

# LEAN TRANSFORMATION: FOR WHEN CUTS DON'T CUT IT

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# Upcoming crisis..

- Obesity crisis
- Behavioural pathogens crisis
- Demography crisis
- Error rate crisis
- Dysfunctional decision-making crisis
  
- And many more...

# Obesity crisis

Research has shown that as weight increases to reach the levels referred to as "overweight" and "obesity," the risks for the following conditions also increases :

- Coronary heart disease
- Type 2 diabetes
- Cancers (endometrial, breast, and colon)
- Hypertension (high blood pressure)
- Dyslipidemia (for example, high total cholesterol or high levels of triglycerides)
- Stroke
- Liver and Gallbladder disease
- Sleep apnea and respiratory problems
- Osteoarthritis (a degeneration of cartilage and its underlying bone within a joint)
- Gynecological problems (abnormal menses, infertility)

# Behavioural pathogens crisis

- As if the obesity problem wasn't bad enough, they are often coupled with the other “bad” things people do to themselves.
- From smoking to a lack of exercise, behavioural pathogens add to the healthcare costs.
- As people age, the impact of behavioural pathogens becomes worse.

# Demography crisis

- The age wave means that 50% of nurses etc. will retire in 5 years.
- That same age wave means that more people will be retiring and they will
  - Pay less into provincial coffers
  - Expect an escalating level of service in non-traditional and traditional service delivery areas

# Error rate crisis

- Errors are becoming more costly for hospitals, but patients and their loved ones have long felt the effects of the patient safety and quality problems in the industry.
  - The Institute of Medicine estimates that nearly 100,000 patients die in hospitals each year due to medical errors and harm to 2,000,000, with more than half of these errors being preventable.
  - This is three times the number of people who die on highways and does not include deaths that occur in ambulatory settings or deaths after discharge that resulted from medical errors when the patient was hospitalized.

# Error rate crisis, continued

- The New England Journal of Medicine reported in 2003 that the quality of adult healthcare in the US was startlingly poor. In that study, 439 indicators of clinical quality of care were reviewed from the medical records of 6,712 patients, for 30 acute and chronic conditions, plus prevention. Participants received about half of the prescribed care. The conclusion: the “defect rate” in the technical quality of American healthcare was about 45%.
- Lean has been used to tackle hand washing and hospital-borne infections. The CBC reported that every year, 250,000 Canadians pick up infections while they are in hospitals being treated for something else. That's a staggering one out of every nine Canadians who are admitted to hospital becoming infected while the prevention was blazingly simple. Every year, those infections kill more than 8,000 people.

# Error rate crisis, continued

- Also from the CBC:
  - Another study estimated the cost of MRSA alone to the healthcare system at \$100 million annually. Although it's difficult to pinpoint the exact cost of all hospital-acquired infections, some Canadian infection control experts have estimated it's as high as \$1 billion annually.
  - With better infection spread control, for example, better hand washing, an estimated 30 to 50 per cent of infections would be preventable in Canadian hospitals. Yet healthcare workers usually only wash their hands between 5-30% of the time.
  - Excuses for avoiding standard work abound – these are the same types of excuses that healthcare workers use to avoid Lean and standard work across many healthcare settings. A study in Montreal found that occupational and physical therapists had the highest rate of compliance to MRSA hand washing guidelines, while nurses complied more often than doctors, cleaning staff and people visiting the hospital.

# Error rate crisis, continued

- Also from the CBC:
  - About as many Canadians die from antibiotic-resistant hospital infections than car accidents, AIDS and breast cancer put together.
  - A 2002 study found the most common hospital-acquired infections were: urinary tract infections, pneumonia, surgical infections, bacteremia and *Clostridium difficile*-associated diarrhea (respectively). The study by the Canadian Nosocomial Infection Surveillance Program and the Canadian Hospital Epidemiology Committee of Health Canada examined 29 acute care hospitals. The same study found that patients in intensive care units were more likely to have additional hospital infections. Infection rates were lower for children than adults, and higher for infants than older children.

# Dysfunctional decision-making crisis

- Frankly, healthcare has viewed quality and capacity in a very naïve manner. The successes noted earlier in this book are all cases of overcoming these threats, whether or not they were explicitly recognized.
  - Quality has typically been addressed by reducing the number of presenting problems (treating the symptoms and not the root causes)
  - Capacity has typically been addressed by asking for more money for more capacity – more beds, more physicians, more nurses, etc.

# And many more crises...

- Medical Decision-Making Biases Are Partly to Blame
- 1) Dysfunctional decision-making: Kevin Patterson warned about the risks of allowing biases in medical decision making. He noted that:
  - The point isn't that some medical treatments don't work as well as it is thought, or even that in treating patients, doctors sometimes hurt them -- this has always been true. The point is that the conclusions doctors reach from clinical experience and day-to-day observation of patients are often not reliable. The vast majority of medical therapies, it is now clear, have never been evaluated by systematic study and are used simply because doctors have always believed that they work.
  - The impact (and truthfulness) of this can be seen in recent reversals about the efficacy of hormone replacement therapy and arthroscopic knee surgery, to name only two items with large impact.
- 2) Rush to diagnose: The rush to diagnose, to proceed with the familiar (and fall victim to decision-making biases) means that the healthcare community can be said to work harder and costlier to make poorer decisions.

# What Can Lean/TPS Deliver to Healthcare?

- Lean/TPS efficiency is not driven by reducing headcount, although some Lean “experts” have based their business model on this. Lean efficiency is about the ability to do more work with fewer people – to build sustainable successes with wits, not wallets.
- We know that at least 30-40% of a typical nurse’s time is spent on waste, such as rework and searching for medication or supplies. Some reviews place that value at 90% and higher. Analysis of healthcare processes, similar to processes in other industries, shows that roughly 80-99% of time spent is on waste or non-value added activities. Lean/TPS improvements focus on removing non-value-added steps versus doing value added steps faster.

# Lean in SPD

| <i>Type</i>                        | <i>Laboratory Example</i>                                    | <i>SPD Example</i>   |
|------------------------------------|--|--|
| <b>D</b> efects                    | Mislabeled patient specimens                                 | Wrong trays delivered                                      |
| <b>O</b> verproduction             | “Just in case” blood tubes drawn from patients, but not used | Wrong trays set up   |
| <b>W</b> aiting                    | Specimens waiting in batches for testing                     | OR room waiting for right trays                            |
| <b>N</b> on-Used Employee Feedback | Employee ideas not listened to                               | Employee ideas not listened to                             |
| <b>T</b> ransportation             | Moving specimens long distances from receiving to testing    | Long walks from SPD to OR                                  |
| <b>I</b> nventory                  | Expired test reagents  | Old Doctor’s preference cards                              |
| <b>M</b> otion                     | Technologist walking due to poor layout                      | SPD staff searching for missing or poorly located supplies |
| <b>E</b> xcessive Processing       | Time/date stamps on labels that are not used                 | Time spent creating a schedule that is not followed        |

# Lean in SPD

- Trays coming up to the OR from SPD had a 50% error rate. That error rate was reduced to functionally zero
- SPD made a photo log book of what every tray should look like, staff compared each tray to a photo
- 75% increase in patient throughput
- 90% reduction in appointment backlogs
- Achievement of Zero JCAHO blood recordables
- Lab on-time delivery improved by 46%
- Birthing Center inventory costs reduced by 25%

# Lean in SPD

- Statistically speaking, reprocessing's environmental and economical impact is tough to ignore. Maple Grove, MN-based SterilMed Inc. points out that reprocessing eliminates approximately 2,000 tons of medical waste annually and generates more than \$150 million in annual savings for healthcare providers. "More than 3,000 hospitals use reprocessed devices every day," said SterilMed president and CEO Brian Sullivan, adding that single use device reprocessing is standard practice in 70 percent of U.S. hospitals.
- Ascent Healthcare Solutions, based in Phoenix, reports that in 2007 alone it enabled its partners to eliminate 1,684 tons of waste from their local landfills, resulting in savings of nearly \$1 million--up 31 percent from the approximately 1,283 tons diverted in 2006. Since the company's inception, Ascent has eliminated more than 11,000 tons of waste from making its way to landfills.

# How'd they do that?

- Standard Work
  - Concentrate on physician's procedure cards, not preference cards
  - Put things away where they should be, not where you want to put them
  - Have common labels for things that are called by different names but are the same
- Follow standard work
- Introduce accountabilities

# How'd they do that?

- Go to gemba
- Use Value Stream Mapping
- Use Lean to identify wastes
- Do the right root cause analysis
- Implement the right counter measures
- Check to make sure that things are going well
- Tie individual accountabilities to individual people

# Examples of Kaizen Event Results in Healthcare

- Reduced the footprint for a new lab from 60,000 sq ft to 40,000 sq ft (cost avoidance of \$800,000)
- Improved utilization of equipment, ER, OR, and Procedure rooms by over 20%
- Shortened the lead time from discharge to payment by over 10 days
- Eliminated unnecessary work for support staff, nurses, providers and improved productivity by 15-20%

# One Example...

- Six cardiac surgeons in one hospital each ordered two types of “surgical packs” (one for their coronary artery graft surgeries and another for valve surgeries). Initially, each surgeon argued that their specific kits were needed for some particular purpose.
- Having surgeons be able to use the specific equipment and supplies they want to use sounds like something that would be of value to patients, right?
- But allowing this practice to continue meant the hospital had to work with multiple vendors (having little leverage with any single one of them because of low purchasing volumes), track and stock 12 different kits, and so on.

# One Example, cont'd...

- When the hospital got all the surgeons in one room and had them talk through all the components of their individual kits, it turned out there was more agreement than anyone could have predicted.
- In the end, the surgeons all agreed on just two standard surgical packs, one for each type of surgery. So instead of having to purchase, track, and account for 12 packs, the hospital now only needed to handle two.
- In other words, having some differences in surgical packs was value-added to the patient, but having too much variability was waste: it added to the administrative cost without improving patient outcomes.

# Another Example... Cleveland Clinic

- Over the last few years, complaints about the accuracy and speed of the SPD had arisen from nurses and physicians from surgical services. Instrument problems or delays in delivery would result in the inability to begin a procedure. Incorrect instruments being delivered would mean that the surgical team had to wait for the appropriate instruments. Multiple events in the same day could cause a ripple effect with delays of up to several hours for cases scheduled at the end of the day. These effects were exacerbated on particularly busy days or for emergency cases.

# Cleveland Clinic, Cont'd...

- Delayed cases and even cancellations would result in discomfort for patients. Cleveland Clinic also suffered financial loss due to inefficient resource utilization. Costs from delays originating in the SPD were conservatively estimated at hundreds of thousands of dollars annually.
- The estimate included lost time in the operating rooms and processing fees for incorrect instrument trays. In addition to revenue loss, costs also resulted from patient dissatisfaction and cancellations, and overall loss of goodwill; these intangible costs were more difficult to estimate and were difficult to account for in strictly financial estimates of cost.
- They knew that the conventional solution would have been to purchase more instruments or hire more staff

# Cleveland Clinic, Cont'd...

- Results for the decontamination event included:
  - Redesigned material flow
  - Balanced job duties
  - Developed standard work for jobs (including supervision)
  - Moved bar code station
  - Moved racks to match flow
  - Implemented visual controls for material path
  - Repositioned drier cabinet
  - Initiated work orders for two safety issues
  - Initiated trial of “tags” strategy to keep instruments together
  - Eliminated unneeded equipment and racks
  - Removed the automated conveyor system
- In one week, the team redesigned the process layout of the decontamination area. They reduced the cart breakdown time (which was identified as the biggest driver of process lead time) by 63%. The team also reduced the walking time, which was identified as an inefficient part of the cycle time, by 56%.

# Cleveland Clinic, cont'd...

- Results for the prep & pack event included:
  - Moved work stations
  - Installed “footprints” for cart locations
  - Created material handler assignment
  - Outlined Tech 1 supervisor duties
  - Installed “footprints” for emergency equipment
  - Removed non-value tasks from prep & pack assignment
  - Changed material flow
  - Added tip protectors for sharps at prep & pack
- As a result of the prep & pack redesign, standard work was created, set assembly cycle time was reduced 26%, and missing tool counts went down 25%.

# Questions...

- For answers to questions...
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