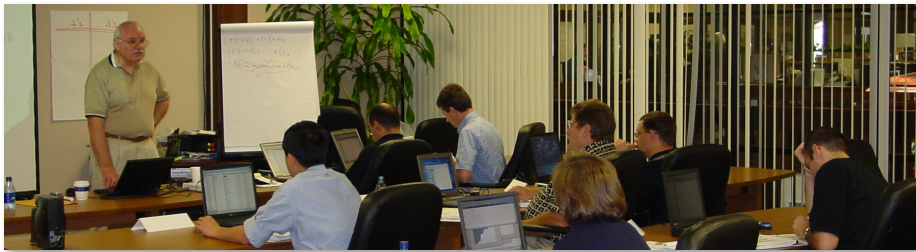


ABOUT SBTI



Value Proposition

Recognized as thought leaders and innovators in business process improvements, SBTI is a global management consulting firm specializing in the deployment of Six Sigma and Lean methodologies. SBTI delivers innovative and sustainable business process excellence solutions by developing future leaders with core competencies to drive superior top and bottom line results. We advance our clients with best-in-class results in revenue growth, cost reduction, new product development and process improvement.

Focused on Healthcare

SBTI brings its considerable deployment history to bear on the healthcare industry. We’ve taken our experience with 70+ major deployments across various industries and modeled a program specifically for Healthcare. By executing dozens of projects and enlisting the expertise of healthcare professionals, SBTI has created the first complete portfolio of tailored process improvement solutions for Healthcare.

What We Provide

SBTI offers a full range of programs and services. These offerings include leadership workshops, asset maximization, strategic planning and assessments, multilevel managerial workshops and specialized “belt” training at the tactical level.

Results. Guaranteed.

SBTI delivers the fastest and highest return on investment in the industry. Always incorporating a measurement benchmark, most of our clients experience an average of 30X return on investment (ROI) within the first 24 months of engagement.

Global Resources

Throughout our history, SBTI has demonstrated a track record of quickly responding to clients’ global needs. Our international offerings are handled through regional offices in Latin America, Europe and Asia. Materials are available in English, Spanish, Italian, French, German, Mandarin, Korean and Japanese. Others in process of being translated.

Our History

Dr. Stephen Zinkgraf, one of the original Six Sigma developers, founded SBTI in 1997. Beginning with two corporate clients, SBTI has grown to more than 70 global corporate deployments and more than 220 clients using SBTI methodology.

SBTI Executive Directors and Master Consultants have a minimum of 10 years industry experience – some 25 or more. Our international offices provide the same unmatched experience and capabilities as in the states, while offering local language and bilingual instructors. All of SBTI’s consultants have lead multiple waves of training, completed numerous projects and continually mentor Black Belts.

CASE STUDY

Industry: Healthcare

Client: Columbus Regional Hospital

Event: Kaizen

50 Words or Less

A 325-bed Midwestern hospital used the Lean concept of Overall Equipment Effectiveness (OEE) to improve the effectiveness of its Computed Tomography (CT) department. Average cycle time from exam start to stop decreased from 21 minutes to 13 minutes (38% reduction). Standard deviation decreased from 86 minutes to 13 minutes (85%).

Reduced Cycle Time in CT Department from 21 minutes to 13 minutes: 38 percent

Project Background

This study was conducted as part of an overall implementation of Lean Sigma in the Radiology Department at Columbus Regional Hospital (CRH) in Columbus, Indiana. Cycle times for CT examinations at CRH were found to be 75 percent higher than national best practice of 12 minutes. External Voice of the Customer (VOC) interviews revealed that, because of high cycle times, physicians were unable to add a case when requested and often, in fact, sought alternative diagnostic imaging sites.

Method

Overall Equipment Effectiveness (OEE) is a Lean tool used extensively by manufacturing in maintenance and equipment reliability to examine equipment availability. OEE represents the percent of potential capacity that the process is achieving, or:
$$OEE = \frac{\text{Actual Capacity} \times 100}{\text{Potential Capacity}}$$

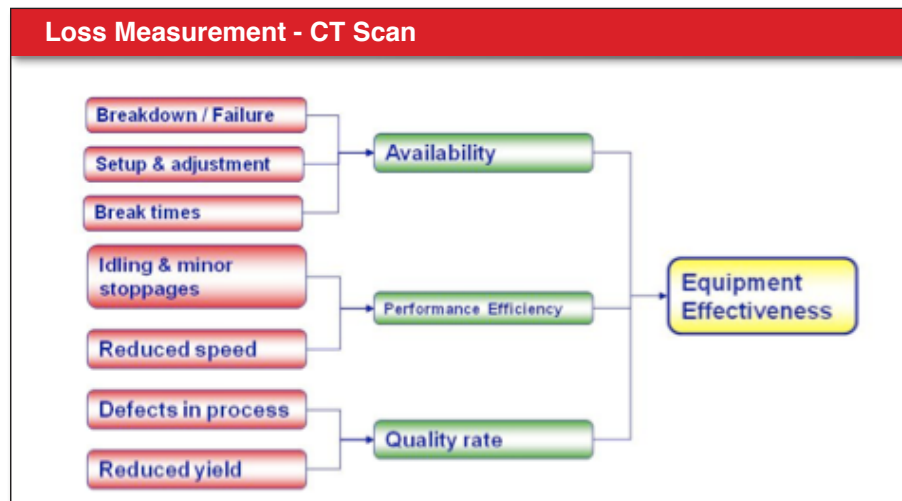


OEE is typically broken into three elements:
% Uptime x % Pace x % Quality.

In the case of a hospital CT scan, % Uptime can be thought of as the percent of time the machine is actually running and providing value. Instead of measuring the “busy-ness” of the room or the staff, the best measure of efficiency is the percent of the time the machine is actually running. Everything else in the department should be organized to maximize CT scanner uptime. % Pace is the ratio of Ideal Cycle Time to average Cycle Time. Stated another way, % Pace compares the average cycle time to those times when the machine is running its best. % Quality is the rate of defect-free processing, or, as a formula:

$$(\text{Processed Amount} - \text{Defect Amount}) \div \text{Processed Amount.}$$





A summary of contributions to reduced OEE is displayed in Figure 1. The OEE metric yields two valuable pieces of information: the capacity possible from the process, and, if capacity is low, the best place to look to improve it (Uptime, Pace, or Quality).

Often, as in this case where the combined resources of equipment, room, and technician are necessary to conduct a procedure, the OEE for the room and technician are useful as well as for the equipment.

Figure 2 demonstrates how this is accomplished.

Figure 1: Components of Overall Equipment Effectiveness (OEE)

Following the OEE analysis in the CT scan department, the team concluded that most promising OEE opportunity was machine uptime.

A kaizen event was conducted in which the following changes were made:

- Moved non-imaging work out of CT room, effectively leaving the machine room open for procedure time only
- Standardized the process and made it more consistent
- Increased efficiency with removal of Non-Value Added Activity steps from the CT exam rooms
- New and more user-friendly CT Control Room layout
- Re-defined job tasks and responsibilities
- Re-developed the staffing matrix

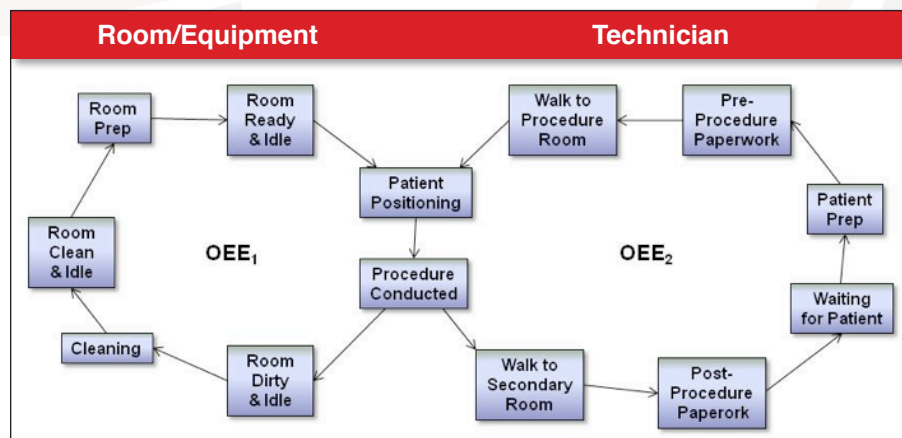


Figure 2: Interaction between OEE Loops: Room/Equipment & Technician

Results

Following the kaizen event, the average cycle time from exam start to exam stop decreased by 38.1% from 21 minutes to 13 minutes (Figure 3). More tellingly, the standard deviation decreased from 86 minutes to 13 minutes, providing more predictability in scheduling. In addition, the cycle time from patient registration to patient exiting the examination room decreased from 45.7 minutes to 34.5 minutes (24.5%), with a much more consistent process.

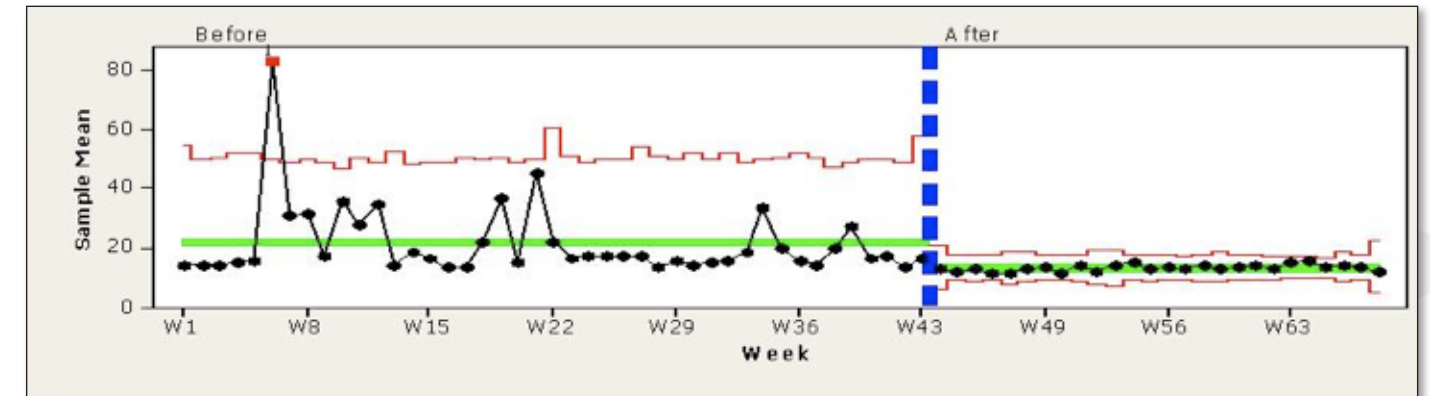


Figure 3: Reduction in CT Examination Cycle Time

In effect, by reducing procedure cycle time, the CT department was able to eliminate the waiting list. When physician offices call to schedule a patient, they are told to send them over. As a consequence, the volume of CT examinations rose significantly (Figure 4).

Conclusions / Implications

Overall Equipment Effectiveness (OEE) is a robust Lean tool capable of improving a hospital's ability to understand and enhance the efficiency of specialized equipment, treatment rooms and surgical suites, and even technical people.

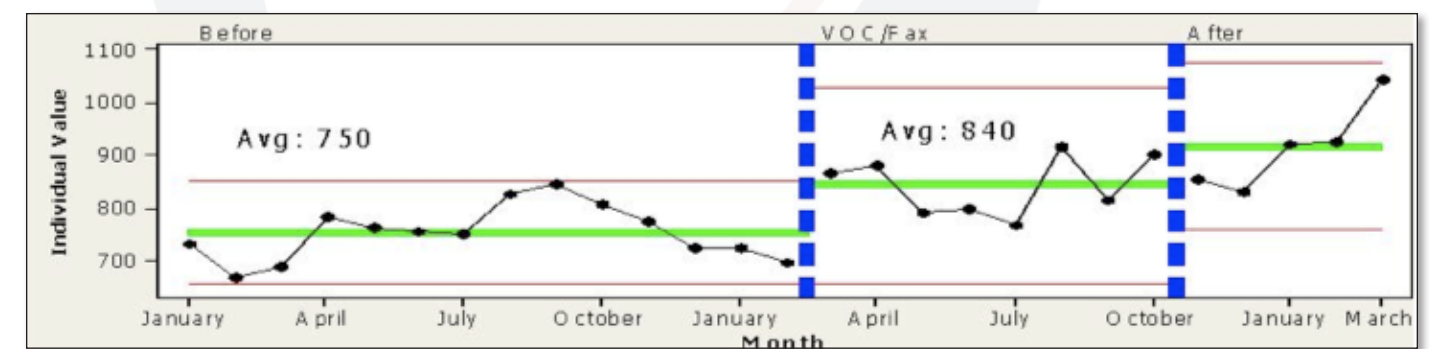


Figure 4: Increase in CT Examination Volume