*Journal of Institute of Medicine Nepal*
*Institute of Medicine, Kathmandu, Nepal*

OPEN ACCESS

*Original Article*

*JIOM Nepal. 2025 Dec;47(3):18-22.*

# Compliance with WHO Surgical Safety Checklist in Otorhinolaryngology in a Tertiary Care Center: A Retrospective Study

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## ABSTRACT

### Introduction

Surgical safety checklist is crucial for patient safety and enhanced communication between operating team members. It decreases surgical morbidity and mortality. This study aimed to evaluate the utilization rate of Surgical Safety Checklist introduced by WHO and completion of its 19-items during Otorhinolaryngology surgery.

### Methods

This was a cross-sectional, observational study conducted in Otorhinolaryngology Department of tertiary care center, Nepal from 14th April, 2024 to 15th October, 2024. Surgical Safety Checklist attached in 111 charts of patients who had undergone surgeries of ear, nose, neck and throat under General Anesthesia were evaluated. Percentage of utilization and completeness of the checklist were calculated.

### Results

The utilization of the WHO Surgical Safety Checklist in Otorhinolaryngology was found to be 67.56% (75 out of 111 charts). The entirely filled checklist was observed in only 8 out of 75 (10.67%) charts. Seventy-one charts were of elective surgeries while only four charts were of emergency surgeries. Time-out section was completed in nearly hundred percent charts. Sign-in was complete in 64 out of 75 (85.33%) charts. The least completed section was the sign-out section, which was filled in only 8 out of 75 (10.67%) charts.

### Conclusion

Utilization of Surgical Safety Checklist in Otorhinolaryngology surgery was observed in two-thirds of the cases. However, its completeness was poor. Time-out was the most fulfilled section while sign-out was the least filled section in the checklist.

**Keywords**

*Checklist, compliance, otorhinolaryngology, surgical, WHO*

**DOI**

*10.59779/jiomnepal.1400*

**Submitted**

Jun 3, 2025

**Accepted**

Dec 13, 2025

## INTRODUCTION

Surgical safety is vital to reduce medical errors. Globally, 234 million surgeries are performed annually.[1,2] Seven million may develop complications or even death.[3-5] About 43% of these adversities are preventable with safe surgical practices.[6] World Health Organization (WHO) initiated a campaign called "safe surgery saves lives" in 2008.[7,8]

WHO Safe Surgery Checklist (SSC) consists of three elements: sign-in, time-out and sign-out with a total of 19 items to be filled in by the nurse in presence of anesthesiologist. Sign-in is performed before the induction of anesthesia; time-out is performed before skin incision; and sign-out is performed immediately after skin closure or before the patient leaves the operating theatre The SSC intends to ensure safe surgical care by infection prevention, safe anesthesia and good team communication during surgery.[8]

The mandatory inclusion of Surgical Safety Checklist aids to prevent medicolegal claims and surgical errors.[9] The implementation of surgical safety checklists during operations is not commonly done due to a lack of proper knowledge or manpower. This study aimed to evaluate the utilization rate of WHO Surgical Safety Checklist and completion of its 19-items during surgeries of ear, nose, neck and throat in a tertiary care hospital.

## METHODS

This is a retrospective, cross-sectional study. This study was conducted in the Otorhinolaryngology department of Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu, Nepal. The study was conducted by evaluating 111 charts of patients who had undergone surgeries of the ear, nose, neck, and throat under general anesthesia from April 14, 2024, to October 15, 2024. Ethical approval for the study was taken from Institutional Review Committee, Institute of Medicine, Nepal.

Patients of any gender and age who underwent surgery in the department, both elective and emergency surgeries were included. The surgeries performed by other departments and surgeries performed under local anesthesia were excluded from this study.

Sample size for the study was calculated by using following formula: $n = z^2 \times p \times q / e^2$, where

n= minimum required sample size
Z= 1.96 at 95% Confidence Interval (CI)
p = prevalence taken as 50% for maximum sample size
q = 1-p
e = margin of error, 10%

The minimum sample size for this study was calculated to be 96. However, we included 111 patient charts.

Systematic random sampling was used to select the patient charts. In our department, we conduct five days per week elective surgeries under General Anesthesia. The files of the first case of the day of these elective surgeries were selected, which was 94 in number. The first cases of the day were selected as the staffs are less tired and adequate in number as compared to the last cases posted for the day. For emergency surgeries, 17 charts of the first surgical cases done on emergency basis under General Anesthesia were selected. In our department, the Anesthesia Nurse fills up the WHO Surgical Safety Checklist in presence of the surgeon and anesthesiologist.

WHO Surgical Safety Checklist in the selected charts were evaluated. Each item in the three components of the checklist i.e. sign-in, time-out and sign-out were evaluated for their completion and calculated in percentage. Frequencies and percentage of the utilization of the checklist and completion of each of the components and item were calculated. Data was collected in a preformed proforma and entered in Excel spreadsheet and data analysis done using IBM SPSS version 26.0.

## RESULTS

A total of 111 patient charts were evaluated. In eleven (9.90%) charts, the WHO Surgical Safety Checklist were completely unfilled and in 25 (22.52%) charts, the checklist was absent. Therefore, the utilization of checklist in surgeries in Otorhinolaryngology was found to be 75 (67.56%).

Those 75 charts were further evaluated to identify the completion of each of the three components and 19 items of the WHO Surgical Safety Checklist. Seventy-one charts were of elective surgeries while only four charts were of emergency surgeries.

Sign-in was performed in 64 (85.33%), time-out in 75 (100%) and sign-out in 8 (10.67%) patient charts. The entirely filled checklist was observed in only 8 (10.67%) charts. The details of completion of each of the items in the three components of the checklist are shown in table 1, 2 and 3.

## DISCUSSION

Surgical safety checklist is vital for a safe surgery. In this study, the WHO Surgical Safety Checklist was utilized in 75 (67.56%) out of 111 Otorhinolaryngology surgeries. Out of those 75 cases, the entirely filled checklist was observed in only 8 (10.67%) surgeries. Time-out section was completed in nearly hundred percent charts. Sign-in was complete in 64 (85.33%) charts. However, the least completed section was the sign-out section, which was filled in 8 (10.67%) surgeries.

*Table 1. Completion of each item in Sign-in component of WHO Surgical Safety Checklist (n=75)*

| Profession | Performed | Percentage | Missed | Percentage |
|---|---|---|---|---|
| Sign-in (with at least nurse and anesthetist) | 64 | 85.33% | 11 | 14.67% |
| 1. Has the patient confirmed his or her identity, procedure and consent? | 64 | 85.33% | 11 | 14.67% |
| 2. Is the site marked? | 64 | 85.33% | 11 | 14.67% |
| 3. Is the anesthesia machine and medication check complete? | 64 | 85.33% | 11 | 14.67% |
| 4. Is the pulse oximeter on the patient and functioning? | 64 | 85.33% | 11 | 14.67% |
| 5.Does the patient have a known allergy? | 64 | 85.33% | 11 | 14.67% |
| 6.Difficult airway or aspiration risk? | 64 | 85.33% | 11 | 14.67% |
| 7.Risk of >500 ml blood loss (7 ml/kg in children)? | 64 | 85.33% | 11 | 14.67% |

*Table 2. Completion of each item in Time-out component of WHO Surgical Safety Checklist (n=75)*

| Profession | Performed | Percentage | Missed | Percentage |
|---|---|---|---|---|
| Time-out (with nurse, anesthesiologist and surgeon) | 75 | 100% | 0 | 0 |
| 1.Confirm all team members have introduced themselves by name and role. | 75 | 100% | 0 | 0% |
| 2.Confirm the patients name, procedure and where the incision will be made. | 75 | 100% | 0 | 0% |
| 3.Has antibiotic prophylaxis been given within last 60 minutes? | 74 | 98.67% | 1 | 1.33% |
| 4.Anticipated critical events to surgeon.<br>- What are the critical or non-routine steps?<br>- How long will the case take?<br>- What is the anticipated blood loss? | 74 | 98.67% | 1 | 1.33% |
| 5. To anesthesiologist -Are there any patient specific concerns? | 74 | 98.67% | 1 | 1.33% |
| 6. To nursing team - Has sterility (including indicator results) been confirmed?<br>- Are there equipment issues or any concerns? | 74 | 98.67% | 1 | 1.33% |
| 7. Is essential imaging displayed? | 74 | 98.67% | 1 | 1.33% |

*Table 1. Completion of each item in Sign-out component of WHO Surgical Safety Checklist (n=75)*

| Profession | Performed | Percentage | Missed | Percentage |
|---|---|---|---|---|
| Sign-out (with nurse, anesthesiologist, surgeon) | 8 | 10.67% | 67 | 89.33% |
| 1.Nurse verbally confirms<br>- The name of procedure<br>- Completion of instrument, sponge and needle count<br>- Specimen labelling (read specimen labels aloud, including patient name)<br>- Whether there are any equipment problems to be addressed | 8 | 10.67% | 67 | 89.33% |
| 2. What are the key concerns for recovery and management of this patient? | 8 | 10.67% | 67 | 89.33% |

WHO Safe Surgery Checklist (SSC) was developed in 2009 which consists of three elements: sign-in, time-out and sign-out, with a total of 19 items.[10,11,12,13] Surgical safety checklist helps to reduce surgery related morbidity and mortality. However, this is achievable only if its implementation and compliance is good.[13] Higashi H et al. showed a decline in surgical site infection from 6.25% to 3.4% and mortality from 1.5% to 0.8% after implementation of Surgical Safety Checklist.[1,14] Allene MD conducted an observational study in Ethiopia, where, more than 90 percent completion was detected in most of the checklist items.[13] Sign-in section was the most fulfilled section in their study while it was time-out section in this study.

Another study from Ethiopia by Girma T et al. observed 93.5% utilization of WHO Surgical Safety Checklist, which is higher than that in the current study. However, its completion was observed in only 17.3% surgeries. The time-out and sign-out sections were the least filled sections.[15] In this study, sign-out section was found to be the least completed section. The low compliance in this section might be due to tiredness at the end of surgery, missed data entry by the nurses, lack of motivation of the operating room team and their occupancy during turnover of the subsequent cases. Designation of the team member and accountability to initiate sign-out might help to increase compliance of this section.

Though the points highlighted in the checklist seem to be trivial as these are routine activities for the operating team, each point is crucial. The checklist is especially important in hospitals with high caseloads and in emergency surgeries to prevent medical errors, medicolegal hassle and ensure patient safety.

Correct and consistent implementation of the checklist is challenging, especially in developing countries. Various barriers for its implementation are identified such as disturbance in routine workflow, inappropriate timing for checklist, poor communication, lack of awareness and training, high workload, lack of time, manpower and resistance from senior surgeons.[12,16]

Gul F observed the documentation of surgical safety checklist to be only 36.8% in their first audit. A significant improvement in compliance with the checklist was observed after education about its importance to the healthcare professionals. In the second audit, their documentation rose to 62.5%. Improvement in completion of all the items in the checklist were observed after educational intervention.[12]

The sustainability of implementation of the checklist could be improved by training and awareness of healthcare staffs, strong exemplary leadership, good communication among team members, commitment and regular audit in this subject.[12,17] The consistent use of checklist in operation rooms will ensure its incorporation into routine practice and break the barriers for its successful implementation.

The limitations of this study are its small sample size, observation over a short period of time and study in a single center. Further studies with large sample in multiple centers are recommended. Furthermore, research on barriers for the successful implementation of the checklist should be performed in current setting.

## CONCLUSION

Utilization of Surgical Safety Checklist in Otorhinolaryngology surgery was observed in two-thirds of the cases. However, its completeness was poor. Time-out was the most fulfilled section while sign-out was the least filled section in the checklist.

## ACKNOWLEDGEMENT

We are thankful to Department of Otorhinolaryngology of Tribhuvan University Teaching Hospital for constant support.

## FINANCIAL SUPPORT

The author(s) did not receive any financial support for the research and/or publication of this article.

## CONFLICT OF INTEREST

The author(s) declare that they do not have any conflicts of interest with respect to the research, authorship, and/or publication of this article.

## AUTHOR CONTRIBUTIONS

Concept of research and Design of research: KD, SG; Literature search: KD, SG; Data collection: SG; Data analysis: KD, SG; Data Interpretation: KD, SG; Drafting and Reviewing of the manuscript for important intellectual content: KD, SG; Final approval of the version ready for submission: KD, SG; Agreement to be accountable for all aspects of the work: KD, SG

## REFERENCES

1. Haynes AB, Weiser TG, Berry WR, et al. A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population. N Engl J Med. 2009 Jan 29;360(5):491–9. https://doi.org/10.1056/NEJMsa0810119
2. Weiser TG, Regenbogen SE, Thompson KD, et al. An estimation of the global volume of surgery: a modelling strategy based on available data. The Lancet. 2008 Jul;372(9633):139–44. https://doi.org/10.1016/S0140-6736(08)60878-8
3. Meara JG, Leather AJM, Hagander L, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. Int J Obstet Anesth. 2016 Feb;25:75–8. https://doi.org/10.1016/j.ijoa.2015.09.006
4. Wilson I, Walker I. The WHO Surgical Safety Checklist: The

Evidence. J Perioper Pract. 2009 Oct;19(10):362–4. https://doi.org/10.1177/175045890901901002

5. Jones S. Your Life in WHO's Hands: The World Health Organization Surgical Safety Checklist: A Critical Review of the Literature. J Perioper Pract. 2011 Aug;21(8):271–4. https://doi.org/10.1177/175045891102100802
6. De Vries EN, Ramrattan MA, Smorenburg SM, et al. The incidence and nature of in-hospital adverse events: a systematic review. Qual Saf Health Care. 2008 Jun 1;17(3):216–23. https://doi.org/10.1136/qshc.2007.023622
7. Kisacik OG, Cigerci Y. Use of the surgical safety checklist in the operating room: Operating room nurses' perspectives: Use of the surgical safety checklist in ORs. Pak J Med Sci [Internet]. 2019 May 20;35(3). https://doi.org/10.12669/pjms.35.3.29
8. Borchard A, Schwappach DLB, Barbir A, et al. A Systematic Review of the Effectiveness, Compliance, and Critical Factors for Implementation of Safety Checklists in Surgery. Ann Surg. 2012 Dec;256(6):925–33. https://doi.org/10.1097/SLA.0b013e3182682f27
9. Watanabe, J., Yamamoto, N., Shibata, A. et al. The impact and prevention of systemic and diagnostic errors in surgical malpractice claims in Japan: a retrospective cohort study. Surg Today. 2023; 53:562–568. https://doi.org/10.1007/s00595-022-02590-9
10. Jain D, Sharma R, Reddy S. WHO safe surgery checklist: Barriers to universal acceptance. J Anaesthesiol Clin Pharmacol. 2018;34(1):7. https://doi.org/10.4103/joacp.JOACP_307_16
11. Merry AF, Cooper JB, Soyannwo O, et al. International Standards for a Safe Practice of Anesthesia 2010. Can J Anesth Can Anesth. 2010 Nov;57(11):1027–34. https://doi.org/10.1007/s12630-010-9381-6
12. Gul F, Nazir M, Abbas K, et al. Surgical safety checklist compliance: The clinical audit. Ann Med Surg. 2022 Sep;81. https://doi.org/10.1016/j.amsu.2022.104397
13. Allene MD. Clinical audit on World Health Organization surgical safety checklist completion at Debre Berhan comprehensive specialized hospital: A prospective cohort study. Int J Surg Open. 2020;24:161–5. https://doi.org/10.1016/j.ijso.2020.05.013
14. Higashi H, Barendregt J, Kassebaum N, et al. Surgically avertable burden of obstetric conditions in low and middle income regions: a modelled analysis. BJOG Int J Obstet Gynaecol. 2015 Jan;122(2):228–36. https://doi.org/10.1111/1471-0528.13198
15. Girma T, Mude LG, Bekele A. Utilization and Completeness of Surgical Safety Checklist with Associated Factors in Surgical Units of Jimma University Medical Center, Ethiopia. Int J Gen Med. 2022 Oct;15:7781–8. https://doi.org/10.2147/IJGM.S378260
16. 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 Nov;10(4):e001593. https://doi.org/10.1136/bmjoq-2021-001593
17. Gong J, Sheng B, Bian C, et al. A survey of surgical team members' awareness and perceptions toward the implementation of the surgical safety checklist in gynecological and obstetrical operations. Medicine (Baltimore). 2021 Jul 30;100(30):e26731. https://doi.org/10.1097/MD.0000000000026731