NK 9 EO: An improvement in practice due to nursing involvement in technology and information system decision-making or due to nurses’ participations in architecture and space design.

Massachusetts General Hospital (MGH) nurses are actively involved in decisions that involve changes in technology, architecture, and space design. Recent examples of this involvement were presented in NK 9. The following example describes the development and use of enhancements to the Post Anesthesia Care Unit Real-Time Integrated Slot Manager (PRISM).

Purpose and Background

Prior to August 2011, preoperative care was provided on Wang 3 in the Same Day Surgery Unit and patients were then moved to the Operating Rooms that were located on the hospital’s third floor (i.e., Ellison 3, Gray 3, Bigelow 3, and Jackson 3). As plans were developed for the new Lunder building, it was evident that there would be operating rooms on three separate floors in the new building. In preparing for the planned change, the Same Day Surgery Unit was changed dramatically. The operating room suites moved under the leadership and management of the “Main Operating Room” and the post anesthesia areas moved under the leadership and management PACUS. The remaining areas became MGH Center for Preoperative Care, focused on preoperative care and post operative discharge.

The goal of any preoperative area is to provide a streamlined process that is patient centered, and at the same time contributes to the efficiency of the perioperative workflow. The nursing staff involved in the planning recognized that the preoperative process should minimize repetitive steps in order to provide optimal allocation of resources and effective communication.

The preoperative nurse’s primary responsibility is to assess the patient in view of their planned surgery, review the patient’s functional health status, and provide patient education and emotional support for patients and family members. This standard of practice requires that all preoperative data is collected and evaluated in order to maintain a patient’s baseline status and develop a plan of care.

The MGH preoperative nursing team recognized that the work processes were manual, less than efficient, and did not contribute to goals for desired start times. The goal of the preoperative department was for first case patients to be “ready for transport” by 6:45 a.m. for surgical cases with a start time of 7:00 a.m. on four days of the week (Thursdays are a “late start” day due to planned department meetings, resulting in an 8:45 a.m. first start time). Prior to the move to the Lunder building the data showed a compliance rates of approximately 60% - 70% of patients “ready to transport” for first cases. The addition of the new geographical areas in the Lunder building only highlighted the issue of the inefficient processes. Nursing staff involved in the planning easily identified several issues: the check in process was manual, required multiple steps, and depended on verbal communication; there were multiple interruptions in the care of the patients due to insufficient communication; nurses needed to make multiple phone calls to the Operations Associates (OAs) for arrival status of incoming patients; and nurses answered repeated phone calls from the individual operating rooms and anesthesia groups requesting readiness status updates, which interrupted patient care. Despite attempts to facilitate a priority list based upon acuity and procedure complexity, patient assignments were often “first come first serve”. Two to three nurses were assigned each day to review first case charts for missing information. Patient tracking utilized a manual white board that was dependent on many phone calls and therefore not always up to date. These factors contributed to the less than satisfactory “ready to transport” times, as well as patient and staff (i.e., preoperative nursing, operating room, anesthesia, surgeons) dissatisfaction.
In contrast, the Post Anesthesia Care Units (PACUs) had developed and utilized an online tracking tool for patient movement called PRISM (i.e., Post Anesthesia Care Unit Real-Time Integrated Slot Manager). PRISM had been planned to be rolled out to the Center for Preoperative Care at a future date, but due to its success in the PACU and ability to adapt the application for the preoperative area, the Perioperative Service leadership agreed to reprioritize the perioperative Information Systems plan to allow the preoperative enhancements to PRISM for the CPC prior to the opening of the new Lunder building (Attachment NK 9EO.a).

Methods and Approach

Planning meetings for the preoperative PRISM application enhancement began approximately eighteen months prior to the planned Lunder building opening. The project team met on a consistent basis to establish project goals, define workflows (current and future), and design the application. Preoperative nursing staff familiarized themselves with the PRISM capabilities in the PACU. The Information Systems (IS) team observed the nursing staff, recorded actual patient flow and reviewed staff workflow processes (Attachment NK 9EO.b). As the coding and development progressed, the IS analysts met with nursing staff for input, validation and approval of completed work. An educational plan was created for the Center of Perioperative Care and PACU Staff Nurse and OA staff. The preoperative PRISM enhancement was implemented in July 2011.

As part of this work, the group also identified workflow process changes utilizing PRISM patient tracking. These changes were implemented in September 2011. The work flow process changes were:

- On the day prior to surgery, nurses are given patient assignment (three to four patients) with a bed assignment. This enables nurses to review the patient record and identify outstanding needs/concerns to be addressed on the day of surgery.
- On the day of surgery, preoperative PRISM is immediately updated upon patient arrival and check in by the OA. The OA assigns a bed electronically, allowing the assigned preoperative nurse to see that the patient has arrived (the color code on the PRISM provides a visual cue), allowing the nurse to begin the admission process in a timely fashion. PRSIM also provides a time stamp for the patient’s arrival to the bed slot which serves as another visual clue for the preoperative staff.

PRISM is updated with a color coded icon when key data such as the Nursing Assessment is completed for the patient in a bed location. At this time, a “Ready for Transport” time stamp can be entered if nothing else is required before transport to an operating room. Another color coded icon appears which indicates completion of the preoperative process. Once this icon appears in the PRISM application, the information is sent electronically to the scheduling application the operating rooms use to track the readiness of a patient. A visual queue alerts the operating team that the patient is ready for transport. This electronic communication greatly reduces multiple phone calls and interruptions in order to determine the transport readiness of the patient. And since PRISM is used and available in other perioperative areas, an added benefit is that staff from other clinical areas (e.g., PACUs) are able to view a preoperative patient’s status.
Participants

The goal of the project was to provide a system that had the ability to track patients in the preoperative area in an effort to streamline communication and optimize resources allocation. An interdisciplinary team assembled and charged with designing a best practice that would help resolve the issues of communication and assist with personnel resource allocation utilizing the enhanced PRISM technology application. The team was composed of the CPC and PACU Nursing Directors, Staff Nurses, Clinical Nurse Managers, Clinical Nurse Specialists, Operations Managers, and Operations Associates (Attachment NK 9EO.c), as well as members of the perioperative Information Systems Team and members of the Perioperative Services administrative team. The nurses were actively involved in both the development and implementation of the enhanced PRISM application for the CPC, which was considered Phase I of the project scope.

Measures and Outcomes:

The primary measure used to determine the impact of PRISM implementation and associated flow processes in the preoperative area was percentage of “on-time” transfers for patients moving from the CPC to the Operating Rooms for the first cases of each day (i.e. ready for transport at 6:45 a.m.). The monthly data for January – June 2011 was considered prior to the PRISM enhancement project work, and data for January – June 2012 was used as a post PRISM implementation comparative timeframe.

Prior to the PRISM enhancement and the associated workflow changes, the percentage of on-time transfers for first case patients ranged from 67% to 75%. After the implementation of the changes, the percentage of on-time transfers ranged from 88-92%, as seen in the graph below.
These results represent a significant improvement in patient throughput. In addition to the gains in efficiency that ultimately impact the entire perioperative schedule, the CPC Staff Nurses are better able to retrieve information about their patients before their arrival on the day of surgery. The PRISM enhancement project also allows immediate communication of assessment and transport status data, which promotes appropriate utilization and deployment of staff resources. The Resource Nurse and Staff Nurses are able to quickly determine the status of all patients and available staff are able to assist colleagues with patient care that expedites the readiness of the surgical patient. The OA is able to answer questions from other providers without interrupting the Staff Nurse caring for the patient resulting in fewer interruptions/disruptions during patient care.

The CPC preoperative area has sustained this improvement for 10 months, despite other changes such as hours of operation and a move to an interim space during Wang 3 renovations. The CPC nursing staff will again be involved in designing additional workflow improvement processes utilizing technology during Phase II of the CPC PRISM project which will include electronic nursing assignments.
Project Charter

**Project Title:** PRISM Pre-Op Phase I

**Start Date:** 10/06/2010

**Estimated End Date:** July 2011

**Executive Sponsor:**

**Project Sponsor:**

**Project Manager(s):** Miller, Patricia, PHS IS; Morris, Gene W.

**Analysts:** Courtney, Erin K.

**Project Description**

PRISM Pre-OP will be an addition to the already existing VB6 OR Application PRISM. PRISM is an acronym for PACU Real-time Integrated Slot Manager; PRISM Pre-OP will be new functionality to allow tracking of patients who are in a “pre-op” status. The new functionality will allow users to track patients that are in a “pre-op” status in the current locations and their appropriate slots while also enhancing the system with the new Lunder Building Perioperative Bays.

This new addition will allow staff members to differentiate patients who are in a “pre-op” status vs. “post-op” status.

It will keep current functionality with the Legacy Building while enhancing the system with the new Lunder Building information.

PRISM Pre-OP will also integrate with the OR Dynamic Scheduling Application in such a way that patient’s “Checks In” and “Ready for Transport” times captured will pass through to the OR Dynamic Scheduling application and update the grid with a color change to reflect these milestones.

**Project Scope Statement**

**PRISM Pre-Op Current SCOPE**

- Check In Functionality that allows users to check in patients and place them on Incoming Lists in different Perioperative Areas.

- Integration that allows PRISM Pre-OP times to feed OR Dynamic Scheduling.

- Differentiation between pre-op patients vs. post-op patients.

- PRISM functionality that allows users to manage their Perioperative Areas/ Bays.

- Functionality to Transfer patients between Perioperative Areas, Send Patients Offsite for additional services, and Depart Patients to the OR for their surgical case or other areas if applicable.

- PRISM Pre-OP will contain specific information for “pre-op” status patients such as Icons and Comments.

- New PRISM Tabs for Pre-Op Areas, Lunder Areas, and a Waiting Tab where virtual space will be used to accommodate “pre-op” status patients.
Project Charter

Out of Scope

- Pre-Op Planning
- Belongings Tracking
- On Call Feature

Communication Plan

- Weekly Meetings every Wednesday Afternoon starting October 2010 through July 2011. This meeting will be used for the design and development of PRISM Pre-Op.
- Minutes & Decisions are sent out to the PRISM Pre-Op Working Group every week and posted: periSCOPE > Shared Documents > PRISM Pre-Op > Meeting Agendas and Minutes > PRISM Pre-op Design and Development

Project Timeline/Milestones

<table>
<thead>
<tr>
<th>Date</th>
<th>Action Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2010 – March 2011</td>
<td>Develop and Finalize Spec</td>
</tr>
<tr>
<td>April 2011</td>
<td>Coding</td>
</tr>
<tr>
<td>May 2011</td>
<td>Testing</td>
</tr>
<tr>
<td>June 2011</td>
<td>User Training</td>
</tr>
<tr>
<td>July 2011</td>
<td>Go Live</td>
</tr>
</tbody>
</table>
**Perioperative Nursing Team Members**
Mary Elizabeth Ellbeg RN, Nursing Director  
Janet Dauphinee Quigley RN, Nursing Director  
Scott Farren RN, Clinical Nurse Manager  
Cheryl Gomes RN, Clinical Nurse Manager  
Lucy Milton, RN, Clinical Nurse Specialist  
Pamela Wrigley RN, Clinical Nurse Specialist  
Teresa MacDonald RN, Clinical Nurse Specialist  
Kathleen Farrell-Alexander, RN, Staff Nurse Clinician  
Pat Kane, RN, Staff Nurse Clinician  
Eileen Picazio, RN, Staff Nurse  
Karen Holland, Patient Care Associate  
Josephine Kubilus, Operations Manager  
Mark Wilson, Operations Manager  
Samuel Roberts, Operations Associate  
William Benedetto, MD

**Department**
Center for Perioperative Care (Wang 3 - formerly Same Day Surgery Unit)  
Post Anesthesia Care Units (White 3, Ellison 3, Lunder, 2,3,4)  
Operating Rooms (Gray 3/Lunder 2,3,4)  
Post Anesthesia Care Units (White 3, Ellison 3, Lunder, 2,3,4)  
Post Anesthesia Care Units (White 3, Ellison 3, Lunder, 2,3,4)  
Perioperative Nursing Administration  
Post Anesthesia Care Units (White 3, Ellison 3, Lunder, 2,3,4)  
Post Anesthesia Care Units (White 3, Ellison 3, Lunder, 2,3,4)  
Center for Perioperative Care (Wang 3 - formerly Same Day Surgery Unit)  
Center for Perioperative Care (Wang 3 - formerly Same Day Surgery Unit)  
Post Anesthesia Care Units (White 3, Ellison 3, Lunder, 2,3,4)  
PCS Clinical Support Services & Center for Perioperative Care  
PCS Clinical Support Services & Post Anesthesia Care Units  
Post Anesthesia Care Units (White 3, Ellison 3, Lunder, 2,3,4)

**Perioperative Information Systems Team Members**
Patricia Miller, Corporate Manager  
Gene Morris, Team Lead  
Erin Courtney, Applications Analyst II  
Ruth Chu, Applications Analyst  
Milcho Nikolov, Corporate Team Leader

**Department**
Partners Information Systems  
Partners Information Systems  
Partners Information Systems  
Partners Information Systems  
Partners Information Systems

**Perioperative Services Administration Team Members**
Bethany Daily, Administrative Director, Perioperative Services  
Michele Sabri, Administrative Manager, Perioperative Services

**Department**
Perioperative Services Administration  
Perioperative Services Administration