



Avera McKennan's new emergency department, designed using LEAN principles, features a medical staff core, which is separate from patient areas. Even on the busiest days, patients do not experience the hustle and bustle of emergency care.

LEAN PRINCIPLES PROVIDE OPPORTUNITIES FOR CATHOLIC HEALTH CARE ORGANIZATIONS

South Dakota Hospital Implements Techniques to Improve Patient Care and Reduce Costs



BY FRED SLUNECKA & DONNA FARRIS

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As costs escalate and insurance reimbursements lag, hospitals and patients alike are asking the same question: "Will health care be accessible and affordable in the future?"

For health care administrators, a moral imperative exists to do all that's within our power to ensure affordable health care for the future. One solution we can all pursue within our individual organizations is to streamline processes and eliminate waste.

As The Joint Commission relates, it has become common wisdom that an estimated 30 to 40 cents of every health care dollar is spent on waste — that is, on non value-added activities. While American industry has achieved a 3 percent productivity improvement every year since 1980, health care has lost productivity of 2 percent per year during that same period. No industry in the world can operate this way indefinitely.

We haven't done anything positive for patients if we perform a world-class surgery on him or her, yet send them home to bankruptcy. It's absolutely essential that we are efficient with our patients' resources while giving them a great result. We can do no less.

Avera McKennan has found a workable solution in implementing the techniques and principles of the Toyota Production System, known as LEAN. Since beginning LEAN projects in 2004, we've saved millions of dollars in construction costs, human resources and supply expense. We've taken a step further by helping other health care organizations realize the same successes through AveraOpEx, a collaboration with OpEx Inc., the consulting firm leading us through our LEAN implementations.

Although LEAN principles have their origin in manufacturing, unique opportunities for health care organizations exist today. American health care is under constant pressures in terms of reimbursement. Government and insurance companies want to pay us less, while, at the same time, patients are demanding more. The only way we can meet patient demands under increasing cost constraints is to make more efficient use of our resources. LEAN has given us the tools needed to handle reduced reimbursements, provide outstanding care and maintain a solid bottom line for the institution.

We've put LEAN principles to work throughout our hospital from our women's center, hospital nursing units and emergency department to the pharmacy, patient financial services and surgery.

LEAN is not a "project of the month" as hospitals are so prone to adopt. We have every intention of continuing these projects until LEAN is

embedded into our culture and becomes our way of doing business organization-wide.

A JOURNEY TOWARD EXCELLENCE

In the late 1990s, Avera McKennan began a journey toward operational excellence to become more competitive in a rapidly changing environment. Our first major push was in trying to adopt “best practices.” Soon, we learned that having hired consultants tell employees how to do their jobs gave them little if any motivation to change.

We resorted to educational sessions designed to bring Avera McKennan’s some 4,000 employees on board for improvement. They did indeed get on board, flooding us with 17,000 suggestions written on recipe cards. Although employees produced some great ideas, we had no way to operationalize them.

In 2004, things turned a corner when an interim director of our laboratory read a journal article about LEAN principles. We gave the go-ahead for our lab staff to pursue a LEAN project, and the results were tremendous. We embraced the concept after seeing lab turnaround time fall by 44 percent; annual lab labor costs drop by \$250,000; test accuracy soar from 3.8 to 5.3 Sigma; and space requirements shrink by 1,000 square feet. And so began Avera McKennan’s Process Excellence initiative to incorporate LEAN principles.

IMPLEMENTING LEAN

We implement LEAN on a department-by-department basis. After we identify a department ripe for improvement, we form a team comprised of front-line employees and Process Excellence staff. We take the steps necessary to free these employees for 10 to 16 weeks, so they can devote themselves completely to the LEAN project, rather than trying to fit it in during “down time,” which rarely exists.

Teams begin their work by gathering data. They videotape all processes within their department, and then analyze them minute by minute. The goal is to find value-added activity — that is, activities that provide care to the patient and are done correctly the first time. The team communicates daily with staff, and engages other employees in problem-solving sessions.

The LEAN team analysis may seem detailed, if not painstaking to some. Teams generate “spaghetti” maps which trace traffic patterns. When placed on a map, all these tracings can resemble a plate of spaghetti. Spaghetti maps in our emergency department revealed that nurses were going to three to four different supply areas, just to start an IV. In the women’s center, there

was little consistency as to where supplies were located in different rooms, often sending nurses on a search for the items they needed and taking them away from the patient’s bedside.

Teams create charts and graphs, noting what processes are done when, and how the work flow is balanced throughout the day. They count the number of steps that nurses or patient care technicians take. They note the number of seconds that callers are placed on hold. They document the amount of inventory in storage. These are just some examples; suffice it to say that no detail is left unexamined.

Teams also go through a 5-S initiative:

- sort
- set in order
- shine
- standardize
- sustain

When waste is identified, such as waiting, transporting or handling inventory, the team engages in problem-solving sessions with other employees to come up with a better way. Going back to our emergency room supply issue, rooms were set up on a universal basis with virtually all the supplies needed for the most common procedures available at nurses’ fingertips in bedside carts. A double-bin system ensures that they are never down to that last syringe. The same tactic was taken in the women’s center. The same supply systems with the items needed for the most common cares and procedures were placed in the same location in every room.

ABOUT AVERA MCKENNAN

Avera McKennan is an integrated delivery network that includes Avera McKennan & University Health Center in Sioux Falls, S.D., a 506-bed tertiary care facility employing 275 physicians with a total medical staff of 540. Within the city of Sioux Falls are 30 primary and specialty care clinics; the Avera Heart Hospital of South Dakota, a hospital dedicated to cardiac and vascular care; and the Avera Behavioral Health Center, a 110-bed inpatient facility. The Avera McKennan network also includes 14 community hospitals, clinics and other services in 50 communities throughout its three-state region. Avera McKennan is one of the nation’s 100 Top Hospitals named by Thomson in 2007, is recognized as a Magnet hospital for nursing excellence, and in 2007 received four Premier Quality Awards from Premier, Inc. — the first health care organization to win four awards in one year. Avera McKennan is a member of Avera Health, comprised of more than 200 care locations in 80 communities in five states. Visit www.averaopex.org for more information.

Teams may “try-storm” ideas – implementing them on a trial basis, and documenting results. “Try-storming” gives teams a concrete sense as to whether the idea that looks good on paper or sounds great in discussion actually works.

Using the information gathered through analysis and problem-solving sessions, the team then builds a best-practice document, detailing the sequence of steps and the timing of new processes, considering safety, quality and work station layout at every step. All employees are trained with this document, ensuring that processes are done the best way by every employee, every time. Documentation continues to keep departments accountable for meeting their goals to minimize errors and waste. This sets in motion a continuous improvement cycle.

GRASS ROOTS CHANGE

Alongside our Process Excellence initiative, Avera launched Service Excellence as a second major initiative to help boost patient satisfaction ratings that were lower than hoped for.

Because LEAN principles begin with the needs of the patient, LEAN created a bridge between Service and process. Not only do LEAN projects save money and improve quality, they increase patient satisfaction. Employees get behind LEAN projects because they see the end point – the patient.

Employees are involved in the change process at the grass-roots level. Through LEAN teams comprised of front-line staff, employees themselves actually design change, and thus own change. Placing the patient at the center, LEAN teams redesign processes utilizing the single best way. A higher level of patient safety is a vital benefit of a LEAN implementation. For example, the concept of standard work decreases opportunities for medication errors, infections or complications. Better ways to care for patients, and streamlining work to allow more time at the bedside are benefits that motivate employees, who entered the health care profession with the desire to help people.

The experience can be transforming and empowering for employees. For example, a member of our maintenance staff became part of LEAN teams to

LEAN ACHIEVES COST SAVINGS, IMPROVED SAFETY AND BETTER CARE

Although Avera McKennan’s laboratory was good with 98 percent accuracy, it is now extraordinary with an accuracy rate of 99.9 percent.

Thanks to our first LEAN project at Avera McKennan in 2004, our lab improved from 3.8 Sigma to 5.3 Sigma, and of course we continue striving to reach the 6 Sigma level.

Standard work is the LEAN principle having the greatest impact on this achievement, along with single-piece flow as opposed to batching.

Analysis found that our test flow was impeded by test batching and storage. We had multiple inspection steps, and a poor layout that required excess walking.

We implemented a new work-cell layout, placing 80 percent of our volume in an automated core. We cross-trained our machine operators. We implemented standard work for each test, as well as single-piece, first-in-first-out processing.

Along with an improved error rate, we improved our average turnaround time by 44 percent, shaving it from 62 minutes to 35.

Our lab staff continually keeps a close



Laboratory staff implemented single-piece, first-in, first-out processing. Average test turnaround time improved from 62 minutes to 35.

watch on error rates and turnaround time, and can guarantee when they will have results back to physicians.

Although we can track our successes with numbers, the greatest benefit is improved care. The bottom-line benefit to patients is enormous, because with faster turnaround time, they can begin healing treatment sooner. Also, we’ve improved physician satisfaction, and have gained an even higher level of trust, because

physicians know they can rely on the results of our lab – the first time.

Emergency Department Patient Scores Hit New Heights

Although LEAN principles saved \$1.25 million in construction costs for our new emergency department, better patient care is the accomplishment staff takes the most pride in. Emergency department (ED) patient satisfaction scores have climbed from averages in the 50th to 60th percentile to frequently hitting the 90th since our LEAN implementation.

We learned through our LEAN analysis that what ED patients really want is to see a physician as soon as possible, get the care they need, and go on with their lives. So we streamlined our process, allowing for an average “door-to-doctor” time of only about 20 minutes. Before LEAN, patients were in our emergency department for about 45 minutes before they saw a doctor. Our average length of stay from arrival to departure was trimmed by 29 percent to just around two hours.

Our new 20-room emergency department, completed in December 2007, was

move equipment and relocate wires as needed. The employee is now Leonardo da Vinci. He has designed some of the most innovative devices to improve efficiency.

Every new team comes up with better ways to provide care, improve patient satisfaction and save money. Dozens of people will surprise leaders with their hidden talents, while some employees thought to be among the best won't survive the journey because they're unable to accept change.

OVERCOMING ROADBLOCKS AND PITFALLS

When a department is identified for a LEAN project, there are certainly obstacles and challenges to overcome. Possibly the most difficult is employee morale. We faced this to a greater degree at the beginning, when LEAN was still an unknown. Employees feared that jobs might be cut. There was a lot of skepticism that LEAN could bring about true improvement. They were anxious that their hours or schedules might change. They feared that their input would no

longer be valued — that they would be expected to operate as “robots.”

We overcame such challenges by supporting and reassuring employees as much as we could, but also by standing firm against push-back. We had to make tough decisions and stand by them. We moved ahead with projects, hoping employees would catch the spirit of working toward positive change.

Through our employee assistance program, we make counseling and support available to LEAN team members as well as staff. Team members get additional training on topics such as communication skills or how to deal with difficult people.

Our job now is much easier, because LEAN successes speak for themselves. Employees in the emergency department, for example, are very positive about the changes LEAN brought about. When nurses talk to their peers about how LEAN makes their jobs easier and gives them more time to spend caring for patients, employees facing an upcoming LEAN project aren't as skeptical or fearful.

designed using LEAN principles, with the valued input of front-line staff.

When patients arrive, they are greeted immediately by a triage nurse who assesses their situation. Patients immediately are taken to one of our private care rooms where they are assessed by the attending nurse and ED physician simultaneously. Orders are entered as early as possible.

It's only after testing or treatment has begun that registration personnel go to the patient bedside to gather personal information and insurance documentation, during what previously had been wait time for patients.

Believe it or not, the inspiration for this design flow comes from a NASCAR pit crew. We want our patients to be surrounded by a flurry of care when they arrive at our ED just as the crew surrounds the race car when it enters the pit.

Rooms are set up on a universal basis, so patients don't have to wait for a suture room or an OB/GYN room to come available. Specialized carts are brought to the patient, rather than the patient being moved to a specialized room.

Because patients are in the ED for

shorter times, it became possible to reduce the number of patient rooms in Avera McKennan's new department from 24 to 20, saving significant construction costs.

Other LEAN Successes at Avera McKennan

- Surgical supply inventory was reduced by \$182,000 and 600 hours of nurse time annually was saved by eliminating end-of-shift surgical suite inventory.
- In ambulatory surgery, RN assessment time for patients was cut by 44 percent, from 45 minutes to 25 minutes. Streamlining the work station and patient room layout cut the number of steps RNs must take by 90 percent, from 260 to 27.
- In patient financial services, a reduction of eight accounts receivable days resulted in a one-time cash infusion of \$5.9 million, and annual savings of up to \$400,000.
- In our 2-West nursing unit, 91 percent of nursing supplies were placed at point of use in patient rooms. A flag system makes rounding easier, and helps nurs-

es anticipate patient needs, leading to less frequent calls.

- A clinic LEAN team reduced patient wait time, and improved privacy and confidentiality by shifting scheduling templates, and asking patients to self-room instead of waiting for a nurse call. Doctors now have the potential to see four to seven additional patients each day.

Targeted Areas for Future LEAN Projects

- **Materials Management:** where we'll evaluate the flow of supplies from the dock to point of use.
- **Nursing:** to implement standard work for 20 percent of the processes that represent 80 percent of the work.
- **Radiology:** to evaluate the patient experience and eliminate waiting time.
- **Pharmacy:** where a LEAN project will involve evaluating patient demand and scheduling.
- **Human Resources:** where we plan to evaluate the flow of information from position open to position filled.

The day-to-day demands of health care present another challenge. We simply could not wait until we had a “slow day” in the operating room. We could not let everyday emergencies and urgencies put LEAN on hold.

That’s why we made the commitment to allow front-line staff members to step away from their jobs to devote their full-time attention to a LEAN project. In addition, we had to take the necessary steps to ensure that departments were adequately staffed with replacements. The long-term benefits more than paid for temporary hardships.

COMMUNICATION AND SUPPORT

Institutional readiness is a key to LEAN success. Do employees recognize that there’s waste in health care, and that health care costs are too high? Do they know where your organization stands with patient satisfaction scores? Do they realize the need for change? Spending at least a year laying this important groundwork is well worth the time.

We planned educational sessions in which all employees learned about the ins and outs of the health care industry — including our financial challenges — with the help of creatively designed, interactive training tool-kits we call iCARE maps.

iCARE sessions continue on an ongoing basis for new employees who come on board. The goal is to help staff at all levels understand that eliminating waste is what will keep health care affordable for themselves, their families and their patients.

Another ongoing communication tactic is a

weekly update meeting — Excellence in Service and Process — where teams share and celebrate their latest achievements with administration and middle management. We find these sessions to be both cathartic and motivating, sending our LEAN teams out ready to tackle the tasks of the next week.

Because health care is so interactive, it’s important to create awareness across the board. What affects the lab affects nursing, what affects nursing affects housekeeping and so on.

Top leadership must be passionate about LEAN and behind it 100 percent, because as with any change initiative, there will be push-back. There will be those employees who try to sabotage you 24/7.

Change is challenging. If and when the drastic changes of LEAN turn our employees’ world on its ear, we must support them, but be uncompromising. In the end, we must make sure that what we’re doing is ultimately for the highest purpose, and that’s to ensure our health care is affordable for the people we serve.

We at Avera look toward the future with optimism, knowing that LEAN principles will allow us to remain financially sound while assuring extraordinary patient satisfaction and exceptional clinical outcomes. At Avera McKennan, we fully expect LEAN to differentiate us from other health care institutions in the country. ■



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The Avera McKennan laboratory is designed so that 80 percent of the volume is handled in an automated core.