Sinai Hospital of Baltimore faced a challenge. The block schedule was maxed out, even though new ORs had been added. There was a need to eke out every available minute. Despite efforts to improve turnover time, it had plateaued at 32 minutes on average for the 22 ORs. Sinai performs about 20,500 cases a year.

Call in the Time Busters—a Lean project team to trim turnover time. The project was partially funded by AORN.

Sinai’s leaders projected that even if only 25% of the opportunity for saved minutes was realized, the hospital had the potential to generate $1.9 million in additional revenue annually.

The OR management team had already addressed the usual snags, such as instrument reprocessing delays and outdated preference cards. Adding to the challenge, the postanesthesia care unit had moved, adding 8 minutes of travel time.

**Kaizen event for turnover**

Sinai’s Lean project centered on a kaizen event, a concentrated 5-day exercise with daily targets. The event, held in September 2011, yielded a streamlined process, standardized work roles, and a plan to roll the new process out to the staff.

(Kaizen, Japanese for “improvement,” generally means humanizing the workplace and systematically eliminating waste.)

“It’s not a formula but relies on the team’s experience and creativity,” explains Jerry Henderson, MBA, RN, CNOR, CASC, assistant vice president for surgical services.

**Internal or external?**

One focus of the Lean turnover project was to separate “external” from “internal” steps. That is, which steps are external to the turnover process and can be done while the previous surgery is in progress, and which steps are internal and cannot be done while the previous procedure is going on, explains Richard Rahn of the Leonardo Group, who consulted with Sinai on the project.

The kaizen team had about 12 members: circulating nurses, surgical technologists (STs), throughput technicians, an advanced practice nurse, perioperative managers, and staff from the central sterile department. Others, including anesthesia providers and infection preventionists, participated as needed.
The hospital’s president, Neil Meltzer, kicked off the event and attended the concluding presentation.

Here’s how the kaizen event went.

**Advance work**
To make the most of limited time, a core team did advance work:
- set goals and metrics (sidebar)
- video recorded 4 to 5 turnovers to document the current process.

The purpose of the videos “was not to put the best face on turnovers but to depict the truth of how it is actually done today,” Rahn stresses. “This lets us know where we are starting from.”

**Kaizen Day 1**
*Goals: Learn Lean principles and methodology. Understand the current state of turnover time.*

Reviewing the videos, the team observed:
- There were no set roles for activities.
- There was wasted motion, with some steps repeated by different people.
- Mistakes were made in wiping down equipment. Some equipment was wiped more than once, while other equipment was missed.

“We saw opportunities to standardize roles and define sequences,” says Rahn.

The group documented necessary turnover steps on sticky notes and began organizing them into a flow chart.

**Kaizen Day 2**
*Goals: Create the ideal turnover steps:*
- Define the roles, activities, and sequence of activities.
- Decide which internal steps could be converted to external steps.
- Assign responsibility for the steps.

An example of an internal step was returning the case cart from the previous procedure to sterile processing. In the old process, during turnover time, the ST pushed the cart to the elevator. The team decided this could be changed to an external step: The ST could place the cart from the previous procedure near the OR and push it to the elevator after the room was ready for the next procedure.

Examples of other ideas:
- Assign each turnover team member to a zone with a set of activities. “We found it was faster for 1 person to stay in a zone rather than to do 2 or 3 things haphazardly,” Henderson says.
- Stage a kit of gowns and cleaning supplies in a hallway closet for ready access.
- Install plastic flags, like those used in doctors’ offices, outside each OR as a visual cue. The staff member who enters an OR to start turnover flips the flag to indicate the room is already being cleaned.

### Expected benefits of Lean turnover project

<table>
<thead>
<tr>
<th>Metrics</th>
<th>August 2011</th>
<th>Post-kaizen</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defect level for disinfectant solution exposure time for all cleaned surfaces</td>
<td>No data Observed &gt;10 defects</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Room-ready time (measured from patient out of room until room ready for next patient)</td>
<td>29 minutes</td>
<td>11:36</td>
<td>Reduced by 17:64</td>
</tr>
<tr>
<td>Turnover time (patient out to patient in)</td>
<td>32 minutes</td>
<td>24 minutes</td>
<td>Reduced by 25%</td>
</tr>
<tr>
<td>RN satisfaction level (NDNQI benchmark mean &gt;57.80)</td>
<td>54.56</td>
<td>Target 60%</td>
<td>Moderate to high level of satisfaction</td>
</tr>
</tbody>
</table>

**Defect level for case cart picking**
- Currently not tracked; estimated at 5% to 10%
- Target 0%

*NDNQI = National Database of Nursing Quality Indicators.*

*Source: Sinai Hospital of Baltimore.*
Kaizen Day 3
Goal: Test the new process.

The team tested and video recorded the new process using an empty OR (the trauma room). One videographer was assigned to each team member.

“Everyone had a script, and we had a checklist for the circulating nurse and surgical tech,” says Henderson. “One person would read the checklist, and one person did the work.”

The process was repeated 4 to 6 times. “We learned each time,” she says.

For example, an ST noted he had extra time in his zone and said, “Why don’t I empty the trash in my area?” even though that wasn’t in his scripted tasks.

This single change trimmed turnover time by about 1 minute.

Kaizen Day 4
Goal: Document the new process. Develop a plan to roll out the process to the staff across multiple shifts.

To document the process, the team:
- created an Excel spreadsheet to show the process step by step
- video recorded the “perfect procedure” for each role so the staff could see the process in action
- discussed the training plan and materials.

Following up and sustaining the process can be at least as challenging as creating the new process, observes Henderson.

Kaizen Day 5
Goal: Present the results.

The best trial time for the new process was 11 to 12 minutes. Patient-out to patient-in time decreased from 32 to 24 minutes. Room-ready time was reduced from 29 minutes to 11:36 minutes.

(Room-ready time is measured from the time the patient leaves the room until the room is ready for the next patient.) The team decided room-ready time was a more consistent interval to track than patient-out to patient-in time because it is the time on which nursing personnel have the greatest impact, Henderson notes.

The final presentation illustrated the staff’s conversion to the Lean methodology. When a PowerPoint presentation failed, a team of staff nurses and STs seized the opportunity.

“They stood up and began evangelizing about the process,” Henderson says. “It was more powerful than if the presentation had gone smoothly.”

Future projects
The kaizen event brought to the surface other ideas for improvement.

Lean also fosters clean, well-organized workplaces through a method called 5S: Sort, Set in order, Shine, Standardize, Sustain. Orderly work spaces are safer and more efficient. But it takes staff time to achieve.

OR team leaders took the initiative to conduct a 5S for specialty supplies, decid-
The cleaning and sorting have continued. The effort has paid off. “I feel better about how our OR looks than I have ever felt,” she says. Signs on the walls now show where equipment is to be stored, and outlines are taped on the floor.

Not only does the reorganization create a safer, more efficient work setting, it also addresses the Joint Commission’s concern about clutter.

**Sustainability plan**

Elements of the plan to hold the gains of the new turnover process include:

- holding regular kaizen meetings to review metrics and report results
- designating staff members as “process owners” who are responsible for maintaining standard work and continuous improvement
- conducting audits of the process
- including compliance with standard work in employee evaluations.

“If you’re not in a continual process of improvement and making efforts to meet regularly, chances are the process will degrade,” says Rahn.

**Allaying staff concerns**

A common concern staff have about Lean management is that they will have to work harder, and it might lead to layoffs. Those concerns must be addressed at the outset to engage the staff’s participation and enthusiasm, Rahn cautions.

A streamlined process might take less labor, but “our general recommendation is that you don’t use this as an opportunity to reduce staff,” he says. Instead, staff are redirected to patient care or quality improvement projects.

At Sinai, nurses are not unionized, but the OR throughput technicians are. Their functions include housekeeping, patient transport, and assistance with tasks such as gathering supplies and positioning.

Though some staff were apprehensive that they might be expected to work harder, they began to see that they were getting the same amount of work done but with fewer steps.

“That was an eye opener,” says Henderson.

Having the staff generate and implement the ideas was critical to the project, she adds. That not only elicited the best ideas but also kept them engaged.

“It’s the staff who do the work, come up with the solutions, and take the credit,” she says. “It’s not me, it’s not the consultant, and it’s not the management team.”

—Pat Patterson

**Reference**

 Lean Enterprise Institute. What is Lean? www.lean.org


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**Have a question on the OR revenue cycle?**

Keith Siddel will respond to questions in the column. Send your questions to editor@ormanager.com

You can also reach Siddel at ksiddel@hrmlc.com.