

## Excerpt from Chapter 6 (5S and Visual Management)

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# LEAN HOSPITALS

Improving Quality, Patient Safety, and Employee Engagement

Third Edition

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Foreword by John Toussaint, MD



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Mark is an experienced change agent, with a background in industrial and mechanical engineering and an MBA from the MIT Sloan Leaders for Global Operations Program. Prior to healthcare, Mark worked in multiple industries, including automotive (General Motors), electronics (Dell), and industrial products (Honeywell). At Honeywell, Mark was certified as a “Lean expert” (Lean Black Belt).

Since August 2005, Mark has worked exclusively in healthcare, where he has coached Lean teams at client sites in North America and the United Kingdom, including medical laboratories, hospitals, and primary care clinics. Mark’s motivation is to apply Lean and Toyota Production System principles to improve quality of care and patient safety, to improve the customer/patient experience, to help the development of medical professionals and employees, to make healthcare more affordable, and to help build strong organizations for the long term.

From June 2009 to June 2011, Mark was a senior fellow with the Lean Enterprise Institute, a not-for-profit educational organization that is a leading voice in the Lean world. In this role, Mark also served as the director of communication & technology for the Healthcare Value Network, a collaboration of healthcare organizations from across North America, a partnership between the Lean Enterprise Institute and the ThedaCare Center for Healthcare Value. Mark continues as a faculty member for the Lean Enterprise Institute and the ThedaCare Center.

In June 2011, Mark also joined the software company KaiNexus to help further their mission of spreading continuous improvement, while continuing his other work and activities. He also serves on the board of the Louise H. Batz Patient Safety Foundation.

Mark was raised in Livonia, Michigan, and currently resides in Texas with his wife, Amy.

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## Chapter 6

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# Lean Methods: Visual Management, 5S, and *Kanban*

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### Lean Is More Than Tools, but Tools Can Help

Looking back to the Toyota Triangle from Chapter 2, technical tools are just one component of the integrated system of Lean. Rather than documenting all of the details of how to implement these methods, this chapter focuses on some of the healthcare-specific examples of the use of visual management, 5S, and *kanban*. We also focus on the management methods and philosophical concepts that are embedded in the effective use of these methods. This chapter is by no means an all-inclusive list of tools, but these are some more commonly used in the early stages of health system implementations, methods that remain helpful over time when practiced with discipline and continuous improvement. Many of the existing guidebooks or manuals for these methods, published for manufacturing, can be adapted for a hospital setting. In addition, healthcare-specific books are now being published on some of these methods, including 5S and *kanban*.<sup>1,2</sup>

### Reducing Waste through Visual Management

Another form of standardized work is the method of visual management. The goal of visual management is to make waste, problems, and abnormal conditions readily apparent to employees and managers. As Fujio Cho, honorary chairman of Toyota, says, “One of the worst situations . . . is not being able to tell whether things are standard or out of standard (normal or abnormal).”<sup>3</sup> Our aim should be to expose problems so they can be fixed, as opposed to the old approach of hiding problems to make things look good. Toyota’s Bonini says, “The ideal, the basic principle behind *jidoka*, is to be notified of any abnormality and solve problems immediately, one by one, as they occur, while the situation is still fresh.”<sup>4</sup>

Many organizations have old habits of ignoring, hiding, or covering up problems. As an alternative approach, visual management is a mindset, more than a specific technology. Our goal, as leaders, should be to ask how we can make our process more visual and our problems more

apparent, as the first step in improvement. As previously noted, the famed Taiichi Ohno of Toyota once said, “Having no problems is the biggest problem of all.”<sup>5</sup>

Gwendolyn Galsworth wrote that the purpose of visual management is to reduce “information deficits” in the workplace.<sup>6</sup> She wrote that, “In an information-scarce workplace, people ask lots of questions and lots of the same questions, repeatedly—or they make stuff up.”<sup>7</sup> These questions about missing information waste time and cause delays. This happens throughout health systems. Listen to the questions employees ask, such as

- Does this patient have any more tests, or can he go home?
- Have these medications been double-checked?
- Which patient should be brought back next?
- Are these tubes ready to load into the test instrument?
- Is this pump clean?
- Who is the physician for this patient?
- Which patients are assigned to that nurse?
- Have these papers been signed?

These questions are rooted in a lack of information, information that either does not exist or is not readily apparent—thus the need for visual management. Visual management should also, ideally, be used for real-time decision-making. Visual management has two main tenets: first, make problems or status visible; and, second, manage those situations, reacting as needed in the short term and solving root causes of those problems over the longer term. Even before Lean, hospitals and clinics often have multi-colored plastic “flags” in the hallway outside each patient room or exam room door. These flags, if used consistently by staff, can provide a clear visual indicator that answer questions such as, “Is there a patient in that room yet?” or “Which patient is waiting on test results?”

In some hospitals, nurses have a set of colored flags that they display on their portable computer carts that indicates their current status, with red meaning they could use help from others, yellow meaning things are normal, and green meaning they currently have some extra time to help others. The organizational culture has to allow nurses to speak up, making it acceptable to admit that they are currently overloaded with tasks instead of keeping their heads down and being tough. But, if nurses are allowed to be honest about their current status, leveling workloads and providing help to each other can be a self-managing process that helps reduce stress and improve patient care.

Some mistakenly understand visual management to be primarily the posting of performance measures or signs throughout the workplace. Yes, performance metrics are important, as discussed more in Chapter 11. But, a chart on the wall is not necessarily visual management. Is it just a visual or does the chart drive the right discussions and improvement? Real-time visual management is much more effective than waiting for monthly, or even daily, reports and metrics to gauge the performance of a process.

Hospitals and clinics have many visuals that are essentially just signs that warn employees against making errors. For example, a piece of pharmacy automation has a label that says, “Warning! Risk of injury. Do not reach inside until motion stops.” Labels or signs posted by managers, such as “Check drawers for home medications before discharge!” are not visual management and are a poor substitute for root cause analysis and error proofing (see Chapters 7 and 8). In the case of the pharmacy automation, it would be better if the machine stopped automatically when the door opened, or if the door could only be opened once the machine had already stopped.

## Examples of Visual Management for Patient Flow

In the radiology department of one children's hospital, some of the children are scheduled for multiple imaging appointments, such as a sonogram and magnetic resonance imaging (MRI). Because most patients just have one modality to visit, and employees can only see the schedule for their modality, it is common for a technologist or nurse to say, "You're done now" after the first procedure. Because many young children do not know what they are in for, and some parents might not fully understand the plan for their child's care, some leave without having the second imaging completed. This leads to idle equipment (which was in high demand), rework for the scheduling staff, wasted transportation and time for the patient and parents, and delays in care.

The front desk staff in the radiology department came up with a simple visual management tool to prevent this waste from occurring. When a child has two modalities to visit, the desk staff clips together two color-coded laminated cards and attaches them to the patient's shirt. This gives a clear indicator to the staff of the first modality that the patient has to move to a second procedure. This is also a form of error proofing, as discussed in Chapter 8. Rather than managers browbeating employees to be careful (or hanging signs), the team took a more effective, simple, and visual approach to solving that information deficit.

Hospitals often use visual management to identify the status of patients or their needs, facilitating real-time decision-making. Tracking boards (either low-tech whiteboards or high-tech plasma screens) are used to identify which rooms are open or to let families know where patients are currently located in the value stream. One outpatient orthopedic clinic used to just stack patient charts on a desk. They now place charts in wall holders that create a clear visual of how many patients are waiting for each physician. In addition, there are clear visual signals that indicate if the patient is ready or is still getting an X-ray. The registration desk staff can easily look down the hallway and use this visual information to prioritize the registration of patients who might arrive at the same time. Instead of the old first in, first out approach, which seems reasonable, they decided it was better for patient flow to first register a patient whose physician is currently available rather than the patient who will be just be waiting until their physician has seen their already waiting patients. These visuals are all used to close information gaps or to make decisions, hence visual management.

Many hospitals have used software systems that display patient status on large flat-panel televisions. It is a common Lean principle to use technology and automation only after the process has been piloted in a manual way. Principle 8 of *The Toyota Way* says to "use only reliable, thoroughly tested technology that serves your people and processes."<sup>8</sup> Lean thinkers are not against technology or software, but they tend not to jump immediately to technology solutions. One large children's hospital created a large whiteboard with color-coded magnets laid over a drawing of the inpatient unit layout. While the board was intended to be a prototype to help them choose an electronic system, the hospital decided the whiteboard worked just fine and was flexible enough to be changed quickly as their needs evolved. Another hospital built a prototype of a patient tracker in a shared network spreadsheet that could be displayed on screens throughout the hospital. They were surprised to conclude that their inexpensive homegrown solution also eliminated the need to buy the commercial system. Homegrown visual systems (analog or digital) have the advantage of being completely customized to your own situation.

New London Family Medical Center built a "Real-Time Monitor System" (RTMS) that is displayed on digital screens throughout the hospital. Major areas of the hospital self-report their workload status and "staff control the color," says chief executive officer (CEO) Bill Schmidt. Like a modified traffic light, green means they have enough capacity, yellow means there is a

concern, and red means immediate help is required. Again, it's visual management because managers respond and help. The RTMS traffic light is unusual in that each area has a fourth color, blue, that indicates they are "overstaffed." In many hospitals, a department's staff would be afraid to admit they were overstaffed because that would mean being sent home early. Their staff are cross-trained and could be shifted to departments that are in yellow or red status, helping level workloads throughout the hospital.

## Examples of Visual Management to Prevent Process Problems

Visual management can also be used to create awareness or prevent problems. In one hospital laboratory, simple visual management methods were used to prevent specimen testing delays. Certain specimens were transported from the main lab site to microbiology through a pass-through box built into the wall that divided the departments. Once used by microbiology, the specimen was placed back in the box for the main laboratory to continue testing. Often, the specimen would sit up to one hour in the pass-through box, waiting to be taken back out by the main lab. The delay was caused partly by the ambiguous signal (or information deficit) of a specimen being seen in the box. The main lab employees could easily, and incorrectly, assume the specimen was still waiting to be taken into microbiology when it was actually done and waiting to be brought into the main lab. Laboratory technologies came up with a simple visual control—a laminated sheet that microbiology could place in the lab side of the pass-through window when a specimen was coming back in that direction. When the main lab took the specimen back, they could take the sign down until it was needed the next time. The visual wasn't a perfect system (it only worked if microbiology actually put the sign up), but things worked better with the sign than without. There were still opportunities for continued *kaizen* or mistake proofing.

Care must be taken that visual controls or indicators are standardized across units or even across hospitals. Patients' color-coded wristbands help identify special needs or do not resuscitate (DNR) requests. Unfortunately, wristbands are not always standardized among different hospitals in the same community, leading to opportunities for confusion when nurses or physicians work at different sites. A yellow wristband that indicates "do not draw blood from this arm" in one hospital might indicate DNR in another, creating an opportunity for catastrophic errors.<sup>9</sup>

The practice of "hourly rounding" has become popular in hospitals, with the aim of ensuring each patient is checked on in a standardized way at least once per hour. Benefits of this practice include 12% higher patient satisfaction rates, 52% fewer falls, 14% fewer skin breakdowns, and 20% less walking for nurses.<sup>10</sup> But, if nurses and techs are overburdened with work, hourly rounding might not always occur, meaning we lose those benefits. One hospital installed an inexpensive visual 60-minute countdown timer outside each patient room, indicating when 60 minutes has elapsed without rounding. Instead of relying on reports, managers can see, in real time, if hourly rounding is occurring. As mentioned in Chapter 5, if it appears that hourly rounding is not happening, managers should ask "why?" and proceed from there, working to reduce waste and fix the system so that hourly rounding can occur more consistently. Again, the visual (the clock) is not useful without the management of that system.

Avera McKennan has used visual management to improve the consistency of patient care in a number of ways. The hospital added "electronic status boards" in the electronic medical record (EMR) system that alerts nurses to the need to remove Foley catheters within 48 hours, if possible. Beyond the visual, the standardized work was changed for this decision to be "nurse directed" and carried out by nurses. The hospital is "monitoring the process, not the outcome," but ensuring the

right process is being followed lead to better outcomes. Avera McKennan has also added a status board showing which patients need immunizations. Since “people always have their face in a computer,” it made sense to them to put the visual alert in the EMR, since it was more likely to be seen. The “individual status board for each patient drives [the nurses’] day.”<sup>11</sup>

## 5S: Sort, Store, Shine, Standardize, and Sustain

Another example of workplace waste might be evident when questions such as these are asked:

- Where are the blankets?
- Why did we run out of syringes?
- Where did those medications go?
- Why are we walking so far within the department?
- Why do we spend so much time looking for things we need?

The 5S (sort, store, shine, standardize, and sustain) methodology reduces waste through improved workplace organization and visual management. Implementing 5S is not about looking neat and orderly, and it should not be confused with a one-time or annual “spring cleaning” exercise. The primary goal of 5S is to prevent problems and to create a work environment that allows people to provide the best patient care in the most effective way. For example, John Toussaint, MD, former CEO of ThedaCare (Appleton, Wisconsin), estimated that 5S improvements had helped reduce the amount of wasted time in an average nurse’s eight-hour shift from 3.5 hours a day to just one hour per day.<sup>12</sup> 5S is often used as an early Lean method as a way to start engaging staff in small improvements as a precursor to addressing bigger challenges, leading to the “revitalization of the workplace.”<sup>13</sup>

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The surest way to alienate medical professionals is to push the 5S methods in a top-down way that does not seem to be solving any meaningful problems. 5S (and Lean) might become dirty words if your first efforts involve a Lean facilitator or a single staff member moving around other people’s stuff and putting tape around things. Nurses at one hospital were trying to engage leadership on patient safety issues, yet they rightfully complained about “being told to reduce the number of pens and pencils” at the nurses’ station.<sup>14</sup> 5S needs to engage everybody and needs to focus on important problems, rather than the trivial.

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The term 5S comes from the origins of the method in five Japanese words, as shown in Table 6.1. Rather than forcing more Japanese words on employees, most hospitals refer to some variations of English translations, but the principles behind the 5Ss are the important thing. Health systems in other countries often translate the words into their own local language.

### First S: Sort

The first 5S activity is to go through the department or area, looking for items or equipment that are no longer needed, items that are just taking up space. In one laboratory, for example, the team conducting the initial 5S sorting activity found things such as



- Old, yellowed stationery and forms with a 1970s hospital logo
- Expired reagents or slides dating back decades
- Broken computers and keyboards
- Specimen collection tubes that expired months ago in the bottom of drawers

Items that can be clearly thrown away without controversy or the risk of someone later saying “I needed that” can be immediately disposed of, recycled, or donated. When unneeded items take up valuable workspace, the department ends up being larger than it needs to be, which results in excess construction and maintenance costs. These larger departments and workspaces lead to excess employee walking and other types of waste. Broken equipment and expired supplies take up space that could otherwise be used for supplies and tools that are used more frequently or for value-adding activities.<sup>15</sup> Before 5S, Seattle Children’s Hospital (Washington) had an operating room that served as a cluttered storage room or “boneyard.” Thanks to 5S, they were able to convert that room back into usable, revenue-generating clinical space in just three days.<sup>16</sup>

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One medical laboratory found a box of slides that, to the employees’ best estimates, dated to the 1960s. The slides were found in the new building, opened in the 1990s, meaning they had been moved from the old building to the new building, just to clutter up the new space. Any new construction, major renovation, or department move should be preceded by a major 5S activity.

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If there is some question about items that *might* be needed, a buffer zone—a 5S sort area—is set up somewhere in the department. Since not all employees can be present during the sort activity, holding items for a week allows everyone to review what the team is planning to throw away. This prevents rash decision-making and the waste of disposing of items that would have to be repurchased. At the same time, we have to prevent people from reclaiming all items just because they think they might need the item someday. If there is disagreement over what is needed, a supervisor can facilitate or intervene. Items that might possibly be needed could be kept in a central supply or off-site storage location (with good records kept about what is being stored off-site).

5S should not be viewed as only being about throwing items away. As part of this initial sort process, a team should also identify needed items that are not readily available in their workplace.

**Table 6.1 5S Term Translation**

<i>Japanese word</i>	<i>Translation 1</i>	<i>Translation 2</i>	<i>Description</i>
Seiri	Sort	Sort	Sort out unneeded items, keep items based on frequency of use
Seiton	Store	Straighten	Organize for the reduction of waste
Seiso	Shine	Shine	Keeping the workplace clean, daily
Seiketsu	Standardize	Systemize	Developing a consistently organized workplace
Shitsuke	Sustain	Sustain	A system for ongoing support of the first four Ss

## Second S: Store

Some organizations make the error of stopping after the first S, sort. While it is beneficial to get unneeded items out of the way, the most ongoing waste elimination will come from properly organizing the material and equipment that remain and “new” items that had been previously missing or unavailable, leading to the store phase.

In the store phase, employees identify how frequently each item is used. Items used most often should be stored closest to the point of use. If items are used by multiple people in an area, such as latex gloves in an emergency department (ED) or laboratory, consider having multiple storage points. There is a trade-off between reducing the waste of motion (keeping supplies close by) and the increase in inventory that might result with additional storage points. If supplies are inexpensive and take up little space, it is better to err on the side of more locations to avoid employee walking and wasted time.

The guidelines in Table 6.2 are only a suggestion. Common sense should prevail over hard-set rules. If an item is used infrequently but takes up little space, or if it is needed urgently (such as a crash cart or maintenance items for an instrument), it should be kept closer to where it is needed.

Items that are used most frequently should be kept in good ergonomic zones, on benchtops or shelves that are not too high or low. Employees waste motion, and can get hurt, by bending to get commonly used supplies out of low drawers. They also exert unnecessary motion opening doors to reach for supplies.

In one Japanese hospital, the nurses all wore a standardized bag around their waist that kept frequently used items with them at all times. The bag included hand sanitizer (to prevent having to walk to a dispenser), pens, alcohol swabs, and other potentially helpful items. A key decision for a nursing team about adopting an idea like this would be how standardized the bags need to be. In other words, can staff personalize the bag, or should they be identical, so anybody can grab any bag at the start of a shift?

Before Lean, most supplies are kept in closed cabinets or drawers, which create waste as employees search for items and cannot see what is located where. With improved organization, employees will no longer waste time opening multiple cabinets or drawers, searching for what they need. When determining storage locations, Lean leaders challenge the need to store items in closed cabinets or drawers. Well-organized departments are not afraid to keep supplies visible and in the open since there no longer are the piles of disorganized supplies that used to be hidden, as pictured in Figure 6.1. Figure 6.2 shows how the organization was improved with 5S. Hiding the old mess in a drawer or behind closed doors was often a workaround to the problem of not keeping things organized.

**Table 6.2 5S Guidelines for Storing Items Based on Frequency of Use**

<i>Frequency of use</i>	<i>Storage proximity</i>
Hourly	Within arm's reach
Every shift	Within a short walk
Daily	A bit further away
Monthly	Department storage
Annually	Hospital storage



**Figure 6.1** Drawers that are unorganized and cluttered before 5S.



**Figure 6.2** Drawers that have been organized through 5S, with supplies in divided bins.

Figures 6.3 and 6.4 show a comparison of OR supply storage, before and after 5S. With effective 5S, it's not just a matter of looking better, but making it easier to find the right supplies more quickly and to ensure that needed items are available.

Figure 6.5 shows, in their “*kaizen* report” format, the before and after situation in a biomed storage room at Franciscan St. James Health (Illinois). As with all *kaizen* style improvements (see more in Chapter 11), Joe Walkowiak was self-motivated to 5S the room, creating a less cluttered and more enjoyable working environment, saving some money for the health system in the process.

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In the case, from Chapter 5, of the hospital unit where the lift assist was not being used, it was stored upstairs on a different floor. The room in the unit with equipment and supplies was overcrowded with broken walkers and way too many old commodes. The 5S process then became an effective way to make it easier for people to use the correct equipment. Freeing space allowed the unit to bring its lift assist to the second floor, where it was much more convenient and became used much more regularly. This countermeasure was more effective than hanging signs.

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**Figure 6.3** Disorganized operating room supplies before 5S.






**Figure 6.4** An operating cabinet that has been better organized through 5S.

### ***Third S: Shine***

After removing unneeded items and determining the best storage location for those that remain, the 5S focus turns to cleanliness. Hospital departments often rely on the centralized housekeeping department, a group that often only does major cleaning, such as floors and trash cans. Dust often accumulates on top of instruments and behind equipment in the pharmacy or laboratory. In the 5S approach, people who work in the area take responsibility for their own light cleaning (areas not cleaned by housekeeping) and the overall cleanliness of the department.

In manufacturing settings, the focus on shine was typically related to oil that might leak from machines. Floors that are always oily not only would be unsafe but also make it hard to determine if machines were leaking at the moment (remember visual management means to make problems visible immediately). Clean floors are safer and let you immediately detect problems with equipment. In healthcare settings, the focus on shine is more correctly oriented toward infection control.

Cleanliness, or the lack thereof, can affect the patients' experience and their perception of the hospital. Dr. Toby Cosgrove, CEO and president of Cleveland Clinic, wrote about a surprise

Biomed 5S		 <small>Division of St. Francis Health Services</small>	
Before		After	
			
Effect			
Easier to find things i need to do my work. Saves time for me and others. Feels less cluttered. I feel more organized. I enjoy being at work more now. I experience more joy at work. More space is available for growth. Estimated annual Cost Savings? \$3,500			
Name	Department	Supervisor	Date
Joe Walkowiak	Clinical Engineering	Joe Walkowiak	12/22/2010

**Figure 6.5** A “kaizen” improvement summary showing the before and after pictures of a biomed room.

he saw when visiting a postsurgical inpatient unit, saying, “The operation had been a great success, but the family was unhappy. When I asked why, they suggested that I have a look under the bed. I looked, and to my everlasting humiliation, saw litter and dustballs. The patient and family felt neglected and disrespected—and they were right to be offended ... As the dustball incident proves, no detail is too small to spoil a patient’s perception of your care.”<sup>17</sup>

Cleaning should not be considered a “make-work” activity but rather an opportunity for the team to show pride in their workplace by keeping it clean at all times. A side benefit is an opportunity to inspect the equipment and benches that are being wiped down. If problems such as frayed wires are seen, they can be reported immediately.

### ***Fourth S: Standardize***

The fourth stage of 5S is often the most visible when you visit a Lean hospital or a department. Once staff have determined the best locations for needed items, it is time to ensure that items are always kept in the defined locations. We can standardize in a department, or we can standardize across departments, bringing benefits to employees or physicians who work in multiple units. At one hospital, the automated supply cabinets in different inpatient units were each organized differently, with no attempt made to standardize. This frustrated nurses who worked in different units, as they wasted time reorienting themselves when in a different unit. Standardized cabinets might have 80% of items that are the same across units, with customized space based on the needs of a particular unit. Again, standardized does not have to mean completely identical.

We often standardize through visual methods, the marking of “home locations” with vinyl tape, shadow outlines, as shown in Figures 6.6 and 6.7. In situations where tape cannot be used on floors or work surfaces because of infection control concerns, there are alternatives for marking locations, such as hanging signs from ceilings or putting signs on walls.



**Figure 6.6** A laboratory bench shows clearly marked locations for specimen drop-off and supply storage.



**Figure 6.7** A different lab's workbench with 5S labeling and visual controls.

Marking the locations of items brings many benefits, including

- Being able to see instantly when an item is missing or out of place
- Less wasted time looking for items
- Subtle psychological incentives for employees to return items to their home locations

In a workplace, we often find an item is missing just when it is most urgently needed. This can be true for tools (such as pipettes in a lab or wheelchairs in an ED) and information (such as maintenance manuals or a patient's plan of care). By using 5S and visual methods to mark standard locations, it is obvious when something is missing. Instead of just seeing a blank space, we see an outline labeled with what is supposed to be in that space. This allows for more proactive problem solving.



In one hospital lab, a collection of binders contained important maintenance and troubleshooting information for a test instrument. Over a weekend, the instrument malfunctioned, and the employees could not find the binder. This led to delays in getting the instrument back in working order, extra work for the team, and increased stress. It turned out that an employee with good intentions had taken the binder home to study it. A clear expectation had not been set that the binder needed to stay in place. The group responded by putting a diagonal tape stripe across their binders, so it became apparent when one was missing, as shown in Figure 6.8. In the future, a supervisor might be able to find the missing binder proactively before it is desperately needed.

In addition to using inexpensive vinyl tape, the practice of “shadowing” the location of items can be helpful. A shadow is a physical outline or photo of an item that is supposed to be in a location. These can be created with digital pictures or by tracing the outline of the item. A laminated plastic shadow can be attached to the location. Some orthopedic surgical trays already use this approach, using photos on the bottom of the tray to indicate which tool goes where. The photos are so realistic that it can be, at times, difficult to tell from a distance if the tool is actually there or not. In cases like that, a solid shadow showing the shape might be more useful than a realistic image.

In a Japanese hospital, the drawers of desks and cabinets had home positions that were cut out of foam board, as shown in Figure 6.9. An advantage of this approach is that it's not only clear if



**Figure 6.8** Laboratory documentation binders set up so that a missing binder would be visually apparent.



**Figure 6.9** Japanese medication cart drawer that is organized with foam cutouts indicating where items are to be kept.

something is missing, but it's also easier to see if staff are loading the drawers with more supplies than are really necessary. This 5S foam board is relatively inexpensive, but it is harder to change than tape outlines when standard items or quantities need to be changed.

### *Standardize Things That Matter*

As with other methods, we need to take care that we are not using the tool (5S) without thinking about the problem that is being solved or the waste that is being prevented. In some health systems, people go overboard by labeling or outlining everything they can. If an item is heavy and not likely to move, such as a large desktop printer, there is no value in putting a tape outline around it and no problem being solved. We are, in fact, wasting tape. Likewise, putting printed labels on obvious items, such as a label that says "Printer" on the machine, adds no value and does not prevent a problem; however, a label may be helpful to identify the specific name or use of a printer to prevent clinicians from having to run around to different machines to find their printout.

Asking people to do 5S for an individual office desk that is not a shared workspace might also bring little benefit to patients or the organization. Banning personal items or family photos from a finance analyst's desk probably doesn't do anything other than irritate people. Common sense should drive the use of this method. If people start questioning the benefit of the approach, it might be a sign that we have gone overboard with the tool. Again, 5S is a method that is meant to engage the staff, not impose top-down mandates on them.

### *Standardizing Airway Carts*

At Avera Health, a group of emergency physicians decided it was important to standardize the airway carts used at their various hospitals. "When we looked across the service line, we could tell that every single one of our regional centers has a different way of using their airway equipment," said Kelly Rhone, MD. Some centers had equipment on a wall or in a bag, and some centers did not have mobile equipment, meaning "you could only do an airway in certain rooms."

Their goal, and their need, was to have "the right equipment in the right room at the right time," eliminating the situation where "it was a real scramble ... with a nurse going one direction and me going another" to get the equipment they needed, according to Jared Friedman, MD, the clinical vice president for the emergency medicine service line.

The system created a standardized airway cart, which "works out very well for the patient and the staff," said Friedman. Rhone says, "It benefits the patient because they can get all of their airway care in the emergency department and we don't have to call down for equipment for the operating room." This reduces delays, saving time for staff and improving care. Physicians now know that, no matter where they are working, they have all of the equipment they need in a standardized, organized cart. "Now we have drawers that are clearly marked and they are the same throughout the system," said Rhone.

The airway cart was the first example of other mobile carts that will be created, allowing them to bring the equipment to the patient. Friedman said, "I think the greatest thing is that it's really created a dialogue for all of the regions and all of the staff, both physicians and nurses, to start talking about who has best practices ideas that can be spread around, to create a greater quality experience for our patients."<sup>18</sup>



### ***Fifth S: Sustain***

To prevent 5S from becoming a one-time event (or a repeated annual event), we need a plan for sustaining and continually improving our workplace organization. The department needs a formal audit plan so supervisors and leaders can see if the new standards are being followed. As with standardized work audits, this can be done on a scheduled basis. The visual management methods also make it possible for leaders to scan the department as they are walking through. If something seems out of place or missing, a leader can ask a few questions and coach employees about maintaining the proper setup. If an item is out of place, it might be because an employee has found a better or more convenient location. For situations like this, the 5S tools (outlining tape and label makers) should be kept available so employees can update their own workplace organization.

### **Safety as a Sixth S?**

Some organizations add a sixth S to the methodology—safety. Detractors point out that safety should be an underlying philosophy of the organization, not something to be tacked on to 5S just because it also starts with the letter *s*. Attention to safety should be the focus of all 5S stages as it should be a focus on any regular day. For example, removing unneeded equipment can reduce tripping hazards that might result from cluttered spaces. Having the right supplies and equipment in nearby locations can help improve patient safety, as well, as the case study at the end of this chapter illustrates. Excluding safety as a formal *S* does not mean that safety is not important; instead, it signifies that safety is not something that can be delegated only to those implementing Lean. A culture of safety is owned by executive-level administrators and all other leaders in the organization.

### ***A 5S Case Study: Saving Time for Respiratory Therapists***

5S is not just a matter of labeling items on shelves. The following case study illustrates how deciding *where* to store items in a supply room can reduce waste and free up time for caregivers.

Maggie Reed was a supply coordinator in charge of the respiratory supply room at one of the hospitals within Franciscan St. Francis Health (Indianapolis, Indiana). In her role and with her view of the hospital, it made sense to organize her supply items alphabetically. For a respiratory therapist to quickly find something in her supply room, they had to reference a detailed wall chart that listed each item, alphabetically, along with its precise shelf location.

Joe Swartz, the director of business transformation for the system, visited Maggie's supply room to see recent improvements she had made. For example, Maggie had made supplies more visual by placing sample supplies on the outside of the glass cabinet doors.

During his visit, Maggie was pulled away for a few minutes and Joe began observing the respiratory therapists retrieve items, asking about their work. They mentioned things like needing to set up a patient on a vent in the ICU or needing a bilevel positive airway pressure (BIPAP) for a patient in the medical/surgical unit. Joe noticed a pattern—her customers, the therapists, seemed to be coming to get systems rather than random, individual parts. But, he didn't want to jump to conclusions or tell Maggie what to do.

If the pattern he observed was true, then Joe also needed to get Maggie to see this pattern, because she felt a strong sense of ownership of the area. Joe asked Maggie if she would do him a favor, saying, "Could you ask therapists periodically throughout the week what they are here

for, and could you group them into two categories: here primarily for parts, or here primarily for systems like a vent or a continuous positive airway pressure (CPAP)?" Joe said he'd stop back by in a week. Maggie agreed.

A week later, Joe asked what Maggie had observed. She said, "It's interesting, about 80% of the time, they are here primarily to get a system." "That's really interesting," Joe said, raising his eyebrows and asking, "Does that influence your thinking about how the supply room should be organized?" "Yes," Maggie said, "I've been thinking—I might reorganize it by systems. What do you think?" "Wow, that's a great idea," Joe replied.

Maggie reorganized items, so that all vent, airway, and tracheotomy supplies were in one area. This made work easier and reduced waste, as therapists could stand and reach all those items without moving their feet. She also placed all BIPAP items in another area, and so on. The resulting layout enabled the therapists to get what they needed in half the time, increasing the time available for patient care.

Maggie was motivated to put in the effort to reorganize her supply area because she felt like it was her idea, and she took ownership. The only thing Joe did was to help her see her world from her customer's point of view and to discover what was needed for her internal customers. Because she was able to see things from a new perspective and took action, Maggie became a hero to the therapists she serves.

## Kanban: A Lean Approach to Managing Materials

*Kanban* is a method that builds on the concepts of standardized work, 5S, and visual management to give health systems a simple yet effective method for managing supplies and inventory. *Kanban* is a Japanese word that can be translated as "signal," "card," or "sign."<sup>19</sup> A *kanban* is most often a physical signal, such as a paper card or a plastic bin, that indicates when it is time to order more, from whom, and in what quantity; it can also be an electronic signal that is sent by an automated cabinet or computer system. See Figures 6.10 (Children's Health, Dallas) and 6.11 (Rouge Valley Health System, Ontario) for examples of a laboratory *kanban* card and a pharmacy shelf that has been nicely organized and set up with *kanban* cards.

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Creating *kanban* cards can require a significant time investment just to get the system up and running. One hospital pharmacy created 1,600 laminated cards to manage medication inventory. After a few months, inventory levels had fallen from \$600,000 to \$350,000 by preventing the accidental overordering that occurred under the old method—not a bad return on that time investment! The time spent in the initial set up of the cards and the *kanban* system is also offset by effort saved over time through the simplicity of the approach.

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The *kanban* approach is sometimes mistakenly thought of as a system that just focuses on low inventory levels when its goals are actually to support the patients and the employees by ensuring needed supplies are in the right place, in the right quantity, and at the right time and to ensure the availability of material with the lowest required inventory levels. *Kanban* systems typically have fewer stockouts and better availability of materials than traditional materials management methods.

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