Eliminating Common PACU Delays

Jamie Jenkins, MBA

ABSTRACT

This article discusses how one hospital identified patient flow delays in its PACU. By using lean methods focused on eliminating waste, the team was able to improve patient flow. Lean thinking required the team to keep issues that were important to patients at top of mind. The improvements not only saved staff time, but they also helped the department prepare for the addition of six beds by focusing on methods to eliminate delays.

The team, assigned by the vice president of surgical services, included a process engineer, two decision support analysts, the PACU charge nurse, the nursing manager and ad hoc department nurses. The team recommended and implemented changes to improve operational effectiveness.

KEYWORDS

- PACU
- Staffing
- Operational improvement
- Delays
- Process improvement

The PACU department in this case study faced many delays recovering patients and discharging them to a unit floor. In addition, because of new construction, the PACU increased in size from 10 to 16 beds. A team was assigned by the vice president with responsibility over the PACU to identify opportunities for improvement. The unit is run by a 20-year nursing veteran who has performed as the department’s nursing manager for three years. From September to December, monthly patient volumes ranged from 840 to 1,000. The unit operates with 13 registered nurses, not including the manager and two transporters who are also certified nursing assistants. Based on historical volume data, the busiest time for the unit was 10:30 a.m. to 2 p.m.

Reviewing process flow is no easy task. Hospitals across the country are looking for ways to improve patient care and productivity. As a patient moves from surgery to PACU, many processes occur. Workflow is a map of tasks that have to be done to move a patient toward the ultimate goal of wellness. Each piece of care given is a building block and part of a queue of activities moving the patient toward the goal.1 Throughout the process, people including patients, physicians, nurses, family members and many others work together to return a patient to the best health possible.

Lean Methods

Remember the old saying, “You can't understand me until you walk in my shoes?” The key to process improvement is to walk in the patient’s shoes. Focusing on the patient,
seeing the care delivery system as a whole and relentlessly eliminating waste is the only way to make lasting changes to a process.2

Hospitals only recently have begun to institute lean methodology that was perfected by automotive giant Toyota. While lean processing is generally associated with manufacturing, hospitals are finding that its principles, based on maximizing time, resources and productivity, are applicable.

One of the main concepts of lean methods is the understanding of waste. Lean philosophy refers to waste as the relationship of resources to the end customer.3 For hospitals, processes not benefiting the patients are wasted processes. The processes the team identified that did not add value to patients were patient and staff waiting times, defects or broken processes, excess motion or extra processing.

Broken process designs produce unreliable and inconsistent results. Hospitals struggling with patient safety and quality care concerns need consistent results. Visually viewing a process from beginning to end improved overall understanding of who is doing what. Process mapping enables organizations to find opportunities to save resources, identify best practices and find root causes of problems. Process mapping identifies where the workflow is inconsistent and determines who owns the action within the process and who is accountable for it. The team's first step in improving PACU operations was to build a process map beginning at the point of entry into the PACU from surgery.

The nurses on the team played a key role in this process. Each step of the department's operations, from early morning supply counts and equipment quality checks, to the final tasks at day's end, was included. Inpatient and outpatient processes were separately built to clearly account for care and resource differences. The maps were broken down into the three major patient care steps of admission, recovery and discharge. When the team completed the map, it was circulated among the department's staff, and further changes were made.

The map of the PACU process gave the team a visual tool to view how patients moved through the system. This scrutiny revealed several process delays. These occurrences were designated on the maps and identified as issues to be resolved. Process times gained from team and staff discussions were verified using the electronic patient documentation system.

**Process Delays**

By identifying each step of the process and the routine delays, the time to admit, recover and discharge patients was determined. Figure 1 shows the system delays that

<table>
<thead>
<tr>
<th>Stage</th>
<th>Issue</th>
<th>Average Minutes delayed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admit Process</td>
<td>Inpatient left in surgery waiting on therapist to deliver vent</td>
<td>15-20 mins</td>
</tr>
<tr>
<td></td>
<td>Waiting for lab results</td>
<td>30-45 mins</td>
</tr>
<tr>
<td></td>
<td>Waiting on physician call backs</td>
<td>20-30 mins</td>
</tr>
<tr>
<td></td>
<td>Waiting on meds from main pharmacy</td>
<td>15-20 mins</td>
</tr>
<tr>
<td>Recovery Process</td>
<td>Waiting on doctors approval for discharge</td>
<td>15-20 mins</td>
</tr>
<tr>
<td></td>
<td>Waiting on floor bed assignment</td>
<td>15-45 mins</td>
</tr>
<tr>
<td></td>
<td>Waiting on unit nurse for patient handoff</td>
<td>2-10 mins</td>
</tr>
<tr>
<td></td>
<td>Outpatient held until social services/family contacted</td>
<td>5-30 mins</td>
</tr>
<tr>
<td></td>
<td>Outpatient held until patient able to void</td>
<td>5-30 mins</td>
</tr>
<tr>
<td></td>
<td>Waiting with transported patient for handoff to family for ride home</td>
<td>10-30 mins</td>
</tr>
</tbody>
</table>
were identified and the amount of time the staff routinely spent working through them.

Delays created by the patient-charging process. The patient-charging function had recently been added to nursing staff responsibilities. The secretary's position was eliminated the previous year and replaced by a nursing position. Tasks formally managed by the unit secretary were now the responsibility of nursing staff, which received little training in recording patient charges. The team reviewed the charging process and found that charges were frequently entered at the end of the day. This led to missed charges because many of the nurses did not remember what charges to enter the patients. During a six-month period, the team's DSAs found that between 4 percent and 14 percent of all patients received no charges.

One hurdle to entering charges was the paper-based system used to track nursing time. The sheets used to document the charges were hard to read, had outdated and obsolete items and were not aligned with actual patient care. Patients moved from intensive to basic care, and the sheets were not designed to follow the progression of patients. The nurses had to search the sheets to find and mark the correct item.

“**For hospitals, processes not benefiting the patients are wasted processes.”**

The team redesigned charge sheets. The sheet was simplified and arranged to match the flow of care delivery. Initial and subsequent charges were designed in a flow chart layout. Figure 2 shows the new charge sheet used by PACU nurses to mark charges.

Entering patient charges was supposed to be the last function the PACU nurses performed before patients were handed off or discharged. Typically, nurses kept the sheets and entered charges at the end of the shift. Marking the charge sheets, signing onto the system, finding the patient account and working through various screens to correctly capture charges required five to 10 minutes per patient. With patient care as the primary responsibility of PACU staff, capturing charges was fairly low on nurses’ list of priorities.

**Delays for patients waiting for ventilators.** During the admission stage to PACU, patients requiring breathing
assistance were often held in surgery for as long as 20 minutes. The delay resulted because of two process slowdowns. Ventilation support from respiratory therapy was not requested until after surgery was completed. In addition, after the therapist was paged, she returned to the RT department to locate and move a ventilator down to the assigned PACU bay.

**Delay for patients waiting for medications.** In the PACU recovery stage, PACU medication orders were filled in three locations. Orders could be filled from the Omnicell, the on-location medication administration system; the main pharmacy, which serviced the entire hospital; and the operating room pharmacy, which serviced pre-operations, surgery and PACU with operating hours from 6:30 a.m. to 5 p.m. Drugs were primarily pulled from the Omnicell. Space limitations, short life spans of some drugs and solutions and pharmacy fears of expensive drug overuse, lead to under-utilization of the Omnicell. Some of the drugs not maintained in the Omnicell were accessible through the OR pharmacy.

The pain medication most preferred by the PACU nurses was also the most expensive drug and was only available through the main pharmacy, which had a policy of rationing higher-priced medications. The belief was that requiring nurses to fill orders through the main pharmacy would deter the use of certain medications. Faxing, tubing, walking orders down to pharmacy, checking for drug delivery and numerous phone calls created routine delays and wasted motion for the PACU staff.

**Delays caused while waiting for physicians to return pages.** Like most nursing units, PACU nurses spend significant amounts of time paging physicians. Waiting for physicians to call back to change or begin care is frustrating for both the nurses and patients. Standing orders, which are pre-established for a given condition based on evidence-based practice, have eliminated many of the waits for nurses. The team found that the staff spent 15 to 40 minutes waiting on physicians to return calls for some patients. Lost pagers, physician exchange issues and busy physicians were the typical reasons for delays. This was a difficult issue to address because records of pages were not maintained.

**Delays in discharge when waiting for bed assignment.** Out of the three main process steps of admission, recovery and discharge, the latter was sometimes more time-consuming than recovery. An in-patient admission, defined as the time from when a patient was placed into a PACU bay to when a report is given by the anesthesia to PACU, took 15 to 37 minutes. Recovery process, the time from performance of anesthesia orders to the fulfillment of post op orders, ranged from 50 minutes to 109 minutes, depending on case severity and process delays. An inpatient took 43 minutes to 67 minutes to discharge after the physician signed off on the order.

One delay in discharge involved bed assignment. Patients were typically held from 10 to 40 minutes waiting for a unit bed. The hospital’s bed tracking system is used to communicate bed availability and to pre-assign beds when possible. When a surgery patient is scheduled, the bedding system assigns a bed based on approximate surgical times. Coordination of many people is required for the system to operate effectively. The team found that lack of trust in that system led to wasted motion. Patients transported to beds marked as available were routinely returned to PACU when transporting staff found the bed occupied or not clean. The staff did not believe the system was up to date and routinely circumvented it by making phone calls to inquire about bed availability.

**Delays waiting for transportation.** The team found that the discharge process was especially difficult for outpatients. Patient transportation for discharge to waiting families was especially time-consuming. Family members were routinely unavailable when patients were ready for discharge. Family members sometimes got lost when they went to find their cars or when finding their way back to PACU. Sometimes, family members were gone to dinner or away running errands. Some patients waited as long as two hours before leaving the unit. The staff not only spent time holding patients in PACU, but also spent time paging and looking for the family members.

For patients who were discharged to another care facility, the involvement of case management and social services added another step to the process. All patients approved for discharge by their physicians had to meet general discharge criteria, including the ability to move from the bed. Although these patients are stable and require less nursing care, they have to be held in the unit until discharge criteria are met.

**Delays involved in transportation to unit floors.** Delays in inpatient transportation occurred from elevator waits and handoff slowdowns. PACU has access to two staff elevators used for transport. The team conducted time studies on both elevators to determine the wait times. The
Process Changes

The team looked for ways to address every identified delay. Some solutions were more effective than others.

To eliminate care delays created by nurses spending time recording charges, this function was shifted to the surgery business office. The business office staff was primarily responsible for surgery scheduling and reporting. The transition of this task took less than a month because the business staff needed little training. The surgery business office receives charge sheets throughout the day from the charge nurse, and the charges are entered into the electronic charge system as sheets are received. This process resulted in more up-to-date patient records. This process change also gave the nursing staff more time for patient care and improved the accuracy of PACU charges that were captured.

To avoid delays for patients requiring ventilation support, the team suggested that the surgery schedule be used to identify patients needing such support the day before surgery. This information, along with estimated surgery completion times, is communicated from surgery scheduling to respiratory therapy. This communication helped that department to better prepare appropriate schedules and to assign workloads. In addition, a ventilator was moved to the PACU storage area to avoid delays waiting for a device to be transported to the PACU. Further, the therapist is now paged during surgery closing in conjunction with the notification given to the PACU charge nurse. When the patient is moved from surgery, the ventilator is waiting for the patient, rather than having the patient wait in surgery for a ventilator.

A data review of medication volumes proved that pharmacy’s rationing policy was ineffective. The most frequently used medication was also the most expensive, and requiring PACU nurses to order through the main pharmacy was not discouraging use of specific medications. A process change of stocking the most-used drugs in the pharmacy was not discouraging use of specific medications. The efficient operation of the bed tracking system relies heavily on environmental staff. There must be adequate numbers of environmental services personnel to physically turn over beds. Beds available, which are not cleaned and released in the bedding system, undermine staff’s trust in the system. Beds that are marked as clean in the system that are actually dirty undermine the staff’s trust in the system. Multiple system failures cause staff to work around the system. To serve in its capacity of quickly assigning beds, the tracking system must be reliable and supported by capable staff. The staff continues to work with environmental to iron out these issues.

To clarify communication and manage transportation delays, the team designed a one-page document with estimated procedure times, waiting room, and pickup locations. Directions for where the family should be at discharge time also were included. The benefits of this process step were immediate and helped to lower frustration levels of staff and family by clarifying communication.

The team considered separating orthopedic patients from the overall inpatient population to alleviate slowdowns in case management placement of patients. A Phase 2 unit of four beds was created, where one nurse and one patient care tech could meet the needs of the patients in the unit. This process change enabled the staff to separate patients requiring more intensive care from those being prepared for discharge. This focused approach freed the nurses providing more intensive care from the disruptions associated with discharging patients to home or other facilities.

Handoff slowdowns occurred when PACU staff arrived on unit floors to find out that the nurse assigned to take the patient was unavailable. This cannot always be avoided. To determine who and why these waits happened, a log identifying the time, the person, and unit was kept. The data was collected for two weeks, and routine offenders were
identified. The study revealed that certain units and nurses required more time for handoffs. The data was shared with the unit directors, and the unit with the most offenses was found to have the most acute patient mix. This process led to a unit re-evaluation of patient loads where patient acuity tends to be higher. The process review is still ongoing.

**Results**

The team was able to identify and decrease process delays. Process mapping not only identified delays but it also enabled the team to identify where resources were needed most and identified areas where resources could be shifted. Looking at processes that do not add value, eliminating delays where possible and properly aligning staff to volumes can generate significant improvements in labor utilization and patient care.

**About the Author**

Jamie Jenkins, MBA, is a senior premier performance engineer with responsibility for benchmarking, process improvement projects and labor management. She works for a 360-bed hospital in the Southeastern part of the country.

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**References**