Using the WHO Surgical Safety Checklist

Two organizations enhance compliance and improve the well-being of surgical patients
In 2008, the World Health Organization (WHO) published its Surgical Safety Checklist, a 19-item list designed to decrease surgical errors and adverse events and increase teamwork and communication among operating room staffs. Soon after the checklist was released, an international study showed that its implementation led to a significant reduction in mortality and adverse events.¹

Today, about 3,900 hospitals around the world use some form of the Surgical Safety Checklist. However, due to poor compliance,²⁻⁵ a lack of buy-in among operating room staff⁶ and/or an ineffective rollout strategy,⁷ some healthcare organizations are not seeing dramatic improvements in patient safety.

With funding support from the Cardinal Health Foundation’s E3 Grant Program, two health care organizations have created solutions that address all three challenges and improve compliance with the Surgical Safety Checklist.

Integrating the Surgical Safety Checklist into existing electronic health record software yields a dramatic increase in compliance.

**Overview of organization**

NorthShore University HealthSystem is a comprehensive healthcare organization with four hospitals (Evanston Hospital, Glenbrook Hospital, Highland Park Hospital and Skokie Hospital) and more than 100 medical offices serving patients throughout the Chicago metropolitan area. It is also the principal teaching affiliate for the University of Chicago Pritzker School of Medicine. NorthShore is considered a leader in implementing innovative technologies, and, in 2003, was among the first in the country to successfully implement a systemwide electronic health record with EPIC software.

“The WHO Surgical Safety Checklist is tremendous. We believe that a sophisticated technological solution may be the best way to improve compliance with it, garner buy-in from the operating room staff and improve patient outcomes.”

Dr. Michael Ujiki, MD, FACS
Chief of General Surgery, FACS
Director of Minimally Invasive Surgery
**Project Summary**

Four years after NorthShore incorporated the WHO Surgical Safety Checklist at each of its four hospitals in 2009, a formal evaluation showed a low compliance rate. As they focused on increasing compliance, leaders identified several deficiencies with the paper forms of the Surgical Safety Checklist. First, if the operating room (OR) nurse was unable to complete something on the Surgical Safety Checklist before a patient entered the OR, the nurse left that item blank. Often, that meant the checklist was not completed until after the surgery. In addition, because members of the operating team are typically in different physical locations before the patient arrives in the OR, someone had to constantly monitor the patient’s electronic health record (EHR) to be sure all team members had completed the paper Surgical Safety Checklist.

Because the EHR was already fully integrated into the OR workflow, incorporating the checklist components into the EHR seemed a logical way to try to improve compliance. So, with funding from the Cardinal Health Foundation, the health system hired a research project coordinator to work with NorthShore’s tech team to computerize the checklist, then track results.

In November 2013, a multidisciplinary team of surgeons, anesthesiologists, nurses and trainers began a trial period with the electronic Surgical Safety Checklist at all of the system’s hospitals. The goal was to increase communication between OR personnel and to encourage best practices during the OR workflow.

The responsibilities for completing the Surgical Safety Checklist were divided between the surgeon, anesthesiologist and nurse. The surgeon is required to complete the preoperative workflow for the Surgical Safety Checklist within 24 hours of surgery. The anesthesiologist must declare readiness to begin the case and attest that all equipment is in working order. The nurse responsibilities (ensuring that the surgeon’s note matches the OR schedule, that the patient’s consent form matches the OR schedule, etc) are divided between the nurse in the ambulatory services unit and the circulating nurse; ultimately the circulating nurse has to verify that all information is correct.
The IT team designed an electronic barrier to prevent a patient from even entering the OR until all checklist-related items are completed: Displayed on the OR status board is an “S,” “A,” “N” and “R” (“Surgeon,” “Anesthesiologist,” “Nurse” and “Room”). In order to transport the patient into the OR, every letter must be dropped from the OR status board.

Clinical decision support was also built into the electronic Surgical Safety Checklist: The patient’s allergies, consent form, history and physical, and other information auto-populates the Checklist, readily available for review and sign off.

In June of 2014, about eight months after the trial began, NorthShore conducted an electronic audit to assess compliance with the electric Surgical Safety Checklist. (Random OR observations were also performed throughout the summer of 2014.) Perioperative risk events, such as consent issues, incorrect counts, wrong site and wrong procedure were compared before and after the electronic rollout.

The overall compliance rate increased from 48 percent to 92 percent. Perioperative risk events were significantly lower, and hospital-wide indicators such as post-op venous thromboembolism, surgical site infections and in-hospital mortality were trending lower.

At the same time, a survey of OR personnel’s perceptions of the new system showed that 76 percent of surgeons, 86 percent of anesthesiologists and 88 percent of nurses believed the electronic Surgical Safety Checklist would have a positive impact on patient safety.
Project objectives

• Increase compliance with and proper use of the WHO Surgical Safety Checklist
• Increase collaboration and communication among operating room team
• Leverage the EHR to auto-populate the Surgical Safety Checklist for certain data points (such as patient allergies and pregnancy test results)

Results

| Improved compliance with the WHO Surgical Safety Checklist from 48% to 92% | Decreased risk events by 32% |
| Hospital days saved: 8 | Dollars saved: $1,000,000 |

Incorporating the Surgical Safety Checklist into the EHR significantly lowered perioperative risk events.

The summary results are estimates that have been separately prepared and provided by each individual grantee and were based on one year periods unless otherwise noted.

NorthShore University Health System leadership

Dr. Michael Ujiki, MD, FACS
Chief of General Surgery, Director of Minimally Invasive Surgery
Project continuation

The electronic Surgical Safety Checklist went live systemwide at NorthShore in November 2014. In the months leading up to the implementation, the multi-disciplinary team responsible for the rollout held regular meetings to inform all OR personnel of the upcoming changes. Every staff member was trained on the new system. And, for the first two weeks following rollout, ORs were staffed with full-time Epic trainers.

The rollout was a success, and the new electronic Surgical Safety Checklist system remains in place.

Dr. Ujiki was the lead author of *Increasing Compliance with the World Health Organization Surgical Safety Checklist—A Regional Health System’s Experience*, a manuscript intended to provide guidance to other health care institutions in establishing similar systems to create a significant improvement in operating room safety. He presented the paper at the 2015 Society of American Gastrointestinal and Endoscopic Surgeons conference. The article has also been submitted for consideration to a peer-reviewed publication.
A multi-disciplinary team developed a process to comply with the third component of the WHO Surgical Safety Checklist—the debriefing before the patient leaves the operating room.

**Overview of organization**

Virginia Mason Medical Center (VMMC) is a private, nonprofit healthcare system in the greater Puget Sound area. VMMC provides both primary and specialized care through a regional network of neighborhood clinics, ambulatory surgery centers and an acute care hospital. VMMC also has a graduate medical education program, an internationally recognized research institute, a nursing residence and day health center for individuals with HIV/AIDS.

“The development and implementation of this project was successful because a multidisciplinary team was involved in every aspect. The result is a process that respects their work and their workflow in the operating room.”

Dr. Ryan Pong, MD
Program Director, Transitional Year Residency; Section Head, Neuroanesthesiology
Project summary

Though VMMC had been using the WHO Surgical Safety Checklist in all procedural areas for several years, in 2012, leadership determined that communications among the multi-disciplinary perioperative team still needed to improve. So they put together a working team to develop and implement a process for the preprocedural “time out,” which involves all team members in an “all-stop” design: All participants cease tasks at hand and participate in the process before starting the surgery. Each team member introduces him or herself with full name and role, and then attests to the components of the checklist that fall into their area of expertise. The surgeon concludes the process with a review of surgical considerations, and solicits input from all other team members.

In 2013, VMMC leadership wanted to develop a system that would similarly enhance communication during the third component of the Surgical Safety Checklist, the post-procedure debriefing. At that time, there was no structured wrap-up process for post-procedure, and VMMC had a 93 percent defect rate for information sharing on the items declared necessary to include in their process to ensure a safe transition of care.

But the workflow at the end of surgery is very different: Prior to surgery, there is a distinct beginning when an “all-stop” communication is feasible. At the end of a procedure, the attention of the surgical team is not as unified. There are multiple compositions of care teams (surgeon alone, surgeon with resident, surgeon with physician’s assistant, surgeon with fellow), as well as varying complexity of cases that impacts the standardization of work. In addition, key team members may have left the operating room, while others are involved in patient care aspects such as anesthesia emergence, sponge counts and other tasks that are difficult to stop on demand.

So, with support from the Cardinal Health Foundation, they convened a Kaizen work group including representatives of all those who work in the OR: surgical technologist, circulating nurse, surgical resident, anesthesiologist and surgeon. The work group also included a post-anesthesia care registered nurse—a downstream customer of the process the workgroup was designing.
The team met for two days to develop a process and an operational tool that would prompt necessary safety inspection and the sharing of vital information at the conclusion of an operation, without diverting any participant’s attention from their primary focus on the patient’s status.

The team reviewed metrics, engaged in creativity exercises, brainstormed individually and as a group, and developed processes and tools. These were subjected to rapid-fire Model of Improvement Plan-Do-Study-Act (PDSA) cycles to assess relevance and validity.

By the end of the second workday, the team had designed a process—the Rolling Wrap-Up, which is a face-to-face conversation between team members to ensure a safe handoff of the patient. The Rolling Wrap-Up allows the team to huddle and share information with one another, at a time appropriate to their workflow and patient safety. All members of the team have an active role in completing and passing along the implementation tool, a color-coded Post Operative Communication Note that serves as a cue to discuss safety checks and hand off care of the patient.

The Post Operative Communication Note becomes a part of the patient record.

This process, when completed, also fulfills the regulatory requirements for a Brief Operative Report to be completed prior to the patient’s next transition of care.

The process was rolled out two months after the planning meeting. In preparation, the team created a video simulation of the process designed to educate all members of the operating room staff. Team members also led discussions at general and section meetings and provided one-on-one coaching for the new process.
Project objectives

- Improve compliance with the Surgical Safety Checklist’s post-surgical steps
- Improve post-surgical communications among all operating room team
- Increase patient safety

Results

| Over 48% compliance in completing the Post Operative Communication Note | Hospital days saved: 24 | Dollars saved: $144,000 |

The summary results are estimates that have been separately prepared and provided by each individual grantee and were based on one year periods unless otherwise noted.
Project continuation

The Rolling Wrap-Up is becoming entrenched in the operating room culture at Virginia Mason Medical Center, leaders say. The process encourages participation by all team members, requires each team member to be mindful of their colleagues’ roles and tasks and improves alignment with the ultimate goal—patient safety.

The implementation team regularly measures compliance with the Post Operative Communication Note, and has realized that gaining 100 percent compliance requires consistent, ongoing education. Since rolling out the program, the team has created additional educational support materials, including huddle cards and a brief PowerPoint “refresher” to continually remind all members of the team of the process’s importance. The team has continued to make minor revisions to the Communication Note for clarity and to improve compliance.

Gaining 100 percent compliance is a process, requiring ongoing education and consistent communications.
About the E3 Grant Program

Since 2008, through its E3 Grant Program, the Cardinal Health Foundation has invested in hundreds of healthcare organizations across the country.

We support a wide array of patient safety work with a focus on accelerating the rate of change with two goals:
- Improved patient outcomes
- Reduced healthcare costs

Because of the complexities in healthcare and healthcare systems, it takes an average of 17 years for evidence-based practices to be fully implemented into healthcare practices, according to The National Institutes of Health. Within a year or two, some of our grantees are affecting change, eliminating errors and creating lasting improvement. They are reducing readmissions to hospitals, reducing lengths-of-stay and, most importantly, saving lives.

For more information, visit cardinalhealth.com/patientsafetygrants.

About the Cardinal Health Foundation

The Cardinal Health Foundation supports local, national and international programs that improve healthcare efficiency, effectiveness and excellence and the overall wellness of the communities where the Cardinal Health (NYSE:CAH) nearly 37,000 employees live and work.

The Cardinal Health Foundation also offers grants to encourage community service among its employees and works through international agencies to donate much-needed medical supplies and funding to those who need them in times of disaster. Cardinal Health is #AllInForGood.

To learn more, visit cardinalhealth.com/community

facebook.com/cardinalhealthfoundation