The World Health Organisation Surgical Safety Checklist: An Audit of Quality Implementation and Staffs Perspectives at a Tertiary Care Teaching Hospital of Southern India

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Abstract: <u>Background</u>: The World Health Organization (WHO) published the WHO Surgical Safety Checklist (SSC) and Implementation Manual in 2008 in order to increase the safety of patients undergoing surgery. The WHO Surgical Safety Checklist was developed after extensive consultation aiming to decrease errors and adverse events and increase teamwork and communication in surgery. The Checklist has gone on to show significant reduction in both morbidity and mortality and is now used by a majority of surgical providers around the world. <u>Aims & Objectives</u>: 1) To assess the attitudes of staff towards checklist and its implementation. 2) To obtain qualitative data on compliance to the WHO surgical safety checklist in operating theatres at Nizam's Institute of Medical Sciences. <u>Methods</u>: In this prospective observational study, we passively observed the implementation of modified version of the WHO SSC during elective surgeries and evaluated the compliance with the checklist, percentage of items for which the use of the SSC prompted an action, and level of interaction between the key team players during the conduct of the checklist. <u>Results</u>: Audits were performed on 352 surgical cases from 8 major surgical departments of the tertiary care teaching hospital which revealed maximum compliance with time out part of SSC. Amid the questionnaire distributed to the staff, maximum number of responses were received from nurses. The checklist was initiated mostly by either nurses or anesthetists. <u>Conclusions</u>: WHO SSC is an effective tool in reducing in-hospital complications thus producing a favorable outcome. The study revealed that SSC compliance has improved over the observed period, while its application revealed inconsistencies during the three phases of the SSC.

Keywords: WHO Surgical safety checklist, Patient safety, communication, Sign in, Sign out, Time out.

1. Introduction

Clinical care of the patient depends primarily upon the competency of the attending physicians, surgeons, and dentists. Formal organization of these groups makes easier the maintenance and improvements of their competencies. It makes possible staff self-regulation and discipline which the conscientious professional person will welcome. Discharge of legal and moral responsibility of the governing board to assure good standards of patient care is better accomplished.

Analysis and evaluation of services are essential to a sustained high quality of care. Basic, primary, immediate, and continuing responsibility is that of the medical staff but such evaluation can be accomplished from policies, moral and legal responsibilities of the governing authority, or from facets of administration.

Continuing evaluation, taking into consideration all of these related factors, stimulates improved clinical services, professional education, hospital administration, better patient care, and community support.¹

In January 2007 WHO began a 2 year process to identify minimum standards of surgical care to address important safety issues such as inadequate anaesthesia safety practices, avoidable surgical infection and poor team communication. The checklist was simple, widely applicable and addressed common and potentially disastrous lapses in practice. The checklist was modified by WHO in 2008 and an SSC implementation manual was also developed. The checklist is given in [Appendix1] The checklist essentially identifies three distinct phases of an operation, each corresponding to a specific period in the normal flow of work:²

- 1) Sign in
- 2) Sign out
- 3) Time out

To implement the checklist, Surgical teams introduced a formal pause in care Prior to induction of anesthesia i.e; Sign in, Prior to incision namely Sign out and Just before closure of incision i.e; Time out.

The checklist implementation is aimed at improving safety practices, infection control and communication among the surgical team. The use of the checklist has been shown to have a significant effect on patient outcomes, reducing mortality from 1.5% to 0.8% ⁽³⁾. The NHS has mandated its use for every patient undergoing surgery, including local anesthesia and any minor surgical procedures.

2. Methods & Methodology

A prospective observational study was conducted to assess the compliance and completeness of SSC, by randomly selecting surgical cases during 2 months period from 08-06-2019 to 08-08-2019. The sample population was 3700, the sample size was 349 with marginal error of 5, confidence interval of 95 and distribution response was 50%. The sample size was calculated by Raosoft, Inc. software.

The major surgical departments which were audited for SSC were 8 namely: 1) Orthopedics 2) surgical oncology 3) neurosurgery 4) plastic surgery 5) cardiothoracic surgery 6) urology 7) vascular surgery 8) surgical gastroenterology.

Exclusion criteria: Only major surgeries were assessed. Minor surgical procedures and other procedures where anesthesia was given are excluded. Emergency surgeries were not included in the study sample. In this study department of surgical oncology can be excluded as it showed 0% compliance. In assessing the attitudes of the staff, those who were wilfully involved in giving the feedback were only included.

The parameters which were used to assess the compliance of SSC were: i) Name of the patient ii) Date of surgery iii) Sign in iv) Sign out v) Time out vi) Surgeons Signature vii)

anesthetists signature viii) Nurse's signature. The three vital parameters, Sign in, Sign out and Time out were checked out if they were complete, Incomplete or not done at all.

To analyze the staffs' attitude towards the checklist, a questionnaire was developed which was validated. It consisted of 2 sections, section I exclusively focused on demographic data (age, sex, occupation) of the staff who were participating in the study. Section II included a set of 20 questions amongst which 1 to 7 questions were to be answered by stating yes or no, questions 8 to 17 were to be answered in a scale of 1 to 5 (likert scale) and questions 18,19 and 20 were to be answered briefly in a word or two. The questionnaire was distributed to a study population of 100 anesthetists, 100 surgeons, 50 nurses and 50 technicians in toto. The questionnaire is given in [Appendix-2]

3. Results

Out of the 349 cases which were studied, 44 cases were studied from each department o assess the compliance. The cumulative compliance of each department taking the cases which were complete for sign in, sign out and time out was maximum for cardiothoracic surgery department (80.2%) and least for surgical oncology department (0%). While the other 6 departments depicted an average of less than 50% compliance.

	Orthopaedics	SOG	Neuro Surgery	Plastic Surgery	Cardiothoracic Surgery	Urology	Vascular Surgery	SGE	
Patient Name	37	0	38	30	40	37	26	44	
Date	10	0	30	13	16	23	7	26	
Signin									
No Attempt	20	44	30	14	4	4	16	18	
Incomplete	10	0	7	14	10	14	10	8	
Complete	14	0	7	16	30	26	18	18	
Sign Out									
No Attempt	16	44	7	14	3	4	10	18	
Incomplete	14	0	30	14	7	16	16	8	
Complete	14	0	7	16	34	24	18	18	
Time Out									
No Attempt	7	44	10	14	0	3	10	18	
Incomplete	34	0	27	27	3	23	20	8	
Complete	3	0	7	3	41	18	14	18	
Signature									
Surgeon	20	0	16	26	41	26	23	8	
Anaesthesiologist	14	0	10	16	34	37	21	8	
Nurse	44	0	37	30	44	30	27	18	
Cumulative Compliance	154(44%)	0(0%)	152 (43.5%)	150 (42.9%)	280 (80.2%)	221(63.3%)	152(43.5%)	158(45.2%)	





Figure 1 is a bar diagram depicting the compliance of various departments towards implementation of SSC. The compliance of other vital parameters namely sign in, sign out and time out is depicted in following graphical representations.





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Among the questionnaire which was distributed to 300 staff personnel which included surgeons, anesthetists, nurses and technicians only 185 responded, thus the response rate was 61.67%. response rate was maximum with nurses (90%) followed by technicians (80%) least was with surgeons (34%) as shown below.

S. no.	Staff	Study Population	Responses	Response Rate
1	Nurses	50	45	90%
2	Technicians	50	40	80%
3	Surgeons	100	34	34%
4	Anesthetists	100	56	56%







The above given demographic data is represented in the form of pie chart interpretation of which says that the maximum(38.3%) number of responses were from the staff who were between the age group 41-60 and female respondents were more(76.20%) when compared to males.

The section II of the questionnaire consisted of questions relating to SSC, its implementation and importance of the same. The results of questions 1 to 7 were as follows:



The above bar graph states that 177 out of 185 people thought that the checklist is simple and understandable. 174

people responded no for Q2 which stated if there was any duplication of checklist items. 160 respondents thought the

checklist brings an added value to the existing safety measures. 31 among 185 staff members thought the checklist was a waste of time. 166 people responded that the staff was attentive and listening when checklist was done. 96 people said that the staff stopped their tasts while checklist was performed. 165 responded yes to the Question 7 which stated if all the surgical team members were present when it was carried out.



The questions 8 to 17 were to be rated on a likert scale of 1 to 5, 1 being least and 5 being highest rating. 77 members of staff thought that time out is really necessary in all cases while 126 respondents anticipated that the checklist implementation is a good tool for patient safety, 86 responded that checklist improved the operating room communication. 62 among 185 staff members thought that Operating room(OR) was quiet to do the checklist, 69 concluded that the checklist was audible to whole OR team. 65 respondents responded with a score of 5 to the question 13, 54 comprehended that the checklist contemplation was checked in brief, 68 among 185 speculated that the communication in OR team was good. The scrub nurse was given enough prior information was replied with a score of 5 by only 98 members of OR team among 185. And only 49 stated that surgeon would intimate them of anticipated complications during procedure.

Additionally for the questions 18,19 and 20, most frequent responses given were noted down. The iterated response for question 18 was that the checklist did prompt actions such as blood reservation, blood availability, drug reactions or allergies, count of sponges, gauze pieces, instruments etc. for question 19, maximal response was that nurses initiated the checklist followed by anesthetists. In question 20 Aggrandized response was that the interaction of OR team was maximum in Time out part of the checklist.

4. Discussion

A checklist will assist a person or a team, to verify that a key action has been taken, and will remove the risk of missing a step in the process, which can be a result of the complexity of work, too many things to be don, or a simple memory error.

Introducing the WHO SSC to the clinical environment can be challenging. The checklist is intended to give teams a simple, efficient set of priority checks for improving effective teamwork and communication and to encourage active consideration of the safety of patients in every operation performed. The checklist has two purposes: ensuring consistency in patient safety and introducing a culture that values achieving it. Experience shows that with education, and leadership, practice barriers to implementation can be overcome. With proper planning and commitment the checklist steps are easily accomplished and can make a profound difference in the safety of surgical care. The evaluation of a team's compliance with the checklist, which is measured by adherence, is as important as evaluating outcomes.^(4,5)A major factor of the SSC use is its correct and consistent implementation. It was shown that increased SSC compliance correlates with reduced complication rates and improved patient outcomes.

The Shared Mental model is a term used to describe a common purpose and knowledge within a team and is enabled by strong communication. It prevents mistakes, improves awareness and improves performance⁶. The interpretation of study was that there is improved communication in OR team with SSC but it can further be focussed upon. In the study the Sign in and Sign out was lower than optimal compliance. Thus the spotlight should be shun on these two vital parameters too by OR team.

The study also revealed that maximum respondents among staff were females and nurses (90%). This concludes that nurses play a very cardinal role in implementation, initiation of checklist as well as communication in OR team.

5. Conclusions

The cost of implementing the surgical safety checklist as a quality assessment programme is minimum but in terms of returns it will improve moral of professionals, contain and reduce cost and provide quality care to the patients.⁷Use of checklist involved both changes in processes and changes in behavior of individual surgical teams. Improved qualitative use of checklist is required to maximise the effectiveness. Thus even if SSC is widely used, proactive management of organizational changes required is indispensable for it to be effective and enduring. A note of caution here though-the

"process" of checking, using a "time out", followed by documentation of the same are distinct from each other. A nicely documented list with all the points tick marked is not a guarantee of a thorough check, unless it is accompanied by the full 'process 'such as the "universal protocol".

6. Recommendations

Staff must be thoroughly trained on the use of this; the process must be integrated into the surgical procedure, and the checklist document must be used for guidance and record. Each staff member in the OR must take the responsibility to take part proactively. Additionally, a specific team member should be consistently responsible for the checklist. ⁸From the results of above study a nurse can be given charge of checklist in OR.

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