

# Writing The New Playbook For U.S. Health Care: Lessons From Wisconsin

The U.S. government needs to reform the insurance payment system so that it rewards good medicine instead of waste.

by **John Toussaint**

**ABSTRACT:** U.S. taxpayers waste far too much money on health care that is merely average or worse. Some health care providers, including ThedaCare, a major Wisconsin health care company, are using the tools of lean manufacturing to eliminate millions of dollars of waste that obstructs the provision of effective medicine. ThedaCare studies care delivery processes to improve care and lower costs. Lessons from lean manufacturing and the Institute for Healthcare Improvement are lowering incidence of preterm births, improving heart attack response rates, and changing the way care is delivered in hospitals to a collaborative, team-based approach. [Health Aff (Millwood). 2009;28(5):1343-50; 10.1377/hlthaff.28.5.1343]

**A**T LAST HEALTH CARE IS AT THE TOP of the national political agenda, with proposed solutions including everything from universal insurance to systemwide electronic patient records. The attention is overdue. Some of the top-down solutions, however, threaten to saddle health care with more cost and waste than Americans can possibly afford.

For the past decade, my colleagues and I have been rethinking health care from the opposite direction, beginning at the patient's bedside. We have discovered parts that are broken both at the clinical level—in the haphazard nature of care, burdened by waste and inefficiency—and at the national policy level—where waste is rewarded while innovation is ignored or penalized.

At ThedaCare, a four-hospital health care system in northeastern Wisconsin, and elsewhere around the world, people are working hard to reduce waste and medical error and to improve quality using methods borrowed from lean manufacturing and the Toyota Production System. In three years ThedaCare has saved an amount equal to 5 percent of our annual revenue, while doubling our operating margin. In return for our efficiency, Medicare gives us about \$2,000 less per inpa-

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tient stay than it gives our competitors. Our inescapable conclusion is this: the U.S. system encourages inefficiency.

At this critical juncture, the government needs to do two things: reform the insurance payment system so that it rewards good medicine instead of waste, and help create transparency in medical quality measures so patients can truly have informed consent.

■ **The problem in numbers.** Most of us know the numbers. The United States spends 16 percent of its gross domestic product (GDP) on health care but, worldwide, ranks thirty-first in overall life expectancy.<sup>1</sup> Every year there are fifteen million instances of medical harm in this country,<sup>2</sup> including drug errors, infections, and wrong-side surgeries. Throughout the care delivery process, doctors, nurses, and technicians are hamstrung by outmoded, cobbled-together systems that encourage waste and do no favors to the most important figure in medicine: the patient. Yet this is the system that we are fighting to ensure everyone can access. Obviously, we need a new playbook.

■ **One solution.** Seven years ago ThedaCare was like other hospitals. Costs were spiraling out of control, and quality was not improving. We knew that change was necessary. ThedaCare's four hospitals—two acute care and two community facilities—and 5,300 employees make it the largest employer in northwest Wisconsin. With 20,868 patient admissions per year, we recognized that any real, systemic change would require the same concentrated attention as major surgery, every day.

We modeled our improvement plans on lean manufacturing and Toyota. In their seminal book, *The Machine That Changed the World*, based on a five-year Massachusetts Institute of Technology study on the failure of the U.S. auto industry, James Womack and colleagues laid out the core ideas of “lean”: learn to see waste in all its manifestations, eliminate it, create one-piece flow, and improve continuously.<sup>3</sup> Above all, make sure that every action and intention is focused on the needs of the customer.

To accomplish this at ThedaCare, we introduced small cross-functional teams that gather for one week to study a process, identify problems, and propose a solution to fix the process. This is called *kaizen*, from the Japanese characters meaning “continuous improvement.” At ThedaCare, there are typically five *kaizen* projects running every week.

■ **Results and further goals.** Working in *kaizen* teams, ThedaCare employees have increased productivity 12 percent since January 2006, saving the company more than \$27 million. ThedaCare has passed those savings along to patients and insurers. With a price increase rate that is half that of our nearest competitors, our costs are consistently the lowest in the state.<sup>4</sup> We have eliminated medication reconciliation errors in one pilot area, offer same-day appointments in every office and clinic, and deliver fewer preterm babies than before the *kaizen* projects.

The results have inspired bigger goals. Last year ThedaCare established the ThedaCare Center for Healthcare Value, a nonprofit group implementing public

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reporting of health care quality measures,<sup>5</sup> a learning collaborative for hospitals trying to reduce waste, and a public policy reform effort to support such work.

■ **Adding up the cost.** Every health care process, from angioplasty to delivering a baby, is a series of steps that consume time and resources. A large fraction of these steps—90–95 percent—create no apparent value for the patient, largely because of poor process design and rework. ThedaCare and other lean health care sites have proved that wasteful steps can be removed and that, with rigorous attention to process design, we can create better outcomes for patients, a better experience for staff, and much lower costs.

We have been removing 40–50 percent of wasted time and resources each time we redesign a care process or value stream. In 2002, for instance, our mortality rate for coronary bypass surgery was nearly 4 percent. After several *kaizen* projects in this area, typically removing 40 percent of the waste each time, mortality dropped to 1.4 percent in 2008 and has been 0 percent through six months of 2009. A patient’s average time spent in the hospital fell from 6.3 days to 4.9, and costs for a coronary bypass declined 22 percent.

It is estimated that the United States spends \$2.4 trillion on health care, a number that grows every year by 6.2 percent.<sup>6</sup> If we removed 40 percent of the waste throughout health care, we would save one trillion dollars.

■ **Lean around the world.** ThedaCare is not alone in adapting lean techniques to medicine. McLeod Health in Florence, South Carolina, for instance, has used such techniques to dramatically improve lab reporting times, cut the length of emergency department (ED) stays by an hour, and lower the error rate in sterile-surgical-instrument delivery by 50 percent.<sup>7</sup> Heart attack mortality rates dropped from 22 percent to 2 percent over two years, as a result of improvements in the cardiac care system.<sup>8</sup> And at Flinders Medical Centre in Adelaide, Australia, lean work techniques helped employees reduce the average time patients spent in a once-chaotic ED by 14 percent, while, overall, they were able to cut in half the number of adverse events reported to hospital insurers.<sup>9</sup>

## How Collaborative Care Is Organized

Using a Robert Wood Johnson Foundation grant administered by the Institute for Healthcare Improvement in 2007, we assigned a core team of nurses, pharmacists, administrators, and one physician to work for six months on redesigning the care process to enable nurses to spend more time at the bedside. We documented our baseline performance, removed steps that were wasteful and unnecessary, and created a process we call Collaborative Care. Then, we remodeled a hospital wing to install this radical redesign.

In our Collaborative Care wing, a nurse, physician, and pharmacist meet with the patient and family within ninety minutes of admission to develop a care plan. Everyone is involved. In Collaborative Care, the nurse “owns the care process” and is responsible for ensuring that quality criteria are met before the patient moves to the next phase of care. The nurse remains in contact with the doctor but does not wait for instruction. Often, it is the nurse who instructs the physician about a needed step or a critical time in the patient’s care.

These are new roles for nurses and physicians, not easily accepted. An organizational development team worked for months with staff, role-playing and working through the repercussions of nurses’ giving orders to doctors before real patients arrived. Extensive interviews after the pilot site had been operational for several months confirmed that even skeptical doctors reported that the nurses in Collaborative Care were better informed, better at thinking on their feet, and more helpful to the doctors overall than other nurses were.

Instead of a hierarchy and “heroic” firefighting, there are now daily huddles and reviews of standard work. Using PDSA (plan, do, study, act) cycles, a problem is identified, a plan is created to address it, and a new process of care is implemented. The process is measured or studied, and changes are made if it doesn’t achieve the desired results.

## Changes To Specific Care Processes

■ **Improved heart attack care.** Transforming care delivery for patients with acute myocardial infarction (AMI) offers an example of lean work at ThedaCare. “Door-to-balloon” time—the minutes between a heart attack patient’s entering a hospital and receiving a life-saving angioplasty—is recognized as a critical window. Seven years ago, when the American College of Cardiology (ACC) said that door-to-balloon should be 120 minutes, ThedaCare hit that mark 70 percent of the time.

In studying the process, we found that like most hospitals, we did not have a clear, standardized response to heart attacks. So *kaizen* teams examined the standard operating procedures. They created value-stream maps—recording every step and aspect of work, no matter how small—and studied our every move in response to heart attacks. In a condition where minutes make the difference between life and death, the *kaizen* team found a lot of delays.

For instance, after an ED doctor diagnosed a heart attack in progress, she would phone a cardiologist to come to the ED, reexamine the patient, and make an independent diagnosis before calling in the catheter team and booking a room for surgery. In lean philosophy, rework and waiting are waste. To eliminate the waste, we had to change the process. This meant convincing reluctant cardiologists that ED physicians could accurately diagnose heart attack. Despite concerns that catheter teams would be called unnecessarily, the cardiologists agreed to try the new way. In the past two years, there have been only two false-alarm diagnoses out of nearly 2,000 heart attack patients.

Meanwhile, ThedaCare's average door-to-balloon time is now thirty-seven minutes. We hit the new ACC guideline of ninety minutes 100 percent of the time. The standard work to evaluate and care for a suspected heart attack is posted in every room in the ED.

■ **Better newborn delivery.** Eliminating unnecessary steps in a process improves productivity, quality, and patient flow. To achieve this, *kaizen* teams focus on the patient, asking what the patient needs and what she is willing to pay for. Everything else is defined as waste.

Patients' input is also critical to providing lean care. After a new mother complained about care during her baby's delivery, we asked her to share her experience by becoming a member of a *kaizen* team studying neonatal care. We studied the neonatal care value stream—every step in delivering a baby, from the mother's admission to getting the new baby home—and identified 140 steps. Of these, only 5 percent were of value, at least in the opinion of the new mother. She would pay for medicine delivered to her baby, for instance, because she recognized the nurse's expertise with injections, but she would not pay for the nurse to go retrieve drugs from the nurses' station. Locked and stocked medicine cabinets installed in each room gave nurses an extra ten to thirty minutes per delivery that could be spent at the bedside.

After reviewing data for the neonatal value stream, the team realized that a surprising 35 percent of babies at ThedaCare facilities were delivered before the normal gestation time of thirty-nine weeks. Nationally, that number is 12.7 percent.<sup>10</sup> Why was the premature birth rate at ThedaCare nearly triple the national average? The team found that many delivery inductions were scheduled early, at times convenient to doctor or mother, without taking into account that babies are not supposed to be delivered that early.

Staff and doctors created a series of protocols that included the criteria of thirty-nine weeks' gestation before the patient could be admitted for induction.<sup>11</sup> Unblinded physician performance on induction was posted in the unit so that all doctors were aware of each other's performance. That led to 100 percent compliance within a month.<sup>12</sup>

Premature babies receiving expensive level II or III intensive care at ThedaCare remain in the neonatal intensive care unit an average of sixteen days instead of thirty. Babies are well enough to go home almost two weeks earlier because a team of people, looking to improve the process, saw the data and said, We can do better.

## Changing Physician Culture

The sea change required for true teamwork in health care begins with medical education. In a process that is still based on outmoded apprenticeship systems, young doctors are trained by individual specialists, who pass along their idiosyncrasies. Practitioners, trained to be autocratic in their decision making, tend to be more loyal to their specialty than to the team with whom they work every day. The

scientific method and careful systems of analysis may be used in research but are not often seen where medicine meets the patient. A lean system requires, however, creating standardized work to deliver repeatable, consistent performance.

In addition, health care suffers from a culture of “shame and blame.” Searching out the errant person instead of studying the process and identifying a root cause leads to low error reporting and unwillingness to be candid.<sup>13</sup> Changing any of this is not easy. ThedaCare considered the existing culture and opted for systemwide transformation instead of incremental progress.

## Team Results

Since Collaborative Care began with a pilot unit in 2007, we have cared for 2,400 people and recorded dramatic improvement in patient satisfaction, quality performance, and medication reconciliation (Exhibit 1). The cost of care in a Collaborative Care ward is 30 percent less than in a traditional ward. These data convinced ThedaCare board members to convert all hospital beds to Collaborative Care. This decision was projected to improve the buildings’ net present value by

### EXHIBIT 1 Results Achieved In ThedaCare’s Redesigned Inpatient Collaborative Care Unit

Measure	Pre-Collaborative Care	End of 2007	July 2008	Compared to non-Collaborative Care units
Defect-free admission medication reconciliation	1.05 defects per chart	0.01 defects per chart (99 percent decline from 2006)	0 defects	0.87 defects per chart, August 2007 through July 2008
Quality bundle compliance	38 percent pneumonia (2005 baseline); no baseline for CHF	100 percent pneumonia (163 percent increase over 2005); 92.5 percent CHF (two patients failed bundle during the year)	100 percent pneumonia; 85 percent CHF (3 patients failed)	84.67 percent pneumonia (all-or-none bundle score); 85.22 percent CHF (all-or-none bundle score)
Patient satisfaction	68 percent rated as top box	90 percent rated as top box (34 percent increase over 2006)	91.4 percent rated as top box	Not available
Length-of-stay (days) <sup>a</sup>	3.71	2.96 (20 percent decline from 2006)	3.14	4.05
Case-mix index <sup>a,b</sup>	1.08	1.12	1.10	1.15
Average cost per case <sup>a,c</sup>	\$5,669, fully loaded	\$4,467, fully loaded (21 percent decline from 2006)	\$4,911, fully loaded	\$7,273, fully loaded

**SOURCE:** ThedaCare.

**NOTES:** CHF is congestive heart failure. Fully loaded means that all direct and indirect costs of care are included in the total cost.

<sup>a</sup> Financial indicators represent a subset of the patients, to demonstrate the impact of the delivery model. Excluded from both baseline and pilot were the following: observation patients, intensive care unit (ICU) patients, and those with lengths-of-stay greater than fifteen days. Pilot numbers included admissions from the emergency department (ED) to the unit or direct admissions to the unit. 2006 is updated baseline.

<sup>b</sup> Used top sixteen diagnosis-related groups that match across Coordinated Care and non-Coordinated Care.

<sup>c</sup> Using Medicare ratio of costs to charges.

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63 percent, or more than \$25 million.

Continuous improvement requires the cooperation of the entire team and can only be accomplished in an atmosphere of trust.<sup>14</sup> Even though reducing waste often reveals the need for lower staffing levels, ThedaCare is committed to never laying off an employee because of conversion to continuous improvement. Redeploying personnel has not always been easy, but the Human Resources department, working in an area about to be improved, often finds people ready and willing to move to a new opportunity within the company.

### **Downside To Better Efficiency**

Will the solution make us bankrupt? We have reduced the length of hospital stay by nearly a day, taken down cost per case by \$2,362, and increased quality (Exhibit 1).

■ **Medicare physician payment.** Although we know from surveys and interviews that patients prefer to spend less time in the hospital, there is a downside to our more efficient system. On average, Medicare pays \$2,000 less per patient in Collaborative Care than in a traditional medical wing. Less efficient competitors with worse quality metrics will still get \$2,000 more from the federal system for their health care. Lacking an accurate, widely used system of quality reporting in medicine, patients are none the wiser. Medicare can spur improvement among U.S. hospitals and doctors by carefully restructuring payment to focus on high-quality health care.

■ **Information technology.** Although we agree that universal electronic health records are necessary, we do have a caution. In 1995 ThedaCare became one of the first companies to begin digitizing health records; over the past fifteen years, we have put the project on hold a number of times because we found that we were digitizing wasteful processes, capturing records that were often unusable in any real sense.

### **Immediate Needs**

The changes we have described involve a fundamental shift in the way people think about and deliver care. It is not just about saving money or doing less with more. This is about returning to the core scientific principles of modern medicine.

We begin with a hypothesis that performance could be better. Then we change the process, measure it, study its effect, and incorporate it into daily work. Before we can convince other health care organizations to join us in radically improving performance, however, there must be some incentive. If we prove that lean health care will put more money in a hospital's pocket, only to have Medicare take it out

of another pocket, we will not enlist many converts. Similarly, if a national insurance plan continues Medicare's rules, paying more money for inefficient health care, we will get a lot more inefficient care. Quality will only thrive when quality is demanded.

There is much more than money at stake. We must find a way to reward and encourage more efficient, better-quality health care, and that's what we will get.

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#### NOTES

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