



IBM Watson Health™

## Simpler Consulting's Lean Primer for Healthcare

Learn the basic principles, terms and methods used in identifying waste and putting Lean management to work in healthcare

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**Simpler® Consulting was acquired by Truven Health Analytics®, part of the IBM Watson Health™ business in 2014. Truven Health Analytics was acquired by IBM in 2016 to help form a new business, Watson Health™.**

### Forward

I remember when I led my first Lean transformation journey. I was thrilled with the idea of solving the problems that kept us from achieving our strategic initiatives, but I wasn't sure that I was prepared to lead people toward a new way of thinking and doing. In retrospect, I wish I had a simple tutorial to refer to that would have kept me on the straight and narrow. I would have enjoyed the opportunity to re-educate myself or pass along simple notes to my colleagues.

To help our healthcare leaders prepare for the transformation, Dr. George Palma has created the following Lean Primer for Healthcare. Dr. Palma describes the tools, techniques and principles and how they are applicable in the healthcare setting. As you read the primer, please think about your own experience in healthcare and how this new thinking applies.

Mike Chamberlain  
President, Simpler® North America

## Introduction

When I was a first-year medical student, I often felt overwhelmed by the concepts and terminology I needed to master. Any of us who work in a specialized area must be fluent in the jargon and technical lexicon of our workplaces, but generally we are not at all familiar with the terms and concepts of other work environments. This is true for healthcare leaders, managers, nursing staff, technicians, physicians and others who are involved the processes of providing care.

Our purpose in writing this primer is to introduce the basic concepts and terms of Lean transformation to all who work in a healthcare organization. Because the Lean methods are derived from the improvement philosophies and methods developed in Japan following World War II (especially Toyota<sup>1</sup>), there is frequent use of Japanese terms that may further confuse the reader. [Appendix A](#) is a glossary of Lean terms, some Japanese and many in English. In the text, a word that is in bold font is included in Appendix A. Appendix B contains a selected bibliography for healthcare workers and leaders who want to become more knowledgeable in Lean work and transformation.

Chris Cooper, in **The Little Book of Lean**, captured the key points of Lean in one sentence. Doing Lean: “Continuous improvement of the flow of value via the elimination of waste by the people who do the work, in their workplace, under the caring guidance of a teacher.”<sup>2</sup> We’ll use this definition to dissect the basic concepts of Lean, and then describe other important supporting Lean concepts and tools.

### Continuous improvement

I recall many occasions when a group of “experts” was commissioned to improve some hospital or clinic process. We would meet in committees, perhaps monthly for an hour or two, and determine how the process ought to be changed. Once we had it “just right,” we would write a policy and procedure (P&P) document to the departments and managers responsible for the process. Job done! We were then on to the next project, fully expecting that our new and improved process would do what we intended. This method led to unwelcome surprises—most often with no improvement and plenty of grumbling from the front-line workers.

### Reflection point:

Consider for a few minutes a recent experience that you have had as a patient, family member of a patient, or provider. What type of waste did you encounter? Can you appreciate how different types of waste often occur together or are directly linked? During your work in Lean, you will become quite adept at recognizing waste in its various forms.

This method of improvement has quite a few problems; episodic, prescriptive and created by “experts” who don’t actually do the work. Continuous improvement—**kaizen**—relies on every member of the healthcare team to be trained and empowered to improve value by recognizing and removing waste. Although much of the improvement work resulting in double-digit percentage breakthrough results relies on week-long events—**rapid improvement events** or **RIEs**—a continuously improving organization does their work every day.

### Value vs. waste

Value seems like an easy concept to define, but a difficult one to achieve. This is because value is in the eyes of the beholder—the customer. In healthcare, all work done ultimately comes down to taking care of our patients and their families. Thus, the patient is the customer. True, there are many other stakeholders in the processes of healthcare. Physicians, nurses, medical students, other providers, administrators, vendors and others may be tempted to put themselves in the customer role, but in the final analysis, everything each of these folks does ultimately filters down to the patient. Therefore, the patient defines value, and until and unless this basic reality is acknowledged, Lean transformation is not possible.

So, for the patient, the work of healthcare can be defined as:

**Work = value-added + non-value-added activities**

If our work does not add value to the patient, we call it waste (**muda**).

We define eight types of waste and provide common examples from healthcare for each type:

- **Overproduction** (doing more or making more than you need to)
  - For example, IV premix solutions that are made in large numbers by the pharmacy in anticipation of some future need.
  - Removing more bodily fluids than necessary for performing tests.
- **Defects** (the process produces an error, a common cause of patient harm)
  - Placing one patient’s laboratory label on another patient’s specimen.
  - Operating on the wrong site or side.
  - Implanting the wrong lens during cataract surgery.
  - Failing to prescribe a statin drug for a patient with an acute myocardial infarction.
- **Movement or transportation** (unnecessary movement of objects)
  - Think of flocks of IV poles, wheelchairs, and tanks of oxygen moved here and there on a hospital unit. They always seem to be underfoot or in the way, unless you need one!
  - Moving or transporting the patient multiple times, even back and forth, when process improvement might be able to redesign flow for moving the patient only once.
- **Inventory** (storage of overproduction)
  - Storing the IV premix solutions that were produced in anticipation of some future need.
  - Storage of patient care supplies, bed linens, etc., in clean storage rooms.
  - Patients awaiting examinations and treatments can also represent the equivalent of inventory. We store this inventory in specially designed containers called “waiting rooms.”
- **Process waste** (overprocessing or process re-work)
  - Collection of patient information often ends up being duplicative. For example, completing demographic and insurance forms in the emergency department (ED) and going through the same data collection with the admissions department is a common form of overprocessing.
  - Advanced printing of patient information labels with excess labels needing disposal after the end of treatment.
- **Waiting time**
  - This is easy—we even have special spaces for waiting, called, of course, waiting rooms.
  - Our customers are called “patients” and this word originally meant “one who suffers” and now we ask them to suffer patiently.

- **Unnecessary motion** (unnecessary movement by people)
  - This is easy too—any time a provider leaves the patient’s side to fetch equipment, supplies, needed forms, etc. represents this type of waste. Watch physicians and nurses in the ED, ICU or medical-surgical floors to learn how much of their motion is unnecessary.
- **Unused human potential** (failure to utilize staff in an optimal way)
  - The registered nurse (instead of a medical assistant) who is rooming patients is not using her training and experience to the best advantage.
  - Creative, engaged people on our staff who are not used to improve the work we all do.

### The flow of value: The value stream

In healthcare, consider that it is the patient who flows through the system to obtain diagnosis and treatment, which is valuable to him or her. There are several other things that flow as part of a patient’s care experience:

- **Information** (medical record, tests, orders, schedules)
- **Materials** (specimens, supplies, medical implants/ devices)
- **Quality** (reporting, documentation)
- **Clinician/physician flows**

We call these flows through the processes of care the “value stream (VS).” The patient enters the stream at some point and exits it at another. Consider a typical outpatient appointment. The patient leaves home and drives to the facility, finds a place to park, walks to the clinic suite and presents himself to the reception desk for registration. Then, the patient waits to be roomed, has vital signs taken, medication reconciled and waits in the examination room for the physician to arrive. After the physician examines the patient and begins treatment (or orders diagnostic studies), the patient will be discharged, pick up medications and obtain the after-visit summary. Finally, the patient leaves the clinic, finds his car and drives off. When conceptualizing this value stream, we need to define the entry and exit points. We call these the “trigger” and “done” points, respectively. These points define the “scope” of the value stream. In our example, the trigger could be when the patient’s car arrives in the parking lot and the done when the patient drives away. Since parking lot conundrums will not be something the clinic team can influence in their improvement work, the scope would perhaps be better defined by what happens in the clinic. The trigger would be when the patient arrives at the reception desk, and the done would be the patient leaving the clinic. The lack of parking space and the long distances patient must walk would be “out of scope” for this particular value stream.

As the improvement team evaluates the value stream, everything that occurs to the patient between trigger and done is formally and thoroughly evaluated, timed, measured and documented. This effort is called the “value stream analysis” or VSA for short. Once the VSA is completed, the improvement work of eliminating waste can be started by scheduling process improvement work that is targeted to the wastes which were uncovered. This work will generally include RIEs, “Just Do Its (JDIs),” and projects as determined by the value stream steering group (see the next section).

### The people who do the work

In our clinic value stream outlined above, we understand that certain types of people touch the patient: receptionist, medical assistant, physician, nurse, etc. Therefore, when we work to improve the patient care experience in this value stream, each of these types of healthcare workers must be engaged to craft the solutions. Note that I did not mention managers, directors, or supervisors. Although management will be critical to ensuring that any improvements created by the work team are implemented and followed, the work must be done by those who know it best. Typically, this work is done in formal REIs, which are week-long activities that guide the front-line workers to craft solutions for waste and flow in their value stream. Once the new standard work has been defined by the RIE team it is implemented in the clinical setting.

### In their workplace

When new standard work, crafted with the aim of eliminating waste and improving patient flow, has been implemented, it must be taught to each worker in the clinic. Its implementation must be the priority of clinic staff and management. This is facilitated by making the processes visible to all who work and visit that clinic via “visual management,” which could include the display of the RIEs, process control boards and other visual displays that depict the clinic’s goals and performance in achieving them. These are typically posted on a wall in a highly used area of the **gemba** so as to be completely transparent to all in the clinic. These displays often form a focal point for leadership visits to the clinic, where leaders seek to learn what the clinic staff is doing and how they are faring in their quest for improvement.

### How are we doing: True North Metrics<sup>3</sup>

Since our goal in doing transformative work is to improve the processes of care and the patient care experience, how we measure that improvement becomes a critical feature of every event. This ties in with the concept of standard work. If there is no standard to measure against, then it is impossible to know

if we are getting better. Traditionally, Lean transformations of healthcare organizations measure improvement in five domains.

**1. Human development** — Since the most important element of any organization is its people, the development of the workers is given highest priority. This might be measured by the number of front-line workers who participated in an improvement event, by employee satisfaction scores or by employee turnover rates.

**Breakthrough goal:** Every physician, nurse and other staff member is capable of solving problems and creating corrective actions on their gemba.

**2. Quality/safety** — From our patients’ point of view, it is critical to ensure the safety and effectiveness of the care we render. Thus, the measurement of quality is part of every value stream. Examples could include proper medication reconciliation, cancer screening rates, management of chronic diseases, etc. In healthcare, we have no lack of evidence-based practices to fuel our drive for quality and safety.

**Breakthrough goal:** Zero defects in patient care.

**3. Delivery** — Since our clinic value stream seeks to improve the patient care experience, our delivery of service can be improved by eliminating wait times, unnecessary motion and other forms of waste. Measuring the reduction of wait times or total time in clinic would be helpful in learning if our clinic is getting better.

**Breakthrough goal:** Provide patients with immediate access to our services.

**4. Cost/productivity** — One of the **Institute for Healthcare Improvement (IHI)**’s aims is to reduce the per-capita cost of healthcare.<sup>4</sup> Metrics that look at cost of care are important, as is a measure of productivity. For example, if we eliminate waste and improve flow, the costs of care will diminish and we will be able to manage the medical care of more people with no increase in cost.

**Breakthrough goal:** Reduce the cost of patient care by 10 percent.

**5. Growth** — Let’s face it: Healthcare is a business and the essence of the success for any business is growth. For a healthcare organization, whether hospital, medical practice, network or another part of the continuum of care, growth translates into how many patients and members we have under our care.

**Breakthrough goal:** Grow the number of covered lives in our network by 15 percent.

## Transformation

Simpler Consulting, is not merely a purveyor of Lean tools and techniques. Rather, our aim is to partner with our client healthcare organizations in the work of transforming themselves into a learning and problem-solving enterprise. Clearly, this involves a change in the way people see and do their work. These changes fall upon leadership as well as front-line workers of all types. Each group—leaders, managers, front-line workers—must embrace the concepts and methods of Lean in order to transform the organization. And, each group has a different role to play in that transformation, defined in large part by their standard work. A learning organization is inquisitive, humble, and sees error not as personal failings, but as a problem with process that needs to be improved.

How does one know if their organization has been transformed? A quote from Eiji Toyoda, one of the driving forces behind Toyota's transformation, sheds light on this question: "Problems are rolling all around in front of your eyes. Whether you pick them up and treat them as problems is a matter of habit. If you have the habit, then you can do whatever you have a mind to."<sup>5</sup> When leaders, managers and front-line workers learn to see their work through a "Lean lens" and search for opportunities to improve, it will become apparent to all that the organizational culture has been transformed. This is difficult work, and it takes time. There are no quick fixes or easy paths to this goal.

## Special concepts and selected Lean tools and techniques

**Takt time** is the rhythm of the output of a work process. It uses the demands on the process and the time available for the work to calculate the needed rhythm. For example, a blood drawing station in a large clinic has an average daily demand for 300 phlebotomies and is open for 10 hours each day. The available time of (10 hours x 60 minutes per hour) 600 minutes, divided by 300 phlebotomies equals a takt time of two minutes per phlebotomy. If the demand was even throughout the day and the takt time maintained, no patient would have to wait. Takt time is a critical concept when looking at work pace and capacity.

The **A3** is the major tool for decision-making and improvement work. A3 is named for the metric paper size used to create it (approximately 11 x 17 inches). The A3 is a scientific, tried-and-true method for defining what you want to accomplish and why, and offers a template for approaching change from the initial (current) state to the target (future) state. The gaps between

the initial and target states are analyzed and then solutions to close the gaps are crafted. Simpler employs a nine-box A3 as shown in Appendix C. Please review this template carefully. The A3 is a great communication tool, too. A visitor to a value stream can read the A3 and in a few minutes know exactly what is going on.

**6S** is a simple tool that arranges and organizes the workplace, making the workplace more productive, cleaner, safer and less frustrating.

**Standard work** is the best known way of doing a task or job. This is generally defined during an improvement event by the people doing the work. An example would be what a medical assistant does when rooming a patient: obtain vital signs and weight, review current medications, review immunization status, review cancer screening status as appropriate and obtain other information such as the reason for the visit. We expect that every medical assistant would do this with every patient, every time.

**Five whys** — "Ask why five times." This simple tool aims to reach the root cause of the gap between current state and target state. An example: "Why do we have such a long wait for new patient appointments?" Because we don't have enough appointment capacity. "Why is there not enough appointment capacity?" Because there are not enough physicians in the clinic seeing patients on a daily basis. "Why are there not enough physicians in the clinic?" Because the physicians are out of the clinic in the hospital, attending meetings, taking time off, etc. "Why are the physicians not in the clinic?" Because there is no clear expectation of time in clinic and no time-off standards in place. "Why are there no standards regarding clinic time and time off?" Because physicians fear a loss of autonomy and physician leadership has not made the case for such work.

**Flow cell** is created by the physical or geographical co-location of processes that flow, one into the other. A great example of a flow cell in action, would be how one American sandwich franchise operates. Nothing is done until the customer starts the process, and everything needed to create the sandwich is located in such a way as to optimize that task: create value and eliminate waste. Another example is the gastrointestinal tract where nutrients flow from mouth to esophagus to stomach to small bowel and finally to colon. Along the way, value is extracted and waste is eliminated.

## Appendix A

Andon = Japanese term for “paper lantern” and used in Lean as a visual system to notify management, maintenance and other workers of a quality or process problem. The centerpiece is a poster or signboard incorporating signal lights to indicate where the problem is located and what it involves.

Gemba = Or genba. Japanese for the “real place” or the place where work is done and value is created.

Gemba coach = A Simpler member experienced in Lean, dedicated to helping with the implementation of standard work and flow in the gemba of a value stream.

IHI = Institute for Healthcare Improvement, an independent, not-for-profit organization that works to improve health and healthcare practices.

JDI = Just Do It (or just stop it). Improvement solutions for waste elimination that are so clear to all that a formal event is not needed to discover or implement it.

Kaizen = Japanese for “improvement” or “change for the better.” It is a philosophy of continuous improvement in the processes of work.

MDI = Managing for Daily Improvement. This is the daily work of everyone, ensuring that standard work is maintained, identifying problems with current processes with the aim of improving them. This work is supported by the gemba coach.

Mission Control = A site where the healthcare organization’s leadership posts its important information about the Lean transformation. This is part of the leadership gemba and where the highest level of visual management occurs.

Muda = Japanese term for waste, futility, wastefulness, idleness. To be sought out and eliminated.

PCB = Production or Process Control Board. A poster or sign board that displays the value stream process metrics and how they measure to the targets for the process. For example, if standard work calls for a patient discharge from the clinic to accomplish five items in five minutes, the PCB would have metrics indicating success in completing items and a mean or median time required. This allows managers and leaders to see at a glance how the work is progressing.

RIE = Rapid Improvement Event. This is the major performance improvement event. It lasts 4.5 days and has a formal structure based on the A3. Updates to leadership occur daily and there is a final report out to leadership on Friday.

Scope = The limits or boundaries of a value stream, improvement event or project. This is defined during the creation of the A3. Activities, processes, locations, etc. are determined to be “in scope” or “out of scope” and thus determine what will and will not be worked on during an event. During the early stages of the transformation, we aim for a scope that is “an inch wide and a mile deep”—narrow scope, deep dive into the value stream. As the transformation matures, the scope expands and becomes wider and deeper.

Sensei = Teacher or coach. Japanese for “one who has gone before.” A Simpler member who is highly experienced in Lean and the Simpler Business System®, and who partners with a client’s leaders, managers, physicians and other staff to transform the healthcare organization. Also called a rhythmic sensei.

TPOC = Transformation Plan of Care. The highest level A3 for a healthcare organization. It defines all the elements (strategy, initial state, target state, etc.) of the A3 for the enterprise level, and it determines the organization’s value streams and the order in which they will be worked. The TPOC A3 is displayed in Mission Control. It is reviewed and updated every 90 days with Simpler’s support and guidance.

Triple Aim = IHI's aims for healthcare:

- Improve the patient experience of care (including quality and satisfaction)
- Improve the health of populations
- Reduce the per-capita cost of healthcare

Visual Management = The use of visual information like story boards, posters and signboards in the gemba to communicate the current state of a value stream, flow cell, work process or other work. These boards are living documents and are updated continuously so that the true current state is always on display.

WGLL = What good looks like.

## Appendix B

**The Little Book of Lean: The Basics** by Chris Cooper

**Simpler Healthcare: Using Lean to Achieve Breakthrough Improvements in Safety, Quality, Access and Productivity** by Marc S. Hafer, CEO of Simpler Consulting

**On the Mend: Revolutionizing Healthcare** by John Touissant, MD, and Roger A. Gerard, PhD, with Emily Adams

**Transforming Healthcare: Virginia Mason Medical Center's Pursuit of the Perfect Patient Experience** by Charles Kenney

**Leading the Lean Enterprise Transformation, Second Edition** by George Koenigsaecker



## About the author

**George Palma, MD**  
Simpler Medical Director

George Palma, MD, joined Simpler in January 2013 in the new role of Medical Director. George's impressive career includes 34 years of experience in clinical neurology and administrative medicine. Prior to his retirement in December 2012, Dr. Palma served as a neurologist with Kaiser Permanente, where he became a passionate student of Lean and an influential leader in the organization's journey.

As a member of The Permanente Medical Group, George served as Chief of Neurology and Assistant Physician in Chief for the Sacramento and Roseville Medical Centers. His responsibilities included leading the medical group's hospital quality and safety work, and operational oversight of the neurology, interventional neuroradiology, and neurosurgery departments at two medical centers. George led the development of a certified Stroke Center and served as its Medical Director for seven years.

In addition to his 19-year career with Kaiser Permanente in Northern California, George had a full-time academic faculty practice at the University of California's Davis School of Medicine, as well as a small group fee-for-service practice in Fair Oaks, California.

We hope you find this helpful and welcome your feedback on what additional topics might be helpful in this format. Please email George at [palmag@simpler.com](mailto:palmag@simpler.com).

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## About Simpler Consulting, part of the IBM Watson Health business

Simpler<sup>®</sup> Consulting, part of the IBM Watson Health<sup>™</sup> business, is a leading management consulting firm that helps organizations around the globe to improve performance through Lean transformations. Since 1996, Simpler has worked closely with clients to foster an organizational culture that continuously seeks out opportunities to make improvements, and to help stimulate business-impacting results. With its proprietary Simpler Business System<sup>®</sup>, Simpler has helped clients to implement Lean transformations across a wide range of industries.

Simpler Consulting was acquired by Truven Health Analytics<sup>®</sup> in 2014. Truven Health Analytics was acquired by IBM in 2016 to help form a new business, Watson Health. Watson Health aspires to improve lives and give hope by delivering innovation to address the world's most pressing health challenges.

## Footnotes

1 Hino, S., Inside the Mind of Toyota: Management Principals for Enduring Growth, English edition copyright (C) 2006 by Productivity Press, a division of The Kraus Organization Limited, ISBN-13: 978-1563273001.

2 Cooper, C., The Little Book of Lean: The basics, Published 2011 by Simpler Consulting, F.P., ISBN: 1475218354, ISBN-13:978147521850.

3 "True North" is a term from the Toyota Production System or the "Toyota Way." The "metrics" term describes measurements that gauge progress toward reaching one's "True North" goals.

4 Institute for Healthcare Improvement, <http://www.ihl.org/Pages/default.aspx>

5 Hino, S., Inside the Mind of Toyota: Management Principals for Enduring Growth, English edition copyright (C) 2006 by Productivity Press, a division of The Kraus Organization Limited, ISBN-13: 978-1563273001.

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