

## Medication Delivery Time

### - from Order to Aware: A Kaizen Event

#### Project Background

A critical factor in safe patient medication administration is the timely response to new or changed physician orders. Through audits, the hospital discovered a nearly two-hour gap between the time the physician wrote the order and the medication appeared on the electronic medication administration record (eMAR). Hospital leadership decided to address the issue through a kaizen event.

Kaizen is a focused, accelerated change event in which key staff spend 4½ days concentrating 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. Using a team approach with representation from all stakeholders in the process, the event was managed by CTMC's Director of Performance Improvement and P.I. Manager with training and facilitation provided by SBTI.

#### Current State

At CTMC, physician orders are faxed to the Pharmacy, reviewed by the pharmacist, and entered into the eMAR. The key measure for this process was medication turnaround time, that is, the time from physician order to the medication appearing on the eMAR. At baseline, that turnaround time was 114.0 minutes. By auditing a sample of 77 physician orders, it was determined that, of the 114 minutes, 31 minutes represented the time from the receipt of the fax in the Pharmacy to the medication being entered into the eMAR. The remaining 83 minutes, or 72.4% of total turnaround time, was from the time the physician wrote the order until it was faxed to the pharmacy.

After a brief training introduction to Lean tools, the team reviewed a list of concerns collected in "I hate it when..." boxes from each of the affected areas in the previous weeks. Through affinity diagramming, the team clustered the issues into categories. In addition to medication delivery timeliness, the state of the medication room and frequency of calls to the pharmacy were highlighted. The team then mapped the medication delivery process in detail. They identified any possible target areas of non-value added (NVA) activity. From this, a future, desired state map was created.

#### In 50 Words or Less

- A kaizen event addressed the link between physicians, nurses, and the pharmacy at Central Texas Medical Center.
- Goal: Reduce time from physician order to nurse aware medication available
- Using Lean tools in a kaizen approach, medication delivery time was reduced by 45%.



Old Chart Rack

*"We hope to continue to use Six Sigma, Lean, and Kaizen together as a portfolio of performance improvement techniques to help us make our hospital a better place."*

*~Hospital CEO*

New Chart Rack



## Project Background

### Implementation

Based on the findings, the team pursued the following improvements:

#### Visual Cues for New Orders

- Chart racks were revised, and physicians instructed, so that all new orders are placed on top of the chart rack.

This provided a visual alert that a new order was ready for faxing to the Pharmacy.

- A magnetic dot system was introduced so that, when the pharmacy tech delivers medications, nurses have a visual cue on their large patient white board indicating medication is now available in the medication room.

### Faxing Process

- Unit staff were instructed that anyone who sees a new chart on the top rack will fax the order sheet to the Pharmacy ASAP.
- A fax stamp and faxing instructions were affixed to the fax machine.

### 5S+1 the Medication Room

5S is a Lean tool used to organize workspace. 5S stands for Sort, Store, Shine, Standardize, and Sustain. In this case, a sixth S was added: Safety.

- Drawers, refrigerators, and cabinets were labeled and supplies organized.
- Unnecessary supplies were returned to Materials Management.
- Equipment was moved to effect an improved workflow.
- Brighter lighting was installed, out-dated materials removed, and "grungy" signage replaced.
- For the pyxis machine, a preventive maintenance schedule was put in place and staff were instructed in a more efficient means for narcotic medication reconciliation.

The "After" picture of a medication room (top-right) shows a well-lit, clean room with plenty of usable counter space, labels, and supplies available at the point of use.

### Pharmacy Changes

- An auditory cue was placed in the Pharmacy department so that, every hour, an alarm alerts the pharmacist to check the medications the tech has ready to go to the units. This keeps deliveries on schedule.
- Unit staff were provided a "Pharmacy Call Script" to instruct them on when to contact the Pharmacy and what questions to ask.

### Refine & Control

Making improvements to a process is often straightforward. Sustaining them is more difficult and the key to a successful event. The team spent considerable time ensuring the correct metrics, roles, responsibilities and accountabilities were in place. All affected stakeholders, on all shifts, were trained on the new process.

The team implemented a schedule for data collection including audits of new orders, unit rounds, and a worksheet for scoring the status of the 5S+1 in the medication rooms.

### Conclusions and General Results

By Day 4 of the kaizen event, the turnaround time for medication availability was reduced dramatically. By Day 5, the Pharmacy Director announced, "It's already working."

Two weeks after the kaizen event, the Performance Improvement Department completed a re-audit of medication turnaround time. There had been a reduction of nearly an hour (51.4 minutes or 45.1%) in the process. Subsequent audits over the next three months confirmed that those results had been sustained. In addition, the number of phone calls to the Pharmacy dropped dramatically, by 28.0%, particularly in categories such as "Medication Not Available," "Administration," and "Order Not in the eMAR."

Visual inspection of compliance on unit rounds showed some slipping in compliance. In services re-emphasized the universal responsibility for all unit staff to look for new orders and fax them to the Pharmacy without delay.

Finally, a standardized 5S+1 scoring system was implemented to report the status of the medication rooms. The radar diagram (bottom-right) shows the units on their way to achieving the target.

With good project scoping, member selection, and preparation, the team was able to improve a critical function in four days and report its success on the fifth. Processes were updated and standardized, staff were trained, working spaces were made more efficient, and patient safety improved. Results were discussed and lauded at Executive and Board levels. In addition, projects were identified for future consideration. The hospital CEO asserted that, "We hope to continue to use Six Sigma, Lean, and Kaizen together as a portfolio of performance improvement techniques to help us make our hospital a better place."



"After" Medication Room

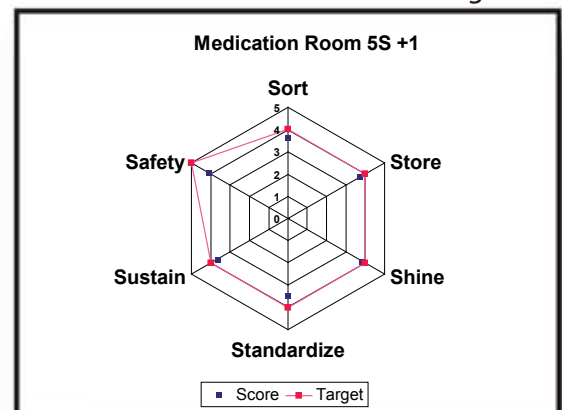
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### References:

1. Wedgwood, Ian. Lean Sigma: A Practitioner's Guide. Prentice-Hall: Upper Saddle River, NJ, 2006.
2. Zinkgraf, Stephen. Six Sigma: The First 90 Days. Prentice-Hall: Upper Saddle River, NJ, 2006.

Radar Diagram





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## About Sigma Breakthrough Technologies, Inc :

### Our History

Dr. Stephen Zinkgraf developed and deployed the Six Sigma methodology while working in various leadership positions at Motorola, Compaq, ABB, and AlliedSignal. Recognizing an opportunity to expand Six Sigma in combination with Lean into every area of a company's business, Dr. Zinkgraf founded SBTI in May 1997. Beginning with 2 corporate clients, SBTI has grown organically through referral to more than 50 global corporate deployments with an additional 50 clients using SBTI methodology. This proven track record of success has made SBTI a global leader in transforming companies.

### Our People

SBTI Executive Directors and Master Consultants have a minimum of 10 years industry experience (many have 25 or more years experience). All of our consultants have a common characteristic of having actually led successful initiatives inside a corporation.

### Our Services

SBTI defines its core competencies around its support of clients in the rapid deployment of Six Sigma and Lean Enterprise methodologies as business changing improvement initiatives. To accomplish this, SBTI delivers a full range of services. These services include strategic planning and assessments, multi-level leadership workshops and specialized "Belt" training at the tactical level. SBTI's methods and offerings are all based on business results and internalization through highly tailored programs that reflect our client's specific needs.

### Our Capabilities

SBTI has offices in the US, Latin America, Europe, China, Hong Kong, and Korea, which offer unmatched experience and capability. These regional offices provide local language and bilingual instructors who are familiar with the SBTI roadmap and materials. These instructors have led multiple waves of training completing projects and mentoring Black Belts. Supporting those experienced MBB's is SBTI's world-class material translated into French, German, Korean, Spanish, Italian, Swedish, Portuguese, Japanese, and Mandarin Chinese.

### Our Results

SBTI encourages our clients to internalize the deployment and training as quickly as possible - usually between one to two years. SBTI clients average 30X return on investment within the first 24 months of the engagement. By bringing our clients world-class consultants, materials, and experience, we can guarantee your program is a successful business and culture change.

**SBTI has delivered the fastest and highest return on investment in the industry by providing:**

- Customized solutions for the client's specific business needs
- Accelerated knowledge transfer of the business process excellence methodologies
- Development of future leaders and process experts
- Truly global solutions (including material translations and home language)

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