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The Surgical Safety Checklist: Results of Implementation in Otorhinolaryngology

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ABSTRACT

Objectives: To assess the impact of implementing the surgical safety checklist (SSCL) on the outcome of patient safety in otorhinolaryngology (ENT) surgical procedures in two hospitals in Saudi Arabia: Aseer Central and Abha Private Hospitals. ***Methods***: This retrospective study conducted over seven years (1 July 2008 to 30 June 2015) followed a staff educational and training program for the implementation of the World Health Organization Surgical Safety Checklist (WHO SSCL). The program included the use of audiovisual aids and practical demonstrations. Incidents of non-compliance were treated as sentinel events and were audited by the process of root cause analysis. ***Results:*** There were 5 144 elective ENT surgical cases in both hospitals in which the SSCL was utilized over the seven-year study period. The average compliance rate was 96.5%. Reasons for non-compliance included staff shortage, fast staff turnover, excessive workload, communication problems, and presence of existing processes. ***Conclusions:*** The implementation of the SSCL was a substantial leap in efforts towards ensuring surgical patients' safety. It is compulsory in the healthcare system in many countries. Such progress in healthcare improvement can be accomplished with the commitment of the operating suite staff by spending few moments checking facts and establishing an environment of teamwork for the benefit of the surgical patient.

There are many benefits gained from using safety checklists. They facilitate multi-step processes to improve team dynamics, prevent or minimize error, and act as a backup to human memory.[1–5] For decades they have been used in many industries, including aviation, with remarkable success for safety outcomes. In 2007, the World Health Organization (WHO) introduced a simple surgical safety checklist (SSCL)[6] in response to an unacceptable surge in surgical deaths around the world, the causes of which pointed to medical errors that could be avoided. The list contains 19 items to be checked included in three sections: the first before the induction of anesthesia (sign-in), the second before skin incision (time-out), and the third before the patient leaves the operating room (sign-out). A trial of the WHO checklist in eight different countries across a spectrum of healthcare systems and environments proved that implementing a simple program might improve surgical outcomes and reduce complications and mortality.[7,8] Since, the SSCL has become an integral part of patient care and a requirement to be fulfilled by healthcare facilities seeking recognition by quality organizations. For example, the Central Board of Accreditation for Healthcare Institutions (CBAHI) in Saudi Arabia and the Joint Commission (JC) in the United States of America and other countries. In their preparation for recognition by quality boards, Aseer Central and Abha Private Hospitals implemented the SSCL from July 2008.

This retrospective study assessed the compliance, completeness, obstacles to effective use, and outcome of the implementation of the SSCL on patient's safety in the two hospitals over seven years.

METHODS

The study was approved by the Research and Ethics Committee. The SSCL was implemented as part of the healthcare quality program at Aseer Central and Abha Private Hospitals in Abha, Saudi Arabia in accordance with Ministry of Health regulations, which state that CBAHI accreditation is a prerequisite for licensing (Health Services Council order No. 8/85 on 9/1/1435H).

Before implementing the quality program, an orientation course and training program of staff were established. They included training sessions, presentations, and videos.[9] The program

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was an ongoing quality improvement process, which was repeated at six-month intervals and whenever it was deemed necessary to implement auditing recommendations on the use of the SSCL. The medical and operative records of patients who underwent otorhinolaryngological (ENT) operative procedures at both hospitals since the implementation of the SSCL, between 1 July 2008 to 30 June 2015, were reviewed. Within the operative section of each record, the SSCL form should be duly completed. Regular audit procedures were carried out at monthly intervals by the Quality Department during the first two years, and annually thereafter to monitor the progress of the program. Reasons for non-compliance and obstacles were noted. Due to its importance and as a sign of the seriousness of the implementation process, all cases of non-compliance were considered sentinel events and investigated by the process of root cause analysis (RCA). Staff immediately adopted and implemented recommendations of the audit process.

RESULTS

During the seven-year study period, there were 5 144 elective cases in both hospitals which underwent one or more ENT surgical procedures that necessitated the use of the SSCL with the involvement of different anesthetic, surgical, and nursing teams. Within the first two years of the study, there were 82 cases of non-compliance with the use of the SSCL without any mortality. The following five years have shown marked decline in the number of non-compliant incidents (87 in total) [Tables 1 and 2]. Incidents of non-compliance were treated as sentinel events and were audited by the RCA process. Following each audit, a corrective action plan was recommended, and by the end of the second year, three additions to the SSCL were made. These additions were risk of hypothermia, prophylaxis against venous thromboembolism (VTE), and preoperative booking of a bed in the intensive care unit (ICU) for elective cases in need of such care. In the third year, another two additions were made, and these were related to dacryocystorhinostomy (DCR) and nasal surgery procedures. In cases of DCR and functional endoscopic sinus surgery (FESS) the addition was included in the second section of the SSCL (time-out) concerning the availability of eye irrigation solution used intraoperatively to prevent corneal dryness. In nasal surgery, the addition to the SSCL was made in the third section (sign-out) and was related to the removal of the throat pack

Table 1: Number of non-compliance incidents per year of the study with their corresponding percentage compliance.

Year	Operative procedures/ year	Non-compliance incidents	Percentage compliance
1	586	54	90.8
2	605	28	95.4
3	827	30	96.4
4	857	19	97.8
5	908	16	98.2
6	638	11	98.3
7	696	11	98.4

Seven-year overall compliance: 96.5%.

Table 2: Number, description, and corrective actions taken as a result of the 169 non-compliance incidents that occured during the study period.

No. of incidents	Description	Corrective actions
21	Missed checklist from notes.	Checklist became part of operative notes.
32	Checklist was not utilized due to staff shortage.	Adequate staff each time recommended.
48	Incomplete checklist.	Re-education.
13	Pre-operative antibiotics not given.	
18	(Venous thromboembolism) prophylaxis missed or incomplete.	
6	Patient allergies not checked.	
5	Anesthetic equipment required.	Equipment became stock item.
7	Surgical equipment required.	
3	Essential imaging not displayed.	Imaging service computerized.
1	Throat pack left after tracheal extubation.	Re-education. Improving the counting process of instruments, needles, and sponges.
2	Postnasal pack left after adenoidectomy.	
11	Incomplete labeling of specimens.	Re-education.
2	ICU bed not available.	Preoperative booking of ICU bed for elective cases.

ICU: intensive care unit.

by the anesthetist. The percentage compliance was calculated as the number of times all three phases of the SSCL was performed/Total surgeries × 100.

DISCUSSION

It was the report titled "To Err is Human: Building a Safer Healthcare System" released by the Institute of Medicine (IOM) that triggered the debate on medical errors and patient safety. The report stated that every year as many as 98 000 patients die in hospitals in the United States.[10] In the specialty of ENT, such errors occur in components of the practice including diagnostic, treatment, surgical, communication, and administration.[11]

The implementation of the SSCL is part of the efforts to establish standards of practice to prevent unnecessary surgical errors leading to improvement in patients' safety. In a retrospective survey, medical errors in ENT were reported as follows: technical 19.3%, medical management 13.7%, testing 10.4%, surgical planning 9.9%, equipment-related 9.4%, postoperative care 8.5%, administrative 6.6%, wrong-site surgery 6.1%, communication 3.8%, wrong drug/dilution on the surgical field 3.8%, anesthesia-related 3.3%, history/physical and differential/final diagnosis (both 1.4%), retained foreign body and miscellaneous (both 0.9%), and nursing/ancillary 0.5%.[12]

The aim of a checklist used in surgery is to summarize the main aspects of safety: correct identification of the patient and surgical site, prevention of infection, safe anesthesia and airway management, and successful teamwork. When implemented in many centers around the world it was associated with a reduction in complications in elective operative cases. Similar checklists developed for commonly encountered emergencies in surgery and obstetrics and gynecology resulted in adherence to critical management steps and compliance with basic standards with improved outcomes.[10,11,13]

The impact of SSCL on patient outcomes is likely to vary with the effectiveness of the implementation process within each hospital.[14] Contrary to interventions involving drugs or medical devices, the application of a team-based intervention usually necessitates a change in clinical behavior to achieve success.[15]

During implementation in both hospitals, it was necessary to modify the WHO surgical safety checklist to accommodate other items considered essential for patient's safety during surgery. These were a risk of hypothermia in susceptible patients, prophylaxis against VTE, and confirmation of availability of an ICU bed in elective cases. In DCR and FESS operations, continuous observation of the eye is required, and the cornea is protected by frequent conjunctival irrigation by the scrub nurse using normal saline. Such modifications are encouraged by the WHO to suit local needs.[16]

The compliance indicator is a process measure. It measures the degree to which all contents of the checklist were performed correctly and appropriately for each patient.[17] In this study, the overall compliance rate in fully implementing the SSCL in both hospitals reached 98.7%. This is comparable to results of other studies.[18–22] The improvement in the compliance rate in this study was obvious year after year with improvement in the learning curve of staff members performance.

There were several factors which affected compliance, including staff shortage, surgical staff turn-over, duplication with existing hospital process, communication problems between operating suite staff and the wards, and the checklist considered as a burden to complete during heavy workload by some members of the team. However, all these barriers have been gradually addressed while implementing the SSCL.

All cases of non-compliance did not result in patient's harm. However, to demonstrate the importance of patient safety and the dedication towards implementing a process proved to be beneficial in healthcare quality improvement, all cases of non-compliance were considered sentinel events. Although relatively infrequent, sentinel events are undesirable incidents that result in unwanted outcomes for patients, families, and the hospital. They occur independent of the patient's condition and usually reflect hospital system and process deficiency.[16] It is called sentinel because it signals the need for immediate investigation and corrective action. According to standards related to quality and safety, healthcare organizations are required to establish which unanticipated events are significant and the process for their intense analysis.[23] The preferred approach for investigation is by conducting the process of RCA, which is a process for identifying the basic or causal factors that underlies variation in performance.[24,25] This should

result in an action plan to prevent the risk of any forthcoming similar events.[26,27]

CONCLUSION

The introduction of the SSCL was a substantial leap in efforts towards surgical patients' safety. It is compulsory in the healthcare system in many countries around the world, and it appears now on many health organizations and institutes reports and websites as a sign of quality performance. Such progress in healthcare improvement can be accomplished with the commitment of the operating suite staff by spending few moments checking facts and establishing an environment of teamwork for the benefit of the patient. The role of leaders, quality and clinical, is of paramount importance. They should help staff members to structure and build teams and to establish a clear vision regarding the direction of the quality change. This will help to manage the change in the proper and best way.

Disclosure
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