



Thomas Jefferson EMS Council

EMS & Trauma Performance Improvement Plan

FYE 2009

TJEMS EMS & Trauma Performance Improvement Plan

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INTRODUCTION

Performance improvement is the concept of organizational change in which the principal officials of an organization put into place and manage a program that measures the current level of performance of the organization, and then generates ideas for modifying organizational behavior and infrastructure to achieve a superior level of output. The primary goals of performance improvement are to improve organizational effectiveness and organizational efficiency in order to improve the ability of the organization to deliver its goods and/or services and prosper in the context in which the organization operates.

PURPOSE

The purpose of this plan is to provide for the development and implementation of EMS & Trauma Performance Improvement (PI) activities at the local EMS agency and regional levels. This dynamic program will develop over time based on available resources.

BACKGROUND

Locality “decision-makers” and citizens need objective evidence that they are receiving value and quality for the cost of EMS. EMS system participants require objective feedback about performance that can be used internally to support quality improvement efforts and externally to demonstrate accountability to locality governing boards and other stakeholders. The primary goal of the EMS & Trauma Performance Improvement Plan (PIP) shall be to ensure continued high quality patient care.

PERFORMANCE IMPROVEMENT PLAN

The EMS & Trauma Performance Improvement Plan is designed to assist EMS professionals in the development and implementation of PI activities by addressing the following components:

- Organizational structure
- Data collection and reporting
- Evaluation of EMS system indicators
- Methods for improvement
- Training and education

SECTION I

STRUCTURE

Organizational Structure

The EMS system organizational structure is defined by code and regulation. There are several complementary components:

- Virginia Department of Health Office of Emergency Medical Services (OEMS)
- Regional EMS Councils
- Medical Care Facilities
- EMS Agencies

These organizations have established an effective system capable of providing patient care in the prehospital setting through the implementation and management of various programs, including strategic planning, patient care protocols, trauma triage, basic and advanced EMS provider education and others. While each has defined roles and responsibilities in achieving its organizational goals, there is also a shared responsibility with all others in achieving EMS system goals.

These organizational levels are described as follows:

A. Virginia Department of Health

Responsible Agency **Office of EMS**

Responsibilities

Code of Virginia Title 32.1-111

“...develop a comprehensive, coordinated, emergency medical care system in the Commonwealth...”

B. Regional EMS Council

Responsible Agency Thomas Jefferson EMS Council, Inc.

The Thomas Jefferson EMS Council, Inc. (TJEMS) is an integral part of the EMS system whose function (in cooperation with local EMS agencies, localities and other stakeholders) is to assess, identify, coordinate, plan and implement an efficient and effective regional EMS delivery system in partnership with the Virginia Office of EMS and the Governor’s EMS Advisory Board.

Structure of the Performance Improvement Organization

The TJEMS EMS & Trauma PI Committee will be a standing committee recognized by the Board of Directors and coordinated by the TJEMS staff. The committee will include individuals that have education and experience in evaluation of EMS system data and an interest in EMS and Trauma Performance Improvement.

Membership on the TJEMS EMS PI Committee may be solicited from, but not limited to, the following:

- Regional Medical Director
- TJEMS Representative
- EMS Agency Operational Medical Director(s)
- EMS Agency PI Coordinator(s)
- EMS Educator(s)
- Martha Jefferson Hospital Representative(s)
- University of Virginia Medical Center Representative(s)
- Representative(s) from local medical care facilities emergency department physicians
- Representatives from Basic Life Support (BLS) and Advanced Life Support (ALS) certified personnel functioning within the TJEMS region
- Public representative(s)

Until such a time as the TJEMS EMS & Trauma PI Committee is selected, the TJEMS Medical Direction Committee will serve as the regional PI committee.

The TJEMS EMS & Trauma PI Committee will seek and maintain relationships with all EMS participants including but not limited to:

- OEMS
- Other Regional EMS Councils
- EMS Agencies
- Thomas Jefferson Health District
- Specialty Care Center(s)
- Law Enforcement
- PSAPs/Emergency Communication Centers
- Constituent Groups

Responsibilities

The TJEMS EMS & Trauma PI Committee should be the central repository of regional EMS system information as it relates to PI activities. The committee should perform the following functions:

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- Cooperate with the OEMS in carrying out the responsibilities of statewide performance improvement activities
- Identify and develop TJEMS specific PI indicators/templates utilizing a standardized format for system evaluation
- Maintain responsibility for monitoring, collecting data on, and evaluating locally identified PI indicators/templates
- Re-evaluate, expand upon, and improve EMS system indicators/templates and locally developed indicators/templates annually or as needed
- Facilitate meetings and presentations on TJEMS PI indicators/templates and the development of performance improvement plans for EMS agencies
- Establish a mechanism to incorporate PI-related input from EMS system advisory groups
- Assure reasonable availability of PI training/education for EMS personnel
- Provide input for improving the TJEMS PIP
- Provide technical assistance for facilitating the PI activities of all organizations participating in the TJEMS PIP

The TJEMS EMS & Trauma PI Committee will meet quarterly, or more frequently as needed, and will conduct these meetings according to standard parliamentary procedures.

Reports

The TJEMS EMS & Trauma PI Committee will periodically publish a summary of activity and plan implementation for distribution to EMS system participants.

C. Medical Care Facilities

Responsible Agencies

Martha Jefferson Hospital

University of Virginia Medical Center

Responsibilities

12 VAC 5-410-280.

“...have 24-hour staff coverage and shall have at least one physician on call at all times...no less than one registered nurse shall be assigned to the emergency service on each shift...shall provide equipment, drugs, supplies, and ancillary services commensurate with the scope of anticipated needs, including radiology and laboratory services and facilities for handling and administering of blood and blood products...emergency drugs and equipment shall remain accessible in the emergency department at all times...”

- Cooperate with TJEMS in carrying out the responsibilities of the TJEMS EMS & Trauma PI Committee

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- Cooperate with the TJEMS EMS & Trauma PI Committee in monitoring, collecting data on, and evaluating local/regional EMS system indicators
- Cooperate with the TJEMS EMS & Trauma PI Committee in the re-evaluation and improvement of local EMS system indicators

Additional responsibilities for the University of Virginia Medical Center:

Provide medical control of prehospital emergency medical care for the TJEMS area defined by existing patient flow patterns and in accordance with policies and procedures established by TJEMS.

D. Emergency Medical Service Agency

Responsible Agencies

All EMS Agencies located in the TJEMS region

Recommend Structure of the Performance Improvement Organization

Membership on the EMS Agency EMS & Trauma PI Committee may be solicited from, but not limited to, the following:

- Operational Medical Director or designee
- Chief Operations Officer or designee
- PI Coordinator, if designated
- EMS Providers
- Other system participants

Responsibilities

12 VAC 5-31-600.

“An EMS agency shall have an ongoing Quality Management (QM) Program designed to objectively, systematically and continuously monitor, assess and improve the quality and appropriateness of patient care provided by the agency. The QM Program shall be integrated and include activities related to patient care, communications, and all aspects of transport operations and equipment maintenance pertinent to the agency’s mission. The agency shall maintain a QM report that documents quarterly PPCR reviews, supervised by the operational medical director.”

The EMS Agency EMS & Trauma PI Committee will perform the following functions:

- Cooperate with the TJEMS EMS & Trauma PI Committee in carrying out the PI activities identified in the TJEMS PIP
- Cooperate with the TJEMS EMS & Trauma PI Committee in monitoring, collecting data on, and evaluating local/regional EMS system indicators

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- Cooperate in the re-evaluation and improvement of local EMS system Indicators/templates
- Develop, monitor, collect data on, and evaluate indicators specific to the EMS Agency, as needed, utilizing a standardized format
- Establish a mechanism to receive input from the TJEMS EMS & Trauma PI Committee, other EMS Agencies and other EMS system participants
- Participate in meetings and presentations of local EMS system information for peer review to local emergency service advisory groups and other authorized constituents

Reports

The EMS Agency EMS & Trauma PI Committee will periodically publish a summary of activity and plan implementation for distribution to EMS system participants.

SECTION II

DATA COLLECTION & REPORTING

Purpose

To improve the EMS system, information must first be collected, reported, and evaluated. The following are guidelines for data collection and reporting of EMS information.

A. Data Collection

Aspects of care that are identified as important should be monitored despite the possible complexity of necessary data or challenges associated with the data collection. All reliable sources of information should be utilized in the evaluation of system performance. EMS organizations should also consider the use of hard copy review (i.e., PPCR), collection check-sheets, customer surveys, direct observation, and skills simulation.

B. Approach to Data System Development

Data collection systems should be designed to answer EMS system performance questions. It is strongly recommended that EMS organizations establish a practical consensus and clear understanding with all users regarding the purpose for collecting and processing the data. This step is vital to assure validity and reliability. The following activities are recommended prior to data collection systems development:

1. Identify the specific mission and purpose of the organization
2. Identify the most important services that support the mission and purpose
3. Identify the resources, activities, and results that comprise the services

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4. Identify what information must be reported to others
5. Identify specific questions (regarding the structures, activities, and outcomes within the organization), which need to be answered in order to better understand the success of the mission and purpose
6. Define how each question will be answered
7. Use the answers as the basis for developing indicators
8. Develop a quality indicator
9. Use the indicators as the basis for identifying what data is needed
10. Develop your plan for data collection based upon the elements identified
11. Recognize that an effective PI program is dynamic and therefore constantly changing, and incorporate this need for change into your data collection efforts. The National EMS Information System (NEMSIS) data set (with associated definitions) should be utilized to allow for data collection consistent from region-to-region and from state-to-state. Additional data elements may be collected at a local level to focus on local and/or regional issues and concerns.

Validity and Reliability

Validity - The data have validity if there is sufficient evidence to warrant the collection and use of the information for measuring the performance of the EMS system. The information is valid if it is:

- Representative of important aspects of service performance
- Determined to be important for successful service performance
- Predictive of or significantly correlated with important elements of performance

Reliability – The data have reliability if the collection and interpretation methods can be trusted to be consistent and predictable. If the data collection is always performed in the same way, using the same data collection tools and interpreted with the same definitions, the information is likely to be reliable. Standardized definitions or agreement by the users regarding what the data will indicate and how they will be collected is critical to the success of the overall program.

C. Organizational Reporting

Data collection, reporting, and analysis shall occur at the local EMS Agency and regional levels. Each level shall submit information to their respective PI committee. Data collection and reporting should be done in the form of summary reports and may be based upon EMS system indicators/templates as adopted by the TJEMS EMS & Trauma PI Committee or individual EMS Agency EMS & Trauma PI Committee. EMS information should be consistent in how it is organized, analyzed, presented and evaluated.

SECTION III

EVALUATION OF EMS SYSTEM INDICATORS

Organization of Information

EMS organizations may develop indicators that address, but are not limited to, the following:

- (1) Personnel
- (2) Equipment and Supplies
- (3) Documentation
- (4) Clinical Care and Patient Outcome
- (5) Skills Maintenance/Competency
- (6) Transportation/Facilities
- (7) Public Education and Prevention
- (8) Risk Management

The recommended approach to organizing data and other sources of information is through the development and use of standardized indicators.

Indicators Defined

According to the Joint Commission on Accreditation of Healthcare Organizations, an indicator is "a quantitative performance measure...a tool that can be used to monitor performance and direct attention to potential performance issues that may require more intensive review within an organization." In other words, an EMS indicator measures the degree of conformance to a reasonable expectation as defined by the community served. Indicators may be related to structures (people, places, things), processes (activities occurring in a system), and outcomes (the results of the structures and activities within a system). In fact, the three types of indicators (structure, process, and outcome) are all related and dependent upon one another. Hence the following equation:

$$\text{STRUCTURE} + \text{PROCESS} = \text{OUTCOME}$$

Changes in structure may affect the process and the outcome. Likewise, changes in the process may affect the structure and outcome. Indicators, in short, are a way to simplify information so that data can be assimilated more efficiently and in a meaningful way.

EMS System Indicators

EMS System indicators will be developed and designed on an as-needed basis and may be used for the long or short term or on an ad hoc basis depending on the goals of the local EMS Agency EMS & Trauma PI Committee or the TJEMS EMS & Trauma PI Committee. All EMS organizations are encouraged to develop

their own indicators based upon their specific needs. Ad hoc indicators are not reported outside of the specific user group and level of organization. In order to assist EMS organizations with developing indicators, instructions on standardized indicator development can be found in *Appendix 1*.

Analysis

Prior to presenting or distributing indicators, it is recommended that the results be analyzed to include measurements appropriate for rapid interpretation by evaluators. Measurements may include the following:

- Statistical

 - Measures of Central Tendency
 - Measures of Dispersion

- Process Analysis

 - Trending
 - Causation
 - Benchmarking
 - Best Practices
 - Published References

These measurements are defined and further illustrated in *Appendix 3*.

Presentation

The results and measurements of indicators should be presented to the users of the information in a formal process and on a regularly scheduled basis. Each presentation should include the purpose, objectives, references, benchmarks, measurements for clarification of data. The indicator information should be displayed to evaluators in a format that is most appropriate for the speed and ease of interpretation. The following are typical ways to display an indicator result:

- Flow Chart
- Fishbone – Cause and Effect Diagram
- Pareto Chart
- Histogram
- Scatter Diagram
- Run Chart
- Control Chart

Examples, definitions, and application of these display methods are available in a variety of Performance Improvement texts and from various Performance Improvement websites.

Decision-Making Process

Each organizational level should have a structured process for making decisions. The following is a general outline of the steps in a structured process for evaluation and decision-making by a PI committee:

1. Identify the objectives of evaluation
2. Present indicators and related EMS information
3. Compare performance with goals or benchmarks
4. Discuss performance with peers/colleagues
5. Determine whether improvement or further evaluation is required
6. Establish action plan based upon decision
7. Assign responsibility for post-decision action plan

FYE2009 EMS & Trauma PI Indicators

EMS & Trauma PI Indicators for use during FYE2009 may be found in Annex A of this document. Use of these indicators does not preclude the use of any other indicators by the TJEMS EMS & Trauma PI Committee or any EMS Agency EMS & Trauma PI Committee.

SECTION IV

ACTION TO IMPROVE

Approach to Performance Improvement

Once valid information has been presented and reliability evaluated, the decision to take action or to solve a problem requires a structured approach that is adaptable and applied to each situation as it is identified. Many standardized and well-developed quality/performance improvement programs may be used during this phase. In all cases, each PI committee, whether local or regional, should choose an improvement method that is systematic and based upon evidence. The approach to improvement should also be team oriented and be done in a way that does not overwhelm the process due to size and complexity. It is recommended that initial improvement projects be simple and based upon a strong consensus within the PI committee that improvement will benefit all. It also may be advantageous for the PI committee to utilize smaller groups within the organizational level to carryout improvement action plans.

Performance Improvement Activities

While there are many approaches to performance improvement, it is recommended that each organization choose a standardized approach and use

the same process each time a project is undertaken. The following are traditional components of a standardized improvement process:

- Establish criteria for measurement and evaluation
- Evaluate information
- Make a decision to take action to improve
- Establish criteria for improvement
- Establish an improvement action plan
- Measure the results of the improvement action plan
- Standardize or integrate change into the system
- Establish a plan for monitoring future activities

Attached in *Appendix 2* are examples of performance improvement models.

SECTION V

TRAINING AND EDUCATION

Introduction

Effectiveness of the PI committee and related training is directly proportional to the energy and resources committed. Organizational leadership should be available and directly involved in the process. When clinical issues are addressed, medical oversight is required.

Action to improve process is intertwined with training and education

Once the decision to take action or to solve a problem has occurred, training, and education are critical components that need to be addressed. As PI activities are developed, the PI committee should establish criteria for measurement and evaluation. Based on these criteria, delivery methods and content of training should be identified. Success of PI activities is dependent upon changing the behavior and knowledge of the individuals who deliver care to patients or services to other participants in the EMS system. To implement change, you must deliver verifiable, ongoing training that is appropriate to the skill level and service goals of the organization.

Medical direction

The local or regional PI committee should place the oversight for directing clinical training and education at the highest level of medical knowledge.

Measure the results of the Performance Improvement Activities

Once the PI activities have been implemented, the measurement of a successful outcome will be dependent upon the validity of the improvement action plan and the effectiveness of the training and education. If the outcome is not satisfactory,

it is necessary to examine both the content of the action plan and delivery method of related training and education.

Integrate change

After successful implementation of the improvement action plan, the organization needs to standardize the changes within appropriate policies and procedures and schedule continuing education at appropriate reoccurring intervals. The final step is to re-evaluate the original EMS system indicators.

Suggested Reporting Format

Statement of PI committee goals and objectives

- Describe processes used in conducting quality improvement activities.
- Were goals and objectives met?

List and define indicators utilized during the reporting period

- Define indicators
- Identify issues for further system consideration
- Identify trending issues
- Create improvement action plans (what was done and what needs to be done)
- Describe issues that were resolved
- List opportunities for improvement and plans for next review period
- Describe continuing education and skill training provided as a result of PI activities
- Describe any revision of organizational policies
- Report to constituent groups

ALTERNATIVE ENTRY INTO PERFORMANCE IMPROVEMENT PROCESS

It is recognized that there may be occasions where it is desirable and appropriate to enter the PI process in a non-standard fashion due to a significant event or outcome. To this end, any EMS system stakeholder may enter patient care or EMS system concerns into the PI process by completing the TJEMS EMS & Trauma Systems Performance Improvement Referral Form and forwarding it to TJEMS. The TJEMS EMS & Trauma PI Committee will determine if the issue is an EMS Agency concern or a multi-agency or multi-jurisdictional concern. If the concern is an EMS Agency concern, the form will be forwarded to the Operational Medical Director for that EMS Agency. If the issue is a multi-agency or multi-jurisdictional concern, the TJEMS EMS & Trauma PI Committee may choose to review it.

Multi-agency/Multi-jurisdictional Reviews

The EMS system participants involved in the review will be notified and a copy of the form will be forwarded to the appropriate representative within 96 hours of receipt by TJEMS. It shall be the responsibility of the appropriate EMS system participant to notify any involved personnel of the initiation of the review process.

The review process may include, but is not limited to:

- A review of pertinent medical records including the PPCR, PSAP communication records and/or patient outcome data
- A formal interview with involved personnel

The TJEMS EMS & Trauma PI Committee will provide the results of the review and recommendations and/or constructive feedback to resolve the issue.

Recommendations may include:

- Changes to policy or protocols.
- Operational changes or equipment changes.
- System-wide retraining, counseling, knowledge and skills evaluation/refresher, and/or clinical monitoring.
- Accommodations for individuals involved.

All recommendations will be forwarded to the appropriate EMS system participants' representatives and Operational Medical Director, if an EMS agency.

ANNEX A

FYE2009 TJEMS Performance Improvement Plan Indicators

FYE2009-1

Patient Care

Adult – Pulmonary Emergencies: Respiratory Distress
• Oxygen: Frequency of Administration

EMS System

Availability in-house of OEMS approved CE **other than** that provided by TJEMS & UVA Prehospital Program

Trauma

In critically injured patients – frequency of assisted ventilations

FYE2009-2

Patient Care

Adult – Pulmonary Emergencies: Respiratory Distress
• Albuterol nebulizer: Frequency of Administration

EMS System

Percentage of active EMS providers who attend Virginia EMS Symposium

Trauma

In critically injured trauma patients – frequency of advanced airway adjuncts

FYE2009-3

Patient Care

Adult – Pulmonary Emergencies: Respiratory Distress
• CPAP: Frequency of Administration

EMS System

Percentage of active EMS providers who attend CE provided by TJEMS & UVA Prehospital Program

Trauma

Frequency of use of continuous direct pressure or a tourniquet to control bleeding

FY2009-4

Patient Care

Adult – Pulmonary Emergencies: Respiratory Distress

- Decrease/Relief of Symptoms

EMS System

Percentage of active EMS providers who attend regional CE provided by organizations other than TJEMS & UVA Prehospital Program

Trauma

Percentage of critically injured patients who are pregnant

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FY2009-1: Patient Care

Protocol	Adult – Pulmonary Emergencies: Respiratory Distress
Measure	Oxygen: Frequency of Administration
Objective	To measure % of patients suffering from respiratory distress related to a pulmonary emergency that receive oxygen in pre-hospital setting
Type of Measure	Process
Indicator Reporting Value	%
Frequency	Monthly (3)
Population Denominator (D)	The number of adult patients treated by EMS Providers for respiratory distress
Population Numerator (N)	The number of adult patients treated by EMS Providers for respiratory distress related to a pulmonary emergency who receive oxygen in the prehospital setting
Inclusion Criteria	<ul style="list-style-type: none"> ◆ Patient has reached age 18 ◆ Patient treated by EMS personnel for respiratory distress related to a pulmonary emergency ◆ Event was in prehospital setting
Indicator Formula	Numerator Value (N) divided by denominator value (D) multiplied by 100 equals percentage (%)
Numeric Expression	N/D=%

FY2009-1: EMS System

Protocol	n/a
Measure	% active EMS providers who attend in-house classes offering OEMS approved CE other than that provided by TJEMS or UVA Prehospital Program
Objective	To measure the % of active EMS providers who attend in-house classes offering OEMS approved CE other than that provided by TJEMS or UVA Prehospital Program
Type of Measure	Structural
Indicator Reporting Value	%
Frequency	Monthly (3)
Population Denominator (D)	The number of active EMS providers
Population Numerator (N)	The number (count) of active EMS providers who attend in-house classes offering OEMS approved CE other than that provided by TJEMS or UVA Prehospital Program
Inclusion Criteria	<ul style="list-style-type: none"> ◆ Active EMS providers ◆ Active EMS providers who attend in-house classes offering OEMS approved CE other than

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	that provided by TJEMS or UVA Prehospital Program
Indicator Formula	Numerator Value (N) divided by denominator value (D) multiplied by 100 equals percentage (%)
Numeric Expression	N/D=%

FY2009-1: Trauma

Protocol	
Measure	Frequency of assisted ventilations in critically injured trauma patients
Objective	To measure % of critically injured trauma patients who receive assisted ventilations
Type of Measure	Process
Indicator Reporting Value	%
Frequency	Monthly (3)
Population Denominator (D)	The number of all critical trauma cases
Population Numerator (N)	The number of critically injured trauma patients who receive assisted ventilations
Inclusion Criteria	<ul style="list-style-type: none"> ◆ Patient has reached age 18 ◆ Trauma is an injury caused by blunt or penetrating kinematic mechanism in the prehospital setting ◆ Critical is an adult patient with the following physiologic criteria: an adult patient that meets EMS trauma triage criteria that mandates triage to a designated trauma center. ◆ Assisted Ventilation is the use of a bag-valve mask to provide ventilations to a patient
Indicator Formula	Numerator Value (N) divided by denominator value (D) multiplied by 100 equals percentage (%)
Numeric Expression	N/D=%

FY2009-2: Patient Care

Protocol	Adult – Pulmonary Emergencies: Respiratory Distress
Measure	Albuterol nebulizer: Frequency of Administration
Objective	To measure % of adult patients suffering from respiratory distress related to a pulmonary emergency that receive treatment with an Albuterol nebulizer in pre-hospital setting
Type of Measure	Process
Indicator Reporting Value	%
Frequency	Monthly (3)
Population Denominator (D)	The number of adult patients treated by EMS Providers for respiratory distress

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Population Numerator (N)	The number of adult patients suffering from respiratory distress related to a pulmonary emergency that receive treatment with an Albuterol nebulizer in pre-hospital setting
Inclusion Criteria	<ul style="list-style-type: none"> ◆ Patient has reached age 18 ◆ Patient treated by EMS personnel for respiratory distress related to a pulmonary emergency ◆ Albuterol nebulizer from a drug box was administered by EMS personnel ◆ Event was in prehospital setting
Indicator Formula	Numerator Value (N) divided by denominator value (D) multiplied by 100 equals percentage (%)
Numeric Expression	N/D=%

FY2008-2: EMS System

Protocol	n/a
Measure	% active EMS providers who attend Virginia EMS Symposium
Objective	To measure the % of active EMS providers who attend Virginia EMS Symposium
Type of Measure	Structural
Indicator Reporting Value	%
Frequency	Monthly (3)
Population Denominator (D)	The number of active EMS providers
Population Numerator (N)	The number (count) of active EMS providers who attend Virginia EMS Symposium
Inclusion Criteria	<ul style="list-style-type: none"> ◆ Active EMS providers ◆ Active EMS providers who attend Virginia EMS Symposium
Indicator Formula	Numerator Value (N) divided by denominator value (D) multiplied by 100 equals percentage (%)
Numeric Expression	N/D=%

FY2008-2: Trauma

Protocol	n/a
Measure	Frequency of placement of an advanced airway adjunct in critically injured trauma patients
Objective	To measure % of critically injured trauma patients who were treated with an advanced airway adjunct
Type of Measure	Process
Indicator Reporting Value	%
Frequency	Monthly (3)
Population Denominator (D)	The number of all critical trauma cases
Population Numerator (N)	The number of critically injured trauma patients

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	who were treated with an advanced airway adjunct
Inclusion Criteria	<ul style="list-style-type: none"> ◆ Patient has reached age 18 ◆ Trauma is an injury caused by blunt or penetrating kinematic mechanism in the prehospital setting ◆ Critical is an adult patient with the following physiologic criteria: an adult patient that meets EMS trauma triage criteria that mandates triage to a designated trauma center. ◆ Advanced Airway Adjunct is a Combi-tube, King Airway and Endotracheal intubation
Indicator Formula	Numerator Value (N) divided by denominator value (D) multiplied by 100 equals percentage (%)
Numeric Expression	N/D=%

FY2008-3: Patient Care

Protocol	Adult – Pulmonary Emergencies: Respiratory Distress
Measure	CPAP: Frequency of Administration
Objective	To measure % of adult patients suffering from respiratory distress related to a pulmonary emergency that receive treatment with CPAP in pre-hospital setting
Type of Measure	Process
Indicator Reporting Value	%
Frequency	Monthly (3)
Population Denominator (D)	The number of adult patients treated by EMS Providers for respiratory distress
Population Numerator (N)	The number of adult patients suffering from respiratory distress related to a pulmonary emergency that receive treatment with CPAP in pre-hospital setting
Inclusion Criteria	<ul style="list-style-type: none"> ◆ Patient has reached age 18 ◆ Patient treated by EMS personnel for respiratory distress related to a pulmonary emergency ◆ CPAP was administered by EMS personnel ◆ Event was in prehospital setting
Indicator Formula	Numerator Value (N) divided by denominator value (D) multiplied by 100 equals percentage (%)
Numeric Expression	N/D=%

FY2008-3: EMS System

Protocol	n/a
Measure	% active EMS providers who attend OEMS approved CE provided by TJEMS or UVA Prehospital Program

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Objective	To measure the % of active EMS providers who attend OEMS approved CE provided by TJEMS or UVA Prehospital Program
Type of Measure	Structural
Indicator Reporting Value	%
Frequency	Monthly (3)
Population Denominator (D)	The number of active EMS providers
Population Numerator (N)	The number (count) of active EMS providers who attend OEMS approved CE provided by TJEMS or UVA Prehospital Program
Inclusion Criteria	<ul style="list-style-type: none"> ◆ Active EMS providers ◆ Active EMS providers who attend OEMS approved CE provided by TJEMS or UVA Prehospital Program
Indicator Formula	Numerator Value (N) divided by denominator value (D) multiplied by 100 equals percentage (%)
Numeric Expression	N/D=%

FY2008-3: Trauma

Protocol	n/a
Measure	Frequency of use of continuous direct pressure or a tourniquet (last resort) in critically injured trauma patients
Objective	To measure % of critically injured trauma patients who were treated with continuous direct pressure or a tourniquet
Type of Measure	Process
Indicator Reporting Value	%
Frequency	Monthly (3)
Population Denominator (D)	The number of all critical trauma cases
Population Numerator (N)	The number of critically injured trauma patients who were treated with continuous direct pressure or a tourniquet
Inclusion Criteria	<ul style="list-style-type: none"> ◆ Patient has reached age 18 ◆ Trauma is an injury caused by blunt or penetrating kinematic mechanism in the prehospital setting ◆ Critical is an adult patient with the following physiologic criteria: an adult patient that meets EMS trauma triage criteria that mandates triage to a designated trauma center.
Indicator Formula	Numerator Value (N) divided by denominator value (D) multiplied by 100 equals percentage (%)
Numeric Expression	N/D=%

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FY2008-4: Patient Care

Protocol	Adult – Pulmonary Emergencies: Respiratory Distress
Measure	Decrease/Relief of Symptoms
Objective	To measure % of patients with a reported decrease or relief of symptoms when treated by EMS personnel for respiratory distress related to a pulmonary emergency
Type of Measure	Process
Indicator Reporting Value	%
Frequency	Monthly (3)
Population Denominator (D)	The number of adult patients treated by EMS providers for respiratory distress related to a pulmonary emergency
Population Numerator (N)	The number of patients with reported decrease or full relief of symptoms after treatment by EMS personnel in prehospital setting
Inclusion Criteria	<ul style="list-style-type: none"> ◆ Patient has reached age 18 ◆ Patient treated by EMS personnel for respiratory distress related to a pulmonary emergency ◆ Event was in prehospital setting
Indicator Formula	Numerator Value (N) divided by denominator value (D) multiplied by 100 equals percentage (%)
Numeric Expression	$N/D = \%$

FY2008-4: EMS System

Protocol	n/a
Measure	% active EMS providers who attend a regional CE program (such as Critical Response or Air Care5)
Objective	To measure the % of active EMS providers who attend a regional CE program (such as Critical Response, March Medical Madness or AirCare 5 Live)
Type of Measure	Structural
Indicator Reporting Value	%
Frequency	Monthly (3)
Population Denominator (D)	The number of active EMS providers
Population Numerator (N)	The number (count) of active EMS providers who attend a regional CE program (such as Critical Response, March Medical Madness or AirCare 5 Live)
Inclusion Criteria	<ul style="list-style-type: none"> ◆ Active EMS providers ◆ Active EMS providers who attend a regional CE program (such as Critical Response, March

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	Medical Madness or AirCare 5 Live)
Indicator Formula	Numerator Value (N) divided by denominator value (D) multiplied by 100 equals percentage (%)
Numeric Expression	N/D=%

FY2008-4: Trauma

Protocol	n/a
Measure	Frequency of critically injured trauma patients who are pregnant
Objective	To measure % of patients who are critically injured and pregnant
Type of Measure	Process
Indicator Reporting Value	%
Frequency	Monthly (3)
Population Denominator (D)	The number of all adult critical trauma cases
Population Numerator (N)	The number of adult patients who are critically injured and pregnant
Inclusion Criteria	<ul style="list-style-type: none"> ◆ Patient has reached age 18 ◆ Trauma is an injury caused by blunt or penetrating kinematic mechanism in the prehospital setting ◆ Critical is an adult patient with the following physiologic criteria: a patient that meets EMS trauma triage criteria that mandates triage to a designated trauma center.
Indicator Formula	Numerator Value (N) divided by denominator value (D) multiplied by 100 equals percentage (%)
Numeric Expression	N/D=%

APPENDIX 1

Development of Standardized EMS System Indicators

THE PROCESS

A primary PI tool is the standardized EMS quality indicator. Methods for developing and using the indicators to measure EMS system performance are described in the following steps:

STEP 1. Asking the Questions

- Gather stakeholders together and begin by identifying those questions about the system that the group would like answered. Distributing a survey can also facilitate this step
- Categorize the questions based upon related subject matter and/or discipline
- Prioritize or rank the questions based upon the level of importance to stakeholders or customers
- If possible, narrow the list of questions by eliminating any duplication or questions that may be too complex

STEP 2. Defining the Answer

Begin by clearly stating the question to be answered. Stratify (break down) the question into steps identifying the structures (who, what, where) and the activities (how), which lead to the outcome that will be measured.

Note: stratification may lead to several smaller measurements, i.e., structures and processes, which affect the outcome indicator that answers the questions more fully.

STEP 3. Develop the Quality Indicator

Standardize how the information will be gathered and define the following:

- Population (inclusion criteria)
- Data numerator
- Data denominator
- Reporting formula
- Reported item

Example:

- Inclusion Criteria - patients 15 years or older defibrillated by prehospital personnel
- Numerator - total patients discharged alive from the hospital after prehospital defibrillation

APPENDIX 1 cont'd

- Denominator - total number of prehospital patients defibrillated
- Formula - total patients discharged/total patients defibrillated x 100 = % survival

STEP 4: Collecting the Indicator Information

- Educate all personnel who will be collecting data on the method of data collection and the indicator
- Issue "step by step - how to" information in writing and explain the indicator process
- Provide resource & contact point for FAQ's and troubleshooting

STEP 5: Organizing the Data into Indicator Format

- Assure all data submissions have been received and checked
- Identify and segregate data by indicator or sub-indicators
- Reference the indicator to identify details such as denominators and numerators
- Perform tests as defined previously by the indicator
- Summarize and organize all results
- Prepare data for presentation
- Perform appropriate tests and measurements of central tendencies
- If appropriate, aggregate and blind the data
- Select and prepare appropriate presentation format (charts, graphs, check sheet, diagram)
- Select appropriate presentation medium (PowerPoint, document, *etc.*)

STEP 6: Present and Evaluate the Answer

This step also gives participants the opportunity to evaluate the credibility of the data and the meaning of the results. It is very important that all participants review the preliminary results prior to the presentation. It is at this step in the process where participants will have to make a collective decision - the decision whether to act or not to act on the answer.

- Present data

1. Schedule presentation date and time (i.e., quarterly PI meeting)
2. Distribute report and publish date, time and location of report presentation
3. Present report with Question-Answer statement from Steps 1 & 2 and indicators/measurements. Include a relevant list of benchmarks from past projects and/or published studies
4. Identify any data collection or analysis problems

APPENDIX 1 cont'd

- Evaluate Data

1. Does the data suffice to answer the proposed questions?
2. Are the data presented in a format that is understood?
3. Are the data and results reasonably believable?
4. Is the answer (data) within an acceptable performance range?
5. Does the answer (data) demonstrate that action to improve performance is warranted?

STEP 7: Acting to Improve the Answer

- Assure all participants have opportunity for input
- Review results and evaluation process
- Identify reasons for improvement
- Identify and verify root causes or need for improvement
- Identify potential improvement action plans
- Select improvement action plan
- Decide whether improvement action plan is short term (60 days-rapid cycle model) or longer (over 60 days-traditional model)
- Create an improvement action plan with specific steps identifying who, what, how and when they will occur
- Schedule performance improvement activities
- Implement performance improvement activities with appropriate schedule

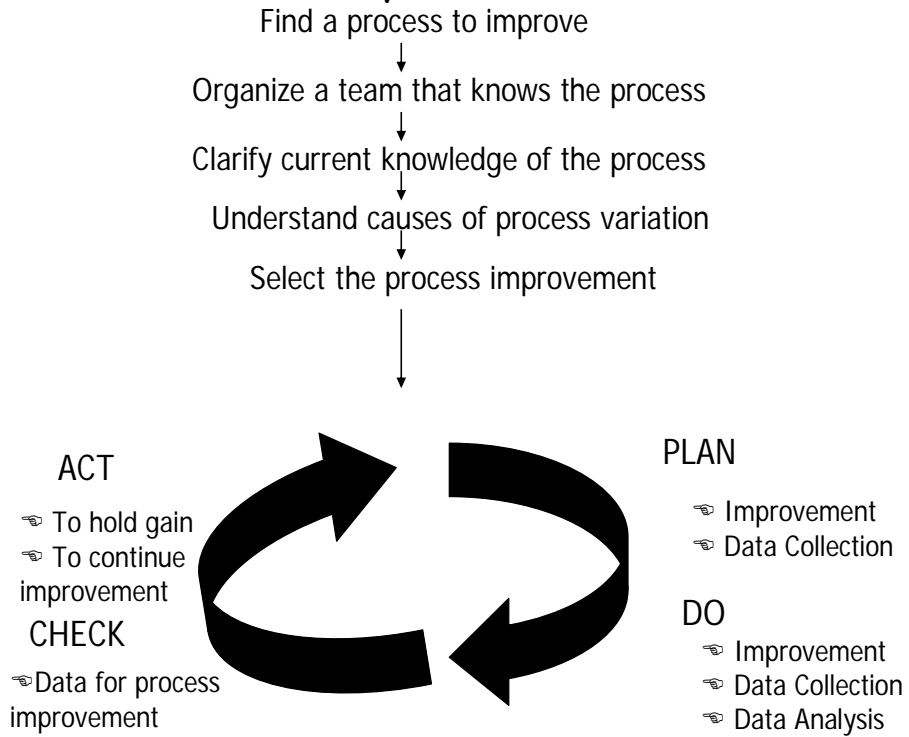
STEP 8: Checking for Improvement

- Set a target date for re-evaluation
- Repeat steps 1-8
- Obtain consensus from participants for sharing results

APPENDIX 2

Examples of Performance Improvement Models

FOCUS-PDCA Performance Improvement Model

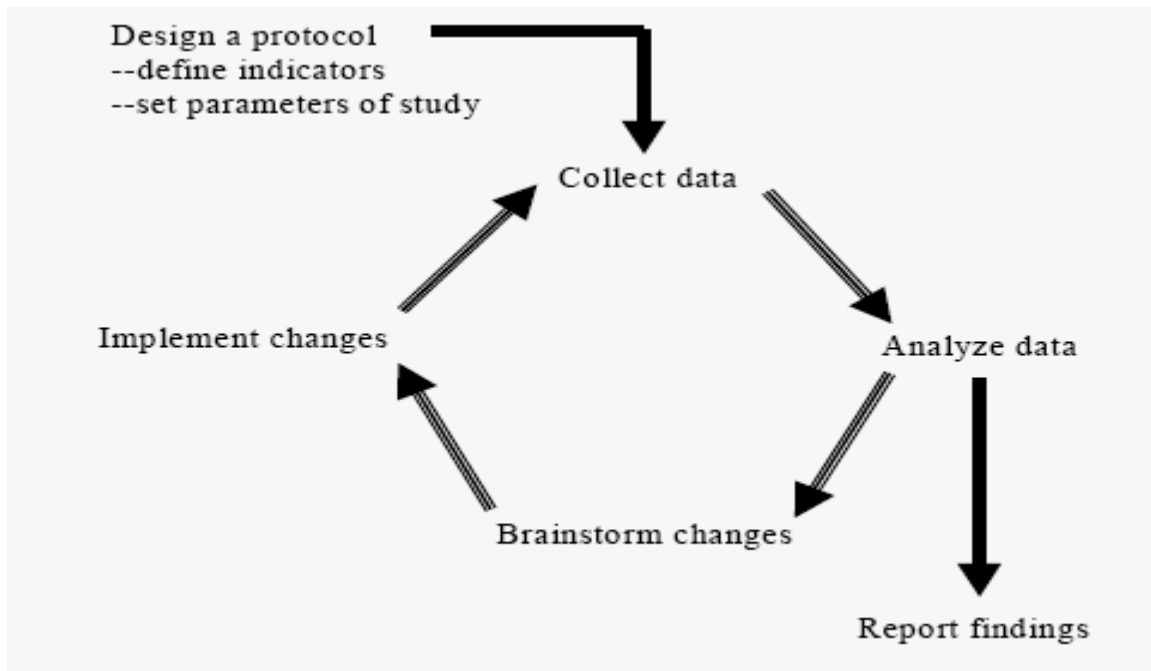


Examples of Quality in a Hospital Setting JCAHO 1992

APPENDIX 2 cont'd

Rapid Cycle Improvement

One approach to EMS PI activities is Rapid Cycle Improvement (RCI), which is based on Deming's traditional "Plan-Do-Check-Act" model (previous page). RCI accelerates the PI process by employing shorter change cycles. RCI is a practical and real-time approach to enhancing performance in diverse organizations. It is an especially valuable tool in making improvements in large or complex systems.



APPENDIX 3

Definitions of Common Data Measurements

I. Statistical

A. Measures of Central Tendency: These are data measurements that show how the data is the same or where most of the people, places or things tend to score or behave. These measurements are in the middle of what has often been called the “bell shaped curve.”

1. **Mean** (average) – The sum of all measured, or counted, data divided by the total number of data points
2. **Mode** – the value repeated most often in raw data
3. **Median** – the middle of all the measured or counted data points.

B. Measures of Dispersion: These are data measurements that show how the data is different or where most of the people, places or things are different. These measurements are on the outside of what has often been called the “bell shaped curve.”

1. **Range** – the maximum value minus the minimum data value.
2. **Standard Deviation** – A measurement that shows how widely spread (dispersed) any set of data is from the mean (average) of an entire data distribution. The standard deviation takes into account all the data points.

II. Process Analysis

A. Process Analysis: evaluation of data by using graphic representations of activities that show trends and variations over time. The following are common activities used to help evaluate an activity:

1. **Trending** - the process of showing by plot or process control chart, the upward, downward or level movement of an activity over a specified period of time.
2. **Causation** – the results of tests that are applied to a set of data points plotted on a process control chart. The tests determine whether a “special cause” exists within the data set and can explain unusual character or nature of undesirable results.
3. **Benchmarking**- using known results of similar data measurements or tests as an impetus for achieving or surpassing a desired goal for improvement.

Appendix 3 cont'd

4. **Best Practices** - using the best-known results of similar data measurements of similar tests for similar systems or operations as an impetus for achieving or surpassing a desired goal for improvement.

5. **Published Referencing** - using published results of similar data measurements or tests as beginning or starting reference point for achieving or surpassing a desired goal for improvement.

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TJEMS EMS & Trauma Systems Performance Improvement Referral Form

Purpose: The purpose of this referral form is to improve the quality and efficiency of patient care in the TJEMS region. Submission of this document initiates further review of the specific incident. All information obtained through this process will remain confidential. This information may be used by the EMS Agency, Operational Medical Director (OMD) and/or the TJEMS EMS & Trauma Performance Improvement Committee for the purposes of Performance Improvement with the ultimate goal being improved patient care. Please complete all known items.

Your Name: _____ Whom do you represent? _____

EMS Incident #: _____ Patient Record # _____

Receiving Hospital: _____ ED Physician: _____

Injury/Diagnosis: _____ Date of Event: _____

Patient Name: _____ Age: _____

Purpose of the referral:

Patient Care Protocol
 Disposition/Destination/Referral Other _____

Description of Events (use other side if necessary):

Pursuant to sections § 8.01-581.16, 8.01-581.17, 32.1-116.2, of the Virginia Codes, data or information in the possession of or transmitted to the Commissioner, the Advisory Board, or any committee acting on behalf of the Advisory Board, any hospital or prehospital care provider, or any other person shall be privileged and shall not be disclosed or obtained by legal discovery proceedings, unless a circuit court, after a hearing and for good cause shown arising from extraordinary circumstances, orders disclosure of such data.

Fax this form to 434-295-2009. The original may be sent via U. S. Mail to: TJEMS, 2205 Fontaine Avenue, Suite 302, Charlottesville, VA 22903

<p>For TJEMS Use</p> <p>Date Received: _____</p> <p>Disposition:</p> <p><input type="checkbox"/> Feedback to EMS System participant(s)</p> <p><input type="checkbox"/> PI Committee Review</p> <p><input type="checkbox"/> Trend/Monitor</p> <p><input type="checkbox"/> System-wide Training/Education</p> <p><input type="checkbox"/> System-wide Alteration</p>

EMS Agency Name:

Month:

Page ___ of ___

Date	O ₂ Y or N	Albuterol Nebulizer Y or N	CPAP Y or N	Decrease/Relief Y or N	Level ALS or BLS	Comments
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
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22						
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24						
25						
26						
27						
28						
29						
Total						

TJEMS EMS & Trauma Performance Improvement Plan: Patient Care

- Review PPCR of Adult Patients with Respiratory Distress related to Pulmonary Emergency
- Total Columns and Apply Indicator Formula from Annex A of TJEMS EMS & Trauma PIP
- Review Results with EMS Agency EMS & Trauma PI Committee and Take Any Necessary Action(s)
- Submit this Form (or Forms) to TJEMS (U.S. Mail or Fax: 434-295-2009) in October, January, April or July, as appropriate.

EMS Agency Name:

Month:

Page ___ of ___

Date	In-house CE, not TJ or UVA	Attend VA EMS Symposium	CE provided by TJEMS or UVA PP	Regional CE Programs	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
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27					
28					
29					
30					
Total					

TJEMS EMS & Trauma Performance Improvement Plan: EMS System

- Review training records
- Total Columns and Apply Indicator Formula from Annex A of TJEMS EMS & Trauma PIP
- Review Results with EMS Agency EMS & Trauma PI Committee and Take Any Necessary Action(s)
- Submit this Form (or Forms) to TJEMS (U.S. Mail or Fax: 434-295-2009) in October, January, April or July, as appropriate.

EMS Agency Name:

Month:

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Date		Assisted ventilations Y or N	Advanced airway adjuncts Y or N	Continuous direct pressure or tourniquet (last resort) Y or N	Pregnant Y or N	Level BLS or ALS	Comments
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
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22							
23							
24							
25							
26							
27							
Total							

TJEMS EMS & Trauma Performance Improvement Plan: Trauma

- Review PPCR of Patients with Critical Trauma
- Total Columns and Apply Indicator Formula from Annex A of TJEMS EMS & Trauma PIP
- Review Results with EMS Agency EMS & Trauma PI Committee and Take Any Necessary Action(s)
- Submit this Form (or Forms) to TJEMS (U.S. Mail or Fax: 434-295-2009) in October, January, April or July, as appropriate.

