



# Training Within Industry And Lean Healthcare



**TWI Institute White Paper**  
**Training Within Industry And Lean Healthcare**

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## Executive Summary

There is a renaissance occurring in a tried and true method for training supervisors to relate to and instruct employees. Training Within Industry (TWI) is that method. It encompasses a number of programs with a long history of effectiveness including Job Relations (JR), Job Instruction (JI), and Job Methods (JM). The J programs are designed to provide supervisors with proven methods for: solving problems with coworkers (JR); instructing employees in standard work (JI); and improving upon current standard work to improve results (JM). The TWI program is completely consistent with lean thinking and a critical element in the implementation of lean. This is especially true of implementing lean in healthcare. Since its early introduction TWI has been successfully implemented in hospitals and other healthcare settings. Nowhere is training in standard work more important than in healthcare. Examples, such as the work being carried out at the Virginia Mason Medical Center in Seattle, Washington, attest to this. The healthcare industry is entering an unprecedented period of change in which it will be asked to serve more people, with better quality care, more efficiently than ever before. The keys to success will be the elimination of wasteful practices (lean) and training to sustain process improvements. TWI can and should be considered as a strategic part of a comprehensive training program in any organization looking to increase effectiveness and efficiency. For more information on TWI visit [www.twi-institute.org](http://www.twi-institute.org).

### Introduction

**“Hospitals Take Tips From Toyota to Fix Their Ills”**. Would you believe that is a headline from the Wall Street Journal? Well it was, April 9th, 2004 to be exact.<sup>1</sup> In that article the reporter described the efforts of a major hospital to institute the principles of the Toyota Production System (also known as lean thinking) in intensive care units. Their efforts resulted in saving both lives and resources. At the end of the article the CEO of the hospital lamented about how slow the progress had been. “It’s the frustration of trying to transfer knowledge even 50 feet...” she said.

This is an all too familiar scenario: the experts come in and tell the patient care providers how to be more effective and efficient. Everyone is enthusiastic and the new methods work well, for a time. Unfortunately, before long folks are back to doing things the same old way. How do we create a new scenario where the standard methods are used by everyone and then are improved upon rather than abandoned? Many organizations have successfully implemented a long term, tried and true method for making lean reforms stick: Training Within Industry (TWI).

TWI is a program with a long and distinguished history. It is best known for contributing to the war effort during World War II. In fact, TWI is credited by some with helping to significantly shorten the war. How did a training program do this? It was designed specifically to quickly train industrial supervisors to quickly train neophyte workers, like the famous Rosie the Riveter, to do the jobs of the workers pressed into service in the armed forces. In the factories in which warships and planes were produced, supervisors used the techniques taught by TWI trainers to geometrically increase the numbers of workers able to do standard work, thereby maintaining the high levels of production and quality critical to the war effort. While many know about the manufacturing successes of TWI, few know of the extensive use of TWI in the services sector to quickly train workers there, especially in hospitals to make up for the massive shortages of skilled patient care providers.

In this paper, we develop the case for the renaissance of TWI in healthcare. While the situation is very different today than 60 years ago, the challenges are nonetheless daunting. The healthcare industry is undergoing a major restructuring in which demands for greater access and efficiency are putting strains on the current ways of doing business. Many, like Virginia Mason Medical Center in Seattle, are ahead of the curve, implementing lean programs to achieve the goals of continuous improvement of patient care and the elimination of waste. Now they face the challenge of making these reforms stick and are turning to TWI trainers to train **their** supervisors to train their staff in current best practices (i.e. standard work). In this way they institutionalize the best practices and maximize the investment in training.

## The Renaissance of Training Within Industry in Healthcare

The pedagogy that grounds Training Within Industry (TWI) can be traced back to the 18th century but, TWI as we know it, was created in the 1940's by the Training Within Industry Service of the War Manpower Commission.<sup>2</sup> In the all out effort to develop an effective workforce in response to the war emergency the TWI Service called for a completely new approach to the training and use of people in industry.<sup>3</sup> The three programs that grew out of this effort were called the “J” (for jobs) programs.

1. Job Instruction (JI): Trains supervisors how to instruct employees so they can quickly remember to do a job correctly, safely and conscientiously.
2. Job Methods (JM): Trains supervisors how to improve job methods in order to produce greater quantities of quality products in less time by making the best use of the personnel, machines and materials available.
3. Job Relations (JR): Trains supervisors how to lead people so that problems are prevented.<sup>4</sup>

TWI was used extensively and successfully in a broad spectrum of American industry including the healthcare field where the shortages of medical staff, in particular nurses, were being acutely felt.

In 1945 the following was written in the American Journal of Nursing.

Training Within Industry, in hospitals as in industry, is not an experiment or a temporary expedient. Its productive values have been established beyond question and will be as permanent as the continuing uses which are made of it. It is one operating tool that will never wear out or become obsolete.<sup>5</sup>

That was correct except that the continuing uses were centered in post war Europe and Japan rather than the United States. Most notably, of course, TWI was instrumental in the recovery and success of many Japanese companies now pre-eminent globally in transportation and electronics. Japanese industries have continuously used lean thinking in tandem with TWI to advance a culture of continuous improvement.

Over the past decade, TWI has been experiencing a renaissance in the United States. As international quality standards have been imposed in a hyper-competitive global business environment solutions are being sought to maintain and improve the competitiveness of American industries. The TWI “J” programs are seen as a key element in the success of any process improvement initiative.<sup>6</sup> During this renaissance, the main focus has been on manufacturing but the renewed appeal of the program is also being felt in the service sector. The archival TWI materials show TWI training occurred in a wide variety of enterprises including healthcare.<sup>7</sup>

It is interesting that the rediscovery of TWI has been a grass roots phenomenon, not related to any specific government program. Materials have been updated to eliminate anachronisms and gender bias

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but stay essentially unchanged from the original TWI Service manuals. This is part of the appeal of TWI. It is not a fad that will come and go, rather it is a time tested program that is as effective today as it was at its inception. The organizations using it today, to great advantage, are in a wide variety of fields but have in common a commitment to change their culture to one of continuous improvement .

Organizations looking for training solutions are finding TWI and discovering the potential it holds. However, TWI is not easily implemented, it requires excellent training, uncompromising fidelity to the model and continuous follow-up. In order to achieve that companies call on the nationwide network of trainers which has emerged. To insure quality, they seek certified trainers who have been trained by organizations such as the TWI Institute.

TWI trainers now practice from a variety of venues including, Manufacturing Extension Partnerships (<http://www.mep.nist.gov>) and a number of non-governmental organizations that offer TWI training. The TWI Institute ([www.TWI-Institute.org](http://www.TWI-Institute.org)) has taken the lead since 2001 in bringing TWI back into the mainstream of American workplace training. The literature on the TWI renaissance is replete with a growing assortment of case studies in articles and books. Regrettably, unlike the 1940's, there is no clearinghouse for information on the type and number of companies and employees trained and the outcomes of that training.

## The Healthcare Challenge

It is common knowledge that the greater the challenges an enterprise faces the more it needs effective training, which is precisely the reason we believe TWI is so rich with promise for the healthcare industry. It faces unprecedented challenges in the decades ahead. First, let us acknowledge that healthcare in the United States can be the best in the world. Why else would wealthy patients from around the world come here for treatment? At the same time the system, by many measures of over-all quality, is badly in need of reform.

The Henry J. Kaiser Family Foundation has an informative web site (<http://www.kaiseredu.org>) where they define quality of care simply as: “the right care for the right person at the right time, the first time”.<sup>8</sup>

It is beyond the scope of this paper to examine the myriad factors that are examined to create metrics for the quality of healthcare, however, the Institute of Medicine in Crossing the Quality Chasm condensed these measures into six dimensions that included:

***Safety:*** Avoiding injuries to patients from the care that is intended to help them.

***Effectiveness:*** Providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and overuse, respectively).

***Patient-centeredness:*** Providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.

***Timeliness:*** Reducing waits and delays

***Efficiency:*** Avoiding waste

***Equity:*** Providing care that does not vary in quality because of personal characteristics<sup>9</sup>

In spite of the alarming statistics we hear in the media, healthcare in the United States seems to be improving, albeit at too slow a pace. The U.S. Department of Health and Human Services pointed out: “The quality of health care in this nation continues to improve at a modest pace. However, the rate of improvement appears to be slowing. The average annual rate of improvement reported across the core measures included in ...[the] fifth annual *National Healthcare Quality Report* (NHQR) is 2.3%, based on data spanning 1994 to 2005. An analysis of selected core measures, which cover data from 2000 to 2005, shows that quality has slowed to an annual rate of 1.5%.”<sup>10</sup> Over the same period costs continue to increase at a rate more than four times the rate of improvement.<sup>11</sup>

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Most contemporary discussions of the changes that must be made to improve healthcare include two themes. The first theme is equity in the availability of high quality healthcare. Depending on your source, between 45 and 47 million Americans under the age of 65 are without health insurance. The negative health effects of the lack of consistent insurance coverage on children and adults are well documented.<sup>12</sup>

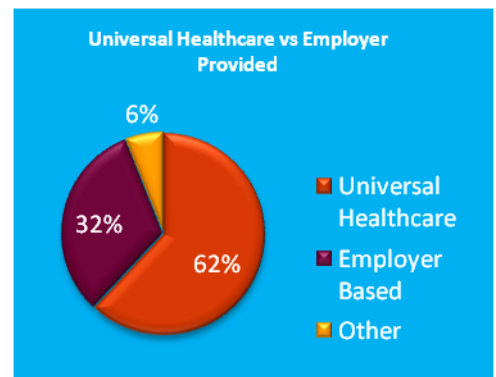
The second theme is cost. Healthcare is too expensive and going to get more so unless steps are taken to curtail the compounding increases. The New America Foundation reported:

- Rising health care costs place increasing strain on state and local budgets and threaten the sustainability of the Medicare and Medicaid programs.
- Health care is consuming a greater and greater share of the federal budget. Over time, health care spending could endanger other vital spending priorities or continue to increase our federal deficits. Former CBO Director and current OMB director, Peter Orszag, has said consistently that rising health care costs are the largest threat to our nation's long-term fiscal future. By 2035, health care spending will account for more than 30 percent of U.S. GDP-double its current share of 15 percent.<sup>13</sup>

In spite of the concerns over cost, there are few who would debate that universal access to healthcare is on the way. ABCNEWS/*Washington Post* polled Americans and by a 2-1 margin, 62 to 32 percent, they preferred a universal health insurance program over the current employer-based system.<sup>14</sup> According to the same ABCNEWS poll, the support for universal healthcare, i.e. universal insurance coverage, is based largely on unease with the current system's costs to patients. Ironically, the opponents of universal coverage cite costs to the taxpayers as one major pitfall of providing such coverage. So the debate continues, but there is one thing almost everyone agrees with: high quality healthcare must become more universally available at a more reasonable cost.

**The question isn't  
how we can afford to  
focus on health care,  
the question is how  
can we afford not to.”**

**- - President  
Barack Obama**



## Training Within Industry in Lean Healthcare

Leatherman and McCarthy said about healthcare:

A key lesson from other industries is that most quality problems can be traced to flawed systems, lack of proper training, and perverse incentives that hinder people from performing optimally. Long-term restructuring programs to build knowledge, standardize processes, redesign systems and reward good performance will be needed.<sup>15</sup>

How do we increase quality and availability and reduce cost at the same time? One answer is **lean thinking**. It isn't simple and it isn't easy but it works. **Lean thinking** is defined as analyses of workplace processes which use the following five lean principles.

1. Specify *value* by specific product or service by asking the customer.
2. Identify every action required to create order and make a specific product or deliver a service and document it in a *value stream map*.
3. Make *value flow* without interruptions by eliminating barriers.
4. Let the customer *pull* value from the enterprise.
5. Pursue *perfection* in the relentless pursuit of discipline and the elimination of waste.<sup>16</sup>

Healthcare professionals may be unfamiliar with some of the terminology used such as *value, flow, value stream map* and *pull*, but these concepts quickly become a part of the vernacular once they start to think lean. Dr. Gary Kaplan CEO of Virginia Mason Medical Center, advises his colleagues as follows: "Do not let the new concepts or terms deter you .... We can create a better, safer, more efficient, and higher quality healthcare system if we are willing to embrace these new methods and are truly willing to lead."<sup>17</sup>

The application of lean principles in the healthcare system holds the promise of improving quality, increasing access and decreasing costs. This may seem too good to be true until you consider the effects of applying these principles in an organization with top down support for bottom up improvement. The Institute for Healthcare Improvement in "Going Lean in Health Care" supported this notion. They said: "While skeptics are right when they say, 'patients are not cars,' medical care is in fact delivered in extraordinarily complex organizations, with thousands of interacting processes, much like the manufacturing industry. Many aspects of the Toyota Production System and other lean tools therefore can and do apply to the process of delivering care."<sup>18</sup>

The effects can be dramatic. Can you imagine the savings and increased capacity if the staff in medical facilities focused on reducing waste in the following seven areas?

- Over Production (e.g. paperwork)
- Wasting Time (e.g. patient wait time)
- Waste of Stock on Hand (e.g. stock exceeding shelf life)
- Waste of Movement (e.g. unnecessary and inefficient placement of personnel and resources)
- Defects (e.g. treatment mistakes)
- Waste in transportation (e.g. moving people and things around in an inefficient manner)
- Waste in Processing (e.g. rework due to poor procedures)<sup>19</sup>

As we said, it isn't fast and it isn't easy to implement lean in a healthcare environment, but, the rewards are immediate and grow as the lean culture takes hold. Case in point, the Virginia Mason Medical Center. Over the first two years (2002-2004) of lean implementation they measured:

- 24 percent reduction in the space needed
- 51 percent reduction in inventory
- 38 percent reduction in staff walking distance
- 77 percent reduction in parts travel distance
- 53 percent reduction in patient lead time
- 62 percent reduction in standard work in process
- 47 percent reduction in quality defects
- 44 percent gain in productivity
- 83 percent reduction in set up time<sup>20</sup>

**“No goal, regardless of how small can be achieved without adequate training.”**

**- - Taichi Ohno  
of Toyota**

The results of continuous improvement kept coming in 2005 and 2006.<sup>21</sup>

With such great results how do you keep the process going to sustain the initial improvements and insure continued success? The answer is training and TWI is a program that institutionalizes effective, standard training.

Liker and Meier pointed out that TWI has been inextricably linked to lean from its inception.

The Toyota method for training is tried and true, and they have used it for over fifty years . It has served them well... today [it] is essentially a replica of the [TWI] material developed in the United States in the 1940's.<sup>22</sup>

At Virginia Mason Medical Center, they clearly recognized the importance of training at every level of the organization to the success of the lean initiative. Their plan said: “All executive leaders will be certified as trainers ... All trainers will devote 50 percent of their time to Lean efforts. ....Fifty percent of all staff will have been trained in “Introduction to Lean ” class ...”<sup>23</sup>.

Today they are inaugurating TWI training to help them standardize their training methodology, sustain the gains already made and continue to make improvements in the future. The first TWI Training was delivered by the TWI Institute in March of 2009.

### Conclusion

TWI in lean healthcare is the lynchpin needed to hold the parts together. Without that lynchpin of continuous training, attention to process improvement can easily fall apart and the gains made will disappear. The time has come for Healthcare, and TWI to partner in meeting the challenges of today and the future. The commitment to lean and TWI must be long term and across all levels of the organizations. Changes in an organization's culture do not come easily or quickly but long term changes, incrementally implemented, have led to the tremendous gains made by the organizations that made them. There are illustrative case studies available at [www.TWI-Institute.org](http://www.TWI-Institute.org).

## Endnotes

<sup>1</sup> “Hospitals Take Tips From Toyota to Fix Their Ills”. *The Wall Street Journal*, April 9, 2004,p.A6. [http://abcnews.go.com/sections/living/US/healthcare031020\\_poll.html](http://abcnews.go.com/sections/living/US/healthcare031020_poll.html)

<sup>2</sup> Beich, Elaine Ed. *ASTD Handbook: For Workplace Learning Professionals*. Baltimore, Maryland: United Book Press, 2008, p. 15

<sup>3</sup> Graupp, Patrick and Wrona, Robert. *The TWI Workbook: Essential Skills for Supervisors*. New York, New York: Productivity Press, 2006, p. xvii

<sup>4</sup> Graupp, Patrick and Wrona, Robert. *The TWI Workbook: Essential Skills for Supervisors*. New York, New York: Productivity Press, 2006, p. xviii

<sup>5</sup> Dietz, Walter. “TWI Can Help Solve Nurse Power Problems.” *The American Journal of Nursing*, Vol. 45, No. 5, May, 1945, p.364

<sup>6</sup> Standard, Charles and Davis, Dale. *Running Today’s Factory: A Proven Strategy for Lean Manufacturing*. Dearborn, Michigan: Society of Manufacturing Engineers, 1999, p.58.

<sup>7</sup> War Production Board, Bureau of Training, Training Within Industry Service. *The training Within Industry Report: 1940-1945*. Washington, DC: U.S. Government Printing Office, 1945.

<sup>8</sup> <http://www.kaiseredu.org/tutorials/quality/player.html>

<sup>9</sup> Committee on Quality of Health Care in America. *Crossing the Quality Chasm* (Washington D.C.: National Academy Press) <http://books.nap.edu/openbook.php>

<sup>10</sup> <http://www.ahrq.gov/qual/nhqr07/Glance.htm>

<sup>11</sup> <http://www.ahrq.gov/qual/nhqr07/Glance.htm>

<sup>12</sup> <http://www.kaiseredu.org/tutorials/quality/player.html>

<sup>13</sup> <http://www.newamerica.net/files/CaseforHealthReform.pdf>

<sup>14</sup> <http://abcnews.go.com/images/pdf/935a3HealthCare.pdf>

<sup>15</sup> Leatherman, Sheila and McCarthy, Douglas. *Quality of Health Care in the United States: A Chart Book* (Commonwealth Fund) <http://books.nap.edu/openbook.php>

<sup>16</sup> Womack, J.P., and Jones, D.T. *Lean Thinking: Banish Waste and Create Wealth in Your Corporation*. New York, New York: Simon and Schuster, 1996, p.10 .

<sup>17</sup> Black, John, with Miller, David. *The Toyota Way to Healthcare Excellence: Increase Efficiency and Improve Quality with Lean*. Chicago, Illinois: Health Administration Press, 2008, p. xiii.

<sup>18</sup> Miller, Diane Ed. “Going Lean in Health Care” , Institute for Healthcare Improvement: Innovation Series, 2005.

<sup>19</sup> Black, John, with Miller, David. *The Toyota Way to Healthcare Excellence: Increase Efficiency and Improve Quality with Lean*. Chicago, Illinois: Health Administration Press, 2008, p. 17 –25.

<sup>20</sup> Black, John, with Miller, David. *The Toyota Way to Healthcare Excellence: Increase Efficiency and Improve Quality with Lean*. Chicago, Illinois: Health Administration Press, 2008, p. 162-163.

<sup>21</sup> Black, John, with Miller, David. *The Toyota Way to Healthcare Excellence: Increase Efficiency and Improve Quality with Lean*. Chicago, Illinois: Health Administration Press, 2008, 162-163

<sup>22</sup> Liker, Jeffery and Meier, David. *The Toyota Way Field Book*. New York, New York: McGraw Hill, 2006, p. 249.

<sup>23</sup> Black, John, with Miller, David. *The Toyota Way to Healthcare Excellence: Increase Efficiency and Improve Quality with Lean*. Chicago, Illinois: Health Administration Press, 2008, 156

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