

## Clinical Audit of Compliance with WHO Surgical Safety Checklist in a Private Tertiary Care Surgical Facility

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**IMPORTANCE** WHO safe surgery checklist was designed to reduce avoidable surgical errors. Literature has shown that after applying this checklist in hospitals a significant drop in complications, mortality and morbidity is observed.

**METHODS** It is a prospective study carried out at a tertiary care hospital after approval of the institutional review board. The study was divided into two phases. In the first phase, we developed a questionnaire based on the WHO safe surgery checklist to see the compliance of our anesthesia, nursing, and surgical staff to the checklist. The results were shared with the relevant departments. A re-audit will be done in the second phase.

**RESULTS AND DISCUSSION** 123 patients were included in the first phase of the study. The sign-in checklist was fully implemented in 35 of 50 total patients (70%). The time-out checklist was fully implemented for 1 of 39 total patients (2.6%) and the Sign out checklist was fully implemented for 0 of 34 total patients (0%).

**CONCLUSION** Poor compliance was observed with the "Time out" section of the safe surgery checklist in our study. This information can help us identify the problems which can be amended in the future.

**KEYWORDS** Audit, surgical audit, WHO safety checklist, WHO, Safe surgery, WHO surgical safety checklist

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### Clinical Audit

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It is reported that approximately 234 million people need surgical treatment for different medical reasons every year and that 14% of these people experience an unwanted event<sup>1</sup>. In 2008, the World Health Organization (WHO) initiated a campaign called "Safe Surgery Saves Lives" in order to draw attention to all these unwanted events resulting from surgical procedures and to improve the safety of surgery and consistency of surgical care based on the fact that at least half of surgical errors can be prevented with safe surgical practices. Therefore, the WHO Safe Surgery Checklist (SSC) was developed to improve teamwork among OR staff, to reduce mortality and complications in the perioperative process, and to ensure the consistent use of procedures for safe surgery<sup>2</sup>.

WHO Surgical Safety checklist has 3 main components i.e. Sign – In (Before Induction of Anesthesia, Time – Out (Before Skin Incision), and Sign – Out (Before the patient leaves the operating room). These components are designed to analyze compliance. This process involves OR Nursing team, Anesthesia, and Surgery team. This study aims to help us understand the compliance of all three

components of the WHO Surgical safety checklist in our tertiary care facility. It can help us minimize the risk of surgical errors and complications in other surgical patients in the future.

### METHODS

It is a prospective study that was carried out at our tertiary care facility. It was divided into two phases. After approval from the Institutional review board (IRB) the first phase of this study was started. In the first phase, compliance with the WHO safe surgery checklist was observed for 1 month. A total of 123 patients were included in the first phase. All the consenting patients who underwent any surgical procedure in that month were included in the study. A questionnaire based on the WHO safe surgery checklist was used to check the compliance. The questionnaire was designed in English as well as in our local language. The nursing staff, anesthesia team, and surgical team were educated regarding the questionnaire. The questionnaire was divided into three parts i.e. sign in (before the induction of Anastasia), time out (before the skin incision),

and sign out (before the patient leaves the operating room). A total of 31 components i.e. 11 components of sign in, 11 components of time out, and 9 components of sign out were included in the study. After the completion of the first phase, a presentation was done in which results were shared with relevant professionals. The second phase of the study will be carried out to assess the change in compliance after our surgical audit. Statistical analysis was done using SPSS with a t-test. A P-value of less than 0.05 was considered statistically significant.

## RESULTS

The study included a total of 123 patients, the 'Sign in' checklist compliance was checked in 50 of these patients, the 'Time out' checklist compliance was checked for 39 patients and the Sign out checklist compliance was checked in 34 patients. The sign in checklist was fully implemented in 35 of 50 total patients (70%). The time out checklist was fully implemented for 1 of 39 total patients (2.6%) and the Sign out checklist was fully implemented for 0 of 34 total patients (0%).

Most skipped components (questions) in the SSC: (# of patients; percentage of patients in the cohort)

### Sign in:

- Site o/ procedure marked? (9 patients; 18%)
- Blood loss (>500mL) risk assessment done? (9 patients; 18%)

#### SIGN IN CHECKLIST:

- Was sign in of WHO checklist performed in pre-op (transfer) area?
- Were questions from sign in part of WHO checklist asked and ticked off immediately?
- Identity of the patient confirmed?
- Site of procedure marked?
- Procedure name confirmed?
- Consent form signed by patient and attendant?
- Anaesthesia safety check completed?
- Pulse oximeter attached on patient and vitals monitoring done?
- Difficult airway/aspiration risk assessment done?
- Blood loss (>500mL) risk assessment done?
- History of any drug allergy confirmed by patient?

*The sign in checklist: components filled for all patients (green), components unfilled in at least 1 patient (red)*

### Time out:

- Did OR members introduce each other and confirm their roles? (34 patients; 87.17%)
- Were answers audibly verified and immediately written documentation upon response was done? (17 patients; 43.6%)

### Sign out:

- Was there any equipment/instrument issue addressed by team? (31 patients, 91.2%)
- Was sign out performed before skin suture? (26 patients, 76.5%)

#### TIME OUT

- Was time out performed in OT before skin incision?
- Did all the OR team members introduce themselves to each other and confirm their roles?
- Did the surgeon, anaesthetist and nurse verbally confirm the patient, site and procedure?
- Did the surgeon review the operative duration, critical steps and anticipated blood loss during surgery?
- Did the anaesthetist review any patient-specific concerns?
- Did the nursing team review the necessary equipment and confirm sterility?
- Was antibiotic prophylaxis given to the patient within last 60 minutes?
- Was essential imaging (X-ray, CT scan etc.) displayed?
- Were checklist items ticked off immediately afterwards?
- Were the answers audibly verified and immediate written documentation upon response was done?
- Was the end of time out announced audibly

*The time out checklist, filled components (green), unfilled*

#### SIGN OUT:

- Was sign out performed before skin suture
- Was there an audible announcement of sign out by an OT team member?
- Did the OR nurse confirm the name of the procedure with the team?
- Did the OR team confirm the name of procedure with the team?
- Was the specimen labelled correctly including patient name?
- Was the any equipment/instrument issue addressed by team?
- Did the surgeon, anaesthetist, and nursing team review the key concerns about recovery and management of the patient?
- Were the checklist items ticked-off immediately afterwards?
- Was the end of sign out announce audibly by the surgeon and confirmed by the Anaesthetist or operation theatre nurse?

*The sign out checklist, filled components (green), unfilled components (red)*

## DISCUSSION

In our study, the compliance with the checklist was highest for the sign-in, lower for the time-out and no successful

completions of the checklist were observed for the Sign out checklist. Reshma Ambulkar et. al. conducted an observational study in a tertiary level cancer hospital in India to evaluate the implementation of the adapted SSC checklist in 352 patients undergoing surgery<sup>3</sup>. Compliance in that study was highest for the first part (100%), lower for the second part (78%) and lowest for the third part (76.5%). This reduced compliance for the third part of the checklist is consistent with the results from studies done in the Western world where the completeness of the checklist was lowest for the third part. Ambulkar et. al. concluded that Members of the OT team 'relatively unoccupied' for sign-in and occupied with a sensitive surgical procedure for the other parts hence the reduced compliance in those sections. The results of this study, therefore, had a similar pattern to our study except the compliance rates were higher for all 3 parts of their checklist.

In a local study, Mariyah Anwer et.al evaluated the compliance and effectiveness of the SSC at the Jinnah postgraduate medical center (JPMC), Karachi. The study included 3638 patients and was performed over four years<sup>4</sup>. The study successfully used three main methods of improving compliance with the SSC over the four years; the SSC was made a part of the ward file, surgical teams were educated by presentations on filling and files were later checked for compliance. The study showed a dramatic improvement in compliance with the SSC over four years (20.4% to 89.9%). This was associated with a reduction in surgical site infections (SSI) in patients over the four years as well from 7.5% in the first year to 2.12% in the fourth year. It was also concluded that the evaluation of the team's compliance was as important as the outcome. Therefore it is evident that simple measures can be implemented to improve compliance with the SSC with benefits such as a reduction in SSI and patient morbidity.

Brigid Brown et al conducted a study that used the quality improvement principles of identifying the problem and designing strategies to improve SSC compliance at Flinders Medical Centre (FMC), Adelaide, South Australia<sup>5</sup>. This

study also showed poor compliance with the SSC with the poorest adherence to the third stage of the checklist. The study found that the SSC process was conducted correctly and in its entirety in just 3.5% of surgical cases but documented as 100%. A staff-wide education program was performed concurrently with an overhaul of the existing SSC checklist including the creation of a new form with modifications for better compliance with WHO standards. A laminated secured form of the SSC was attached to metal boards in all operation theatres to be filled during each procedure to promote better team participation and coordination in filling the SSC. Four separate assessment and improvement cycles (PDSA cycles) were performed for improvement and assessment. These focused on educating the staff, receiving feedback, specifically improving compliance to particularly overlooked elements of the SSC, and assessing the benefits of the program. The compliance to the SSC was improved from 3.5%- 63%, with stage 1 compliance ultimately improving to 99%. Staff specifically commented that all teams were more involved in the process and that verbalizing team members' names were useful, noting an improved knowledge of their team. The study showed a reduction in near-miss events such as lack of consent, wrong surgical site, and faulty equipment. Similar methods could be implemented in all health institutions to improve surgical safety through the implementation of the SSC.

## CONCLUSION

Our study found that the overall compliance to the SSC at Shalamar Hospital was poor with the 'Time out' section being completed in none of the patients that were observed. Similar patterns have however been observed in institutions around the world and significant improvement can be made through the implementation of measures to improve SSC compliance. The improvement of SSC compliance is essential in preventing potentially disastrous outcomes in all surgeries

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## REFERENCES

1. Borgmann H, Helbig S, Reiter MA, et al. Utilization of surgical safety checklists by urological surgeons in Germany: a nationwide prospective survey. *Patient Saf Surg.* 2015;9(1):37. doi:10.1186/s13037-015-0082-5
2. O'Leary JD, Wijeyesundera DN, Crawford MW. Effect of surgical safety checklists on pediatric surgical complications in Ontario. *C Can Med Assoc J = J l'Association medicale Can.* 2016;188(9):E191-E198. doi:10.1503/cmaj.151333

3. Ambulkar R, Ranganathan P, Salunke K, Savarkar S. The World Health Organization Surgical Safety Checklist: An audit of quality of implementation at a tertiary care high volume cancer institution. *J Anaesthesiol Clin Pharmacol*. 2018;34(3):392-398. doi:10.4103/joacp.JOACP\_328\_17
4. Anwer M, Manzoor S, Muneer N, Qureshi S. Compliance and Effectiveness of WHO Surgical Safety Check list: A JPMC Audit. *Pakistan J Med Sci*. 2016;32(4):831-835. doi:10.12669/pjms.324.9884
5. Brown B, Bermingham S, Vermeulen M, et al. Surgical safety checklist audits may be misleading! Improving the implementation and adherence of the surgical safety checklist: a quality improvement project. *BMJ open Qual*. 2021;10(4):e001593. doi:10.1136/bmjopen-2021-001593