ALL: CHRIS MILLIMAN

Before coming to Dartmouth, Paul Batalden practiced pediatrics and was an assistant surgeon general in Washington, D.C.

In September of 1955, President Dwight Eisenhower suffered a heart attack. His treatment—the best available at the time—consisted of bed rest, stress reduction, weight control, a low-cholesterol diet, an anti-clotting drug, and a gradual reintroduction of exercise. If a president were to suffer a similar attack today, he would almost certainly receive new cardiovascular plumbing—either catheterization and insertion of a stent (which Vice President Dick Cheney had in 2000) or bypass surgery (which former President Bill Clinton had in 2004). The main difference between the two eras can be summed up in a single word: technology.

Technological advances in cardiovascular care, and nearly every other branch of medicine, have extended countless lives. But those advances have also produced a health-care system that many individuals—and the nation—are having a harder and harder time affording. For example, the cost of catheterization and a stent ($40,200 at DHMC) or bypass surgery ($67,450 at DHMC) could well bankrupt someone without health insurance. Eisenhower's treatment, however, wouldn't have ruined anyone financially.

Health-care spending in the United States—now closing in on 15% of the gross domestic product—continues to boom, and there seems to be no end in sight. But why? The answer lies, in part, in human ingenuity, according to Paul Batalden, M.D., a Dartmouth faculty member who has sought to transform medicine's bloated cost structure for decades.

"If you have the problem of human disease and add to that an engine of scientific creativity and smart researchers, you have a formula for unending spiraling costs," says Batalden, director of health-care improvement leadership development at Dartmouth Medical School. "So we're going to have this problem from this time forward."

But Batalden is not fatalistic about the future of health care, nor is he paralyzed by the seemingly insurmountable task of controlling health-care costs. He believes he's found a way to reduce costs while improving quality and efficiency. His strategy lies in a concept known as the clinical microsystem. Slowly, clinic by clinic, hospital by hospital, the evidence is growing that the microsystem model may be able to cure American health care.

What system?

By Doug McInnis

A clinical microsystem is a fancy term for a relatively simple concept. A microsystem is a frontline unit, the place where patients and care teams meet—such as an outpatient orthopaedic clinic, an operating room, or a chemotherapy infusion suite. It is a group of interdependent people who come together for a common aim. The patient is at the center of any microsystem, but a given patient is not fixed within a single microsystem.

At first glance, it may be difficult to see how such a simple concept could revolutionize health care, but one needn't look any further than the intensive care nursery at DHMC.

In 1992, Batalden's colleague Eugene Nelson, D.Sc., M.P.H.—the director of quality education, measurement, and research at DHMC—met with neonatologist William Edwards, M.D.—the director of DHMC's intensive care nursery (ICN). They sat down to discuss Edwards's vision for the unit. Edwards wanted DHMC's ICN to be the best in the world—not to claim bragging rights, but to provide the best care possible. That meeting was, in effect, a tipping point, setting in motion an ongoing quest for excellence in the ICN.

Shortly thereafter, Edwards formed an interdisciplinary team of about seven ICN staff members. The team met regularly for six months to think through their mission and goals. They identified critical clinical outcomes for their tiny patients—

No one ever sat down and designed the U.S. health-care "system." It simply evolved, in bits and pieces. As it now threatens to crack under its own weight, a DMS faculty member is a leading proponent of the need to stop tinkering and rethink things—from a "microsystem" perspective.

Doug McInnis is a freelance writer based in Casper, Wyo., who specializes in science, agriculture, and business. His work has appeared in publications ranging from the New York Times, *to the* Corn and Soybean Digest, *to the alumni magazine of Oberlin College, his alma mater. He wrote about global health for the Spring 2005 issue of* Dartmouth Medicine *magazine.*

From 1994 to 1997, using the microsystem approach, the intensive care nursery reduced its hospital-acquired infection rate by about 70% and decreased the mean number of days that infants needed mechanical ventilation.

such as whether an infant developed infections, hemorrhages, or various kinds of impairment—as well as the primary drivers of costs both for patients' families and for the ICN. The team then identified changes that had a strong potential to create better outcomes.

The first change they focused on was reducing noise levels in the ICN. Research suggested that noise can affect the physiology of low-birthweight babies and even cause serious damage. Batalden, Nelson, Edwards, and others wrote about this initiative in the November 2003 *Journal on Quality and Safety* of the Joint Commission on Accreditation of Healthcare Organizations (JCAHO): "The next steps involved assessing the sources of loud noises (people and equipment), gathering baseline data on noise levels, and planning tests of change using the scientific method . . . The first set of changes focused on noise produced by staff, family, and visitors." Using a clever twist on a standard phrase—"Quiet Pleases"—the team posted signs throughout the unit. "The second set of changes targeted equipment noise produced by myriad alarms—'buzzers, bells, and whistles'—that were constantly erupting to signal possible danger."

The team's efforts proved successful. Before the changes, noise in the ICN exceeded 60 decibels (about the volume of a normal conversation) 55% of the time. Afterward, noise exceeded 60 decibels only 33% of the time. Even more powerful than the noise reduction was the fact that the project gave everyone in the ICN—physicians, nurses, nursing assistants, and administrative staff—a chance to work together and learn the principles of microsystem quality improvement.

"It generated a visible, short-term 'win,'" Batalden and his colleagues wrote in the JCAHO journal. In addition, this initial project reinforced understanding within the unit of how to achieve improvement, reinforced the importance of using data and the scientific method in the process of doing so, and, perhaps most importantly, "fostered respectful interdependence and shared leadership patterns, all of which built a solid foundation for continuing on the path toward excellence and transformation." That foundation was a launching pad for even more dramatic changes.

From 1994 to 1997, the ICN used the microsystem approach to improve discharge planning, management of apnea and related conditions, and infants' transition to oral feeding. They also focused on reducing unnecessary diagnostic tests and changing antibiotic prescribing patterns. All told, the changes led to a recurring savings of $1.3 million per year for patients and insurers and a measurable drop in the average length of stay. But these changes weren't just about cost-cutting. During the same time period, the DHMC nursery reduced its hospital-acquired infection rate by about 70%; decreased the mean number of days that infants needed mechanical ventilation; and, as part of a collaboration with 10 other ICNs, increased family involvement by including parents in daily rounds and making them members of the care team.

Most recently, DHMC's ICN has applied the microsystem approach to reducing intravenous-related bloodstream infections in babies who weigh less than three pounds or were born more than 10 weeks early. Previously, the average period without such an infection had been 10 to 15 days. A few months into the project, the ICN experienced infection-free runs of 30 to 40 days. And between May 2005 and mid-December 2005, the nursery went more than 200 consecutive days without a single infection in target babies. "Our results have far exceeded my expectations," Edwards said recently. (For more on this and other infection-reduction efforts at DHMC, see page 18 in this issue.)

As illustrated by the ICN example, a microsystem approach to improvement requires the involvement and investment of all frontline players, including patients and families. It also requires observation, data collection, intervention, measurement, and analysis.

The ICN is not the only unit at DHMC that has used the microsystem approach to create change. Others include the Comprehensive Breast Program—which coordinates all aspects of breast cancer diagnosis, treatment, and support for patients; and the Spine Center—internationally known for its approach to back care, in which the biases of surgeons and other specialists are removed from the decision-making process.

J. Brian Quinn, an emeritus professor at Dartmouth's Amos Tuck School of Business Administration, wrote an essay about his care at DHMC's Spine Center for Dartmouth Medicine's Fall 2000 issue. When he began to have back pain, he said, "Everyone has advice. . . . I do it all. But nevertheless—slowly but inexorably—the pain gets worse. Advice and results conflict more and more. I am confused. Can't sit, can't walk, can't see any way through the pain.

"Then comes the Spine Center," he continued. Founded in 1998, it was designed from the ground up as a microsystem. "It is a health-delivery innovation that has given me back my active life," wrote Quinn. "At its heart are people—an orthopaedist, a neurosurgeon, an anesthesiologist, and a physical

therapist. All are very human and friendly. They focus on me, on my problem, not on their particular skill and how to sell it. All look at the same MRI, the same history, the same charts, simultaneously. They exchange views, give me confidence." Quinn concluded by calling Dartmouth's Spine Center "a true jewel."

As it happens, although Quinn wrote that essay from the perspective of a patient, not an academic, the concept he benefited from in 2000 had its origins in his own scholarly work.

"The inspiration for microsystem thinking," says Gene Nelson, who worked with Batalden at the Hospital Corporation of America before both came to Dartmouth, "was in 1992 when Brian Quinn wrote the book *Intelligent Enterprise*." Quinn, who is also a longtime DHMC Trustee, "was studying the best service organizations in the world," continues Nelson, such as Federal Express and Sony. "What he discovered was that these [corporations] were fanatical about figuring out when their customer comes in contact with their organization [and] what happens to create value for that customer."

Nelson, Batalden, and Donald Berwick, M.D.—who at that time, with Batalden's help, was starting the Institute for Healthcare Improvement in Cambridge, Mass.—realized they could apply many of the innovations taking place in industry to health care. All three had worked on various quality improvement efforts throughout their careers.

Batalden had served in Washington, D.C., as assistant surgeon general and director of the Bureau of Community Health Services from 1972 to 1975. He was also influenced in the 1980s by the guru of quality improvement, W. Edwards Deming. By then in practice as a pediatrician, Batalden read of Deming's work in transforming manufacturing companies and signed up for one of his seminars. Batalden found himself in a smoke-filled room where Deming was talking about ball bearings. "It was awful," Batalden remembers thinking at first. "But then I realized he was not really talking about ball bearings. He was talking about a theory of work, a theory of the workplace, a theory of workers, and a theory that linked all of that to the people who benefited from the work."

For years, American industrialists had ignored Deming while he helped the Japanese make astounding leaps in quality and productivity. But in the 1980s, Ford Motor Company—losing money for the first time in its history—asked for his help in turning the company around. One result of that collaboration was the revolutionary Ford Taurus. Deming prodded Ford to focus on making the new car well, while seeking manufacturing efficiencies that wouldn't cheapen the product. The company

Batalden, pictured at DHMC, has been influenced by W. Edwards Deming and a Dartmouth management theorist.

offered special training to thousands of white-collar and production workers. It bought top-quality cars from competitors, took them apart, and tried to figure out how to improve on their best features. Ford also worked closely with 5,000 outside companies that would supply parts for the Taurus.

And Ford made two clean breaks with tradition. Instead of picking suppliers that offered the lowest cost, the company made its choices based on quality. Ford also built prototypes of the Taurus for potential buyers to test so the kinks could be fixed before the first commercial models rolled off assembly lines. Typically, the American auto industry had resolved problems after the first batch of owners discovered them.

To gain maximum production efficiency, the company asked its assembly and parts plants to suggest better ways to build the new car. Ford amassed 1,400 ideas and used 550 of them. The Taurus came in $400 million under budget, eventually replaced the Honda Accord as the best-selling car in America, and boosted Ford's bottom line.

Ford's strategy involved an unhurried reexamination of every step involved in building a new car. The clinical microsystems approach employs a similar strategy, but in the health-care setting.

When Batalden and Nelson came to Dartmouth Medical School in the mid-1990s, their emerging

"The inspiration for microsystem thinking was in 1992 when Brian Quinn wrote the book *Intelligent Enterprise*." Quinn, an emeritus professor at Dartmouth's business school, "was studying the best service organizations in the world," such as Federal Express and Sony.

"If we keep doing what we have been doing," Batalden says, "we'll keep getting what we've always gotten"—an expensive, high-tech, inefficient health-care system. "The health-care system needs to be redesigned."

ideas on microsystems gained traction. Since then, Batalden has spearheaded the implementation of the microsystem approach in numerous units at DHMC, as well as in health-care systems throughout the United States and abroad. Among the organizations now using the microsystem approach are Geisinger Health System in Pennsylvania, the University of California at Davis, the Cystic Fibrosis Foundation, and the Vermont Oxford Network (a collaborative of intensive care nurseries), plus organizations throughout Europe.

Most recently, the American Hospital Association (AHA) asked Batalden, Nelson, and Marjorie Godfrey, M.S., R.N., director of clinical practice improvement at DHMC, to coauthor a guide to microsystems thinking for other health-care organizations. In December 2005, *Clinical Microsystems: A Path to Healthcare Excellence* was officially released (see pages 34 and 35 for details about the guide). This "toolkit," as Godfrey and Nelson call it, has been well received. "The phone is ringing off the hook," says Godfrey.

"Now your first reaction is likely to be, 'Oh, no, not another management fad,'" says Batalden in a video that's part of the toolkit. "But wait a minute," he continues, "clinical microsystems already exist within . . . hospital[s]. . . . What our research team at Dartmouth has focused on is how to make each frontline system achieve its best performance and how to link these units such that the entire hospital becomes a high-performing organization."

Batalden hopes that, hospital by hospital, the clinical microsystem approach may be able to transform American health care from the dysfunctional and expensive "system" it is today into an efficient and high-quality system. He is fond of the saying "Every system is perfectly designed to get the results it gets."

"If we keep doing what we have been doing," he says, "we'll keep getting what we've always gotten"—an expensive, high-tech, inefficient health-care system. "The definition of lunacy," he adds, "is to keep doing what you've always done and expect different results. The health-care system needs to be redesigned. There is no choice but to redesign, because people are working hard—they're working as hard as they know how—and it's not working."

The United States spends more on health care per person then any other country in the world. According to a 2005 report from the World Health Organization, U.S. health-care spending is 14.6% of the country's gross domestic product (GDP). No other country comes close to that figure. In Canada, for instance, health-care spending is only 9.6% of the country's GDP; it's 9.7% in France, 10.9% in Germany, 9.2% in Sweden, and 11.2% in Switzerland.

Yet the U.S. ranks behind most of Western Europe in key health measures, such as infant mortality and life expectancy. In a 2000 report, the World Health Organization ranked the American health-care system 37th in the world in overall performance. Perhaps most surprising, given that the United States does not have a nationalized system, is the fact that health-care spending makes up 23% of this country's government expenditures—a much higher percentage than in most European countries that do offer universal health care.

"The medical system is kind of like a deer in the headlights," says Susan Dentzer, a 1977 Dartmouth College alumna who tracks health-care spending as the health correspondent for the PBS *NewsHour with Jim Lehrer*. "Nobody can quite figure out what to do about it.

"In many industries," she adds, "technology decreases costs. It's just the opposite in health care."

That's a key difference between health care and the industries with which Deming worked. A recent series of articles in the *New York Times* illustrated the problem. The *Times* focused on four diabetes prevention and treatment centers that opened in the late 1990s at New York hospitals. Seven years later, three of them had closed and the number of New Yorkers with preventable type II diabetes had nearly doubled.

"They did not shut down because they had failed their patients," the *Times* explained. "They closed because they had failed to make money. They were victims of the byzantine world of American health care, in which the real profit is made not by controlling chronic diseases like diabetes, but by treating their many complications. Insurers, for example, will often refuse to pay $150 for a diabetic to see a podiatrist, who can help prevent foot ailments associated with the disease. Nearly all of them, though, cover amputations, which typically cost more than $30,000."

The problem exists to varying degrees in all specialties. "We had a visiting surgeon from Bosnia," Batalden recalls. "While he was here, he leaned over to me and under his breath, he asked, 'How can you spend so much money?' I said, 'It's easy. If you divide a problem into enough pieces and you charge by the piece, you can run up the cost.'

"For instance," Batalden continues, "we say, 'Go see so and so. He's the best at treating the left eyelid.' We get better and better at less and less. It's amazing how much knowledge you can get about some part of the body. But who's going to pay for this," he concludes, "is really a tricky issue."

Batalden, center—in collaboration with Marjorie Godfrey, left, and Eugene Nelson, right—developed the materials pictured on the table to help other organizations apply the microsystem concept. See page 34 for more on this "toolkit."

Employers, who historically have financed private insurance for their employees, are pulling back from that role more and more to remain competitive. "People who work in international markets are very concerned because the cost of health care is making American industries less competitive," says James Strickler, M.D., former cochair of the board of directors for the International Rescue Committee and former dean of DMS. "If they can't compete, they will shut down or move operations overseas, which means there will be fewer insured workers putting money into the health-care system."

A recent study by the Commonwealth Fund reported that the percentage of Americans making between $20,000 and $40,000 a year who lacked health insurance for part or all of the year was 41% in 2005—a dramatic jump from 28% in 2001.

"Many people of the liberal persuasion think we should provide good health care because it's the right thing to do," Strickler continues. "I believe that. But this isn't what influences the political system. What does influence it is hard, cold reality . . . that American business is increasingly compromised by its health-care costs."

Until recently, most efforts to "fix" U.S. health care have simply shifted costs somewhere else—to individuals, private insurers, employers, the government, or academic medical centers and other nonprofit hospitals—rather than trying to reduce the cost of the entire system. Batalden, his microsystems team, and their colleagues in Dartmouth's Center for the Evaluative Clinical Sciences (CECS) have shown repeatedly that spending more on care doesn't necessarily result in better care. Rather, systems that spend less on health care often have better outcomes and are more efficient than their high-spending counterparts. (This field of research was pioneered by CECS's director, John Wennberg, M.D., who recruited Batalden to Dartmouth.) Furthermore, improving quality and efficiency often results in cost savings, as demonstrated by the efforts in the Dartmouth ICN.

Neither Batalden nor any other reasonable health-policy expert expects to solve the cost problem by returning to the low-tech medicine of Eisenhower's era. But the unbridled use of costly technology hasn't worked either.

What's called for, Batalden and his colleagues argue, is a systemic approach—one that recognizes that the greatest power for change and improvement lies on the front lines, where patients and caregivers meet. "The microsystem is where health care is made," says Batalden. An organization "can't really do quality improvement," he says, unless it understands how patients and frontline providers interact and the way frontline processes work. "If you don't understand the way things work," he continues, "and you try to change them, you can follow any recipe, but it won't really be a sustainable change." Microsystems are "not something you install," he says. "Microsystems just are. The question is, how aware are you of them?"

What's needed, Batalden and his colleagues argue, is a systematic approach—one that recognizes that the greatest power for change lies on the front lines, where patients and caregivers meet. Microsystems are "not something you install," Batalden continues. "Microsystems just are."

The microsystem approach is also being applied in England, Sweden, France the Netherlands, Germany, Kosova, and elsewhere. The microsystems toolkit developed at Dartmouth has been translated into several languages.

The nuts and bolts of microsystems

For over a decade, Paul Batalden, M.D., and members of his quality improvement team —Eugene Nelson, D.Sc., M.P.H., and Marjorie Godfrey, M.S., R.N.—have been singing the praises of "clinical microsystems," the building blocks of every health-care system. About six months ago, they released a "toolkit" titled *Clinical Microsystems: A Path to Healthcare Excellence*. Intended to help others understand the microsystem concept, it was featured at the Institute for Healthcare Improvement's national forum in December 2005 in Orlando, Fla.

The toolkit includes a choice of a video or a DVD describing the characteristics of high-performing clinical microsystems; two workbooks, including an exercise to help users see health care through patients' eyes; and a tutorial on adapting the workbooks to individual microsystems.

Following is an edited transcript of interviews conducted by Dartmouth Medicine's associate editor, Laura Stephenson Carter, with Batalden, Nelson, and Godfrey. Batalden is the director of health-care improvement leadership development at DMS. Nelson is the director of quality education, measurement, and research at DHMC. And Godfrey is the director of clinical practice improvement at DHMC.

DM: Where did the microsystems idea come from?

Nelson: The spark was in 1992, when Brian Quinn [now an emeritus professor at Dartmouth's Tuck School of Business and a longtime DHMC Trustee] wrote the book *Intelligent Enterprise*. He discovered that the best service organizations in the world were focused on what was happening between the customer and the frontline service provider, such that customers get what they want and need. We realized how far away we are in health care from focusing attention on what happens to the patient.

Batalden: As I read that book, I wondered what the analogue was in health care. I thought back to my own practice as a pediatrician. Another pediatrician and I, a nurse practitioner, a nurse, and a secretary all worked in the same hallway. We had a group of patients that we shared. Bingo—there it was, a microsystem.

DM: What do you mean by a "microsystem"?

Godfrey: It's the place where patients, families, and care teams meet. It's frontline care, and it includes the support staff, processes, technology, and recurring patterns of information and behavior and results. The patient is central to every clinical microsystem.

DM: Why is it important to look at microsystems?

Batalden: What microsystems are about is understanding what you are trying to change or improve. You can't do quality improvement that's going to last unless you understand the work and how people interact.

DM: How do you know what a good microsystem is?

Nelson: We visited 20 of the best performing clinical microsystems in North America. We chose them by evaluating published results, award winners, and organizations that had done best in Institute for Healthcare Improvement (IHI) assessments; by talking to people in the know; and then by asking the selected organizations to identify their best microsystems. Some were inpatient units; some were ambulatory units; some were home health; some were nursing homes.

Then we observed what they did, what made each microsystem so good on quality, on efficiency, a place you'd like to work in. Our work was supported by a Robert Wood Johnson Foundation grant—$300,000 for three years—and after we did the work we published a nine-part series in the Joint Commission *Journal on Quality Improvement*. We learned a lot of lessons.

DM: What sort of lessons did you learn?

Nelson: That it was a blend of five things that made these units so great. First, they were very focused on the patient. Second, they were very focused on staff. The staff felt like they were important and that their work was valued, no matter if they were the newest hire, the most senior person, or the housekeeper. A third was excellent leadership. There were always two leaders—be it a nurse and a doctor, or a doctor and an administrator. The leaders reinforced the idea that patients were at the center and that staff contributions were valued.

Fourth was the emphasis on providing good care—on outcomes and on the processes that produce those outcomes. They were always trying to figure out how to get better results, because that's what delivered the health benefit to the patients. Fifth was innovative and/or easily usable informa-

tion technology, as well as effective communication—staff to staff, or staff to family or patient.

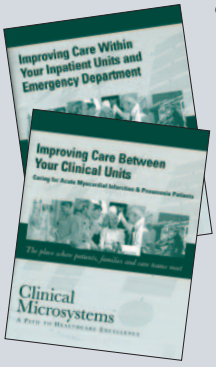
Godfrey: We also learned that every clinical microsystem is unique.

DM: Are there other theories of quality improvement?

Batalden: There are some who believe that what you need to do is to get the financial incentives right—that if you pay people correctly they will magically do the right thing.

DM: It doesn't sound like you agree with that approach.

Batalden: The incentive is extrinsic to the needs of production. You can believe if we put the financial incentives in place, then the magic will happen. Or if doctors write the correct order, the magic will happen. Or if we get the right people there, the magic will happen. What we're trying to do is deconstruct the magic, actually try to understand how people interact.



DM: And you feel this is more effective than a top-down approach?

Batalden: Well, the top down can make things happen. But you know how happy you'd be if you got precise instructions about how to write an article. You could do it, but it wouldn't be a source of joy. And the effects most likely wouldn't be sustainable.

DM: What are the high-performing microsystems at DHMC?

Godfrey: The Spine Center is one. Its creators came to our 10-week course at Dartmouth and learned how to create a high-performing microsystem. Another really good unit is the Intensive Care Nursery, which is part of a national collaborative using microsystems thinking. Plastic Surgery has been working for about two years using microsystems thinking. There's also the Comprehensive Breast Program and Dermatology.

DM: How did the toolkit come about?

Godfrey: The American Hospital Association (AHA) called us about 18 months ago and said, "We'd like to put a publication out with you. What do you think?" We developed it with the help of the Geisinger Health System, the AHA, the Institute for Healthcare Improvement, Premier, and VHA, Inc. It was exciting, and it also helped formalize our materials.

DM: Can you describe how the toolkit works?

Godfrey: It will help interdisciplinary frontline units assess themselves and identify the five Ps—purpose, patients, people, processes, and patterns. For instance, in assessing the third P, the people—the professionals—we consider questions like these: Do we know when they're available? Do we have mismatches in volume and need? Are there roles we haven't included? One group realized that most of their population was over 50 years old and had primarily musculoskeletal complaints. The fifth P is patterns, such as outcome patterns: What does our data show us as far as productivity or social patterns? How often does an interdisciplinary team talk about the process of care or safety?

DM: Can people order the toolkit and use it on their own?

Godfrey: Premier, VHA, and AHA are distributing these toolkits all over the country right now. Institutions can order them directly from us, too. We will also be offering orientations via web seminars and interactive videos, as well as opportunities for face-to-face learning.

DM: How long does it take for a particular unit to become a high-performing microsystem?

Godfrey: We usually find that it takes 18 to 24 months. By then the new ways of working have become habit.

DM: Where else is the microsystem approach being applied?

Godfrey: In England, Sweden, France, the Netherlands, Germany, Kosova, and elsewhere. The toolkit has been translated into several languages.

DM: How much interest has there been in the toolkit?

Godfrey: Our phones have been ringing off the hook since we introduced the toolkit in Orlando.

DM: Do you have any final words about microsystems?

Batalden: It's essential to have a basic understanding of how a given system works. If you don't understand the way things work and you try to change them, it won't be sustainable change.

Nelson: To create a high-performing organization, you have to have high-performing small systems within it.

For more information about microsystems and the toolkit, visit **http://www.clinicalmicrosystem.org/**. ■

It's essential to have a basic understanding of how a given system works. If you don't understand the way things work and you try to change them, it won't be sustainable change. . . . And to create a high-performing organization, you have to have high-performing small systems within it.