



Working lean into
**HEALTHCARE
DESIGN**

Lean. It's not just for manufacturing anymore.

When people hear the term “lean principles” they often think of lean manufacturing and cost reduction.

However, most people don't associate “lean” and “healthcare.” At first glance they seem like two unrelated concepts.

First and foremost, lean is a way of thinking. It's a strategy that can apply to any process, and like manufacturing, healthcare involves a series of processes. Applying lean principles is a growing trend throughout the healthcare industry and in healthcare design.

“Lean is really two things:

1) defining quality from the patient's perspective, and 2) getting rid of waste – learning to see it, eliminate it, and reinvest in whatever it is that is meaningful to the patient, to improving their outcomes,” says Pat Rutherford, vice president of the Institute for Healthcare Improvement, a non-profit organization based in Cambridge, MA that works to improve healthcare worldwide.

A strong case can be made that many designers routinely apply lean principles in the process of healthcare design. “When you study a project and come back with a recommendation to the client that they can use an existing space more efficiently, maybe even not build a new building, the reaction is often ‘There's no way we can do that.’ They can't fathom it. But that's the opportunity for us to be change agents, to help the client facilitate the changes they need to make,” says architect Lorissa

MacAllister, healthcare studio leader at Progressive AE in Grand Rapids, MI and a proponent of using lean principles in design.

According to Rutherford, MacAllister, and others who have taken its principles to heart, lean can do more than reduce waste and save cost. “Lean not only makes things more efficient, it makes people who do the work happier. They're getting rid of some of the hassle in their life. It makes the job more satisfactory. Workers feel empowered, valued, and that their skills are being put to better use,” says Karen Baldoza, director of operations for IHI.

Why groceries are like sutures

Lean grew out of the manufacturing sector, so people in other industries often ask: what can a product-oriented strategy teach an organization that deals with people? A quick example offers answers.



Tesco is the biggest retailer in the UK. Their service level –a way of measuring how well they’ve provided customers with exactly what they want– is over 96%. They achieve this level of performance in large part by applying lean principles to their operations.

For example, Tesco replenishes each of their stores continuously over a 24-hour period. This eliminates the need to hold stock in the back room like a Wal-Mart does, or in high-bay storage like a Lowe’s. Within hours of when a customer purchases an item, Tesco reorders the product and has a key supplier producing it. The product moves to a regional distribution center and is cross-docked quickly to a truck that delivers to the store.

During slow periods, Tesco workers fulfill internet orders from the shelves. This reduces labor costs, avoids a separate warehouse for web orders, and has helped to make Tesco the world’s largest internet grocer.

Tesco is already the UK’s market leader in groceries, with twice the market share of their nearest competitor. The company is expanding to Eastern Europe, Asia, and the U.S. Tesco gives customers what they want, where and when they want it. Their lower cost structure and efficiency have lead to higher margins and increased customer satisfaction and loyalty.

Wouldn’t every organization, hospitals included, like a 96% service level rating? Of course. A better question: can Tesco’s approach to handling products be applied to the thousands of supplies –from sutures to saline and soaps– used every day in a typical hospital?

In fact, healthcare is learning from just such examples. Various hospitals are using radio frequency identification tags (RFID) to track and manage supplies, medications, and

expensive equipment. Others are using robots to deliver and track supplies around the hospital.

But supplies are just part of a hospital operation. Healthcare is a complicated, people-centric business. That’s part of the challenge in applying lean principles.

The Institute for Healthcare Improvement offers validated industry averages to show the impact of lean:

Direct labor/ productivity improvement	45–75%
Cost Reduced	25–55%
Space Reduced	35–50%

Going Lean in Health Care. IHI Innovation Series white paper. Cambridge, MA: Institute for Healthcare Improvement; 2005.

Consider a supply room in an OR. IHI’s Rutherford helps hospitals apply lean principles at the front line, and says “what you see often is that the process has been designed around the ancillary staff. If I’m from central supply, it’s easier for me to

take a big cart up to OR once and load up the supply room with extra stuff, so I have to make fewer trips. But it’s harder for the front line people to find things. If you change to a just-in-time inventory system, my job as an order person has to change.”

Similarly, if medications are delivered to each patient room rather than one central medication room, it makes it easier for the nurse but harder for the supply staff. “It’s not just redesigning the work, you want to make the interface with the patient more efficient. Ancillary staff work has to be redesigned, pharmacy staff may have more work to do. It starts to get more complex,” says Rutherford.

“People tend to think about their own programs, what’s within their span of control. Lean looks at the entire process.”

Another supply system change was a big win. MacAllister worked with a hospital that needed a more efficient location for a patient floor supply room. The existing supply room was in “a wonderful space, out of the way, lots of light. At the same time, the staff break room was in a conveniently



Hospitals use massive amounts of supplies on a daily basis, so lean principles are often first used to improve supply distribution and management.



located, but dark room, with no windows. Both rooms were about the same square footage, so after some discussion we suggested swapping the function of these two spaces. Staff morale improved, and both rooms were in better locations.”

1 + 1 = 1

The key, she says, was “a rich dialogue” with all the affected groups, and understanding the processes involved, part of what she calls the “lean journey.”

A more complicated journey started when a hospital wanted to combine a positron emission tomography (PET) unit located off-

Get all workers in the dialogue about the work processes in a space. “It’s not pivotal to the design of the space, but it helps define what space they need.”

site, with the rest of the nuclear medicine department on the main campus. The objective was to combine them efficiently in one space. The hospital added up the square footage of the two units and figured that number was the total amount of space they needed for the new combined department. Using a lean approach, Progressive came up with a spec that used half the amount of space.

“We took the time to talk with everyone involved, and held open dialogues with all of the staff and physicians. ‘How do patients come in? How do they move through the department? How are supplies brought in? How do the nurses work? The physicians? How about the other workers? How does the department operate today, and how would you like it to operate in the

future? What are your targets for patient and staff satisfaction?’”

The process took 3 months and uncovered many issues. “Some were simple: access to a locked room, for example. Who’s got the keys? Why not put a pushbutton lock on that room instead? Can some rooms or services be shared?”

By leading this multi-disciplinary conversation the Design firm delivered another benefit to the client. “Hospitals often say they have a lean process, but it’s often just a list, not a process, and it doesn’t involve everyone. We focus on the patient experience, we follow the patient. The hospital isn’t always set up that way.”

“The dialogue is so important, getting everyone at the table, getting people to those ‘Aha!’ moments where they realize what’s possible. It’s not pivotal to the design of the space, but it helps define what space they need.”

Saving the hospital real estate and construction costs in their new combined PET/nuclear medicine unit were big achievements. But the process yielded even more benefits. The smaller space also improves adjacencies, with the result that:

- patients walk 57% less to receive their treatment
- the staff walks 63% less to treat the patients

It’s an example of the complexity of a healthcare organization and how lean can help. “The hospital as a care setting is very complicated. Lean principles are very easy to understand but very hard to apply. It’s that cliché of peeling the onion. You think it’ll be easy and it gets more and more complex,” says IHI’s Baldoza.

Getting Lean

Based on their work with hospitals around

the world, IHI suggests some important first steps for healthcare designers:

1) Encourage the front line staff to get the process right first. “Before anything is designed, before anything is built, get the process right. Whether that’s decreasing the movement of staff, decreasing transportation of people from this place to that place, changing inventory, whatever it is. Once you have the process right, the design can maximize it,” says Rutherford.

2) Make it easy to do the right thing. “Med carts are a good example. When they’re centrally located on a floor but

The newly combined PET/ nuclear medicine department uses half the space the hospital had estimated.”

patient rooms are scattered throughout the floor, you have people running all over the place, you have errors. Make it easy for people to do things right.”

3) Provide visual cues. “You can walk on to a manufacturing shop floor, or into the OR supply room, and you can tell at a glance in both places if things are in control or not. Maybe you see equipment everywhere, things stacked up, so you don’t know if what you’re looking for is there or not. You have to step over cords or around equipment, etc. It’s a safety issue, first. Redesign those rooms to get rid of what’s not necessary, so equipment that’s needed is marked off on the floor: you walk in and see if the machine you want is there or not. There’s a check out sheet, it’s not here, but it’ll be back at 4 o’clock.”

If some of these lean principles seem similar to a well-executed design process, they are. Lean is a part of good design, just like sustainability or the performance of the space are parts of it. Good interior designers always consider adjacencies, the right use of space for particular processes, making the most of the available real estate, providing the most effective furnishings and tools. Lean principles fit perfectly within the design process.

IHI's Baldoza says "Lean looks across silos. Having everyone involved to understand and design the process is key. There's value in a better process, yes, but just getting people together who have never spoken, so everyone understands that when this happens someone else is affected, that can be more valuable than anything else." Who better than the Design firm to make lean a part of healthcare design?



Get everything to the table. "Before anything is designed, before anything is built, get the process right," says IHI's Rutherford. "Once you have the process right, the design can maximize."

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Learn More About Lean

The **Institute for Healthcare Improvement** offers seminars and conferences, audio and web programs, white papers, (including the "Going Lean in Health Care" article cited in this article) and other professional development tools. (<http://www.ihl.org>)

AIA offers conferences and publications that include lean principles, and The Architect's Handbook of Professional Practice, 2006 Update, contains information on lean as well. (<http://www.aia.org>)

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