If It's Good Enough for Cars… How Lean Manufacturing Principles Can Help Heal What Ails Us in the Healthcare Business

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Can Toyota save your life at the hospital? According to Mark Graban, who argued convincingly in his manifesto (No. 32.02) for ChangeThis.com in March 2007, the answer is a resounding YES.

At that time Graban cited the Centers for Disease Control's (CDC) estimate that hospital-caused drug errors and infections contribute to 90,000 deaths and 2,000,000 injuries each year. He also highlighted the Institute of Medicine's (IOM) estimate that up to 98,000 Americans die from preventable medical error and HealthGrade's 2004 survey that placed the number of medically-related deaths between 2000 and 2004 at 195,000 per year.

Graban went on to identify specific elements of the Toyota philosophy, management system and methods that could help reduce medical errors and save thousands of lives. Specifically, he emphasized the following practices:

1. Engaging employees in improving quality by improving the way they do their work.
2. Reducing waste—that is, "anything that does not add value to the customer" or anything that results in defects.
3. Incorporating standard work—that is, consistently using what the science says is the current best practice.
4. Incorporating "error proofing" to reduce harm and improve patient safety.

When Graban's manifesto appeared in 2007, a small number of hospitals and healthcare systems had already begun to incorporate Toyota practices and were seeing positive results. For example, the ThedaCare Health System in Appleton, WI, and the Intermountain Health System in Salt Lake City, UT, began using team-based care, standard work, waste reduction and evidence-based practice using the scientific method to achieve better quality outcomes and simultaneously reduce costs.

ThedaCare, for example, reduced the number of patients who died from cardiac surgery from 12 per year to near zero. They also reduced the average length of stay for such patients by 1.4 days and reduced the cost of bypass surgery by 22%.[1] Intermountain Health System reduced the rate of elective (not medically required) deliveries by Caesarian-section to 20%. That's 14% below the national average. They also dramatically reduced the number of babies that ended up in the neonatal intensive care unit and reduced the cost of deliveries by 50 million dollars.[2]

In the 6 years since 2007, there has been some good news and some bad. The good news is that more hospitals are making improvements in reducing patient harm. For example, the CDC recently reported that hospitals that participate in the National Healthcare Safety Network have significantly reduced specific types of hospital-acquired infections. Other hospitals, like Intermountain, have been able to reduce the number of Caesarian-section deliveries performed for no good medical reason. And, they have also reduced the number of Medicare patients who have unplanned readmissions within 30 days of being discharged from the hospital. A few, like Lehigh Valley Heath Network, have even managed to reduce harmful and/or fatal medication errors. (*AARP Magazine*, April/May 2013)

1 ThedaCare stats come from *On the Mend* by John Toussaint

2 Intermountain stats come from the PBS special, "Money and Medicine," broadcast on 9/25/2012. Source was Brent James, Chief Quality Officer.

The bad news is that recent research at Harvard found that about 18% of patients are still being injured while in the hospital, including injuries that are life-threatening or fatal. The Inspector General for Health and Human Services recently estimated that 1 out of 7 Medicare patients are harmed in the hospital in ways that contribute to 180,000 deaths per year. Finally, the Joint Commission Center on Transforming Healthcare says that, even with all our efforts to prevent surgical errors, as many as 40 "wrong site, wrong side and wrong patient" procedures occur every week in the U.S. Clearly, there's more work to be done in improving patient care!

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We'd like to take a page from Graban's book—or a screen from his manifesto—and suggest there's more that healthcare can learn from Toyota to reduce patient harm and control our sky rocketing costs. Specifically, we'd like to add the following Toyota practices:

1. Understand what adds value to the customer.
2. Take a product line approach to managing and delivering patient care.

Value to the Customer

One of the key elements of Toyota thinking is that value is defined by the customer. But at Toyota that means putting yourself in the customer's shoes—or car seat—not just running focus groups and doing marketing surveys.

A now apocryphal story at Toyota details the adventures of Yuji Yokoya, Chief Engineer for the Toyota Sienna minivan, as he undertook an attempt to understand what changes needed to be made to the second generation Sienna. To get that understanding, Mr. Yokoya took his family on a 53,000-mile trip across North America—including 5 trips from coast-to-coast and visits to all 31 Mexican states, 10 Canadian provinces, Hawaii, the Virgin Islands and Puerto Rico—in a first generation Sienna. The cumulative effect of all those experiences was a redesigned Sienna that jumped to second place in the minivan market, in large measure because it incorporated features that customers valued such as a tighter turning radius, roll-up shades for all side windows, and all-wheel drive. It was, wrote Andrew Tilin in *Business 2.0 Magazine*, "emblematic of Toyota's unswerving focus on the nitty-gritty of the user experience."

In healthcare, understanding value to the patient customer is too often limited to reviewing patient satisfaction survey scores. Indeed, one of the provisions of the Affordable Care Act (Obamacare) provides that a portion of hospital reimbursement by Medicare will be linked to

patient satisfaction scores as a component of "value-based purchasing." Not that we think such scores have no value. However, patient satisfaction surveys are only one tool for defining customer value.

Another tool we'd like to see doctors, nurses, and hospital administrators use on a regular basis is following a typical patient's journey end to end. That means, for example, setting aside the normal work of the day and sitting in the waiting area, observing patients answering the same questions over and over, visiting patient rooms and observing them wait for a response to a call signal, sitting in on a patient discharge and trying to interpret discharge instructions—walking in a patient's shoes or riding in their wheelchairs or on their gurneys! Those are experiences most healthcare professionals get first hand only when they are ill themselves or when they have a loved one enter the hospital.

Other examples of listening to the voice of the customer include adding a patient representative to the hospital board, sharing performance data with patients and their families, dimming hallway lights and lowering conversational volume in patient care areas in mid-afternoon, allowing patients access to their records and encouraging patients with difficult-to-diagnose conditions to access organizations like the Association of Cancer Online Resources (ACOR) and other online communities, where they may find the latest in diagnostic and treatment options, practical information about dealing with treatment side effects and emotional support. All of these are

examples of what true patient and family engagement might look like as healthcare organizations try to meet the goals of the CMS Partnership for Patients. And they not only improve patient satisfaction, recent research suggests that they can help reduce the length of hospitals stays and costs as well.

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Product (or Model) Line Approach

Toyota’s “model line” or “product family” approach means that, in addition to the vertical structures for performing and managing the functions within an organization (departments or divisions for research and development, product design and engineering, manufacturing, human resources, finance), there are horizontal structures for each of the major product lines that incorporate all the processes and activities needed to produce a given product or product family from beginning to end. At Toyota there are typically about 15 such product lines. Each of those lines is overseen by a Chief Engineer, who has overall responsibility for the

performance of the product line but little direct authority over the people who work there. The benefit of this addition to the typical management structure is that it helps improve communication and ensure coordination of effort and resources across the organizational silos.

In healthcare this method of organizing and managing work flows is variously referred to as a value-stream, service-line or model-line approach. Briefly mentioned in the Institute of Medicine's recent report, Best Care at Lower Cost: The Path to Continuously Learning Health Care in America, and in the Affordable Care Act itself, this approach is largely overlooked in most healthcare organizations. At its core, it means focusing on HOW care should be provided, not just WHAT care should be provided. In our opinion that is an oversight that needs to be remedied.

What we are talking about here is an end to end focus on healthcare delivery processes, which we call value streams, from the patient arrival at an Emergency Department (ED) to discharge or admission to the hospital, from the doctor's decision to schedule a patient for surgery to hospital discharge of the patient to a rehabilitation facility, from application of a patient for admission to a skilled nursing facility to discharge home, from receipt of an appointment reminder to completion of a routine physician office visit. It can also include a focus on the processes supporting delivery of care such as purchasing, replenishment of medication and supplies, and hiring staff.

Why insist on an end-to-end focus on workflows or value streams when focus on improving isolated problems, sometimes called point *kaizen*, has saved thousands of healthcare dollars and improved quality of care? We'll answer with a story from one of our first ventures into healthcare.

We were asked to work with an Emergency Department where delays were frequent and long, ambulances were sometimes diverted elsewhere because there was no capacity, staff turnover was 30% annually, and staff members were attacked on more than one occasion by irate patients or family members because of long waits to see a doctor. A quick analysis of the flow in ED revealed that there was no mechanism to "treat and street" patients who arrived with only minor problems at the same time patients with true emergencies were being seen. We also observed that patients who came into the ED on Sunday nights routinely waited 12 to 20 or more hours for admission to the hospital on Monday as there were no empty beds available on Monday mornings even though all ED patients had beds by 2:00 that same afternoon. That meant not only the discomfort of an extended stay in the emergency department, it also meant care under the watch of staff who were trained to deal with a completely different set of problems.

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As we worked with the ED Improvement Team to help them find out why the same patients who had been released by 2:00 pm to clear ICU, surgical and medical beds couldn't have been released earlier, here's a sample of what we found:

- Orthopedic patients ready to leave on Monday morning had to stay until midday or afternoon because there were no physical therapists to complete the required assessment allowing them to leave; or, the patients lacked the necessary devices (properly fitted crutches, canes, wheelchairs, etc.) to send them home safely.
- Patients with a variety of problems had to wait in the ED because no one had arranged with their caregivers to transport them home or their caregivers were not available until the evening.
- Patients had to wait in the hospital because discharge planning had not been assured that there was appropriate supportive care at home or a bed in a skilled nursing or rehab facility.
- Patients remained on the medical floors over the weekend because their attending physician failed to leave information for the covering doctor regarding what criteria (normal temperature, etc.) the patient needed to meet for safe discharge; or, the patient met the criteria but the covering physician was reluctant to discharge another doctor's patient.

This is a small sample of the problems that surfaced but it is typical of the broken systems used in delivering care in healthcare settings throughout the U.S. What is apparent is that, while the problem manifested in the ED, the underlying causes were spread throughout the hospital. That means that, although some of the underlying causes contributed more to the problem than others, there was no single silver bullet that would fix the problem of patients boarding in the ED until they could get a bed. It also means that unless someone assumed responsibility for performance of the entire value stream—a "value-stream owner" (or ED "chief engineer"), no one would look at the system level fixes that needed to occur to make things better.

Taking a workflow or value-stream approach means establishing systems for identifying the major flows within the organization, determining measures of desired performance, monitoring the performance regularly to look for gaps and initiating problem solving to see why the gaps are occurring. It also means engaging front line staff as cross unit or cross functional teams to surface problems, identifying underlying causes, running simple, reversible experiments to see if their proposed solutions improve the performance issue, and applying solutions in the context of the entire system so that the solutions they initiate do not create problems in other parts of the value stream. And, it means teaching front line staff to do problem solving on workflow problems using the scientific method.

It sounds like a daunting task but it is happening all over the country in places like the following: the University of Michigan Health System, Seattle (WA) Children's Hospital, Palo Alto Medical Foundation, The Mayo Clinic (Rochester), Beth Israel Deaconess Medical Center (Boston), the Group Health Cooperative (Seattle), Denver Health Medical Center, Virginia Mason Medical Center, and UPMC Health System (Pittsburgh). Although there has been significant progress in improving value stream performance in specific areas, very few hospitals have taken this methodology to the next level, matrixing their management structure so that work flows are managed horizontally across the organization as well vertically within functions.

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Fewer still have taken a page from the book of manufacturing organizations who lead in this approach, implementing systems to hire and develop people who can work in cross functional and cross disciplinary teams, rewarding team-based improvement, adapting traditional budgeting and forecasting processes to support lean operations, and developing managers and leaders who can support the problem solving skills of the people who report to them rather than jumping in and trying to solve the problems. But that's content for a different manifesto.

Conclusion

Providing healthcare organizations with the technical skills to make these changes is relatively easy. Helping them navigate the cultural barriers to implementing the skills and the associated new ways of thinking is a much greater challenge. However, there are methodologies that are being used inside healthcare and out that are proving to be successful. What we need is a higher level of support from healthcare leaders, healthcare consumers and healthcare policy makers to advocate for what is, in comparison, a relatively lower cost, high yield approach to improving healthcare delivery.

Atul Gawande asked last year in an article in the New Yorker, "If the Cheesecake Factory can do a good job of satisfying the diverse needs of its customers, why can't healthcare?" And, as our friend John Shook of the Lean Enterprise Institute, adds, "While it's true that people are not cars, if [lean value stream thinking] is good enough for cars, surely it's good enough for people."

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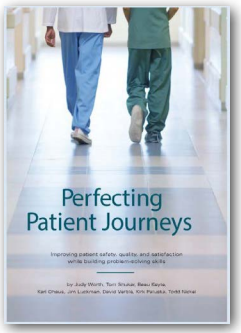

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ABOUT THE AUTHOR | Judy Worth and Tom Shuker are authors of *Perfecting Patient Journeys*, along with Beau Keyte, Karl Ohaus, Jim Luckman, David Verble, Kirk Paluska, and Todd Nickel. To learn more about the book and their work, please go to lean-transform.com.

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