

Improving Patient Care in Hospitals

Author

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Introduction

In the early 1990s things began to change in my profession. It is fair to say that my heart began to break for some of the changes that I was seeing in health care. From my perspective, it seemed that many of the fundamental values I had been taught, literally at my father's knee, weren't being built into the systems of care being created. I didn't understand why these particular changes were happening, and I felt angry that dollars were being put between patients and doctors. I wanted to understand what was happening, which led me through a course of self-study and, five years ago, back to school for a year at Harvard where I received a Masters of Public Administration in healthcare policy. During that time I had the opportunity to reflect about the changes occurring in health care—why they are happening, what they mean for us as practitioners, and what they mean for patients.

After my year at Harvard and several years back in Kansas, I was offered a position at Dartmouth Medical School, which I accepted as an opportunity to explore some ideas that I had been formulating for some time about how doctors, nurses, patients, and others can work together in better ways. I'm happy to report some of that work to you in this article. I believe that everyone reading this—those of us in health care and those in other fields—will be able to appreciate this because all of us, in our own ways, are pioneers, explorers of ways of thinking and acting that we believe have promise for the future for our respective professions.

What does “health care” mean?

When we use the term “health care,” just what do we mean? Where does it all begin? I believe health care began when the first primordial creature came stumbling out of the swamp and the creature next to it reached down and tried to help drag it out. I think this is the fundamental idea operating in health care. That is, we help each other because we never know when we will need that same help ourselves. Health care emerges from relationships founded on trust and, ultimately, in shared human experience. A sense of interdependence and reciprocity underlies what we do in health care, and in life. This connection with some of the most fundamental aspects of our being is what makes work in health care so special, and our responsibilities so great.

The challenge of transforming health care

This is a time of profound transformation in health care. The decisions we are making, and the actions we are taking today, will determine the care that we and those we love will receive in the years ahead. We must take this work very seriously. We face important challenges. Despite our best efforts, costs are very high, quality is uneven, people don't feel well cared for, and many Americans have no health insurance.

The challenge of transforming health care, continued

There are no easy answers to these challenges. With basically the same health-care workforce we have now, and the same resources, we must find orders-of-magnitude increases in effectiveness and efficiency in order to meet the needs of our patients and society. The challenge is ours: To take what we have and do things very differently.

How health care is seen

It's interesting to look at health care because what it looks like depends, to some extent, on where you stand. From the inside, from the practitioner's perspective, we see ourselves working hard every day to give patients the best care we can. We care, but we're busy. Our patients usually do well, and every year they do a little bit better. If a patient makes it through the door of our hospitals or clinics, we care for them; we don't turn people away. But it's getting harder to do a good job. Staffing is tighter; resources are being trimmed; patients are getting sicker and older; reimbursement is falling steadily. That's how it feels from the inside.

From society's perspective, though, health care looks very different. Costs are way too high and are going up at intolerable rates. Mistakes are made—huge mistakes when seen in aggregate. Also, patients say, "Nobody listens to me anymore." To make matters even worse, many Americans have no health insurance; estimates are that between forty-two and forty-three million Americans are uninsured out of a population of about 275 million. Those are staggering numbers of people, and the evidence is very compelling that without such coverage health status does not reach its optimum. So we have this extraordinarily difficult situation in that healthcare workers are doing the best they can, under increasingly difficult conditions, and yet important needs of patients and society are not being met. It is not an easy time.

Problems as the unintended consequence of success, not failure

We often approach problems by looking for someone to blame; but I am increasingly convinced that this approach is very unproductive in health care. One of the most surprising conclusions I came to after studying these problems for several years is that, in most cases, the problems we face in health care are the result of success, not failure. Most of our present problems are the unintended consequence of well-motivated, successful efforts to solve previous problems. Let's take a look at our concerns of cost, quality, and loss of a patient center, one at a time.

The link between cost and capability

First, there is the concern for cost. We are nearing resource limits in health care. What is the cause of the cost problem? At first it seems easy to assign blame; to assume the cause must be waste, or fraud, or abuse of the system. But careful studies have shown the reason for the problem of high cost lies in another direction. Our high costs today are directly related to a major problem of an earlier era in health care: the problem of limited medical capability.

In years past we couldn't do anywhere near as much as we can today. In 1957, when my father graduated from medical school, much of the care we are able to offer today as a matter of routine did not exist. For example, in my specialty of cardiac surgery, the first operation using the heart-lung machine occurred in the year

The link between cost and capability, continued

of my birth, 1953. The first heart valve was implanted in 1960. The first coronary artery bypass operation was performed in 1965, the year that Medicare was created. It wasn't until the 1960s, and even the early 1970s, that hospitals began developing intensive-care units, coronary-care units, and other specialized units that we take for granted today. Administering many of the drugs that we have today also began then. In short, since World War II there's been a phenomenal expansion of medical capability.

Health care has become more complex—we have added exponentially to what we can do—but costs have increased proportionately as well. Our very success at solving an old problem, limited medical capability, has unintentionally created a new problem, high cost. We have overcome limits of one kind but have reached limits of another kind—limits of the societal resources that can be dedicated to health care. This is not to say that we should ignore waste, or fraud, or abuse. But a much greater challenge lies at the center of the cost problem. And the more successful we become at solving capability problems—the artificial heart comes immediately to mind—the greater our cost challenges will be.

There are only two general solutions to the cost problem when viewed from this perspective: either we do less for patients, or we find new ways to do more. For me, there is only one acceptable answer.

Viewing the issue of quality

Next let's consider the issue of quality. There is an understandable concern for quality today in health care. The recent Institute of Medicine reports on medical error are startling. How can we, with a clear conscience, tolerate 100,000 people a year dying in this country due to medical mistakes? The answer is we can't! Recent studies have questioned the magnitude of the IOM conclusions, but even one preventable death is too many. How shall we think about his problem? Just as in the case of cost, I believe that our quality concerns today are grounded in success, not failure. Let me explain.

Concern for quality is not new in health care. What is new is an emerging understanding of the importance of system-based approaches to quality, approaches that have proven themselves in other industries that are now achieving quality at six-sigma levels.

The time-honored solution to the concern for quality in health care has been a professional commitment to *individual* responsibility. When I was a medical student in the 1970s I was told: "Don't trust that laboratory report; look through the microscope yourself. Go do this, then go do that, because there is no greater responsibility than caring for the life of another person." Well, we took that to heart, and have created the best system that can be made by self-reliant, individual caregivers doing their utmost not to make mistakes.

We have succeeded in developing deep cultures of individual responsibility that were appropriate in an earlier era, but paradoxically are now unintended barriers to the adoption of system-based approaches necessary for taking quality to even higher levels. We have no familiarity with such approaches and resist them. We have been trained to be distrustful of anyone except ourselves. Our old medical philosophy said, "This is the most important task you could ever have. Do not make a mistake."

Viewing the issue of quality, continued

A culture of mistrust, shame, and blame is the other side of this intense culture of responsibility. In other industries, such as aviation, which I'll cover more directly in a little while, the approach was and is very different. It is assumed that people *will* make mistakes, and systems are built to keep what is understood as inevitable human error from causing adverse events. So, again, our challenge is not based in failure or lack of concern about quality, but rather it is an unintended consequence of success from an older perspective.

Loss of a patient center in our work

In 1924 my grandfather began his medical practice. When a patient came to him he knew that patient by name. He knew the patient's family situation. He knew that he might not get paid but that that would be all right. He knew that maybe the patient was coming in because he and his wife were fighting, or were worried about their finances, and not necessarily because of stomach pain. My grandfather also knew that he could help craft a solution and that when the patient left he would feel truly cared for in a holistic way. The term "patient-centered care" describes this type of relationship.

We have a wish, in health care today, to regain this kind of relationship, this sense that health care is really in the service of the *person*. We hope that health care will be in the service of repairing *a disrupted life*, not just in fixing a metabolic abnormality or correcting this or that condition. The wish is for health care to truly be in the service to the *whole patient*. That's what the term "patient-centered care" means. But care like this is hard work, and it gets harder every day. Our systems no longer support it.

Why have we lost our focus on the patient as a person? Again, I think this is yet another example of an unintended consequence of successfully addressing a previous problem. This problem of the loss of a "patient center" in our work became prominent as care itself became more and more complex. The challenge then was mastering this increasing complexity and sophistication of medical science. The solution was specialization. The unintended consequence of this solution was a gradual emphasis on treating medical conditions, not people. Health care became specialized, and now we have a heart doctor, a lung doctor, a brain doctor, a cancer doctor, but we never seem to have the *patient's* doctor anymore. Our success in solving the problem of complexity created a new problem. Now the patient says, "No one listens to me anymore." We are learning that great care of organs and diseases sometimes feels terrible to the whole person. Our past success again set the stage for our present discomfort.

A legacy from the 1920s

The same paradox is true of the way health care is organized, and of our usual work patterns. Most of the organizational structures of our healthcare system are legacies from the 1920s. They are the result of well-intentioned efforts by healthcare professionals who were attempting to organize care in the best way they knew at the time. Those ways of organizing care were, for their time, a great advance. But, here we are today, with those same organizational structures and those same work patterns. In many cases those organizational structures and work patterns no longer help us. In fact, they often stand in our way. But because that is how we were

A legacy from the 1920s, continued

trained, and for the most part how we still work, it is hard for us to even imagine doing things differently. It is not easy to step outside of the cognitive models that we use to define and organize our world. But we must. We can do better.

Commitment and care as vital forces

I'd like to shift, for a moment, to some positive things in health care. There are some very valuable resources in health care that are often forgotten and left unmentioned. The most important is the reservoir of care and compassion that *does* exist in the healthcare workforce. I marvel as I watch the nurses in the Intensive Care Unit caring for our patients, for the families involved, worrying over their needs. The same is true for every healthcare professional. It's not fashionable to recognize it, or even acknowledge it right now, but the care and concern are there. This passion is crucial. Its power should never be underestimated. Throughout the history of health care this commitment to give patients better care has been the most important driving force for improvement, far more significant than economics, regulations, or any other incentive. I see this commitment as a vitalizing energy force capable of transforming our healthcare system. Our task is understanding how to harness it productively.

The notion of customer

I'd like to say something about the idea of customer service and the term "customer." Now, I'm often a customer, and I am also a healthcare practitioner. I would agree with many who say that in health care there is a lot to be gained from thinking about ideas of customer service in business. I've never been a business owner, and I don't understand the notion of customer exactly from that perspective. But as best as I do understand it, "customer" is an important word in business, and *fundamental* to the concept of customer in business is the idea of respect for the individual.

But I also want to say, as a healthcare person, that there isn't a perfect fit between the term "customer" and my profession. We often feel a sense of responsibility and connection to our patients that transcends what I understand the customer/business relationship to be. It's a deeper relationship and one that is much more personal. In a sense it is similar to the responsibility that one feels toward a loved one. So I have a little difficulty with the word "customer." My relationship with my patient means even more to me than that. But for many people the word helps to define relationships of service, so I don't mind it too much. We just need to remember how special, sacred really, this relationship must always be. The great surgeon and educator Francis Moore said it succinctly: "The fundamental act of medicine is assumption of responsibility." This human connection, of responsibility for another, is at the center of health care.

Circle of identity

Related to this sense of responsibility for a patient is a concept that one of my friends, Martin McKneally, calls the "circle of identity." His thinking has helped me understand what my role is when I ask for consent for a procedure, or recommend a particular course of treatment. By "circle of identity," Martin means the way in which we grow to become fully responsible, well-functioning individuals.

Circle of identity, continued

To his way of thinking, when we are born our “circle” is rudimentary, kind of empty, and by the time we get to around twenty-one or twenty-five that “circle” is pretty well fully formed, although fluctuations do occur. Over the years those who teach us, our parents and others, step in and out of that circle, helping us when we need that help; but over time they’re always stepping back in with the goal of making that circle intact and complete, bright and vital.

In normal business relationships, customers are presumed to come with a fully intact functioning circle of identity. The world of business presents people with choices; it expects them to make rational, informed decisions, and live with the consequences.

In health care we have made mistakes in both directions regarding the circle of identity. In earlier eras health care grievously stepped too far into the patient’s circle of identity, depriving the patient of the dignity of making independent decisions. But today we are at risk of making mistakes in the other direction, of assuming that a person can be a rational decision maker when that is just not possible for them. Very often the thing that brings the patient to us also works on the circle of identity. For example, if a patient suddenly has a heart attack, that patient may not be able to decide clearly and rationally about risks, options, and whatever else. Part of the patient’s circle of identity may become incomplete; although the circle may still very much be intact in its majority, there may, nonetheless, be gaps.

What my friend has helped me understand is that it is my professional duty to step forward just enough to make that circle whole, to lend a little of my own identity to that patient for a while. I can do this in different ways. I might say: “Here is what I think the facts are.” “Here is what I would do for myself or a member of my family.” “Here is what I recommend to you.” I might also ask, “What other information can I provide for you to help you make a good decision?” The reality is that I’m steering a lot of that interaction, and if I say otherwise I don’t think that I am being totally truthful. Our present laws and procedures assume otherwise, but the reality is more complex. The reality is that the patient’s circle of identity often is incomplete; and health care, almost uniquely in our society, requires practitioners to step forward and help repair that. It is our ethical responsibility to step forward. But equally we have the responsibility of always working ourselves out of that circle, of making that patient whole again.

The social contract of health care

I think this vulnerability, and our professional responsibility because of it, is what underlies what has been called the social contract of health care. Sam Thier has written about this eloquently. The social contract of health care says, in essence: *Society grants to the health professions the privilege of caring for the sick, and many other honors and rewards, in exchange for the promise that the welfare of the sick will always be held before all other concerns.* These are the absolute terms of our relationship with those we care for. We violate this social contract at our great peril, as managed care is learning the hard way. Any other relationship does harm to the essential soul of our profession and will not be tolerated by society. This basic principle must lie at the heart of any new system of care.

Importance of self-care

I have been discussing some basic principles that underlie what we do in health care: ideas of reciprocity, patient service, the circle of identity, the social contract of health care, and so forth. I also think that we need to add self-care and peer-care as essential principles in a healthcare system.

We all need to take on the responsibility of caring for ourselves; it is an essential first step. Dr. Herbert Benson, as you may recall from his article in the previous issue of this *Journal*, thinks of a healthcare system as a three-legged stool, with procedures and pharmaceuticals being two of the legs, and self-care being the third leg. It is worth thinking about self-care, because we often shortchange this leg.

The concept of self-care is deceptively complex. Self-care is not the norm in our present systems. Instead, present norms tend to keep “ownership” of care within the system itself, in effect keeping patients at a distance from the information and resources they need to care for themselves. Again, I don’t believe this has been deliberate. It’s just the way it has worked out. But the result is that we have unintentionally disenfranchised the most valuable workforce in health care, our patients themselves. Not only do people want and need the information necessary to manage their own illnesses, there is a practical side to it as well: we will never be able to care for everyone as well as we would like unless we all step forward as true partners in that care.

There is another dimension to self-care that begins very close to home, with how healthcare practitioners work and live. The news here is not good. As a doctor, I exist in a culture of tremendous overwork. Doctors, especially in the training years, may stay up all night and still go to the operating room the next day. We may start our days before dawn and get home at 8:00 or 9:00 at night. Nurses and other caregivers are being asked to do more and more with less and less. This tendency toward overwork is epidemic in American society as a whole and is especially true in health care.

A colleague of mine once asked me an interesting question that really struck home for me: “How can we take good care of our patients if we don’t take better care of ourselves and each other?” Her point really is worth considering. We are trained and acculturated to look outward, toward our patients and our work, and not to look inward at ourselves. We often model in our own life choices that are exactly the opposite of what we hope to accomplish for our patients.

What is quality?

Obviously, when you’re working with a patient, or on a person’s heart, you want to do the highest-quality work you can. But what does that mean? Just take the simple question “What *is* quality?” It’s worth thinking about that for a minute.

I don’t know that there’s a right answer, but one that I love came from an elderly lady in the second row at a talk that I once gave. The members of the group I was addressing were all senior citizens. Many were eighty or ninety years old. I asked the group to think of things in their life that exemplified “quality.” The gentlemen talked about certain kinds of things they had made, and the ladies spoke of certain things they had baked, or sewn, or of relationships. It was an older group, and at first they were very traditional in their gender divisions. They agreed that quality was

What is quality? continued

hard to define, that you just sort of knew it when you saw it.

But then one lady put her hand up. She said, “I think it’s just paying attention to what you’re doing.” I was really struck by that. I said, “Tell me more. What do you mean by that?” and she said, “Well, you just look carefully at what you’re doing, you reflect about it, and then you try to do it better.” The group agreed. I thought, “Well, that’s pretty interesting.”

We eventually decided that *quality is less a property and more a way of being. It is what happens when you pay attention to what you’re doing, reflect on it, and try to do better as you go along.* I think it would be hard to come up with a better definition.

Linking quality with learning into an “improvement loop”

I have thought about her answer a lot. What I eventually understood she meant is that there is a relationship between quality and learning. I think she was saying that quality constitutes part of a learning journey. I eventually linked that thought up with another idea about learning that was expressed by Gregory Bateson. Gregory Bateson was married to Margaret Mead, the famous anthropologist. He was a highly original thinker, back in the 1950s and 1960s, one of the early theorists in the field of cybernetics. He said, “All learning depends on the ability to detect difference.” His point was that if everything seems the same, if you can’t detect any difference between one state of being and any other, how could you possibly learn?

So, if you put together Bateson’s interesting quote that learning depends on the ability to detect difference, and my audience member’s idea that quality is a learning journey, what you get is something I like to think of as the “improvement loop.” Here is how it works. You have some process, and you want to build quality into it. So you add learning. You measure something about the outcome of your process; you compare it for a difference with previous outcomes; you reflect on the difference; and then you try to do better. You keep running this over and over again, and pretty soon what you get is “quality.” Easy as pie.

What is our level of self-awareness?

Clearly, though, you need some level of self-awareness to even know you have a process going. In health care, many people aren’t at this level of self-awareness when it comes to systems and processes. They’re just doing something. If you stop and ask them how it’s happening, they’ll just say, “Well, I’m just being the best doctor or nurse I know how to be.” They don’t really understand what they are linked into and that everything that they do is rising or falling depending on the environment that they are in. So, as a first step, you have to have some degree of self-awareness.

Measurement and quality

As a second step, you also have to have some sort of measurement in place. Most healthcare systems do not have outcomes-measurement systems, except in very crude forms. The systems that do exist are more often used for judgment and monitoring rather than as learning tools.

Within the vast body of what we do there is a relatively sizable domain known as “evidence based” practice: treatments for which there are reliable, scientific evidence

Measurement and quality, continued

that if you do this, that will happen, and so forth. It is important to remember that this body of knowledge changes over time. When I was a medical student one of my teachers said, "Half of what I'm teaching you is wrong. The problem is, I just don't know which half." It's evolutionary, I guess. Still, at any given time, there is knowledge that should be put to use. It is interesting that, of all that we do in medical practice, most estimates are that only about 15% to 20% has a true rigorous evidence base, a scientific basis. A good deal of the rest of it is sort of experiential.

There's been quite an interesting push over the past ten years or so in health care for more evidence based practice. Let me give you a very concrete example. There's an overwhelming body of evidence that if you have a heart attack you need to be on a class of drug called a beta-blocker. Patients on those drugs have a dramatically lower risk of having another event or of dying. There's clear evidence for it. It's very well known. And yet when studies are done to see, at any given hospital, what percentage of heart attack patients went home on a beta-blocker, it's a remarkably lower number than you would wish it to be. Somewhere between 60%, 70%, or maybe 80%, but nowhere near the 98% or 99% that it ought to be. A huge part of this is because, until recently, there's been very little measurement of how many people in hospitals actually went home on betablockers after heart attacks. It was just assumed that good doctors would make sure that their patients were on beta-blockers, and to the extent that good doctors could make sure good things happen, patients were on beta-blockers. *We need to measure how procedures that are known work are being applied.* This process type of measurement is very often not being utilized in health care.

So we need better systems of measurement. But we need even more than this. We also need to have some sort of structure that affords an opportunity for reflection at a system level. In health care, with lots of different people involved, there's no way we're going to be able to talk or think effectively about how to change what we are doing unless we get them all together somehow. And so thinking about measurement takes us back again to the idea of optimizing the social architecture of health care.

Self-conscious and unselfconscious forms

Let's touch upon some philosophical origins and roots. Christopher Alexander, an architectural theorist at Berkley, authored three books: *Notes on Synthesis the of Form*, *A Timeless Way of Building*, and *A Pattern Language*. Alexander, interestingly, is not widely known in the architectural world, but in the world of computer programming, especially object-oriented programming, he's considered something of a god. Alexander has an interesting idea that relates directly to measuring and improving what we do in health care by optimizing our organizational structures. He says that human beings create structures or "forms" in at least two ways, which he calls "self-conscious" and "unselfconscious" form making. In "unselfconscious form making" we engage in the kind of direct creative work involved with making, say, a primitive mud hut. With the other type of form making, which he calls "self-conscious form making," humans participate more indirectly, for example by contracting out to someone like I. M. Pei to build them something really fancy.

Self-conscious and unselfconscious forms, continued

Alexander says we were always learning and always improving when we were involved with unselfconscious form making, because the result was immediate. You'd build a hut, and then you'd go live in it. If it rained, and the roof leaked, you'd daub a little mud up there, and if that didn't work, you'd build your next hut in a way that remedied the leak. However, with self-conscious form making, less of a connection exists between the architect who designs the building, the builder who raises the structure, and the people who eventually live in it.

Alexander suggests that the result of engaging with "forms" in an explicitly self-conscious way is often this: we make terrible buildings. Alexander says, "In unselfconscious form making, you do it, you live with it, you change it. This happens almost subconsciously. But it's different in our modern world. Where things get more complex, the connections don't happen."

So am I suggesting that we simply go back to simpler times? Of course not. The reality is that complexity is here to stay. We just need to be smarter about dealing with it. Alexander is not actually criticizing complexity. He is pointing out that increasing complexity has separated us from an immediate and intuitive knowledge of the cause-and-effect relationships of our work. The way we deal with complexity in organizations has effectively decoupled our natural improvement loops. To build quality into our work we need to get those loops working again.

Using tools to make differences visible

I've talked about how improvement loops bring together doing and learning. And about how learning begins with the ability to detect differences. Yet, there are limits to our ability to measure differences. If the result of a process takes a long time, or if changes are subtle, there may be differences that we are unable to see with clarity. So we need somehow to magnify them. That's what run charts, statistics, maps of variance, and so forth were made for. They are tools that magnify small changes. We need these tools. They enable us to view subtle changes clearly and respond to them appropriately. In health care the desire for quality is evident. But the tools needed for seeing differences aren't always well used. We are going to have to begin to use our tools. They are crucial for measuring our processes of care and, in turn, for improving them.

Product and process innovation

When we talk about transforming health care, we are basically talking about innovation, which means doing something that's never been done before. Economists often divide innovation into two types: "product innovation," which is improving the goods or services of an industry, and "process innovation," which is improving the production resources of an industry.

In health care we have had a remarkable product innovation, and almost no process innovation. We have better and better drugs. We have better and better operations. We have better ways of monitoring, testing, checking this, and checking that. Yet when we look at *how* the production resources in health care are assembled to create those innovative products, we have really had very little progress for most of the past century.

Product and process innovation, continued

It's not the same in other industries. For example, if you go into a computer plant today and compare it with thirty years ago, you will find that the computers are much better *and* that the production process today bears no resemblance at all to how computers were made thirty years ago. *Both* the product and the process have changed!

In health care, for all the advances that have been made, the "production process" works almost exactly the way it evolved a century ago. It is more complex, certainly, but the fundamental ideas of organization, patterns of interaction, modes of communication and information flow are structurally just the same. Almost all the knowledge that has been used to dramatically change production processes in other industries has just completely bypassed health care. It's interesting to ask why.

Why has process innovation not occurred in health care?

In most industries, the primary driver for process innovation is cost reduction. Until relatively recently, cost-consciousness has not been part of medical decision making. For most of the past century, for good reasons, medical decisions and cost decisions were kept distinctly separate as a matter of ethical principle. When the Medicare program was created, it was based on cost-plus reimbursement. In theory, hospitals and doctors did whatever was right for the patient, and the system paid for the cost of doing it. When I was a medical student I was taught, "You're not even to think about cost." I remember when the CAT scan first came out and we were trying to figure out when we should use it. We were basically told, "Young doctor, your job is to take care of this patient the best way that you know how. It's someone else's job to figure out how it is going to get paid for." There were no incentives built into the system to keep costs down; in fact, they were deliberately built out of the system, because the intent was to be sure that people got the best care possible.

As a nation we have just finished a ten-year experiment with managed care, which was basically an attempt to rapidly bring process innovation into health care by intense cost-consciousness. I believe the experiment has failed. We hear a lot about adopting ideas from business and industry, and there is a lot that business has to offer health care. But I think we've found out that differences exist between health care and business, and that these differences can be profound. People find it very objectionable to have cost concerns layered over clinical decision making. For fifty years we have enjoyed the results of explosive product innovation in health care, yet because we're fifty years behind in process innovation everything is staggeringly expensive. Yet, when we try to drive cost-consciousness into health care by competitive market forces, we hate what we produce.

So this is our challenge in health care today: How can we drive process innovation in health care, yet not distort the essence, the fundamental spirit, of what health care is? I think the answer is in reformulating the question. The question we need to ask is "How can we help healthcare practitioners actualize their commitment to better patient care by incorporating process innovation as an ethical dimension of their work?" I think the answer to this better question lies in the clinical environments we build around them.

Creating an optimum environment for system improvement

I believe the key is creating optimal environments for an inside-out transformation for health care. This is a far better strategy than focusing on economic incentives, oversight, or regulation. The latter is the tack that we've taken over the last few years, and it's proving to be a recipe for making a healthcare system that patients neither want nor will tolerate.

I think we can make a system that works better than one founded on external pressure, where somebody from the outside is always saying, "You must do a better job." I think that we can, instead, set a stage that allows for the emergence of this natural tendency of people who are working inside the healthcare system. We must create a system that allows these deep feelings of human responsibility, of compassion and care for others, to naturally arise and become active in shaping our patterns of care and interaction. Right now we don't have structures that allow this commitment to translate into reduced error, better outcomes, and so forth. I think that the care and compassion of our healthcare workforce is the best hope for driving healthcare transformation. My belief is that health care will be transformed by the shared effort of people inspired by the vision of giving better care. *What is necessary is a different infrastructure that actively supports the natural inclination of caregivers to do the best job for their patients.*

Productive environments for innovation

Much is known about environments that produce innovation. Innovation has been studied extensively, and there's a huge amount of literature about this. Perhaps the best example of an environment designed specifically to produce innovation is the Lockheed Skunk Works. The Skunk Works developed almost every new jet fighter that our country produced from World War II until almost the end of the century.

Basically, the leadership at Lockheed took a big manufacturing plant and made a little subdivision within it. They essentially said to the employees, "You people are not quite beholden to us in the same way that everybody else is. We're still going to hold you accountable for your work, but we're going to give you some protected time, we're going to give you some undesignated resources, and we're going to let you make decisions right on the spot." And then they took a most important step. The leadership brought the pilots, mechanics, and engineers together and put them all in a single room; they arranged their desks so that they literally bumped shoulders and elbows with each other, creating opportunities for them to interact with each other on a frequent basis. It was in those informal interactions that the different groups all saw one another's ideas on the subject: Pilots looked at the airplane one way, engineers viewed it in another way, and mechanics perceived it in still another way, even though they were all looking at the same airplane. As the different groups talked and interacted, new ideas began to emerge—spontaneously. *That's where innovation happens: at the intersections between disciplines, between people who each see what is apparently the same thing from slightly different viewpoints.*

What's been discovered is that *innovation occurs in environments where there's a very flat hierarchy*. A rigid hierarchical system tends to discourage innovation. The

Productive environments for innovation, continued

latter is more for running the show once you've got something figured out, but definitely not for figuring out something in a new way. It is known that in addition to this flat hierarchical structure, when aspiring to generate innovation you need a number of elements:

1. You need *multiple viewpoints*. This should be facilitated by specific ways of improving communication, even if it's just bumping elbows with the person next to you.
2. You need *authority to make decisions*. If you have to go through five or six layers of approval to try something new, then nothing is going to happen easily. It is much better to be able to say, "Let's go do this today."
3. You need some *flexible resources*. Interestingly, though, innovation generally happens best when resources are not lavish. The garage in which Hewlett and Packard created their company comes to mind. They were just two people trying to figure out how to do something with what they had, and just a little more. If your resources are too much and too lush, then innovation may kind of retreat or recede from you.
4. You need *clear goals but open means*. Over and over again, innovators at Lockheed had clear and measurable goals. They would say, "We will make a new jet that will fly at three times the speed of sound in two years with this many dollars." It was that specific. But they were careful not to mandate the "how." The "how" is where innovation lives.
5. You need *intrinsic motivation*. It is always the case in innovation studies that people who are passionate about the thing with which they're engaged do a dramatically better job than people who are bribed, beaten, or encouraged in any other way. Intrinsic motivation trumps, by astronomical amounts, extrinsic motivation.
6. You also need *leadership* of a unique kind. Kelly Johnson was the leader of the Skunk Works, and he did two things. First of all, he gave his people a lot of room to do things on their own. He inspired them, gave them support, and helped them believe in themselves. So he led them inwardly, but then he also protected them from the outside. He said to others, "You stand back. These are my people. If you have a problem, you come to me." This type of inward-outward leadership is enormously important and enabled the type of thing that was happening there.

So how does this all translate into health care? Unfortunately, not very well. In almost every category, the attributes known to produce innovation are rare in health-care organizations. In fact, patterns of organization in health care are usually just the opposite.

Health care: information transfer in a relational context

Now, let's take all this discussion and begin to focus it. Where we are headed is to the bedside of our cardiac patients in Concord. I am going to tell you how we are taking all of these ideas and giving them form in our program there. But to understand what we are trying to do in Concord, there are two more ideas that we need to consider. These are about the central role of information transfer in health care and about the small-scale organizational structures, which Paul Batalden calls "micro-

Health care: information transfer in a relational context, continued

systems,” where the real work of health care actually takes place.

Health care is, in some sense, a process of information transfer in a relational context. This may sound kind of strange, but look at what I do. Yes, I operate on people. I talk to them. I examine them. But I’m also involved with something else. I’m taking in information from patients about how they are doing, and I’m pulling that in with other information I’m learning about their condition from tests, and the like, and I’m adding to that base what I have from my medical training. I may supplement this by looking things up, or researching things in other ways, and then I apply all this information, with other resources, to try to make the patients better. This is all done in a context of relationships; it’s information transfer in a relational context.

To me, the efficiencies we are seeking in health care will come from making the relational contexts function as “information superconductors.” This implies that virtually no energy at all is being used to make the information flow effortlessly throughout the entire system. It also implies that the transfer of information is absolutely precise and complete, and is communicated to every single part of the system involved. I think that if we direct our efforts toward the efficiency and precision of information transfer, all the other things, such as cost and quality, will follow.

Seeing the microsystems

Paul Batalden and other innovative thinkers at Dartmouth Medical School have been very interested in what they call the microsystems of health care. People in health care have tended to think about systems in terms of health plans, hospitals, and other larger organizational structures. But in reality, according to Dr. Batalden and his colleagues, the *functional unit* of health care turns out to be something else. The functional unit, or “microsystem,” is the small group of people and resources that are brought together on a daily basis around the needs of a particular kind of patient. What is interesting is this: If you look at the organizational chart for most healthcare institutions, these microsystems are nowhere to be found. They’re almost invisible.

Learning from architectural theory

Christopher Alexander, the architectural theorist I mentioned earlier, looked at various patterns found in nature and then looked at architecture. He said, “You know, there are certain patterns that just make people feel good. For example, if you are looking out through a number of windows at a garden and the sun is shining in, you feel great. On the other hand, if you’re in a great big room that has no windows, or maybe one tiny window on the north wall, you feel terrible.” Alexander went through various patterns that recur across the world, and across time, and he developed what he called a “pattern language” for architecture. He suggested that you could take these patterns, put them together, and construct buildings out of them. As it turns out, his theories didn’t work very well in architecture, but they worked great in computers. The entire field of object oriented programming is built on packets of reusable code that are pieced together in the way Alexander envisioned for his buildings.

Regardless of how the concepts are used, I regard Alexander’s thinking about

Learning from architectural theory, continued

patterns to be hugely important. In the book *Notes on the Synthesis of Form*, Alexander puts up a random pattern of dots connected by lines and asks, “OK, how would you cluster this if you were going to group things together?” Alexander suggests that you should group things by taking those that are richly connected in some way and putting a boundary around them. Where there are sparse connections, you recognize that as a place where boundaries should cross. What does this have to do with microsystems? The idea is that if you have a certain set of people who work together all the time, then you ought to put some sort of organizational circle around them. The boundaries should cluster together people with a common purpose. The individuals forming the circle’s interior, then, have to match one another in some kind of significant way.

Organizational circles in health care

In health care almost all of our organizing circles were created back in the 1920s, when scientific medical practice first came into being. We’ve changed almost everything that we do since then *except* for our circles, except for our way of organizing healthcare relationships and processes. When I look at most healthcare organizations, I see groups of people who come together every day to care for certain kinds of patients; but there are rarely well-defined organizational boundaries around them that match the way care is actually given. The nurses report to nursing leaders, the doctors are over here, the physical therapists are over there, and management is somewhere else. We pull all these people together around a patient, and then when the immediate work is done, everyone goes back to their own departments. The old boundaries don’t match the way we work anymore. They don’t help us, and sometimes actually get in our way.

Recognizing the circle, the microsystem, at Concord Hospital

At Concord Hospital we are working to build circles around people who do similar things—not similar in their exact professions, as, say, doctors or nurses, but similar in that they are all coming together to care for a certain kind of patient, say a heart patient. Now, wouldn’t it be nice if we could put a boundary around all those people so that, in some metaphoric way, they became similar to the “open room” with the warm sunshine coming through it that Alexander spoke of? We need to begin to pull people together like this.

I think that a fundamental design principle for healthcare systems should be this: *Patterns of organization should reflect patterns of interaction. And patterns of organization should match patterns of patient need.*

The key to healthcare transformation is optimizing the patterns of interaction, and the information transfer that occurs within those patterns, by making them respectful, effortless and precise. This is mostly about facilitating how people work together. I think that visualizing our relationships, recognizing the rich connections and the sparse connections and getting the boundaries right, is where we should begin. I believe we should consciously seek out the “pattern language” of health care, creating a new “social architecture” that helps us do our work much more effectively and efficiently.

Our work at Concord Hospital

And that leads me, finally, to the work we have been doing during the last year and half in our program at Concord Hospital. First, let me tell you a little about Concord Hospital. The quality of the hospital and its nursing and physician staff is unusually high, and there is a very strong ethic of wanting to do the right thing for the community. The CEO of the hospital, Mike Green, is very gifted and forward thinking, and so is his leadership team. Mike and others decided several years ago to bring more-sophisticated services to Concord. Patients, at that time, were leaving the community for treatment for complex conditions, such as cardiac care or cancer treatment. He wanted to expand the services that could be offered locally.

He started out by setting a multi-year plan and began by strengthening the cardiac program. A major part of that was the creation of an open-heart surgery unit that was developed through a partnership between Concord Hospital and Dartmouth Medical School. Dartmouth has an extraordinary reputation nationally for quality. The cardiac surgery program came together under the direction of Dr. Steven Plume, who at the time was the president of the Dartmouth-Hitchcock Clinic. Dr. Plume wanted to bring the best of Dartmouth to Concord.

I want to point out that the entire region of northern New England has the best outcomes in cardiac care of any region in the country; the only one that is equal to it is New York State. This was not always the case. About ten years ago, long before the creation of the Concord program, a collaborative quality improvement initiative was begun in northern New England that involved all the programs providing cardiac care in Maine, New Hampshire, Vermont, and northern Massachusetts. That group was called the Northern New England Cardiovascular Disease Study Group.

The doctors, nurses, and administrators in these different programs agreed to meet four times a year to discuss how they were doing in terms of caring for their patients. The teams throughout the area visited one another. They observed the care given in the operating room. They videotaped operations. They exchanged information. They agreed to use a standard database to measure outcomes and to share the information, although the information itself was utilized in a blind fashion. The information was simply being shared with the goal of improving quality across the region. During this time there have been dramatic reductions in deaths and complications from cardiac care. Now a little bit of that reduction has occurred as a national trend, but the region has surpassed that by a significant degree.

With this heritage of Dartmouth and the northern New England region in general, the Concord program was really an outstanding program right from the outset. I mention this because I am going to tell you about how it became even better.

Getting started at Concord Hospital

In the fall of 1999, we initiated a transformation effort in our program. We took a very good program, but one basically operating within a more traditional healthcare framework—with doctors doing their thing, nurses doing theirs, and so forth—and shifted the way it was being run. We initiated instead a much more collaborative care process, and made *collaborative rounds* the centerpiece.

Collaborative rounds

You may not stop to think about it but there are quite a number of professional disciplines that interact around the care of an open-heart surgery patient. In our program about sixteen different disciplines come together around our patients. Doctors are one discipline. Nurses are another. There are respiratory therapists, physical therapists, social workers, occupational therapists, spiritual care people, and on and on.

This extended team is really quite large, and the challenge of having this many people communicating effectively with each other and with patients and families is quite complex. In the traditional mode of operation caregivers interact with the patient and each other at various times during the course of the day. Team members communicate in many ways: Some may write a note in the patient's chart, some may make a telephone call, or page, or talk to other team members when they happen to see each other over the course of the day. Some healthcare providers might talk to the patient or family and say one thing, and others something else, and so forth. Despite good intentions, it's actually more a variably connected amalgamation of individual efforts rather than real teamwork.

We thought about this, and decided that we wanted to do better. We decided that we could improve how we functioned and communicated if we came together at *one* time instead of at different times across the course of the day. That proved to be very difficult at first but eventually we were able to get people to adjust their schedules so that we could do that, and we began something that we now call our "collaborative rounds process." It has five elements: (1) Interdisciplinary, with everyone present at the same time, (2) Patient and family included as part of the care team, (3) Respectful, open environment with flat hierarchy, (4) Consistent pattern of communications and decision making and (5) Specific attention to identifying "system glitches."

Advice from others

Once we got people used to meeting together each day, we began to work specifically on the precision and completeness of our information sharing process. We went outside our industry to Mr. Jeffrey Brown, an aviation safety expert, and others with expertise in team-based communications and said, "Help us. We have started this collaborative process, but we don't know quite what we are doing. Could you teach us how we can improve the way we exchange information?" We took a number of new ideas, modified them to fit our needs, and added them to what we were doing. With these insights, and with the entire team working together, we developed a communications protocol that is consistent with the best teachings in cognitive psychology and human factors research, yet is applicable directly to our work caring for patients.

Changes in patient care

We made other changes in the program as well, which at first might seem a little bit paradoxical. For example, we started doing less for our patients. We started monitoring patients less with invasive monitoring lines that are so often used after surgery. We started taking lines and tubes out of the patients sooner. We started getting breathing tubes out really early, as soon as the patient comes out of the operating room. We started really minimizing the number of medicines that we gave people.

Changes in patient care, continued

Broadly speaking, it's really a philosophical change from the way we grew up in heart care. The old idea was that the heart patients were the sickest patients in the hospital. We'd kind of say that the patients were *sick until proven well*. Now we think of them differently. We think of them as *well until proven sick*. We now say, "Fine, you had a little thing done to you, and that's great. But all your lines and tubes are out. Get out of bed. Let's walk around. Let's get you back to what you were doing before." It's a very different mindset.

Involving the team in clinical assessments

We began to stress the value of what we call "integrative clinical assessment" of our patients more than our traditional invasive measurement of how they are doing. I might ask the nurse, "What do you think about this patient?" and the nurse might say, "He looks sick to me," or "He actually looks pretty well, and when I think about it, he looks well because he's warm and he's pink and he's peeing and he's talking to me." We used to measure all this with our lines, and with all sorts of other things. Now we're asking the nurses and the doctors to put more emphasis on their integrative clinical skills, rather than on the measurements that break assessments down into "the pulmonary artery pressure is this, the central venous pressure is that, the cardiac index is this," and so forth. We have tried to step back a little bit and see the bigger picture. Not that the details aren't important. But the context is critically important, too. It is the overall picture that really matters, and that big picture is more than a collection of measurements. We began trying to do all that in this collaborative setting, and absolutely significantly, where we have the families and the patients together too. We are trying to build an understanding of how the patient is doing from these multiple perspectives.

Working on the environment for communication

We also tried a number of things to create an environment where people would feel safe and enfranchised enough to give their opinions, even even to express concerns or offer suggestions unrelated to their specific area of expertise. I'll give you an example of what I considered to be a true victory of this process. Just a few months ago a patient was complaining of some nausea and everybody on the care team had had a turn at presenting their view of how the patient was doing. Basically, nobody had picked up on the fact that the patient was complaining of nausea, and that the patient was still on some narcotic pain medication which actually causes nausea at times. Finally, at the very end of the rounds process, someone brought the problem out into the open. Past me, past everyone else, our spiritual caregiver finally said, "Well, I talked to the patient yesterday and I think her spirits are doing just great. But, by the way, don't you think we ought to stop giving her that Lortab because she's nauseated. Maybe we could put her on some Tylenol instead." This just thrilled me that our chaplain was willing to step forward and make a suggestion for a medication change.

Let me give you another example of how helpful the collaborative process can be. During rounds, a patient's wife mentioned that it was very hard for her to stop smoking. She wanted to stop, so that she wouldn't put her husband at risk. I had six

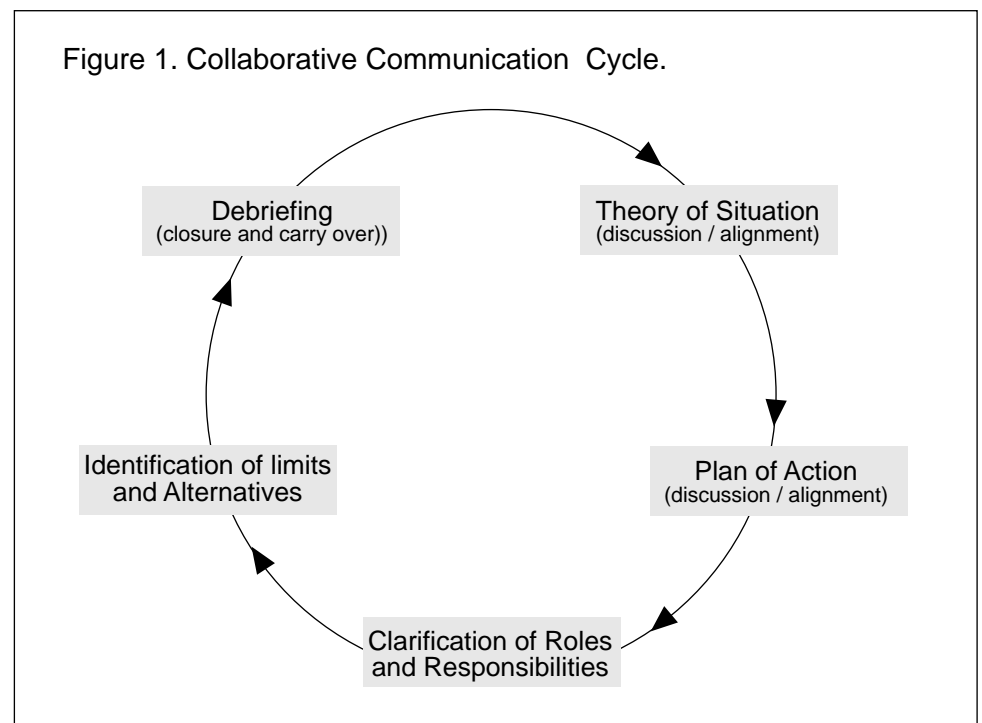
Working on the environment for communication, continued

or seven people on my care team giving her advice. They were talking with her about their experiences with patches, and with this and with that. It is just amazing when you look at a particular problem from all these different viewpoints. It is like a diamond with all its facets! We're trying to put all the facets together to see a whole picture, to step back far enough from the clinical situation on a regular basis to ensure that we're not lost in all the details, and develop a shared ability to grasp the bigger picture of it all.

The collaborative communications cycle

We call our communications process the "Collaborative Communications Cycle." I would like to describe it to you. First, let me set the stage. We are at the bedside of a patient who, a day or so ago, had open heart surgery. The whole care team has come together. Usually it's about a minimum of eight and a maximum of about twenty people. We just gather around the patient's bed. We have the family, the patient, and all of the health care staff present. All are part of the care team. It's interdisciplinary. We view the patient and family as essential members of our team.

Achieving excellent communication is really the center point of the whole process. This requires a consistent pattern of communication and decision making. It's a pattern of information exchange that everybody has now become comfortable with, and it pretty much guarantees that everybody will be involved. We don't miss very much anymore. We work very hard to make this a respectful, open environment, with as much of a flat hierarchy as is reasonable. Although the surgeon is ultimately in charge of the process, we actually step back and let our nurse practitioner be the one who convenes the cycle and moves it along. I envision myself more as a CEO of a wonderful corporation with outstanding executive vice-presidents rather than as a sole-proprietor (see Figure 1).



The collaborative communications cycle, continued

We start the process by developing what we call “the theory of situation,” a term borrowed from aviation safety. At the “theory of situation” stage we sum up just what we believe the situation is, where we think we are with a patient. Somebody proposes a theory of the situation and then everyone else contributes to confirm or modify that initial suggestion. If we were in an airliner, a crewmember might say, “Well, I think we’re twenty miles outside of Boston and that we can start down now,” and somebody else might say, “I think we’re actually twenty-five miles outside of Boston and there’s a big tower that’s between us and where we want to be.” The captain might respond with, “I’m glad you mentioned that. Let’s just double check where we are.”

We might ask somebody like Addie, the social worker, or Judy in Spiritual Care, or Lynn, from respiratory therapy, “Could you tell us how you think this patient is doing?” And so somebody will offer that and then we ask, “Does everybody agree with that? Does anybody have any other thoughts about it?” Then we’ll take an active period of time to just be quiet and let ideas come out. We even ask questions like, “What are we missing?” or “Does everybody agree?” We’ll ask the family questions. We’ll especially ask the patient, “Do you agree with that? Do you actually feel that way? Is there anything that you’re worried about? Is there anything that we haven’t mentioned here?”

When everybody’s in agreement we move on to the next step, developing a plan of action. In aviation a crewmember might say, “Given that we’re twenty-five miles from Boston and there is a tall tower just ahead, why don’t we stay at the present altitude for three more miles and then safely start down.” In medicine we might state it as, “Given that we are doing pretty well but we have these concerns, maybe we want to change that medicine.” Again, we open the conversation up for discussion, and we hope that somebody like Judy will say, “Maybe we ought to just stop that medicine.” Or maybe a family member will say, for example, “Well, you know, we tried that medicine a year ago and that didn’t work very well.” We might say, “Great, let’s not use that medicine.” And, so, we work with each other, and with the patient and family, to develop a plan of action that is a better plan than any one of us might have come up with alone.

Next we clarify roles and responsibilities. Often there isn’t a great need to say a lot about this because much of our work is role-based, but not infrequently there is some degree of cross over, and clarification is very helpful.

The next step we call “identification of limits and alternatives.” We decide together what we expect will happen, what is acceptable and what is not, and what we will do if things don’t happen as we would like. There is much less ambiguity. Together we devise alternate plans that can be put in motion if needed.

Finally, we summarize and double check what we have decided. We end by summarizing: “Ok, we’re going to do this and this and this and this. Addie’s going to do this and this. We’ll reconvene tomorrow. “Everybody agree? O.K., great. Mr. Smith, do you agree? Any concerns that you have? O.K., fine.” Then we go on to the next patient.

The next day when we come back we begin where we left off. The person who

The collaborative communications cycle, continued

summarized the day before will say, “Mr. Smith, good morning. I’m going to review for you what we planned yesterday. Yesterday you still had your chest tubes in. We were going to take those out. It looks like that has been done. How did that go? We were going to get you up and get you to the shower. Did you get your shower? That’s great.” The talk will go on about a number of concerns. This discussion will form the beginning of a new theory of situation, and then the cycle gets under way, and repeats each day.

Very importantly, we also interrupt this process and talk about actively catching errors, right on the spot. As problems surface, and of course they do, we use them as a lens to look at root causes more deeply within our system. We try to recognize and take note of problems when they occur so we can address them specifically later at a system level. We call these problems “system glitches.” The word “glitch” is very effective for us. It is a very easily understood, non-threatening name that allows people to focus on issues without becoming defensive.

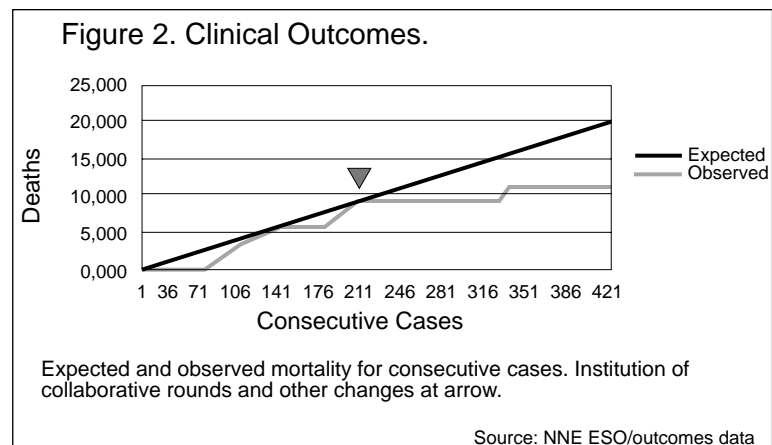
System Rounds

The other thing that I want to mention is that we also try to get the same group of people together one afternoon a week for what we call “system rounds.” We call the collaborative morning efforts the “morning rounds,” which are really “patients rounds.” But one day a week we sit down and make our collaborative system itself the patient. We probe it. We think about it. We talk about what we are doing and what we could do differently. A lot of our positive work is comes out of these weekly conversations.

Results

Early in our work we developed a set of quality indicators that we wanted to measure and track in our program. The dimensions of quality we follow are: clinical outcomes; patient/family satisfaction; and quality of work life.

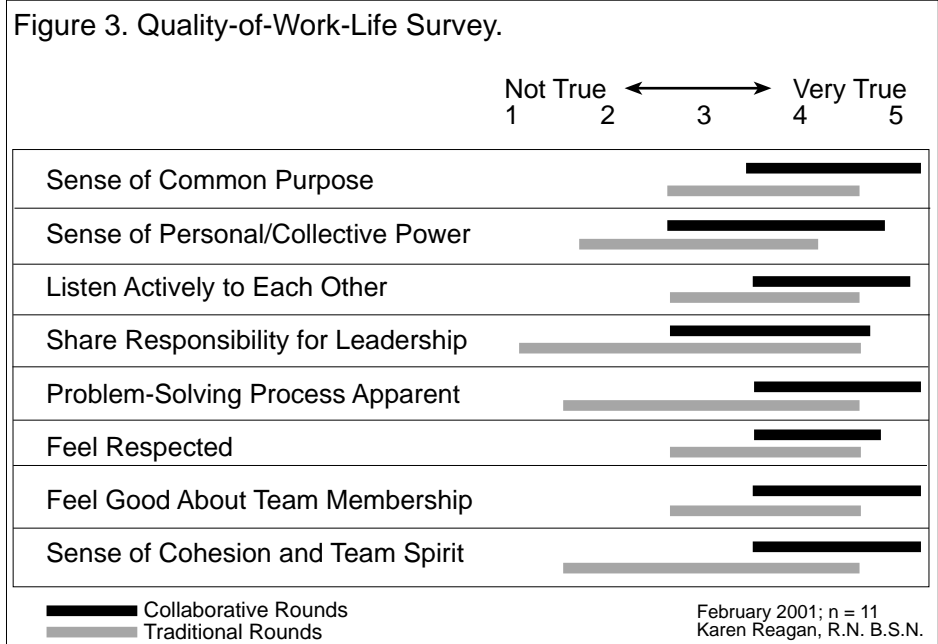
We measure our clinical outcomes by participating in a shared outcomes database with all other open heart programs in northern New England. This database includes a statistical risk-prediction model that permits us to compare actual clinical outcomes to those predicted for the region for our particular patient population. The results of this comparison are shown in Figure 2 for consecutive patients since the program began. At the arrow, the changes described in this paper were instituted. A significant and sustained reduction in mortality has been observed.



Results, continued

We measure patient/family satisfaction using a nationally standardized patient survey (Press, Ganey, and associates). Traditionally, the happiest patients in the Concord Hospital have been mothers having babies. Now, however, the happiest patients in our hospital, happier than mothers having babies, are the open heart patients. Our patient satisfaction outcomes have also been recognized nationally as outstanding.

In February, 2001, we conducted a quality of work life survey of team members comparing the “collaborative rounds” process with traditional rounds. We found improvements in all eight categories (see Figure 3).



We are also beginning to receive outside recognition of this work. In the most recent site visit to the Concord Hospital by the Joint Commission on the Accreditation of Healthcare Organizations, the collaborative rounds model received commendation as a national best-practice model.

Conclusion: The concept of relational synergy

It's unlikely that we will ever have better individual doctors, nurses, or administrators, because they are excellent already. Yet, to meet the needs of patients and society our healthcare system must become remarkably more effective and efficient.

We have, fundamentally, an *individual* healthcare system now. People are immersed in old organizational structures and work patterns that do not facilitate their communication and interaction. The Concord experience shows that something more is possible.

The Concord cardiac program is a special environment for taking patient care to new levels, a living laboratory for innovations in patient care, dedicated to finding new ways for practitioners, patients, and families to work together safely, harmoniously, and effectively. It is a prototype of a new model of collaborative practice that produces “relational synergy,” Relational synergy is what happens when parts of a

Conclusion: The concept of relational synergy, continued

system are woven together in new ways, producing resources where there were apparently none before. It is where “the rabbit comes out of the hat.”

I'll give you a very brief, final example of relational synergy. In my former community of Wichita, Kansas, a group of practitioners decided that we could do a better job of caring for the uninsured in our community. We learned of Project Access, a program being used in Asheville, North Carolina, and we brought it back to our community and implemented it there. Now in every community in this country, right now, there are doctors who are caring for uninsured people. There are hospitals giving away care to uninsured people. There are all these parts of the picture then, and every part is trying hard, but none of it is woven together effectively.

Project Access brought together all the parts of the healthcare system. The project linked all the functioning subgroups together so that if a patient needed doctor care, or hospital care, or pharmacy care, or whatever else, he or she could get all of that together. The effect has been that over \$10 million worth of care in the last year and a half has been given to the uninsured in that community, even though healthcare professionals are doing no more than they already were doing.

Just a small amount of organization, superimposed on work already being done, made something out of apparently nothing. Just as in the Concord experience, Project Access took a pattern of isolated parts and related them functionally, and through this made a system that works in a dramatically better fashion. I think that is what we have to be thinking about and looking for in health care.

Author information

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Dr. Uhlig received his M.D. degree from the University of Kansas School of Medicine, where he received the Thomas G. Orr award as outstanding student in surgery. He completed his residency training in general surgery and general thoracic surgery at the Massachusetts General Hospital and in cardiothoracic surgery at Indiana University. He was also a research fellow in cardiovascular physiology at the Cardiovascular Research Institute at the University of California, San Francisco. Dr. Uhlig maintains an academic affiliation with the University of Kansas School of Medicine–Wichita as adjunct associate clinical professor of preventive medicine.

For the academic year 1996–1997 Dr. Uhlig was the Thoracic Surgery Foundation Alley Sheridan Scholar-in-Residence at Harvard University's John F. Kennedy School of Government, where he studied U.S. health care policy. Dr. Uhlig received the degree of Master in Public Administration from Harvard in June, 1997. He is presently co-chair of the national health policy committee of the Society of Thoracic Surgeons, and was the lead author of the Society's recommendations for Medicare reform presented before the National Bipartisan Committee on the Future of Medicare.

Dr. Uhlig's professional interests concern transformational change in health care, information transfer in healthcare environments, and collaborative leadership. Dr. Uhlig's present academic work concerns the establishment and study of collaborative environments for innovation and transformational change in healthcare institutions. Prior to joining the Dartmouth faculty, Dr. Uhlig practiced cardiothoracic surgery in Wichita, Kansas, and was the founding president of the Central Plains Regional Health Care Foundation. In February, 2000 Dr. Uhlig and Mr. Patrick Hanrahan of Wichita, Kansas, received the Mary M. Gates award of the United Way of America for their work with Project Access, a community-based program of care for the uninsured.

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