

## **Assembly required**

Health care from the Toyota factory floor

Tom Blackwell, National Post

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David Ng and his colleagues used to look sheepishly at the hospital advertisements across the river in Detroit, colourfully promoting emergency-ward wait times of as little as 29 minutes -- and free sports tickets for patients forced to wait longer. At Dr. Ng's Hotel-Dieu Grace Hospital of Windsor, Ont., on the other hand, residents of the car-industry city had to line up in emergency for hours, with not even a remote chance of compensation.

His team finally found a treatment for those chronic backlogs, though, and now the idea behind it -- borrowed from the auto industry itself -- is taking Canadian health care by storm.

A study just published by Dr. Ng's team suggests that adopting an assembly-line process pioneered at Toyota Motor Corp. had slashed the emergency department's lengthy wait times, results many others are hoping to match. Toyota is making headlines these days mostly for production defects, but its so-called Lean manufacturing philosophy has been adopted in one fashion or another by close to half of this country's health-care facilities in the last two to three years, one expert estimates.

The Windsor study appears to be the first Canadian research in a peer-reviewed journal to report scientifically on the front-line impact of the system. The Toyota principles have also been used, though, to eliminate delays plaguing pathologists in Ottawa, boost cancer-screening productivity at a Moose Jaw, Sask., hospital and get new mothers home faster after being discharged from a Vancouver maternity ward.

"I believe strongly that we are creating a new norm," says Tim Burns, who oversees an Ontario government program aiming to apply the Toyota system to 90 of the province's hospitals by 2011. "There is evidence that it works. It's a pretty enduring fad."

As the concept becomes de rigueur, however, some red flags are going up. One consultant says that many health-care facilities are being offered a watered-down version of the system that may line the pockets of the advisors hired to help them but will bring about little lasting change.

"A lot of health-care facilities are getting ripped off," said Tim Hill, a veteran Lean expert based in London, Ont. "There is a lot of hit and miss out there.... You need to instill a problem-solving culture, so you can get to the root cause."

The Toyota production system, coined "Lean" by the American authors of a 1990 book on the company, was developed by the car maker after the Second World War, its goal to focus efforts on only what offers value to customers, largely by cutting waste and empowering employees to devise efficiencies.

The multi-stage process includes: "value-stream mapping," where the organization's production process is laid out in detail to help identify glitches; "Kaizen" meetings at which front-line workers brainstorm efficiency ideas; just-in-time delivery of supplies; and the concept of using visual cues to help employees streamline their work.

The idea was widely applied in the U.K. and U.S. health-care systems in the early 2000s -- and across the manufacturing industry a decade or more earlier, Mr. Hill said.

Though Canada's health system is also hampered by a serious shortage of doctors and nurses, there is ample waste to trim using systems such as Toyota's, argues Michael Carter, a professor with the University of Toronto's Centre for Research in Health Care Engineering. One problem is that physicians -- mostly private entrepreneurs -- and others tend to work in isolation, making it difficult to smoothly co-ordinate the system, he said.

"So many people in health care say [about Lean] ... 'You're treating us like we make cars and widgets,' and their back goes up," said Prof. Carter, who has worked extensively with the Toyota concepts. "They say, 'We're dealing with patients, with people.' Yeah, but you're dealing with them really badly."

At the Hotel-Dieu emergency department, value-stream mapping revealed some key problems, and surprisingly simple fixes, the doctors note in their study in the Canadian Journal of Emergency Medicine.

Staff realized, for instance, that they needed to not only get patients into the department faster, but treat them and discharge them sooner, freeing up beds for other patients. One solution was to put the less-acute patients in a separate stream with their own dedicated staff. That way, the person with a sprained ankle would not be left waiting for hours while his or her nurse concentrated on the patient next door with chest pains.

Porters in the past escorted patients to the X-ray suite, but would only make the trip after collecting several people, bunching up the system. So the hospital painted directional lines on the floors that allowed a constant stream of patients to guide themselves to the imaging room.

"Just like a factory would have tape on the floor and organize their factory in a very logical fashion, we did that in our department," Dr. Ng said.

The result? The average time between a patient's arrival and seeing a doctor fell to 78 minutes from 111; the total stay dropped to an average of 2.8 hours from 3.6; and the share of patients who gave up waiting and left before seeing a doctor shrank to 4.3% from 7.1%.

The lack of change elsewhere in the hospital initially stalled the emergency department's advances, but other wards have since adopted Lean with success, said Dr. Ng. The radiology department cut wait lists for certain scans to two days from two weeks by eliminating some paperwork and standardizing the work habits of doctors, he said.

In a Toyota-system project in Ottawa, a team of pathologists had wait times that totalled 70 years each when the delays facing all patients were added together, said Mr. Hill. Those backlogs were cleared with various changes, including use of voice-to-text computer software to speed up transcription of pathology reports.

The Ontario government program has already implemented Toyota Lean at five hospitals in the Waterloo area, bringing about significant -- if not dramatic -- cuts in wait times and the number of patients leaving before being treated, said Kate Pengelly, ministry lead for the project.

Among the innovations was a creative visual cue: Electronic white boards that alerted visitors to when their relative would be discharged and would need help to get home, speeding up the crucial bed turnaround time to about 70 minutes from three or four hours.

At the Moose Jaw Union Hospital, mapping of a unit that performs endoscopies -- procedures where an instrument is fed through the digestive tract to look for disease -- found that an inefficient system for ordering supplies was wasting equipment and workers' time, said Ed Seman, the official who oversaw the project. Changes not only led to a just-in-time stocking of supplies, so fewer goods expired before being used, but freed up enough employee hours that the team could do 300 more endoscopies a year, he said.

Success with the system, though, is not universal. Prof. Carter acknowledges that Toyota Lean has become a "buzz word" that is not always properly implemented. But at least, he said, the concept has prodded health care to look for waste and inefficiency.

"The word is out there. Lean has lit a fire under people," said Prof. Carter. "From that perspective, it's great."