

Compliance with the Surgical Safety Checklist

Results of an Audit in a Teaching Hospital in Italy



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AIM: *We carried out an audit to verify compliance to Surgical Safety Checklist (SSC), as we have become aware that compliance across different teams and by individual surgeons has not been optimal.*

MATERIAL OF STUDY: *100 SSC records from October-December 2014 and 100 from March-June 2015 were inspected to verify correct . 44 surgeons and 34 scrub nurses were asked to complete a questionnaire to know surgeons' compliance to the different stages of the Checklist and the compliance of each surgical team. 100% of scrub nurse and 73.7% of surgeons completed the questionnaire.*

RESULTS: *All Checklist records were correctly filled out but we could verify that while nurses have a strong commitment to the SSC, the Checklist's implementation is not being actively supported by all surgical team members.*

DISCUSSION: *Many surgeons showed limited awareness of not collaborating during SSC procedure and admitted delegating the responsibility for answering questions to other members of their team. A number of them fell into contradiction answering to various parts of the questionnaire. Consistent with the literature, at our hospital there is a gap between quality of Checklist paper records and correct use of this safety tool.*

CONCLUSIONS: *Thanks to the data we have collected we will improve the way the SSC is used and promote change in the behavior of surgeons. Eighteen surgeons (40.9%) expressed willingness to be involved in a work group to revise the SSC and we hope that their commitment to safety and quality will increase.*

KEY WORDS: Surgical Safety Checklist, Surgeons commitment.

Introduction

The Campus Bio-Medico University Hospital provides health care in agreement with the Italian National Health System. Currently the Hospital has a total of 206 beds for inpatient admissions, an Intensive Care Unit, with

an average of 1,100 monthly discharged; 5,000 patients/year undergo surgery in 9 operating rooms.

The areas of surgical specialization are General Surgery, Cardiovascular and Thoracic Surgery, Vascular Surgery, Orthopedic Surgery, Heart Surgery, ENT Surgery, Plastic Surgery, Urology and Gynecology. We also carry out Eye Surgery but the eye team has a separate surgical Checklist (a customized version of the WHO Surgical Safety Checklist) and was therefore excluded from the audit.

Use of the Checklist is mandatory in all operating rooms, for both major and minor surgery. Quality and safety data are gathered and collated by the hospital management and are regularly shared with hospital staff in order to maintain awareness of important issues, including safety during surgery. This audit was completed between May and June 2015.

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Objectives

The main objective of the study was to assess compliance with the use of the Checklist and compare nurses' and surgeons' experience about its execution and completion.

Method

100 Checklist records from October-December 2014 and 100 from March-June 2015 were inspected. These were randomly selected from all the SSC records held by the hospital Quality and Safety Team (QST). The records were inspected to verify if they contained all basic information (patient data, surgical procedure performed, name and signature of the nurse who is the SSC coordinator) and if the three phases of the Checklist had been fully completed.

Using semi structured questionnaires, we asked nursing staff to give their perception of how well various surgical teams adhered to the Checklist.

All operating theatre staff (34 scrub/circulating nurses) were asked to complete a questionnaire so that the experience of SSC coordinators could be better understood. This included questions on compliance to the different phases of the Checklist and the compliance of different surgical teams. The questionnaire was completed by 100% of nurses.

Surgeons also completed questionnaires designed to assess their awareness of their own behavior with regard to the Surgical Safety Checklist. The surgeons' questionnaire was anonymous (only their specialization was requested). It evaluated their awareness of their own participation in the 3 phases of the SSC and whether they had received any of the hospital communications regarding adverse events connected with safety in surgery. 44 of 60 surgeons completed the questionnaire (73.7%).

We also considered comments that some nurses and surgeons added to their questionnaires.

Results

The collected data show that all Checklist records were correctly filled out with regard to patient data and nurse data. "Sign in" and "time out" fields were also correctly entered in 100% of cases. Omissions were found in the "sign out" field of 12 Checklist records (6%). Omissions were registered mainly in orthopedic procedures.

- 32 nurses answered that "sign in" was completed with the surgeon and anesthesiologist. This was very near 100% for surgery although there was some variation.
- 23 nurses (67.6%) answered that at the moment of "time out" they found themselves being ignored and only obtained full answers in 50.75% of cases.
- 23 nurses answered that at the phase of "sign out"

they were able to get the team's attention only about 50% of the time, despite clear and precise questioning.

Nurses identified General Surgery staff (79% of the nurses) and Vascular Surgeons (35.2%) as the more cooperating surgical teams during Checklist phases. No nurse cited Urology, Orthopedics or Cardiovascular surgeons, whilst only a few nurses cited Gynecology, Plastic surgery, or ENT surgeons.

Nineteen nurses (55.8%) answered "no" to the question "Are you under the impression that surgeons consider the SSC as an instrument to improve safety?".

We asked nurses if they were aware of one or more adverse events that had been avoided thanks to the Checklist. 25 nurses out of 34 (73.5%) answered "yes". 44 of 60 surgeons (73.7%) answered the questionnaire. All participating surgeons work exclusively in our hospital and 21 had their higher education at our university. Therefore they know very well the culture of our institution and have actively participated in the JCI accreditation process (2012-2014).

The 44 surgeons that answered the questionnaire made these statements:

- They consider the surgical Checklist to be a useful instrument for improving safety but find it "excessive": 6 (2 general surgeons, 1 orthopedic, 1 plastic, 1 ENT surgeon, and 1 urologist) 13.6% of surgeons.
- 42 surgeons are *always present* or *nearly always present* at "sign in" (the two that answered as being less present also admitted they were less involved at "time out" and "sign out").
- 44 out of 44 do not delegate the sign in procedure to residents, even if senior residents.
- 41 (of note is that 8 out of 10 orthopedic surgeons answered "always" or "nearly always") answer personally to "time out" questions:
 - 37 surgeons affirmed that they "always" or "nearly always" answer personally to "sign out" questions; 7 surgeons admitted to answer only *occasionally* : 2 "often"; 3 "sometimes"; and 2 "never".
 - Many surgeons leave the operating room before surgical procedure is over (and therefore they do not answer "sign out" questions): 12 (including 1 cardiothoracic surgeon) answered "sometimes"; 2 of the 4 urologists answered "sometimes" and the other "always" 1 plastic surgeon answered "sometimes" as did 1 gynecologist 3 general surgeons answered that they leave the operating room "sometimes" and 1 "always" 1 orthopedic surgeon reported leaving the operating room "always" before "sign out" and 2 reported leaving "often" and "sometimes". Overall, around 27% of the surgeons who responded did not answer "always" or "nearly always" at "sign out". These results do not tally with all the answers given to previous questions.
 - 17 surgeons (39.5%) claimed they value the Checklist because they have personally encountered an adverse event that had been avoided thanks to SSC (a "near miss")

– 34 surgeons feel that usually actively participate in the SSC procedure in 100% of surgical procedures, 7 for 75% of cases and 3 for 50% of cases.

Among the comments highlighted by surgeons only 2 wrote that they found the current SSC satisfactory. Instead, 15 (34%) suggested drafting a new SSC more focused on their area of surgery. Nineteen surgeons (43.1%) considered that the Checklist needs redrafting in order to flag up errors and technical problems (malfunctioning equipment) – 3 cardiovascular surgeons, 4 orthopedic surgeons, 3 general surgeons, 2 gynecologists, 3 plastic surgeons, 2 ENT surgeons and 2 urologists. Moreover, 8 surgeons suggested repeat training for the SSC to all surgeons and surgical residents to improve safety culture.

Eighteen doctors (40.9%) expressed willingness to be involved in a working group to revise our Surgical Safety Checklist.

Twenty seven surgeons (61.3%) said they had no notice of adverse events or near miss related to SSC.

Discussion

For approximately 3 years the Surgical Checklist has been a mandatory procedure at our Teaching Hospital. It was introduced following a modification of the WHO Checklist to produce a tool that is more appropriate to workflow in our surgical theatre. The version of the Surgical Safety Checklist used today (2016) is the third version, the result of further changes adopted on the recommendations of surgeons and nurses. We decided that that SSC would be managed by nursing staff. It is therefore a nurse (usually the circulating nurse) that coordinates surgeons, technicians, and anesthesiologists in order to follow the three phases of the checklist. Thanks to the support and leadership of the nursing staff, official compliance with the practice is around 100%. As demonstrated by the results described above, from a nursing point of view there are only a few cases of non-compliance, which are of limited relevance.

The greater part of the Checklist's records are correctly filled in. However, consistent with the literature, at our hospital there is a gap between SSC records and its correct implementation. In other words, the Checklist's use is not being actively supported by all surgical team members^{1,4,5,6}. In fact, close inspection of results allows us to see that despite the efforts of nursing staff many surgeons struggle to answer questions in some phase, and do not collaborate fully.

The hospital QST is responsible for Risk Management and Quality Management, and has therefore decided to perform an in-depth study so it can implement corrective measures in this area. Nursing staff reported a number of cases of poor compliance during 2014 by some surgeons who sometimes do not answer "time out" ques-

tions, or else leave the operating room before "sign out". They also confirmed that the first part of the Checklist was always completed, as the hospital's policy requires "sign in" to be completed before a patient can be moved from the pre-operative area to the operating room.

Our study confirmed that the unauthorized practice of delegating completion of the Checklist (in particular the "sign in") to a Resident is uncommon. The "time out" phase receives less attention than "sign in", with compliance dropping from 100% to 50.75%. This is the same figure reported by Ridenfält and Pickering^{1,7}. The first phase is perceived as important by our staff following a number of serious adverse events that occurred in the hospital as a consequence of inadequate patient identification and surgical site marking.

The fact that nurses and anesthesiologists will not allow patients into the operating room until sign in has been completed is a key factor in ensuring this stage of the Checklist is fully carried out. The nursing staff in particular plays a key role in carrying out the SSC, a role considered useful and relevant also by other authors⁸. The nurses do not appear to feel frustration when asking time out and sign out questions. However, a disparity in the behavior of different surgical teams is evident to them. It is also evident that there is a difference between surgeons and nurses in sensitivity to safety issues⁹.

The surgeons who are most attuned to safety problems are those that perform surgical procedures in large body cavities (the thorax and abdomen) and who frequently perform high-complexity procedures. In these kind of major procedures there is hands on involvement from all members of the surgical team.

The General Surgery team was involved in a serious adverse event in 2014 and is therefore particularly attentive to "sign out". Nurses stated that other surgical teams are not as attentive to the Checklist or aware of safety problems in surgery. In particular, the Orthopedic team, although very attentive to "sign in" to avoid surgical site errors, is less attentive to the other stages of the Checklist, especially "sign out".

Analysis of the surgeons answers shows that "sign in" is well completed but that "time out" and "sign out" are perceived as less important. Some surgeons admitted to not answering questions or even being absent during the "sign out" phase. Many of them showed limited awareness of not collaborating during this step and admitted delegating the responsibility for answering questions to other members of the surgical team. A number of surgeons fell into contradiction in their answers to various parts of the questionnaire. Mostly they stated that they answer the "sign out" questions but later admitted to leaving the operating room before "sign-out" phase is performed.

We also noted that many senior surgeons tend to be absent at "sign out" because they delegate the final part of the operation to junior colleagues. The likelihood that

“sign out” is completed by a different person than the one signing in is therefore very high. This practice could be risky since younger member of the surgical team may not have sufficient knowledge or competence to answer correctly “sign out” questions, in particular questions relating to critical post-operative issues.

Of special note, the answers of both nurses and surgeons show that near misses are underestimated and insufficiently kept in mind by surgical staff. In fact, a number of nurses and doctors confirm that in their personal experience the Checklist is effective in preventing adverse events but we have not the same records in our incident reporting system. At the same time, it needs to be highlighted that 27 surgeons ignore life-threatening adverse events correlated directly with surgery, despite the Quality and Safety Team informed all hospital staff of one such event from January 2015.

In any case, the opinion of the nursing staff is that surgeons have not fully understood the potential of the Checklist as a tool for improving safety in the operating room. This position is consistent with Literature. Our study has highlighted some inappropriate behaviors in our staff. Our data shows that at least one member of the orthopedic surgical team does not adhere to hospital policy. This is also the case with some members of the Urology and General Surgery teams. Regardless of surgeons reported awareness of their own behavior, information from the nursing staff will allow us to plan a training initiative to improve compliance with the SSC by surgical teams.

It is interesting to consider that only 2 surgeons consider the Checklist currently used by our hospital to be satisfactory. A significant number of surgeons proposed a review of SSC to identify and prevent technical problems related to specific instrumentation that can arise during surgical procedures, such as minimally invasive procedures. However, this objective is separate from the Checklist's purpose as has been discussed by OMS (10). In any case the hospital management has taken note of this and is working with surgical teams and clinical Engineering office to create a separate technical Checklist for surgical equipment.

Eighteen surgeons volunteered to participate in a working group to help draw up specific Checklists: we hope this will improve SSC practice, as it's well known that successful implementation of SSC requires adapting the Checklist to local routines and expectations. On the other hand, it is evident that some members of different surgical teams will require improve personal commitment on quality and safety culture.

Conclusion

The results of this research might be of relevance for design a project to improve the way the Surgical Safety Checklist is used. Quality and Risk Managers may use

the results as objective evidence to plan for future strategy to continuous improvement in this field.

Above all, after a detailed analysis of the position of surgeons regarding the SSC we will promote change in the behavior of these healthcare professionals. Proposals for new specific Checklists should, in our opinion, be drawn up. These Checklists would be written by surgeons themselves who must use the WHO model as their starting point. We hope subsequently to find better compliance to SSC completion¹¹⁻¹³.

We propose improving internal communication to share incident reporting data as efficiently as possible. This should bring to give evidence to SSC as a tool that actually prevents and identifies errors and abnormalities in surgical practice. We have noted a strong perception of risk around the technology used by surgeons and we are therefore working with the Clinical Engineering Office to find an appropriate tool.

Riassunto

La Checklist per la sicurezza in sala operatoria (Surgical Safety Checklist, SSC) introdotta dall'Organizzazione mondiale per la Sanità (OMS) nel 2008 ed in Italia dal 2009 è in uso da parecchi anni nel Policlinico Universitario Campus Bio-Medico in modo apparentemente in linea con l'atteso ma abbiamo avuto evidenze di un suo utilizzo non corretto, che potrebbe inficiarne l'efficacia come strumento per aumentare la sicurezza. Abbiamo svolto nel 2015 un audit di cui, in questo lavoro, riportiamo alcuni risultati.

Sono state esaminate 200 Checklist scelte a caso; sono stati intervistati 44 chirurghi (il 73,7% del totale) e i 34 infermieri del blocco operatorio (100% del personale). Il personale infermieristico è risultato fortemente motivato e attento all'implementazione della SSC. Il “sign-in” ha una elevatissima percentuale di esecuzione. La consapevolezza di alcuni eventi avversi e near miss avvenuti in questa fase ha accentuato la cura con cui sia i chirurghi che gli anestesisti ed il personale infermieristico lo eseguono.

Le criticità si verificano nel “time-out” e nel “sign-out”; ci siamo resi conto che – come descritto in letteratura – spesso queste due fasi sono vissute con superficialità e non di rado eseguite senza la reale cooperazione del chirurgo capoequipe e/o dei componenti dell'equipe chirurgica. Questa criticità è stata confermata sia dal personale infermieristico che dai chirurghi; abbiamo potuto verificare che alcuni professionisti non percepiscono il proprio scarso impegno nella procedura di sicurezza della SSC.

Da questo audit abbiamo ricavato un piano formativo per il 2016, che coinvolgerà i chirurghi per redigere versioni specialistiche della SSC dell'OMS così da ottenere una maggiore collaborazione ed interesserà tutto il personale per migliorare la rilevazione di eventi avversi legati anche ad anomalie tecniche.

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