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DENVER HEALTH uses Lean methods to cut costs, improve care, and remain financially sound.

Lean and Healthy

"Healthcare is an information business," says Dr. Patricia Gabow, CEO of Denver Health, pictured with CIO Gregory Veltri.

A Model *for the Nation* By Jean Gogolin

Surgeons with Black Belts? Bar coding to make administering drugs safer? It's a good bet we won't see either of those on "House" or "Grey's Anatomy" TV shows next season. But in some real American hospitals, IT and the principles of Lean are effecting transformations that could help shape U.S. healthcare tomorrow.

One of them is Denver Health and Hospital Authority. A dozen years ago, staffers of what was then Denver General drove hard copies of medical records around the city in a car, the way many smaller U.S. hospitals still do. Since then, a major investment in IT and the adoption of Lean methodology have made Denver Health one of the most advanced, integrated, and admired healthcare systems in the country.

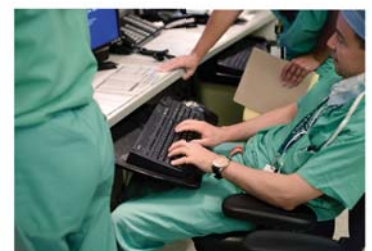


DENVER HEALTH'S IT environment supports a medical center, trauma center, 911 system, family health centers, and school clinics.

ACHIEVING A BROAD AND DEEP TRANSFORMATION

"Today, we've eliminated manual processes wherever possible and we use technology to streamline our operations," says CEO Dr. Patricia Gabow. "There is no healthcare facility in the nation that's done as broad and deep a transformation as ours."

A "safety-net" facility committed to serving patients of all economic levels, Denver Health comprises a medical center;



PHOTOGRAPHS BY KATHLEEN DOOHER



The IT system makes it nearly impossible for a patient to get the wrong medication.

a regional trauma center; a 911 system; family health centers; public school clinics; Denver Public Health, a poison and drug center; an inmate healthcare program; and the Rocky Mountain Center for Medical Response to Terrorism.

In 2008, more than 40 percent of Denver Health's care was provided to uninsured patients. The facility is also Colorado's largest Medicaid provider. Yet it remains financially solvent and fiscally sound, in part by automating the once manual process for capturing patient information and submitting claims so as to receive maximum reimbursement from insurers. Those funds, in turn, have enabled it to provide better care for more patients.

The system cost less than \$600,000 to implement and paid for itself in a month. Today it generates more than \$2 million a year that would previously been written off as uncollectible.

EXECUTING A THREE-PHASE PLAN

Over the last decade, Denver Health has invested more than \$350 million in technology. The investment was made in three phases, explains CIO Gregory Veltri: building a robust technology infrastructure, enhancing the center's financial performance, and implementing advanced clinical, data mining, and electronic health records.

"Our goal," says Veltri, "is to use IT not only to support the center's overall business objectives but to enhance the quality and safety of patient care." The center has implemented and integrated several hundred applications, 70 of which it considers "core": financial coding, claims "scrubbing," clinical support, and medical imaging. Because all the data collected flows into a common financial and clinical data warehouse and common results repositories, information is tightly integrated.

Fewer than 10 percent of the hospital's projects have failed to achieve their objectives, says Veltri, compared with an industry average of over 50 percent. Furthermore, projects that utilize Lean toolsets during implementations are completed 50 percent faster, with higher end-user satisfaction and about 35 percent lower cost.

Veltri attributes that success to strong support from hospital management and combining IT with the use of Lean processes and tools. "All of this was a journey," says Veltri. "Patty Gabow believes healthcare is an information business, and everything we've achieved reflects that belief."

EMULATING FEDEX AND THE RITZ

Dr. Gabow, a leading expert in polycystic kidney disease and a professor of medicine at the University of Colorado Denver School of Medicine, has been the prime mover behind the hospital's transformation. Surprisingly, she looked not to other hospital systems but to companies such as FedEx, Dell, and the Ritz-Carlton to develop her hospital's best practices: not just in technology but in delivery of care.

One result was the way the hospital now handles patient information. "Doctors and other healthcare providers need access to all of a patient's information," she says, "and they need it on the spot. Without it, they waste time and can make mistakes." So Denver Health has digitized patient records and installed PCs to access them wherever they're needed, from examining rooms, to clinics, to imaging centers, to operating rooms.

In parallel with its IT investment, Denver Health adopted Lean methods to become more efficient. For example, the hospital has optimized the time involved between giving pre-operative antibiotics and surgical "cut time" to only an hour. It has implemented a system for administering medications that involves using a bar code on a patient's armband, detailing his medications and the nurse caring for him, so it's nearly impossible for the patient to get the wrong medication. The same system helps prevent adverse drug interactions, allergic reactions, and overdosing.

MEASURING AND RECOGNIZING SUCCESS

Denver Health recently won a "Model Practice Award" from the National Association of County and City Health Officials for reporting tests and results for sexually transmitted disease, made possible by replacing a manual system with one that is fully automated and paperless. Automation cuts the time required to get reports to patients and county health officials from more than four days to less than one. The hospital is now expanding the application beyond the STD clinic to its TB and HIV/AIDS clinics.

The hospital's VAX TRAX application automates vaccine tracking so that the right vaccines get to their target populations, improving Denver area vaccination rates from about 60 percent of the population to more than 90 percent.

Integrating and managing its technology implementations has been a joint effort of Denver Health and EMC Consulting. The result is a degree of IT integration which, says Veltri, less than five percent of hospitals have achieved.

Achieving all this has not been without its challenges. Says Dr. Gabow, "There is so much waste in the way healthcare is delivered—typically 60 to 90 percent. We had to change that. The biggest challenge was creating the organizational structure to do everything we wanted to do concurrently. You can't just impose changes like these; they have to become simply the way you do the work."

Although initially there was some resistance to the new IT applications and Lean methodology, over time the staff has become enthusiastic about both.

"When people see the benefits of these systems, they quickly get on board and want more," says Veltri. "At this point, we're close to being completely electronic. But there's no end in sight for improvement."

The hospital has documented \$21 million in savings through its use of Lean tools and methodology. Although demonstrating the ROI on its investment in IT is more difficult statistically, Dr. Gabow is convinced it has been significant. "For instance, when you look at the specific things you're supposed to do for patients who come in with a heart attack, we're at 100 percent," she says. "When your systems mean patients stay less time, you can admit and care for more. And because we know immediately when patients miss taking their prescriptions because our pharmacy system is automated, we can take steps to find out why. There are hundreds of such examples.

"Our goals have been improving patient care quality and safety while at the same time increasing efficiency and cutting costs, and we're achieving those goals."

THE NUMBERS



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ADDRESSING A PROBLEM OF NATIONAL PROPORTIONS

Healthcare is the country's largest and among its fastest-growing industries¹, and care is so varied it will undoubtedly be among the most complex and difficult to reform. Today there are no generally accepted standards on what constitutes acceptable care for everyone. At one end of the spectrum are patients who pay up to \$25,000 a year to belong to concierge, or “boutique” medical practices; while at the other are those with no health insurance who depend on hospital emergency rooms or simply go without care.

Asked what changes she thinks should be made to the U.S. healthcare system, Dr. Gabow laughs and says, “Do you have all day? To begin with, we don't *have* a ‘system.’ To create one, we'd need to do three things:

“First, define a floor for care—what everyone gets—and a ceiling—what no one gets unless they pay for it, like routine full-body CT scans.

“Second, we need to clarify the payment problem. Get rid of the fee-for-service model and develop some standardized way to

bundle payments.

“Third, fix our delivery model to develop integrated models of care. We can add people and spend money, but we won't get affordable healthcare until we change the model.”

In the U.S., spending on healthcare exceeds 15 percent of Gross Domestic Product, outpacing spending for either housing or food. If spending continues to increase at its current rate, it will exceed 22 percent of GDP by 2020 and reach almost 30 percent of GDP by 2030². Healthcare also accounts for about one-quarter of total federal spending. So the stakes are high.

In June 2008, speaking before the Senate Finance Committee Health Reform Summit, Federal Reserve Chairman Ben Bernanke called individual hospitals' efforts to follow best practices and increase the use of information technology critical to improving the overall quality of healthcare³.

No one believes reforming healthcare in the U.S. will happen easily or quickly. But systems like those developed at Denver Health are helping to point the way. ■

1 www.leanhospitals.org. 2 Speech by Ben Bernanke to Senate Finance Committee Health Reform Summit, June 2008. 3 Ibid.