ABOUT SBTI



Recognized as thought leaders and innovators in business process

Value Proposition

	improvements, Sigma Breakthrough Technologies Inc. (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
	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.



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From Start To Breakthrough

CASE STUDY

Industry: Healthcare

Client: Columbus Regional Hospital

Sigma Breakthrough Technologies. Inc. $^{\circ}$

Event: Lean Sigma

Hospital-Wide Deployment Improved Patient Satisfaction, Safety and Financial Benefits.

One of the most important competencies for a healthcare organization is that of driving change. You want to move your organization to a new level of performance. It does many things well, but something seems to be missing: productivity isn't where it should be; growth is not fast enough and the competition is intense; margins are declining and revenues are harder to come by. You must build an organization that drives change quickly. One facility, Columbus Regional Hospital (CRH), is successfully addressing these issues by deploying Lean Sigma throughout the organization.

Columbus Regional Hospital is a 325-bed hospital providing care to a 10-county service area surrounding Columbus, Indiana. In early 2005, CRH selected Sigma Breakthrough Technologies, Inc. (SBTI) as the consulting group to facilitate the Lean Sigma deployment.

Lean Sigma

Lean Sigma is the integration of Lean and Six Sigma process improvement methodologies. It approaches sustainable continuous improvement with the goal of improving patient care, safety, and satisfaction while simultaneously reducing costs and increasing revenues. Using Lean and Six Sigma (or Lean Sigma), Columbus Regional Hospital analyzes variation and determines root causes. Through Lean Sigma, participants eliminate non-value added activities (waste) and design new processes around steps that add value. Lean Sigma puts controls in place to sustain gains and ensure continued success.

Full Deployment vs. Targeted Projects

Often, healthcare organizations elect to start small, implementing Lean Sigma in increments. This may be appropriate for some, but CRH leadership determined that the advantages of organization-wide deployment outweighed the risks. Leaders did not want to appear tentative about the decision to deploy Lean Sigma, fearing it could turn into another "program-of-the-month." Leaders were on board and committed to a complete, well-disseminated pre-launch deployment plan.

This case study describes one hospital's experience in the first two years of Lean Sigma implementation and results in areas of patient safety, satisfaction and financial benefit. Full deployment engages leadership, enhances project selection that is tied to hospital strategy and goals, and encourages linkage between projects to augment individual project improvements.

The First 90 Days

The first three months were critical. Full deployments rely on the organization knowing what's going on. CRH leadership used that window to link strategy to the operating plan and to Lean Sigma projects simultaneously. By visualizing the big picture, informed department heads could energize their staff.

Within the first 90 days, Lean Sigma training began. Eventually, six Black Belts and 18 Green Belts were trained. Executives and Champions were trained prior to launch. During the same period and as part of training, Lean Sigma projects were selected, chartered and initiated. Champions were assigned from among hospital leaders, projects were chartered and teams organized.

Project Selection

Project selection was important because early success would encourage acceptance and establish the groundwork for future success. Leadership was fully engaged in project selection. A Hospital Core Process Map (Figure 1) was used to demonstrate the inter-connectedness of CRH departments and processes. The organization used key business documents to select the initial projects:



Figure 1: Organization-wide core process map



Figure 2: Surgical services core process map



mission statement, strategic plan, operating plan, profit and loss statement, and quality indicators. Leadership selected three project areas to begin: Surgery, Nursing Unit Medication Delivery and the Emergency Department.

Organization-Wide Core Process Map

1) Surgery. A Core Process Map was developed for the Surgery Department (Figure 2). CRH leaders elected to apply one of the tools of Lean Sigma, a Kaizen event, to examine and re-design the scheduling and flow of patients and procedures. Kaizen is a focused, accelerated change event in which key staff spend 4¹/₂ days focused on mapping the current process, mapping the ideal future process, and implementing the bulk of the changes. Kaizen events achieve

sustainable short-term wins that build program momentum and deliver measurable business results within one week.

This was amply demonstrated in the surgery project. Through careful planning and team selection, four kaizen events were launched simultaneously, addressing the following processes:

- Set-up, Clean-up and Turnover
- Scheduling & Intake
- Surgery Procedure Flow
- Recovery Room

In five days, the CRH Turnover team reduced surgery changeover time for orthopedic procedures from 43 minutes to 14 minutes. This had an immediate effect on the medical staff. Instead of intruding on the way they practiced, surgeons and anesthesiologists experienced a methodology that reduced downtime and increased the number of procedures they could realistically complete. The team is planning to roll out the accelerated surgery turnover process across all procedure types.



Figure 3: Average turn-around time data

Individual Kaizen Team Results

Intake Accelerators team: streamlined the flow-through for pre-admission testing and intake. The result was a more efficient flow, a 27.6% increase in capacity, and improved accuracy of information to surgery.

Procedure team: standardized roles and eliminated non-value added steps in the process. As a result, there was a 15.5% time savings in orthopedic surgeries.

Recovery Room teams: evolved into longer-term Lean Sigma projects, each with its own charter and leadership oversight to assure that inter-dependencies were recognized and considered in project resolution.

Room team: reduced outpatient surgery turnover time and recovery release time by 50%, improving capacity in both areas.



Figure 4: ED - length of stay by acuity monthly



Figure 5: ED - 75.6% left without being seen

Columbus Regional Hospital is continuing to deploy Lean Sigma throughout. Electing full deployment has allowed CRH to strategically add projects that supplement the improvements seen in the original projects. For example, in the Emergency Department, patient length of stay was decreased by three additional Lean Sigma projects: improving radiology throughput; reducing the time required for an inpatient service to receive an ED transfer and decreasing the time necessary to discharge a patient from an inpatient nursing unit.

In the first years of Lean Sigma integration, the hospital realized both a financial and cultural return on investment. Staff no longer accept inefficiency and waste as inevitable and are actively engaged in their elimination. There is better communication across the hospital and a shared vision of its future.

2) Nursing Unit Medication Delivery. Another Lean Sigma project improved medication delivery time, functionally defined as the time from written order to when the nurse is aware the medication is available on the unit. Working with the pharmacy, the team centralized order entry, applied 5S and other Lean tools such as visual cues, to standardize the process. As a result, the hospital reduced average medication delivery time by 60% (Figure 3) and improved accuracy of the first dispensed dose from one error in 16 to one in 18,329 opportunities (5.37 Sigma).

3) Emergency Department. A third project area addressed the Emergency Department (ED) length of stay. The team standardized the registration and triage processes, revised acuity level assignment and implemented triggers to accelerate patient flow. In the end, lengths of stay were reduced by acuity level, between 26% and 38% (Figure 4). In addition, the rate of patients who left the ED without being seen decreased by 75.6% (Figure 5), increasing patient satisfaction. An increase in reimbursed revenue of over \$800,000 was realized in the first year.

Conclusions and General Results