CONTINUOUS QUALITY IMPROVEMENT: METHODS AND TOOLS

by

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CONTINUOUS QUALITY IMPROVEMENT:  
METHODS AND TOOLS

BEHAVIORAL OBJECTIVES

UPON COMPLETION OF THE READING MATERIAL, THE PRACTITIONER WILL BE ABLE TO:

1. Define continuous quality improvement.
2. List the goals of continuous quality improvement.
3. Select obstacles that interfere with effective communication.
4. Explain how brainstorming is used in continuous quality improvement.
5. Describe how process-flow diagrams are used.
6. Describe continuous quality improvement problem-solving techniques.
7. Describe how run charts are used.
8. Identify the CQI technique used to identify the suppliers and customers of a process.
9. Determine the need for Pareto charts.
10. Identify the need for CQI.
11. List CQI activities that need documentation.
12. Define “poka-yoke”.
13. List the variables of the communication process.
14. Apply problem-solving techniques learned in this course using your critical thinking skills.

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INTRODUCTION

Continuous Quality Improvement (CQI) is a quality management strategy. We often ask ourselves why CQI is an important tool to understand. Do we learn about CQI strategies and collect data only to satisfy the JCAHO? If one looks at this process as a necessary evil as opposed to a valuable tool, they may not be seeing the big picture in how a properly run study is not difficult to run and not a waste of time. Moreover, the results can improve the work environment for management, staff and patients. CQI is more than a simple quality management strategy. It is an entire management philosophy. A management philosophy that departs sharply from philosophies of the past. Traditional management philosophies are built upon a bureaucratic “command and control” model. CQI is a management philosophy based upon a nonbureaucratic “educate and support” model. This change in management philosophy is the most difficult aspect of CQI.

CQI is a mechanism that identifies and resolves problems that cause quality defects. It provides small incremental improvements in quality over a period of years. Generally, one does not get results overnight. CQI is not a quick fix for a failing business. The typical implementation time for CQI is 5-7 years.

There are two components to CQI: philosophy and tools. Use of the tools will result in improved quality even if one does not adopt the CQI philosophy. CQI “activities” can occur without changing to a CQI “environment.” However, embracing the entire concept and utilizing both the philosophy and the tools obtain the greatest success. We will begin the discussion with an overview of quality. Particular emphasis will be placed on service quality.

QUALITY OVERVIEW

Quality, by itself, is indefinable. An aspect of the object in question can only describe it. No product or service can ever be described as low, medium, or high quality without an explanation of what that means. For example, product “X” is of poor quality because it falls apart quickly. Hospital “X” is of poor quality because there is a high incidence of nosocomial infections. It is impossible to state that product “X” or hospital “X” is of low quality without further explanation.

Quality in a service industry, such as, health care, is even more abstract. Unlike product quality, service quality doesn’t last. Service quality is created at the moment the service is provided and then it disappears. The employee dealing with the customer, as opposed to a production process, creates Service quality. A production process influences Service quality, but the customer’s perception of quality is created when they deal with employees.

Management for service industries must understand they are not in charge of quality or customer satisfaction. The employee who deals with the customer is in charge of quality and customer satisfaction. Consequently, employee satisfaction is paramount in quality efforts for service organizations. Dissatisfied employees will not provide quality service or satisfy customers.
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For example, hospital employee satisfaction surveys, the percent of participation and the results are of paramount importance to upper management. This is mostly because a patient’s satisfaction seems to have a direct relationship with employee satisfaction.

Of equal importance to customer satisfaction is employee empowerment to deal with routine customer problems. The employee must have the skills, resources, and authority for customer interactions. Management must provide the employee with these skills, resources, and authority. The staff must be empowered by the organization to create change and have a positive impact in their environment. Administration must educate and support employees for quality to occur. Information and knowledge are the raw materials for a service organization. Loyal employees and customers are the assets. These cannot be measured through traditional accounting methods. Nor can they be managed with traditional quality management procedures. To provide quality service, one needs a workforce that feels valuable and like their job. Each staff member needs to feel like a part of the team. Employees also need the authority to deal with the customer. Poor quality service occurs when the personnel lack such authority.

The historical approach to quality has been to add more inspection steps. This adds more workers and increases cost. (The health care industry quality assurance (QA) monitoring system uses this approach.) Traditionally, quality assurance is assigned to individuals or a department who inspect the “quality” after the service has been provided. This allows everyone else in the organization to ignore quality. It’s not their “job.”

A better approach to quality is to get everyone involved in the quality process and consider quality before the service is provided. Inspect the service in the design stage so the process is made to be stable and reliable. Consistency is the first step to improved quality. Hitting the quality bulls-eye occasionally can be less valuable than getting close to it all the time. In the case of the latter, a minor adjustment can bring one into the bulls-eye on a consistent basis. In the case of the former, many adjustments are necessary to hit the quality bulls-eye consistently.

If the design and the process are good, quality is inherent. CQI is a quality management strategy that begins in the design stage. The problems that cause a decrease in quality are identified and resolved before they occur (when possible). CQI provides a quality loop that inspects the service before, during, and after it is delivered.

CQI is but one of many quality management strategies. Other strategies are: customer satisfaction, employee involvement, benchmarking, supplier partnerships, time-based competition, and self-managed work teams. Each organization should determine which they would employ. CQI has many, if not all, of the characteristics of these other strategies. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) is promoting CQI as the means to improve quality in health care. With the new JCAHO visitation occurring at any time - CQI becomes even more of an ongoing philosophy to follow as opposed to a task to complete prior to a hospital accreditation survey.
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DEFINITION OF CQI

CQI is a customer-oriented, data-driven management philosophy. It expands the idea of the customer to include customers within the organization (employees) as well as traditional end-of-the-line customers (patients, families, etc). It is a philosophy rooted in concrete data rather than abstract ideas. The data collected in CQI is used to identify problems and their causes. The CQI philosophy believes that removing the causes of problems results in improved quality. The “blame the employee” philosophies have had to be put to rest in order to facilitate reporting of incidents and truly see the causes, which, in many cases are system-related.

GOALS OF CQI

There are numerous goals of CQI depending upon your industry, institution, or profession. We will discuss four goals that apply to all:

- involve everyone in the quality process
- eliminate causes of problems
- change workplace behavior
- change workplace culture

CQI recognizes that quality is the result of a process that extends to everyone in the institution. It cannot be delegated to a specific person or department thus allowing everyone else to ignore it. Every person in the organization contributes in some way to the achievement of quality so everyone must be involved in the quality process.

Major portions of CQI activities are aimed at eliminating the causes of problems. This requires problem identification, analysis, and solution. Numerous techniques are available for this. Brainstormings, cause-effect diagrams, check sheets, pareto charts, and process-flow diagrams are a few. These techniques use statistical process control for identification and monitoring of specific problems. They provide a uniform structure for problem solving. Using these techniques regularly is essential for obtaining a CQI environment.

The third and fourth goals are interrelated. Changing the behavior of those in the workplace will inevitably change the workplace culture. Both will be very difficult to achieve because behavior and culture are ingrained within the individual and organization. The behavior of an adult or organization changes very slowly. Do not expect large changes in a short period. However, small incremental changes are possible over extended periods. It takes years to change to a CQI workplace culture.

The present workplace was formed when society made the transition from an agricultural focus to an industrial focus. This created the bureaucratic style of management so prevalent in today’s
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The continuous quality improvement (CQI) philosophy is based on the belief that the overwhelming majority of workplace problems are system-related, not people-related. It is estimated that 80-85% of workplace problems are specifically due to system defects. CQI assumes that most people want to be involved in decision-making and want to perform their job well. What prevents this in many cases are the systems in place. One should concentrate on correcting systems and many “people” problems will disappear.

A second assumption is that an adversarial relationship between management and staff is counterproductive to quality. Management that distrusts staff or vice-versa will invariably lead to poor quality. Adversarial relationships are usually related to a lack of communication. Communication is probably the single most important aspect of CQI. Much more can be accomplished when management and staff work together on common agreed-upon goals.

In today’s marketplace, freedom of expression is not just a political goal but also an economic necessity. Workers must feel comfortable with management to suggest ideas on improving the organization. An extremely important assumption of CQI is that those closest to the process have the most knowledge about it. There must be open communication between management and staff for that knowledge to be tapped. Every institution has breakthroughs, ideas, and “gems” residing in its employees waiting to be discovered. Barriers between members of the organization will prevent their discovery.

Management to allow for a free flow of ideas must cultivate an environment of intelligent error. In a workplace where employees fear making a mistake, there will be no suggestions. They will not offer solutions because they don’t want to be wrong. In a workplace that tolerates intelligent error, this is not a consideration. Employees are stimulated to make suggestions in such a workplace. They are encouraged to be thinking about the process of what they are doing. They are not afraid to make a mistake or be “wrong”. Intelligent error encourages innovation.

A final assumption of CQI is that a structured problem-solving process gets better results than a
nonstructured process. All members of the organization must uniformly apply techniques of problem solving. Most presentations on CQI concentrate heavily on these techniques. They are also called problem solving “tools”.

**PROBLEM-SOLVING TECHNIQUES**

**BENEFITS** - Structured problem-solving gets better results than unstructured problem-solving. There are many techniques used for structured problem solving. Use of these techniques has many benefits. One of the most significant of these is improved communication. The techniques of CQI provide a common language for discussing problems. Standardized terminology is essential for effective communication. Use of the techniques help dismantle communication barriers.

Another benefit is the techniques provide a clear delineation of goals to work towards. People perform much better when they know what they are trying to achieve. Delineation of goals and action plans are essential components of CQI techniques.

The techniques provide data to separate opinion from fact. This is essential for valid problem solving. They provide the means to quantify the severity of the problem and allow objective monitoring to occur. This is essential to evaluate the effectiveness of your problem resolution. A final benefit of the techniques is they force one to take a global perspective in relation to the problem. They force one to look at all possibilities for problem identification, analysis and solution.

We will briefly describe several techniques and their uses. One technique is not recommended over another. They each have their advantages and disadvantages. Some are useful for problem identification, others for problem analysis, and still others for problem solution. Different techniques may be used on the same problem, depending on the stage of the problem identification, analysis, or solution process. Personal preference and the individual situation will determine which is used at a given time.

**BRAINSTORMING** - Brainstorming is often used in conjunction with other techniques. Brainstorming is a procedure that expands thinking to all aspects of a subject, problem, or solution. It creates a maximum number of ideas in the shortest possible time. Brainstorming can be structured or unstructured. Structured brainstorming consists of going around the table and having each person contribute an idea. This ensures full participation, but can be stressful for some participants. Unstructured brainstorming consists of simply recording all ideas that is presented but not requiring an idea from each participant. This is a more relaxed atmosphere and is usually more productive. Be careful that one or more persons do not dominate the session. An example of an unstructured brainstorming session is provided below:
Guidelines for brainstorming are simple. The first guideline is to write down the subject of the brainstorming session so all participants can see it. Obviously, everyone must agree on the subject or else the ideas presented may have no relation to it. Write the subject down on a chalkboard or flip chart in plain view of all participants. As the ideas are presented, write them around the subject. Write every idea in full view of everyone. Each idea, no matter how outlandish, can stimulate additional ideas. Keep in mind that it takes many ideas to come up with one “gem”.

The second guideline is that no idea is criticized. Criticism hinders creative thought. The purpose of brainstorming is to generate creative ideas, not to get all “right” ideas. Each idea presented, right or wrong, stimulates the thought process of the other participants. Therefore, judgement and evaluation of each idea are not performed during brainstorming. In our example above, there are several suggestions that are ridiculous. These were recorded as they were presented. They were not activities that would be actively pursued to achieve the stated goal. However, they were very useful to record because it caused the group to loosen up and start presenting more relevant ideas. Some of the ridiculous ideas stimulated other ideas that were useful.
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A third guideline is to not interpret the words of the speaker. Simply record the idea in their words. It can be interpreted or explained after the session. The last guideline is to limit the session. Five to fifteen minutes are all that are necessary for brainstorming a topic. Brainstorming is not designed for long discussions or debates about the ideas. The intellectual discussion takes place after the session.

BRAINSTORMING METHOD: SUMMARY OF GUIDELINES

- Don’t criticize
- Write the subject in plain view
- Write all ideas down
- Don’t interpret
- Limit the session

PROCESS-FLOW DIAGRAM - The thought process used in this technique is familiar to many. It is the same as that used in standard decision trees and branching logic-types of operations. Persons familiar with protocols will grasp process-flow diagrams quickly. Process-flow diagrams are pictorial representations of all steps of a process and their relations. They outline the beginning, action steps, decisions, paperwork, communication, and end of the process being studied.

Process-flow diagrams use standardized symbols to represent specific types of activities. The symbols provide easy identification of similar activities no matter which process is being studied. This aids multidepartmental communication when discussing a process. Symbols are connected via lines describing the flow of the process.
Two diagrams should be constructed, one for the actual process-flow and one for the ideal process-flow. Deviations between the two are noted and addressed. (An alternative to two diagrams is to just diagram the actual process-flow and then analyze it for problem areas. The result of the analysis will produce an ideal process-flow diagram.) Be patient and honest in the construction of the diagrams. Observe and document each step and decision point for the process.

It is important to define the boundaries of the process before construction. This makes it clear what you will be looking at. For example, you may wish to diagram how a new order is processed. The start of the process may begin with the receipt of the order in the department. The end of the process may be when the order is assigned to a specific staff member. An alternative may be to begin with the physician writing the order and to end with the completion of the order. Either is acceptable depending upon the information you want.

**Figure 2: Process-flow symbols.**
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It is important that start and stop points of the process be clearly defined so everyone is looking at the same thing. The actual start and stop points are at your discretion. A simplified process-flow diagram for a hospital QA monitoring process is provided below. Simple symbols are used to make it as easy as possible to understand the diagram. Every feedback loop that outlines a deviation from the ideal pathway needs an escape (a way to return) to the correct pathway. Try to have only one output line for each process box. Two or more lines from a process box indicate a decision point. If so, a decision diamond would be more appropriate than a process box. (Several decision diamonds in our example have only one line because the decision at this point does not affect the process-flow pathway.)
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QA MONITORING PROCESS

- List department activities
- Identify high volume / high risk activities
- Choose activity to monitor
- Establish indicator of quality for measurement
- Develop measurement instrument
- Measure quality indicator
- Evaluate measurements
  - Problem exists
  - Trend identified
  - No trend identified
- Identify action to take
  - Inservice
  - Further monitoring
  - Communication
  - No further action
- Implement actions
- Remonitor

Figure 3: Process-flow diagram of a typical QA monitoring process.

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MEASUREMENT (check sheets, surveys, etc.) - The thought process behind measurement is also familiar to many. The majority of hospital QA monitoring activities utilize measurement. Measurement allows problems and causes to be quantified. It also allows one to monitor the effect of solutions. Measurement confirms or negates problems and turns opinions and perceptions into verified data. Data collection and the proper use of data dispel much of the subjective conflicts that can occur in a group.

The results of measurement data are used to regulate, modify, monitor, accept or reject a process being studied. The aim of measurement is to gather meaningful data, not just a bunch of numbers. Data should be objective and impersonal. It should be a truly random sample and be gathered consistently. Bad data is worse than no data. The data must be useful to understand the actual situation.

Check sheets are simple data-gathering devices. They are used to record sample observations and detect patterns. Check sheets identify how often a given event or problem occurs. This is used to translate opinions into fact. Do not be surprised or discouraged if the check sheet demonstrates what you thought was the problem isn’t the problem. This occurs frequently. The check sheet can, just as frequently, provide evidence of the actual problem. Either way you achieve your purpose. The opinion that is disproved is what led you to look at the problem in the first place so the effort was not wasted.

The concept of “Intelligent error” was briefly mentioned earlier in this text. When a check sheet demonstrates that your original perception of a problem is incorrect it is an example of intelligent error. An error of perception was made, but if it hadn’t been made the problem would not have been studied. The original perception or opinion is what triggered action to look at the problem. That action led to data collection. This identified causes of the problem and, hopefully, solutions.

The task of management is to keep the “intelligent” in an intelligent error environment. Check sheets and the other structured problem-solving techniques are ways in which this is done. They educate the staff and keep the process focused. They remove bias, prejudice, and other emotions from problem solving. The more this is done, the more it becomes routine. This is the start of the behavior change for CQI.

As with any study, the data-gathering device must be valid to provide useful data. Construction of the check sheet is therefore critical. The first step in construction is for all parties to agree on what to observe. For example, one may choose to count how many times problem “X” occurs. The second step is to set the monitoring period. The occurrence of problem “X” may be counted for the next two weeks, three months, quarter, year, etc. Hours of the day or days of the week may be specified for the measurement. Setting the monitoring period will depend upon what information is sought and how often the event occurs.

The third step is to ensure the form is clear and easy to understand. It should be simple and have adequate space to record the data. It must be very easy to fill out. If the data can be gathered
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automatically via computer or other means, this should be done. If it is collected manually, time must be allotted for the activity. This will give better results than telling someone to get the data in addition to their normal duties.

The data collection must be done consistently and honestly for valid results. The sample population must be homogeneous and as representative as possible of what you are observing. If not, categorize the population and sample the categories individually. This will still provide data on the whole population but also will detect differences within that population. For example, there may be a belief that surgical patients are in your hospital too long. This triggers you to look at the length of stay (LOS) for these patients.

LENGTH OF STAY

<table>
<thead>
<tr>
<th>Type of Surgery</th>
<th>&lt; 1 Day</th>
<th>1-2 Days</th>
<th>3-4 Days</th>
<th>5-6 Days</th>
<th>7-8 Days</th>
<th>&gt; 8 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal</td>
<td># cases</td>
<td># cases</td>
<td># cases</td>
<td># cases</td>
<td># cases</td>
<td># cases</td>
</tr>
<tr>
<td>Thoracic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiac</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orthopedic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatric</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 4: Data collection check sheet on surgical LOS

Surgical patients are hardly a homogeneous population. Looking at them as a whole will probably not provide any information other than to confirm or deny the original belief. It will not provide information useful for identification or solution if a problem exists. Breaking the surgical population into categories of abdominal, thoracic, cardiac, orthopedic, and pediatric surgeries for sampling will be far more valuable. This will still confirm or deny the original belief but also will help focus in on a problem area if one exists.

The problem area can then be subdivided for further detail. A sample data collection check sheet is provided above. One can simply record the number of surgeries in each category and the LOS for each patient. When completed, one may find that the average surgical LOS is short but the cardiac surgery LOS is long. This denies the original belief but identifies what caused the belief. This would not have been discovered if the original study population had not been categorized. The cardiac surgery cases may now be studied for further problem identification.

CHECKSHEETS:

- Agree on what to observe
- Set monitoring period
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- Create clear, easy to understand form
- Allow time for data collection
- Be consistent and honest in data collection

Surveys are a form of check sheet used to collect data on perceptions, as opposed to observable events or problems. For example, before looking at surgical LOS for the above surgeries the staff could have been surveyed. Their opinion on which surgical patients have an extended LOS could have been documented with a survey. This opinion could then be measured via check sheets. Doing the survey first helps to decide what to look at with a check sheet.

Employee surveys are very useful. Employees can be surveyed to determine what they believe are the most pressing or costly problems. This focuses the group to gather data on those problems. This can save a lot of time and money. Remember that those closest to the process know the most about it. Customer surveys are also very common and valuable.

Survey construction is as critical as check sheet construction. Questions should not “lead” the respondent to an answer. In some cases, questions that require a yes/no response are the most valid. In others, a narrative response would be more appropriate. In still others, a numbered response (a scale of 1 to 10) provides the most valuable information. Questions should not be misleading or biased. If so, the survey results are invalid. Below is a sample survey regarding internal customer satisfaction. This simple survey could provide a wealth of information on customer and professional relations. Based upon the responses, problem areas can be identified for further investigation.

INTERNAL CUSTOMER SURVEY

On a scale of 1 to 10, with 1 being very poor and 10 being excellent, how would you score the RC department?

SCORE

1. Helpfulness
2. Courtesy
3. Timeliness
4. Knowledge
5. Professionalism

How often do you interact with the RC department?

____ daily _____ weekly _____ monthly _____ rarely

Are your interactions primarily bedside patient-care related?

____ yes _____ no
HOSPITAL-WIDE AND DEPARTMENT-SPECIFIC STUDIES - A quality council report on organizational performance may include many categories of elements. The elements actual percentage or number is then “benchmarked” (or compared statistically) with a known standard. Element categories may be monitoring inpatient admissions or cardiac cath lab procedures. The element number is compared to historical data of that facility. Patient satisfaction is continuously monitored. It may be “benchmarked” against a Gallup poll source.

Common element categories in an acute care facility are:

- Patient rights
- Patient satisfaction
- Patient safety
- Number of days, admissions, visits or procedures
- Care of patients
- Hospital specific services
- Utilization management
- Information management
- Human resources

Common “benchmarks” are:

- JCAHO
- Centers for Disease Control
- Expected to actual
- Gallup
- National
- College of Anatomical Pathology
- Historical data
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EXAMPLE REPORT

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>BENCHMARK</th>
<th>FIRST QUARTER, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HUMAN RESOURCES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turnover Rate</td>
<td>Historical 5%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Evaluations on Time</td>
<td>JCAHO 98%</td>
<td>98%</td>
</tr>
<tr>
<td><strong>ACTIVITY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Department Visits</td>
<td>Historical 11,800</td>
<td>13,000</td>
</tr>
<tr>
<td><strong>PATIENT RIGHTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Satisfaction with Pain Management</td>
<td>Gallup 3.44</td>
<td>3.67</td>
</tr>
<tr>
<td><strong>HOSPITAL SPECIFIC SERVICES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal-Child</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ventilator Associated Pneumonia-NICU</td>
<td>CDC 3.8%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

**PARETO CHART** - Pareto charts are specialized forms of vertical bar graphs. They are based upon data from check sheets, surveys and other data-collection devices. Pareto charts determine the most important problem and its basic cause. They display various problems and the relative importance of each. Once constructed, they act as the baseline for monitoring success. To construct a pareto chart, select the problems or events to be compared and rank them according to actual data or brainstorming.

**CHARTED ADVERSE REACTIONS**

Figure 5: Pareto chart of charted adverse reactions to RC procedures.
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What is being compared is listed horizontally. The standard of comparison is listed vertically. Common pareto charts list time horizontally and what is being counted vertically. Problems or events are listed from left to right and from high to low, if known.

An example of a pareto chart on adverse reactions to RC modalities is provided above. Different modalities are listed horizontally. These are being compared for the number of charted adverse reactions associated with each. The number of charted adverse reactions is listed vertically. In this example, medication nebulizer therapy has the highest number of charted adverse reactions.

Several charts can be made to compare the most important problems via different measurement scales, such as, frequency versus cost. This can be very enlightening because the charts may not correlate. One may discover the most frequent problem may not be the most costly or vice versa. In medicine, one bad case can be far more costly than many cases with a simple and frequent problem. Using the different charts can help one decide which problem to tackle first.

In our example of charted adverse reactions, medication nebulizer therapy had the most frequent incidence of adverse reactions. However, a pareto chart on the costs of the adverse reactions may reveal the single mechanical ventilation adverse reaction was far more costly than those associated with medication nebulization. One may choose to tackle the mechanical ventilation problem before the medication nebulization problem.

Pareto charts are useful for before and after comparisons and to analyze different groups of data. One can set up the chart to analyze a problem by day, shift, type of defect, etc. Problems can be broken down into smaller parts for more specific data. For example, initial monitoring may reveal the majority of problems occur on a Monday. This may trigger a shift comparison for Mondays to see if there is a difference in shifts. This reveals that most of the problems occur on the day shift. This should trigger discussion on what is different about day shift on Monday versus other days and shifts. The result of this discussion may reveal causes of the problem. For example, Monday’s day shift may have less staffing, may be doing tasks left over from the weekend or be using equipment that hasn’t been calibrated for a few days. Any of these may explain the increase in problems on Monday’s day shift.

RUN CHARTS - Run charts are the simplest method of displaying trends over time. A typical example is the plotting of sales over the past quarter or year. Run charts are used to focus attention on trends, not on individual data points. They show deviations, such as, consistent runs above or below the average. Deviations can then be correlated with points in time. For example, sales are always down in September or breathing treatments always increase during pollen and smog seasons. These examples may be perceptions, opinions, or facts. A simple run chart will determine which is true.
Run charts are very easy to construct. One simply plots time on the horizontal axis and what is being measured on the vertical axis. Then connect the dots for each measurement. It is important to mark the time periods and your unit of measurement clearly. The sequence of the data points is also critical since they are being compared over time. Data points must be recorded in the correct order or the data is useless. The sample run chart of ventilator usage provided above reveals a steady upward trend from April to June.

**CAUSE-EFFECT DIAGRAMS** - Cause-effect diagrams are also known as “fishbone” diagrams. They are used to identify possible causes of a problem. They also sort and relate the causes.

Fishbone diagrams identify what you do know and what you don’t know about the process. One begins by stating the problem and recording it on a piece of paper or board so all can see it. Then draw a line from the problem across the page or board. Draw 4 branches off the line. These will be used for generic categories of man, machine, method and material. (Some prefer “people, procedure, policy or plant.”) These are the most common causes of a problem, but you may use different or additional categories depending upon your situation.
Begin brainstorming potential causes of the problem in each category. Make as many branches as necessary. When looking at each cause note any change or deviation from the norm. Look for causes that appear repeatedly. Reach a team consensus on the causes and then verify each cause via measurement.

Some useful tips on cause-effect diagrams are to keep the causes within the control of the group. The purpose of the diagram is to make changes to solve the problem. It is useless to discuss causes you have no control over. Be brief in listing the causes and make sure there is consensus on the original problem statement. A cause-effect diagram on the problem of peak flows (PF) and slow vital capacities not being performed on breathing treatments is provided below:
CAUSE-EFFECT DIAGRAMS METHOD: SUMMARY OF GUIDELINES

- Identify problem (effect)
- List possible cause categories (usually material, man, machine, method)
- Brainstorm causes
- Verify causes via measurement
- Keep causes within control of the group
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FORCE FIELD ANALYSIS - Force field analysis is used to identify the forces acting on a given change or event. Change occurs as a result of driving forces for the change overcoming restraining forces preventing the change. When the forces are equal, there will be no change. If the restraining forces are stronger, there will be no change. Change is possible only when the driving forces are stronger than the restraining forces. Generally, better results are obtained by working on decreasing the restraining forces rather than increasing the driving forces.

Force field analysis displays the positive (driving) forces and the negative (restraining) forces on a balance sheet. It forces people to think together about all facets of the change. It encourages people to agree on the priority of the forces on each side and provides a starting point for action.

**DRIVING FORCES**

<table>
<thead>
<tr>
<th>Decrease conflict</th>
<th>Decrease stress</th>
<th>Improve morale</th>
</tr>
</thead>
</table>

- Lack of staff involvement
- Lack of cohesion
- Lack of department focus

**RESTRAINING FORCES**

Figure 9: Force-Field analysis on improving internal departmental cooperation.

A force field analysis on the subject of improving cooperation is provided above. The change desired is listed in a box on the far right. The driving forces are listed along the top and the suspected restraining force opposing each is listed opposite (on the bottom). An arrow represents the direction of each force.

Another example of a change desired might be “make the change to a CQI environment.” The driving forces for such a change may be: the CEO wants to do it, decreased costs, improved quality, satisfy a regulatory agency, etc. Some restraining forces might be: the rest of management does not want to do it, CQI will cost a lot of money to implement, there is a belief that quality cannot be improved further, or there is an alternative to satisfy the regulatory agency.
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Arrange these into a force-field analysis on the practice sheet provided at the conclusion of this course.

FORCE-FIELD ANALYSIS METHOD: SUMMARY OF GUIDELINES

- Identify desired change
- List driving forces
- List restraining forces opposite

INPUT, PROCESS, OUTPUT (IPO) MODEL - The IPO model identifies the input, process, and output for a given event, product, or service. It also identifies the customers, requirements, and suppliers of the process. Once this has been done, the IPO model allows one to match suppliers to the inputs required to complete the process. The inputs are, in turn, based upon the requirements of the customer. Putting these together determines the output of the process. Construction of an IPO model utilizes information from several other tools, such as, process-flow and cause-effect diagrams.
To construct an IPO model, begin with identifying a process. Second, identify the output(s) for the process. Third, identify the customer(s) of the output(s). Fourth, discuss with the customer what it is they actually need (or want) from your process. This can be done with a survey, check sheet, etc. The results are listed as customer requirements in the model. Customer requirements are extremely important in matching output to actual customer need. Therefore, it is extremely important that each requirement of the customer be valid, realistic and achievable.

Screen all customer requirements for validity. Ensure each one meets the criteria of: customer-focused, measurable, and agreed upon by you and the customer. Meeting these criteria ensures that you and the customer are speaking the same language and working for the same goals. If a
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requirement doesn’t meet all three criteria: it isn’t what the customer needs (customer-focused), there’s no verification the need has been met (measurable), or they require something you cannot provide (agreed upon).

Fifth, identify the items you need to perform the process and list them as inputs. Sixth, identify what is needed for each input. These are listed as the input’s (your) requirements. The same criteria apply to these requirements as the customer’s requirements. The only difference is that you are the customer for these requirements. Your suppliers must meet your needs. Cause-effect diagrams listing the four “M’s” (man, machine, method, material) are useful in identifying inputs and input requirements. The last step in constructing an IPO model is to identify a supplier for each input requirement. When completed, the IPO model provides a macro view of a process from the raw material phase (suppliers) to the finished product phase (customer).

IPO Model Steps Method: Summary of Guidelines

1. Identify process or key action step
2. Identify output(s)
3. Identify customers of output
4. Determine valid customer requirements
5. Identify inputs
6. Determine your requirements
7. Locate suppliers for each input

Start-Up Suggestions

A logical starting point for CQI is to learn how to communicate. CQI is all about information. A tremendous amount of information needs to be gathered and provided to implement CQI. Therefore, communication should be given the highest priority to achieve success. We have included sections on the process of communication as part of this course. The importance of good communication cannot be stressed strongly enough.

Begin by identifying your internal and external customers. (You may choose to narrow this down to the customers for a specific product or service in the early phases.) Some examples of external customers are the patient, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), or a state-licensing agency. Some examples of internal customers are physicians, nurses, the ICU, the payroll department, or administration.
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After internal and external customers have been identified, open the communication lines. Find out what your customer needs and position yourself to supply those needs. It is important there be agreement with the customer on what you can provide. Quality will suffer when you don’t know or cannot provide what the customer needs.

Third, identify the processes of your department, organization and job. Obviously, to make improvements in a process you must know all aspects of the process. Answer the questions of who does what, when, where, why, and how. Medicine, particularly regarding patient care processes, has a significant advantage over other industries in this respect. Medicine has already created extensive procedures and protocols outlining many aspects of their processes. These merely need to be expanded to encompass the other activities that impact on the process, such as, scheduling, bookkeeping, staffing, etc. The written procedure also must be compared to the actual procedure being performed to identify discrepancies. This can be done with traditional quality assurance (QA) monitoring.

A final suggestion is to learn and use structured, valid, and appropriate problem-solving techniques. The techniques should be practiced until they are second nature to the individual. When this occurs, the behavior change necessary for CQI has occurred. Initially, using the techniques will be very time-consuming. This is no different from learning any procedure. As you become more efficient the time will decrease proportionally. Eventually, you will find you are using the techniques automatically for minor everyday workplace problems. At this point, you only resort to the formal mapping out of problems when they are uncommon or complex.

DOCUMENTATION

Paperwork provides objective evidence of CQI efforts. Medicine requires such paperwork to meet the needs of both internal and external customers. This is the easiest requirement of CQI to achieve. Everyone is familiar with meeting minutes, reports, monitors, forms, etc. Documenting CQI activities is primarily a clerical activity, once the forms have been decided upon.

However, do not forget the paperwork produced is one of the most significant channels of communication. The paperwork should be constructed for the transfer of information. It should not be done for the simple purpose of meeting a deadline or requirement. It should be done to transmit relevant, useful information to anyone who reads it. Therefore, the principles discussed in the following “communication” section should be utilized when creating your paperwork related to CQI.

CQI requires that you record and improve your processes. Some examples of the documentation used are meeting minutes, action plans, data collection sheets, reports, and monitors. Additional paperwork you may find useful is CQI logs, announcements, certificates and anything else that helps to transmit CQI information. Each of the above will be discussed briefly.
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MEETING MINUTES - Minutes should describe the purpose(s) of the meeting, who attended, discussions, and recommended actions/tasks in narrative form. They should record who is responsible for each action or task. The anticipated date of implementation or completion for each action/task is also necessary. It is very important to document specific actions to be taken and results of discussions. It is of equal importance to assign responsibility for each action. If both are not clearly documented, there is less chance of success. Minutes that state, “We will begin inservicing the staff sometime this year on the subject of CQI,” are far less effective than, “Gloria and Sheila will begin inservicing the staff by July 1st on the subject of problem-solving techniques”.

ACTION PLANS - Action plans are derived directly from the meeting minutes. They are summaries that describe who will be doing what, how they will do it, and when they are expected to have it done. Action plans are usually in a table format for easy review. Additional information also may be recorded such as issues and mitigating factors regarding the task in question. These must be considered and resolved if possible. An action plan for each issue or factor may be necessary. The action plan can easily be combined with meeting minutes in one document as in the following example:
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HEADER
CQI MEETING MINUTES/ACTION PLAN

DATE: ______________________________

PURPOSE OF MEETING:
____________________________________________________________________________
____________________________________________________________________________

ATTENDEES: _________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

DISCUSSION:
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

ACTION REQUIRED RESPONSIBLE PERSON DATE OF COMPLETION
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

DATA COLLECTION - The method of data collection, (electronic, check sheet, survey, etc.)
should be saved for future reference. For many industries, saving the “hard copy” is optional. It
is not an option for medicine. JCAHO will occasionally request data collection sheets. They
will compare this information to the information reported via minutes, monitors, and other
reports. They want to see where the data came from and ensure the validity of the data reported.
(Saving the data collection information for an appropriate period is wise regardless of JCAHO
requirements. It may be useful for future reference.)

REPORTS AND MONITORS - Each institution will develop a specific format to be used for
CQI reports and monitors. Generally, it will differ little from previous formats used for QA
reports and monitors. The reports should describe the CQI activities in summary form. They
should briefly describe what has been worked on and the results of that work. Conclusions, what
remains to be done, and remonitoring should be included. These documents should be generated regularly, usually on a quarterly basis with a yearly summary.

**OTHER** - A log of CQI activities should be kept and posted. Many of the results of CQI activities are subtle and slow to develop. Results may be undetectable on a day-to-day basis. It is easy to lose track of the small successes and the progress being made. A log can remind people that action is taking place and that improvements are occurring.

It is important to formally recognize CQI achievements on an ongoing basis. Formal recognition rewards and motivates employees for their work. It reinforces the behavior change one is trying to achieve. Logs, certificates, announcements, banners, etc. are methods of reinforcing the principles of CQI. Any charts, diagrams of problem-solving techniques or other visual aids used in CQI activities should be posted. All such examples of paperwork help to communicate CQI information.

**OBSTACLES TO CQI**

**CULTURE** - Americans react poorly to programs geared to perfection. “Nothing is perfect” is inherent within our culture. We are a pragmatic culture that is satisfied with making things work rather than making things ideal. CQI requires a continuous quest for the ideal.

Americans prefer to jump into projects without heavy planning. We are action-oriented and want to get started as soon as possible. Our business strategies tend to focus on short-term profits as opposed to long-term goals. America is an impatient country. CQI requires both patience and heavy planning. Short-term gain is certainly possible with CQI; however, the emphasis is on long-term gain.

Individualism is the hallmark of American culture. In no other country in the world are the rights of the individual exalted as in America. America became a world leader because of this. CQI requires a heavy emphasis on teamwork as opposed to individual effort. Everyone must work together to achieve agreed-upon goals. Employees must “buy into” the change management is seeking for the change to occur without employee dissatisfaction. Focusing on “team work” can be stifling to some individuals. In fact, one of the greatest dangers of CQI is that a management structure is created that actually stifles revolutionary change. To prevent this, try to construct CQI teams and structures that allow individuals to “shine” without disrupting teamwork.

Surveys indicate that approximately 70% of Americans are afraid to offer suggestions or ask for clarification on the job. This can be the result of many factors, such as previous rejection, fear of appearing stupid, or the idea that it’s not their job to make suggestions. These can be dispelled with open communication and the development of trust. Management must develop a workplace culture of communication and trust.
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ATTITUDE - Impatience is an obstacle to CQI. Over enthusiasm can lead to impatience. Many CQI advocates/consultants/zealots oversell the concept. People become very enthusiastic, highly motivated, and jump right into CQI. When results are not immediate or there is a setback, the concept is abandoned. Keep in mind it is impossible to maintain the high initial enthusiasm level over a period of years. Realize that setbacks will always occur in a business, particularly a dynamic business like health care.

It is very difficult to implement CQI in a hospital where morale is low. Recent lay-offs, pay cuts, staffing reductions, etc. all lead to low morale. It will be equally difficult if CQI follows other programs long on rhetoric but short on substance. (Examples of the latter are the guest relations “smile campaigns” so popular in the past.)

Management’s attitude cannot be overemphasized. CQI often fails because management has other priorities. If CQI is not given a very high priority by management, it will not succeed. Many managers won’t give up the “control” necessary for CQI. Managers need to adopt humility and have the endurance to learn a new system of management. A system of working with their employees instead of controlling them. This requires tremendous patience.

MONEY - CQI can be very expensive. To improve service quality, many dollars may need to be spent on technology alone. New phone systems, computers and other equipment may be needed. Add to this an extensive amount spent on education and training of all employees. CQI doesn’t come cheap and if the money isn’t allocated, there will be little progress. One should keep in mind that CQI will result in saving money over the long run due to a decrease in errors, waste, duplication and inefficiency. Improvements in quality always result in lower costs over the long run, but start-up costs may be high.

LOGIC - Logic is finite and has its drawbacks. It does not work particularly well when dealing with large systems with an infinite number of variables. Hospitals are such systems. CQI is an attempt to make hospital management as logical as possible. It can be very effective in achieving this, but it is virtually impossible to account for everything that can occur in a hospital. Systems and processes should be designed as possible, but don’t be surprised if sometimes it doesn’t work. This is not a failure, just a setback. Logic works perfectly on paper, not in reality. Do not give up on logical problem-solving techniques because they fail occasionally.

VALUE TRAPS - Value traps are a result of rigidity in one’s values. They result in an inability to revalue current information due to previous values. This can be expressed as, “I’ve always done it this way so I’m going to continue to do it this way.” Another might be an inability to “read the writing on the wall.” The facts are there, but because of rigidity people are often unable to see them.

Value traps pop up when someone is stuck on a problem. Possibly, “everything” has been tried and nothing works. This is a time to step back and examine which facts and aspects of the
problem you are placing a high value on. A person needs to change what you think is important to something else to see if that solves the problem. Ego is one of the main causes of rigidity and value traps. If one has a strong ego it is more difficult to recognize and accept new facts.

COMMUNICATION

There are three steps to CQI: communication, behavior change, and culture change. A change in the workplace culture is the ultimate goal. This is achieved by changing the behavior of the individuals in the workplace. Management must communicate this behavior change through their words and actions. This begins with a thorough knowledge of the process of communication. The variables, obstacles, and keys to communication will now be discussed. This is followed with some tips on listening.

VARIABLES OF COMMUNICATION

The source is the originator of the message. Obviously, the source should be reliable and trustworthy for message transmission. If the source is not trusted, the message will not be transmitted accurately.

The message is the idea and feeling that is communicated. Messages are both verbal and nonverbal. Verbal messages consist of words and phrases. They depend upon their organization to be effective. This cannot be overemphasized in regards to verbal messages. Many people take verbal communication for granted, particularly when a simple message is involved. Time is often taken to determine what is going to be said, but no time is granted to how it’s going to be said. This can decrease communication effectiveness considerably. An unorganized message will never be as effective as an organized message.

Nonverbal messages are transmitted via facial expressions, tone of voice, attitude, and the body language of the speaker. This also cannot be overemphasized. Improper facial expressions, speech tone, attitude and body language can convey a nonverbal message that is incompatible with the verbal message. Praising an employee with a stern face and arms folded across the chest is contradictory. Teaching a procedure with a bored attitude does not promote interest in the procedure. Be aware of the nonverbal messages being transmitted in all verbal communications.

Channels are the means used to convey the message. Airwaves convey verbal messages. Light waves convey nonverbal messages. Touch and smell also convey messages. One should try to involve as many senses as possible in message transmission. The more channels used for a message, the greater the chance of success. For example, a demonstration and an oral presentation are far more effective than either by itself. Adding a hands-on lab to the demonstration and oral presentation enhance it even further. Verbal messages should be bolstered with pictures, graphs, and handouts when possible. Colors are more stimulating than black and white so highlighting enhances written messages. Try to stimulate the receiver via
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sight, sound, and touch for maximum effectiveness. Use a variety of audio-visual materials.

The receiver is the person who decodes the verbal and nonverbal messages transmitted. The decoded message may or may not be what the source intended it to be. Feedback on the message transmitted must be elicited. Effective communication only occurs when the receiver demonstrates understanding to the source by feedback. The quality of communication is judged by the receiver’s understanding. It is not judged by what the source says or writes.

Feedback is the point where the receiver becomes the source and the source the receiver. Feedback allows the receiver to transmit the message back to the source to check for accuracy and meaning. It is the only method to gauge the quality of communication. Feedback should not consist of a simple repetition of the message, although this may be the first step. Simple repetition provides feedback that the receiver “heard” the message. It does not verify they have grasped the meaning of the message. When the receiver can transmit the message “in their own words” they have grasped the meaning.

Noise consists of distractions that interfere with the communication process. External noise is visual or auditory distractions that divert attention from the message. Examples are people passing by, telephones ringing, traffic, construction noise, doors opening and closing, loud music and a million other things. These are generally easy to identify and require little discussion. Their interference with communication is obvious. Suffice to say, external noise should be minimal for effective communication.

Internal noise is not easy to identify or minimize. Internal noise is related to the internal perceptions and experiences of the people involved. These can be very difficult to identify or control. They are conditions that exist within the source or the receiver that interfere with message transmission. For example, a source may believe the receiver lacks the intelligence or training to understand the message. Another example is a receiver who believes the source doesn’t know what they are talking about. Acute life situations such as, divorce, sickness, financial stress, etc., are other examples of noise that affect both the source and the receiver. If either party is preoccupied with these types of problems message transmission is impaired. All forms of internal noises should be identified and decreased.

VARIABLES OF COMMUNICATION:

- source
- message
- channel
- receiver
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- feedback
- noise

OBSTACLES TO COMMUNICATION

Content is the skeleton of communication. It is the framework around which the message is constructed. The content of the message must clearly define the topic and purpose of the communication. The source should not drift from the defined topic. Lack of content or disorganized content is a serious obstacle to communication.

Organization consists of the introduction, body, and summary of the message. Proper organization tremendously increases effectiveness of communication. A good introduction tells the receiver what message will be conveyed. The body gives the message in detail. The summary re-emphasizes the key points of the message. Proper organization allows the source to provide the message very quickly in three different ways, once in the introduction, once in the body and once in the summary. (For maximum effectiveness, teachers are taught to “tell the student what is to be taught, teach it, then tell them what was taught.” This advice is also applicable for workplace communication.)

Proper style consists of appropriate language, attitude, articulation, and the use of a relational approach to the message. The language used should be appropriate to the receiver. The words used should be geared to the level of the receiver. For example, technical language is used with peers, but not with a layperson. The words used should be considered neither “above nor below their head.” Remember that the receiver, not the source, judges the quality of communication.

The role of proper attitude in communication is self-evident. A bored attitude conveys a boring message. An angry attitude distorts the message and activates defense mechanisms in the receiver. The appropriate attitude must be assumed for proper message transmission. Serious topics should be presented with a serious (but not somber) attitude. Less serious topics can be presented with a more relaxed attitude.

Proper articulation is also self-evident. Words must be pronounced clearly to be understood. The volume used should be appropriate to the size of the room, the audience, and the presence of external noise. Talking loudly in a small office pushes the receiver away. Talking softly in a noisy environment means some of the message will be lost. Varying the volume and pitch of speech can emphasize key points or convey a feeling. For example, dropping to a whisper creates a feeling of confidentiality.

The use of a relational approach to the message enhances communication by linking the message with information already known by the receiver. The new message is linked with information stored in long-term memory. The linking of new information with old enhances both retention and understanding. It allows the receiver to accept the new information as an expansion of previous knowledge. Without this, the new information is classified as “new” and placed in
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short-term memory. (This relational process is the basis for many “memory improvement” courses. The item to be remembered is linked to another item.)

The effect of noise on communication has already been discussed. A type of internal noise not discussed is that produced by defensive reactions of the receiver. Defensive reactions occur when there is a real or perceived threat by the receiver. If the receiver feels a threat to themselves, their group, profession or department, defenses will be activated. Defensive reactions prevent listening and distort the message.

Defensive reactions are particularly prominent in health care due to the tremendous variety of competing groups and professions. Mistrust is the usual cause of a defensive reaction. Mistrust is a result of fear, pride, politics, or conflict. Develop trust by communication, respect, competence, fairness, predictability and support. These should be cultivated in the workplace to minimize mistrust and resulting defensive reactions.

OBSTACLES TO COMMUNICATION:

- lack of content
- lack of organization
- lack of style
- excessive noise
- defensive reactions

KEYS - Preparation is the most important key to communication. Make a checklist of the six primary variables and give proper consideration to each for your message. The message itself is the second most important key. Examine the message for content, organization, style and delivery so that clear, concise points are transmitted. Be mindful that the normal attention span is about 30 seconds. Maximum effectiveness is obtained when each point is delivered within this time limit. (This is why TV commercials have switched from 60 seconds to 30 seconds and less.)

Another important key is to minimize internal and external noise. Be aware of the obvious and not so obvious noise. Try to lessen their impact on the message. Pay attention to potential and actual defensive reactions. Be aware of the effect mistrust has on communication. Feedback is a key that should never be overlooked. Obtain feedback on every important point. Feedback is the only way to ensure that communication has been effective. The final key to effective communication is to practice listening. If all members of the organization become effective listeners, there will be no communication problems. Listening is a skill that can be learned. Once learned, it must be practiced regularly.
LISTENING - Up to this point, the discussion has primarily concentrated on communication from the source’s viewpoint. Very little has been mentioned from the receiver’s viewpoint. Communication is a two-way street. The receiver also must do his or her part in message transmission. (Becoming an effective receiver also makes for a better source.)

There is a tremendous difference between hearing and listening. Hearing is a simple neurological process. Hearing occurs without any conscious effort on the part of the receiver. Listening is considerably more than hearing. Listening is making sense of what is heard so it can be accurately recalled and reproduced. Listening is a skill that can be developed and practiced. To develop (and practice) listening, the following is recommended:

1. Ask open-ended questions of the other person (the source). Open-ended questions are those that cannot be answered with a simple yes or no response. They force the person talking to rephrase the message for further clarification.

2. Restate the message using the source’s words. This verifies you have heard the message and can repeat it. It does not imply you understand the message. It simply lets the source know their words were received accurately. The next step verifies understanding.

3. Paraphrase the message using your words. This demonstrates correct decoding and making sense of what was said. You can now recall and reproduce the message using the source’s words and your own, providing evidence of understanding. Begin the restatement of their message with “In other words,”

4. Check your perception of the message by describing the source’s emotions and feelings in addition to the verbal message. Pay attention to the subtle clues of facial expressions, voice tone and volume, body language, etc. Verify your perception of the nonverbal message by saying, “I can see this makes you very confused / angry / sad, etc............”

5. Sit upright and focus your eyes on the source without “staring.” This is simple common courtesy and demonstrates you are paying attention.

6. Weigh and consider each part of the message. Be methodical and give each point its proper degree of attention.

7. Withhold judgmental and emotional responses until comprehension is complete. One of the biggest problems in communication is knee-jerk reaction before all the facts are presented. This creates defensive reactions and internal noise, which interferes with listening.

8. Concentrate on the mental picture the source is creating. When one can picture the
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situation being described, comprehension is complete. A picture is truly worth a thousand words.

LISTENING SKILLS: SUMMARY OF GUIDELINES

- Ask open-ended questions
- Restate
- Paraphrase
- Check perception
- Focus your eyes

Practice the above frequently, systematically and naively. The best way to get people to listen to your message is to simply listen to theirs.

USEFUL CONCEPTS

The following are useful concepts in relation to the CQI philosophy.

BENCHMARKING - This is a quality management strategy of rating business practices against the world’s best companies. Traditional management strategies compare competitive company to competitive company. Benchmarking compares the business to the world’s best, regardless of the industry, product, or service.

JUST IN TIME (JIT) - Delivery of services, products, parts, equipment, etc. at just the moment they are needed. JIT reduces the need for large inventories and storage. It decreases waiting (and therefore unproductive) time. In the hospital environment, JIT means having staff available when they are needed instead of constantly available. It may be traditional to staff “X” number of people for a department or shift. But JIT requires an evaluation of when the peak work periods are and adjustment of staff to accommodate the peak periods.

POKA-YOKE - Making the service, product, or process mistake-proof is an example of poka-yoke. If there is a right way to do something, make it impossible to do it another way. Poka-yoke means to make the process as idiot proof as possible. Try to conceive of every possible human error that could occur and safeguard against it. (Medical gas cylinder connecting systems are an example of poka-yoke.)

ROBUST DESIGN - Design the process so it withstands the random fluctuations that decrease quality. No matter how well everything works there will always be fluctuations in the process. Design the process to “flex” enough so fluctuations do not decrease the overall quality. For example, an RC department should be designed so if an RCP calls in sick, the quality of patient
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care is not affected. The department should be designed to accommodate this random fluctuation.

A danger to robust design in medicine is the belief that if you can do it one time you can do it all the time. This is typical of managers who believe that crisis response can be sustained on a daily basis. In a crisis like the example of an RCP calling in sick, the other RCP’s can “crank it up” and still get everything done. This intense performance level cannot be provided daily. Obsolete management philosophies disagree and expect it to be performed daily. The employees learn very quickly to not get everything done so they can get additional help when needed. If they always get everything done, management sees no need for additional resources. This leads to a system where employees do not ever go “above and beyond.” The motivation in medicine is to not get everything done so one can get more staff or resources. This leads to chronic underachievement.

Organizational Capital - Organizational capital is the training, education, experience, and intelligence of its employees. This capital is as valuable as traditional forms of capital. It can and should be utilized. Organizational capital can very quickly be converted to traditional capital if management utilizes it properly.

Creative Destruction - Many of the traditional concepts of management and how to do business are obsolete for today’s marketplace. Organizations must change and change dramatically to survive. Change should not occur just for the sake of change. It is absurd to change something that the organization does well just to change it. (If it works well, don’t fix it.) One must identify the good and the bad in the organization and destroy the latter. Creative destruction is a “smart” bomb type of destruction process. Only destroy that which is counterproductive to quality.

Made-to-Order Components - This is a departure from one of the basic concepts of industrial-age thinking: interchangeable parts. Made-to-order components are the ultimate in customization. In this type of operation, a slight deviation in one component is compensated for by the other components. For example, if one part of a product is “off” a millimeter, the other components are made “off” the same amount. The end product fits together and functions properly instead of being defective due to one component.

An analogy for medicine might be a back up in admitting causing a delay in the surgery schedule. Using a made-to-order process, the surgery schedule and staff is flexed to accommodate the back up. Some patients may be triaged or some staff may be assigned other tasks, such as, going to help admitting, stocking, doing paperwork, etc. A made-to-order system allows for the ultimate in flexibility for an organization.

Flex-Firm - Flex-firms allow individual departments to adopt a structural model that best suits their primary activities instead of forcing a standard model on every department. Hospitals are generally bureaucratic structures and departments within hospitals follow this organizational model. Bureaucracy is just one of many organizational models. Other models are: family,
organism, tribe, village, orchestra, jazz band, sports team, etc. These models are far more effective in performing certain activities than a bureaucracy. A model should be adopted that is the most compatible with the philosophy and activities of the specific group. For some, a bureaucracy is the most efficient. For others, a sports team or family-type of model may be the most efficient. Flex-firms employ several models based upon the department or activity.

**INNOVATION IMPERATIVE** - In today’s marketplace, a company must have new products or services to stay viable. No company can corner the market and stay there without constant innovation. Stagnation or “resting on your laurels” will not lead to success. Innovation, experimentation and creativity are actively encouraged to remain competitive. Innovation is imperative for today’s business.

**CHAOS** - Chaos theory deals with randomness and complexity. This theory can assist in the understanding of complex and dynamic processes such as, running a hospital. Most sciences look at a given “state” of matter. They derive information from very strict control of the variables of what they are studying. The science of chaos accepts the fact there are an infinite number of variables. It concentrates its attention on the science of process rather than of state. Chaos studies becoming rather than being. This type of thought-process is at the core of CQI. An elementary knowledge of chaos theory can be very useful. Knowledge of “emergent” behavior is also extremely useful.

**SHADOW MANAGEMENT** - A management structure that takes over during a crisis is shadow management. During a crisis, decisions must be made rapidly. There is little time for extensive discussion or to form a committee/task force to study the problem. Certain actions need to be implemented immediately. There should be an organizational mechanism in place that can take such action during a crisis. When the crisis is over, this management returns to the shadows. The organization should be able to operate in two modes, one for normal operations and one for crisis situations. Shadow management becomes operative in the latter. CQI does not lend itself well to crisis management. CQI can help prevent the crisis through careful planning, but it is not a quick response system. Shadow management may be necessary for a crisis.

**AD-HOCRACY** - An organization run by project teams or task forces. Teams and task forces are formed to achieve the current goals of the company. They are given the authority to achieve those goals. When the task is completed, they are disbanded or reduced to maintenance. The team or task force working on a more current project replaces them. This provides a more democratic distribution of power due to the changing nature of the task forces.

**ANALYSIS PARALYSIS** - CQI can provide a tremendous amount of data on an organization. This can be overwhelming and lead to no action. So much time can be spent discussing and diagramming problems nothing gets done. This is analysis paralysis.

**INTELLIGENT ERROR** - Errors that only hindsight could have prevented. A correct thought process and decision was made prior to the action producing the error. The organization accepts the fact that risks must be taken for innovation to occur. This attitude will result in intelligent
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errors. In contrast, an organization that penalizes such errors will have few innovations.

SUMMARY

CQI is a management philosophy that departs sharply from management philosophies of the past. Management philosophies of the past are based upon a bureaucratic “command and control” model. In this model, specialized workers perform repetitive tasks at specific levels within the organization. Specific people are assigned specific tasks. Work is a sequence of discrete individual steps. Communication and interactions between people in the organization occur in a linear fashion. Communication and interaction primarily occur with the level immediately above and below the individual’s location in the bureaucracy.

Quality in such an organization is treated like any other task. It is assigned to an individual or department within the organization. It is someone’s “job” to ensure that quality is achieved. Quality is reduced to a task as opposed to a process. CQI recognizes that the process is composed of discrete tasks and delineating those tasks is a first step. But CQI changes the worker’s emphasis to the process instead of the tasks.

CQI attempts to return quality (and work in general) to a process instead of a task. It contradicts many of the assumptions of industrial age and bureaucratic thinking. CQI assumes employees are not interchangeable, each is unique and valuable. It specifically states all members of the organization contribute to quality, so all are responsible for achieving quality. This requires communication across all levels, rather than just along the chain-of-command typical of a bureaucracy. CQI implies that a bureaucratic structural model may not be the most efficient model for today’s organizations.

CQI requires a tremendous shift in one’s mindset regarding quality and work in general. This mindset has been in society for hundreds of years. It has served society very well during that time. We are in transition from an industrial to a post-industrial culture. This requires a new way of thinking and problem solving. Traditional bureaucratic management structures are inadequate to meet the needs of such a society. Information flow and decision-making must be rapid and flexible. A post-industrial organization functions at a much more rapid speed than its industrial counterpart. Bureaucratic management is too slow for post-industrial organizations.

Conditions can change within a matter of minutes to dramatically alter our workplace. Coping with such acute conditions must be immediate. Passing the information up the chain of command for a decision and relaying the decision back down the chain is not sufficient. The people involved with the situation must have the decision-making skills and authority to deal with a problem when it occurs.

This is the challenge to management for CQI: to change from a “command and control” mode to an “educate and support” mode. Employees must be educated in all aspects of the work process. They must be educated in problem-solving techniques to make appropriate decisions. They also must be given the authority to implement those decisions. The primary reason for most CQI
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failures is management’s inability to give up some of their control.

CQI is the next logical step in the evolution of the work environment. It defines the primary management philosophy for a post-industrial society. CQI will be essential for service industries where bureaucratic structures currently interfere with quality and efficiency. Health care is an excellent example of this.

The goals of CQI are: involve everyone in the quality process; eliminate causes of problems, change workplace behavior, and change workplace culture. To achieve these goals we must assume: the majority of workplace problems are system-related, adversarial relationships between management and staff are counterproductive, those closest to a process have the most knowledge about it, and structured problem-solving gets better results than unstructured problem-solving.

A first step in CQI is improving and opening the lines of communication. Proper consideration must be given to the variables, obstacles and keys to communication. Listening skills are also critical.

Numerous problem-solving techniques are available. They include: brainstorming, process-flow diagrams, measurement, pareto charts, cause-effect diagrams, run charts, force field analysis, and the IPO model. Brainstorming is used to generate a maximum number of ideas in the shortest possible time. Process-flow diagrams provide a pictorial representation of all steps of a process. Measurement tools (check sheets and surveys) quantify problems and causes. Pareto charts identify the most important problems and their basic cause. Cause-effect diagrams are used to identify, sort, and relate causes of problems. Run charts display trends over time. Force field analysis identifies forces acting on a given change. The IPO model identifies the inputs, process, and outputs of a given event.

Start-up suggestions for CQI are: learn to communicate, identify internal and external customers, open communication lines, identify processes, and use structured problem-solving techniques. Documentation of CQI activities includes: meeting minutes, action plans, data collection sheets, reports, monitors and other documents. Obstacles to CQI are: culture, attitude, money, logic and value traps.
CONTINUOUS QUALITY IMPROVEMENT: METHODS AND TOOLS

SUGGESTED READING AND REFERENCES

1. Hoper, D., THE PROCESS OF COMMUNICATING


3. McLaurin, D., Bell, S., OPEN COMMUNICATION LINES BEFORE ATTEMPTING TOTAL QUALITY


5. THE MEMORY JOGGER: A POCKET GUIDE OF TOOLS FOR CONTINUOUS IMPROVEMENT, GOAL/QPC, 1988, 13 Branch Street, Methuen, MA 01844


8. Varian, T., COMMUNICATING TOTAL QUALITY INSIDE THE ORGANIZATION
The following several pages are blank practice worksheets for brainstorming, cause-effect diagramming, force-field analysis, and creation of an IPO model. Please remove and copy these for practice in the problem-solving techniques previously discussed.
CONTINUOUS QUALITY IMPROVEMENT: METHODS AND TOOLS

BRAINSTORMING
CONTINUOUS QUALITY IMPROVEMENT: METHODS AND TOOLS

CAUSE

EFFECT

Problem

Man/People

Machine/Plant

Method/Procedure

Material/Policy
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FORCE FIELD ANALYSIS

DRIVING FORCES
(move towards change)

RESTRAINING FORCES
(preventing change)

DESIRED CHANGE
CONTINUOUS QUALITY IMPROVEMENT: METHODS AND TOOLS

IPO MODEL

1 Process

2 Output

5 Input

6 Your Requirements

7 Supplier

4 Customer Requirements

3 Customer

Determine the above in the numerical order listed
CONTINUOUS QUALITY IMPROVEMENT: METHODS AND TOOLS

POST TEST

DIRECTIONS: IF COURSE WAS MAILED TO YOU, CIRCLE THE MOST CORRECT ANSWERS ON THE ANSWER SHEET PROVIDED AND RETURN TO: RCECS, 16781 VAN BUREN BLVD, SUITE B, RIVERSIDE, CA 92504-5798 OR FAX TO: (951) 789-8861. IF YOU ELECTED ONLINE DELIVERY, COMPLETE THE TEST ONLINE – PLEASE DO NOT MAIL OR FAX BACK.

1. CQI is defined as:
   a. Rating your business practices against the world’s best
   b. A customer-oriented, data-driven management philosophy
   c. A “command and control” management philosophy
   d. Organization of employees into self-managed work teams
   e. a and c

2. What are the goals of CQI?
   a. Involve everyone in the quality process
   b. Eliminate causes of problems
   c. Change workplace culture
   d. Change workplace behavior
   e. All the above

3. Which of the following are obstacles to CQI?
   1. Effective communication
   2. Lack of money
   3. Improper attitude
   4. Workplace cooperation
   a. 1, 2, 3, 4
   b. 3, 4
   c. 2
   d. 2, 4
   e. 2, 3

4. Useful start-up suggestions for CQI are:
   a. Identify internal and external customers
   b. Learn problem-solving techniques
   c. Learn to communicate
   d. Identify your processes
   e. All of the above
CONTINUOUS QUALITY IMPROVEMENT: METHODS AND TOOLS

5. Brainstorming is used to:
   a. Create a maximum number of ideas in the shortest possible time
   b. Provide a pictorial representation of the steps of a process
   c. Accurately quantify problems and causes
   d. Identify the customers and suppliers of a process
   e. Display trends over time

6. Process-flow diagrams are used to:
   a. Create a maximum number of ideas in the shortest possible time
   b. Provide a pictorial representation of the steps of a process
   c. Accurately quantify problems and causes
   d. Identify the customers and suppliers of a process
   e. Display trends over time

7. What problem-solving technique would you recommend to sort and relate the causes of a problem?
   a. Cause-effect diagram
   b. Process-flow diagram
   c. Force-field diagram
   d. IPO model
   e. b and d

8. Which problem-solving technique identifies the forces acting on an event?
   a. Cause-effect diagram
   b. Process-flow diagram
   c. Force-field diagram
   d. IPO model
   e. b and d

9. What CQI technique is used to identify the suppliers and customers of a process?
   a. Cause-effect diagram
   b. Process-flow diagram
   c. Force-field analysis
   d. IPO model
   e. b and d
CONTINUOUS QUALITY IMPROVEMENT:
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10. Run charts are used to:

   a. Create a maximum number of ideas in the shortest possible time  
   b. Provide a pictorial representation of the steps of a process 
   c. Accurately quantify problems and causes 
   d. Identify the customers and suppliers of a process 
   e. Display trends over time

11. Pareto charts help to:

   a. Determine the most important problem 
   b. Identify the relations of the steps of a process 
   c. Identify the customers of a process 
   d. Display trends 
   e. Identify requirements of a process

12. What are some obstacles to effective communication?

   a. Excessive noise 
   b. Well-prepared messages 
   c. Defensive reactions 
   d. a and c 
   e. All the above

13. How can CQI activities be documented?

   a. Action plans 
   b. Meeting minutes 
   c. Simple verbal presentations 
   d. Reports 
   e. a, b, d

14. What is “poka-yoke?”

   a. Mapping out a process 
   b. Making a process “idiot-proof” 
   c. Graphing the trends of a process 
   d. Diagramming the causes of a problem 
   e. None of the above
15. Which of the following are variables in the *communication process*?

1. Feedback
2. Message
3. Source
4. Noise

a. 1, 3, 4
b. 2
c. 2, 3, 4
d. 1, 4
e. 1, 2, 3, 4
CONTINUOUS QUALITY IMPROVEMENT: METHODS AND TOOLS

ANSWER SHEET

NAME____________________________ STATE LIC #________________________

ADDRESS____________________________ AARC# (if appl.)____________________

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1. a  b  c  d  e
2. a  b  c  d  e
3. a  b  c  d  e
4. a  b  c  d  e
5. a  b  c  d  e
6. a  b  c  d  e
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8. a  b  c  d  e
9. a  b  c  d  e
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14. a  b  c  d  e
15. a  b  c  d  e

KM: Test Version C
Continous Quality Improvement: Methods and Tools

Evaluation Form

Name: _____________________________ Date: ____________

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Was the material well-organized? ______ ______

Was the material relevant to your job? ______ ______

Did you learn something new? ______ ______

Was the material interesting? ______ ______

Were the illustrations, if any, helpful? ______ ______

Would you recommend this course to a friend? ______ ______

What was the most valuable portion of the material?

________________________________________________________________________

What was the least valuable portion of the material?

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