MAYO CLINIC

Supply On Demand – Reducing Non Value-Added Time in a Large Vascular Interventional Radiology Practice

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Background

Inventory management in Vascular Interventional Radiology (VIR) has been a major issue that influences the physician's ability to provide the highest quality of patient care by having the right medical supplies at the right time. One of the most difficult aspects of the inventory management process is a lack of standardization of the supplies located in the supply room and procedure rooms (this includes types of supplies, quantities, layout, and replenishment practices). This causes a significant amount of time to be wasted by both the radiology technologists and lab assistants as they search for the requested supplies, potentially causing delays in the patient's procedure. In addition, the lack of standardization has also led to increased time and effort spent training new personnel on the location of supplies.

The goal of this project was to reduce the amount of non-value added time that the lab assistants and radiology technologists spend searching for supplies in the supply and procedure rooms.

Methods

DMAIC refers to a data-driven quality strategy for improving processes and is an acronym for the five interconnected phases: *Define, Measure, Analyze, Improve, and Control.*

Value Stream Mapping is a visual tool that helps you to see and understand the flow of material and information as a patient or service makes its way through the process, as well as the management and information systems that support the basic process.

Kaizen Events are structured, short cycle (usually 1 week in duration), improvement efforts with tightly scoped objectives that align with higher level project goals.

5S is a Lean tool that is used to improve the performance and safety of a process by implementing and maintaining high standards for cleanliness, organization, visualization, and standardization.

Visual Management is a system that makes process flow, operations standards, schedules, and problems instantly identifiable to even the casual observer. This is accomplished through the use of signs, information displays, material storage tools, color-coding, and poka-yoke or mistake proofing devices.

Figure 1: Vascular Interventional Radiology – High Level Process Mapping

Future State Value Stream Map -
Improvement opportunities identified
• 5S procedure rooms and supply room
• Implement visual management system for supplies

Current state Value Stream Map -
Problem areas identified
• Procedure rooms not standardized (wasted time searching for products)
• Staff has to leave room during procedure to locate supplies requested by Radiologist (increased procedure time)
• Stock not rotated in procedure rooms

Measurement

Measurement Process and Data Collection

Measurement Definition
- NVA = Non-Value Added
- RT = Radiology Technologist
- LA = Lab Assistant
- Trainee = Someone who is not familiar with the storage locations of product in the procedure rooms and supply room
- Product = Supplies or materials that are used during procedures in Vascular Interventional Radiology

Process Measures
- Amount of NVA time the staff spent searching for product in the procedure room
- Amount of NVA time the staff spent searching for product in the supply room
- Distance staff member (RT, LA, Trainee) travels to acquire product in procedure room
- Distance staff member (RT, LA, Trainee) travels to acquire product in supply room

Measurement Process
Baseline data was collected on day 1 of the kaizen event. One representative from each staff position (RT, LA, trainee) was given the same list of 8 items to locate within the procedure room and 8 items to locate in the supply room. The duration of time spent searching for the 8 items in each location was measured using a stopwatch. The distance traveled while searching for the 8 items in each location was measured using a surveyor's wheel.

This same measurement process was duplicated after the kaizen interventions in order to measure change in the primary process measures.
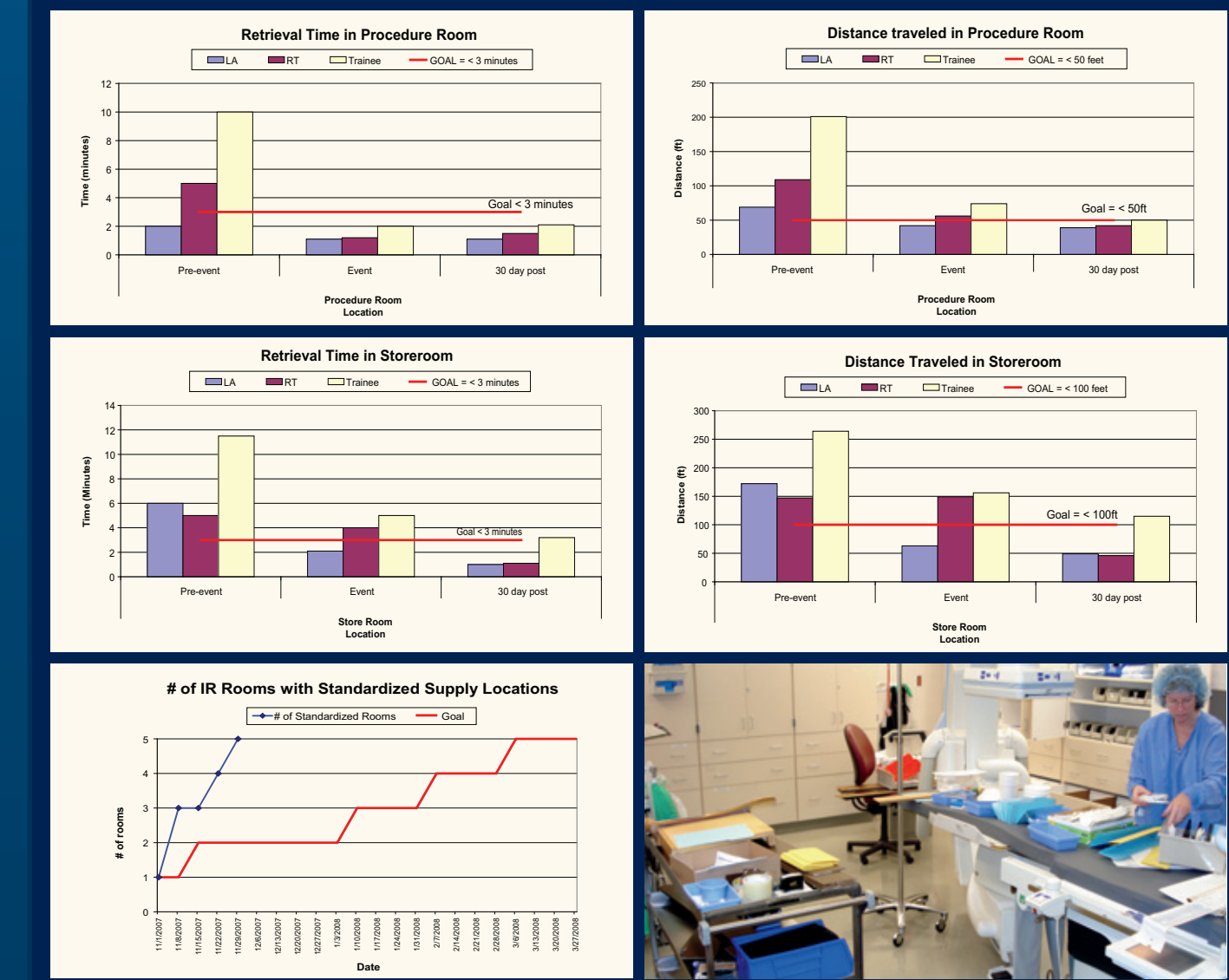
Figure 2: Identify Current State

Team determined baseline performance by having various staff search for 8 items in the procedure room and supply rooms. Search time and travel distance to find each item was recorded.

Figure 3: Red-tagging and Organizing

Day 1 & 2 – Red Tagging (determine disposition) of items with little or no use. Identify and label home locations for supplies.

Figure 4: Bias for Action and Real-time Change

Store Room

Procedure Room

All changes implemented within 4-day kaizen event. Visual management: larger font can be read from any point in room, color coding matches supply locations in procedure and supply rooms for easier acquisition. Storage locations closest to the point of use were prioritized for highest usage items, as well as items that needed to be acquired quickly.

Figure 5: RESULTS (Verify, Sustain, Diffuse)

On last day of kaizen event, the team repeated the measurements taken on day 1 to confirm the improvements made during the kaizen event. This was also repeated 30 days after the event to ensure original improvements were sustained. Visual management system was quickly replicated in the remaining procedure rooms.

Discussion

Critical Success Factors for Kaizen Event:
- Aligns with Department / Institution goals
- Improvement need felt by management and team members
- Existing process: defined, documented, routine and stable
- Accessible, actionable and self-contained process
- Sponsor who is supportive, active, and engaged is identified to champion event (Physician participation)
- Project team of 6-10 process experts, including a department co-lead and expert facilitator
- Empowerment given to Kaizen team
- Management commitment and presence (should be at daily report outs)
- Workforce involvement
- Communication of purpose and benefits
- Dedicated resources (full-time participation with probable overtime). No observers!!!
- Dedicated workspace for team, close to work location, for duration of event
- Budget for event from department for small supplies, food, overtime, and team recognition
- Support services (facilities, IT, materials, etc.) are available and empowered to make REAL TIME changes per team needs identified during try-storming

Conclusion

Standardization of supplies in the procedure rooms and the storeroom, in addition to color-coded labeling has resulted in quicker retrieval of supplies, a more efficient method of restocking supplies, and an increase in material flow.
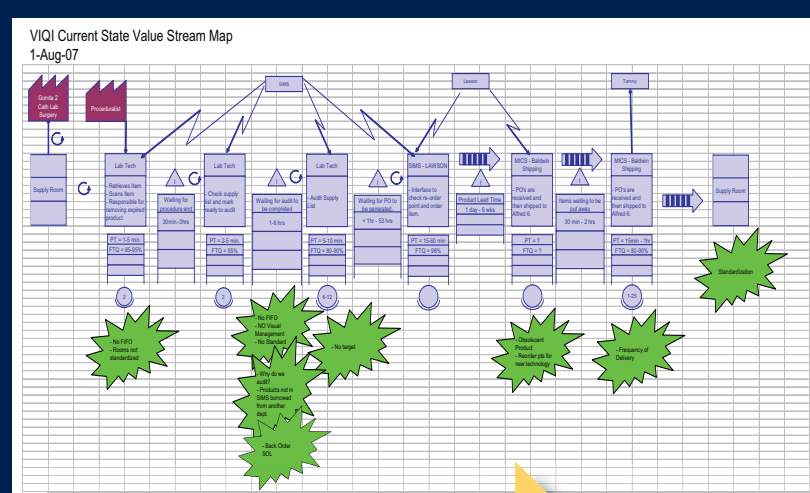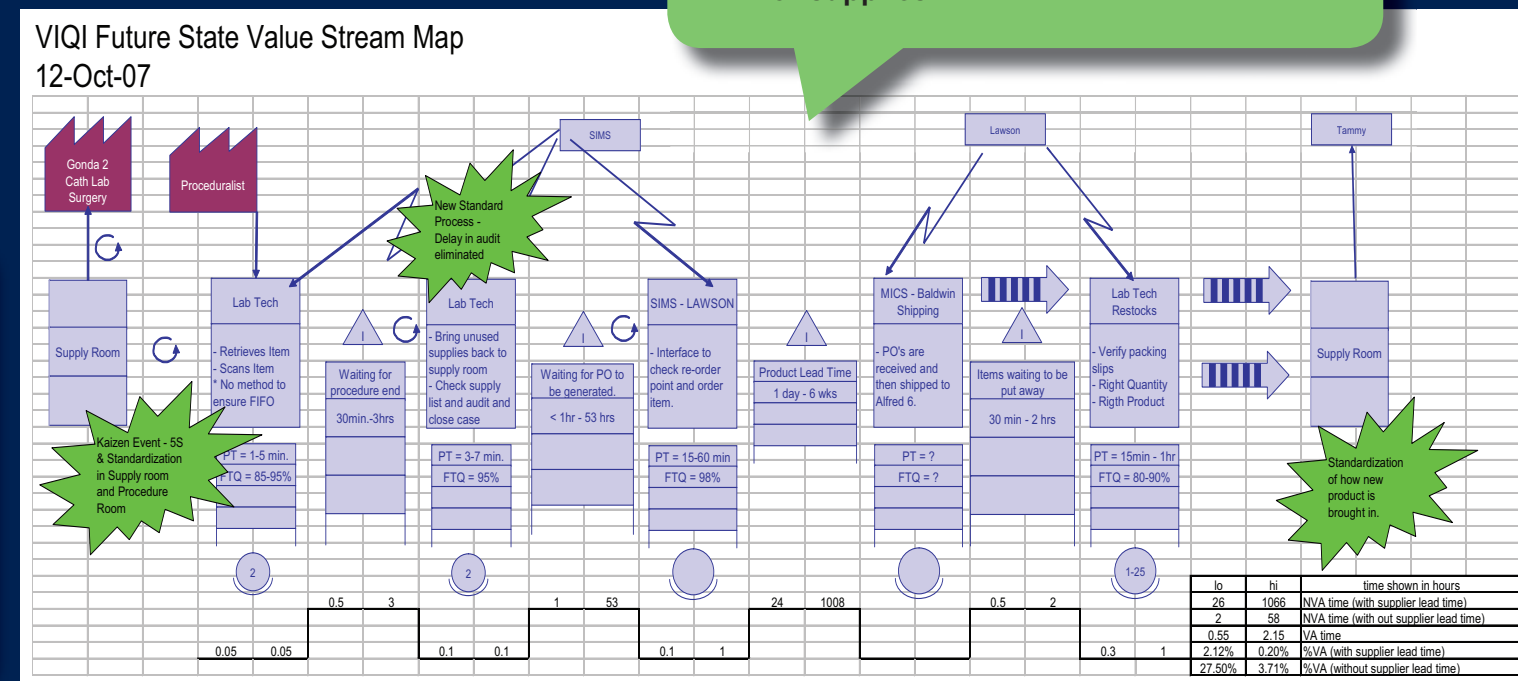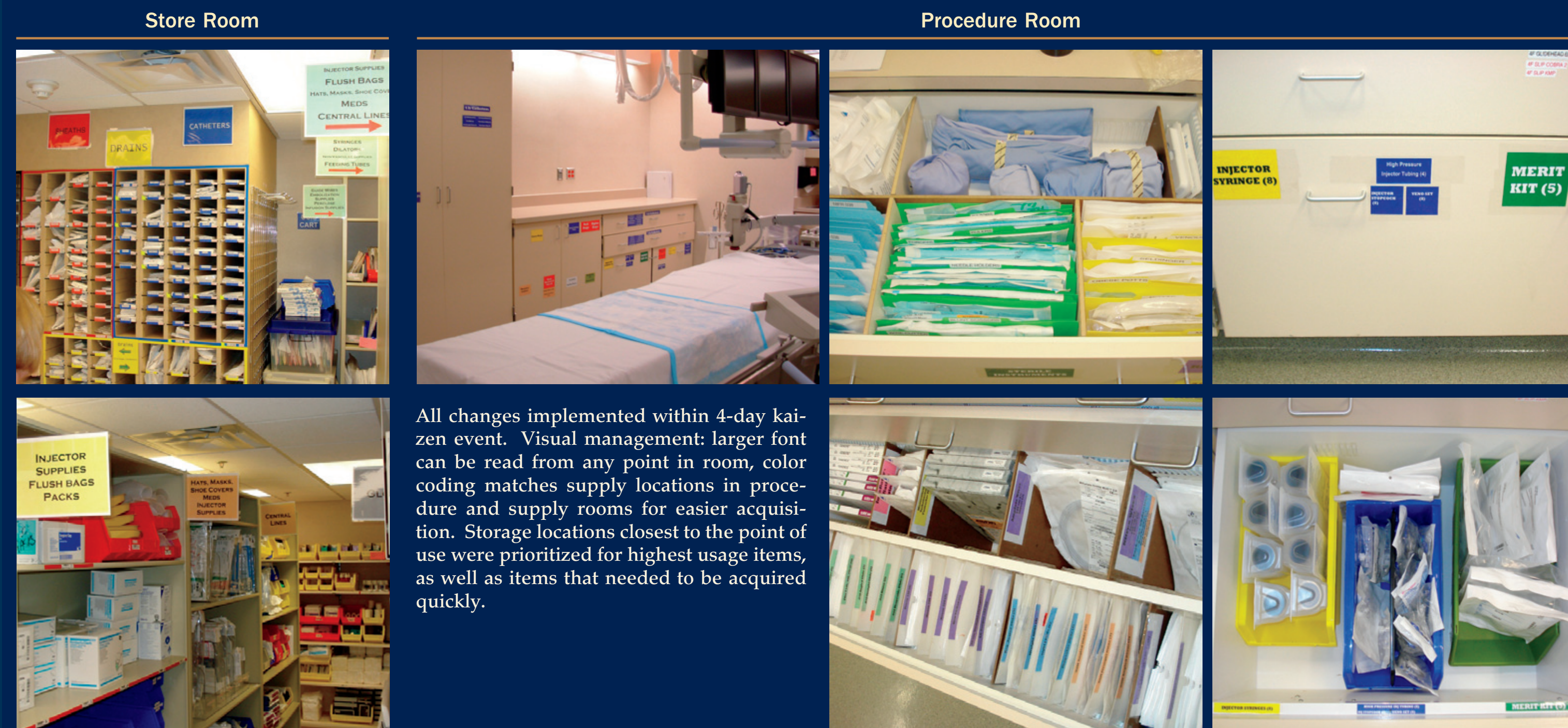
Quotes from team members and staff

"I learned to appreciate the stress the lab assistants, techs and radiologists have had over supply issues. We have tunnel vision as far as our own jobs and do not realize the entire picture." (RN)

"I really like the layout of the storeroom now. There are a lot less wasted steps." (LA)

"The task at the beginning of the Kaizen event seemed overwhelming but it was wonderful to see it together in the end." (Supply Management Coordinator)