

# Health care from the perspective of a patient: Theories for improvement

Heero Hacquebord

*The future of health care will depend on the ability of providers to produce health services that satisfy the needs of all customers at prices they can afford. This implies both innovation and improvement of quality. Quality has to start with the provider. The patients do not know what they want, although they are fast learners and can judge what they have received. Patient feedback is important, but it is only a small part of the many facets of transformation needed in health care. Improvement involves prediction and prediction depends on theory. This article describes some theories for improvement based on a patient's hospital experience.*

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As a consultant to industry on the application of Dr. Deming's management philosophy for the past 12 years, I have often been asked how that philosophy applies to health care. While I have been involved as a consultant in helping some health care organizations improve quality and productivity, this article outlines some principles of improvement that I identified from a personal experience as a patient. Of course, anyone who has been involved with surveys in health care would know that the opinion of one patient, based on one experience, in one hospital, is hardly a sample worth considering. Nonetheless, I think that some of my observations are common to many health care organizations, and that the theory for improvement is universal, irrespective of the organization.

## WHEN THE MANAGEMENT CONSULTANT BECOMES THE PATIENT

Plagued by back pain for three years, I eventually ended up in the hospital December 12, 1991, for planned surgery to correct a condition to the interface between the L5 vertebra and the sacrum. Although this was major surgery, I was told that I would be able to go home on December 17 after only a six-day hospital stay.

I checked into the hospital at 6:00 A.M. on December 12 for surgery that was scheduled to begin at 7:00 A.M. In the past, one would have checked in the night before so that the hospital staff could prepare the patient adequately for surgery, but I was told that health insurance no longer pays for that extra day. Therefore, I had to prepare myself before leaving home for the hospital; which meant getting up at 4:30 A.M. Of course, I was also told to get a good night's sleep before the surgery! We arrived on time, I changed into a hospital gown, and the staff inserted an IV in preparation for the surgery. After a few moments of prayer with my wife and pastor, I was on my way to the operating room. In contrast to my experience in the pre-surgery interviews two weeks prior, where I spent 70 percent of my time waiting, everything was on time. I was in the operating room, glad to be first.

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After what seemed like only a short time, I woke up in the recovery room. However, the clock on the wall said it was 1:30 P.M.; I figured it must still be the same day. Shortly thereafter I saw my wife, who told me that the surgeon spoke to her; the surgery was a success—he had performed a laminectomy, attaching the L5 vertebrae to the sacrum by means of a bone graft.

The first couple of nights in recuperation I hardly slept. My hips ached so much from the hard hospital bed (or so I thought), that I constantly asked the nurse to help me turn over. Of course, my sleep was also regularly interrupted by the stream of people entering my room to draw blood samples, check IV tubes, etc. But, by the evening of December 14—two days after the surgery—the nurses had me up on my feet and I was walking. A few days later, I was looking forward to going home on schedule after the six-day stay. Except for the throbbing headaches and nausea (which I thought was normal after major surgery), I did not feel too bad. The nurses gave me pain medication for my headaches, and I overcame the nausea by refusing to eat.

At 3:30 A.M. on December 17 (the day I was to be discharged) I rang the nursing assistant to help me put on my back support (similar to a corset made of ¼-inch plastic) so I could get out of bed to go to the bathroom. When I reached the bathroom, I felt fluid coming from my back, and my pajamas were dripping wet. I suspected that something was wrong, but I got back to the bed by my own power, removed my back support and undershirt, and, feeling dizzy and nauseous, called for help. The same nursing assistant who had helped me put on the back support arrived. She did not investigate the source of the fluid, but, instead, handed me a washcloth and basin of water, and asked me to call her when I was finished. When she returned, she did discover that the fluid was draining from the incision, although it is not clear that she took any action based on this knowledge. Later that morning, trying to eat breakfast, I became very sick. The woman in the room next to mine called the nurse, who put me back in bed and promised to call the surgeon. The surgeon visited me that day, discovered that the leak was spinal fluid, and recommended that I stay in bed for two more days to allow it to heal.

It did not heal, and so on Thursday, December 19, at 3:30 P.M., I was wheeled back into the operating room to have the spinal fluid leak repaired. My surgeon explained to me that during the original surgery he had “nicked a nerve sack.” He had stitched the tear to the

sack, but this stitch tore further into the sack, apparently due to my violent coughing right after I woke up from the original surgery.

By the afternoon of the next day, December 20, I was feeling fine—no more headaches, no more nausea, and now I was hungry. For the first time, I realized how I should have felt after the first surgery. Should I go back for another surgery (God forbid), I will know how one is supposed to feel. This will help me know when something is wrong so that I can insist on special treatment.

I was finally discharged Monday morning, December 23. Instead of being in the hospital for 6 days, I had ended up staying for 12—not what one might call a vacation!

My personal experience in the hospital, although painful, was interesting from the point of view of management and quality, and in this article I will outline some principles of improvement. Again, I realize that I am just one patient, with one experience, in one hospital. But I believe that my experience was not atypical of the processes that patients experience in the health care system. Therefore, I believe that the principles I will outline below are widely applicable to all types of health care organizations.

## **SOME PRINCIPLES FOR IMPROVEMENT OF QUALITY**

### **Improving quality includes customer education**

There were numerous examples of lack of clear customer education during my stay. Looking back on my experience, I am struck by how often I was left feeling misinformed or confused. For example, the instructions that I received from the nurses during my pre-surgery visit to the hospital left me with the impression that the onus was on me, the patient, to do all of the necessary pre-surgery cleansing at home. This involved me using a special soap, as directed, with clean, sani-

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tized washcloths and remembering not to use deodorants of any kind. While I followed the instructions to the letter and felt anxious about the consequences of not doing it properly, I still do not know how important these at-home pre-surgery cleansing procedures are. I still get differing opinions from various experts in health care.

My inability to sleep well during the nights immediately following the surgery can also be traced to lack of timely attention to customer education. I could not sleep because my hips ached terribly; I blamed it on the hard hospital bed. It was two days later when I finally found out from the surgeon that the pain I was experiencing was from the surgery. I wondered, "How would one get pain in the hips from surgery on the back?"

But when the surgeon explained, it made sense to me. Had I known all this theory, I would have used the pain medication apparatus, which allows the patient to add predetermined amounts into the IV by simply pressing a button. I was under the impression that the pain medication was to be used for back pain only. Because I did not know—because no one had told me—I suffered needlessly.

We incorrectly define quality as meeting customers' (patients') needs. The customer (patient) does not know what he or she needs and has to rely on past experiences or the experiences of others. It is true that the customer is a fast learner, but health care organizations need to do a better job of educating the patient and defining quality. They should not assume that the patient already knows, nor should they rely on the patient to figure it out.

So, my first principle for improvement of quality in health care is this:

Improving quality includes customer education, because the customer does not always know what he or she needs. The customer does, however, judge what he has received, and can only specify what he wants based on his past experiences, or what he has heard others experience.

**To improve quality we need to be able to predict quality; this requires continually updated theories and proper use of data**

While the health care professionals that I came in contact with collected and recorded a great deal of data about me during my stay, it is not clear to me that this information was fully utilized to improve my care, or the care of future patients. My first concerns about how

data were being used came in the days immediately following my original surgery. Recall that I had throbbing headaches and nausea, for which the nurses gave me pain medication, and I simply refused to eat. During this period the nurses also complained about my temperature, which was alternating between high and low values. Some of them even looked at me as if I were the cause and should be able to explain such strange temperature readings. Of course, these nurses knew that I had no control over my temperature and could not be the cause of the variation, yet they made me feel that way. Based on these readings and my general condition, some of the nurses seemed to infer that there was some problem, but they did not follow up nor theorize on possible causes. Instead, all that I observed was that they simply recorded my temperature readings, along with other data they collected on my vital signs, on a log sheet, individual figure by individual figure.

Vital signs on a patient's condition should not be just simply recorded; it is necessary to interpret such data effectively so that correct remedies and actions are taken. Recall that during this time I had a spinal fluid leak that was as yet undetected. Considering the data—my headaches, nausea, and highly variable temperature readings—one might conclude that somebody was negligent in not informing the doctor at the time. However, in the absence of an explicit theory to account for this pattern in the data, one cannot blame the nurses. I do not believe that the nurses who collected data about my temperature variations, headaches, and nausea were negligent to the extent that any one or all of them could be held responsible. Instead, I believe that this was a typical systems problem—many health care professionals are involved in collecting individual bits of data, but no one is *systematically* interpreting this data in the light of an *explicit* theory of variation for the purposes of predicting the patient's outcome and improving the system of care.

I realize that most doctors and nurses try to avoid tampering with the patient's biological processes; they would often prefer to wait and see if the body's natural processes will gain control of symptoms such as nausea and temperature fluctuations rather than intervening themselves. However, by what theory would they know the difference between tampering and improvement? It may be normal that one has headaches, nausea, and temperature fluctuations after major surgery. The question is, for how long and at what rate should this be allowed to go on before action is taken?

The theory of variation explains how we can analyze data to know whether we are dealing with a special event that requires action, or merely with random causes that should not be tampered with by inappropriately focusing on any individual piece of information. Better collection and analysis of patient data before and after surgery can be helpful to answer the question above. All data will vary over time; that is, a patient's temperature, blood pressure, etc. will vary over time. If such data are plotted in time order on graphs called *statistical control charts*, like the ones shown in Figures 1 and 2, we can perform interesting analysis which can lead to profound conclusions.

In Figure 1 we see that the data vary over time in a repeatable and predictable fashion within a certain "band" of variation. The theory of variation would call this a "stable, predictable system"; the causes of the past variation will repeat themselves in the future, provided no extraneous change occurs. We can calculate these "bands" for probable variation for the future, they are known as *control limits*. As long as points fall within these limits, the variation is said to come from *common causes*. In these instances, the theory of variation asserts that the differences between high and low points are due to the natural, random variation caused by the system. There is no specific single reason for any observation that occurs, whether it be high, low, or average. Improvement actions will only be effective if they are directed at the underlying system, rather than any specific person, material, or condition that one *thinks* may be the cause. In fact, acting on an event that is part of the

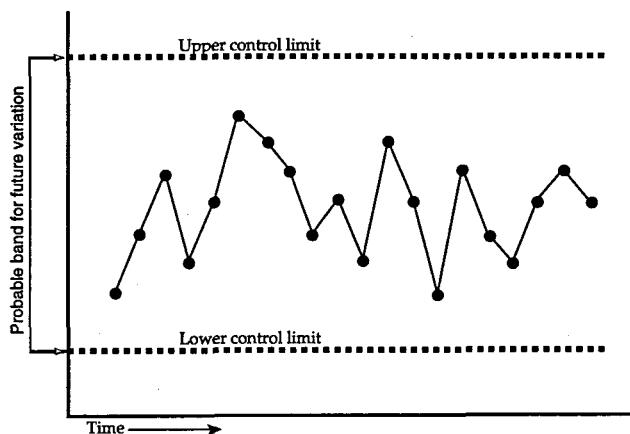


Figure 1. Common cause variation.

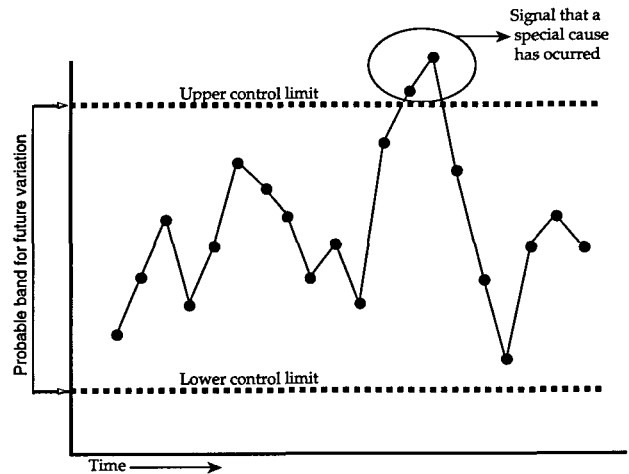


Figure 2. A special cause has occurred in addition to the common causes already present.

common cause system as if it were due to some specific reason is called *tampering*, and this will only make things worse. The key point is that in the case of common cause variation, it is relevant to treat the system, not one specific symptom.

In contrast, in Figure 2 we see erratic and unpredictable variation as evidenced by points falling outside the band of variation that described the stable system in Figure 1. The sources of the variation are now not only due to common causes, but also include one or more specific factors, known as *special causes*. As long as special causes exist and are not removed, we cannot predict future performance. Improvement action has to focus on the origins of the special causes in order to remove them. When these special causes have been removed, future performance can once again be predicted to fall within the control limits. If necessary, performance can then be further improved by acting on the system.

The importance of this theory of variation, and of understanding what the variation is telling us, is that nurses, nurses aides, and physicians can interpret data and act upon it more effectively by using statistical control charts. These graphic methods help us to know when and what action to take. In fact, most of the data collected following surgeries such as mine—indeed, most of the data collected in any health care system—could be better interpreted on such charts. When variation exhibits a persistent pattern, or points exceed the

control limits, the specific contributors to the special causes need to be identified, removed, and prevented from reoccurring. When the variation is within the control limits, we should avoid tampering with the system; or, if improvement is desired, realize that improvement actions must fundamentally address the system itself, not some individual factor that we might think is the cause. In addition, statistical control charts provide a rational, theory-based approach to the interpretation of data and earlier warning for anything that goes wrong with the patient. This eliminates the need for health care professionals to use their own personal biases when interpreting data and will ultimately lead to better health care for the patient, with lower costs and the enrichment of health care professionals' jobs.

The development of specific theories of variation and the use of graphical methods to display data can also improve the communication of information within the health care system. For instance, how nurses communicate information to surgeons is of paramount importance in patient care; I certainly feel that it was important in my case! After all, it is the nurse who interacts regularly with the patient. What is even more crucial is how physicians discern what is important about a patient when the nurses appear to log all data without identifying the major points of interest. I believe this problem of data overload comes about in health care because there is often no explicit theory that one is testing that could then be used to drive data collection and the identification of key information. In manufacturing organizations, in contrast, theories are available that help management to determine the importance of criteria that relate to quality. These theories are helpful in standardizing what data the workers will collect and determining how and when they will communicate information about defects and problems to management. This same approach, this same theory of variation, can be used in health care. In manufacturing, the challenge is to construct a system so that what management needs to know will indeed get their attention. We also face this same challenge in health care. A system that fails to cue the physician into extraordinary variation, I think, explains why my surgeon did not suspect the spinal fluid leak before the dreaded morning of December 17.

In summary, improving quality is not just looking at past or present events. Rather, it involves predicting what actions will lead to a better future. Such prediction is

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effective only when the theory of medicine is combined with the analysis of data that has been conducted in the light of an appropriate theory of variation—a theory that distinguishes between common and special causes. Clinical practice and health care management should not be guesswork, trial and error, nor experience based on the repetition of the errors of those who have come before. Rather, it should be prediction based on theory.

Proper use of data is a second principle for improvement of quality in health care:

To improve quality, we need to be able to predict quality. This requires that experience should be continually updated by the application of better theories. Proper use of data can help us develop better theories.

#### **Improvement of quality includes staying ahead of the customer**

Closely related to customer education and the use of past data to predict the future is the issue of how past experience can be used to better design the system of care for future patients. I believe that I suffered often and needlessly during my hospital stay because of the lack of forward thinking and anticipation on the part of the people who were caring for me. For example, I did not use the self-administered IV pain medication the first two nights of my stay because I did not know that the terrible pain in my hip was the result of the surgery on my back. I cannot believe that I am the first person to misunderstand this, and I frankly doubt that I will be the last. How will the system of care use the learning from my experience to make appropriate adjustments in areas such as training of staff so that they will anticipate the information needs of the next patient who has back surgery?

The nursing assistant who responded to my call button at 3:30 A.M. when I discovered fluid draining from my incision is another potential example of how the system of staff training does not stay ahead of the

patient's needs. When she came into my room, she did not investigate the source of the fluid nor was she of any help in undressing me or washing me. She seemed totally unprepared to deal with the situation. Instead, I, the customer, felt as though I had to give her instructions on what to do. She eventually handed me a washcloth and basin and asked me to call her when I was finished. Here I was with a throbbing headache, trying to wash myself, while I felt that the nursing aide was avoiding me like the plague. This incident, and numerous others like it throughout the stay, left me with the impression that the hospital was filled with personnel who do not have the training or wherewithal to deal with all the situations they might find themselves in. Nursing aides, people who clean rooms, and those who wheel patients around in wheelchairs must often be faced with critical situations that they are not able to properly handle. And I am not blaming them as individuals for this; the system that is supposed to train them and prepare them for likely critical situations that must occur frequently in a hospital is simply not designed to anticipate needs and provide adequately for them.

As a third example of lack of thinking ahead on the patient's behalf, consider my surgeon, whose accidental damage to the nerve sack lead eventually to the leaking spinal fluid and my extra days of stay in the hospital. I understand that there is a possibility of complications with major surgery such as mine and I do not question his skill as a surgeon. But, knowing that he had damaged the nerve sack during the operation, couldn't he have better anticipated the likelihood that I might suffer complications? Couldn't he have left special instructions with the nurses to watch more closely for anticipated signs and symptoms?

I suppose that it is possible that my story is unique and that these events represent the first time that these things have ever happened in the experiences of the people I interacted with. But, if this is so, then another question one must ask is, What did the surgeon, nurses, and other hospital staff learn from this experience, so that relevant action (considering differences between special and common causes) is taken to prevent similar occurrences in the future? A third principle for the improvement of health care that relates to my experience as a patient is this:

To improve the quality of health care, we need to stay ahead of the patients, anticipating their needs for care, information, and assistance from staff.

### **A supervisor's job is to help subordinates improve**

During my hospital stay I interacted with many nurses and nursing aides. While I do not know if I ever met these people's manager, I believe that I can fairly assume that such a person exists. Judging from my experience, I also believe that I can fairly assume that this supervisor does not completely understand variation, its potential impact on care, and the supervisor's role in reducing it.

Over a 10-day period, I interacted with seven nurses and seven nursing aides. Instead of the supervisor assigning specific staff to the patient for each of the three shifts so that we could get to know one another and establish an effective working relationship (i.e., reduce the variation), the staff were constantly rotated. Besides trying to recover, I was forever trying to remember new names. This increased the variation in my care, resulting in increased tension and decreased trust. This constant change of staff may also have made it more difficult for anyone to notice any pattern in my symptoms that might have led to an earlier detection of my complications.

I also found the performance of the various nurses and aides to be highly variable (that is, in my judgment as a patient; I, of course, cannot judge their actual technical competence). From my hospital bed, I derived my version of a control chart on the performance of these nurses and aides (see Figure 3). Naturally, there is not a system of measurement on the performance of these people from which one could devise numbers necessary to construct an actual control chart. However, by a process of judgment between patients one could agree on those workers who are outside the system. This is similar in theory to points outside the control limits. People whose performance is within the system—according to judgment based on consensus—cannot be ranked. Their performance is a part of the system, and hence indistinguishable from the system within which they work. This theory makes a mockery out of performance appraisal schemes that try to rank and rate people by putting them in slots. What is significant in Figure 3 was that both nurse M and aide H were outside the system as poorer performers from my point of view, and both were assigned to the night shift (11:00 P.M. to 7:00 A.M.) for the entire duration of my stay. In my situation, this was the time when I needed help the most. The patient in the room next to mine, an 83-year-old woman,

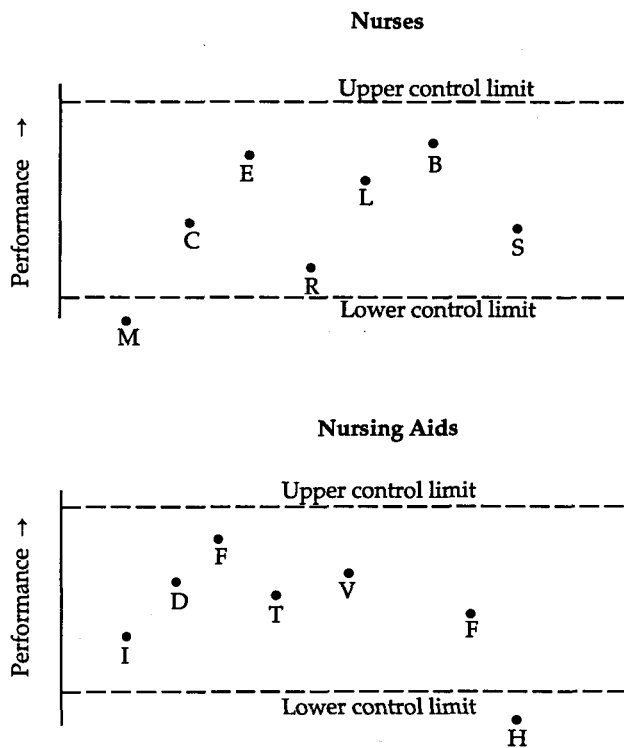


Figure 3. The nurses and nursing aides did not form a system.

referred to M as “crazy M” based on their encounters during the night.

It should be the job of supervisors to help nurse M and aide H to become part of the system (eliminate special causes), and then work with all of the staff to improve the system (understand the common causes). All workers will vary from one another; however, those who are outside the system on the low end are in need of special help. The job of management is to set up a mechanism to identify these people and either help them become part of the system or transfer them to less demanding work. Customer judgment is one piece of data that management needs to use effectively to do this. Man-

agement should also use customer data to identify who is within the limits of variability inherent in the system and who (if anyone) is outside the system and therefore in need of special help. Therefore, my fourth principle for the improvement of quality in health care is this:

By understanding variation, supervisors can know how to help to improve the performance of their subordinates.

### Management must be concerned with optimizing the whole system

The job of management extends beyond the supervision of the individual staff and processes within a department. Because the patient does not merely experience individual departments but the entire system of care, managers must be concerned with optimizing this total system.

Like most organizations, the hospital is divided into various departments, each one responsible to its bosses for the duties assigned to it. While each of these departments have different bosses, they all interact with the same patients, who should ultimately be the real “bosses.” For example, I counted eight different people/departments who interacted with me during days and nights:

1. laboratory people for blood tests,
2. pain medication providers who supplied the pain medication apparatus,
3. nurses and nursing aides who took my vital signs,
4. the surgeon,
5. surgeon’s assistants,
6. housekeeping staff,
7. orderlies who transport patients to Radiology, etc., and
8. members of the Dietary department who take food orders and deliver meals.

With so many health care professionals involved, the question is how to coordinate activities between and within these departments so that the patient is most comfortable. For example, during the night the following activities are performed: draw blood samples, check drainage from incision, empty all flasks that contain drained fluid, measure urine passed, measure blood pressure and temperature, check IV tubes, and check incision dressing. Because all these activities were done by various people from various departments, I found it impossible to sleep for more than 30 minutes at a time during the first few critical days after the surgery. There was a constant stream of people coming in and disturb-

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ing me so they could do their jobs. I am sure that each was sympathetic to my need for sleep, but what could they do—they had to perform their assigned tasks. Furthermore, it was difficult to get all those involved to turn off lights and shut the door when they were done. Eventually, my wife posted instructions on the door asking that the lights be turned off and the door closed; that did help. I learned that when the patient is strong enough, requests can be made directly to the staff, who will respond willingly. Patients who are too weak to make requests need the extra care even more!

It would not surprise me at all if each of the individual departments involved in this nightly parade could produce information showing that it is meeting its own, internal standards of performance and service to the patient. But my question in all of this is, Who is coordinating the visit schedules of all these personnel from various departments such that the overall disruption to the patient is minimized? I also wonder what other processes, interfaces between departments, and systems of care in this hospital are suffering under the same lack of coordination and attention.

This divided responsibility and lack of coordination is more than just a simple nuisance. I believe that it causes mistakes, increases costs, and guarantees continuation of trouble. For example, when I was nauseous the nurse instructed me not to eat. The person who brought the food from the dietary department said I must eat. The person who I felt would have known what I should do, the physician, saw me only once a day. What was I to do? Another such example, with obvious cost implications, occurred on the day of my discharge. That morning the surgeon's assistant replaced the dressing over the incision. When the morning nurse came on shift 30 minutes later she proceeded to change the dressing. I told her that the doctor had already done so; yet she went ahead and changed the dressing "just to be sure." Several minutes later my surgeon walked in. The nurse was still there and told him that she had just put on a clean dressing. He remarked that I should not have a dressing and removed it!

The patient does not usually see or interact with the leaders who are responsible for the system. In the manufacturing industry, customers have access to senior leaders through the customer service managers of products that fail to perform satisfactorily. Customer service departments are equipped to deal with the system and take care of customer problems without the

customer having to speak directly to many individual workers. In health care, as in many service industries, the customer (patient) has no access to the people who are responsible for the system. Instead, patients are forced to speak to the workers who only work within the system and are, therefore, at a loss as to how to help the customer. We all remember those experiences when flights are delayed or canceled and we, as frustrated customers, are trying to make sense out of information from gate agents who, in turn, are only trying to do their best. In health care, patients often experience similar situations.

All the various departments try their best to satisfy their individual bosses, thus optimizing their performance. But the patient experiences the combined effect of all of these departments, and when there is poor performance, it is due to poor management of the system. When leadership, which is responsible for the system, allows those who work within the system to optimize their parts without coordinating activities in order to optimize the system as a whole, then suboptimization of the system occurs. To optimize the system, we need to manage the system, not just the individual parts.

Optimization of the parts of a system will ordinarily lead to suboptimization of the whole system.



As I said at the beginning of this article, the experiences of one patient, at one hospital, hardly constitute a sample with a statistical validity. However, we often hear reports in the media and from family and friends about complications and process problems within the health care system. While each such story is different and, therefore, the specific actions taken are different, I believe that the lack of understanding of principles like those outlined above is the underlying flaw in the system. I was glad to go home from the hospital. I hope not to return.