Thinking Lean in Healthcare

by **Robert James Campbell**, EdD, CPEHR

Lean thinking is the efficient use of staff, resources, and technology to provide the highest level of service possible to the ultimate healthcare customer: the patient.

In today's volatile healthcare environment, health information managers are being asked to do more with less—less staff exertion, less technology, less time, and less workspace—while providing patients, physicians, nurses, and administrators with a high level of service.[1] To meet increasing demands, HIM professionals can join their healthcare colleagues in looking to lean thinking, a philosophy of management that focuses on process improvement and change management.

Lean thinking can be used to identify and eliminate waste in any activity performed within a facility. Based on the Toyota model, lean thinking focuses on how efficiently resources are being used, and with each step in a given process stops to ask "what value is being produced?" The method can be used to improve service to any group within a facility, including eliminating processes that offer no value to healthcare's ultimate customer: the patient.

At its core, lean thinking involves five steps to improve a selected process: value, the value stream, flow, pull, and perfection.

Value

The question of value is the most important concern within the lean thinking paradigm. Each step in a process should produce value for the customer. The customer, depending on the process, can be a patient, a physician, or an administrator. If a process does not add value it must be re-engineered or eliminated.

Patients routinely get stuck in processes that do not add value to their care. They wait 30 minutes to see their primary care physician, or they fill out a patient medical history form multiple times within the same medical encounter. Those processes were designed to add value to the healthcare professional, not the customer. In lean thinking, a first step in evaluating value is determining who the customer is and looking from his or her point of view.

The Value Stream

The value stream is the steps required to complete a process or service (or in manufacturing, to create a product). Examining the value stream helps to identify waste within a process.

Each step within a process will have one of three outcomes: it will create clear value; create no value but be unavoidable due to configuration of the current process; or create no value and must be eliminated immediately. Returning to the example of seeing one's primary care physician, the step of being examined by the physician adds clear value to the patient. The step of filling out a medical history form multiple times is a step that could be interpreted as adding no value but which is unavoidable due to current processing requirements. Finally, the step of waiting 30 minutes to see the physician adds no value and should be removed immediately.

Flow

The goal of flow is to eliminate the use of batching and queuing within a process. Processes that use batches and queues produce multiple wait times and interruptions.

The US healthcare system is built on batch and queue systems.[2] A patient who feels sick calls his physician and makes an appointment. At the appointed date and time, he arrives at the provider's office and waits to be seen. Upon examination, the doctor may recommend the patient see a specialist, have laboratory tests performed, and even begin taking a prescribed medication. Each step entails waiting for a service or product to be delivered.

Batches and queues are also evident in processes involving reimbursement, coding, and chart review. Even electronic health record systems, promised to streamline healthcare, rely on some form of batching and queuing. For example, a patient's phone message and request for appointment may be stored in a queue on the toolbar of the physician's computer. If the physician reviews his queue before going home and calls back only those patients that he thinks are the most severe, the system actually impedes providing needed treatment in the timeliest manner.

The ultimate goal of flow is to ensure that a process is continuously worked on until it is complete. For the patient, this means receiving the care he or she needs without waiting, interruptions, and suffering unnecessary pain.

Pull

Pull has been described as "performing work as it is requested or needed by a step in a value stream."[3] This is the opposite of push technology, where a product can be created when there is little or no demand. Push processes can lead to large inventories and related costs to maintain them.

Push leads to steps in a service being performed out of order if a next step in the process is not ready. For example, during the transfer of a baby from a surgical suite to a neonatal intensive care unit (NICU), if the baby arrives at the NICU and the respirator and the respiratory therapist are not waiting for the patient, there is a problem. The baby has been pushed to the NICU without the appropriate services and staff on hand to provide appropriate care.

Pull works to ensure that the respirator, the respiratory therapist, and charge nurse are ready and waiting when the baby arrives in the NICU.

Perfection

A key tenet in lean thinking is that no matter how many times a process is improved, it can be further enhanced. The idea of perfection rests on the notion of "continuous improvement through incremental change based on outcomes."[4]

Use of the plan-do-study-act cycle helps in the strive for perfection. In any process improvement initiative using lean thinking, a small incremental change is recommended based on study of the process. The recommendation is put into place and then studied to determine its impact. If the impact is positive, the change is incorporated in the process, and the cycle begins anew.

Thus far, the discussion has focused on the core concepts associated with lean thinking. In what follows, the discussion will identify the major types of waste that can be found in healthcare processes and describe a technique, value stream mapping, that can be used in process improvement.

What Is Waste in Healthcare?

Waste, according to Taiichi Ohno, the Toyota executive responsible for the development of lean thinking, can be described by the Japanese word *muda*. According to Ohno, *muda* is evident in mistakes that require correction, production of goods without demand, inventories and remaining goods that are stockpiled, steps within a process that are not needed, unnecessary movement of employees, movement of goods from one place to another without a plan, employees standing idle waiting for an activity to be completed, and merchandise and services that do not meet the needs of the ultimate customer.[5]

Healthcare has its own specific types of waste, which include information, process, and physical environment.

Information Waste

Healthcare is fraught with information waste. Take, for example, the redundant input and output of information. How many times are patients required to fill out multiple forms that ask the same questions, only to have their healthcare provider pose the

same question during a face-to-face interview?

The solution is to work from a single source of information. However, until the electronic health record becomes ubiquitous, the collection of redundant data, some of which may never be used, will be a problem.

Associated with information waste is the problem of incompatible systems. Many systems use the same process but are unable to share data. This can lead to medical errors and the consumption of valuable computing and staff resources. Other issues associated with information waste include manual checking, reentering data, converting formats, data errors, and data safety issues.

Process Waste

The biggest type of process waste in healthcare can be termed defects. A defect occurs when a process or service does not serve the purpose for which it was created. With an estimated 44,000 to 98,000 deaths due to medical errors occurring in the US, process waste is a serious problem.[6] Other types of process waste include rework, workarounds, approvals, and waiting.

Physical Environment Waste

The most common physical environmental waste is safety. This type of waste occurs if physicians do not wash their hands or members of the operating team walk into the surgical suite without adhering to proper sterilization techniques. Such practices can lead to long-term illnesses and death due to hospital-acquired infections, such as *clostridium difficile* and *methicillin-resistant Staphylcoccus* .

Other types of physical environmental waste include movement; unclear roles, responsibilities, authority, and accountability; and lack of training.

Value Stream Mapping

Value stream mapping identifies waste within a process. It helps the organization visualize a process, identify problems within the process, and provide direction for transforming it. Value stream mapping begins by defining the current state—how a process is currently being performed. This helps uncover waste while providing a big picture as to how the process operates within an organization.

Once the current state is documented, the organization works toward the creation of a future state, the projected, improved process. The value stream mapping procedure consists of six steps: document the customer and his or her need; identify the main steps within the process; select metrics to measure each step (process time, lead time, changeover time, percent complete, and accuracy); perform a value stream walk-through of the process; establish how steps in a process are prioritized; and calculate summary metrics.

Managing Change

HIM professionals can take several roles in implementing lean thinking within organizations. The first role is as a systems analyst charged with investigating how current processes operate before implementing new technology such as the electronic health record. Failure to perform process analysis will result in "the automation of outdated and inefficient processes."[7]

HIM professionals can also take the role of an administrator charged with streamlining hospital services and integrating individual departments into programs.[8] A third role is that of safety analyst. Using lean thinking, safety analysts can work to reduce hospital-acquired infections and medication errors and develop guidelines to improve patient safety.[9]

It must be noted that lean thinking is a technique for creating change. As is the case in most organizations, healthcare professionals can become complacent and begin to believe that their way of doing things is the best.[10] Lean thinking challenges this belief by asking individuals, departments, and administrators to examine the value being produced for the customer and then engaging in the practice of continual improvement. Without the involvement and participation of healthcare professionals and staff, any lean thinking initiative will fail to take root. Everyone within the organization must be involved to ensure success.

More on the Web

http://journal.ahima.org

Read how health services and information management students at East Carolina University learned about lean thinking by applying its techniques to the patient transfer process.

www.ahima.org/perspectives

Read the research paper "Teaching Workflow Analysis and Lean Thinking via Simulation: A Formative Analysis" by Robert James Campbell, Laura Gantt, and Tamara Congdon in *Perspectives in Health Information Management*, the AHIMA Foundation's scholarly journal.

Notes

1. Womack, James, and Daniel Jones. *Lean Thinking: Banish Waste and Create Wealth in Your Corporation*. New York, NY: Simon & Schuster, 2003.
2. Ibid.
3. Bushell, Sylvia, Joyce Mobley, and Becky Shelest. "Discovering Lean Thinking at Progressive Healthcare." *Journal for Quality and Participation* 25, no. 2 (2002): 21.
4. Tsasis, Peter, and Cindy Bruce-Barrett. "Organizational Change through Lean Thinking." *Health Services Management Research* 21, no. 2 (2008): 192.
5. Womack, James, and Daniel Jones. *Lean Thinking*.
6. Kohn, Linda, Janet M. Corrigan, and Molla S. Donaldson, eds. *To Err Is Human: Building a Safer Health System.* Washington, DC: National Academy Press, 2000.
7. Wager, Karen, Frances Wickham-Lee, and John P. Glaser. *Managing Health Care Information Systems: A Practical Approach for Health Care Executives.* Hoboken, NJ: Jossey-Bass, 2005, 173.
8. Tsasis, Peter, and Cindy Bruce-Barrett. "Organizational Change through Lean Thinking."
9. Grunden, Naida. *The Pittsburgh Way to Efficient Healthcare: Improving Patient Care Using Toyota Based Methods.* New York, NY: Productivity Press, 2008.
10. Kotter, John. *A Sense of Urgency.* Boston, MA: Harvard Business Press, 2008.

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