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# 6 Getting Organized across the Hospital with 5S

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## 6.1 INTRODUCTION

An employee working in the Intensive Care Unit was cleaning a forgotten corner of the unit during a Lean project and came across a curious artifact: a 25-year-old issue of *National Geographic*. Anyone who has sat in a physician's waiting area is familiar with the often ragged, out-of-date magazines used to entertain patients, but this was extreme. Why was this item there? How was it forgotten for so long? While amusing, this example suggests that there are many other expired, broken, forgotten, or misplaced items cluttering work areas in healthcare. In the case of the magazine, little harm was done, and it was eventually donated to "Lean Archives." However, a cluttered and disorganized work space can contribute to more serious issues, such as the potential to use expired medical supplies or run out of needed items, time wasted searching for items, excess travel time and energy spent retrieving items not strategically located, and an environment that leaves a poor impression on patients and their families.

5S, a Lean tool focused on organizing the workplace, can be used to tackle the problems depicted above and create an efficient and productive physical work space. This chapter describes the experience of implementing the Lean tool 5S across various departments within a healthcare system. 5S is a simple Lean tool, originating in the manufacturing industry that helps create and maintain a clean and organized high-performance working environment. Each S, sort, set-in-order,



shine, standardize, and sustain, represents actions needed to create the desired work environment. The outcome of 5S is a well-organized department, where employees can easily distinguish common and uncommon conditions to ensure a reduction of defects and costs, and to maintain a safe work environment. Most recently, this tool is successfully propagating throughout the healthcare industry. Some of the major benefits of using 5S in the healthcare setting include the creation of space for revenue-generating functions rather than storage, time saved in travel and search, and assurance that work areas are HIPAA (Health Insurance Portability and Accountability Act) and TJC (The Joint Commission on Accreditation of Healthcare Organizations) compliant through proper organization, safety, and hygiene.

One remarkable story of the success of 5S in the healthcare setting is that of Ochsner Health System. Located throughout southeast Louisiana, it is one of the largest nonprofit, academic, multispecialty, healthcare delivery systems in the region, with eight hospitals and over 50 health centers. Ochsner's hospitals range in size from 35 to 473 beds, with over 9000 employees throughout the system. At Ochsner the Lean journey started with the partnership with GE Medical System in 2003, when selected managers and directors, and top management (e.g., CEO, COO) were introduced to Lean concepts. This laid the groundwork for developing a program of Lean initiatives, and in 2007 the Lean vision of Ochsner was developed, and resources to create a Lean team were coordinated. In 2008 the first Lean leaders were trained, and they started planning and deploying Lean projects. Ochsner started with one Lean leader, and currently there are eight active Lean leaders whose main role is to aid in the development of the hospital's Lean strategy, plan and execute Lean projects, and train and mentor key personnel. In the past three years Lean efforts, in particular 5S projects, have had a great impact in improving patient safety, quality of care, patient throughput, and provider efficiency while reducing cost. Since 2008, Ochsner has conducted a total of 45 5S projects with approximately 600 employees, resulting in approximately \$509,000 saved (including cost avoidance and direct cost savings) and 215.8 m<sup>2</sup> (2323 ft<sup>2</sup>) created throughout their eight hospitals. In addition, over \$4 million in revenue capacity has been created due to creating extra rooms, beds, chemotherapy chairs, etc. Currently, approximately 320 managers and leaders are 5S trained.

5S is an integral part of Ochsner's Lean vision, which promotes "a place for everything and everything in its place" and paves the way for a true Lean healthcare transformation. The main purpose of 5S is to eliminate waste (e.g., waiting, extra inventory, defects, overproduction, extra processing, excessive transportation and motion) (Figure 6.1), to create a visual workplace and processes and to reveal abnormalities or problems in the process.

The 5Ss are the foundation of the Lean production system (Toyota Production System; TPS) from the manufacturing industry. The 5Ss are activities that focus on creating order in the work environment, and in turn support error proofing, visual management, and preventive maintenance. The standard 5Ss were tailored to fit the needs of healthcare processes and a 5S self-checklist and prework steps were also added (Figure 6.2).

The prework entails 5S team selection and training and data collection on the current state of the department. Initial observations are used to provide a



Seven wastes	Healthcare flow
Waiting	Inpatients waiting in ED Patients waiting for discharge Physicians waiting for test results
Inventory	Lab samples batched Dictation waiting for transcription Patients waiting for bed assignments Storage of medical supplies
Defects	Re-sticks Medication errors
Extra Processing	Multiple bed moves Retesting
Transportation	Moving patients to test
Overproduction	Preparing more IV bags than used before expiration
Motion	Looking for patients Missing medications Missing charts or equipment

FIGURE 6.1 Examples of the Lean wastes in healthcare flow.

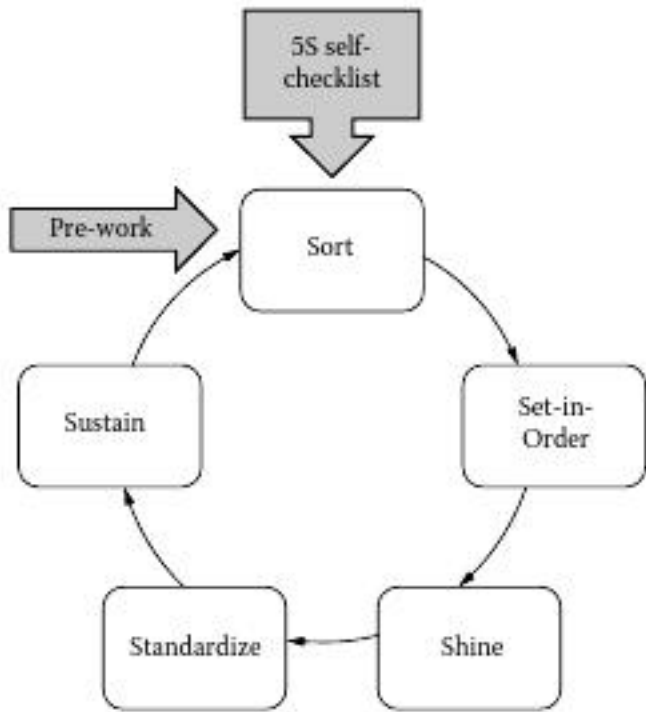


FIGURE 6.2 5S structure.



breakdown of percentages spent on various activities by different employees ("circle of work"). Often the results show a significant amount of time spent traveling, searching, or other non-value-added activities. Spaghetti maps are used to show the travel paths of employees throughout the workday and often reveal inefficiencies in location of work and storage areas. The third prework item, voice of the customer, is an in-depth process of capturing, organizing, and prioritizing customers' wants and needs in terms of relative importance and satisfaction with current alternatives. Depending on the project scope and targeted department, both internal (e.g., nurses, physician) and external (e.g., patients, vendors) customers are interviewed. The 5Ss (sort, set-in-order, shine, standardize, and sustain) are performed in the targeted work area. At the end of the 5S event, the process owner of the 5S event uses the 5S checklist to conduct a workplace scan to assess the current process condition. The process owner asks questions to determine if changes have been made and whether those changes have been sustained. If certain areas need attention, the 5S process continues. The checklist is used 2 to 3 times per week in the first three months following the 5S to ensure the gains are sustained.

1. **Sort**—The purpose of this phase is to separate the needed items from the unneeded items which are then removed to a "red-tagged" location. Then, red-tagged items are moved to a permanent location (e.g., other department) or disposed. The 5S team follows four steps to sort the targeted work area: (1) identify items that are needed based on the process and personnel that interact with the targeted work area; (2) reduce the number of items to only what is needed (e.g., excess inventory); (3) remove or eliminate unneeded items; and (4) dispose items that are not needed and obsolete.
2. **Set in Order (Straighten)**—The purpose of this phase is to arrange the remaining items following the process flow. The 5S team follows five steps to set in order the targeted work area: (1) determine the frequency of use of each remaining item; (2) find a location based on the frequency of use, avoiding the use of closed storage areas (e.g., drawers and cabinet); (3) position items in storage area following the process flow; (4) neatly label each storage location; and (5) use ingenuity to make maintenance easy (e.g., shadow boxes). In this phase, the team also considers takt time (cycle time required to meet demand) and frequency of use of each item to determine and align the correct amount of each item with its use/consumption.
3. **Shine**—The purpose of this phase is to maintain the work area for the already sorted and set in place items. The 5S team follows four steps to shine the targeted work area: (1) inspect and deep clean items (e.g., equipment) and work area; (2) establish daily cleaning requirements; (3) establish periodic preventative maintenance schedule; and (4) establish periodic corrective maintenance procedures.
4. **Standardize**—The purpose of this phase is to ensure sort, set-in-order, and shine are consistently followed across all users. Standardization is the foundation of Lean concepts and leads to patient satisfaction due to the improvement in accuracy, predictability, and consistency in patient care.



5. **Sustain**—The purpose of this phase is to maintain and improve the outcome from sort, set-in-order, shine, and standardize phases. The 5S team follows four steps to sustain the gains in the improved work area: (1) communicate and maintain visual management, and train all workers in 5Ss; (2) spread activities and pride of ownership to all levels and areas; (3) make deviations from the standard obvious, using visual controls, to take immediate corrective action; and (4) review regularly using the 5S Scorecard.

When work areas and processes are redesigned according to the 5Ss, employees can expect to have all of the required resources needed to perform their work right and safely. Whether a nurse is compiling a patient's medications or a surgeon needs particular scalpels for an operation, their tools are right at hand, ready for use. Furthermore, 5S is an appropriate tool across all departments, from direct patient care units such as nursing floors to support departments such as central supply.

Several completed 5S projects that followed the 5S structure presented in Figure 6.2 are presented next, from internal and external processes to auxiliary processes, all vital to serve Ochsner's patients. Each 5S project was conducted at one of the eight Ochsner hospitals and took at least nine weeks per project, from prework to the end of a 30-day action plan to address more time- or resource-consuming issues. Projects were completed at the request of department managers, unit directors, or other leaders. Some projects occurred as an outcome of other Lean projects. For instance, the supply chain 5S project was one outcome of a value stream-mapping exercise. Lessons learned from these implementations are discussed and used to propose guidelines to ensure a successful 5S project.

## 6.2 INTENSIVE CARE UNIT (ICU)

The Intensive Care Unit (ICU) had two major goals for the 5S of organizing supplies and standardizing patient charts and forms. The purpose of organizing supplies was to reduce staff travel time, eliminate safety violations, and adjust quantities on hand to reflect true demand. By standardizing charts and forms, the department hoped to reduce nurse and physician time spent searching for these items. The ICU 5S team had 21 team members, including three Lean leaders.

The results of the 5S project were tremendously positive. The team found that having a more organized department imparted a more calm effect to patients and their families—essential when dealing with patients who are often in the most critical conditions. A major feature of the ICU 5S was the creation of dedicated work areas for various functions including specimen collection, PCC office, pharmacy, MD, case managers/social workers, and two additional patient rooms (reclaimed after removing excess inventory). The 5S also resulted in better organization of RN stations, forms, equipment storage, and secretary work stations. Respiratory supplies were relocated closer to the point of use, which saved RN and RT travel time by approximately 25%. The department returned \$3,071 of overstocked supplies and reduced the par level (amount required on hand to ensure that the department would not run out while waiting for resupply) or order point by 20%. Finally, several safety and HIPAA issues were addressed, which helped bring the department into



compliance with TJC standards. Future work planned to continue 5S mostly consisted of installing shelving to continue setting items in order and also included fresh paint (shine) and programming doors to the ICU to match visitation hours.

6.3 OUTPATIENT INFUSION

The outpatient infusion 5S team was one of the smaller groups doing a 5S project, consisting of 11 members, with one Lean leader and one student intern. The objectives for this department were to secure patient information to avoid HIPAA issues, balance supplies so that needed supplies were available without having too much excess, create functional and standardized work spaces, create space for an additional chemo chair, and maintain TJC compliance. By the end of the 5S event, the team reduced \$4,302 in inventory, created space for an additional chemotherapy patient chair (Figure 6.3 and Figure 6.4), which equates to an additional \$118,682 in revenue, created a storage/equipment room, and “found” 83 square feet of space. Furthermore, storage areas were arranged to be more ergonomically sound, and all areas were thoroughly cleaned, making the department safer for patients and staff. The department developed standardized work flows for specific equipment (chemo chairs, lunch tables, and supply carts) for all staff to follow. The event ended with a 30-day plan to continue 5S activities that would further save space by removing unnecessary equipment and introducing organization aids and would increase compliance with TJC requirements.

6.4 MEDICAL/SURGICAL UNIT (MED/SURG)

The Med/Surg unit, which is a typical patient care floor of a hospital, had 19 people on the 5S team, including two Lean leaders. This department had an ambitious list of objectives to organize supplies and designate accessible equipment locations, reduce RN travel time by 25%, adjust quantities of supplies to match demands, organize forms to reduce search times, provide safety enhancements to the work environment,



FIGURE 6.3 Outpatient infusion work area before 5S.





**FIGURE 6.4** Outpatient infusion after 5S with space for additional treatment chair.

establish work areas for nurses, physicians, case managers, and support staff, and recapture a patient isolation room.

The 5S had many positive results, the most noteworthy being the return of one room to being a functional patient room rather than storage. The unit returned \$4,500 in unneeded supplies and reduced par levels by 8% (Figure 6.5 and Figure 6.6). Changes in storage areas and layout resulted in reduced staff travel (estimated at 30%) and in the creation of designated work areas for various staff. Last, these changes helped bring the unit into compliance with TJC standards.

## 6.5 CENTRAL SUPPLY

5S has also been used extensively in supporting auxiliary departments within the Ochsner Health System. Improvements to central supply at one facility started with a 12-person 5S team, including three Lean leaders, one leader from the upper administration of the hospital, and eight hospital personnel working in the supply room. The Central Supply Storage Area (CSSA) was home to the hospital's copious supplies, including sterile trays, syringes, dressings, and rubber gloves. Central supply storage areas are designed to store these and other supplies by placing them in a centralized location of the hospital that is most easily accessed by the staff and personnel. The main problems identified with the Central Supply Storage Area at Ochsner was the lack of order and ease of finding supplies, along with the years of collected dust and limited storage space. To solve these issues, the 5S team first sorted through all of the items in inventory, red flagging obsolete, expired, or misplaced items. By putting into action the first "S," Sort, in the 5S process, the CSSA 5S team removed over 148 obsolete and expired items. Furthermore, 45 products used exclusively by surgery were moved to their specific inventory room, creating more storage area and supplying the hospital with a more accurate inventory count. Excess inventory totaling \$13,712 was removed.





**FIGURE 6.5** Med/Surg supply area before 5S.



**FIGURE 6.6** Med/Surg supply area after 5S.

The remaining supplies were “set in order” using a color-coding system which placed like items together, designating colors to categories, and also making sure that items were placed in logical and ergonomic places (Figure 6.7). Frequently used items were placed in easy-to-access areas, while items rarely used were placed further toward the back of the room or on higher shelves. The entire room





**FIGURE 6.7** Organized supplies after 5S in central supply.



**FIGURE 6.8** Central supply work area before 5S.

was thoroughly cleaned in order to make it “Shine.” This created a safer environment not only for the employees entering the room but the patients using these supplies. If supplies are being housed in a clean environment, the possibility of bacteria being transferred to a patient drops dramatically. Furthermore, the 5Ss were extended to the supply desk by removing unneeded items and created a clean, organized space to work (Figure 6.8 and Figure 6.9). The 30-day action plan provided a timeline for further improvements, including replacing nonfunctioning lights, completing labeling of all bins and shelves, and installing additional power outlets.



6.6 HISTOLOGY LAB

The Histology Lab’s Lean leader, project owner, and six lab personnel identified problems similar to those identified in the Central Supply Storage Area. The Histology Lab specializes in human tissue studies and research. Their eight-person 5S team noticed that space was being wasted with clutter, obsolete items, and dirt, and overall organization was lacking (Figure 6.10). To fix these problems, supplies were “sorted” and “set in order” by throwing out the broken and expired items, and supplies not used in their department were returned to their designated departments (Figure 6.11). Supplies were also organized to ensure ease of access and enhance



FIGURE 6.9 Central supply work area after 5S.



FIGURE 6.10 Histology lab work area before 5S.





**FIGURE 6.11** Histology lab work area after 5S sorting and setting in order.

ergonomics by placing the items used more frequently in the middle shelves closest to the entrance. A broken door to the Histology Lab was removed, eliminating time and frustration spent in trying to open it. Dirty equipment was cleaned, and a process was put in place to ensure items are cleaned or discarded after use and put in their proper place, completing the “shine” and “standardize” steps. This project was also “sustained” with periodic checks. These improvements created a safer, cleaner, and more aesthetically pleasing working environment.

Each department described had successful 5S projects which encompassed each of the 5Ss in some form. Figure 6.12 provides specific examples of each S from each department.

## 6.7 DO 5S RESULTS LAST? EVALUATING THE 5TH S—“SUSTAIN”

In many cases the last S “Sustain” proves to be the most difficult. Sustaining is challenging because it requires participants to continue the 5S mentality and actions long after the initial 5S event has concluded. Ochsner has a system in place to follow up with departments that complete the initial 5S project to track the level of sustainability. Department leaders fill out a quick scorecard rating system monthly to track progress on 5S goals. The scores range from 0 to 25, with 25 being the best. Each of the 5Ss is rated on a scale of 0 to 5, with 0 being backsliding (the worst) and 5 being focus on prevention (the best case). Figure 6.13 provides 5S scorecard results for three of the departments described earlier from the time each department conducted the initial 5S event. The figure illustrates how these three departments have sustained their 5S goals over several months.

None of the departments are yet in the top tier (scores of 20 to 25) of taking 5S to the next level, but the Med/Surg unit and outpatient infusion both appear to be sustaining at the next best level, which is having all employees consistently follow 5S standards. While the initial results of the 5S were very promising for the ICU,



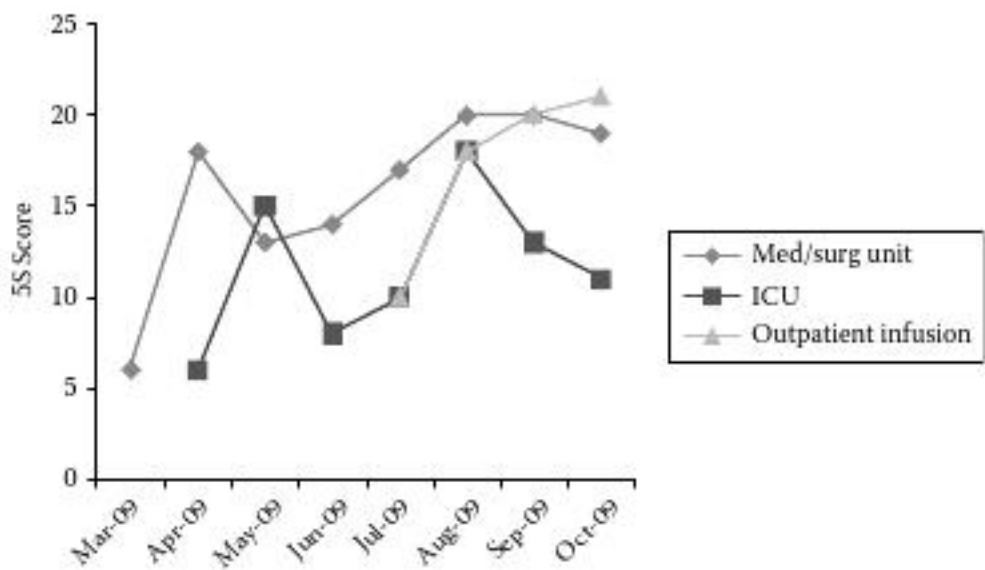
	Sort	Set in Order	Shine	Standardize	Sustain
ICU	Reduced par levels by 20%	Moved shredder and respiratory supplies closer to point of use, saving 14 miles of walking per year	Fresh paint	Made staff responsible for maintaining and cleaning equipment on a daily basis	Developed checklists to be completed each shift
Outpatient infusion	Removed \$4302 in unneeded or expired inventory	Established equipment storage room	Cleaned all areas	Established equipment process for chemo chairs, lunch tables, and supply carts	Developed weekly checklist to maintain changes
Med/Surg unit	Reduced items to eliminate 2 storage rooms	Moved dialysis supplies closer to dialysis room	Included cleaning medication room on daily checklist	Arranged East/ West supply and medication rooms to be identical	Developed checklist for unit secretary to fill out daily
Central supply	Removed 148 obsolete products	Found a designated place for all items	Cleaned all shelves and removed old stickers	Developed a cleaning mechanism and communication plan	Developed control plan to audit sustainability plan
Histology	Removed broken, unused, and expired supplies and equipment	Removed broken door	Developed standards for frequency of cleaning equipment	Developed standard of work for lab room	Used visual cues to sort, shine, and set in order equipment and supplies

**FIGURE 6.12** Examples of the 5Ss in five different departments.

follow-up 5S scorecards indicate that this department has not sustained the improvements over time. Part of this may be due to a change in director after the initial 5S. Anecdotal evidence suggests that the new director was not as invested in 5S as the previous one, which illustrates the need for management support in 5S projects.

Aside from management commitment, other strategies can be used to ensure the initial 5S efforts are sustained. First, nearly all departments developed a 30-day plan for continuing 5S work. In many cases there were several improvements requiring





**FIGURE 6.13** 5S scorecard results starting from initial 5S event.

more time for completion, such as installing new shelves, moving telephone lines, and painting. Having a timeline for completion ensured that there was a target date for having these items completed. Another Lean tool to help with sustaining gains is using visual cues such as labels on shelves and bins to indicate where items should be placed and checklists or process sheets to show standard operating procedures. These cues guide workers toward sustaining order rather than relying on memory.

**6.8 BENEFITS AND WORDS OF CAUTION IN USING 5S**

As part of a Lean vision for Ochsner Health Systems, 5S is a vital tool in eliminating waste in the physical workplace. The five departments described all saw tremendous benefits from implementing 5S, though the degrees of success may have differed. All departments agreed that communication and planning were keys to a successful 5S project, and the major benefits and hurdles to overcome are described below.

A major outcome of 5S is the creation of space, due both to removing items that were expired, broken, overstocked, or obsolete and also to better organization of essential items. Removing items also means a decreased chance of using improper equipment in patient care, which in turn improves patient and employee safety. Improved safety indicates another major benefit: improved compliance to various safety, fire code, HIPAA, and TJC standards. In several instances, employees are now fully aware of the fire code mandate to have an 18-inch clearance between the ceiling and stored items. In other instances, computer screens and paper forms were relocated to ensure patient privacy and meet HIPAA regulations. An additional benefit of 5S is time saved by reducing time spent searching for items and traveling to various locations to retrieve items that are not placed optimally. Time saved on the part of healthcare workers translates to less waiting time for patients, which can ultimately improve patient care and satisfaction. A final benefit of 5S projects is the opportunity for employees across several levels within and outside a department to work together toward a common goal, which can improve morale and job satisfaction.



While 5S produces many positive results, planning and communication are critical to a successful project. 5S work requires significant time commitment from employees, which often results in voluntary hours spent beyond the regular workday to complete 5S activities. A point of pride for several departments was being able to accomplish the 5S while keeping up with regular workloads. Nevertheless, it can be difficult and time consuming to make these significant changes. As with any change, resistance and returning to old habits are possibilities. Finally, 5S is difficult to sustain without strong management commitment and support. As illustrated by the ICU project and 5S scorecard follow-ups, a change in leadership can negatively impact 5S gains if new leadership does not fully promote and support the 5S program.

The implementation of 5S requires major changes throughout each department and the entire organization, which can be difficult. Based on Ochsner's Lean journey, there are three vital components of successful 5S projects: (1) leadership, (2) culture, and (3) process. Strong management commitment and inspiring leadership from Lean leaders is essential to the success of the project. A Lean culture is the required setting to implement Lean tools and techniques, such as 5S. One of the challenges of evolving the culture to a Lean culture in healthcare is that it requires employees to identify waste in their own work—it is a personal experience. Realizing that many of their daily tasks are wasteful and not optimal can be difficult for healthcare professionals. To facilitate the evolution of the Lean culture, leaders must create a clear vision and guide employees through the Lean journey. In addition, the leaders should lay out and guide the process of implementing the 5S. A well defined process for implementing and sustaining a 5S project aids employees and ensures success. Ochsner has guidelines to implement a 5S project that allows departments or unit managers to request support from the Lean leaders to coordinate planning and details of the 5S event, conduct the prework, complete final arrangements to implement the 5S, and follow up after the 5S event is completed.

## 6.9 CONCLUSIONS

5S has brought tremendous positive changes to Ochsner Health System through reduced inventory, increased available revenue-generating space, and reduced travel times. 5S has been popular with Ochsner employees because the successes are immediate and visible, which has helped the overall Lean program at Ochsner gain support at all levels of the organization. While it is only one component of the Lean program, it has become a valuable tool for improving healthcare processes in Ochsner's Lean journey.

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