NATIONAL EMS MANAGEMENT ASSOCIATION

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Chapter 5

EMS SUPERVISOR

PRINCIPLES AND PRACTICE

Creating a Culture of Quality

Objectives

- Define the term *quality.*
- Discuss the history of quality initiatives.
- Discuss the benefits of quality management programs.
- Describe how to introduce quality into an EMS organization.

Objectives

- Describe the components of quality management.
- Describe how to select a quality management program.
- Describe the tools used for continuous improvement.

Introduction

- Recall a positive experience that you have had with a business such as a retail store, hotel, restaurant, airline, or hospital.
- Your positive opinion most likely resulted from the way you were treated during the interaction and the quality of the goods and/or service provided.

Introduction

- Although price is an important factor, it is not the entire reason why we decide to engage with a certain organization.
- Would you buy goods or services because they were inexpensive if you knew the product would soon break or did not meet your expectations?

Introduction

- As an emergency medical services (EMS) officer, it is important to understand that both tangible and intangible items must be quality driven.
- Tangible items include goods, such as a stretcher, heart monitor, ambulance unit, or ECG strip.
- Intangible items include services, such as the act of responding to the scene of an emergency or transporting a patient to the hospital.

Introduction

- The EMS officer will primarily work with service delivery patient care (intangible), but will certainly be involved with the purchase of numerous goods (tangible) to ensure effective EMS operations.
- When providing EMS, quality must be embedded at the very core of the service being provided.

Introduction

- To ensure quality service delivery in EMS, it is important to:
  - Look at how other EMS organizations provide quality service
  - Benchmark your organization against non-EMS-related industries

Introduction

- The goal is to learn how successful organizations best serve their customers, remain competitive, and provide a culture of quality across the organization.
- Every EMS officer or other individual in a leadership role must be committed to a culture of quality and demonstrate the importance of quality to all members across the organization.

Introduction

- Many businesses are known for continuously delivering quality goods and services and excelling at exceeding customer expectations.
- Elements of the way in which these businesses operate can be adapted to EMS organizations.
- As the EMS officer, you can share your vision of quality and explain how you expect the team to deliver quality service.

Introduction

- Team members must embrace the fact that EMS is a business and is delivering a service.
- They should not assume that patients have no choice when requesting EMS simply because that organization is the sole provider for the community.
- Customers are very powerful, and they can either support the organization or abandon it.

Introduction

- The moment an organization stops delivering quality services and becomes complacent, either the leadership team or the organization will be replaced.
- As an EMS leader, you must look at your patients as customers and exceed their expectations in the services you provide.
- Customer service is only one element of quality service.

Definition of Quality

- The definition of *quality* may vary depending on who you ask, but a common thread can be detected among definitions.
- Regardless of whether it is a product or service, the outcome must consistently meet or exceed a customer's expectations.

Definition of Quality

- Therefore, *quality* entails meeting or exceeding customer expectations by delivering goods or services consistently with minimal to no variation from the expected outcome.

Definition of Quality

- Delivering quality service, regardless of the business industry, must be a point of emphasis because:
  - It is what sets the organization apart from its competitors.
  - It gives the patients the care they need.

The History of Quality Initiatives

- The quality philosophy dates back hundreds of years.
- More recently, during World War II, a surge in quality efforts occurred as part of a drive to ensure the safety of military equipment.
- Manufacturers used routine inspections and other quality control systems as a form of ensuring quality outcomes.

The History of Quality Initiatives

- Nevertheless, it was not until after World War II that a quality focus gained significant traction in business.
- Organizational leaders began to understand the importance of having a quality initiative, and the “total quality” philosophy was born.

Benefits of a Quality Management Program

- All organizational leaders must demonstrate their commitment to quality.
- Numerous benefits can be realized from incorporating a quality management program into an organization.

Benefits of a Quality Management Program

- Benefits of a quality management program include:
  - Improvements in organizational processes and systems
  - Identification of processes that do not add value
  - Reduction of operational and administrative waste
  - Focus on meeting or exceeding customer expectations

Benefits of a Quality Management Program

- Benefits of a quality management program (continued):
  - Detection of underperforming processes before they affect customer satisfaction
  - Comparisons of similar processes to determine whether the processes overlap informed decisions about keeping or eliminating processes
  - Cost savings and promotion of a lean environment

Benefits of a Quality Management Program

- The intent of a quality management program is to identify variations within current processes that might prevent the organization from:
  - Delivering quality goods or services
  - Meeting customer expectations

Benefits of a Quality Management Program

- Without a quality management program, quality activities, and tools that make up the quality management program, your organization most likely will experience:
  - A loss of customers
  - Increased expenses
  - Duplication of work
  - Poor outcomes
  - Loss of market share

Benefits of a Quality Management Program

- A quality management program can help the EMS officer know whether his or her organization is:
  - Meeting customer expectations
  - Failing to meet expectations
  - Having a detrimental effect on patients

Benefits of a Quality Management Program

- Many organizations conduct quality assurance reviews pertaining to patient care only.
- The EMS officer, however, must ensure that the quality management activities:
  - Go beyond reviewing patient care charts
  - Continuously address a broad spectrum of organizational EMS processes and systems

Benefits of a Quality Management Program

- EMS delivery encompasses:
  - Patient care
  - Response times
  - On-scene times
  - Transfer of care
  - Transportation to the appropriate receiving facility
  - Treatment modalities
  - Many other activities and processes

Benefits of a Quality Management Program

- Given the wide scope of EMS operations, quality assurance reviews are important, but they do not provide the entire picture.
- In addition to quality assurance, the EMS officer must consider quality control measures, continuous quality improvement, tracking outcome metrics, and more.

Introducing Quality Management to the Organization

- To introduce the concept of quality within the organization or division, the EMS officer and those in managerial leadership roles must first understand a basic tenet.
- If a culture of quality is to exist within the organization, the initiative must begin and be supported by the top leaders of the organization.

Introducing Quality Management to the Organization

- Before implementing a quality initiative, the leadership team may establish a quality management team to ensure that all phases of the organization's new quality initiative have been addressed before it is presented to the organization.

Introducing Quality Management to the Organization

- These phases may include:
  - Introducing the desired culture
  - Establishing a quality management program
  - Selecting a quality management program
  - Identifying continuous improvement projects

Introducing Quality Management to the Organization

- Introducing a formal quality management program to the organization must be done slowly to:
  - Provide an opportunity for all team members to grasp the required material in the program
  - Prevent learning frustration
  - Avoid resistance to the new program

Introducing Quality Management to the Organization

Figure 5-1 All members assigned to quality improvement projects must be trained to follow the organization's quality management program.

Introducing Quality Management to the Organization

- Establishing a culture of quality will set the organization on a path to achieve operational effectiveness and efficiency, leading to excellence in service delivery.
- A culture of quality must be supported across the board—by the top leadership members, middle managers, supervisors, and front-line employees.

Establish Leadership's Commitment to Quality

- First, the EMS officer must demonstrate his or her own commitment to the organization-wide quality initiative.
- Although it is imperative to obtain buy-in from the team members, the initiative starts with those in the leadership role.

Establish Leadership's Commitment to Quality

- The leadership team must:
  - Be fully committed to the quality initiative before introducing it to the organization as a whole
  - Demonstrate that all organizational leaders stand behind a culture of quality
- Unless the senior leadership team publicly embraces a new culture of quality, the new initiative is likely to fail.

Establish Leadership's Commitment to Quality

- The EMS officer can demonstrate commitment to the organization's quality initiatives by:
  - Being trained in quality management
  - Providing opportunities for the team members to learn about continuous quality improvement
  - Providing the team members with the tools necessary to achieve quality outcomes
  - Asking questions and seeking input from the team members
  - Making it a point to celebrate successful quality outcomes with the team members

Establish a Clear Message About Quality

- The second step in establishing a culture of quality is to send a clear message about:
  - Embracing a culture of quality
  - Defining what the results of being a quality-driven organization will look like
- The message must demonstrate how this initiative will impact the organization, its members, and its customers.

Introduce Quality Across the Organization

- Third, the total quality management approach must be an organization-wide effort that obtains buy-in from the team members.
- To achieve buy-in from the team members, the EMS officer must include the team members as part of the total quality decision-making process.

Introduce Quality Across the Organization

- EMS officers, as well as other organizational leaders, must be prepared to empower their team members and allow them to be part of the quality movement.
- The employees must feel that their role will be directly tied to the success or failure of the organization.

Introduce Quality Across the Organization

- It is important that all members understand what the organization plans to achieve through the quality management program, why it is important, and how they plan to get there.

Introduce Quality Across the Organization

- In some cases, the EMS officer may consider implementing a reward or incentive program to motivate employees when introducing the total quality improvement approach.
- This approach may pose some challenges, but, if done correctly, may be very effective.

Introduce Quality Across the Organization

- For example, the EMS officer may choose to recognize an individual or an entire team by giving them:
  - Gift cards
  - Paid time off
  - Additional paid training of the individual's or team's choice
  - Some other token of appreciation

Introduce Quality Across the Organization

- Many organizations celebrate their accomplishments as a team.
- This strategy not only acknowledges the great work in successfully completing a project, but also fosters unity across the team and the organization.

Introduce Quality Across the Organization

- When working with an incentive or rewards program, you must know what motivates your employees and make sure that employees are not rushing through a project just to get an award.
- Moreover, the EMS officer must ensure that all members have an equal opportunity to participate in continuous quality improvement projects and to receive rewards for the successful completion of projects.

Introduce Quality Across the Organization

- Any rewards must be truly earned.
- Therefore, the project improvement outcomes must be measurable, key performance indicator benchmarks must be achieved, and the project must provide a real benefit to the organization and its customers.

Introduce Quality Across the Organization

- Some organizational leaders have asserted that having a job and receiving a paycheck are enough reward and recognition for completing a project.
- Other managers express concerns about rewards and incentive programs because they create an additional expense for the organization.

Introduce Quality Across the Organization

- It is imperative that every organizational leader:
  - Take the first of the 5 BPs—people—seriously
  - Remain committed to supporting the organizational members when introducing a quality management program for the first time

Introduce Quality Across the Organization

- Regardless of whether the organization chooses to establish a rewards or incentive compensation program, a total quality management approach cannot exist without continuous improvement.
- Therefore, people (teams) must be your most valued asset.
- The team members are the driving force behind every organization's total quality management and continuous improvement process.

Ensure Quality Is Ongoing

- The fourth step in establishing a culture of quality:
  - The EMS officer must ensure that the total quality approach is ongoing and not a one-time event.

Ensure Quality Is Ongoing

- The organization can begin addressing underperforming processes or systems once:
  - The senior leadership team and the employees have made a solid commitment to quality management
  - A culture of quality is interwoven into the organization
  - A quality management program is firmly in place

Ensure Quality Is Ongoing

- When deciding what will need improvement, if anything, the EMS officer must:
  - Review the organization's (or division's) quality assurance (QA) outcomes
  - Conduct a quality improvement survey that includes all members of the organization
  - Seek customer feedback pertaining to the organization's service delivery

Ensure Quality Is Ongoing

- With these data in hand, the EMS officer and team members must:
  - Prioritize the quality initiatives
  - Execute the improvement strategy
  - Evaluate the outcomes

Ensure Quality Is Ongoing

- The steps for executing a process or system improvement initiative must be part of the organization's quality management program.
- This system should also incorporate a quality plan specific to the improvement of the underperforming processes or systems.

Ensure Quality Is Ongoing

- In addition, the EMS officer must consider creating a project charter.
  - This document is commonly prepared by a senior leadership team member or the project manager.
  - It contains information about how the project will be managed.
  - The project charter is subsequently shared with all participating team members.

Ensure Quality Is Ongoing

- Once an underperforming process or system resulting in poor outcomes is identified using the QA process, the EMS officer must take action to either:
  - Improve the underperforming process or system
  - Eliminate it completely if it does not add value

Ensure Quality Is Ongoing

- If the EMS officer decides to improve the process or system, he or she must determine which quality tools and activities would best help remedy the underperforming process or system.

Ensure Quality Is Ongoing

- The implementation of a quality management program and the use of its tools and activities require training.
- Quality initiatives should be managed by someone who has experience in dealing with quality programs.

Ensure Quality Is Ongoing

- The EMS officer must support the quality movement by doing the following:
  - Routinely evaluate the organization's strategic quality objectives and ensure that they are clearly defined
  - Provide the necessary tools and training to maximize quality outcomes
  - Ensure that the quality initiatives align with the organization's vision and the organizational performance measures are reflective of a quality-driven organization

Ensure Quality Is Ongoing

- The EMS officer must support the quality movement by doing the following (cont.):
  - Ensure that continuous quality improvement initiatives are taking place at all levels of the organization
  - Gather feedback from external customers to ensure that the organization is meeting or exceeding their expectations
  - Gather feedback from internal customers and continue to empower the team members when making quality improvement decisions

Components of Quality Management

- For a culture of quality to exist within an organization, the organization's senior leadership team must promote and continuously support a quality philosophy within all aspects of the organization.
- For a quality management program to thrive within an organization, the organizational leaders must choose the most appropriate quality management program.

Components of Quality Management

- The organizational leaders also must have:
  - Clearly defined quality objectives
  - Well-understood policies
  - Sufficient employee training for the activities
  - The tools necessary to achieve quality outcomes
  - A commitment across the entire organization for continuous improvement

Components of Quality Management

- As part of every quality management initiative, organizational leaders must select the quality management program that will best fit their organization's goals for achieving quality outcomes.

Components of Quality Management

- Many EMS organizations already use quality management activities—for example, during patient care chart reviews.
- Activities that can help the organization when monitoring or correcting quality outcome issues include:
  - Quality planning
  - Quality assurance
  - Quality control
  - Continuous quality improvement

Quality Planning

- Quality planning is a critical component of quality management that is used when preparing to work on a specific project or when attempting to improve other organizational performance outcomes.

Quality Planning

- Elements the EMS officer must consider following when creating a quality plan:
  - Description of the project improvement initiative
  - The project baseline (current) and benchmark (desired outcome)
  - Who is responsible for the project (project manager)
  - Which participants are assigned to the project

Quality Planning

- Elements the EMS officer must consider following when creating a quality plan (cont.):
  - Measurable objectives
  - Evaluation of quality assurance, quality control, and quality improvement outcomes
  - Which quality management tools will be used
  - Which operational and administrative resources will be needed
  - Feedback from stakeholders during and after project completion

Quality Planning

- The plan must be clear and concise, but adjustments should be anticipated as the program evolves.
- Only the items that will have a direct impact on the project and contribute to performance improvement should be included in the quality plan.

Quality Planning

- Regardless of which quality management program is used, the goal must always be to:
  - Improve the organization's processes and systems
  - Remove processes that do not add value
  - Meet the organization's strategic and financial objectives
  - Deliver quality outcomes that meet or exceed customer expectations

Quality Planning

- The EMS officer must create a quality management program that will support the implementation of the organization's quality management plan.
- Ultimately, the reason for implementing a quality management program is to ensure that the organization is well positioned to achieve the desired quality outcomes when delivering goods and services.

Quality Planning

- When deciding which policies and procedures to put in place, it is important to seek input from the senior leadership team, because those managers will need to support the initiative to ensure its success.

Quality Planning

- The individuals responsible for establishing a quality management program must keep in mind what they are trying to accomplish concerning service delivery quality outcomes.
- Those individuals responsible for implementing a quality management program framework must also dedicate uninterrupted time to completing this project.

Quality Planning

- The goal when implementing a quality framework that is supported by standard operating procedures (SOPs) is to ensure that any current and future members of the organization understand what is expected of them as part of the organization's quality management program.

Quality Planning

- After the quality management program is in place, the senior leadership team or those assigned to oversee quality management initiatives can add or remove policies, barriers, or processes that do not add value to the quality outcomes.

Quality Planning

- In addition to gathering input from the senior leadership team, it is equally important to seek input from the team members.
- They are the individuals “in the trenches” who will be dealing with the future quality management policies and procedures on a daily basis.
- They, too, can answer many questions as to what will work and what will not.

Quality Planning

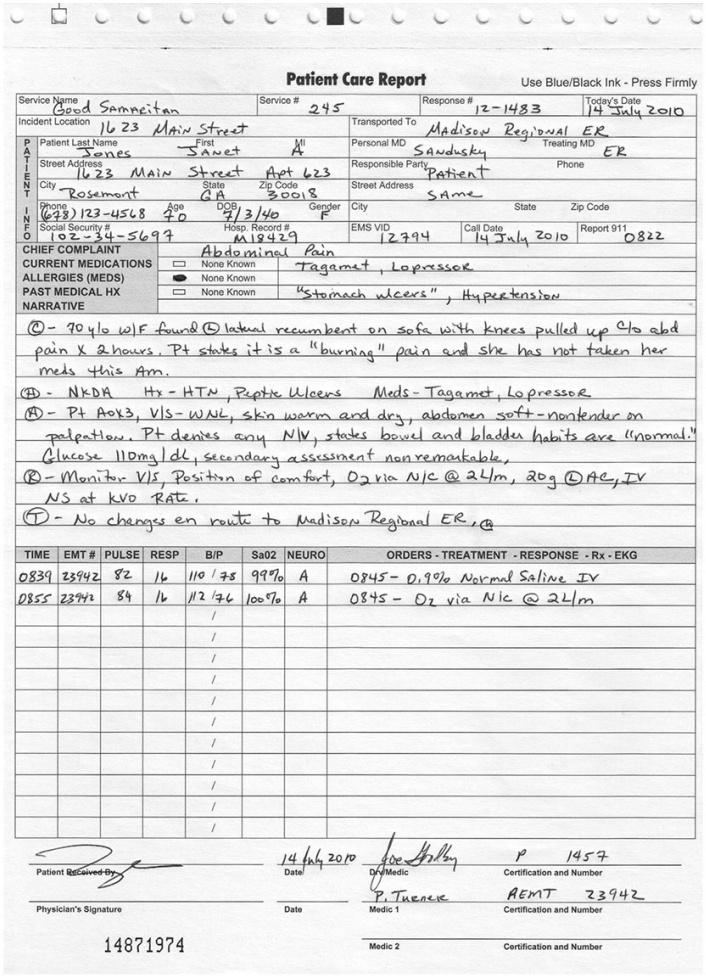
- If someone within your organization has experience with quality management initiatives, ask that individual for help.
- If there is no one to offer guidance, you should get involved in a quality training session and not be afraid to jump in, rally the team, and determine where service delivery improvements can be made.

Quality Planning

- As the organization moves forward with current and future quality management initiatives, the organization's service delivery outcomes will be directly related to:
  - The senior leadership team's commitment to quality
  - The extent to which the employees embrace the quality management initiative

Quality Assurance

- Quality assurance (QA) is a quality management activity that monitors (audits) organizational standards and detects any variation from the expected delivery of quality goods or service.
- QA activity is required to ensure that the organization's quality objectives are being met.



Patient Care Report — Use Blue/Black Ink - Press Firmly

Service Name: Good Samaritan	Service #: 245	Response #: 12-1483	Today's Date: 14 July 2010
Incident Location: 1623 Main Street		Transported To: Madison Regional ER	

PATIENT INFO

Patient Last Name: Jones	First: Janet	MI: A	Personal MD: Sandusky
Street Address: 1623 Main Street Apt 623			Treating MD: ER
City: Rosemont	State: GA	Zip Code: 30018	Responsible Party: Patient
Phone: (678) 123-4568	Age: 70	DOB: 7/3/40	Gender: F
Social Security #: 102-34-5697	Hosp. Record #: M18429		Street Address: Same
City:	State:	Zip Code:	
EMS VID: 12794	Call Date: 14 July 2010	Report 911: 0822	

CHIEF COMPLAINT		Abdominal Pain
CURRENT MEDICATIONS	☐ None Known	Tagamet, Lopressor
ALLERGIES (MEDS)	● None Known	
PAST MEDICAL HX	☐ None Known	"Stomach ulcers", Hypertension
NARRATIVE		

Ⓒ - 70 y/o WF found Ⓛ lateral recumbent on sofa with knees pulled up c/o abd pain x 2 hours. Pt states it is a "burning" pain and she has not taken her meds this Am.
Ⓐ - NKDA Hx - HTN, Peptic Ulcers Meds - Tagamet, Lopressor
Ⓑ - Pt AOx3, VS - WNL, skin warm and dry, abdomen soft - nontender on palpation. Pt denies any N/V, states bowel and bladder habits are "normal." Glucose 110mg/dL, secondary assessment non remarkable,
Ⓡ - Monitor VS, Position of comfort, O2 via N/C @ 2L/m, 20g Ⓛ AC, IV NS at KVO Rate.
Ⓣ - No changes en route to Madison Regional ER, Ⓣ

TIME	EMT #	PULSE	RESP	B/P	Sa02	NEURO	ORDERS - TREATMENT - RESPONSE - Rx - EKG
0839	23942	82	16	110/78	99%	A	0845 - 0.9% Normal Saline IV
0855	23942	84	16	112/76	100%	A	0845 - O2 via N/C @ 2L/m
				/			
				/			
				/			
				/			
				/			
				/			
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Patient Received By	14 July 2010 Date	DO/Medic	P 1457 Certification and Number
Physician's Signature	Date	P. Turner Medic 1	EMT 23942 Certification and Number
14871974		Medic 2	Certification and Number

Courtesy of Rhonda Beck.

Quality Assurance

Figure 5-2 One element of quality assurance involves review of patient care reports to ensure they meet the organization's requirements.

Quality Assurance

- The organization's medical director must determine what would be considered a variation from a protocol.
- The medical director must then share his or her expectations with the QA review committee.

Quality Assurance

- The QA committee may comprise the organization's medical director, EMS officer, senior paramedics, and emergency medical technicians (EMTs).
- The goal is to provide balance and experience evenly throughout the committee.

Quality Assurance

- This review process must not be confused with an investigation of wrongdoing.
- It is used merely to identify whether any variation from the organization's protocol has occurred and to determine whether the organization is meeting its target quality objectives.

Quality Assurance

Quality Assurance

- Is an audit or an evaluation of a business activity, such as patient care
- Is process oriented
- Ensures that things are being done correctly

Quality Control

- Is a specific activity within the quality management program set in place to ensure quality service is being delivered
- Is product oriented
- Ensures that desired outcomes occur

Quality Control

- Quality control (QC) is a quality management activity that seeks to ensure necessary procedures are in place to support a quality outcome.
- If a violation of protocol is detected during the QA process, the first action must be to review the quality control mechanisms and determine which activities are in place to prevent the deviation in protocol.

Quality Control

- As the EMS officer, you must ensure that you implement a quality control process so there is constant evaluation of the division's systems and processes prior to and after implementation of any operational or administrative activity.
- Then, through the quality assurance process, you will be able to determine whether the quality control processes are effective, need adjustment, or should be eliminated.

Quality Control

- Any process or system that does not align with the organization's quality plan and is not meeting or exceeding customer expectations must be addressed immediately.
- Subsequently, by using the continuous quality improvement process, you have the option to improve any underperforming activity or eliminate the activity if it does not add value.

Continuous Quality Improvement

- Continuous quality improvement (CQI) is an ongoing quality management activity pertaining to continuous process and/or system improvements.

Continuous Quality Improvement

- First and foremost, those participating in the quality improvement activity must have a thorough understanding of the organization's processes and systems.

Continuous Quality Improvement

- The continuous quality improvement activity focuses on the use of tools that will lead to improvements in organizational internal and external outputs.
- These tools will be directly related to the quality management program adopted by the organization.
- Therefore, it is important to become familiar with the tools included within the organization's adopted quality management program.

Continuous Quality Improvement

- Examples of these tools include:
  - Define, measure, analyze, improve, control (DMAIC)
  - Critical to quality (CTQ)
  - Cause and effect (fishbone) diagrams
  - Process charts
  - Brainstorming

Continuous Quality Improvement

- The organization must have a quality improvement activity in place to ensure that a variation is corrected.
- Furthermore, CQI should not be used solely when a process or system has been identified as underperforming during the quality assurance or quality control activities.

Continuous Quality Improvement

- The EMS officer, after reviewing the quality control procedures, must determine:
  - Why the violation of protocol occurred
  - What can be done to ensure that a repeat occurrence is unlikely

Continuous Quality Improvement

- The EMS officer must make the necessary improvements to address the root cause of the problem.
- The EMS officer must also ensure that protocol violation is not repeated if the reason for the violation is due to:
  - A lack of clearly defined protocols
  - Minimal training to appropriately manage the patient
  - Not having the tools available to provide the care
  - Negligence on the part of the provider

Continuous Quality Improvement

- Quality improvement is not a one-time event, but rather must be part of every quality management program.
- It must be initiated quickly when a process or system is identified as underperforming—or even performing optimally.
- Improvements must be continuously evaluated.

Sample Use of a Quality Management Program: Jones EMS

- The Jones EMS Department, consisting of approximately 500 employees, realized that many of the EMS patient care reports were incomplete or never submitted to headquarters by the crews after completing an emergency response.

Sample Use of a Quality Management Program: Jones EMS

- This issue came to light when an administrative employee could not find a report that was requested by a local hospital a week after the incident had occurred.

Sample Use of a Quality Management Program: Jones EMS

- The organization did not have a quality management program in place.
- Therefore, it was difficult to determine how long the organization had been experiencing this underperforming process.
- The Jones EMS director ordered an investigation to determine how many reports were incomplete or missing during the previous year.

Sample Use of a Quality Management Program: Jones EMS

- The EMS director immediately implemented the following quality management plan:
  1. The EMS director obtained senior leadership team support for the project and introduced a quality management program across the organization.
  2. The EMS director's vision was shared with all employees.
  3. Policies and procedures were implemented to provide guidance to all employees regarding the concepts and activities included in total quality management.
  4. The plan consisted of the following quality activities: quality assurance, quality control, and quality improvement.

Jones EMS Quality Plan in Action

- The Jones EMS director created an action plan to address the underperforming process of completing patient care reports.
- The EMS director included the following actions as part of the quality action plan:
  - Determining the root cause.
  - Determining why the underperforming process was not identified sooner.
  - Implementing a corrective measure and setting benchmarks.
  - Implementing a zero-tolerance policy for incomplete patient reports

Jones EMS Quality Plan in Action

- As part of the action plan, the EMS director:
  - Made every effort to correct the underperforming patient care report writing process
  - Made a commitment to the implementation of the TQM philosophies and concepts on an organization-wide basis

Jones EMS Quality Plan in Action

- During the Quality Assurance Phase
  - Every morning, several team members would cross-reference the calls for service from the previous day with the patient care reports that had been completed and submitted to headquarters from that shift.
  - If this process revealed that a report was missing or incomplete, the crew members would be notified and required to complete the report immediately.

Jones EMS Quality Plan in Action

- During the Quality Control Phase
  - Initially, there were no quality control measures in place.
  - Once the issue was identified, however, the following control measures were put into place:
    - EMS field supervisors were required to review each completed patient care report before the report was submitted to headquarters.
    - Increased emphasis was placed on documenting, completing, and submitting patient care reports to headquarters in all new-hire orientation classes and with senior employees.

Jones EMS Quality Plan in Action

- During the Quality Control Phase
  - Control measures (cont.):
    - Every Monday morning, an e-mail was sent to all members of the organization providing an update on how many reports were missing or incomplete during the previous week.
    - The organization acknowledged the continued improvements and celebrated the accomplishments across the organization.

Jones EMS Quality Plan in Action

- Quality Improvement Phase
  - The organization implemented a policy that reinforced the importance of completing and submitting patient care reports after every emergency response.
  - In addition, a brochure was created and disseminated to all field stations that outlined the proper procedure for submitting the patient care reports.

Jones EMS Quality Plan in Action

- Quality Improvement Phase
  - This brochure also included instructions on how to submit a report in the event that technical issues with the computer arose, considering that all patient care reports were being submitted electronically.
  - Lastly, a tracking system was implemented to detect habitual offenders who routinely did not complete their reports or did not submit them to headquarters after a duty-day.

Jones EMS Quality Plan in Action

- Quality Improvement Phase
  - These individuals would be required to attend a short one-on-one in-service program to review the proper procedure for completing and submitting patient care reports.
  - If the pattern continued, the employee would be issued a verbal counseling.

Jones EMS Quality Plan in Action

- The EMS team:
  - Was able to identify how many patient care reports were missing or incomplete during the previous year
  - Used the data as a measurable starting point prior to beginning the quality improvement activity
  - Then tracked improvement outcomes after the implementation of the continuous quality improvement activity

Jones EMS Quality Plan in Action

- Results of the continuous quality improvement activity:
  - A total of 378 reports were either missing or incomplete prior to implementation.
  - A total of 126 reports were identified as incomplete or not in the system after implementation of the quality management plan.
  - Thus the organization achieved a 67 percent improvement within 6 months after initiating the improvement initiative.

Jones EMS Quality Plan in Action

- The success of the Jones EMS Department clearly demonstrates what can be achieved if an organization has an organized and systematic quality management program that it can rely on when addressing underperforming processes or systems.

Jones EMS Quality Plan in Action

- Moving forward, the Jones EMS Department knew it was important to identify when any variations occurred from the expected outcomes for all organization-wide processes and systems, to:
  - Ensure that quality control measures were in place to prevent variations from the expected outcomes
  - Sustain the new quality management program

Jones EMS Quality Plan in Action

- The organization, within a very short time, improved its outcomes by two-thirds, and there was potential for further improvement.

Selecting a Quality Management Program

- The information included in this section is intended to serve as an introduction to commonly used quality management programs.

Selecting a Quality Management Program

- When discussing quality management programs, similar programs may be referred to by different names.
- For example, several quality management programs use a total quality approach.
- However, the specific name of the program is likely to vary depending on the philosophy, quality tools, and the pioneer credited for creating the program.

Selecting a Quality Management Program

- The quality philosophies are similar in that they aim to:
  - Achieve total quality throughout the organization
  - Meet or exceed customer expectations
  - Increase revenue
  - Reduce waste
  - Ensure continuous improvement of the organization's processes and systems
  - Promote a culture of quality throughout the organization
  - Ensure that all team members have the necessary tools and training to achieve quality outcomes

Selecting a Quality Management Program

- The key for every organizational leader is choosing the program that will best fit the organization's needs.
- Options include but are not limited to:
  - Total quality management (TQM)
  - Six Sigma
  - ISO 9000
  - Baldrige National Quality Program

Table 5-1 Total Quality Leaders	
Leader	**Philosophy**
W. Edwards Deming	Deming was invited by Japanese leaders to give lectures and provide guidance about quality in the post–World War II country. Although Walter Shewhart conceived the plan–do–check–act (PDCA) model, Deming was an influential advocate of the model, used statistical methods for process control, and was known for his 14 principles (presented in his book *Out of the Crisis*) used to make organizations highly effective. The introduction of Deming's 14 principles marked the beginning of the TQM movement.
Joseph M. Juran	Juran was a quality leader sought out by Japanese organizational leaders, in 1952, to give lectures and provide consulting on quality management. According to Juran, managing for quality consists of quality planning, quality control, and quality improvement—collectively known as the Juran trilogy.
Kaoru Ishikawa	Ishikawa, the so-called "father of Japanese quality control efforts," developed the concept of company-wide quality control (CWQC), quality circles, and quality education. He emphasized company-wide participation and seven basic quality tools: ■ Flow charts ■ Check sheets ■ Pareto charts ■ Cause and effect diagrams ■ Scattered diagrams ■ Control charts ■ Histograms

(*continues*)

Selecting a Quality Management Program

This table lists seven prominent leaders of the quality movement and summarizes their philosophies.

Table 5-1 Total Quality Leaders (continued)	
Leader	**Philosophy**
Armand V. Feigenbaum	Feigenbaum is credited with developing total quality control (TQC) in an attempt to achieve quality. His basic principles emphasized serving internal and external customers and ensuring competitive advantage, market share, and productivity.
Genichi Taguchi	Taguchi was an engineer and statistician who is credited with developing specific quality techniques, known as the Taguchi Methods, to improve quality and reduce cost. One of these methods, quality loss of function, is a tool (an equitation) used to quantify customers' diminishing perception of value as production variation occurred, resulting in poor quality outcomes. Taguchi's methods focused on improving products and processes. Taguchi is credited with being the first person to identify the relationship between quality outcomes and cost.
Philip B. Crosby	Crosby concluded that quality performance issues could be addressed within the current management structure of an organization. His quality philosophies included the following: ■ Do it right the first time (DIRFT) and prevent multiple attempts to achieve quality outcomes of the same product or service. ■ Understand the process of manufacturing goods or delivering service. ■ Include the concept of "zero defects" as a performance measure and encourage managers to determine the price of not delivering quality goods or service.
Frederick Taylor	Taylor was an engineer and scientist credited with the development of industrial efficiency. Taylor conducted workplace experiments to find ways to achieve maximum performance efficiency, leading to what is known as Taylorism. Taylorism consists of the following basic scientific management principles: ■ Determine the most efficient way to get the work done. ■ Managers should spend time planning and training employees, while allowing the employees to complete the work tasks. ■ Evaluate employee performance and implement instructions to ensure that the most efficient methods of achieving the set tasks are being achieved. ■ Employees must be aligned with the jobs that match the employees' skill sets to achieve optimal performance efficiency.

Selecting a Quality Management Program

This table lists seven prominent leaders of the quality movement and summarizes their philosophies.

Selecting a Quality Management Program

- Once a quality management program has been selected, the EMS officer will need to determine which activities and tools are part of the adopted quality management program.
  - It does not matter which tools or which quality program is selected.
  - As long as quality initiatives are taking place throughout all levels of the organization, the organization is on the path to achieve total quality management.

Selecting a Quality Management Program

- Prior to the selection of any quality management program, the EMS officer or organizational leader responsible for introducing a quality program must have formal quality management training.

Selecting a Quality Management Program

- Several of the quality management programs in use today were created by highly regarded quality and management leaders of the past.
- One quality management leader in particular was regarded as a quality guru: Dr. W. Edwards Deming.
- His quality management programs were credited with contributing to the success of many well-known organizations.

Selecting a Quality Management Program

- Although several quality management programs might potentially serve an EMS organization well, choosing the quality management program that will best fit the organization, its employees, and its customers is critical.
- What works for one organization might not work for your own organization.

Selecting a Quality Management Program

- Ask yourself what you are trying to accomplish, why you are trying to accomplish it, and how you can get there.
- Quality management is not a “one size fits all” proposition.
- Rather, it must be tailored to the organization’s desired outcomes.

Selecting a Quality Management Program

- A few quality management programs are described in the remainder of this section.
- Only a brief introduction to each of these programs is provided here.
- If one of these programs will be adopted, additional research into its specific components will be required.
- Training must be a key priority for any quality initiative.

Total Quality Management

- Total quality management is a management philosophy and program that emphasizes the importance of continuously improving processes and systems so as to deliver quality products and service.

Total Quality Management

- In addition, TQM strives to meet and exceed customer expectations by eliminating variations within the organization's service delivery outcomes.
- TQM is not just about data, charts, and measuring outcomes, however.
- It is also about people, both internal and external to the organization.

Total Quality Management

- The statistical charts that led to TQM were developed in 1923 by Walter Andrew Shewhart, an American engineer, physicist, and statistician.
- Shewhart is considered the father of statistical quality control.

Total Quality Management

- As manufacturers in Japan transitioned from production of military equipment to production of civilian goods after World War II, the quality of those companies' products often failed to meet customer expectations, resulting in a decreased demand for Japanese export goods.
- This trend, in turn, threatened the viability of Japanese manufacturing organizations.

Total Quality Management

- Japanese business leaders acknowledged that something needed to be done if they were to remain in business.
- They sought assistance from several quality experts and other industry leaders as they worked to improve their production outcomes.
- Working independently of each other, Japanese manufacturing leaders and engineers invited the quality experts Deming and Juran to assist them in establishing the foundation for quality initiatives within their organizations.

Total Quality Management

- The plan to turn around Japan's poor quality outcomes was embraced by Japanese business leaders.
- However, the plan included a different quality approach to doing business.

Total Quality Management

- Japanese business leaders acknowledged the importance of quality, but this new approach was based on “total” quality.
- In other words, quality needed not only to be in place to address certain products or services within the organization, but also to be present at all levels within the organization and with all team members.

Total Quality Management

- Total quality is a commitment to creating a culture of quality across all levels of the organization, ensuring:
  - That the goods and services meet or exceed customer expectations
  - That continuous improvement is at the center of every quality initiative

Total Quality Management

- Within about 20 years, the transition to “total” quality was achieved.
- Japan soon became recognized as the world’s leader in quality, surpassing its international competitors.
- American organizations, for their part, often focused on the price of a product rather than its quality.
- This approach ultimately led U.S. manufacturers to fall behind their Japanese competitors’ quality approach of doing business.

Total Quality Management

- Quality was not completely absent from all U.S. businesses during the middle to late 1970s.
- In fact, many American organizations did use statistical tools for product inspections and identification of poor product outcomes.
- Nevertheless, quality remained a low priority for many American businesses.

Total Quality Management

- During the 1980s, however, U.S. business leaders realized that they had no choice but to address quality concerns within their organizations if they were to remain competitive in the world market.
- It was through Deming's guidance that American organizations began to understand the importance of total quality and to adopt this approach.

Total Quality Management

- If TQM is the quality program adopted by the organization, training must be provided to all personnel on appropriate use of the tools that are part of the TQM program.
- Selecting, being familiar with, and using the tools necessary for continuous improvement is as important as selecting the quality management program that will best fit your organization.

Total Quality Management

- The following are key activities that support the TQM philosophy:
  - One hundred percent customer satisfaction (internal and external)
  - Prevention of variation from the desired outcome by committing to continuous improvement of processes and systems
  - Leadership-driven program
  - Corporate-wide initiative
  - Continuous improvement, elimination of waste, zero defects, and setting best practice benchmarks

Total Quality Management

- The following are key activities that support the TQM philosophy:
  - Establishing performance measures
  - Employee buy-in
  - Culture of quality
  - Quality training
  - Celebrating success
  - Employee empowerment

Total Quality Management

- When working with TQM, all participants must have a clear understanding:
  - That customer satisfaction is paramount
  - That quality improvement must be involved in every step of the value chain, from the start of the process to the end.
  - For TQM to work in your organization, everyone must be on board and willing to support the quality initiative

Six Sigma and Lean

- The Six Sigma quality management program focuses on achieving near-perfect outcomes.
- The goal with this program is to measure outputs, thereby:
  - Identifying variations within a process or system
  - Allowing the organization to make necessary improvements
  - Ultimately delivering a defect-free product or service

Six Sigma and Lean

- Six Sigma uses several tools (methodologies) for continuous improvement, including:
  - DMAIC
  - Critical to quality definitions
  - Cause and effect (fishbone) diagrams
  - Process flow charts

Six Sigma and Lean

- It is not uncommon to hear the terms Lean and Six Sigma used in the same sentence.
- The Lean quality program is based on the Toyota Production System (TPS).
- Although Lean and Six Sigma are slightly different in their approach to continuous improvement, they complement each other.

Six Sigma and Lean

- The Lean quality approach focuses on:
  - Eliminating waste (i.e., doing things over because of errors)
  - Eliminating excessive inventory
  - Using the necessary resources to ensure continuously flowing activities that add value to quality outcomes and enhanced speed of completing processes to meet or exceed customer expectations

Six Sigma and Lean

- When working within the Lean philosophy, the members of the organization identify the steps in each of the organization's processes and systems that add value and those that do not add value.
- By eliminating waste, the organization is able to:
  - Save money
  - Have higher profits
  - Be more efficient with its internal and external operations

Six Sigma and Lean

- Waste is any step within a process or system that does not add value to the internal and/or external customers.
- Waste can also take the form of excessive inventory, poor continuous improvement flow, and poor outcomes.

Six Sigma and Lean

- From an EMS perspective, waste is apparent when:
  - The organization purchases equipment that is seldom used, resulting in increased inventory
  - Poorly trained personnel translate into detrimental outcomes
  - Having an increased number of units in service during non-peak times leads to increased costs to the organization

Six Sigma and Lean

- Six Sigma, by comparison, focuses on identifying the variation (root cause) within a process and improving outcomes.
- Its goal is to deliver an error-free product or service.

Six Sigma and Lean

- Lean and Six Sigma work well together because an organization should ideally make a concentrated effort both to:
  - Prevent waste (Lean)
  - Deliver an error-free product or service (Six Sigma)
- Both of these quality activities can lead to a more profitable organization that exceeds internal and external customer expectations.

ISO 9000

- Like other quality management programs, the one set forth by the International Organization for Standardization (ISO) has its primary focus on delivering quality products and services.
- ISO is an organization comprising members from different countries that publish standards intended to ensure products and services are safe, reliable, and meet specific quality levels.

ISO 9000

- The ISO standards are geared toward a variety of industries:
  - ISO 9000, Quality Management
  - ISO 14000, Environmental Management
  - ISO 22000, Food Safety Management
  - ISO 31000, Risk Management

ISO 9000

- During the 1940s, delegates from several countries decided to create a new international organization to establish industrial standards (primarily in the manufacturing sector) that would ensure all products met the same quality specifications no matter where the products were sold.

ISO 9000

- ISO 9000 was created to ensure quality standards across all types of business sectors.
- This umbrella standard provides the framework for the ISO quality standardization program and includes terminology pertinent to ISO standards.

ISO 9000

- However, several subsections have since been formed to explore the individual components of the quality management program; for example:
  - ISO 9001 includes quality management program requirements.
  - ISO 9004 includes guidelines for making a quality management program more efficient and effective.
  - ISO 19011 includes guidelines for internal and external audits of quality management programs.

ISO 9000

- If an organization chooses to adopt ISO 9000 as its quality management program, it can either informally use the standards as guidelines to ensure quality outcomes or, more formally, seek to become a certified ISO organization.

ISO 9000

- The ISO 9000 standards and guidelines can be applied in any business organization because they:
  - Promote the use of quality management and continuous improvement activities
  - Stress the importance of closely monitoring all organizational processes, not just a few of the processes within the organization

ISO 9000

- As consumers, regardless of where we are in the world, it is important to know that when we purchase a product or use a service, the organization providing that product or service has implemented a set of standards that ensure its reliability and safety and its ability to meet our expectations.

ISO 9000

- When an organization demonstrates a commitment to quality, that commitment will both:
  - Set it apart from its competitors
  - Send a message to customers that the organization's product and service has met a set of quality standards that are continuously evaluated and improved
- ISO 9000, like many other quality management programs, is used to ensure quality outcomes.

The Baldrige National Quality Program

- During the mid-1980s, many organizations in the United States were struggling both to compete with their international rivals and to stay viable within their local area.
- One of the major reasons why U.S. businesses struggled in this era was because they had made few investments in quality management programs.

The Baldrige National Quality Program

- When U.S. companies started losing market share to international competitors, they had to adjust their business models and reexamine the importance of quality in their products or services.

The Baldrige National Quality Program

- In 1987, the U.S. Congress passed a bill, which was subsequently signed by President Ronald Reagan, geared toward recognizing organizations that demonstrated performance excellence by meeting a set of performance criteria.

The Baldrige National Quality Program

- The award established by this legislation, named after deceased Secretary of Commerce Malcolm Baldrige, identifies U.S. organizations that have demonstrated performance excellence within their organization as well as in their products and services.

The Baldrige National Quality Program

- Malcolm Baldrige National Quality Award recipients have met all seven categories demonstrating that they are truly performance excellence organizations:
  - Leadership
  - Strategic planning
  - Customer market focus
  - Measurement, analysis, and knowledge management
  - Workforce focus
  - Operations focus
  - Business results

The Baldrige National Quality Program

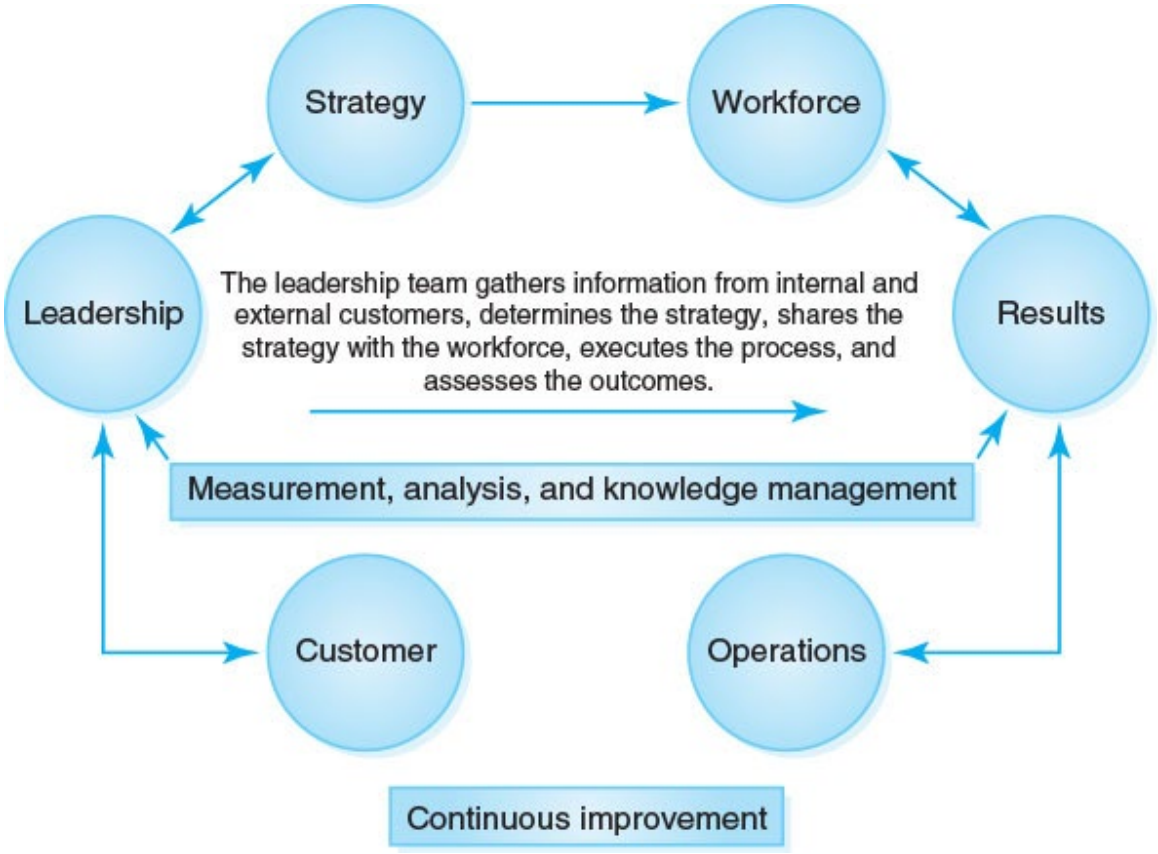
- Organizations seeking to adopt the Baldrige Performance Excellence Program must incorporate this framework into their core values and culture and answer the Baldrige Performance Excellence Program questions specific to each criterion.

The Baldrige National Quality Program

- To achieve the performance results the organization is seeking, it is important to understand what drives the quality management process.
- The seven criteria can be divided into three sections: leadership, system foundation, and results processes.

The Baldrige National Quality Program

- The leadership section is responsible for oversight of the organization's strategic planning and customer focus (criteria 1–3).
- The link between the leadership and the results activities is criterion 4: measurement, analysis, and knowledge management.
- The results section (criteria 5–7) focuses on the workforce, operations, and ultimately delivering the results.



The Baldrige National Quality Program

Figure 5-3 Baldrige Criteria for Performance Excellence.

The Baldrige National Quality Program

- Organizations may choose to use this program as a framework to ensure total quality throughout the organization or even apply for the Malcolm Baldrige National Quality Award.
- Like other quality management programs, the Baldrige Performance Excellence Program stresses the importance of continuous improvement.

Quality Tools for Continuous Improvement

- When working toward implementing a quality management program, the leadership team must learn the requirements and tools that are part of the program.
- Numerous tools have been developed, and many are used in multiple quality management programs.

Quality Tools for Continuous Improvement

- If a specific quality tool has proved beneficial when team members are working with continuous process improvement activities, then it should be used regardless of which quality management program has been adopted.
- Organizational leaders must keep in mind that the goal is to achieve total quality across the organization.
- Therefore, using tried-and-true tools must be the priority.

DMAIC

- DMAIC is a Six Sigma methodology tool that can help identify a process or system that should be improved.
- DMAIC—which stands for “define, measure, analyze, improve, and control”—can give the team a roadmap to ensure that everyone stays on track.

DMAIC

- *Define:*
  - The EMS officer clearly defines set goals and objectives for organizational processes and systems under his or her responsibility.
  - The EMS officer must routinely ask himself or herself whether the current organizational processes and systems are performing at optimal efficiency and effectiveness.
  - This is done by reviewing key performance indicators (KPIs) and defining the goals that must be met to achieve the desired outcomes in meeting or exceeding customer expectations.

DMAIC

- *Measure:*
  - Metrics are set to evaluate performance outcomes.
  - Each measure must be specifically defined to include what is being measured and how it must be measured, to maintain consistency.
  - The EMS officer must review the functional unit's or organization's processes and systems and collect data to determine whether the functional unit or organization is achieving the set goals.

DMAIC

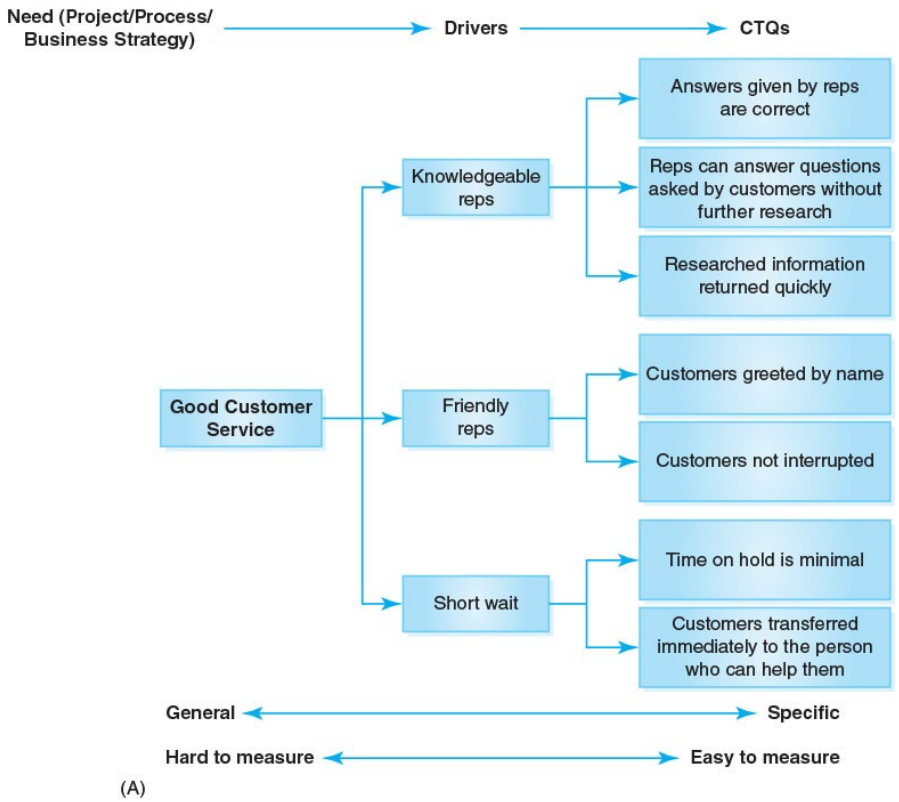
- *Analyze:*
  - The EMS officer gathers all data that suggest the presence of a problem (not meeting KPIs) and begins to uncover the root cause of the variation in the desired outcome.
  - The EMS officer continuously analyzes current processes, technology, customer needs, and external forces that are continuously changing.
  - What was once a quality process may, however, be outdated 6 months or a year later.

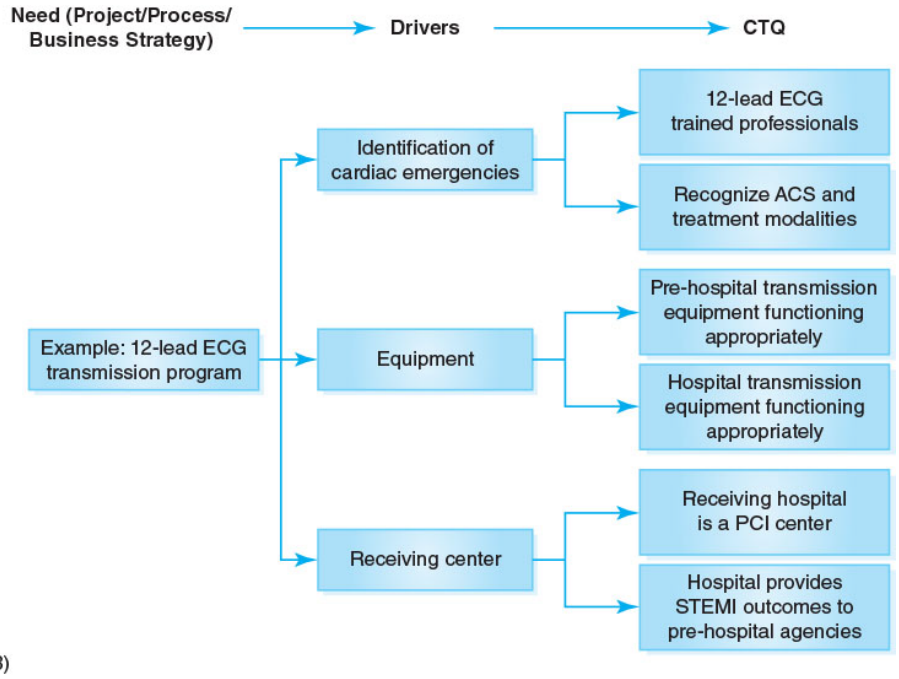
DMAIC

- *Improve:*
  - The EMS officer removes the root cause of the underperformance by either implementing a new process, improving the current process, or eliminating the process if it does not add value.
  - The EMS officer must also empower team members across the organization to make the necessary adjustments to improve the process.

DMAIC

- *Control:*
  - The EMS officer monitors the new processes to ensure that the root cause of the problem has been removed and that the problem/variation will not recur.
  - The officer must be diligent to eliminate variations from quality production.





Critical to Quality Tree

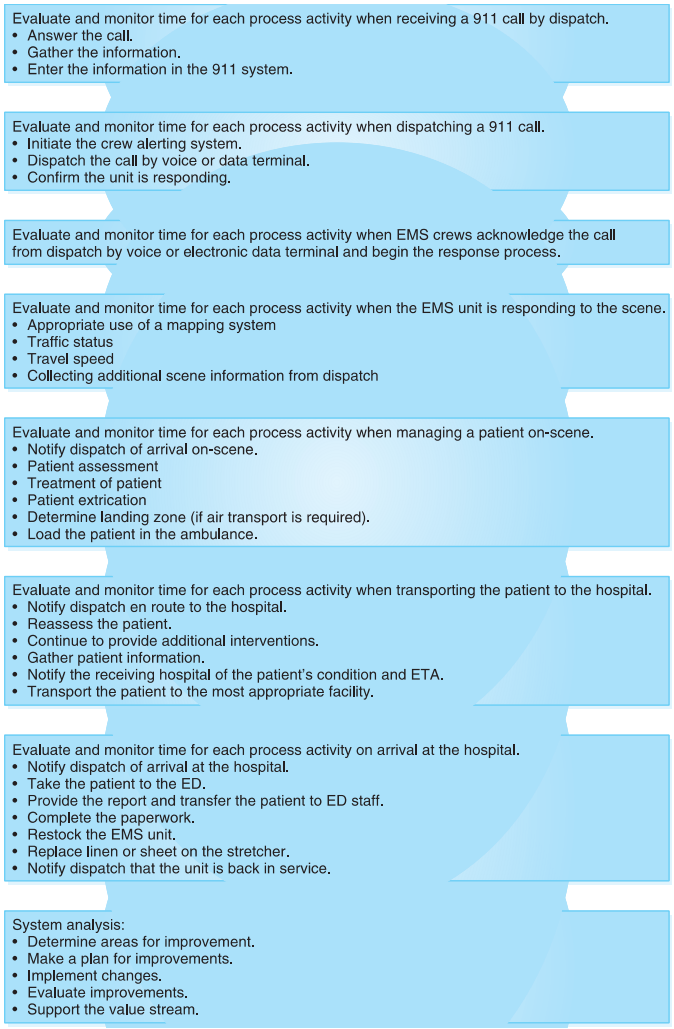
Figure 5-4 A. Sample CTQ tree. B. A 12-lead ECG transmission project set in a CTQ tree.

Value Stream Mapping and Process Flow Chart

- Part of any continuous improvement process is a clear delineation of the steps required to evaluate the activities and to improve the flow of production or service delivery.
- Value stream mapping and process flow charts are two quality tools regularly used within the Lean quality program.
- However, they can also be used on their own (without Lean) to improve processes.

Value Stream Mapping and Process Flow Chart

- Value stream mapping (VSM) is a technique that is used to illustrate the steps in a process or system and that can be extremely beneficial for an EMS officer who is attempting to track the flow of EMS activities.
- VSM requires analyzing each step in detail to provide information that will allow the quality management team to determine which improvements need to be made.



Value Stream Mapping and Process Flow Chart

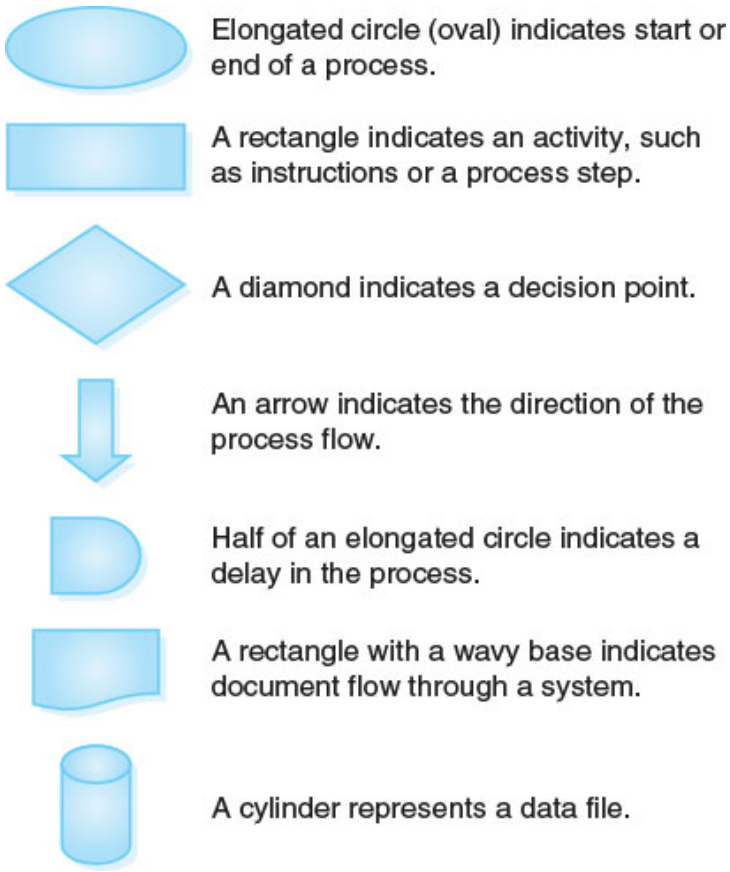
Figure 5-5 Value stream mapping (EMS response).

Value Stream Mapping and Process Flow Chart

- Each of the components of the value stream map must be dissected and analyzed to determine whether each activity is functioning effectively and efficiently.
- The goal is to have the entire process or system be as efficient and effective as possible and to eliminate wasted activities that add no value in meeting or exceeding customer expectations.

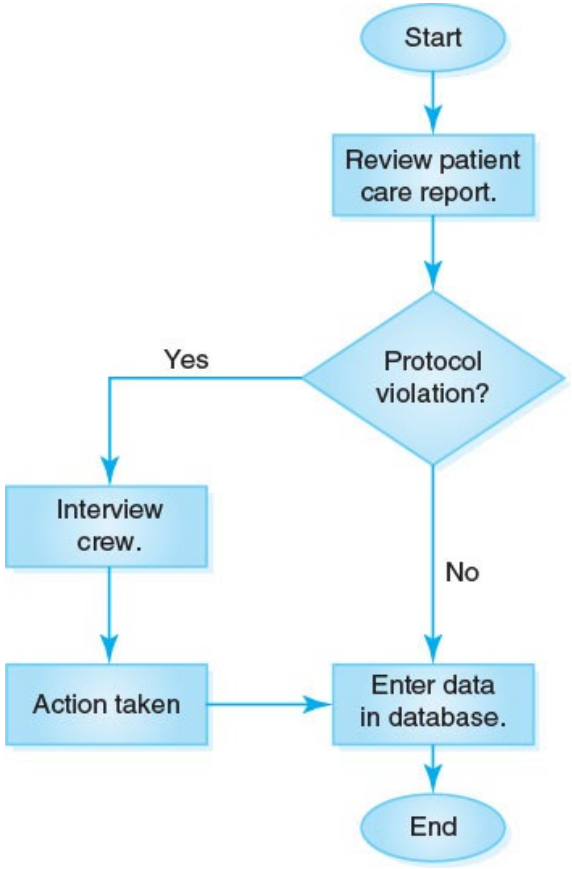
Value Stream Mapping and Process Flow Chart

- If analyzing each step in a process is not required, but a general overview of a process or a system is needed, a process flow chart will be extremely helpful.
- Such a chart includes the start and finish points within a process and the tasks that make up the process.



Value Stream Mapping and Process Flow Chart

Figure 5-6 Common process flow chart symbols.

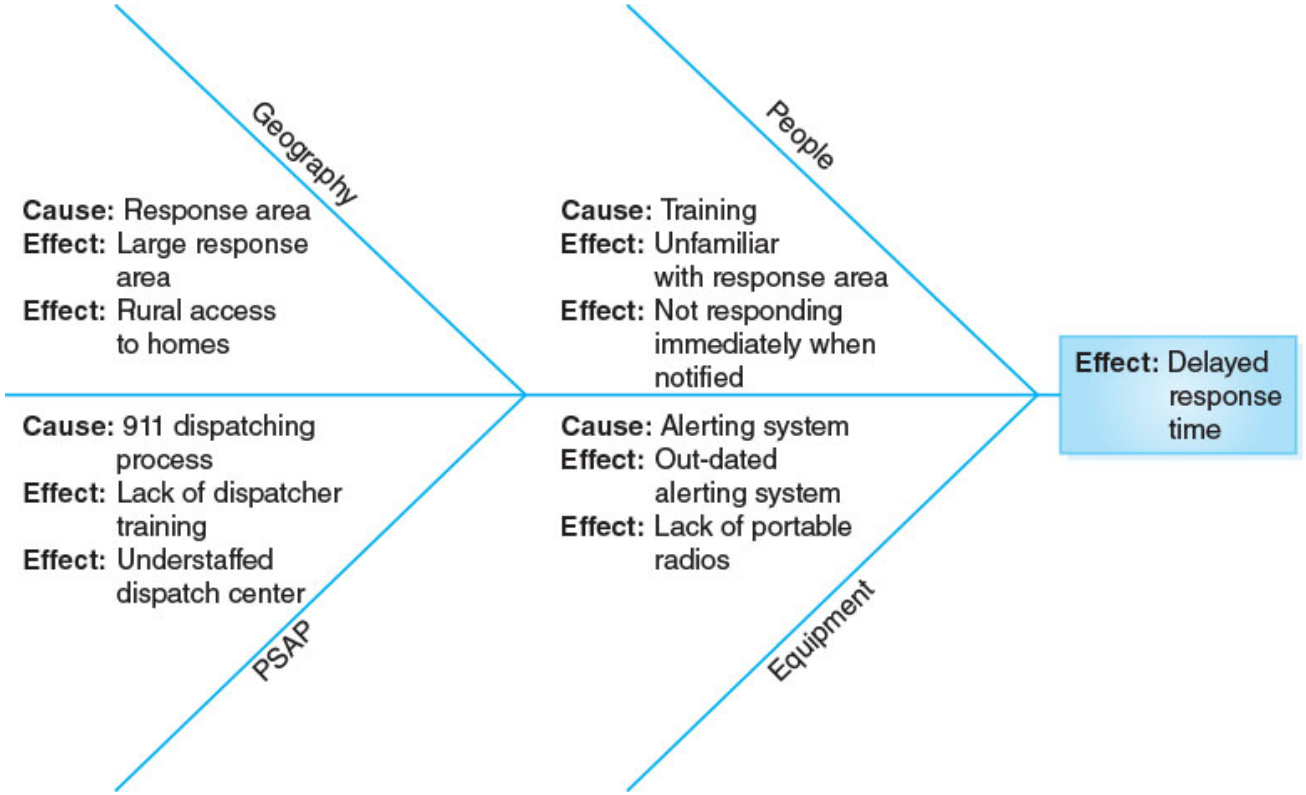


Value Stream Mapping and Process Flow Chart

Figure 5-7 Sample process flow chart.

Cause and Effect (Fishbone) Diagram

- After discovering a variation in a process or system, determining the root cause of that variation is critical to eliminating it, and selecting the right cause and analysis tool is a priority.
- With this tool, you can move backward from the ultimate effect and determine which causes and effects in different areas helped lead to the ultimate effect.



Cause and Effect (Fishbone) Diagram

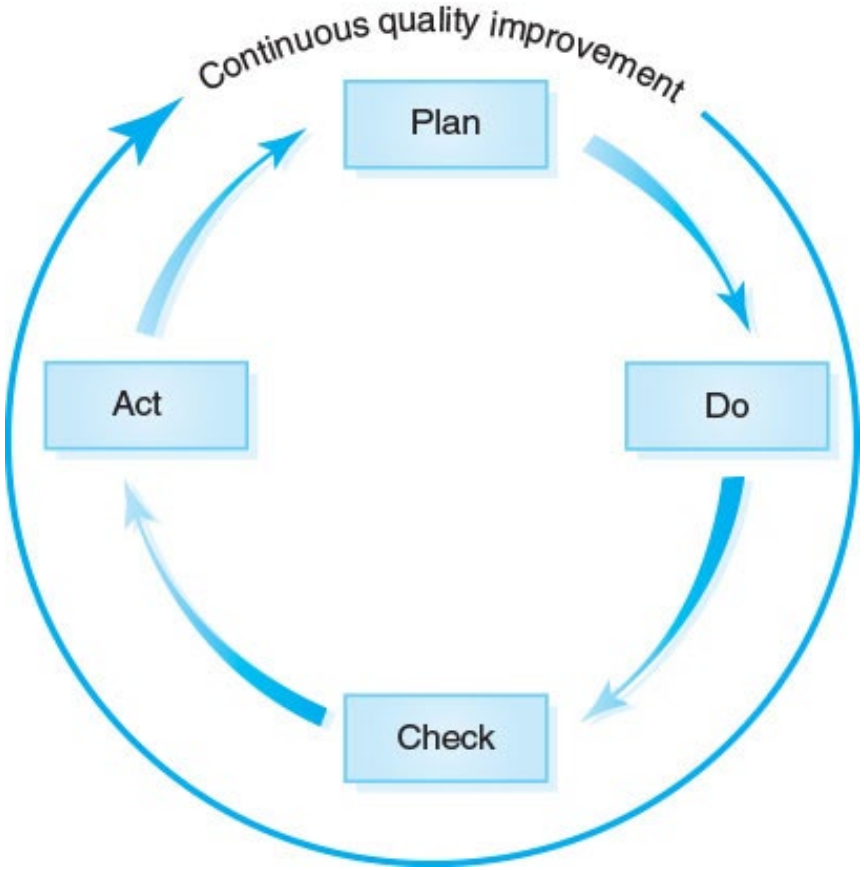
Figure 5-8 Fishbone diagram showing cause and effect.

Plan–Do–Check–Act

- Plan–do–check–act (PDCA) is a cycle used as part of the continuous improvement process.
- The PDCA cycle is included in many quality management programs, such as ISO and the Baldrige Performance Excellence Program.
- However, it can certainly be part of any organization's continuous improvement business activity.
- The PDCA is used to control and manage continuous improvement.

Plan–Do–Check–Act

- When attempting to eliminate a quality control issue, you may consider this plan, which consists of the following elements:
  - *Plan:* Design or redesign a business process by setting goals that will meet or exceed internal and external customer expectations.
  - *Do:* Execute the plan to achieve the goals set in the plan phase.
  - *Check:* Determine how well the plan is working by measuring its performance.
  - *Act:* Support the plan if it is successful.



Plan–Do–Check–Act

Figure 5-9 The PDCA cycle.

Benchmarking

- To evaluate how well the EMS organization or division is performing, the EMS officer must have a thorough understanding of the organization's practices, processes, systems, products, and services.
- In addition, the EMS officer must review the performance outcome data pertaining to the processes and systems.
- Only then will he or she have the opportunity to make truly beneficial improvements.

Benchmarking

- The data can be captured:
  - By calling other organizations or networking with other professionals during seminars
  - By reading posted information about the organization on its website
  - Through electronic surveys
- Once gathered, the data can then be compared to your organization's performance data to determine how well your organization matches up with its competitors.

Benchmarking

- Benchmarking means comparing your business processes, practices, and metrics to those of organizations that are industry leaders.
- Several types of benchmarking should be considered when creating a benchmarking plan:
  - Competitive benchmarking
  - Functional benchmarking
  - Internal benchmarking
  - Strategic benchmarking

Benchmarking

- Performance measures and benchmarking must be part of every organization's continuous improvement plan.
- The EMS officer must have a system in place to:
  - Evaluate EMS performance outcomes
  - Evaluate and implement new benchmarks
  - Make improvement
  - Ensure that the organization is exceeding customer service expectations

Balance Scorecard

- A balance scorecard is a management tool that focuses on aligning key business practices and processes with the vision, mission, and strategy of the organization.
- It is used by numerous service industry organizations, and its goal is to ensure that the organization is well balanced to provide quality products and services.

Balance Scorecard

- The balance scorecard, which was developed by Drs. Robert Kaplan and David Norton as a performance measurement framework, assesses the organization from four perspectives:
  - *Learning and growth perspective*
  - *Business process perspective*
  - *Customer perspective*
  - *Financial perspective*

Balance Scorecard

- These four perspectives are essential in ensuring that the organization is balanced to achieve the desired outcomes.
- They are not just part of the 5 BPs, but must also be part of the organization's strategic plan.

Table 5-3 Sample Balance Scorecard			
Perspective	**Goal**	**Measure**	**Target**
Learning perspective	Train department paramedics in critical care paramedicine	CCEMT-P certification	50% of department paramedics must be certified
Financial perspective	Decrease budget expenses	Organization's master budget	10% overall annual reduction in expenses
Customer perspective	Achieve a customer satisfaction survey score > 4.5	Customer surveys	Achieve > 4.5 on a 1–5 Likert scale (1 = lowest score; 5 = highest score)
Business perspective	Add one EMS station each year for the next 5 years	New EMS station being operational by providing service delivery to the community	Completion of one EMS station each year for the next 5 years and completed within the 1-year time frame from the start date

Balance Scorecard

With these perspectives in mind, the next step is to determine the goals, measures, and targets specific to each of the four perspectives.

Basic Statistical Tools

- In addition to other quality management tools, statistical tools are used to measure outcomes.
- Although many of the statistics can be computed using a calculator, it is advisable to explore the wide variety of statistical functions found in Excel and similar spreadsheet programs.
- They can prove highly beneficial when you are working with large numbers and multiple data sets.

Basic Statistical Tools

- Although quality management programs include many statistical elements, you do not need to be a statistician to implement the program.
- Basic math skills are typically sufficient.
- Training that includes more advanced math skills, however, may enable the team to have deeper understanding and wider use of the quality management tools at their disposal.

Basic Statistical Tools

- Several basic statistical terms, measurements, and charts can help when working with process improvement management.

Basic Statistical Tools

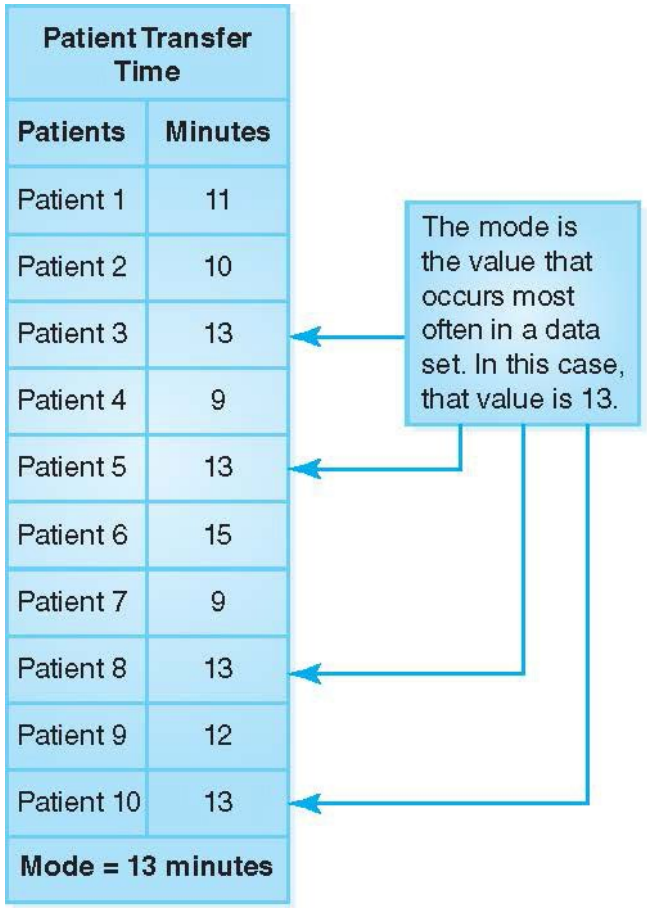
- Mean: The sum of the values divided by the number of values; the average.
- *Example:*
  - The Jones EMS Department wanted to know the average number of EMS transports per ambulance during a specific year.
  - To provide this value, the team took the number of transports for the year, and then divided that number by the number of Jones EMS ambulance units.

EMS Units	Number of Transports	EMS Units	Number of Transports
Med 1	1225	Med 12	908
Med 2	1449	Med 13	1933
Med 3	1404	Med 14	2272
Med 4	1063	Med 15	492
Med 5	1683	Med 16	891
Med 6	1430	Med 17	1825
Med 7	1710	Med 18	1439
Med 8	1918	Med 19	2388
Med 9	825	Med 20	993
Med 10	1667	Med 21	1229
Med 11	765	Med 22	695
		Mean	**1373**

Add the number of transports for all units (30,204) and divide that total by the number of EMS units (22) to find the mean transports per EMS unit (1373).

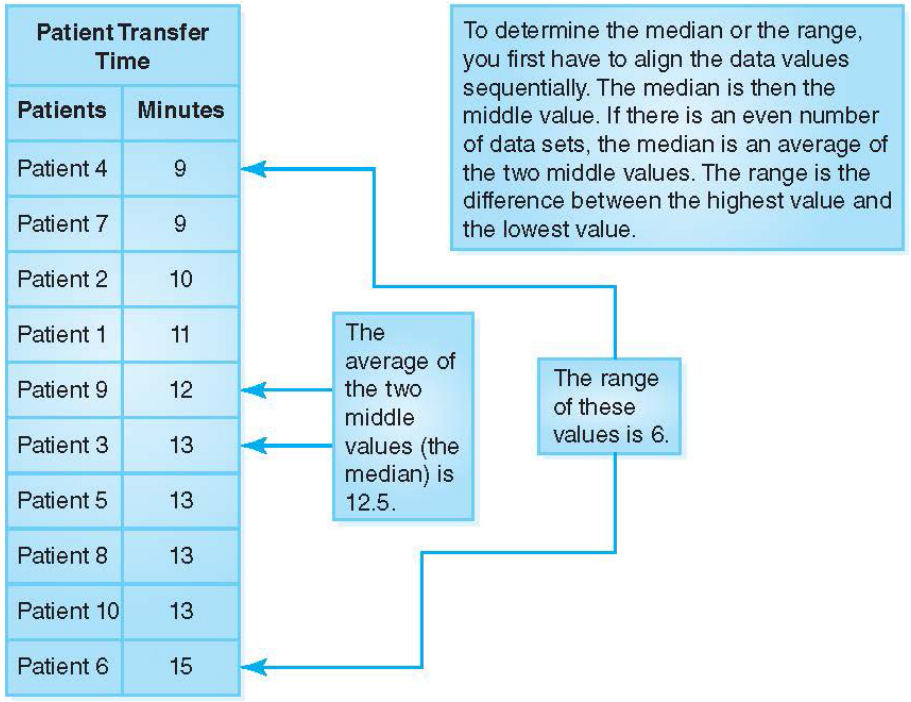
Basic Statistical Tools

- Mode: The value that occurs most often.
- *Example:*
  - The Jones EMS Department was analyzing the number of minutes it was taking to transfer patient care to a local emergency department during peak time and identified the most common transfer time (the mode).



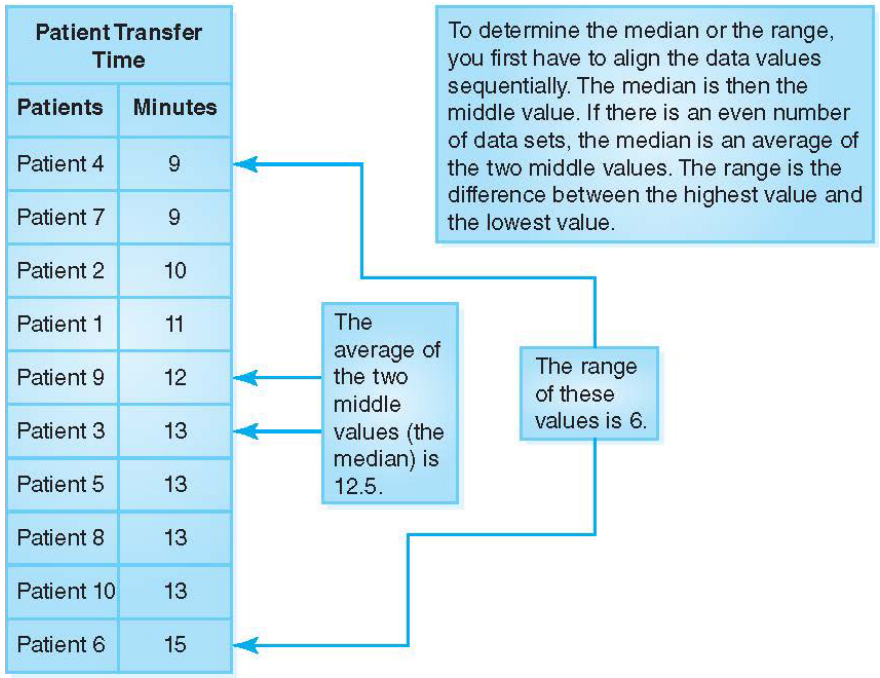
Basic Statistical Tools

- Median: The midpoint in a series of values.
- *Example:*
  - Using the same data for patient transfer times, the Jones EMS Department wanted to obtain the median, which is the center point of the data.
  - The median represents the halfway point of the entire data set.
  - The data must be placed in ascending order and then the number in the middle is selected.



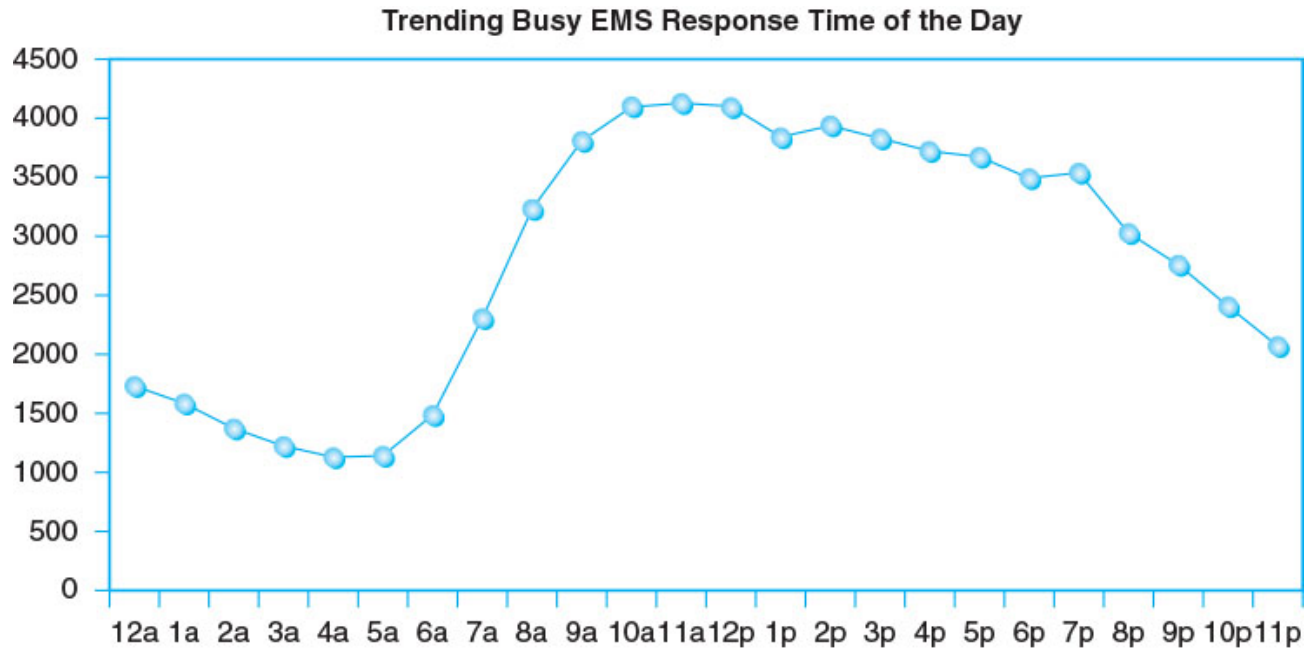
Basic Statistical Tools

- Range: The difference between the highest and lowest numbers in a set of values.
- *Example:*
  - Using the patient transfer data, the Jones EMS Department wanted to know the range of the data, which would provide insight as to the spread from the lowest data set to the highest.



Basic Statistical Tools

- Trend: A movement of a series of data points in a specific direction over time.
- In the Six Sigma quality methodology, six or more points continuously increasing or decreasing from the median and in the same direction indicate a trend.
- *Example:*
  - The Jones EMS Department was exploring the addition of a peak ambulance unit and needed to determine an in-service time frame.
  - The department conducted a year-long analysis of the number of responses at different times of day.

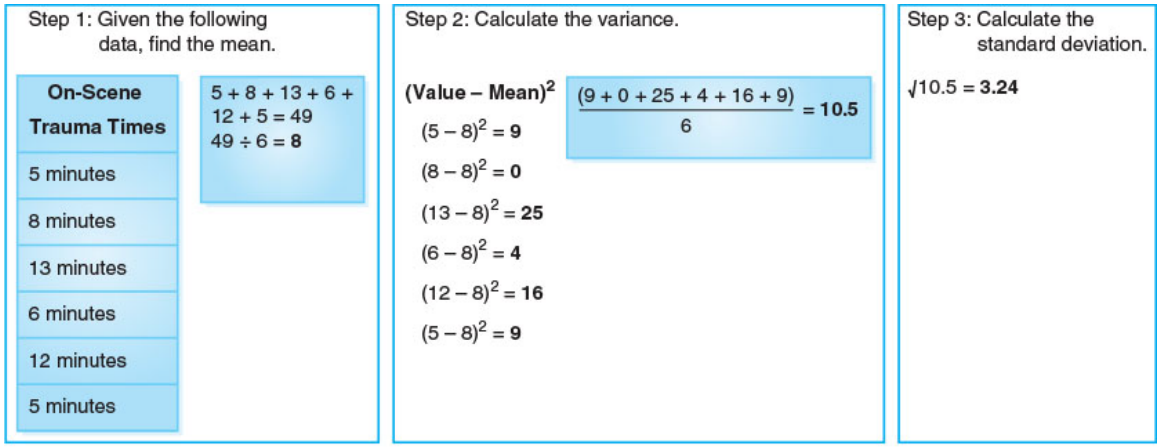


Basic Statistical Tools

Figure 5-12 Sample trend graph.

Basic Statistical Tools

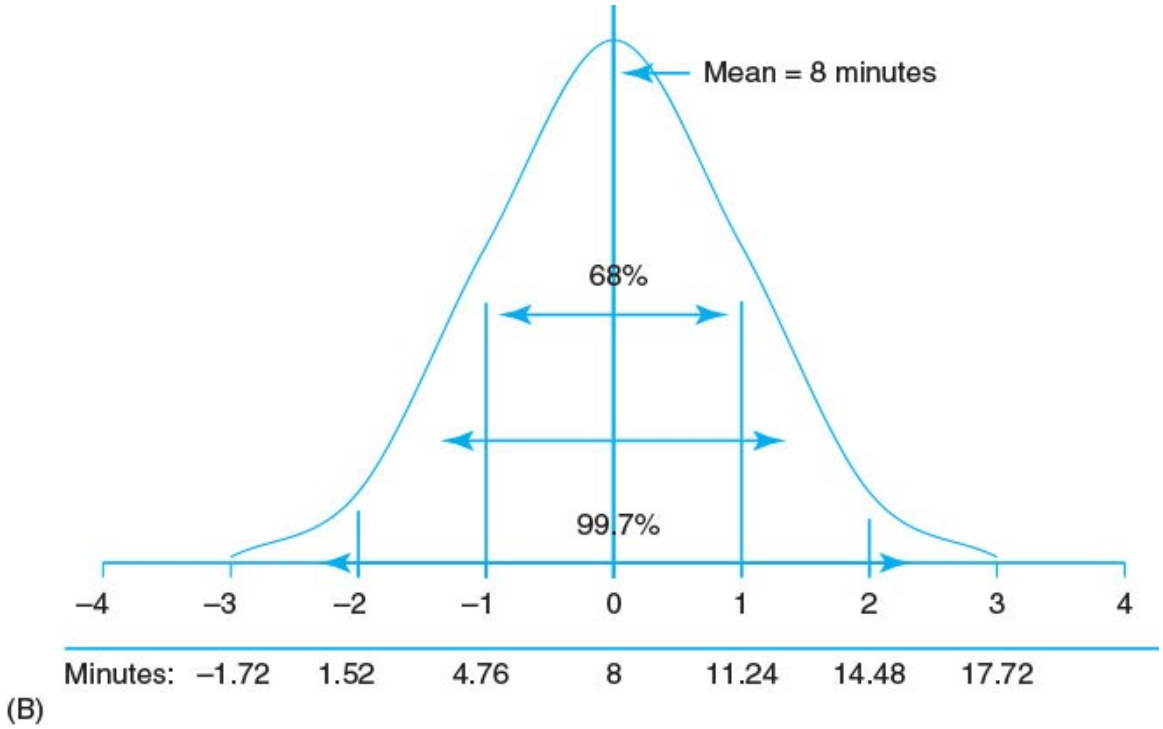
- Variation: A value or data point that differs from the mean.
- Standard deviation: The amount of variation or distance from the mean.
- *Example:*
  - Jones EMS Department has an average on-scene trauma time of 8 minutes, which meets its on-scene performance benchmark of less than 10 minutes.
  - When analyzing all data points, however, the following on-scene times are observed: 5 minutes, 8 minutes, 13 minutes, 6 minutes, 12 minutes, and 5 minutes.
  - Thus two data values not only exceed the organization's benchmark, but exceed it by at least 50 percent.



(A)

Basic Statistical Tools

Figure 5-13 A. Sample calculation of standard deviation.

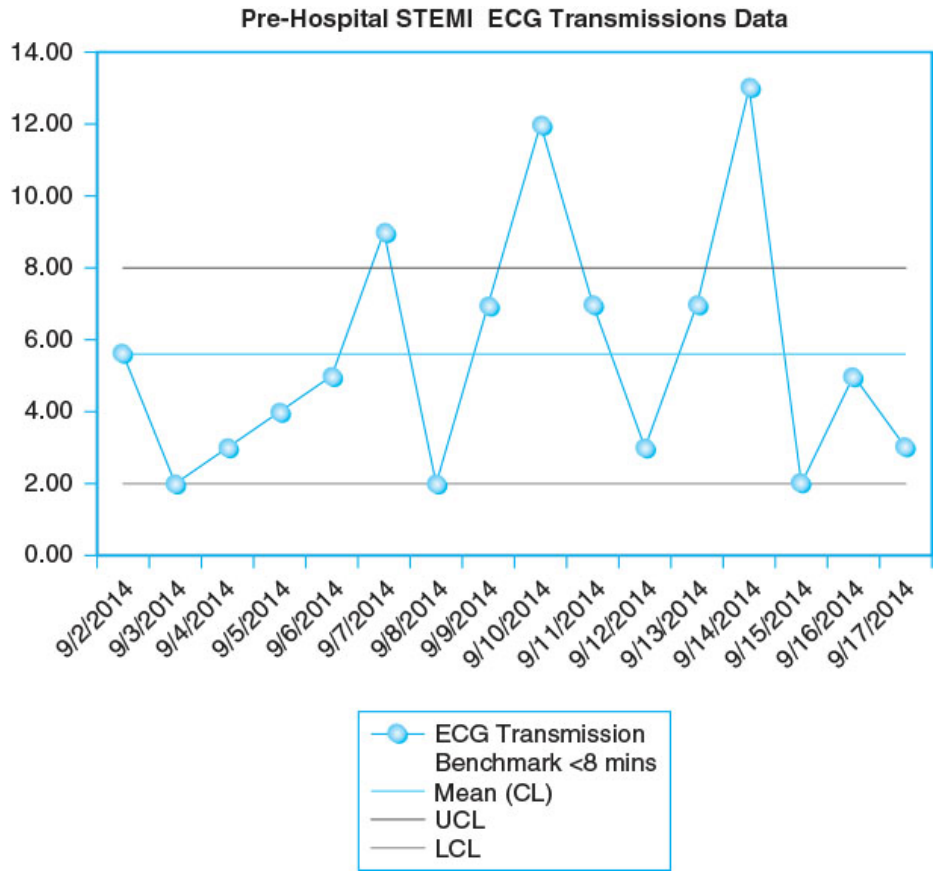


Basic Statistical Tools

Figure 5-13 B. Normal distribution curve for sample data.

Basic Statistical Tools

- Control limit chart: A chart with upper and lower limit specifications that pertain to a process or system.
- Control charts are beneficial in detecting variations and can be used within any business organization.

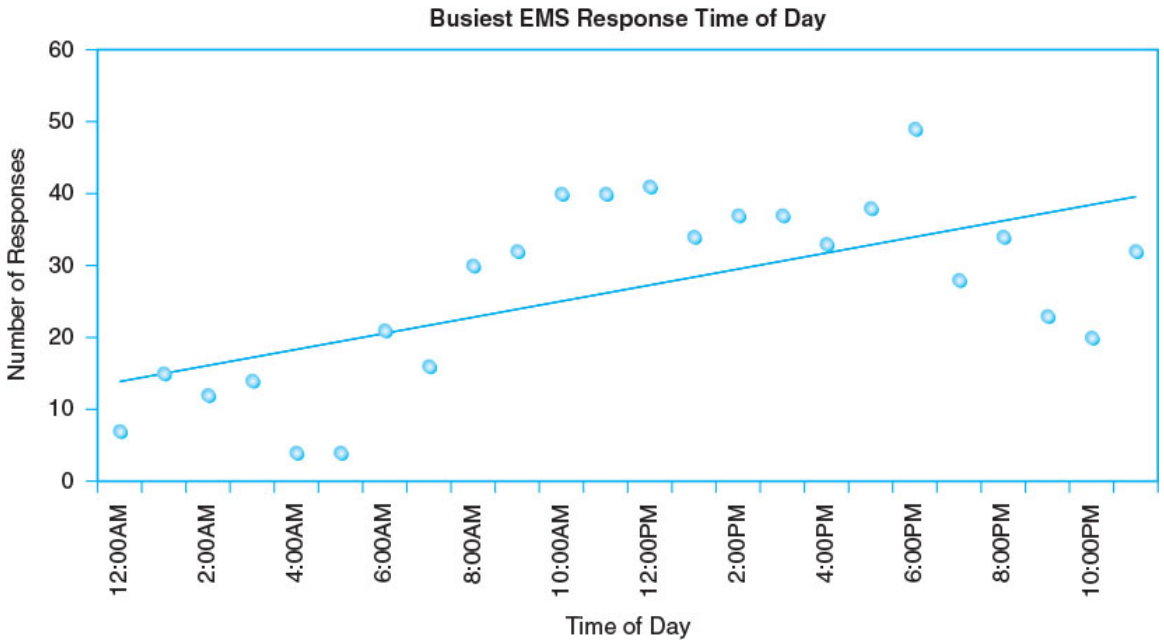


Basic Statistical Tools

Figure 5-14 Sample control limit chart.

Basic Statistical Tools

- Scatter plot: A graph in which individual data points are plotted in two dimensions to show their relationship.
- *Example:*
  - An EMS organization was considering the implementation of several peak-time response units and wanted to identify the busiest times for service delivery requests.
  - The quality management team captured response data and placed it in a scatter plot for discussion and strategy planning.

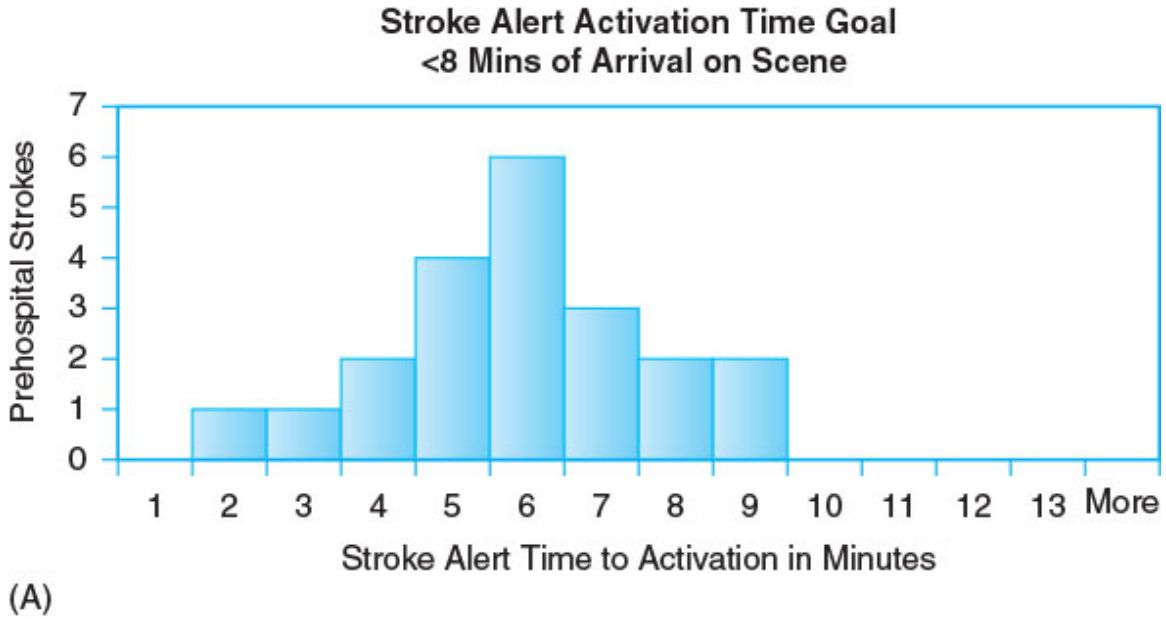


Basic Statistical Tools

Figure 5-15 Sample scatter plot chart.

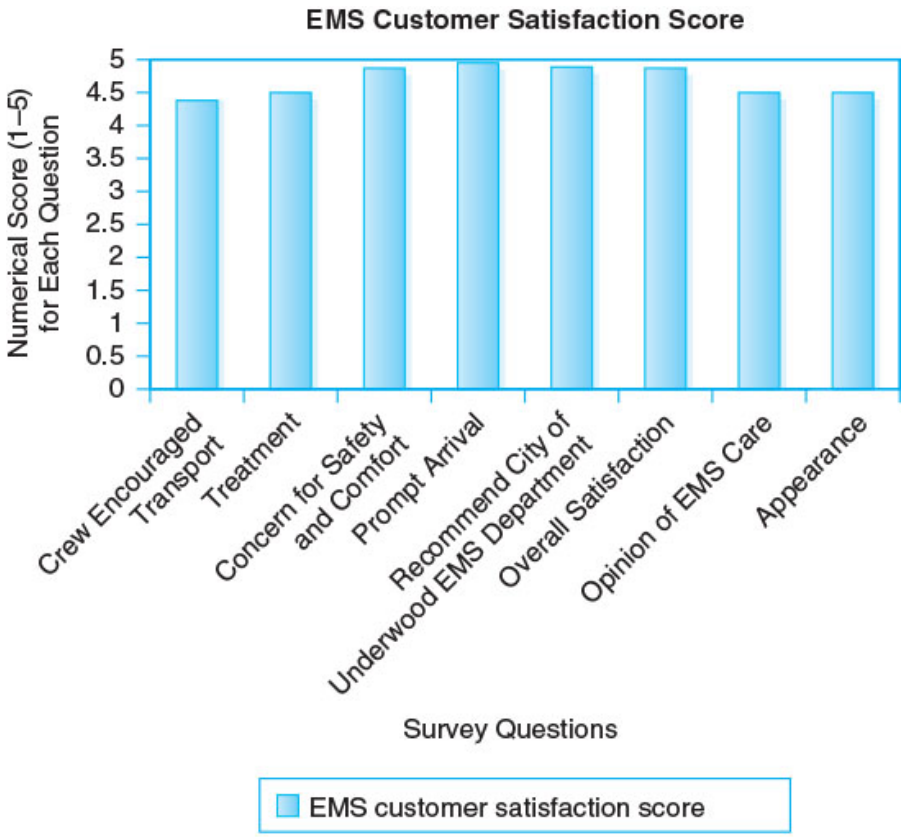
Basic Statistical Tools

- Histogram: A group of vertical bar graphs illustrating data points and the frequency of each data point.
- *Example:*
  - The Jones EMS Department wanted to review the time it took crews to identify a stroke patient.
  - The quality team observed, by using a histogram, that most medical emergencies were being identified as strokes within 6 minutes.



Basic Statistical Tools

Figure 5-16 A. Sample histogram.



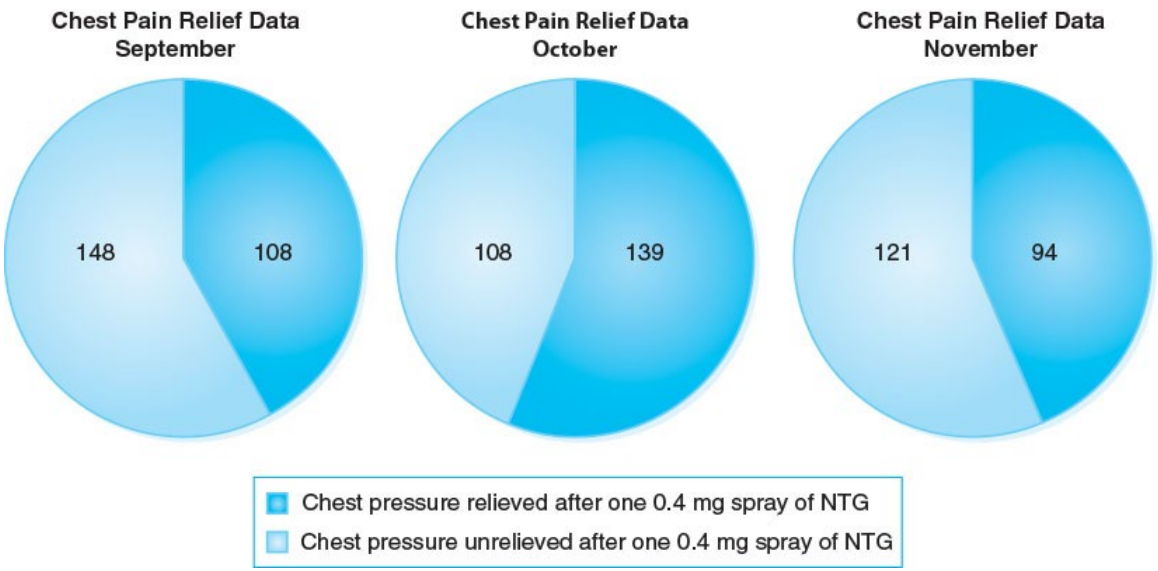
(B)

Basic Statistical Tools

Figure 5-16 B. Sample bar graph.

Basic Statistical Tools

- Pie chart: A circular graph divided into sections containing specific data assigned to each section.
- *Example:*
  - The medical director requested a review of pain relief provided to patients with chest pain.

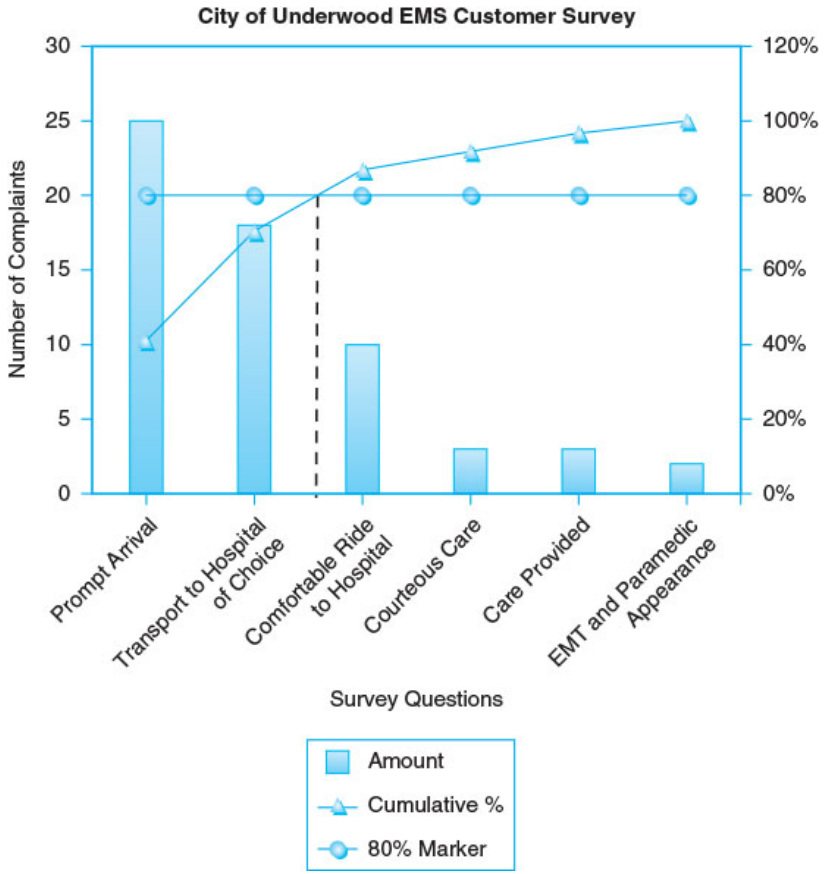


Basic Statistical Tools

Figure 5-17 Sample pie charts following data over a 3-month period.

Basic Statistical Tools

- Pareto chart: A graphical bar view, where bars are in descending order, representing the greatest issues affecting an organization.
- It helps identify where improvements should be made, based on the principle that 20 percent of sources are creating 80 percent of the problem (80/20 rule).
- *Example:*
  - The City of Underwood EMS chief wanted to address what areas of EMS service delivery could be improved.



Basic Statistical Tools

Figure 5-18 Pareto chart.

Basic Statistical Tools

- Frequent use of these tools will:
  - Improve your proficiency with them
  - Allow you to learn more about data processing and how it can facilitate some of your managerial duties
- Setting up the analysis accurately and inputting the appropriate data will produce a clear picture that will help you make better business decisions.