

# Leading Lean: A Canadian Healthcare Leader's Guide

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## Abstract

Canadian healthcare organizations are increasingly asked to do more with less, and too often this has resulted in demands on staff to simply work harder and longer. Lean methodologies, originating from Japanese industrial organizations and most notably Toyota, offer an alternative – tried and tested approaches to working smarter. Lean, with its systematic approaches to reducing waste, has found its way to Canadian healthcare organizations, with promising results. This article reports on a study of five Canadian healthcare providers that have recently implemented Lean. We offer stories of success but also identify potential obstacles and ways by which they may be surmounted to provide better value for our healthcare investments.

**V**irtually all healthcare systems face the same challenge: improving the quality of patient care, increasing the number of patients served and reducing wait times, while keeping spiralling costs in check. For many, it is difficult to imagine finding new opportunities to do more and better with less; yet such demands persist, and many organizations, in fact, continue to succeed.

One proven approach is Lean. As we show, once an organization is familiar with Lean methodology, it takes no more than a few hours of observation on the front lines to uncover opportunities for improvement, such as repeated laboratory orders, staff walking miles to find equipment and forms produced and never read. These non-value-added steps, called *muda* in Japanese and *waste* in English, impede the quality of care, increase wait times and cost the public money. Toyota pioneered Lean and has led the world in demonstrating its benefit. Lean thinking has propelled Toyota to become the world's most profitable automobile manufacturer and a leader in quality (May 2007).

While Lean was developed originally in the automotive sector, it has spread across the manufacturing and the service industries to companies such as Southwest Airlines, Alcoa and Vanguard Insurance (Spear 2005). Recently, the healthcare industry has demonstrated success using these principles in the United States, United Kingdom, Australia and now Canada (Royal Bolton Hospital 2009; Bush 2007; Ben-Tovim et al. 2007; Foster 2007; Kim et al. 2006; Institute for Healthcare Improvement 2005). In healthcare, there is an opportunity to do more with less – if we can eliminate that waste. This opportunity is found in supporting front-line staff to identify and remove unnecessary steps from their everyday work. This is the essence of Lean, and it has been employed in manufacturing industries for decades. It is now becoming a critical tool for

healthcare leaders (Macleod et al. 2008).

This article is intended to serve as a practical guide for healthcare leaders who may be considering using Lean approaches to value creation. We first introduce the concepts of Lean applied to healthcare and then document the Lean experiences and lessons of five Canadian hospitals.

### Lean 1-2-3

#### Great Waste, Great Opportunity

Healthcare is an ideal environment in which to reap the benefits of Lean. To understand why, managers and clinicians must first accept that waste equals opportunity: the more waste (repeated steps, rework and unnecessary motion) that exists in a process, the greater the opportunity is to convert that waste into value-added activities. Remove the “waste of making defective products,” and quality improves. Remove the “waste of inventory,” and capital is freed up to invest elsewhere. Remove the “waste of waiting,” and patient wait times are reduced (see Table 1 for Taiichi Ohno's seven wastes as applied to health care) (Bush, R. W., 2007). While virtually all Canadian healthcare organizations have attempted to drive out waste, many have concluded that the well has run dry; Lean reveals new opportunities to improve effectiveness.

#### Lean on the Ground

Unfortunately, Lean is often presented as a mystical process, only to be practised by “Lean Wizards” – a.k.a. management consultants. Too often, unless one is working with teaching-oriented consultants and trainers, the magical benefits of Lean disappear shortly after the consultants leave. There is nothing magical about Lean other than the leadership and discipline needed to bring a change to an organization's culture and processes. In short, waste is eliminated through a structured process that trains and empowers front-line workers. The example outlined below in steps one to five describes what Lean might look like in early stages in an organization (Lummus et al. 2006; Joint Commission on Accreditation of Healthcare Organizations 2006; Kim et al. 2006; Institute for Healthcare Improvement 2005; Laing and Baumgartner 2005; Thompson et al. 2003).

Imagine the following: Twelve staff members from the emergency department (a few nurses, a ward clerk, a physician, a porter, cleaning staff and the manager) walk into a single room. Each day, this group works side by side delivering care, and yet they have never taken the opportunity to discuss how to improve their collective work. An executive stands at the front of the room to set the stage, and a Lean facilitator – an expert in Lean methodologies – takes the lead.

#### Step One: Define Value

Front-line workers are led through a conversation on “value” (Figure 1). What do patients want and need from a visit to the

#### Lean Terminology: What Does It All Mean?

**Lean:** A term coined by those who compared Toyota's methods to those of other manufacturers: “Lean is the antidote to waste ... It provides a way to specify value, line-up value-creating actions in the best sequence, conduct these activities without interruption whenever someone requests them, and perform more and more effectively” (Womack et al. 1990; Womack and Jones 2003).

**Value-added work:** Work that adds value from the perspective of the client or customer; it is the kind of activity or service for which end users are willing to pay. In healthcare this could be the taking of blood for a medically necessary test or patient time spent with an examining physician.

**Waste or muda:** Activities of overproduction, waiting, transportation, processing, inventory, movement and defective products. Type 1 muda represents activities that cannot be avoided immediately given current assets and technologies. If a physician cannot eliminate the need to fill out a drug allergies form because of an existing policy, that muda is categorized as type 1. In contrast, type 2 muda is clearly wasteful activity; it is the prime target for immediate elimination.

**Value stream map:** Visual presentation of activities required to bring a service or product from customer order to delivery. Value-added steps and muda are most easily identified on a value stream map. The mapping starts with defining what the customer demands (in the top right corner) and then captures all the steps required to fulfillment. The “current state” value stream map represents the steps, similar to the filling of a customer order. The “future state” value stream map is a visual representation of an idealized state. Improvement activities (like kaizen events below) undertaken by front-line staff move the process toward the future state.

**Gemba:** In Japanese, *gemba* means “actual place.” In the Lean context, it refers to the place where value is actually created: the shop floor in manufacturing, or a clinic (e.g., emergency department, outpatient dialysis unit, or operating room) in the healthcare setting. The concept of gemba is important because it emphasizes the Lean principle that value – what customers actually want – is created on the front lines, not in boardrooms. The value stream mapping exercise forces workers to “walk the gemba” to see value and the process that creates it.

**Kaizen event or rapid improvement event (RIE):** *Kaizen* means “improvement” in Japanese, and kaizen events are focused on implementing improvements to the process of meeting customer demands. In healthcare, these week-long events provide the opportunity for front-line workers from different disciplines to work together to rapidly plan, implement, measure and adjust improvements.

**Kamikaze kaizen:** Kaizen activities that improve an isolated segment of a process but negatively affect the entire process are referred to as “kamikaze kaizens.”

**Table 1. Ohno's 7 Wastes as Applied to Health Care \* Bush, R. W. JAMA 2007;297: 871-874.**

<b>Waste</b>	<b>Description</b>	<b>Examples in Health Care</b>	<b>Process Remedies at Virginia Mason Medical Center</b>
Waste of overproduction	Producing what is unnecessary, when it is unnecessary, and in an unnecessary amount	Fragmented, parallel care: separate resident, attending, social services, pharmacy, and care management rounding cycles; making photocopies of a form that is never used; providing copies of reports to people who have not asked for them and will not actually read them; processing piles of documents that then sit at the next work station; cc's on e-mails	Multidisciplinary bedside rounds, with contemporaneous documentation and order entry by portable wireless computer; primary care physician flow stations incorporate many lean principles
Waste of time on hand (waiting)	Waiting for materials, operations, conveyance, inspection, idle time attendant to monitoring and operation procedures, rather than just-in-time supply or "pull production"	Patients waiting to see their physician; office staff batching test results for patients; waiting on the phone to schedule appointments; early-morning admits for surgeries that won't be performed until later in the day; waiting for support services such as internal transport; waiting for office equipment (computer, photocopier, etc.) to be repaired before being able to do work; waiting for a meeting that is starting late	Patients are advised at point of care when tests will be available, and test results are reported as they become available; emergency department physicians enter orders in the electronic medical record within 15 minutes of patient arrival
Waste in transportation	Conveying, transferring, picking up/setting down, piling up, and otherwise moving unnecessary items; problems concerning conveyance distances, conveyance flow, and conveyance utilization rate	Moving individual files from one location to another; moving supplies into and out of a storage area; moving equipment for surgeries in/out of operating and procedure rooms; patients receiving chemoradiation treatment traveling 1220 horizontal feet and 25 vertical floors per episode	Travel for chemoradiation reduced 55%, to 544 feet and 12 floors, by providing injections and dressing changes in radiation oncology department; instead of patients or supplies traveling to and from isolated process villages, the input proceeds through the operations in single-piece-flow in 1 short space
Waste of processing	Unnecessary processes and operations traditionally accepted as necessary	Hard copies of memos already sent by e-mail or posted on intranet; redundant capture of information at admission; multiple recording and logging of data; writing by hand, when direct input to a word processor could eliminate this step; producing paper hard copy when a computer file is sufficient; patients waiting for preapproval of urgent treatments	Hyperbaric oxygen indications negotiated with payers, who have agreed to waive preapproval; redesign of chamber to allow emergency cases without canceling scheduled patients; eliminate medication lists on electronic medical records progress notes
Waste of stock on hand (inventory)	Inventory waste is when anything – materials, parts, assembly part – is retained for any length of time, including not only warehouse stock but also items in the factory that are retained at or between processes	Office supplies in hallways; expensive clinical supplies and implants that can be ordered on a just-in-time basis; charge slips piled up to be dictated; unnecessary instruments in operating room kits	Surgeons now accept only those instruments that are frequently used, or 25 instruments, in the operating room kit

Waste of movement	Movement that is unnecessary, that does not add value, or that is too slow or too fast	Physicians and nurses leaving patient rooms for common supplies or information	Common supplies are stocked in hospital, operating, and outpatient rooms, with visually controlled restocking system; computer access in outpatient examination rooms and wireless portable computers for inpatient rooms
Waste of making defective products	Waste related to costs for inspection of defects in materials and processes, customer complaints, and repairs; passing defects down to a coworker or patient, rather than the defect producer "feeling the pinch"	Iatrogenic illness; fixing errors made in documents; misfiling documents; dealing with complaints about service; mistakes caused by incorrect information or miscommunication; handwritten orders; sending out bills with an incorrect address	Ventilator-acquired pneumonia bundles decreased annual incidence from 40 to 5 cases; patient safety alerts; computerized clinician order entry
*Adapted from Ohno. <sup>14</sup>			

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emergency department? Despite years of struggling to provide it and the best intentions to do so, staff have no trouble answering the question: patients want an accurate diagnosis and appropriate treatment without mistakes and without wasted time. To get this group to the long elusive next step, the concepts of value-added work and muda are introduced as a way of systematically

the patient comes in the door until discharge) is drawn as boxes or placed as sticky notes on the paper (Figure 2). To learn more about the process, the staff may leave the room and "walk the line" ("gemba") from the perspective of the patient, observing the activities that are required to deliver care. The output is a current state value stream map that covers the wall, depicting the

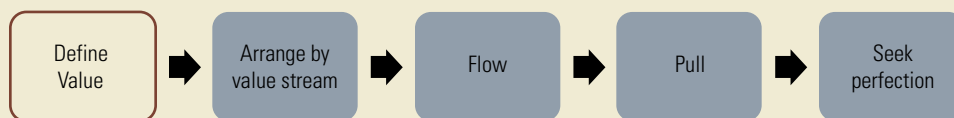
steps in this emergency department process as they exist from beginning to end. Waste is attributed to the process of activity, not to the failings of any individuals. This framing is critically important if staff are to become engaged and not feel threatened.

Also noteworthy

about this early experience is that, for the first time, a multiprofessional and administrative team can (1) appreciate the work of all team members – and the connections between their work – and (2) see the *total* amount of work required to deliver care to one patient. The feeling is nearly unanimous in the room: "I can't believe there are so many steps, some of them so silly; there must be plenty of room for us to improve *how* we work."

The facilitator next leads the team through a series of questions to help them identify opportunities for improvement in this value stream. He or she points to each box and asks the team: "Is the step valuable or is it wasteful activity – waiting, rework or unnecessary motion in looking for items?" "How

**Figure 1. The five principles of Lean thinking\***



\*As defined by Womack and Jones (2005).

classifying the kind of work that has been done in the past and, more importantly, that must be done in a waste-free process.

### Step Two: Arrange by Value Stream

In the beginning, there is an unspoken belief that every activity is value added. Who, after all, wants to believe that the work they do is not value added? Mindsets shift as the discussion continues, allowing the team to realize that some activities are muda from the patient's perspective (see Table 1). Value stream mapping helps the team *see* the waste. The team sits in front of a big piece of craft paper taped on the wall. The sequence of steps in a specific process (e.g., delivering care from the point

**Figure 2. North York General Hospital staff from across disciplines at a value stream mapping kaizen event**



does the work at this stage positively or negatively impact the work of others down the stream?" It becomes clear that staff have a number of workarounds (steps they take to get around a problem with the process) that are wasteful (Hollingsworth et al. 1998). Team members tag wasteful steps for elimination (with a sticky note) on the value stream map for all to see. The total number of steps in the process begins to drop, and cost and length of stay drop with it.

#### Step Three: Flow

Next, the facilitator asks, "Does the patient 'flow'?" For example, when a patient walks in the door, is she triaged, then registered and then seen by a physician without interruption, or does she queue between these steps? Ideas are generated to remove the waits between steps, such as removing the second waiting room after registration. The net result of flow is a reduction in the time from beginning to the end of the patient's experience. By removing the waiting, underlying waste can be more easily identified and addressed.

#### Step Four: Pull

A further question is asked: "Does the process allow customers to pull value?" Conventional thinking has the emergency room "pushing" patients from the waiting room when registration is complete, only to have them wait again. A "pull" system has the healthcare worker who finishes preparing an empty bed bring the patient from the waiting room to ensure the bed does not sit idle. As pull is implemented, the time from the patient demanding care to the time care is delivered begins to drop.

#### Step Five: Continuously Seek Perfection

The ideas generated by the team lead the group to envision a

"future state" in the form of a value stream map that comes closer to perfection. The new process may have fewer steps, leading to lower cost and a shorter stay. This map becomes the vision that guides all improvements.

Next, the process is standardized and each step is well defined, eliminating the uncertainty and confusion that often leads to errors. For example, the new process may place all heparin vials in one box and insulin in another to help prevent medication errors. Improvements are prioritized and added to the value stream map. Seeing all the potential improvements on the value stream map helps the team to avoid "kamikaze kaizens," improvements that better one section of the process without positively impacting the whole. The team leaves the room knowing exactly who needs to do what, by when, in order to achieve the future state.

With waste identified, the team moves to a process of disciplined waste elimination. Here, Lean theory is flexible. Since each individual situation is different, staff are encouraged to use whatever method is most appropriate to remove the waste. (Common choices from industrial engineering and management science include The Deming Cycle, PDCA, or A3 problem solving. Any method that produces results would be acceptable.) In some cases, the elimination of waste simply involves moving equipment to a new location. For example, the nurse returns to the ward and creates a "home" for the telemetry units to prevent future waste of motion. More complicated waste-removal initiatives are left for kaizen weeks – week-long events for front-line staff dedicated to continuous improvement. For each waste-reduction project, the front-line workers establish measures of success that are meaningful to them.

As initiatives are implemented, the emergency department begins to see a drop in wait times, improved job satisfaction due to a reduction in workarounds and a reduction in errors. Two or three small changes quickly lead to an extra bed and an extra patient seen each day. More importantly, Lean becomes part of the culture, and waste can be easily spotted, identified and corrected at multiple levels. Continuous improvement persists until the future state is achieved. Then the entire process begins again.

#### The Canadian Experience

We turn now to lessons we have learned from studying Lean implementations in Canada. We first present the three *Ls* critical to successful Lean implementations: launch, learning and leading. We conclude with lessons shared by hospital leaders from ongoing lean initiatives.

Our study involved semi-structured interviews with five Canadian organizations between December 2007 and March 2008. These included the Five Hills Health Region in Saskatchewan, two community teaching hospitals (North York General Hospital and St. Joseph's Health Centre, both in Toronto, Ontario), a quaternary care research centre (Toronto's

University Health Network [UHN]) and a regional tertiary care centre (Hotel-Dieu Grace Hospital in Windsor, Ontario). The goal was to highlight how these organizations began their Lean initiatives and to identify some lessons helpful to others applying Lean in a Canadian setting. The interviewees included a chief executive officer (CEO), directors of quality/patient safety, a director of a clinical program, a senior project manager and a designated Lean coordinator. Semi-structured interviews were performed by phone or in person, with the 18 questions provided beforehand. Notes were taken during the interview, and data were sorted by theme. Some data were obtained through correspondence after the interviews. Table 2 describes the sites and provides details about the Lean initiatives.

### Launch

What prompted the above organizations to begin Lean projects? For some, such as Hotel-Dieu Grace, it started with a crisis: the hospital was featured in the local newspaper for its long wait times. For other sites, motivation came from a challenge from leadership – the need to transform the organization and deliver better quality service to patients within the available budget.

We also observed that each organization had an internal champion to seed the idea of Lean due to personal experience with the approach. For instance, Dan Florizone, CEO of Five Hills Health Region, spent a week participating in a rapid improvement event at Virginia Mason Medical Centre alongside front-line workers. After seeing Lean in action in another institution, he led the commitment to go Lean. For other organizations such as UHN, those who became champions of Lean had heard about the initiative at a hospital in the same city.

Finally, although each organization had unique circumstances that created a desire to improve its process, all faced a similar

constraint – funding. Fortunately, four of five hospitals in this study were provided with government funding to make the Lean improvement initiative possible. The investment covered hiring Lean expertise, education programs within the organization, compensating staff, and for systems. The return on this investment for these five hospitals would come in the form of reduced wait times, a change in culture and improved patient safety. None of this could have occurred, however, without sufficient start-up resources – which would only later prove to have a positive return on investment.

### Learning

When Five Hills' CEO Dan Florizone returned from experiencing Lean in action at Seattle's Virginia Mason Medical Centre, he commented that he "knew enough to do damage." That is, he knew Lean could work and wanted to make it happen, but he lacked the know-how to accomplish anything. Even worse, he realized that an early failure of execution might kill the credibility of future Lean efforts. To address his problem, he went to a nearby wire manufacturer that had previously implemented Lean when it swept across the manufacturing industry. Florizone aimed to recruit a Lean black belt (a trained Lean expert), Dale Schattenkirk, to come and work for Five Hills with the promise that he could apply his knowledge to save lives. Schattenkirk had been down the challenging path of implementing Lean and was skeptical that Florizone understood what he was getting into. Once Florizone assured Schattenkirk that the hospital was in this for the long-haul, and that this project was not a passing fancy, Schattenkirk agreed to lead Lean.

Like Five Hills, four of the five hospitals hired or trained staff externally to develop the in-house knowledge of Lean implementation. Three sites hired Lean experts with backgrounds in

**Table 2. Participating hospitals**

Hospital	Type of Facility	Departments with Lean Applied	Started Lean
Hotel-Dieu Grace Hospital	Regional tertiary care centre	ED, MH, CTU, rad, GIM, sterilization, ortho, pharm	2005
UHN – Toronto General Hospital	Quaternary care, research intensive	MI, OR, Surgical preadmission, palliative care, ED, GIM	2005
Five Hills Health Region	Saskatchewan Health Region	49 projects	2006
St. Joseph's Health Centre	Catholic community teaching hospital	ED, GIM, HR	2006
North York General Hospital	Community teaching hospital	ED, GIM, MI, infection control, in-patient ortho	2005

CTU = clinical teaching unit; ED = emergency department; GIM = general internal medicine; HR = human resources; MH = mental health; MI = medical imaging; OR = operating room; ortho = orthopedics; pharm = pharmacy; rad = radiology; UHN = University Health Network.

manufacturing, retail or service industries. In contrast, Hotel-Dieu Grace chose to train its Lean-leading staff at the University of Michigan's Lean healthcare course.

While "classroom" experiences, seminars and simulations are useful starting points, our interviewees reported that Lean is ultimately learned through hands-on experience. Each site employed consultants to act as guides through the early stages of Lean implementation. The consultants helped set objectives for the Lean initiative, determine tactics and facilitate the first mapping sessions.

All the hospitals attempted to transform external expertise to internal knowledge, but hospitals that used consultants with a focus on Lean reported greater progress than those that employed generalist consultants. (In our study, four different consulting firms provided advice to the five hospitals.) In contrast, non-teaching-oriented consultants delivered one-time changes, but the initiative seemed to lose momentum upon their exit. Thus, consultants with proven experience in teaching Lean are critical to success. For Lean to be sustainable, it is important to live by Lao Tzu's dictum, "Give someone a fish, feed them for a day; teach someone to fish, feed them for a lifetime." This is akin to Ontario's recent coaching-teams initiatives in critical and perioperative care (Sherrard et al. 2009) in which existing expertise in the system is leveraged to other organizations.

## Leading

In an earlier article in *Healthcare Quarterly* (Golden 2006), one of us presented a model for organizing complex change efforts in healthcare organizations (Figure 3). That model suggested that the successful implementation of complex changes in healthcare organizations (e.g., the implementation of Lean) typically proceeds through four stages: (1) determining the desired end state, (2) assessing readiness for change, (3) broadening organizational support and organizational re-design and (4) reinforcing and sustaining change.

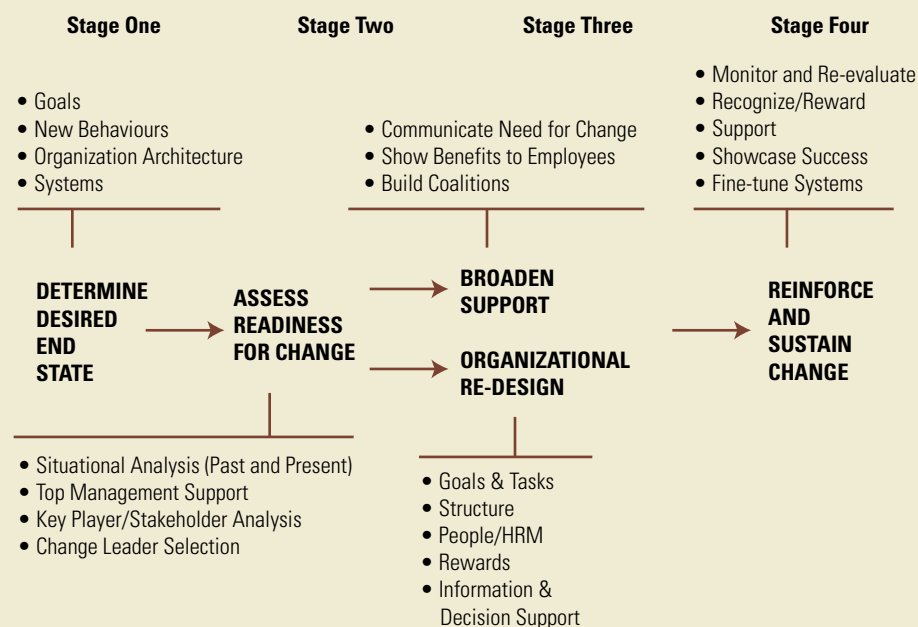
Because the present article focuses more on the specific task of implementing Lean than the common challenges of change management,

we do not devote much attention here to change in general. However, several important steps in the Lean implementation process, also addressed in that earlier article (Golden 2006), are especially noteworthy. Among these is the need to identify and support a Lean change leader who possesses those qualities found in other successful "change agents" (e.g., technical skills, credibility, personal commitment and broad support in the organization).

The leaders who championed Lean in the five organizations we studied held varied titles and responsibilities (CEO, vice-president or director) (Table 3). Each of these change agents kept Lean on the agenda, provided vision and inspiration and removed barriers for managers and front-line workers.

Assigning responsibility for driving the work of Lean – planning and execution – appears to be a critical decision for the organization. In two cases, dedicated Lean leadership roles were established: (1) Hotel-Dieu Grace trained a LEA(R)N coordinator to manage Lean (Hotel Dieu Grace labels it "LEA(R)N" to promote the continuous learning aspect of Lean); and (2) Five Hills' Lean expert, Schattenkirk, currently leads and manages the implementation of Lean across 49 projects in Five Hills. At the other hospitals, Lean was built into existing responsibilities. UHN housed its Lean leadership in the project management office, hiring Lean experts to manage projects under a

Figure 3. Four stages of leading change



HRM = human resources management.  
Source: Golden (2006).

**Table 3. Key decisions of early Lean deployment demonstrating various approaches to Lean**

Hospital	Who Led the Change?	Who Drove Work?	How Was Knowledge or Expertise Acquired?	Crisis or Lever	First Value Stream Mapping	First Win	Objective
HDGH	EVP	LEA(R)N coordinator	Training, consultant	ED in newspaper	Portering	ED	Reduce ED wait times
UHN	PMO senior manager	PMO	Hire consultant	CEO's transformation agenda leveraged to introduce Lean	Bullet rounds (GIM)	ED-GIM	Reduce ED wait times
St. Joseph's	Former VP, now CEO	Manager of access services	Consultant	VP challenge	ED admit and discharge processes	ED-GIM	Patient safety
FHHR	CEO, QI	Lean expert	Hire consultant	Provincial government brought CEO to see Lean at VMMC	ED flow	ED	Change in culture
NYGH	VP	Lean deployment leader chaired Flow Steering Committee	Hire consultant	SARS outbreak and subsequent leadership transformation	ED-GIM	ED-GIM	Move patient safety and quality agenda

CEO = chief executive officer; ED = emergency department; EVP = executive vice-president; FHHR = Five Hills Health Region; GIM = general internal medicine; HDGH = Hotel-Dieu Grace Hospital; NYGH = North York General Hospital; PMO = project management office; SARS = severe acute respiratory syndrome; QI = quality improvement; UHN = University Health Network; VMMC = Virginia Mason Medical Centre; VP = vice-president.

director. St Joseph's appointed a manager of access services from the internal medicine floor to lead Lean. Lean at North York General Hospital was led by the director of quality. Each of the leaders who drove the Lean work had varying degrees of Lean understanding; but in all cases, they had ready access to Lean experts or consultants.

Two leadership lessons emerge from these five cases. First, when the CEO was fully engaged in the initiative and worked closely with the Lean leaders, the Lean initiative spread across the organization more quickly. On the other hand, if the change agent was a director, the change tended to be limited to his or her span of influence (creating what could be called a Lean "ghetto"). While the Lean project was important in every organization we studied, we suggest that the highest probability of *broad* success comes when senior leadership is fully behind the change.

Second, and also consistent with earlier change research, we believe that the organizations that achieved the greatest results did so because they not just one but two champions leading the way: A true executive champion at the top of the organization to provide inspiration, and a Lean expert to provide advice and

manage the Lean implementation. In cases where an executive champion was present but lacked a Lean expert, projects stalled. At hospitals where Lean experts were present but the executive was not fully bought in, Lean was limited in its scope. Only when both champions were committed and involved did the diffusion and sharing of implementation responsibility occur and result in the best outcomes.

### Challenges and Additional Lessons Learned

Each of the five organizations studied here characterized their Lean experience as a "success." As with hospitals in the United States, United Kingdom and Australia, mentioned above, Canadian sites reported decreased emergency wait times, decreased patient length of stay, improved operating room usage, more radiology procedures per time period and better infection control outcomes. (Some of the results have been previously described in recent articles in *Healthcare Quarterly* (Adamson and Kwolek 2008; MacLeod et al. 2008). However, leaders of the Lean initiatives also experienced several ongoing challenges as they aimed to implement a sustainable Lean culture. As a

guide for leaders implementing Lean, typical challenges are described below, along with some tactics that were successfully employed to address them.

### Staff Concern about Jobs

Staff are concerned that Lean means cutting jobs. This fear needs to be addressed up front. Hotel-Dieu Grace faced this challenge acutely. With its community tied to automotive manufacturers, Hotel-Dieu Grace staff had been warned about Lean systems – they mean job cuts. In order to counter this myth strongly and firmly, Hotel-Dieu Grace established a core rule of Lean: *no jobs are lost because of Lean*. This rule protected the interests of staff, allayed concerns and provided freedom for the staff to be creative.

### Flavour of the Month

Staff believe Lean is the flavour of the month. In the shadow of other failed process improvement initiatives, Lean may face intense skepticism. However, Lean differs in the way it engages front-line staff. Front-line workers develop ideas and make changes rather than having process changes imposed on them from above. Two effective tactics used by the hospitals to confront this challenge were demonstrating results from elsewhere and having senior-level leaders speak in terms of years of commitment to Lean.

### Slow Engagement

Physicians are slow to engage. All five hospitals found it difficult to get physicians “in the room” to plan improvements. The reasons for the lack of physician engagement include a substantial opportunity cost because of fee-for-service payment schemes and cultural barriers.

One way hospitals have engaged physicians is by paying them, to make it worth their time. Another is more creative: pick an issue of key concern to physicians and deliver results to build physician interest and faith in the Lean initiative. For example, a physician may be frustrated by time wasted looking for a central line kit in the storage room. Performing a Lean initiative to reduce waste of motion using Lean tools will demonstrate the value of the Lean process, even in this localized case, thus increasing the likelihood for greater subsequent involvement.

More generally, change leaders need to address the “WIFM” question (“What’s in it for me?”). In an age of shrinking resources and increasing demand, purchasing support from physicians or anyone else is problematic. Thus, reframing of opportunities needs to occur. Rather than buying support, for instance, Lean initiatives may promise the reward of reducing the bottlenecks that physicians have been grouching about for years. In all cases, WIFM must be answered; but the solution

need not involve rewards other than the removal of obstacles to the work of healthcare professionals.

### Challenge of Sustainability

As with any change initiative, the Lean initiative is challenging to sustain. To address this, Lean must first be treated as a long-term commitment. Five Hills speaks of Lean as a 50-year project. Establishing its longevity is important for sustaining the change. Second, the cultural penetration of Lean concepts must be made a primary aim of the initiative. The principles must be taught to those who will practise it. Those who truly understand Lean will see its value and begin to apply it to their work; their actions and news of their successes will spread the idea. All of the hospitals described a point – a “tipping point” – at which Lean leaders no longer had to “push” Lean ideas out to staff. Instead, staff started to “pull” Lean and demand it for themselves. For example, Five Hills has a regular Rapid Access Process Improvement Team (RAPIT) team that introduces Lean in small bursts on three consecutive Tuesdays. Third, Lean must feel like a natural part of day-to-day operations, not an isolated initiative. For example, kaizen events are held regularly on the third week of each month at North York General Hospital to maintain a sense of rhythm. Finally, results must be demonstrated.

### Negative Connotations

Lean language may evoke negative images of shedding jobs, trimming fat and aiming for ruthless efficiency. Five Hills labelled the initiative “Pursuing Excellence,” emphasizing the kaizen continuous pursuit of perfection (like Toyota’s Lexus brand). As mentioned earlier, Hotel Dieu Grace labels it “LEA(R)N @ HDGH” as a way of promoting the continuous learning aspect of Lean in appealing to staff.

### Future of Care: Aligning Delivery by Value Stream along the Patient Journey

Lean hospitals look at the delivery of healthcare from a new perspective. Instead of organizing a hospital by function – wrought with barriers, leading to waste and repetition – there is the opportunity to arrange delivery by value stream, from arrival to departure. According to LEA(R)N coordinator Nicki Schmidt at Hotel-Dieu Grace, “We don’t serve patients of 5 South, 6 East or the Emergency Department. We are here to deliver care across boundaries and silos along value streams. That requires us to look at where we are providing value according to the patient, and that opens up a whole new way of thinking and ways to improve care.”

We can imagine that patients of the future will enter into a specific value stream (e.g. medicine-short stay, surgery-long stay). The hospital will add value at every step of the way, from entrance to discharge, and every staff member will be empow-

ered to eliminate any wasteful activity.

This cross-functional approach to delivering value is how Toyota builds cars and beats its competitors – in quality, product development time and profit. It also provides insights into how we can face our current challenges in healthcare: remove waste to improve the quality of patient care and increase the number of patients we serve, all while reducing costs and the time patients wait.

The first step on a Lean journey begins by experiencing Lean in action. All you have to lose is the muda.

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