Element Sources – Department employee records, daily supervisor logs, exposure reports, line of duty injury reports.

Indicator 2.12**EMPLOYEE TURNOVER**

Definition- rate of employees leaving employment with the department for any reason, thus no longer participating in the EMS system.

KEY TERMS -

OJI – “on-the-job-injury” -- Injury or illness during or due to work activity

Sick Time: earned benefit commonly addressed within the collective bargaining agreement or departmental personnel policy. Typically, sick leave accrual, maximum accumulation, conditions of sick leave and cash-out of unused sick leave at resignation or retirement are addressed.

Education Incentive: provides an employee additional compensation for improved skill and expertise gained through education. Education incentive is typically received for successful completion of established credit hours and/or degrees offered in fire science and related fields.

Tuition Reimbursement: ensure that the employer reimburses costs associated with the employee’s education process. Employees are reimbursed for any costs incurred for books, fees and tuition upon successful completion of courses related to the fire service and for all courses necessary to complete degrees in fire service areas.

Grievance: method of dealing with a complaint made by an individual or by union or management, which allows the workplace to continue operating without interruption. The procedure generally provides for efforts to resolve the grievances at progressively higher levels of management authority, with arbitration typically being the last step.

Shift: normal workday for fire suppression/EMS personnel. Typically, either a 24-hour shift or a 10-hour day/14 hour night shift.

Platoon: fire suppression/EMS coverage must be provided round-the-clock 365 days a year, so fire suppression/EMS personnel are divided into equal groups or platoons. Typically, there are 3 platoons necessary for round-the-clock coverage on a 56-hour workweek and 4 platoons for round-the-clock coverage on a 42-hour workweek.

Rationale – employee experience, morale, and employee satisfaction contribute to employee performance. Employee performance, in turn, contributes to the overall quality of the EMS system.

Established Standard – none

Measure Type - Structure

Measure Status - Developmental

Measure – percentage turnover of EMS-trained employees per year

Goal – less than 5% employee turnover (per time period measured, e.g. per year)

Measure 2.12

What is the annual turnover rate for EMT trained personnel in the department?

What is the annual turnover rate for Paramedic personnel in the department?

Related Information

- 1) Percentage of scheduled work shifts per calendar month used as employee sick time? _____

- 2) Number of patient-care related service complaints received per month?

3) Number of employee grievances filed per month? _____

4) What employee incentives are available within the department?

Education incentive

Tuition reimbursement

EMS related incentives

Other _____

5) What is the employee work schedule?

a. Number of hours worked per week (7 day period) _____

b. Number of platoons/ shifts deployed _____

c. Number of hours worked per shift (tour of duty) _____

6) What are the reasons for employee turnover? What percentage leave due to...

Employment in another department _____

Retirement _____

Termination _____

Spouse transfer _____

Better paying job _____

Better benefits elsewhere _____

Other _____

Data Element Sources – Department employee records, daily supervisor logs.

Indicator 2.13**QUALITY PROGRAM**

Definition- The department operates a complete quality program that includes total quality management, continuous quality improvement, and quality assessment. The programs also include direct field observation by a designated medical quality officer or medical director. **Note:** the observer should be of equal or higher level of training.

KEY TERMS -

Total Quality Management (TQM) – Management system fostering continuously improving performance at every level of function focusing on customer satisfaction.

Assumes that most problems result from the inability of the system to perform rather than individual.

TQM in an EMS System requires three elements.

- 1) absolute commitment from top leaders
- 2) identification of measurable and accurate indicators of quality
- 3) involvement of workers in all quality improvement efforts

Continuous Quality Improvement (CQI) – The sum of all activities undertaken to examine and improve the products and services continuously, including using system performance measures to compare the system to itself over time.

Quality Assessment (QA) – the performance measurement of structure, processes, and outcomes within the EMS system and their comparison against a standard.

Quality – the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.

Medical direction – The authorization for treatment by medical directors in local, regional, or state EMS systems. Direction is provided on-line by direct communications or telecommunications or off-line by standing orders and established protocols.

Field observation – the act or practice of noting or recording facts and events of an EMS call.

Medical quality officer – non-physician EMS trained officer responsible for system quality.

Actively involved medical director – medical director who is involved in protocol development, field observation, training, reviewing call reports, and reviewing patient care cases.

Rationale – An established “quality” program is an indicator of the system’s attention to quality. Though quality programs likely differ from department to department, an established program indicates the administration’s effort toward establishing and maintaining quality within the EMS system.

Established Standard – NFPA 1710

Section 5.3.3.1 The five basic functions within a career fire department EMS system shall be as follows: ... (5) Assurance of response and medical care through a quality management program.

Section 5.3.4.1.1 The fire department shall institute a quality management program to ensure that the service has appropriate response times as required in 4.1.2.1.1 for all medical responses.

Section 5.3.4.2 All first responder and BLS medical care provided by the fire department shall be reviewed by the fire department medical personnel. This review process shall be documented.

Section 5.3.4.3 All fire departments with ALS services shall have a named medical director with the responsibility to oversee and ensure quality medical care in accordance with state or provincial laws or regulations. This review process shall be documented.

Measure Type - Structure (Nominal)

Measure Status - Core

Measure - does an overall quality program, as described above, exist within the EMS system?

Goal – System evaluation program in place with a focus on quality.

Measure 2.13

Does the department have a TQM program?

Yes No

Does the department have a CQI program in place?

Yes No

Does the department have a quality assessment (QA) program in place?

Yes No

Does the department utilize direct field observation by a designated medical quality officer or medical director as part of the overall quality program?

Yes No

Related Information

- 1) Does the EMS system have a Physician Medical director actively involved in medical oversight? YES NO
- 2) How many hours of field observation are performed per month? _____
- 3) How many hours per ALS employee? _____
- 4) Who does field observation?
Medical director
EMS supervisor
Quality officer
Other _____

Data Element Sources – quality program reports,

Indicator 2.14**SYSTEM USER OPINION**

Definition- Quality of the system as described by the user.

KEY TERMS -

System User – anyone having an encounter with the EMS system

Public – a community at large

Rationale – The opinion of an EMS system user, whether it be the actual patient treated, a family member, friend, or bystander is an indicator of both the actual and the perceived quality of the system. Though system users will not likely recognize true indicators of quality, they nonetheless judge the attributes they perceive as important. This perception contributes to a system administrator's ability to see beyond the perceived to the actual component having quality or lack thereof, allowing preservation or improvement of that attribute.

Established Standard – none

Measure Type - Outcome

Measure Status – Developmental - Data is available from few departments for this measure since most do not collect data on user opinion other than documenting complaints. Departments may correlate public opinion survey data for this indicator recognizing that the greater public's opinion will include users of the system.

Measure - mail/phone survey to assess the satisfaction of system users with the system's performance.

Goal - 90% or greater satisfaction

Measure 2.14

Percentage of users satisfied with the system?

Related Information

1) Average number of complaints received per month _____

2) Does the department conduct an opinion survey including questions regarding the EMS system?

Public Opinion

User Opinion

Other _____

No survey conducted

Data Element Sources – user survey

For Your Information (FYI)

Typical Questions asked in a survey of system users include the following.

1) Were the services provided in a friendly, courteous, and professional manner?

Yes No

2) On a scale of 1 to 5, with 1 being the best, how would you rate the service provided to you?

Please Circle - 1 2 3 4 5

3) What could have been done to improve the services provided to you?

Indicator 2.15**MULTI CASUALTY EVENT RESPONSE PLAN**

Definition- The existence and practice of a detailed plan for system response to known multiple casualty events.

KEY TERMS -

Multiple casualty- manifold or complex incidents resulting in the injury or death of more than one individual

Incident Command System (ICS)- The common approach to organization of facilities, equipment, personnel, procedures, and communications at a fire department response. The Incident Commander has responsibility for the management of assigned resources to accomplish stated objectives pertaining to an incident.

Mutual Aid – A written policy or contract to allow for the deployment of personnel and equipment to respond to an alarm in another jurisdiction as dispatched by a communication center. The reciprocal assistance of emergency response service agencies in neighboring jurisdictions under a prearranged plan.

Automatic Aid - The predetermined response of personnel and equipment for an alarm to a neighboring jurisdiction. A plan developed between two or more fire departments for immediate joint response on a first alarm. This process is accomplished through simultaneous dispatch, documented in writing, and included as part of a communication center's dispatch protocols.

Rationale – A system's ability to respond to disasters involving multiple patients is an indicator of the preparedness and the overall quality of the system. In order to assure the

safety and well being of the citizens dependant on the system, it is imperative that a detailed plan for disaster response be developed and practiced.

Established Standard –

NEPA 1561- Section 2.1.3 - The emergency services organization shall prepare and adopt written plans, based on the incident management system, to address the requirements of the different types of incidents that can be anticipated. These plans shall address both routine and unusual incidents and shall provide standardized procedures and supervisory assignments that can be applied to the needs of situations of differing types, sizes, and complexities.

Measure Type – Structure/Process

Measure Status – Core

Measure – An established plan to mitigate a multiple casualty disaster while maintaining sufficient resources to respond to the normal volume of emergency calls within the jurisdiction.

Goal – Plan in place and practiced at least biannually.

Measure 2.15

Does the department have a multiple casualty response plan in place?

Related Information

- 1) How often does the department conduct training drills on the plan?

- 2) What agencies are included in multi-casualty response training?
 - Emergency management agency
 - Police
 - Hospitals

Private ambulance companies
Military
Public health departments
FEMA/USAR
Other _____

- 3) What resources does system consider using resources in addition to the normal deployment for response to multi casualty events?

Mutual Aid
Automatic Aid
Call back Overtime
Other

Data Element Sources – Disaster plan, multiple casualty plan.