CASE STUDY

Industry: Healthcare

Client: Central Texas Medical Center

Event: Kaizen

50 Words or Less

Communications between physicians, nurses and the pharmacy are critical to safe patient medication administration. Using Lean tools in a kaizen approach, Central Texas Medical Center improved time from physician order to nurse aware medication available by reducing medication delivery time by 45 percent.

Physician Order to Nurse Aware Medication Available time reduced by 45 percent.

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). Leadership decided to address the issue through a kaizen event.

Using a team approach with representation from all stakeholders in the process, a Kaizen event was managed by Central Texas Medical Center's (CTMC) Director and Manager of Performance Improvement (PI) 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.

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, they 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.

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Figure 1: Old chart rack

Figure 2: New chart rack. This provided a visual alert that a new order was ready for faxing to the Pharmacy.

The team mapped the medication delivery process. They identified possible target areas of non-value added activity. From this a desired state map was created.

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.
- 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 (below) 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.

The "auditory" cue, in this case, was a clock that chimed on the hour.

Refine & Control

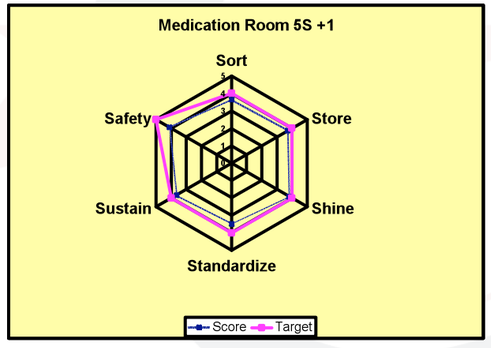
Making improvements to a process is often straightforward. Sustaining them is more difficult and the key to a successful event. The team spent considerable time ensuring the correct metrics, roles, responsibilities and accountabilities were in place. All affected stakeholders, on all shifts, were trained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

Contributors
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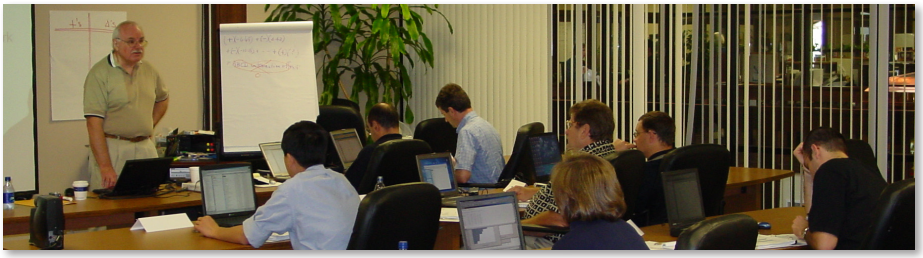
References:

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.

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.

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