



1995

Total Quality Management in Physical Therapy: A Primer for Physical Therapists in Search of Quality

Brian C. Kittelson
University of North Dakota

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TOTAL QUALITY MANAGEMENT IN PHYSICAL THERAPY:
A Primer for Physical Therapists in Search of Quality

by

Brian C. Kittelson
Bachelor of Science in Physical Therapy
University of North Dakota, 1994



An Independent Study

Submitted to the Graduate Faculty of the

Department of Physical Therapy

School of Medicine

University of North Dakota

in partial fulfillment of the requirements

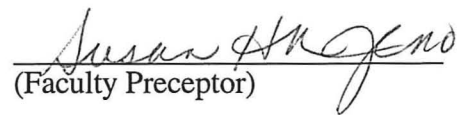
for the degree of

Master of Physical Therapy

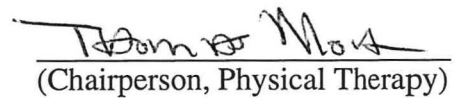
Grand Forks, North Dakota

May
1995

This Independent Study, submitted by Brian C. Kittelson in partial fulfillment of the requirements for the Degree of Master of Physical Therapy from the University of North Dakota, has been read by the Faculty Preceptor, Advisor, and Chairperson of Physical Therapy under whom the work has been done and is hereby approved.


(Faculty Preceptor)


(Graduate School Advisor)


(Chairperson, Physical Therapy)

PERMISSION

Title Total Quality Management in Physical Therapy

Department Physical Therapy

Degree Master of Physical Therapy

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Signature Brian C. Kellerman

Date 12-19-94

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ACKNOWLEDGMENTS

Special thanks to the following people:

- Erin Simonds, member of the UND PT faculty, for sparking my interest in TQM and encouraging me to write this primer.
- Sue Jenö, my preceptor, for her input and encouragement during the writing of this primer.
- Kara Klosterman, fellow classmate, for her helpful proofreading efforts.
- Stuart Mettler and Shaun D. Lehmann, former roommates, for the extensive use of their computers.
- My parents, Rena Kittelson and Craig Kittelson, for their love, support, and encouragement throughout the years.

Also many thanks to:

- All UND PT faculty and staff for a top notch PT education and three wonderful years.
- All of my classmates from the Class of 95 for many great memories.

ABSTRACT

Total quality management (TQM), a management system first successfully utilized in the manufacturing industry, has gained much popularity in the healthcare industry over the past few years. Books, articles, conferences, workshops, and video tapes that teach health care executives how to utilize TQM in their organizations abound. Unfortunately, resources which specifically apply the TQM philosophy and tools to the practice of physical therapy are few. The purpose of this project is to provide a resource that introduces the philosophy, methods, and tools of TQM with applications to the physical therapy setting.

Chapter one briefly discusses the general history of TQM in manufacturing and health care and also provides an introductory definition of TQM. Chapter two elaborates on several of the primary principles of TQM and notes potential applications of these principles in physical therapy practice. Chapter three discusses the fundamental differences between the traditional approach to quality management in physical therapy, Quality Assurance (QA), and TQM. Chapter four introduces a practical, step-by-step model called FOCUS-PDCA and discusses how physical therapists can apply this model to the physical therapy setting. Chapter five describes several TQM tools and provides examples which illustrate how these tools can be applied to physical therapy practice. Finally, a list of healthcare-related and non-healthcare-related TQM resources is provided for persons wishing to engage in a more in-depth study of TQM.

Preface

Total quality management (TQM), a management system first successfully utilized in the manufacturing industry, has achieved increasingly greater popularity in the health care industry over the past few years. As a result, resources that teach health care executives how to utilize TQM in their organizations abound: books, articles, conferences, workshops, and video tapes which apply TQM to healthcare are numerous. Unfortunately, resources which specifically apply TQM philosophy and tools to the practice of physical therapy are few. The purpose of this primer is to provide a resource that introduces the philosophy, methods, and tools of TQM with applications to the physical therapy setting.

This primer is designed for physical therapists who know nothing or very little about TQM and wish to understand how TQM can be used to improve the quality of their services. It is not designed to provide an exhaustive explanation of TQM or a comprehensive guide to implementing TQM. Rather, this primer is intended to help physical therapists understand how TQM can be applied specifically to the physical therapy setting. It is also intended to spur further, in-depth study of TQM by physical therapists.

Chapter one provides a brief history of TQM in manufacturing and healthcare as well as an introductory definition of TQM. Chapter two elaborates on several of the primary principles of TQM and notes potential applications of these principles in physical therapy practice. Chapter three discusses the fundamental differences between the traditional approach to quality management in physical therapy, Quality Assurance, and TQM. Chapter four introduces a practical, step-by-step quality improvement model called FOCUS-PDCA, and discusses how physical therapists can utilize this model. Chapter five describes several TQM tools and provides examples which show how these tools can be applied to physical therapy practice. Finally, a list of other resources that can be referred to

for a more in-depth study of TQM is included.

Physical therapists who wonder whether or not TQM can truly help them and their organization's daily practice should consider the following questions: Are you ever frustrated because, no matter how hard you try, you are unable to provide the quality of care that you would like to provide? Do the procedures that your organization uses seem to waste steps, duplicate efforts, or change unpredictability? Do you think that your organization is focusing more on its own needs than your patient's needs? Do your patients complain frequently about any aspect of your organization? Do you ever redo your work because something went wrong the first time? Do you often waste time waiting, when you should not have to? Does communication ever fail within your organization? Is information that you need ever lost? If the answer to any of these questions is yes, it is likely that you and your organization could benefit from utilizing TQM.

Although the most important benefit of using TQM in physical therapy is improved patient care, there are numerous other benefits that may be realized through the effective use of TQM (Fig 1). Physical therapists who study and apply the fundamentals of total quality management daily will most likely come to know better efficiency, greater effectiveness, lower cost, and the gratitude and loyalty of more satisfied patients and employees.

- Improved quality of service and care for patients
 - Increased levels of patient satisfaction
 - Prevents focused reviews
 - Decreased risk of malpractice suits
- Promotes optimization of entire system
 - Increased employee involvement, pride, and morale
 - Improved communication and cooperation within organization
 - Increased efficiency and productivity
 - Decreased costs and increased revenues
 - Eases the impact of human resource shortages
- Promotes proactive approach to quality
 - Prevents flurry of activity that precedes inspections for accreditation
 - Increased credibility for physical therapy profession

Fig 1. —Potential Benefits of using TQM in Physical Therapy

Chapter 1

Introducing Total Quality Management

History of Total Quality Management in Manufacturing and Healthcare

Total Quality Management (TQM) is a management philosophy that was first developed by Dr. W. Edward Deming in the 1930s. Dr. Deming first introduced TQM to Japan after World War II in an effort to help the Japanese manufacturing industry improve its products and services. Under Deming's guidance, Japanese firms thrived, eventually dominating many markets previously controlled by United States manufacturers.

In the 1960s and 1970s, United States manufacturers sought ways to regain their status in the international market. Recognizing Japan's overwhelming success with TQM, many American manufacturers began utilizing TQM in the early 1980s. The results were encouraging, as American manufacturers started to regain the competitive position they once held in the world marketplace.

During the past several years, the United States healthcare industry has been under many of the same pressures that United States manufacturers faced in the 1960s and 1970s: heightened competitive pressures, purchaser concerns about quality, escalating costs, and increased accountability to the public. In an effort to face up to these pressures, the United States healthcare industry began experimenting with TQM in the late 1980s. Starting with hospitals, and followed by other healthcare organizations, the principles of TQM began to infiltrate the industry. This trend continues to grow as many hospitals have either started the journey toward TQM or intend to do so. Many physical therapy departments and clinics have also begun to utilize TQM in attempt to provide high quality, cost-effective physical therapy services.

Definition of Total Quality Management

The Memory Jogger Plus+, by GOAL PC, defines TQM as a structured system for creating organization-wide participation in planning and implementing a continuous improvement process to meet and exceed customer (patient, stockholder) needs.⁴³ Total quality management is also commonly referred to as quality improvement (QI), continuous quality improvement (CQI), organization-wide quality improvement, total quality excellence, total quality control, and quality improvement process.

TQM is mixture of many management philosophies represented by a unique list of ten core principles which include customer focus, quality first, continuous improvement, process management, total employee involvement through teamwork, statistical analysis tools, prevention, training, supportive management, and commitment (Fig 2). Chapter 2 discusses these primary principles of TQM in greater detail.

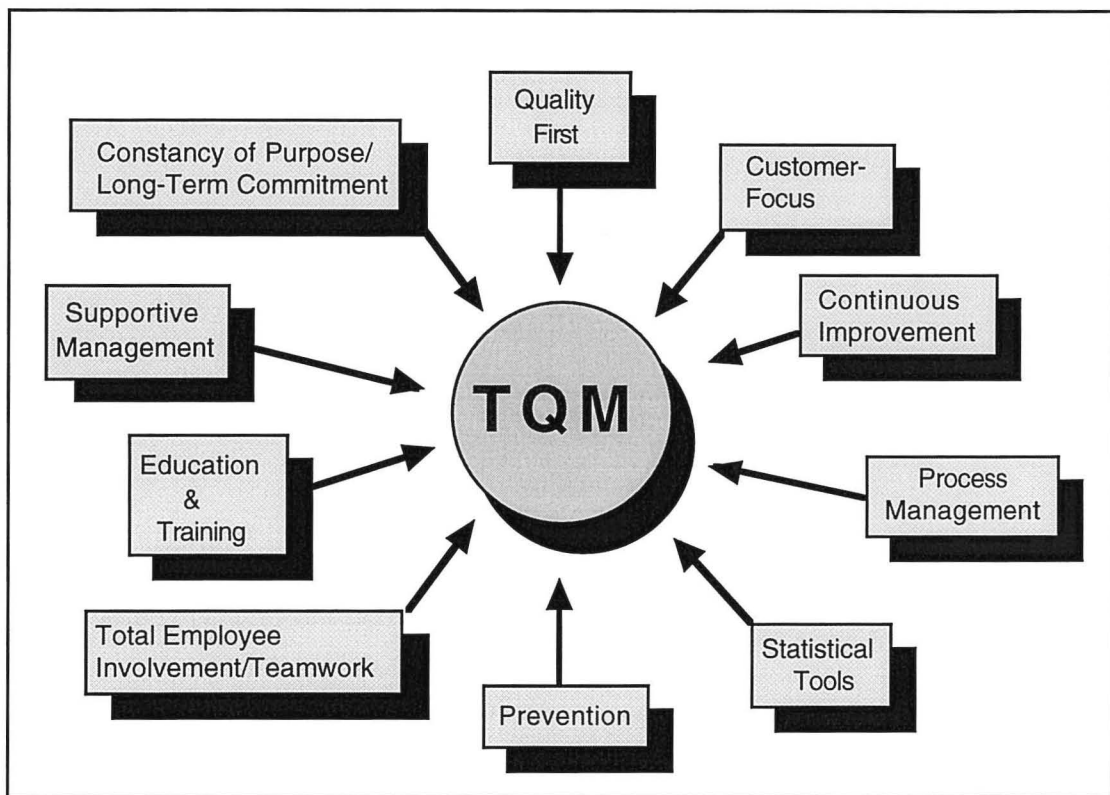


Fig 2. —Ten Core Principles of Total Quality Management Philosophy

Chapter 2

Understanding the TQM Philosophy

Since Deming first introduced TQM to the world, many people have expanded upon Deming's ideas, contributing unique perspectives and different approaches to quality management philosophy. Some of the more notable contributors to quality management philosophy include Walter Shewhart, Joseph Juran, and Philip Crosby. In healthcare, respected quality management philosophers include Donald Berwick, Kaoru Ishikawa, and George Labovitz. A comparative analysis of these persons' quality management philosophies reveals several common themes. These common themes make up the core principles of modern TQM philosophy. This chapter discusses ten of the primary principles of modern TQM philosophy and applies them to physical therapy practice.

1. Customer Focus

Ultimately, TQM places its primary focus on the customer. In the physical therapy setting, a *customer* is defined as any individual, department, or agency that, directly or indirectly, receives services or products from a physical therapist or physical therapy organization. Customers of physical therapy can be "internal" or "external" (Fig 3). *Internal customers* are individuals or departments employed by the organization in which the physical therapist works. *External customers* of physical therapy are people, departments, or agencies who are not employed by the organization in which the physical therapist works but who receive some type of service from physical therapy. The most important external customer of physical therapy is the patient.

Within the TQM philosophy, satisfying the customer is the key to success. In fact, the TQM definition of quality, applied to physical therapy, is *meeting or exceeding the expectations of patients and other customers*.

External Customers	Internal Customers
<ul style="list-style-type: none"> • Patients • Patients' families and friends • Patients' employers • Rehabilitation consultants • Insurance companies • Certifying agencies • Regulatory organizations • Industries • Attorneys • General public • Physicians* 	<ul style="list-style-type: none"> • Transcriptionists • Physical therapist assistants • Physical therapy technicians • Transporters • Medical records • Nursing • Receptionists at Front Desk • Physicians*

Fig 3.—Common Customers of Physical Therapy Services

*Physicians can be classified as either internal or external customers, depending on the type of organization in which the physical therapist works.

Every customer maintains certain expectations of physical therapy services provided by a physical therapy organization (Fig 4). To ensure quality, physical therapists must strive to understand and meet the expectations of each customer. Thus, maintaining continuous, active, and sensitive communication with all customers is a crucial part of TQM.

"The customer is always right."
Unknown

2. Quality First

TQM designates the production of quality services and products for all customers as the most important task of an organization. In order to achieve customer satisfaction, an organization must put quality at the top of its agenda. TQM places quality before profit, productivity, costs, budgets, and schedules. Within TQM, there are no acceptable excuses for compromising the quality of products and services.

Physical therapy clinics and departments must strive towards the primary goal of providing quality services and products for all customers. Physical therapy provides many

<p>Patients expect:</p> <ul style="list-style-type: none"> • Adequate explanation of their conditions • Reduction or elimination of pain and disability • Understandable home program instructions • Know the estimated length of time off work • Competency in technical skills • Continuity of care • Confidentiality • Prompt service 	<ul style="list-style-type: none"> • Improvement in function • Control over the future (e.g., work, pain) • Understand the physical therapist's plan • Personalized and compassionate care • Professionalism in terms of knowledge, creativity, and demeanor • Accessibility of physical therapy services • Adequate facilities
<p>Physicians expect:</p> <ul style="list-style-type: none"> • Timely, functional data for decision making • Regular communication with therapist • Efficiency of communication with therapist 	<ul style="list-style-type: none"> • Sound plans of care and effective treatment programs for patients • Concise, timely, and objective information about patient progress
<p>Front Office expects:</p> <ul style="list-style-type: none"> • Paperwork to be correct and complete • Physical therapists keep front office informed about where they are • Adequate training 	<ul style="list-style-type: none"> • Physical therapist helps schedule follow-up visits • Adequate physical organization of supplies equipment, etc
<p>Physical Therapist expects:</p> <ul style="list-style-type: none"> • Adequate time to treat patient • Adequate support staff • Dictation turnaround in 48 hours • Continuing education 	<ul style="list-style-type: none"> • Evaluation tools available • Enough treatment space, equipment, and supplies • Early notification of canceled appointments • Administrative support
<p>Patients' Families expect:</p> <ul style="list-style-type: none"> • To be informed about goals involved in rehabilitation • Responsiveness and compassion from staff members • Access to patient (i.e., in hospital) 	
<p>Third Party Payers expect:</p> <ul style="list-style-type: none"> • Documentation of demonstrated need for professional care • Objective documentation of improved function • Lowest possible costs • Decreased risks of reinjury 	<ul style="list-style-type: none"> • Time-specific treatment plan • Patient compliance • Optimal health outcomes • Communication
<p>Patients' Employers expect:</p> <ul style="list-style-type: none"> • Appointment times convenient with clients' work schedule • Decreased risk of reinjury • Identification of job-related physical capabilities and limitations 	<ul style="list-style-type: none"> • Communication • Information on how to make work site safe • No residual pain problems

Fig. 4. —Common Expectations of Several Physical Therapy Customers (adapted from Hunter¹⁶)

services, some of which include patient care, staff and community education, and consultation. Physical therapy also produces a variety of "products." These products, although not typically thought of as products in the industrial sense of the word, include progress notes, insurance claims, and patient education materials. For each service or product that is delivered by a physical therapy clinic or department there are one or more customers who hold specific expectations about the attributes of the service or product. By focusing the majority of their energies and resources on the ultimate task of delivering the highest quality services and products possible, physical therapy organizations can succeed in satisfying the expectations of patients and other customers.

"Quality is job one"
The Ford Corporation

3. Continuous Improvement

TQM embraces the concept of Continuous Quality Improvement (CQI). CQI is a never-ending process of assessing and improving the quality of every service and product through small, incremental improvements. Within the TQM philosophy, "Good enough" is never a satisfactory outcome. Quality standards must never become static. Promoting continuous quality improvements helps ensure that customer expectations will be met not only in the present but also in the future.

The ever-changing nature of the field physical therapy makes continuous quality improvement a necessity. New, innovative treatment techniques and philosophies are always emerging. Rules of reimbursement are unpredictable and beyond the control of physical therapists. Turnover of physical therapy staff is continuous. Most importantly, the needs and expectations of patients and customers are continually changing. In the ever-changing field of physical therapy, there is always room for improvement.

"If it ain't broke, it can still be improved."
Unknown

4. Process Management

TQM proposes that the quality of work processes, not the quality of individual performances, determines the quality of products and services. A *process* is a series of related work activities which repeatedly come together to transform inputs provided by

suppliers into outputs received by customers. Deming estimates that 85% of identified quality problems are a result of system or process defects as opposed to individual error.³⁹ Thus, the TQM philosophy proposes that improvements in quality result primarily from improvements in processes.

Processes abound in the daily activities of all physical therapy organizations (Fig 5). The most obvious process in physical therapy is the care giving process. The care-giving process begins as a physician or other referral source "supplies" a physical therapy clinic with a patient suffering from a particular injury or illness. The therapist and support staff then take the patient through the care giving process, which is made up of many other smaller processes, some of which include evaluating, treating, educating, and discharge planning. Ideally, the care giving process transforms the unhealthy person (the input) into a more healthy person (the output). The patient is the primary customer of this care-giving process.

- | | |
|------------------------------|--------------------------------|
| • Transporting patients | • Billing |
| • Scheduling | • Handling phone calls |
| • Discharge Planning | • Ordering & Stocking supplies |
| • Dictating and Transcribing | • Patient Intake |
| • Patient Evaluation | • Maintaining Equipment |
| • Managing patient records | • Educating patients and staff |

Fig 5.—Common Processes in Physical Therapy

Quality improvement efforts in physical therapy must focus not only on direct clinical care processes but also on processes indirectly related to clinical care. These processes include scheduling, transporting, billing, marketing, cleaning, repairing, dictating, and transcribing--to name a few. The quality of these processes is just as important as the quality of the processes involved in direct patient care, because it affects

the facility's ability to meet the requirements of its multiple internal and external customers. The quality of all processes in the physical therapy setting should be continually assessed and improved.

In all physical therapy organizations, some current processes are effective and efficient, but a significant number are not. Activities such as checking, rescheduling, retyping, sorting, rearranging, waiting, retesting, reworking and other activities that do not add value to the process of providing quality service are performed in physical therapy settings every day. Tests and measurements are often repeated because they are not performed correctly the first time. Therapists often spend time looking for lost charts and rescheduling appointments. Equipment and supply requisitions are rewritten because they are lost or filled out incorrectly. Bills are mailed to patients or insurance companies without complete information. Patients must wait for excessively long periods to see therapists. Processes that can be improved abound in physical therapy.

Individuals and teams can better achieve valuable, high-quality process improvements in a reasonable amount of time if they follow a rational and thorough model for making improvements. This primer presents the FOCUS-PDCA cycle²⁵ for process improvement in chapter 4. This model offers a systematic strategy for achieving process improvements which follows the thought processes that many people intuitively and instinctively use in decision-making and problem-solving. Many other similar process improvement models exist, any of which may be adapted to help physical therapists successfully improve the processes within their clinics or departments.

5. Total Employee Involvement and Teamwork

Total employee involvement through teamwork is one of the most important elements of TQM. TQM recognizes that employees directly involved in the current work processes are the "experts" in those processes and are the best sources of information on problem areas and potential solutions. Thus, TQM encourages all employees to take responsibility for continually assessing and improving their work processes so as to continuously improve the quality of the organization's products and services.

In TQM, employees actively participate in process improvement efforts as members of teams commonly referred to as Quality Improvement teams or QI teams. A QI team usually consists of 8-10 persons who possess special knowledge of the specific process being addressed. These QI teams are not usually permanent entities, as each new process improvement effort requires the input of different employees. Using FOCUS-PDCA, QI teams combine the knowledge, skills, and creativity of several employees to improve work processes.

There are many reasons to utilize the teamwork concept within an organization. Teamwork promotes the optimization of the entire system by capitalizing on the individual strengths of all employees within an organization: teamwork produces much better results than the work of single persons. Teamwork also promotes communication and cooperation which help to break down the barriers between employees, departments, and professions. Breaking down such barriers prevents duplication of services, misunderstanding, and conflict. Finally, employee morale often increases with the sense of empowerment and unity that comes with working as part of a team.

Physical therapy managers and persons designated as quality assurance personnel are no longer solely responsible for assuring the quality of physical therapy services. Through teamwork, everyone in a physical therapy department or clinic must strive to make continuous, systematic improvements in work processes and the level of care. Depending on the physical therapy setting, QI team members might include physical therapists, physical therapist assistants, secretaries, managers, nurses, physicians, occupational therapists, speech therapists, transporters, and custodians.

"The self-managing team should become the basic organizational building block."

Tom Peters⁵⁵

6. Statistical Tools

TQM recognizes that variation is an inherent characteristic of any process. The time required to perform an activity, even when performed exactly the same way, will vary each time it is performed. The quality of process outputs also varies, even when the process is

performed in an identical or standardized manner every time.

TQM also recognizes that, while variation cannot be eliminated, variation can be reduced through improvements in the process. As variation is reduced, inefficiencies and errors are also reduced, resulting in lower costs and higher quality services and products. Thus, TQM strives to improve quality by reducing unnecessary process variation.

TQM includes a number of practical tools which can help quality improvement teams reduce process variation thereby improving the quality of services and products. Some examples of TQM tools include flow charts, Pareto charts, histograms, cause-and-effect diagrams, run charts, scatter diagrams, and control charts. The specific uses of these and other tools are discussed in chapter 5 of this primer.

Despite the use of protocols, critical care pathways, and standardized procedures, physical therapy processes have variability which is caused by differences among customers, staff, environmental conditions, procedures, equipment, and other variables. Such variance in processes leads to variable quality rather than uniformly high quality. Thus, physical therapy clinics and departments must strive to understand, reduce, and control the variability in their work processes in order to produce high quality services consistently and predictably. These tasks can be achieved more effectively and efficiently through the use of the TQM tools.

7. Prevention

Traditional approaches to quality management focus on the detection of errors, defects, or other quality shortfalls after they occur. This detection approach requires inspecting some or all of the outputs of a process, considering quality "after the fact". These methods are certainly not as cost-effective as preventing problems in the first place. Experts state that finding and fixing poor-quality care can cost up to 40 percent of the total costs in a service organization.⁹

TQM focuses on *preventing* quality shortfalls rather than fixing them after they occur: quality is built in, not inspected in. Quality can be "built in" by continuously improving processes so that the number of errors, defects, and quality shortfalls is

reduced. Prevention requires communicating, planning, proofing, and working in ways that eliminate opportunities for poor quality care and service.

In physical therapy, inspection comes in the form of burdensome and expensive regulations and time-consuming chart audits. Of course, in a health care setting such as physical therapy, the monetary cost of errors is not the only issue: some mistakes can mean the difference in saving a limb, facilitating health, or even saving a life. Physical therapists make decisions and work with processes that potentially have a high cost if done poorly. Recognizing problems after-the-fact in physical therapy can be not only costly but also dangerous and even unethical.

Physical therapists should readily embrace this preventative approach to quality management, as they are acutely aware of the value of preventative medicine. As professionals that pride themselves in delivering proactive health care, physical therapists should also approach quality management in proactive manner. Quality must be built in to physical therapy services through the careful designing and continuous redesigning of patient care systems.

"An ounce of prevention is worth a pound of cure."
Unknown

8. Education and Training

TQM requires investment in people, the largest and most valuable asset in an organization. Education, training, and retraining of all employees is one of the best ways to invest in people. Organizations cannot spend too much time on training. All employees at every level of the work force must receive proper training and education, not only in job-specific skills but also in TQM philosophy and methods. Without this training TQM will not work.

In the physical therapy setting training and education of all staff is crucial. Physical therapists, physical therapist assistants, secretaries, transporters, technicians, and managers should all receive training and education on a regular basis. Training and education must include more than just the traditional inservice courses mandated by the Joint Commission on Accreditation of Health Care Organizations (JCAHO) and continuing education courses

for acquisition and perfection of job-specific skills. Employees should also receive training in TQM philosophy, TQM concepts, TQM methods, TQM tools, problem solving techniques, team dynamics, team processes, professional development, and personal development.

"In good times, train, and in bad times, train even more. Train everyone--lavishly."

Tom Peters⁵⁵

9. Supportive Management

If TQM is to be truly successful, managers must commit themselves to managing their organizations' resources so as to create a *quality culture* for their employees. Creating a quality culture involves many tasks: driving out fear of offering suggestions, breaking down barriers between departments, instilling leadership in all employees, eliminating slogans and numerical quotas, supporting improvement efforts, listening to staff suggestions, maintaining equipment and work environment, using new approaches to employee evaluation, recognizing and rewarding teams for successes, and allocating resources for quality improvements and education. Through their words and actions, management and administration must support, praise, and reinforce quality improvement efforts. Managers must "walk the talk" so that employees understand the commitment of management and of the organization to quality improvement.

"The employee is the hub of the process, but management is the axle that makes it turn"

J.H. Harrington⁴⁶

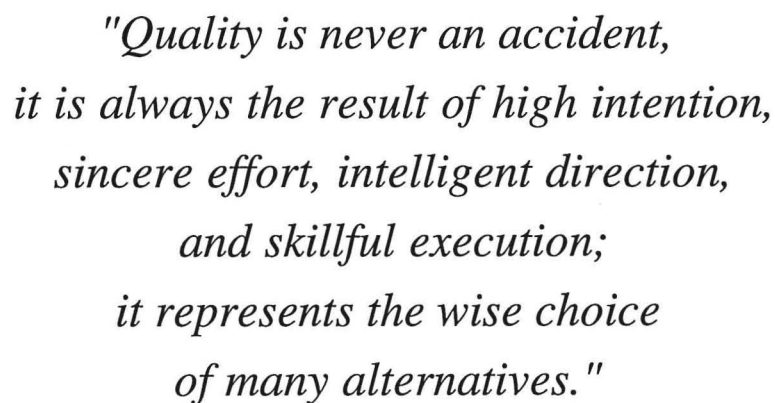
10. Constancy of Purpose & Long-term Commitment

TQM promotes constancy of purpose and long-term commitment to quality. Employees and administrators of an organization, through their decisions and actions, must constantly support the organization's mission and work towards common organizational goals. The key: "Acting short-term while thinking long-term."⁴⁵ Acting short term while thinking long-term means that all decisions made in an organization must be consistent with the organization's long-term goals. The ultimate goal of providing high-quality services and products must be supported today if it is to become a reality tomorrow.

In physical therapy practice today, acting short term while thinking long term can be difficult to achieve. Many of the problems that physical therapy managers face today beg for short-term solutions at the expense of a long-term commitment toward quality improvement. However, the physical therapy organization wishing to overcome its problems in hopes of improving the quality of its services must eliminate its tendency to fix problems with temporary solutions. By continually focusing on the ultimate goal of continuous quality improvement, a physical therapy organization can permanently ease many of its current problems and guarantee continuous quality improvement in the future.

Conclusion

TQM is not a "magical pill" or a "quick fix" that produces instantaneous improvements in quality. *All* of the principles discussed above must be conscientiously utilized over a period of time for TQM to work effectively. Individually, the principles of TQM are not particularly complex, but implementing all of them can be quite challenging. Providing quality physical therapy services will never be a simple task but always an important task.



*"Quality is never an accident,
it is always the result of high intention,
sincere effort, intelligent direction,
and skillful execution;
it represents the wise choice
of many alternatives."*

Will A. Foster

Chapter 3

Contrasting TQM to Traditional Quality Assurance

Since the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) first began using Quality Assurance (QA) in the 1950s, QA has been the dominant method of quality management in physical therapy. Like TQM, the ultimate goal of QA is to assure quality patient care. Although the ultimate goal of both QA and TQM is the improvement of patient care, QA and TQM differ in several ways. This chapter briefly discusses fundamental differences between QA and TQM.

Primary Focus

QA tends to place much of its focus on meeting standards that are defined by physical therapy providers and accrediting agencies such as the Commission on Accreditation of Rehabilitation (CARF) and JCAHO. As a result, customers' needs and expectations are given lower priority and sometimes completely neglected.

TQM focuses all activities on meeting customers' needs and expectations. This customer focus is genuine and real, not just a marketing gimmick. In TQM, physical therapy organizations maintain continuous communication with their customers for the purpose of acquiring ideas concerning specific service requirements, evaluating the adequacy of services, and creating solutions to problems that arise.

Standards and Thresholds

Traditional QA has accepted that there is an objective goal or threshold for every process of care. These thresholds are typically minimum thresholds or maximum "gold standards". When such goals are met, it is assumed that further improvements are not necessary.

TQM assumes that opportunity for improvement always exists and promotes continuous improvement above and beyond current performances. TQM views minimal thresholds and gold standards as ceilings that limit further improvements in quality. Thus, TQM seeks to raise the standards, not just achieve them.

Mass Inspection

QA promotes frequent, broad-based mass inspections for the purpose of problem identification. Once problems are identified by mass inspection, they are then corrected. This mass inspection method is a reactive approach to quality management. JCAHO's ten-step process, commonly used in the hospital setting, utilizes this mass inspection approach.

TQM philosophy suggests that quality cannot be inspected into a product or service, and promotes the elimination of mass inspection as a means for quality management. Rather than inspecting for problems, TQM strives to prevent problems: TQM's preventative method is a proactive approach to quality management.

Object of Quality Improvement Efforts

In QA, individual employees are the objects of quality improvement efforts. QA assumes that quality care is delivered if caregivers are qualified, well-educated, skilled, committed, and hard-working. Conversely, QA attributes poor quality to incompetent, careless, and corrupt caregivers. As a result, QA solutions to quality problems often focus on improving caregivers' abilities or on removing them from the situation. This approach inherently encourages individual performances.

The primary object of quality improvement efforts in TQM is the overall performance of the system and processes within the system. TQM recognizes that defects in quality are rarely the result of a lack of will or intention by the caregiver but are instead the result of problems within the system's processes. Thus, TQM solutions to quality problems focus on improving the processes within the work system. This approach encourages team performance rather than individual performances.

Scope of Quality Management

QA tends to limit its scope of quality management to clinical aspects of the physical therapy organization, aspects directly related to patient care (i.e. evaluation and treatment procedures). QA does not attempt to improve the quality of non-clinical processes including scheduling, transporting, billing, dictating, and transcribing.

TQM maintains a broader scope than QA by attempting to improve the quality of not only direct clinical care processes but also processes not directly related to patient care. Non-clinical processes are viewed as being an important part of providing services that meet the requirements of all customers of physical therapy services.

Responsibility

In QA, responsibility for quality is typically given to management members, their designees, QA coordinators, and physical therapists. As a result, other staff members tend to take responsibility for quality only prior to accreditation time.

In TQM philosophy, quality is everyone's responsibility. TQM encourages all employees to take responsibility for continually assessing and improving the physical therapy organization's work processes so as to continuously improve the quality of its services.

Control

QA utilizes a hierarchical model of management which gives most, if not all, organizational control to management. As a result, management often make decisions without consulting with their employees to determine whether or not their decisions are truly in the best interest of the organization and its customers.

TQM eliminates this hierarchical management model, giving organizational control to all employees. Because they are directly involved with the work processes, all employees are given the authority to make decisions that impact the quality of physical therapy services.

Commitment

With QA, it is typically assumed that employees are committed to quality. Because commitment has tended to be an assumed element, true commitment to quality in many physical therapy organizations has not been demonstrated, except at the level of management or the QA staff.

In TQM, however, commitment to quality is stressed as being of paramount importance at all levels. For TQM to be successful, every employee within the physical therapy organization must always display commitment to quality through their words, decisions, and actions.

Conclusion

Although there are many differences between QA and TQM (Fig 6), it is important to note that common ground does exist between QA and TQM, and that TQM need not be used exclusively of QA. Instead, physical therapy organizations can utilize strongest components of both QA and TQM in their efforts to provide quality service.

QA	TQM
Focuses on meeting provider standards	Focuses on meeting customer standards
Strives to achieve preset quality standards	Strives to improve quality continuously
Inspects for quality; reactive	Prevents poor quality; proactive
Attributes poor quality to individuals	Attributes poor quality to the system
Encourages individual performance	Encourages team performances
Focuses on clinical aspects of organization	Focuses on all aspects of organization
Designated persons responsible for quality	All employees responsible for quality
Management controlled	Employee controlled

Fig 6.—Contrasting Quality Assurance to Total Quality Management

Chapter 4

Improving Physical Therapy Work Processes with FOCUS-PDCA

This chapter introduces FOCUS-PDCA, a process improvement model that provides a step-by-step methodology for improving processes in a rational and efficient manner. FOCUS-PDCA was created by the Hospital Corporation of America (HCA) Quality Resource Group, Nashville.²⁵ The PDCA portion of this model is often called the Shewhart/Deming Cycle as it was originally created by Walter Shewhart and later embraced by Deming. Essentially, the FOCUS-PDCA strategy involves forming a team that works to study the process and improve the part of the process that has the largest impact on customers' needs and expectations.

FOCUS-PDCA is an acronym representing nine steps that can be used to improve work processes (Fig 7). This chapter briefly discusses each step of FOCUS-PDCA and notes which TQM tools can be used to assist the team in accomplishing the tasks of each step. A more in-depth discussion of each tool will be provided in chapter 5.

Step 1: Find a Process to Improve

The first step of FOCUS-PDCA involves identifying a work process that would have the greatest effect on improving customer satisfaction. It may be helpful to first generate a list of processes that demonstrate a need for improvement. Ideas for this list can be obtained through brainstorming, surveys, focus groups, and an analysis of complaints. A Pareto chart can then be used to assist in identifying the process that has the most impact on customer satisfaction. The remaining steps of FOCUS-PDCA will focus on improving this process.

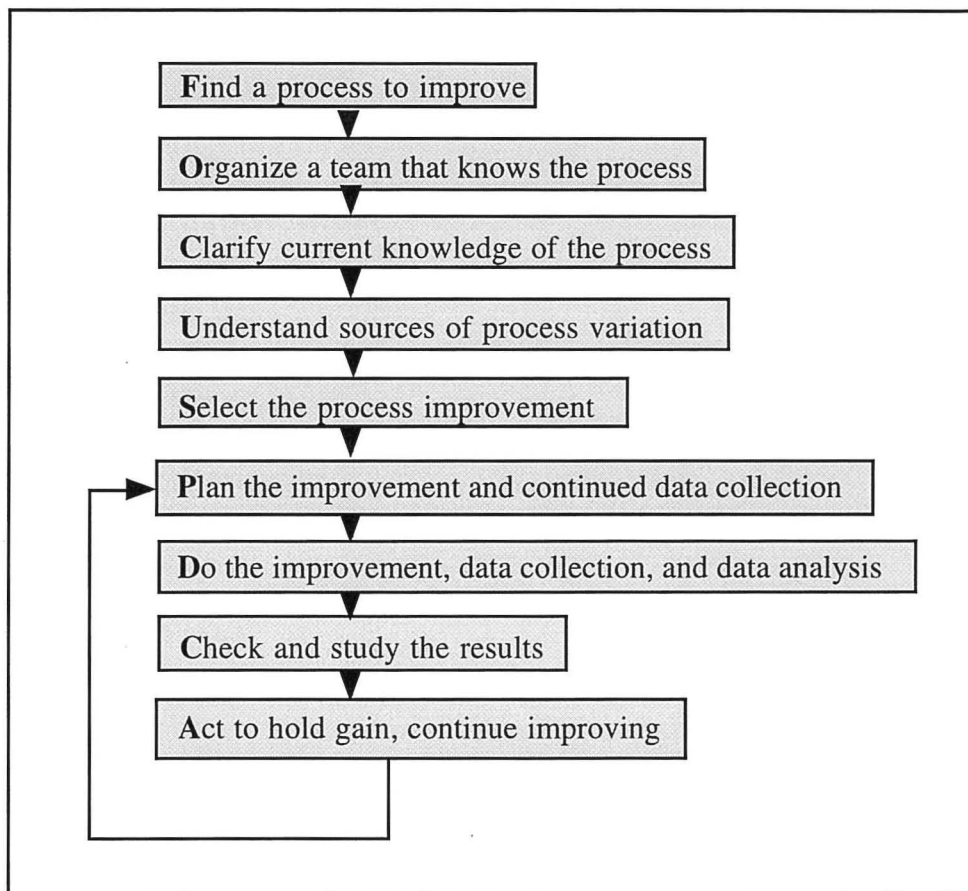


Fig 7. – The FOCUS-PDCA cycle (from Al-Assaf¹)

Many of the processes within physical therapy organizations have evolved with no conscious design and could be greatly improved using FOCUS-PDCA. These processes include not only processes directly related to the care-giving process but also processes not directly related to the care-giving process such as transporting, billing, scheduling, and record keeping. Opportunities for improvement abound in all physical therapy organizations, but they can only be identified through active communication with employees, patients, and other customers.

Step 2: Organize a Team that Knows the Process

The next step is to organize a team consisting of several people with special knowledge of the process. This team is often referred to as the improvement team. The members of the QI team should include people who are currently a part of the process, suppliers of the process, customers of the process, people with authority to change the process, and other persons with special knowledge of the process: physical therapists, patients, administrators, physical therapist assistants, secretaries, managers, outside vendors, nurses, physicians, occupational therapists, speech therapists, transporters, and custodians. Team members may be selected by a department manager, the Quality Improvement Council, or they may be self-selected. Regardless of the selection method, all team members must be willing and active participants in the process improvement efforts.

The *team's size* depends on the boundaries of the process being considered. For narrow, specific problems, one or two persons may complete the entire improvement process. However, processes are usually at a level of complexity that requires a team of six to ten members. It is wise to avoid larger teams, because a team is ineffective if it becomes too large.

The QI team should select a *team leader*. The leader should be selected on the basis of the person's knowledge of the process rather than authority, seniority, or other characteristics. The leader is often selected because he/she is the person who initially brings to attention the problem or the opportunity for improvement. Although the leader

essentially becomes the "owner" of the improvement effort, he/she should avoid dominating the review or forcing a particular solution on the team.

A team facilitator should also be selected. The *facilitator* is the QI team's expert on process improvement, TQM tools, and team dynamics. The facilitator should be a very well-trained employee or a hired expert. The facilitator's duties include keeping team members focused on the task of process improvement, instructing the QI team about the tools that it needs, and guiding the QI team's effort when technical expertise is required. This person serves only as a process facilitator and must remain objective and unbiased during discussions.

The QI team should also choose a person to be the team's recorder. The *recorder* is responsible for tasks such as documenting the flip charts, recording minutes, and assisting the team leader in preparing meeting agendas. The role of team recorder may be rotated among the members of the QI team.

Persons not filling the roles of leader, facilitator, or recorder are called team members. *Team member* responsibilities include understanding the QI team's mission, participating in the group process, listening to customers and fellow team members, and sharing ideas. Team members need to understand that their participation is a priority responsibility, not an intrusion on their "real jobs." Team members are responsible for participating as fully in the process improvement efforts as possible.

During one of the first few team meetings, ground rules which specify acceptable and unacceptable behavioral interactions must be created. Ground rules should address topics such as attendance, promptness, participation, responsibility to assignments, group interaction, and conflict resolution. Ground rules are important because they lay the foundation for open discussion and provide a sense of unity and direction for the group.

It is not the intent of this manual to provide a detailed discussion of the numerous topics related to teams including team dynamics, team processes, team-member roles, and team ground rules. Peter Scholtes thoroughly discusses these and other topics related to teams in *The Team Handbook*.⁵⁷

Step 3: Clarify Current Knowledge of the Process

After the QI team has been formed and roles have been defined, the team's next task is to clarify its current knowledge of the process chosen in step 1. The goal of this step is to create a shared understanding of how the process currently works.

A typical QI team's reaction is to want to solve the problem without taking the time to describe, study, and measure the underlying process that produces the problem. It is important for QI teams to avoid this "ready-fire-aim" approach, because without complete knowledge of the process, the QI team cannot know what the current process' strengths are nor where the current process fails and thereby might be improved. The task of clarifying the QI team's current knowledge of the process is critical, because a process cannot be improved unless the QI team understands how the process works in the first place.

The best way to document the QI team's current knowledge of the process is by drawing a flow chart of the process. Flowcharts provide a graphic representation of the step-by-step sequence of events, reactions, and decisions which make up a process. (Chapter 5 discusses flowcharts in greater detail.) As the team flowcharts the process, it will often quickly see possibilities for improvement. It may require 2-8 meetings to accurately describe a process.

Step 4: Understand the Causes of Process Variation

The Understand phase of FOCUS-PDCA, typically the most difficult step, calls for understanding the causes of variation within the process. This step can be divided into two substeps: 1) measuring and analyzing process variation, and 2) identifying the root causes of the process variation. It is important to understand the variability of the process, because unnecessary process variation often results in poor or inconsistent levels of quality.

Substep 1: Measuring and Analyzing Process Variation

The goal of substep 1 is to measure and analyze process variation. To accomplish this goal, the QI team must first select a specific measure that will provide an accurate assessment of how well the process is performing. This measure is called a *process*

performance measure. In a sense, a process performance measure is the window through which the QI team can observe the process. Examples of process performance measures in physical therapy are provided in figure 8.

- Number of days elapsing between referral date and patient's initial evaluation
- Number of times patients wait more than ten minutes in waiting room
- Number of incident reports or risk management cases
- Number of injuries due to equipment problems
- Number of patients not adequately prepared for physical therapy session
- Number of complaints by specific groups of customers (i.e. patients, physicians, secretaries)
- Number of specific types of complaints (i.e. poor parking, discourteous staff)
- Number of late events: patient transports, equipment deliveries, bill mailings
- Number of jobs reworked: rebilling accounts, retyping
- Number of telephone calls not answered within the first three rings
- Number of total visits per patient
- Percentage of patients that go home, to rehabilitation, or to long term care facility
- Percentage of patients with specific diagnoses that return to work
- Number of patients that return after discharge for same problem
- Number of total dollars charged per patient
- Number of charges rejected by third party payers

Fig 8.—Process Performance Measures in Physical Therapy

Once a measure of process performance has been selected, process performance measurements can be carried out. Measures of process performance should be taken from the actual process as it normally occurs over a period of time. Persons who work directly with the process on a daily basis are usually best suited for carrying out performance measurements. Logs and check sheets are the tools most commonly used to collect data

from performance measurements.

Once enough data has been collected to provide a representative sample of the process, process variation can be analyzed. Tools that can be used to analyze process variation include histograms, run charts, and control charts.

Substep 2: Identifying Root Causes of Process Variation

Substep 2 involves analyzing all possible causes of variation to determine the root cause of the process variation. Root causes are those causes that have the most powerful impact on the process. It is important to identify root causes, because treating a root cause of variation can reduce process variation significantly. Also, identifying the root cause(s) of variation prevents a QI team from solving the wrong problem.

One of the best tools for organizing and analyzing all possible causes of variation is the cause-and-effect diagram. Often used in conjunction with brainstorming, this diagram breaks the possible causes into general categories, making it easier for the QI team to select causes that deserve further attention. (Cause-and-effect diagrams are discussed in greater detail in chapter 5.) Once all possible causes of variation have been identified, a scatter diagrams and Pareto charts can then be used to help the QI team select the root cause(s) of process variation.

Step 5: Select the Process Improvement

Once the root causes of variation are identified, the improvement team should generate as many alternative solutions to the problem as possible. Each solution should attempt to decrease or eliminate the root cause(s) of the process variation that were identified in the previous step. Selecting a solution before generating alternatives may cause the team to settle for the obvious and ineffective solution rather than the creative and powerful solution. Tools that are helpful in generating alternative solutions include focus groups with customers, discussions with the staff involved, and brainstorming. Once a variety of alternative solutions have been proposed, focus groups with customers and interviews with staff may be used to help identify the most promising solution from among the many. The end product of this step is a proposed solution.

Step 6: Plan Improvements and Continued Data Collection

It is important to have a *plan of action* that summarizes the improvement plan. This plan of action should describe the following: steps to be taken, who will be responsible at each step, how implementation will be monitored, and how continued data collection will be carried out. In creating the plan of action, persons who will actually be responsible for implementing the solution and making it work should be involved, so that they will take on ownership of the plan of action.

In some cases it is valuable to test the proposed modification on a small-scale pilot study prior to process modification on a larger scale. The purpose of a pilot study is to obtain necessary information for improving a project and/or for evaluating its practicality. A pilot study may not be necessary depending on the size, specificity, and quantity of the changes to be implemented.

Step 7: Do Improvement, Data Collection, and Data Analysis

During the "do" step, the improvements should be implemented (in the form of a small-scale pilot-study or on a full scale), and then process performance data should be collected and analyzed. Once again, data collection is best performed by those persons who work with the process on a daily basis. Logs and check sheets can be used to collect the data. It is important to allow enough time to collect enough data so that it will provide valid information about the process. Once enough data has been collected, it can be analyzed for variation using histograms, run charts, and control charts.

Step 8: Check the Results of the Improvement Effort

During this step, data analysis and customer feedback should be checked to determine the effectiveness of the process modification. If a pilot-study was conducted, the results of the pilot study should be checked. Based on the results of the pilot study, one of three decisions can be made:

- 1) Scrap the solution and generate other possible solutions.
- 2) Make a few changes to the solution and then implement it.
- 3) Implement the new change on a full scale.

Step 9: Act to Hold Gain and Continue Improvement

Once the team has decided to implement new changes on a full scale, the organization must act to ensure that the improvements are fully implemented and improvements in the process continue in the future. Specific tasks at this stage are listed in figure 9.

- Drawing a revised flowchart which clearly shows the revamped process as it should work from now on.
- Modifying standards, procedures, policies, and performance expectations to reflect the changed process.
- Communicating the changes to the employees, customers, and suppliers involved with the process.
- Training employees as needed.
- Documenting the project and presenting it to:
 - Administration
 - Departmental managers
 - Persons who worked on the project
 - Other team leaders or facilitators who can learn from the team's experience
- Determine whether projected improvements in performance were obtained
- Verify that customer satisfaction has improved.
- Continue to evaluate the process and outcomes to make sure that the solution fixed the problem.
- Improve the process continuously using the PDCA improvement cycle

Fig 9. —Tasks to be achieved during the "Act" step of FOCUS-PDCA

Conclusion

Improvements in physical therapy services and products can be achieved by improving the processes that produce the products and services. The FOCUS-PDCA quality improvement model provides a strategic roadmap for improving processes. There are a variety of other quality improvement models that may be used to improve quality in an organization (Fig 10). It is important that an organization customize its own quality improvement model to fit its own special needs.

- Einstein Consulting Group's Customer-Driven Management Model (Leebov and Ersoz, 1991)
- The Ten-Step Model for Monitoring and Evaluation (JCAHO, 1992)
- The Ten Key Lessons for Quality Improvement (Berwick et al., 1991)
- The Quality Improvement Framework (Omachonu, 1991)
- The Quality Improvement Process (Philip Crosby Associates Inc., 1988)

Fig 10.—Other Quality Improvement Models

Chapter 5

Utilizing TQM Tools in Physical Therapy

As noted in chapter two, TQM includes a number of practical process analysis tools designed to help QI team's in their efforts to improve quality. These tools serve several important functions (Fig 11). This chapter describes several TQM tools and provides examples which show how these tools can be applied to physical therapy practice.

- Promoting a systematic, efficient, scientific approach to quality improvement
- Promoting management by facts, not opinions
- Speeding up consensus building and decision making
- Bringing attention to process variation and process improvement opportunities
- Creating visual pictures of complicated processes
- Helping teams determine the root sources of process variation
- Studying the effects of process changes on process variation

Fig 11.—Functions of TQM Tools

Surveys

Surveys are valuable tools for measuring customers' perceptions of quality. For the purposes of this primer, surveys are written questionnaires used to collect quantitative data from customers. Each question on a survey is designed to provide information about one element of performance in an organization. Figure 12 lists some of the elements of physical therapy services that can be measured.

<p>Access: Physical location of facility Hours of operation Telephone access Appointment waiting time Waiting time in waiting room Accessibility for disabled persons</p>	<p>Technical Management: Ambience of facility Parking Payment/Claims Competency of staff Technical skills of staff Adequacy of equipment and space</p>
<p>Interpersonal Management: Warmth/friendliness of staff Enough time spent Privacy respected Adequate explanations Participation in developing goals Communication skills of staff</p>	<p>Overall Patient Care: Satisfaction with health outcomes General Satisfaction Intent to return Recommend facility to others</p>

Fig 12.—Elements of Physical Therapy Services that can be Measured by a Customer Survey

Surveys can be used for several purposes:

- To identify customers' expectations
- To monitor customer satisfaction with present services
- To identify problems or generate improvement opportunities
- To show customers that their perceptions are valued

There are several basic rules that should be followed when designing a survey. The survey should be as short as possible. Individual questions should be clear and simple to understand and should require a minimal amount of time and effort from the respondents. All questions should be numbered for ease of sequencing by the responder and for ease in data processing. Print should be large, clean, and easy to read. The language used in the survey should be simple so that all respondents can understand the questions. The questions should not bias or lead respondents towards a particular answer. The survey should appear professional. Figure 13 provides a sample of a patient survey that might be used to evaluate patients' perceptions of physical therapy services.

DEPARTMENT OF PHYSICAL THERAPY QUESTIONNAIRE

To help assess the quality of care, we are asking your opinion about your experiences with the Physical Therapy staff and treatment programs. Your name and responses are confidential. Answer these questions carefully.

Today's Date _____

- | | | |
|---|-----|----|
| 1. Was your scheduled appointment within three working days? | YES | NO |
| 2. Did you request that an initial appointment be made beyond three working days? | YES | NO |
| 3. Did you have difficulty obtaining an appointment? | YES | NO |
| If yes, please explain. _____ | | |
| 4. Did the receptionist greet you in a courteous manner? | YES | NO |
| 5. Did you have to wait longer than 15 minutes beyond your scheduled appointment time? | YES | NO |
| 6. Did staff personnel introduce themselves on the first visit? | YES | NO |
| 7. Which staff member treated you? _____ | | |
| 8. Did staff personnel clearly explain the purpose of the exercise or treatment you rec'd.? | YES | NO |
| 9. Were you treated in a courteous manner? | YES | NO |
| 10. Were you informed of your physical therapy progress? | YES | NO |
| 11. Did staff personnel listen to you? | YES | NO |
| 12. Did they answer your questions? | YES | NO |
| 13. Did you practice what the staff asked you to do? | YES | NO |
| 14. Do you think physical therapy is helping you? | YES | NO |
| 15. How long have you been treated in physical therapy? _____ | | |
| 16. What do you expect from your Physical Therapy program? _____ | | |
| 17. If you have any suggestions that would have made your physical therapy experience better, please make them on the back of this page. | | |
| 18. If you want to speak to the department director about the physical therapy care you received, please provide the following information: | | |

Name _____

Home Phone (include prefix): _____

Fig 13.--Example of a Patient Survey (from Lucania²⁰)

Developing and implementing a valid survey is not a simple task, especially for persons with little knowledge or experience in these areas. At the very minimum, it is important to study literature which specifically addresses the topic of surveys in healthcare. It may be wise for an organization to consult or contract with an external marketing research firm that will assist in creating and utilizing a valid survey. Such customer survey methods are the most objective but are more expensive than informal surveys. Regardless of the approach used, it is important to involve caregivers in designing the survey.

Focus Groups

The focus group is an information-gathering technique that utilizes small-group discussion to identify the views of people in the group (usually customers and/or staff) about a specific subject. A facilitator leads the discussion using a question guide. Focus groups are most effective when questions are open-ended and the facilitator encourages considerable discussion of each question.

The focus group tends to achieve greater depth of knowledge than written surveys, because interaction among focus group participants triggers additional thoughts. Another advantage of focus groups over written surveys is that the QI team can probe and follow up for more information.

Focus groups can be used for the following purposes:

- To identify customer expectations
- To solicit perceptions of the organization's performance
- To generate ideas for improvement opportunities
- To "field-test" solutions or changes in order to refine or select among them

Brainstorming

Brainstorming is an extremely versatile tool that can be used several times throughout the FOCUS-PDCA cycle. Brainstorming is a simple and useful technique that is used to help a group generate many thoughts or ideas in a very short a time, without criticism or discussion along the way. Brainstorming encourages group members to freely and creatively express their thoughts and ideas without being concerned about the




practicality or “quality” of their suggestions. The goal is simply to generate an exhaustive list of thoughts and ideas regarding the area or topic at hand. A typical brainstorming session lasts between 5 and 15 minutes.

Brainstorming has three phases: generation, clarification, and evaluation.¹⁹ During the *generation phase*, the leader briefly reviews the rules of brainstorming, clearly states the question or topic, writes the purpose of the session as the header on a flip chart or chalkboard, and then invites responses from group members. Group members then offer as many concise thoughts and ideas as possible, without discussing or criticizing any ideas. The leader records **every** idea **exactly** as it is expressed by the speaker. During the *clarification phase*, the group reviews the generated list to ensure that everyone has a common understanding of the meaning of each item. During the *evaluation phase*, the group refines the list by eliminating duplications, irrelevant ideas, or impractical ideas.

Brainstorming can be used to help QI teams to:

- Identify problems that require attention.
- Generate a list of improvement opportunities.
- Identify possible root causes of problems.
- Create alternate solutions to problems.
- Generate questions for customer satisfaction surveys
- Understand the elements of a processes before organizing them into a flowchart.

Flowcharts

The Flowchart provides a pictorial representation of all the steps within a process in the sequence which they occur and illustrates how the steps are related to each other. These steps include events, reactions, and decisions. Each step in the process is denoted by a symbol. An oval, , identifies the first or the last step in a process and usually contains the words “start” or “stop”, or “begin” or “end.” A rectangle, , indicates an operation or a task in the process. A diamond, , indicates a point in the process where a decision must be made. Figure 14 shows a flowchart for the process of communicating requests for physical therapy consultation in an acute care setting.

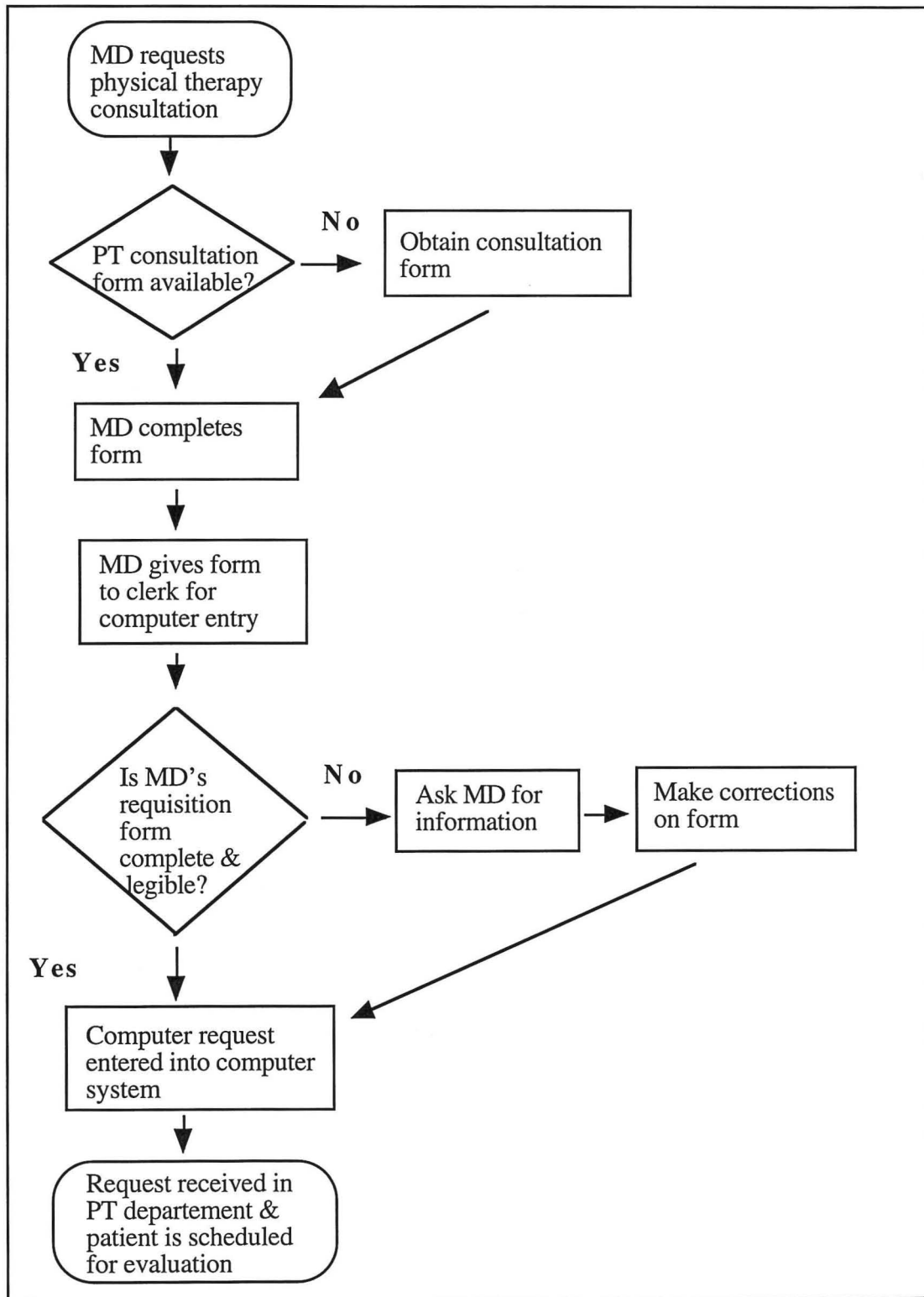


Fig 14. —Flowchart Showing the Process of Communicating Requests for Physical Therapy Consultation

Flow charts can be used for:

- Creating a visual display of a process
- Documenting current knowledge of a process
- Stimulating ideas for process improvement

Cause-and-Effect Diagrams

Sometimes called the Fishbone Diagram (because of its shape) or the Ishikawa Diagram (for its creator, Kaora Ishikawa), the Cause-and-Effect Diagram supports the brainstorming process for identifying the root causes of problems within a process. The Cause-and-Effect Diagram illustrates the relationship between a problem and all of the possible "causes" of the problem.

In Cause-and-Effect Diagrams, causes of problems are commonly divided into four major categories: 1) people, 2) methods, 3) materials, and 4) equipment. Other categories of causes might include environment, policies, and measurements. However, any major category that emerges from the process or helps a team think creatively can be used. Cause-and-Effect Diagrams break these major categories down further into causes and "subsidiary" causes. The problem is stated on the right side of the diagram and the possible causes are listed to the left.

A cause-and-effect diagram showing the potential reasons for hospital patients being late to physical therapy is shown in figure 15. In this cause-and-effect diagram, the major categories of causes are "patient", "transporting technician", "nursing unit", and "equipment". Under each of these major categories are several specific possible reasons why patients may be late for therapy.

The Cause-and-Effect Diagram can be used to do the following:

- Define the most likely of all possible causes of a problem.
- Identify and select causes for further analysis.
- Discriminate between causes and symptoms of a problem.

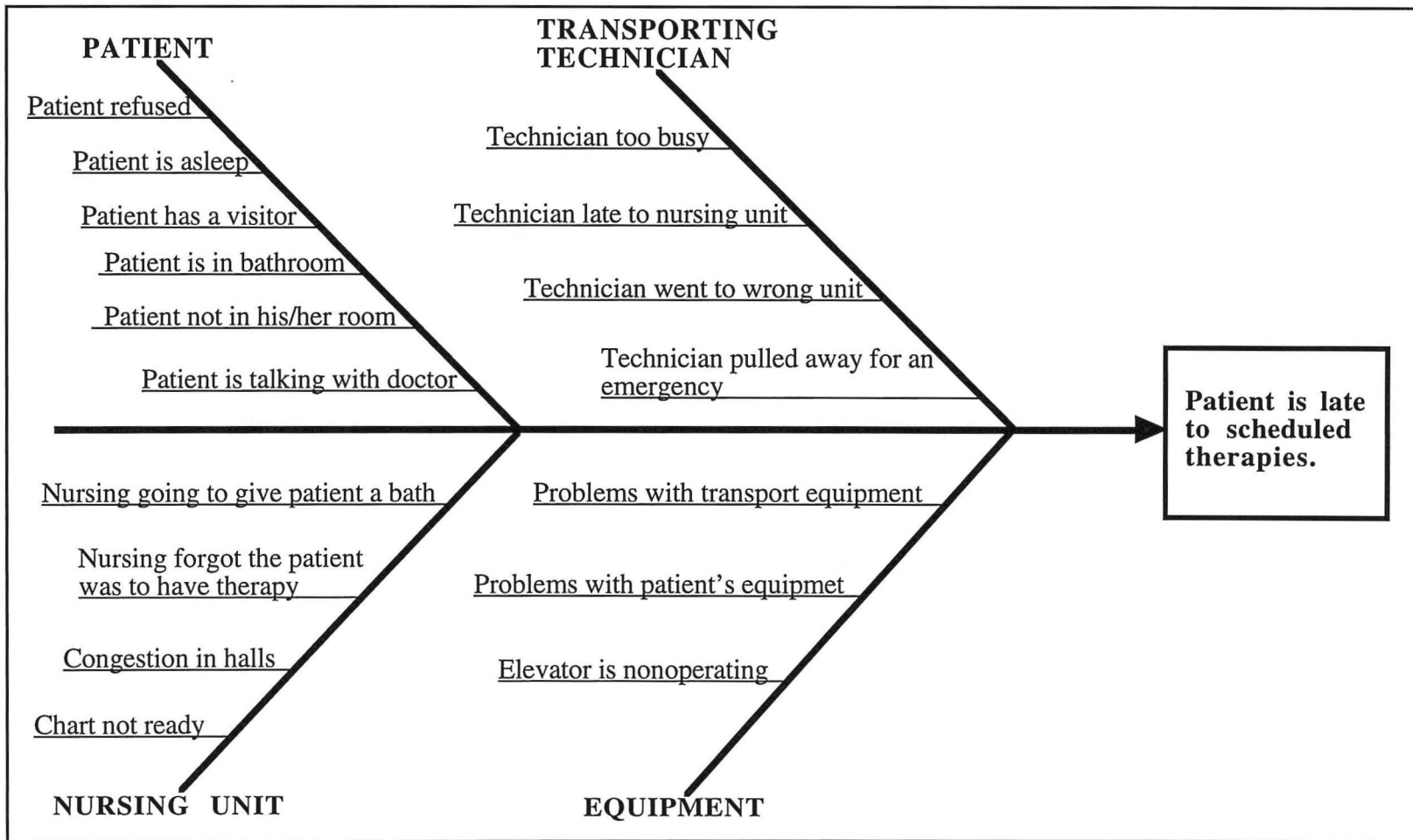


Fig. 15. —Sample Cause-and-Effect Diagram

Check Sheets

Check Sheets can be used to begin the process of translating "opinions" into "facts" which can be used to facilitate wise decision making. Check Sheets help to illustrate how often certain events are occurring. When an observation or event occurs, the recorder makes a check mark or enters the appropriate data across from the item on the sheet. The information gathered in a Check Sheet can then be summarized visually using one of the other process control tools. A check sheet designed to tally the reasons for rejected physical therapy bills is shown in figure 16.

Logs

Logs are simple chronological records that track the sequence of events, the nature of errors or complaints, and the times they occur. Logs are usually drawn as rows and columns with a summary of the statistics at the bottom. Figure 17 shows a log that could be used by a physical therapy receptionist to track patient waiting times. When using logs, it is important that employees record only the raw data without trying to identify or elicit a trend in the data.

Pareto Charts

The Pareto Chart is special form of a vertical bar graph which displays data on the frequency of complaints or the causes of problems. The Pareto Chart displays the frequency of causes of a problem in descending order so that the most frequent causes clearly stand out. The Pareto Chart is based on the Pareto principle¹⁹, also known as the 80-20 rule, which states that 20 percent of the causes account for 80 percent of the occurrences of the problem (Figure 18).

Figure 19 illustrates an example of a Pareto Chart that could be used to determine which problems should be targeted for improvement. This chart shows that discourteous staff and problems with equipment are the most frequent reasons for complaining. The category "Other Complaints" is out of height order because it represents all of the less-common complaints that did not fit into any of the other complaint categories.

March				
Reason	Outpatient Ortho	Acute	Rob.	Total
Illegible Bill				
Ineligible person				
Incomplete information				
Unreimbursable charge				
Totals				

Fig. 16. —A Check Sheet Designed to Tally the Reasons for Rejected Bills (adapted from Leebov¹⁹)

Log				
Patient Name	Therapist	Patient's Arrival Time	Time Patient Taken for Appointment	Wait Time

Fig 17. —Log for Tracking Patient Waiting Time in Outpatient Physical Therapy (adapted from Leebov¹⁹)

- Eighty percent of patient complaints relate to 20 percent of the problems.
- Eighty percent of patient complaints occur on 20 percent of the days of the week.
- Eighty percent of late patient transports come from 20 percent of the hospital units.
- Eighty percent of the equipment breakdowns involve only 20 percent of the equipment.
- Eighty percent of denied charges come from 20 percent of the diagnosis.
- Eighty percent of the improvements are made by 20 percent of the staff.

Fig 18. —Examples of the 80-20 Rule in Physical Therapy

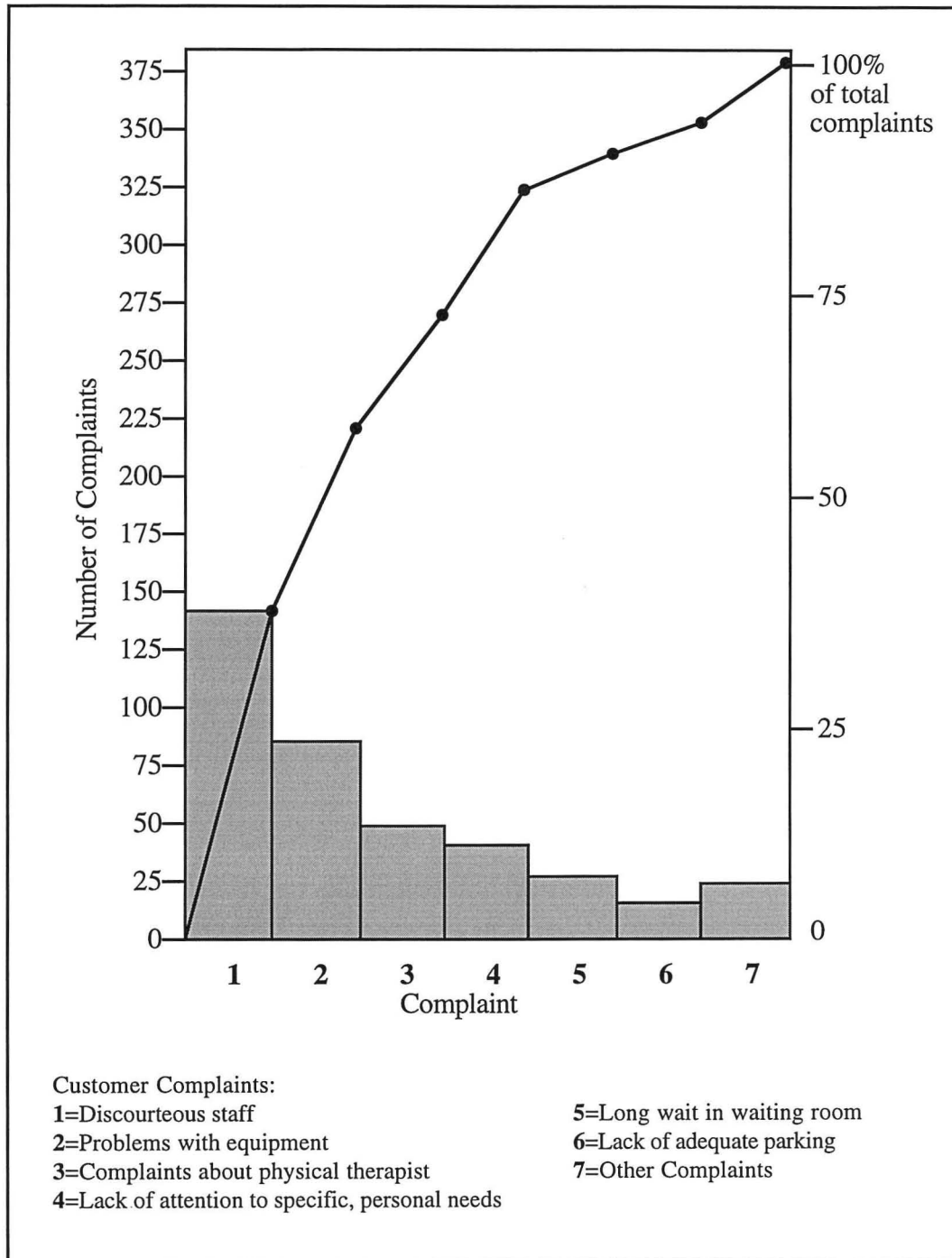


Fig 19. —Pareto Chart of Patient Complaints (adapted from Leebov¹⁹)

Pareto Charts can be used for the following purposes:

- To determine which problems should be addressed first.
- To identify the more influential causes of a particular problem.
- To assist in breaking down broad causes into more specific, root causes.
- To illustrate changes in performance over time by comparing Pareto Charts before and after changes in a process have been made.

It is important to be aware that the Pareto Chart assumes that quantity equals importance, which is certainly not always the case. Often, a particular problem occurs less often than other problems but is far more costly than the problems which occur more frequently. Thus, common sense must be used when interpreting Pareto Charts.

Histograms

Like the Pareto Chart, the Histogram is special form of bar graph that displays the frequency with which certain events occur. The Histogram differs from the Pareto Chart, however, in that the Pareto Chart only deals with *characteristics* of a product or service (e.g., type of defect, problem, safety hazards), whereas the Histogram takes measurement data, e.g., time, dollars, temperature, weight, and displays its distribution. The Pareto Chart displays the frequency of nominal data, whereas the Histogram displays interval/ratio data.

Technically, a Histogram consists of a series of equal-width bars of differing heights. The width of each bar represents a preset interval within the total range of data. The height of each bar, however, varies because the height of a column reflects the number of data points or observations within that interval. The varying heights of the bars give a "bird's-eye view" of the amount of variation that a process has within it.

Figure 20 shows a histogram displaying the frequency distribution of the various lengths of time that patients had to wait in the waiting room. Although this histogram shows that most patients spent between ten and twenty-nine minutes waiting to see their therapists it also shows that several patients had to wait more than twenty-nine minutes. The broad distribution of this histogram suggests a high variability for waiting time.

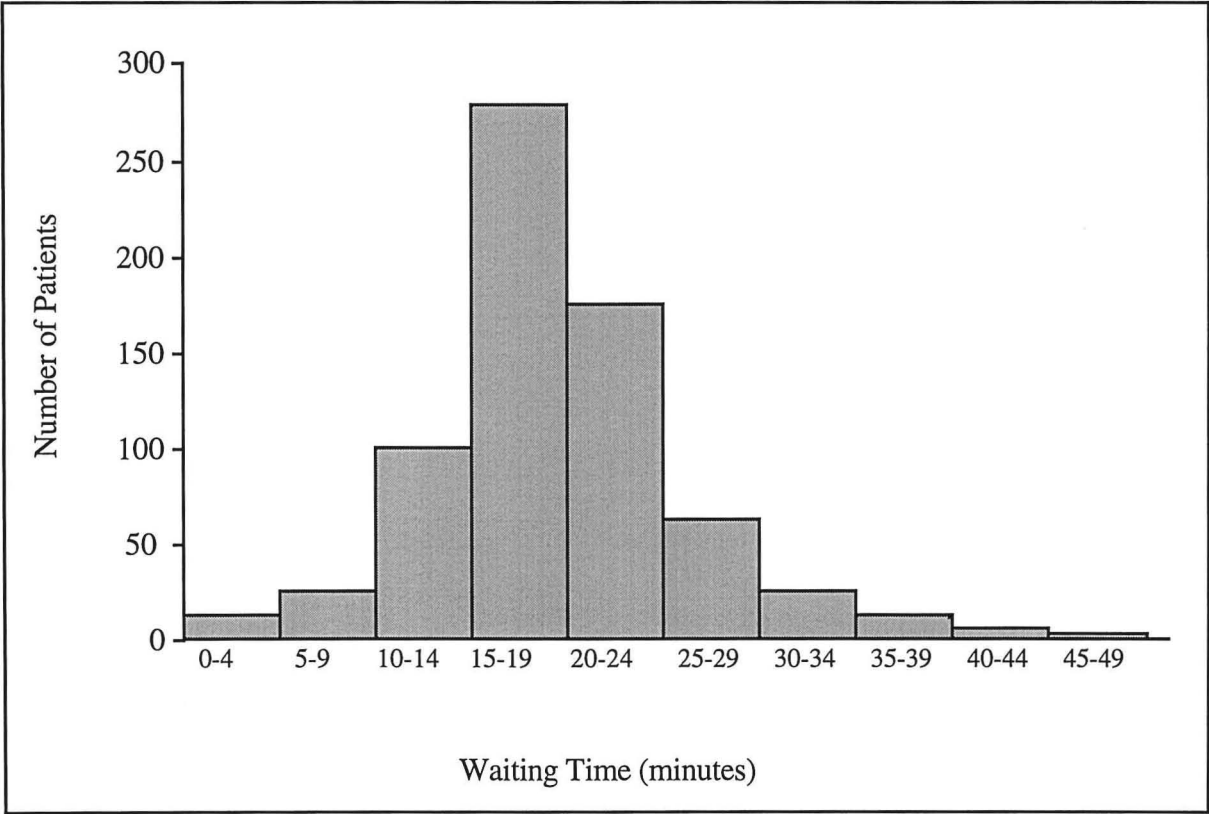


Fig 20. —Example of Histogram for Outpatient Waiting Time

Histograms are generally used for the following two purposes:

1. To understand the variability within a process so that the capability of the process to yield consistent, acceptable results can be assessed.
2. To help generate alternative theories about the dynamics of a process and the causes of problems

Scatter Diagrams

Scatter Diagrams visually assess and display possible relationships between one variable and another. Essentially a simple form of correlation analysis, the Scatter Diagram tests for *possible* cause and effect relationships but does *not* prove cause and effect. The data collected from two variables are plotted on a graph, with one variable on the *x*-axis and the other on the *y*-axis. The "tightness" of a cluster of plotted points on a Scatter Diagram gives some idea as to the strength of the relationship between the two variables. The more that a cluster resembles a straight line, the stronger the correlation between the variables.

Figure 21 shows an example of a scatter diagram which shows a relationship between the number of overtime hours worked by secretaries and the number of billing errors. This diagram suggests that the number billing errors per week increases as the number of overtime hours worked by secretaries increases.

Run Charts

A Run Chart is a line graph used to visualize a pattern of behavior of certain data over time. In a run chart, measurements are plotted in sequence and then connected to form a line graph. This graph provides a visual tool for highlighting trends that suggest that the process has *significantly* changed.

When monitoring any process, one should expect to find an equal number of points falling above and below the average. Therefore, when a sequence of seven or more points fall on one side of the average, the process is considered to be significantly changed compared to its average performance. Other trends which might indicate that a process has significantly changed and should be investigated include the following¹⁹:

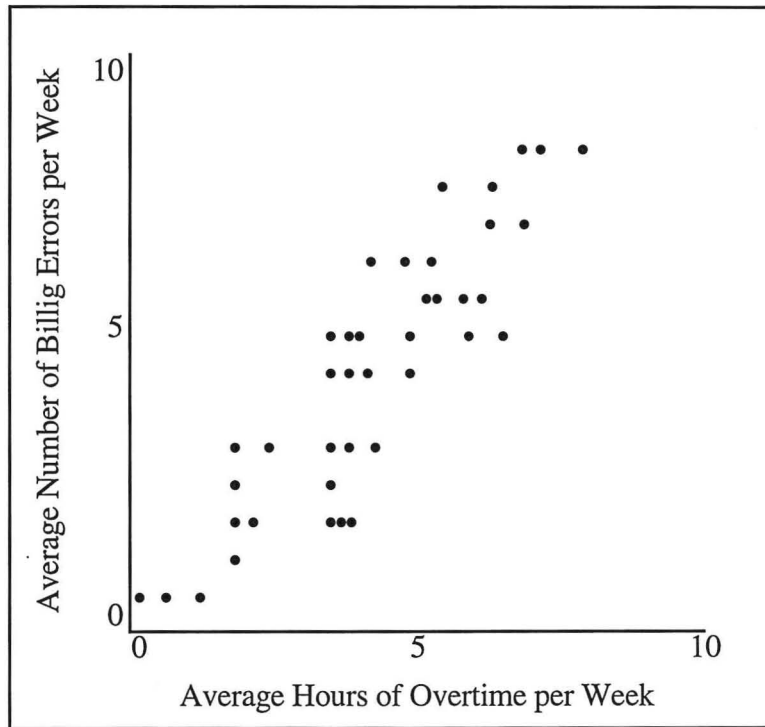


Fig 21. —Scatter Diagram Showing the Relationship between Overtime Hours Worked and Number of Billing Errors

- Freaks--Extreme data points.
- Trends--A trend of seven or more points steadily increasing or decreasing.
- Sudden Shifts--A sudden shift of the data in a different direction.
- Cycling--A zig-zag pattern of data.

Figure 22 is an example of a trend chart showing the number of patient complaints by month for fourteen months. The zig-zag pattern of the chart suggests that a problem worth investigating may exist. A closer look at various aspects of the patient complaints (dates, types, etc.) may provide further insight into the reasons for the variability of patient complaints.

Control Charts

A Control Chart is simply a Run Chart with statistically determined upper (Upper Control Limit) and lower (Lower Control Limit) lines drawn above and below the process average. It is important to understand that these control limits are not thresholds, specifications, or standards; control limits are calculated using actual measurements from the process. The upper and lower control limits are typically drawn at three standard deviations from the process average.

Control Charts are primarily used to determine whether or not a current process is consistently producing predictable degrees of variation. The Upper and Lower Control Limits allow you to assess whether variations in performance are within normal limits (due to common causes) or are out of control (due to special causes). A process is said to be in control if the trend lies within the Upper and Lower Control Limits around the average. However, if any portion of the trend falls outside these limits, the process is then considered to be out of control. A process is also considered to be out of control if it displays any of the trends or patterns that were discussed in the previous discussion on Run Charts.

Figure 23 is an example of a control chart showing the total number of outpatient physical therapy visits for sixteen different patients diagnosed with lumbar strains. This control chart suggests that the process of care for lumbar strain patients is in control, as all

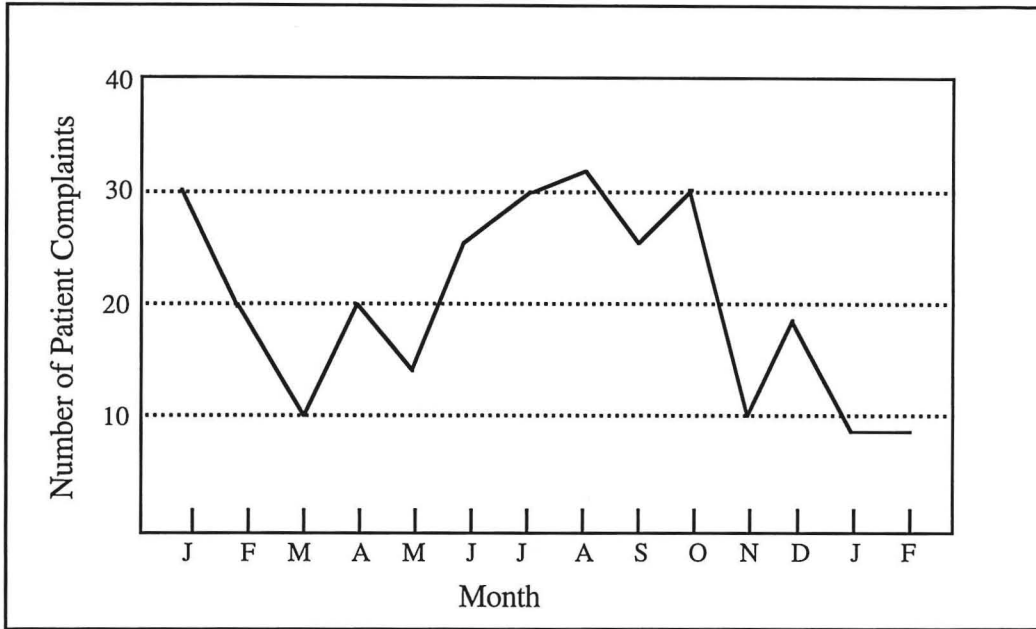


Fig 22. —Run Chart Displaying Patient Complaints by Month (from Al-Assaf¹)

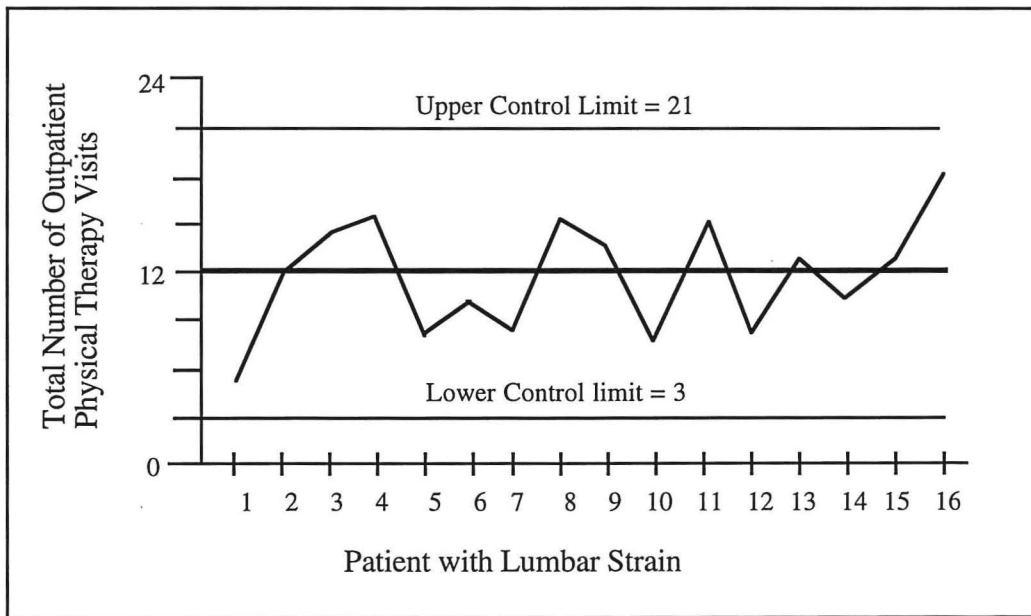


Fig 23. —Control Chart Displaying each Patient's Total Number of Outpatient Physical Therapy Visits

of the data lie within the upper and lower control limits.

Caution! Just because a process appears to be under control does not mean that it is producing acceptable results. It just means that the process is performing consistently. For example, a Control Chart may show that a clinic's patients are consistently waiting for twenty minutes in the waiting room prior to seeing their physical therapists. However, the patients are probably not satisfied with this long wait. Therefore, if a process is in control, it is not necessarily a good process; conversely, if a process is out control, it is not necessarily a bad process.

Conclusion

This chapter briefly discussed a few of the more commonly used TQM tools (Fig 24). As more organizations invest time in quality management, more tools and techniques emerge. It is important to emphasize that these tools are not difficult to use. While there are computer programs that can assist in the production of the tools noted above, most of the work can be done with paper and pencil. An aversion to "statistics" can be overcome with coaching from a consultant well versed in TQM philosophy and methods.

Physical therapy organizations can improve the quality of their services through the effective use of TQM. In order for TQM to be most effective, the core principles of TQM, the FOCUS-PDCA cycle, and the tools of TQM must all be used consistently and appropriately. Most importantly, TQM requires the firm and continuous commitment by all employees and administrators to one common goal--providing high-quality physical therapy services.

Physical therapists seeking to improve the quality of their services are encouraged to share this primer with their co-workers and to continue their studies in TQM. A list of references and resources is provided at the end of this primer for persons wishing to learn more about TQM.

TQM Tool	Used for
Surveys	Gathering information
Focus Groups	Gathering information and ideas
Brainstorming	Generating thoughts and ideas
Flow Charts	Documenting actual and ideal process paths
Cause-and-Effect Diagrams	Exploring causes of variation
Check Sheets	Gathering data based on observation
Logs	Gathering data based on observation
Pareto Charts	Displaying relative importance
Histograms	Displaying distribution of data
Scatter Diagrams	Testing themes of relationships
Run Charts	Displaying simple trends over time
Control Charts	Determining variation

Fig 24.—Summary of TQM Tools and Their General Uses

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