

Making Quality Improvement Work:

A report on the initiation of a quality improvement process within San Jose Medical Group

I Introduction

During the 1920's, a professional, systematic approach to quality improvement (QI) began to evolve in US manufacturing. Following WW II, American quality experts were invited to Japan to address the topic of quality improvement. The Japanese subsequently undertook a decades long drive for Total Quality Improvement (TQI) that incorporated and expanded the ideas presented by the American experts. By the late 1970's, the Japanese had used quality so successfully against the US that the American electronics and automotive industries were forced to adopt a strategy of "if you can't lick 'em, join 'em."

II San Jose Medical Group

US health care, facing severe restructuring, is reluctantly attempting to implement manufacturing style TQI.

Unlike manufacturing, health care is not faced with a major Japanese competitive threat. The primary motivation for adopting TQI in health care is the belief that it will reduce expenses by ten to thirty-five percent or more. This is very attractive to hospitals who, like the US railroads in times past,¹ have seen the need for their services reduced (and experienced a corresponding loss in profits) due to advances in other segments of their own industry. By practicing QI hospitals expect to become more efficient and thus remain a part of the industry they have led for so long.

One exception to this hospitals only trend is the San Jose Medical Group (SJMG). The organization was founded more than thirty years ago. It serves a patient base of 125,000 with nine locations. It has a staff of more than seventy doctors and 350 nurse and administrative personnel. Though their 1990 revenues exceeded \$25,000,000, they experienced a significant financial loss in 1990. This prompted the Board of Directors to bring in new management in October 1990.

The new CEO spent the first few months getting to know the stakeholders (primarily the doctors employed by the Group) and stabilizing the situation (e.g., avoiding a layoff by having the line of credit extended to provide sufficient cash for payroll in the immediate months ahead). The results of this initial "get acquainted" effort (which included a formal survey of the doctors) showed widespread systemic malfunction. The organization's basic administrative processes (e.g., accounts receivable, patient registration, medical records management, etc.) were failing daily. This, in turn, meant having to expend valuable resources doing rework.

In addition to this obvious waste, the organization was struggling to become a provider of managed care which meant they had to lower their internal costs substantially. Consequently, they seemed like an ideal candidate for initiating quality improvement activities. The medical

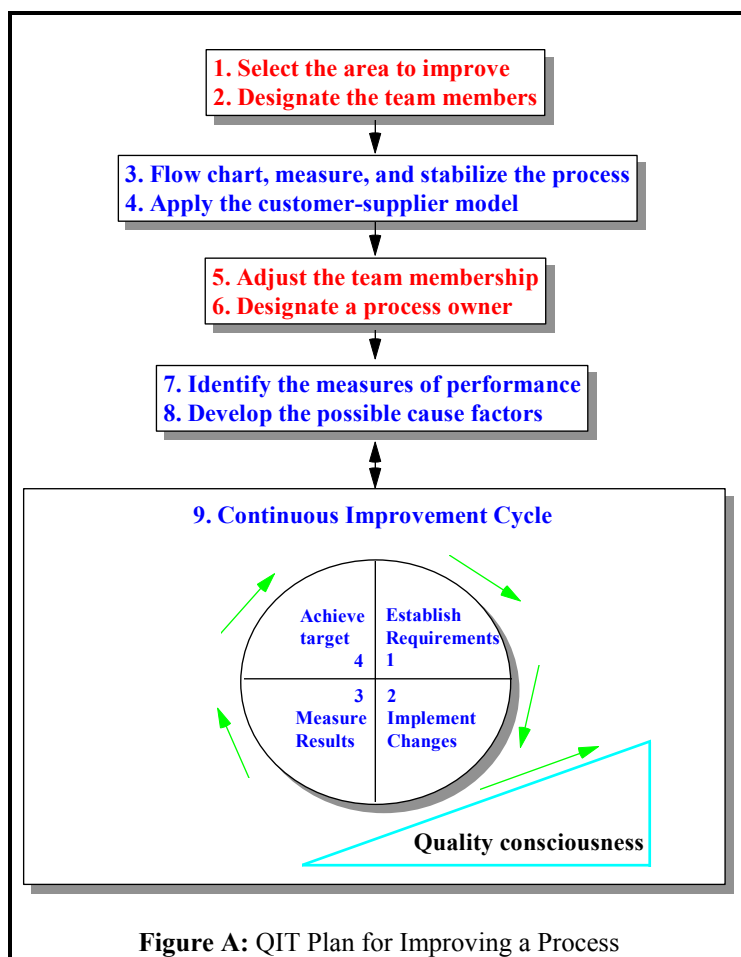
¹Levitt, T.: *Marketing Myopia*, The Harvard Business Review, July/August 1960, reprinted September/October 1975

and management staff were introduced to the concepts of QI. Once oriented, they readily agreed to begin a pilot QI effort.

III The SJMG Quality Improvement Team for Medical Records

Quality improvement at SJMG involved forming a QIT and following a simple nine step plan.

The SJMG QIT followed the simple nine step plan shown in Figure A. Team meetings were scheduled weekly for ninety minutes. Before recounting that experience, it should be noted that a decision was made at the outset to provide "just in time" training for the team members. That decision took advantage of the fact that the team would be led during its early stages by a seasoned meeting facilitator who also was expert in quality improvement techniques. At the point in time the group encountered a situation that it was not trained to handle, it was the facilitator's duty to train them personally (or arrange for their training) during a regularly scheduled team meeting. This approach can be expensive but maximizes the probability of retaining the training material and gaining mastery of the techniques.



The QIT activities were:

1. Select the area to improve: To ensure success, an organization normally targets a "safe" (easy) process for its pilot QI effort.² But the CEO felt it was critical to improve the medical records process quickly. The retrieval and management of patient medical records was particularly troublesome to the specialist doctors. Without a patient's medical record, specialist clinical care could not always be rendered reliably. If care was given without access to the patient's medical record, the doctor increased the risk of malpractice.

Management had taken some spot measurements that led them to believe that the care of as many as eighty patients per day were affected by this situation.

If QI methods could be employed successfully to improve a process that was so visible to the doctors, then acceptance of QI as the vehicle for dealing with other defective processes in the organization would undoubtedly follow. Therefore, the CEO chose the medical records process.

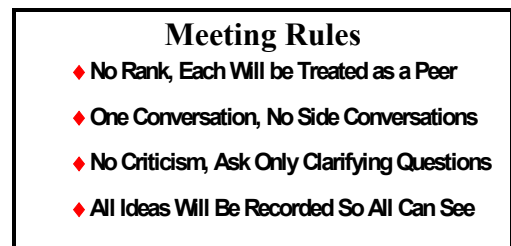
2. Designate the team members: The medical records process spanned several functional organizations (e.g., lab, x-ray, the branches, nursing, administration, courier, the hospital,

²Livingston, J.: *Florida Power and Light*, Harvard Business School Case 9-688-043, 1987, revised 8/15/90, pg 3

etc.) and thus presented a particularly difficult challenge regarding who should be on the QIT. Rather than attempt to address all the membership issues at once, the initial team membership was decided upon during a QI orientation presentation to personnel in the main medical records filing function. The personnel were so empowered by the idea that management would involve them in decisions about their work that the most respected among them were immediately nominated to be QIT members. Realizing that step five in the QIT plan would call for adjusting team membership, management felt comfortable launching the QIT with only the personnel drawn from the medical records functional group.

During this orientation meeting, a group discussion ensued which resulted in the formal QIT objective being defined as "Develop and implement the changes necessary to ensure that no patient is seen without a medical record."

Since the team membership was composed of both managers and nonmanagers, the first team meeting focused on development of rules for how the members would interact with each other. They unanimously agreed on the meeting rules shown in the inset.



3. Flow chart, measure, and stabilize the process.³ The team members were asked to get together before the first meeting and flow chart the existing process for retrieving and filing medical records. That flow chart was the subject of the initial meeting. And, since no one person (not even the manager) knew all the steps involved in handling some chart situations, a lively discussion occurred. After several meetings, they eventually agreed upon the flow chart shown in Figure B.

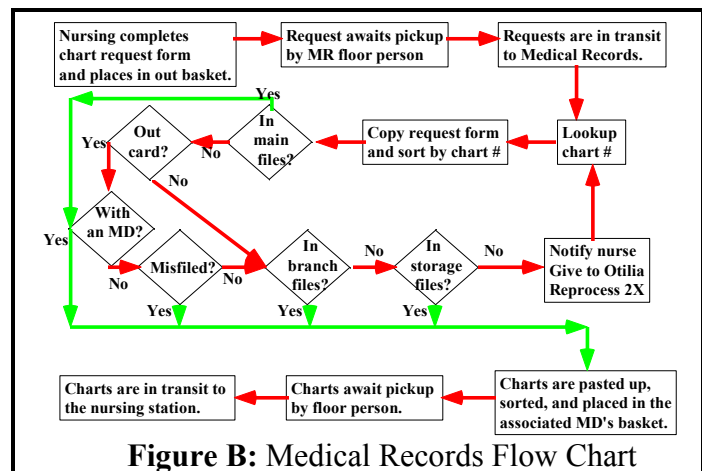


Figure B: Medical Records Flow Chart

This step produced many ideas about possible actions to take and they were recorded by the team recorder for possible use later.

Next, it was necessary to measure the overall process. However, that wasn't readily possible since not everyone involved in the process was represented on the team (e.g., nursing). Nonetheless, a group consensus existed that identified the retrieval of records from the various branches as the most severe problem. And, since the data for five of the eight branches could be done without involving others, its collection was immediately initiated.

³Pall, G.: *Quality Process Management*, Prentice-Hall, Inc., 1987, pg113

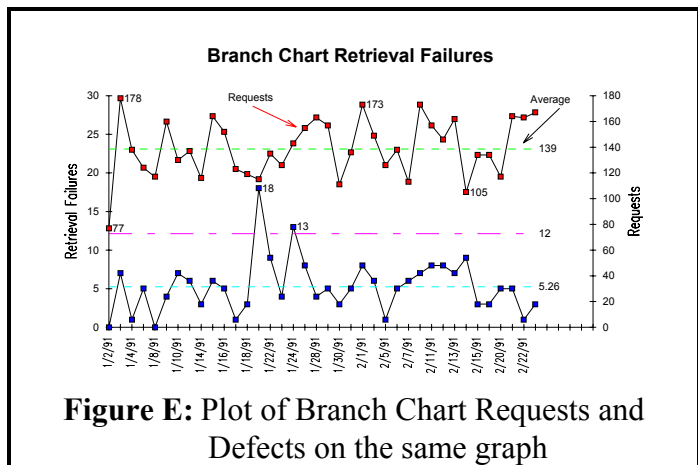
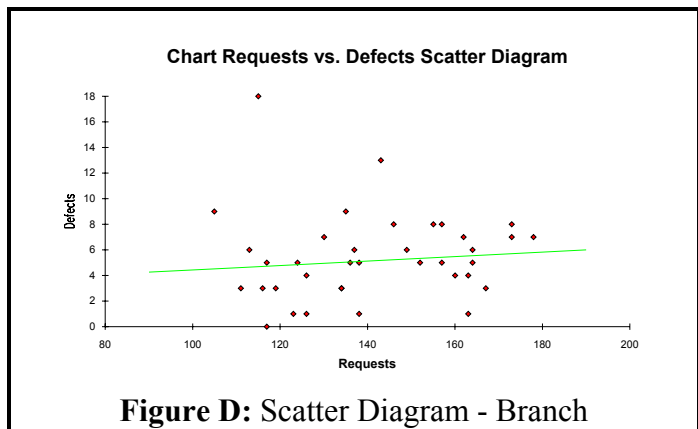
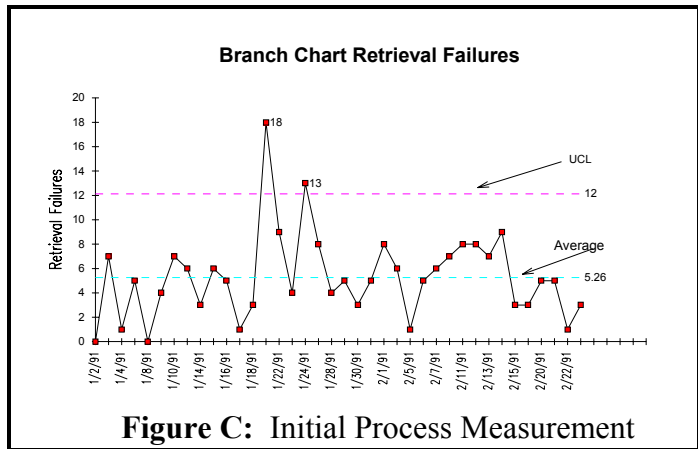
The measurement consisted of recording the daily volume of charts requested from the branches as well as the number actually received. Any not received were counted as "defects."

The defect data for the first seven weeks of 1991 is shown in Figure C. The upper control limit (UCL) of twelve was computed by assuming a Poisson data distribution.⁴ (As a check, an alternative computation that yielded a UCL of thirteen was made by assuming a normal distribution existed after the outliers were discarded.)

The two peaks (outliers) of eighteen and thirteen were investigated and confirmed to be due to the same special variation: the employees who process the requests in a given branch were not available (e.g., due to vacation, illness, etc.) to do the work on either of those days.

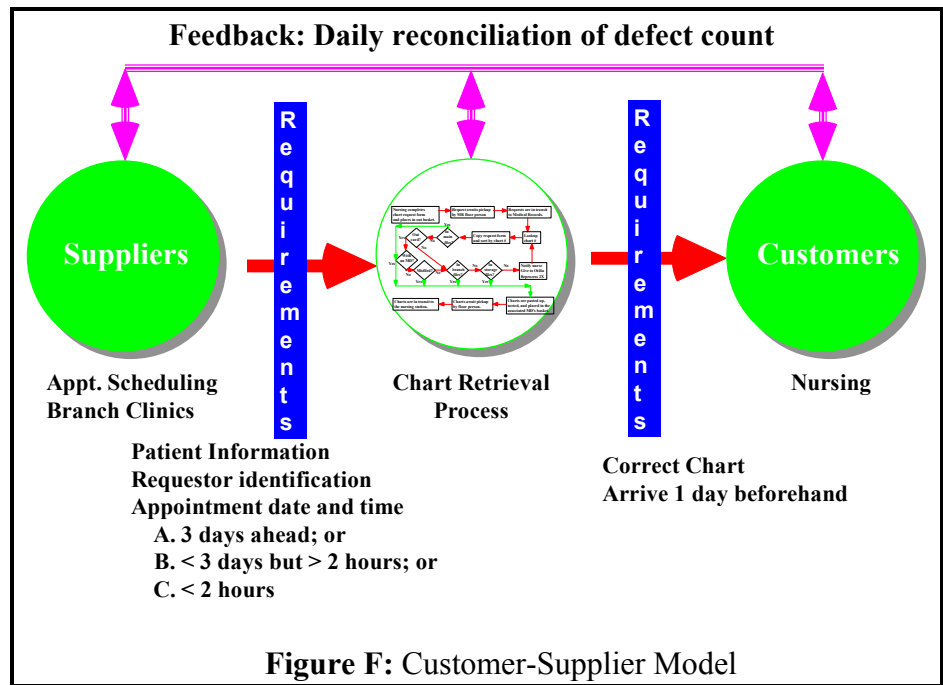
In an attempt to see if there was a correlation between the number of charts requested and the number of defects, a scatter diagram was plotted (see Figure D). Its horizontal nature shows there is no correlation. This was confirmed visually by plotting the same data on the y-axis versus time on the x-axis (see Figure E). Intuition says that if the defect count correlates to the workload (requests), then the defects should increase on days of high requests. The lack of correlation was confirmed by noting that the defect peak of eighteen coincided with a request low point of 115!

There was speculation among some QIT members that the defects might correlate with the patient work load in the branch office that failed to forward the requested chart. That was noted for later follow-up.



⁴Gitlow, H., Gitlow, S., Oppenheim, A., and Oppenheim, R.: *Tools and Methods for the Improvement of Quality*, Irwin, 1989, pg 252-255

4. Apply the customer-supplier model: At this point the group identified the inputs and outputs to the process along with the responsible party. Although it might seem obvious that the branches were suppliers, it was not so obvious that nursing was the customer. This idea required a mind-set change by some medical records personnel since relations with nursing were strained.



Next, the group formalized the input and output requirements. There were three types of requests for which requirements had to be documented: routine appointments (3 days notice); adds (less than three days notice, e.g., to handle a walk-in); and, sometimes, the request was urgent ("stat" - less than two hours notice). The customer-supplier information is shown in Figure F.

5. Adjust team membership: At this point management reviewed the team membership. Initially, it had been set based on management's guess that personnel from the medical records department should comprise the team. But now additional information had been developed about whom should participate. For instance, it was suggested that the "customer" (nursing) be on the team. As should the "supplier" (branch clinics). In addition, since there was more work than one team could handle, it was decided to split the team into two groups: one (the Branch team) to work on the branch related issues, and one (the Appointments team) to work on items related to the rest of the process. To coordinate the two efforts, two medical records personnel (one supervisor and one clerk) were assigned membership on both teams. The Branch team was expanded to include three of the eight branch managers. The Appointments team was expanded to include two nurses and, later in the project, two doctors.

To fit the schedules of the nurse and doctor team members, the Appointments team meeting time was set for Wednesdays from noon to 1:30 p.m. This, combined with the fact that there was the possibility of being assigned tasks by the team, might have dampened the desire to participate. That, however, was not true. The potential dampening was offset by the empowerment that the team members felt when asked to participate in solving a personally frustrating problem that had plagued the organization for years and that involved decision making about how their work was done.

6. Designate a process owner:⁵ SJMG was functionally organized but the medical records retrieval process was cross functional. Nonetheless, one person was assigned as the "owner" for the Branch process and another as the "owner" for the Appointments process. The assignment, however, was not declared by fiat. Instead, participative management techniques were employed to ensure maximum buy-in by all team members. The position of process owner carried matrix management powers with it but did not have the clout that goes with being a functional manager. Therefore, cooperation of all concerned was important if the person selected were to have the best chance for succeeding.
7. Identify the measures of performance: The initial measurements taken in step three had focused on the number of branch charts requested and the number received. The number not received (defects) was then calculated as the difference. This data was also accumulated for a few weeks for the Appointments process. Nursing was asked to gather the Appointments data so the team would have a "customer" perspective. However, this meant additional work for data that probably wouldn't be used. Therefore, this approach was soon dropped in favor of only counting the defects (charts that weren't received by nursing by the time needed). This latter approach was much simpler since a "chart request" document existed for every chart ordered by nursing. Both nursing and medical records personnel kept the counts and they were reconciled daily.

8. Identify _____ the possible cause factors:⁶

The QITs used a cause-and-effect diagram⁷ (see Figure G) to brainstorm the possible reasons for not being able to retrieve a chart. This information was used to design a Branch check sheet (see Figure H). Room was left on the check sheet to write in additional reasons as they were encountered. Each time a defect occurred, a copy of the related chart request form was made and a notation made regarding the reason the chart had not been retrieved. This information was tallied daily using the check sheet. The data for the most recent period (usually two weeks) was then tabulated and plotted on a Pareto diagram (see Figure I).

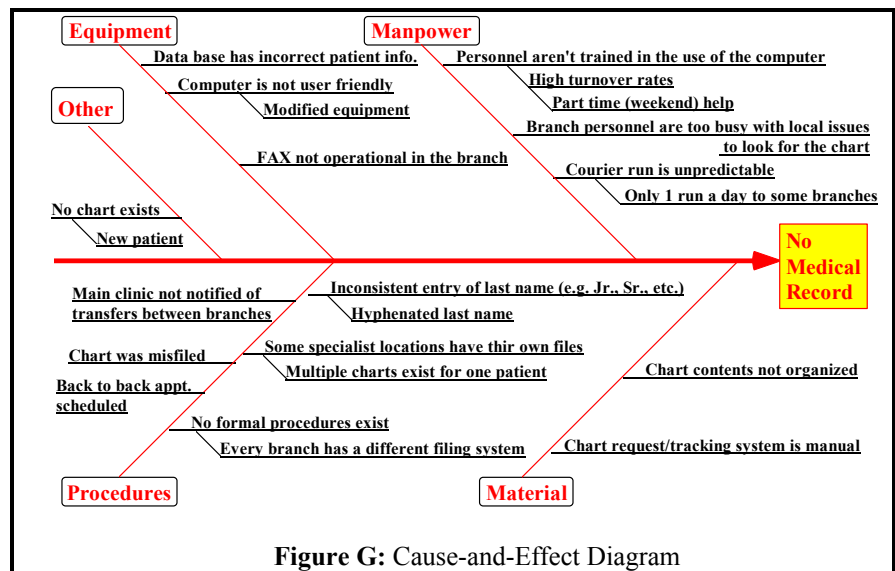


Figure G: Cause-and-Effect Diagram

⁵Pall, G.: pg 162-169

⁶Gitlow, H., Gitlow, S., et al, pg 379-408

⁷Bohn, R.: *Statistical Quality Control for Process Improvement*, Harvard Business School, 9-684-068, rev 11/88, pg3-4

A similar check sheet (not shown) was developed for the Appointments process with the exception that specialist doctor names were used instead of branch clinic locations. Information for a two week period was compiled in a Pareto diagram (see Figure J).

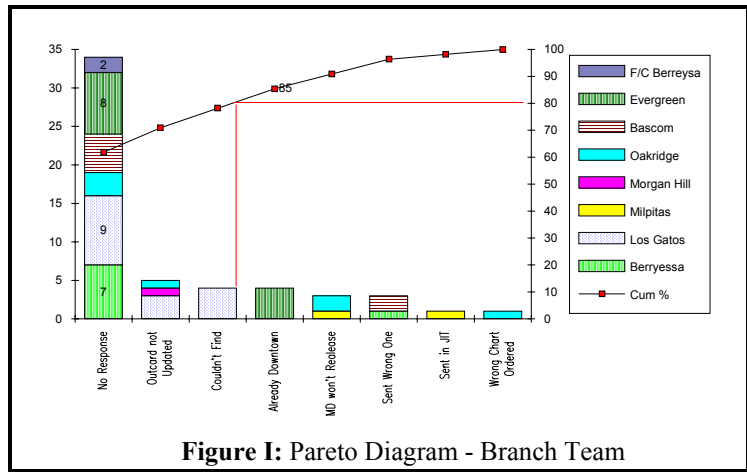


Figure I: Pareto Diagram - Branch Team

9. Continuous Improvement Cycle: After 10 weeks of QIT activity, the process was determined to be stable so it was decided to initiate the first of repeated cycles of

Date: _____		(Attach a detailed explanation for each chart not found today.)							First Care		
Reason	Berryessa	Los Gatos	Milpitas	Morgan Hill	Oakridge	Bascom	Evergreen	Berryesa	Total		
No Response											
Could not find											
MD Won't release											
Sent Wrong One											
Already Downtown											
Outcard Not Updated											
Ordered Wrong #											
Sent back just in time											
Total:											

Figure H: Daily Check Sheet used by the Branch Team

improvement.

- 9.1 Establish Requirements: The cost of defects (rework in this case) was estimated to exceed \$50,000 annually (i.e., more than one full time employee). This estimate was based on the fact that when a chart did not arrive as requested, nursing time was expended on the phone with the appropriate branch arranging for elements of the chart to be sent via FAX to the main clinic.

In addition to the nurse time, investigation revealed that the medical records personnel often would detect the pending defect situation and, in an attempt to avoid it, would repeat the process of requesting the chart. These follow-up chart requests, even though they were handled via telephone, usually met with failure as well. The large volume of charts requiring this special handling made the total cost quite high.

Informal discussions with medical records employees revealed chart retrieval work to be so frustrating that they would occasionally take a "sick" day rather than come into work. The estimated cost of defects did not include this cost of employee absence. Nor did it include any cost associated with employee turnover even though management felt more than one employee had left because of the frustrating work environment. Neither did it quantify the cost associated with having to reschedule patients rather than administer care without the chart. (This latter situation had the potential to become lost revenue entirely.) Nor did the cost of defects include the fact that the frustration of working in a defective process lowered the self-esteem of the medical records personnel and, therefore, productivity was not what it should be. Neither was it possible to quantify accurately the cost associated with the expenditure of doctor and management time to deal with complaints by irate doctors. (One doctor who recently left the organization cited the inability to consistently obtain medical records as a factor influencing his departure.) When these additional factors are considered the cost of defects could easily exceed \$75,000 annually. And to that must be added a cost associated with the risk of malpractice.

The Pareto diagram for Appointments (Figure J) revealed that more than forty percent of the overall failures were due to failures in the branch subprocess. And the previous Pareto diagram for Branch failures (see Figure I) revealed that about sixty percent of the branch failures were attributed to the branch just not responding to a request for a chart ("no response"). This was concluded to be a procedural and training issue. Once corrected, the general situation was expected to improve by more than twenty-five percent. Therefore, it was decided that the first cycle of continuous improvement should focus on eliminating the "no response" condition entirely.

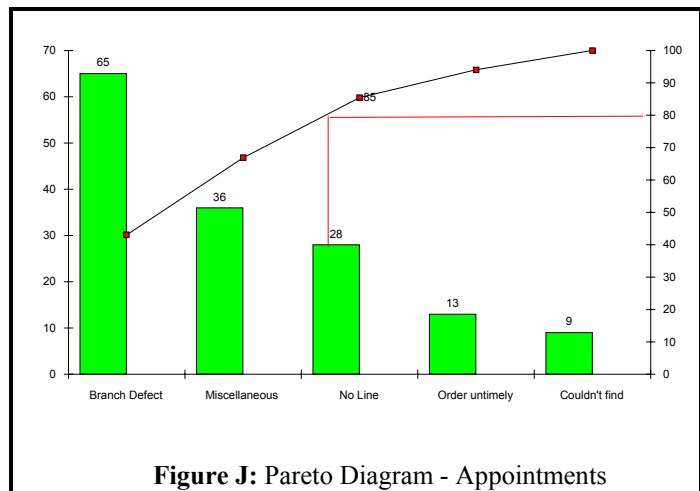


Figure J: Pareto Diagram - Appointments

- 9.2 Implement Changes: The team decided the primary change needed was increased awareness about the importance of forwarding a chart immediately upon request. The first step in increasing awareness was to invite more branch managers to join the team. In addition, it was decided that the data that was being collected would be published monthly to provide feedback to each branch about how well it was doing. Additional

steps included half day working visits to each branch by medical records personnel. Branch personnel reciprocated by visiting the main facility and viewing the operations there.

The team also targeted the lack of formalized procedures and began to develop and implement those as time permitted. The procedure for the Branch process included the requirement that the clinic operations officer be notified immediately upon the occurrence of a "no response" condition by a branch. It was the duty of the operations officer to then personally contact the responsible branch manager for an explanation.

The detailed list of action items that had been initiated in step three began to grow quite rapidly. It now included action due dates and the name(s) of the person responsible for achieving them. The weekly meetings often became consumed with reviewing all open action items as well as the ones completed since the last meeting. Any remaining time was devoted to a review of the weekly performance data and brainstorming and new action items.

9.3 Measure Results: The measurement continued daily (see Figure K). Progress was painfully slow since no sooner would one branch achieve improvement than another one would degrade. Every time a special variation occurred, it was investigated and almost invariably found to be due to insufficient trained staffing.

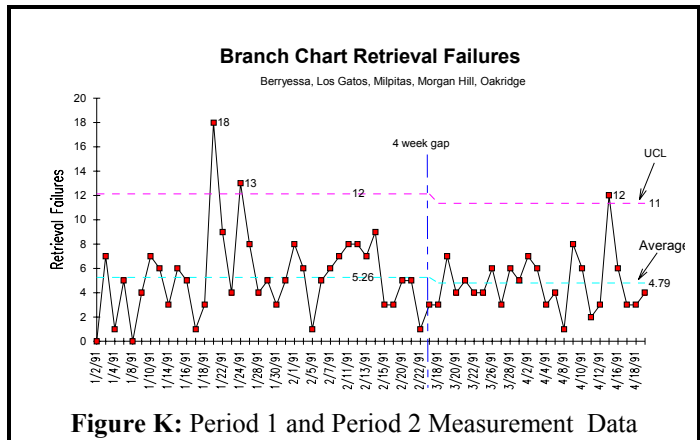


Figure K: Period 1 and Period 2 Measurement Data

9.4 Achieve Target: The Branch team achieved elimination of the "no response" condition after about fourteen weeks into the effort. Their accomplishment, coupled with other improvements attained by the Appointments team, resulted in the achievement of zero defects for the clinic as a whole (see Figure L).

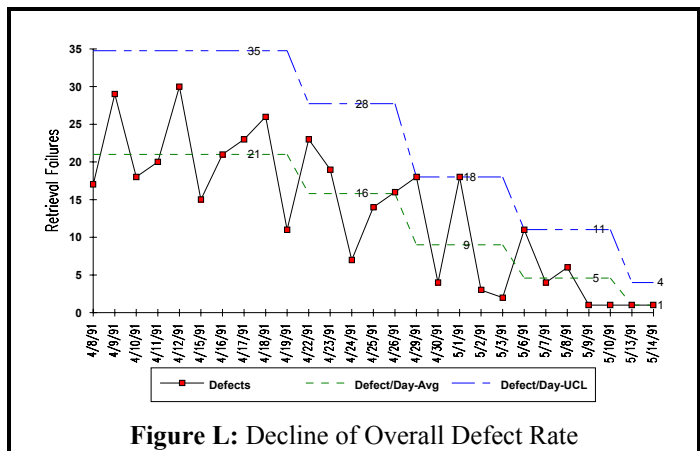


Figure L: Decline of Overall Defect Rate

Though many action items were achieved, the written procedures were still being developed at the time this report was written. In addition, only the passage of time will confirm management's continued commitment to keeping the process in control. Thus, the final results of the first continuous improvement cycle must await a follow-up report.

Once the final step of the first cycle of continuous improvement is achieved, the plan calls for retesting the validity of the cause factors (Step 8) and the measures of performance (Step 9). That too must await a follow-up report.

IV Conclusion

SJMG management did not have the knowledge needed to improve the medical records retrieval process. However, once the employees were invited to address the situation via a formal QIT setting, that knowledge became readily available. Interestingly, the team assigned nearly all the action items to the management members of the QIT. Management's willingness to carry out these assignments not only ensured the success of the QIT but greatly improved the morale of all medical records personnel. During the two weeks before achievement of zero defects, doctors and management not included in the QIT effort commented on the noticeable improvement in the self-esteem of the medical records personnel.

The factors deemed critical to the success of the medical records QIT activity were:

1. Treatment of the team members, particularly the non managers, as peers;
2. The commitment and actual implementation by doctors and management of the tasks assigned by the team;
3. Flowcharting and measurement of the process coupled with utilization of SPC and the other technical analysis QI tools, particularly the Pareto diagram;
4. Disciplined adherence to the weekly meeting time and duration;
5. Utilization of an experienced meeting facilitator who also was a QI expert;

The idea of managing the medical records retrieval process as if it were a manufacturing production line was new to the organization. But the staff readily accepted the idea and did not need much training to implement it. The use of SPC and related quantitative tools provided undisputed grounds for prioritizing changes to implement and, later, for deciding which changes were effective. The tools involved were not difficult for the QIT members to learn in spite of the fact most were not college graduates.

A far more difficult skill to teach has been that of team facilitator. Yet, even that skill was being acquired by a couple of individuals who should become sufficiently proficient after a few more weeks to run the meetings. Once that occurs, both QITs will be able to function with only occasional outside assistance.

The success of the project was evident to management even before it was achieved and as a result they immediately initiated two more QITs: one focused on patient registration and the other focused on accounts receivable. Both these are following the same action plan, and, although not as far along as the medical records QIT, have been experiencing similar success. Word of the medical records QIT success has spread throughout the organization and, consequently, membership on these later teams has become something of an honor.

A "quality council" has been formed and is meeting once a week with the objective of integrating continuous QI into the organization as part of its permanent culture. Its membership includes two SJMG board members (both are physicians), the medical director, and two physician department chairs. It also includes the director of nursing and several executives from administration.

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