

## SAFE SURGERY CHECKLIST: ANALYSIS OF THE SAFETY AND COMMUNICATION OF TEAMS FROM A TEACHING HOSPITAL

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### ABSTRACT

This study aimed to apply the WHO surgical safety checklist in the surgical specialties of a university hospital and to evaluate the opinion of the team regarding the influence of its application on the safety of the surgical process and on the interpersonal communication of the team. It is a descriptive, analytical, qualitative field study conducted in the surgical center of a university hospital. Data were collected by applying the checklist in a total of 30 surgeries. The researcher conducted its application in three phases, and then members of the surgical team were invited to voluntarily participate in the study, signifying their agreement to participate by signing an informed consent form and answering guiding questions. Bardin's Content Analysis Method was used to organize and analyze the data. The subjects did not notice any changes in their interpersonal communication when using the checklist; however, they gave suggestions and reported that its use provided greater safety to the procedure.

**Descriptors:** Safety. Communication. Operating rooms. Checklist.

### RESUMO

*Este estudo teve como objetivo aplicar o checklist de "cirurgia segura", da Organização Mundial de Saúde, nas especialidades cirúrgicas de um hospital escola, e verificar a opinião das equipes sobre a influência da aplicação do checklist na segurança do processo cirúrgico e da comunicação interpessoal da equipe. Trata-se de um estudo de campo, descritivo, analítico, com abordagem qualitativa, realizado no centro cirúrgico de um hospital-escola. Para a coleta de dados, foi aplicado o checklist num total de 30 cirurgias, conduzido pela pesquisadora, em três etapas, e, a seguir, um componente da equipe cirúrgica foi convidado a participar do estudo, assinando o TCLE e respondendo a questões norteadoras. Para organização e análise dos dados, recorremos ao Método de Análise de Conteúdo de Bardin. Os sujeitos não perceberam mudanças na comunicação interpessoal com o uso do checklist, porém, indicaram que o uso proporcionou mais segurança ao procedimento. Adaptações ao checklist foram sugeridas.*

**Descritores:** Segurança. Comunicação. Salas cirúrgicas. Lista de checagem.

**Título:** Checklist de cirurgia segura: análise da segurança e comunicação das equipes de um hospital escola.

### RESUMEN

*Este estudio tuvo como objetivo aplicar la lista de cirugía segura de la OMS y comprobar la opinión del equipo quirúrgico sobre la influencia de la aplicación de la lista en la seguridad del proceso quirúrgico y en la comunicación interpersonal. Se trata de un estudio de campo, descriptivo y analítico con enfoque cualitativo realizado en el centro quirúrgico de un hospital escuela. Para recolectar datos, la investigadora aplicó la lista en un total de 30 cirugías, en tres etapas. A continuación un componente del equipo quirúrgico fue invitado a participar en el estudio, que firmó el consentimiento informado y contestó algunas preguntas guía. Para organización y análisis de los datos recurrimos al Método de Análisis de Contenido de Bardin. Los sujetos no perciben cambios en la comunicación interpersonal con el uso de la lista, pero hicieron sugerencias e indicaron que su uso le ha brindado más seguridad al procedimiento.*

**Descriptores:** Seguridad. Comunicación. Quirófanos. Lista de verificación.

**Título:** Lista de chequeo de cirugía segura: análisis de la seguridad y comunicación de los equipos de un hospital escuela.

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Philippines, New Zealand, Tanzania, England and the USA) shows that the use of the checklist nearly doubled the chance of the users receiving surgical treatment that met or exceeded care standards. In these countries, there was a reduction of 47% in mortality and surgical complications, which averaged 11% and are now currently 7%<sup>(1-4)</sup>. It is not possible to identify the mechanism responsible for this reduction, but it is believed that it may result from the change in routine and behavior of the team, from every member individually, including interpersonal communication<sup>(5)</sup>.

The essential purpose established by the WHO is to reduce the morbi-mortality of surgical patients, providing surgical teams and hospital administrators with guidance regarding the function of every individual member of the surgical team and a standard for safe surgery. It also aims to offer a uniform instrument of evaluation of the service for national and international surveillance programs<sup>(1)</sup>.

The implementation of the checklist is a low-cost endeavor, essentially consisting of the reproduction and distribution of the instrument, but there is difficulty in applying the instrument within the surgical team. The necessary time estimated for the application of the three phases of the verification process is three minutes and it is recommended that only one person be responsible for this application, with the nurse being the professional indicated to guide the safety checking process, but any professional participating in the surgical procedure may be the verification coordinator. This professional must have full authority over the surgical process, and must be able to interrupt the procedure or prevent its start if he/she judges any of the items as dissatisfactory, even when considering that this interruption may result in stress for the team, depending on their maturity. If there are violations of the safety checking process, the entire process will have occurred in vain, since the small details that go unnoticed are the ones that cause the most risk<sup>(6)</sup>.

It is important to look at the integration and interaction of the team, and to utilize the safety check as a means of interpersonal communication; that is, as a facilitator in patient care, especially considering that interpersonal relationships are the second most common item indicated as a stressing agent among professionals in the surgical center, exceeded only by work overload. The use of the checklist aims to reduce disagreements caused by

unexpected situations, and the introduction of the team members prior to the procedure improves patient safety<sup>(7)</sup>.

Therefore, imposing protocols is not enough for the institutions - professionals must also use the presented tool, which occurs when teams understand the importance and the need, accept the process and incorporate the "new" into their daily practice. Having a coordinator designated to go through the checklist, with the full participation of the patient and the team, is essential in order for the procedure to be successful<sup>(5)</sup>.

In the light of this, the purpose of this study was to apply the WHO surgical safety checklist in a teaching hospital and to verify the opinion of the surgical team regarding the safety of the surgical procedure and its impact on the interpersonal communication of the team.

## METHOD

This is an analytical, descriptive field study with a qualitative approach. The qualitative method allows one to work with the universe of meanings, studying relationships, perceptions and opinions. It favors investigations of discourses, stories from the point of view of individuals, groups and delimited segments, as well as relationships and analysis of documents<sup>(8,9)</sup>.

The study was developed in the surgical center of a teaching hospital, in a public institution in the state of São Paulo, in the second half of 2011. This unit is comprised of eleven operating rooms that are used for minor, moderate and major surgeries of diverse specialties, following a weekly schedule established for each team. Approximately 9,000 surgeries are performed in this unit annually.

Study subjects were 30 members of the surgical team (surgeons, anaesthetists, nurses, and nursing technicians and assistants) who were present during the three phases of application of the checklist.

Initially, the study project was sent to the professionals responsible for the surgical unit of the hospital for their analysis and authorization. Afterwards, the project proposal was sent to the professionals in charge of the thirteen specialties that share the surgical schedule of this unit. Authorization was obtained from the anesthesiology department, as well as eight from the 12 other surgical disciplines, namely: cardiac surgery, pedi-

atric surgery, thoracic surgery, vascular surgery, gastrointestinal surgery, neurosurgery, ophthalmology and otolaryngology.

The project was submitted to the Research Ethics Committee of the institution, receiving authorization under protocol 130/11.

Following, data collection was performed with the application of the WHO checklist, which was conducted by the researcher in its three suggested phases: Sign in, Time out and Sign out.

One member from each surgical team was then invited to participate voluntarily in the study, signing the Free and Informed Consent Form and answering four guiding questions: (1) Do you believe the application of the checklist provided increased safety during the surgical process? Explain. (2) Did you observe changes in the interpersonal communication of the surgical team based on the application of the checklist? Could you provide examples? (3) If you were working in an operating room, would you like the checklist to be applied? Why? and (4) Do you know of any checklist regarding safety in the operating room?

Data were organized and analyzed utilizing the content analysis method, which is defined as a set of communication techniques aimed at obtaining indicators through systematic procedures for analysis of the content description of the messages, which allow the inference of knowledge regarding the conditions of production/reception (inferred variables) of these messages<sup>(10)</sup>.

The content analysis method is performed in three phases: pre-analysis, material exploration and treatment of the results. Pre-analysis is the phase in which initial ideas are organized and systematized, and it must be accurate and flexible. The author suggests the choice of documents to be submitted to analysis, as well as the formulation of hypotheses and indicators that ground the final interpretation. Therefore, the researcher reads the texts exhaustively in search of representations of the selected sample. In the preparation of this material, the researcher must transcribe all of the answers obtained entirely, so as to facilitate the analysis. Material exploration involves the administration of the decisions made in the previous phase. Essentially, it consists of both coding and categorization operations, based on previously formulated rules. Coding includes the transformation of the material, by cutting,

aggregation and enumeration of raw data from the text, allowing an exact description of the pertinent characteristics of the content through the classification of the categories.

Categorization is an operation of classification of the elements by differentiation; that is, the operation of grouping common text elements as per their category. The categorization criterion may be semantic; syntactic; lexical and/or expressive. The term 'semantic' means grouping themes with the same meaning or subject; 'syntactic' corresponds to grouping verbs and adjectives; 'lexical' is the classification of words based on pairing close meanings and synonyms; and 'expressive' classifies speech disorders.

Treatment, inference and interpretation of the data obtained occur when the elements are treated so as to be significant and valid. The researcher may propose inferences and advance interpretations based on the anticipated purposes, comparing the results obtained with the material serving as a basis for the analysis.

The decoding and interpretation of the findings were defined by semantic categories, classified after the transcription of the interviews. The researchers chose to cut the speeches into comparable texts of categorization for thematic analysis.

## RESULTS AND DISCUSSION

The checklist was applied in four surgeries (on average) in each specialty, resulting in a total of 30 surgeries. The specialty was chosen from the daily surgical schedule, with the goal being to apply the same number of checklists in each specialty.

Study participants were 30 members from the eight surgical specialties in which the checklist was applied, including a nurse, three nursing technicians, four nursing assistants, nine anaesthetists and 13 surgeons. These subjects constituted a young population, presenting a median age of 28 years, which is justified by the fact that 73.3% of the study subjects were intern physicians and there was only one professor who participated. The median time in the current position was 2.2 years, also justified by the fact that most of the subjects were intern physicians. In terms of gender, 50% of the subjects were women and 50% were men.

Considering the purpose of this study, to apply the safe surgery checklist and to analyze its contribution to the safety of the surgical process,

as well as the possibility of improvement in the interpersonal communication of the teams in the studied surgical unit, the authors have obtained results that support the use of this instrument in assuring safe surgeries and promoting effective communicative processes in these environments.

The speeches of the subjects are represented by the letters: 'A' for anaesthetists, 'S' for surgeons and assistants and 'T' for the nursing team; that is, the nurse, nursing technicians and nursing assistants (operating room nurses and surgical technologists).

Regarding the safety provided to the surgical process through the application of the checklist, the meanings attributed by the subjects were classified into thematic categories and, further, into two groups.

### The checklist provided safety to the surgical process

In this group, four thematic categories emerged from the answers of 80% of the subjects.

Category 1 – It reduces risks and possible complications.

*Chances of failing decrease (T 1).*

*It reduces the risks, assures safety (S 2).*

The decrease in morbidity and mortality with the use of the checklist was also demonstrated in a multicenter study, developed in eight hospitals in eight countries with different economical contexts, totaling 3,955 surgeries<sup>(4)</sup>. This demonstrates the feasibility of implementing the checklist in any institution, since the guidelines to be followed may be used in any part of the world, disseminating the practice to institutions everywhere<sup>(1)</sup>.

Category 2 – It standardizes procedures and reviews safety steps.

*We need all the material to be ready in case any unexpected complications occur (A 2).*

*It reviews materials and their operation (A 9).*

*It helps us manage procedures (S 4).*

*It must be performed to standardize procedures (S 7).*

*It helps in remembering and reviewing steps (S 9).*

*It provides a review of several items in the immediate pre-surgery period (S 10).*

Admitting that errors happen and communicating them is the first step to their reduction, but in the current system of guilt and blame, not everything that happens is reported, which prevents others from learning from situations in which they were not present. Learning about errors helps in the improvement of clinical processes and the prevention of similar future cases<sup>(3)</sup>.

Category 3 – It allows others to better understand the process.

*It guides us to better understand the process (S 8)*

*It helps the entire team to communicate regarding the procedure to be performed and its possible complications and risks (S 12)*

The use of the checklist involves changes in the working process and in the team behavior<sup>(4)</sup>. The experience provided with the application of the checklist allowed the subjects to perceive that, despite being interested in its use, some professionals were not concerned with the behavior change required to perform the checklist. On the other hand, when work is collective in nature, the team begins to perceive themselves as more than the executors of tasks, which helps to recover the emotional dimension of the work<sup>(11)</sup>.

Category 4 – It provides safety to the team as a whole.

*There are much lower chances of forgetting steps with the application of the checklist (A 3).*

*It reinforces items that are important for the safety of the procedure (A 4).*

*It assures more safety to the team (T 2).*

*We feel more relaxed knowing that all the material needed is in the room (T 6).*

*It facilitates our saving people's lives (T 5).*

The introduction of the checklist is believed to be an important step towards a new culture of safety in the operating room<sup>(5)</sup>. The present study showed that this surgical team is willing to accept this new culture, since 100% of the subjects stated

they would like to have the checklist applied in their operating room, as it is a means to standardize the routine, providing more safety to the patient, predicting complications, avoiding errors and organizing the surgical act.

### **The checklist does not provide more safety to the surgical process**

The construction of this thematic category emerged from the answers of 20% of the study subjects:

Category 5 – It is not inserted in the routine of the institution.

*It has changed neither the procedures nor the sequence of intraoperative events (A 7).*

*No, we are not in the habit of using it (T 5).*

*I don't think it has provided more safety. I believe that within a surgical team everyone has their individual safety rules, and there is also teamwork, despite there not being a checklist for that (S1).*

*The questions were not different from our usual practices (S 11).*

The implementation of the checklist costs little, consisting essentially of the reproduction and distribution of the instrument, but there is difficulty in its application in the surgical team.

The most promising way to cope with adversities is to create a sense of teamwork among all professionals, distributing responsibilities and increasing the care delivered to the patient and therefore, as a consequence, increasing his/her safety<sup>(9)</sup>.

When questioned regarding the way the use of the checklist had influenced the interpersonal communication of the team, the following meanings were attributed by 86.7% of the study subjects:

Category 1 – No changes were perceived in the interpersonal communication of the surgical team based on the application of the checklist.

*I haven't observed any changes (A 3).*

*There was no difference (A 6).*

*There is already good communication between the teams (A 8).*

*I believe this evaluation is premature based on an isolated event (S 5).*

Failure in communication is one of the main factors contributing to medical error and adverse events, since there is no transference of critical information<sup>(12)</sup>. It is believed that most of the subjects have not perceived that the application of the checklist allowed them to communicate with the entire team while they confirmed items and communicated their actions and concerns to everyone in the operating room.

While 86% of the subjects in this study did not perceive any changes in interpersonal communication, 84% of the subjects from seven countries where the checklist was applied reported that communication in the operating room improved<sup>(7)</sup>. Good communication in work relationships is developed by learning one's own characteristics and needs, as well as those of the others. Believing in the reporting ability of others makes people able to perceive symptoms of anxiety in themselves and in the others, and to observe their own non-verbal ability<sup>(11)</sup>.

The application of the checklist in 40,000 surgeries performed in a university hospital in France showed that professionals have difficulty sharing information orally in the surgical time out; that is, in the second part of the checklist – before the skin incision<sup>(13)</sup>. During the experience of applying the checklist, it was possible to perceive that a few surgeons had sharing information, especially in this phase.

Communication in the operating room remains insufficient and constitutes an important characteristic for improvement<sup>(14)</sup>. The investment in relationships is necessary, not only in the operating room but also with the patient, since the checklist detected a situation in which the person responsible for the patient was not fully aware of the procedure to be performed. Competent communication allows humanization to occur and builds transforming care, resulting from the interaction between patients and work colleagues<sup>(15)</sup>.

Studies developed in two university hospitals in France<sup>(13,14)</sup> showed similar results to this study regarding interpersonal communication. University hospitals usually have an increased staff turnover with intern physicians not remaining for a long period of time with the same team, which often makes them feel like they are not a part of the team, complicating the growth and cohesiveness of the team.

Category 2 – Changes were perceived in the interpersonal communication among the surgical team and with the family.

A total of 13.3% of the subjects reported that they perceived changes in interpersonal communication:

*Regarding this particular surgery, the mother of the child still had not talked to the physician regarding the site of incision and the time of surgery, and the application of the checklist pointed that situation out (T 6).*

*It foresees surgical risks that could cause interpersonal difficulties within the team (S 2).*

*Greater knowledge and communication of the team (S 9).*

*Critical steps are always emphasized by the guide (S 12).*

The checklist is an instrument of communication that allows the opportunity to improve communication among professionals in the operating room<sup>(14,15)</sup>. A multicenter study, developed in a university hospital in Finland, showed that operating room nurses and anaesthetists perceived improvement in communication after the application of the checklist<sup>(12)</sup>. Communication is facilitated through good professional interaction and a clear definition of the roles of everyone involved<sup>(11)</sup>.

Positive changes in the perception of the team work environment are related to improvement of postoperative morbidity and mortality<sup>(7)</sup>; in addition, the use of the checklist reduces disagreements caused by unexpected situations.

Therefore, imposing protocols is not enough for the institutions- professionals must also use the presented tool. Proper use of this tool takes place when the teams understand the importance and the need, accepts the process and incorporates the “new” into their daily practice. Having a coordinator to go through the checklist, with the participation of the patient and the team, is essential for the procedure to be successful<sup>(5)</sup>.

## FINAL CONSIDERATIONS

This study allowed us to perceive that improvement of safety in surgical procedures requires investments in the knowledge regarding the surgical act, both for the patient and the team.

The feasibility of implementing the checklist was shown in studies involving several hospitals in many countries, from varied economical contexts, but difficulties are still perceived in the implementation of this safety tool in teaching hospitals, especially in terms of acceptance by the surgical team. The nurse, as leader of the unit, may adopt this tool, reaping benefits for both professionals and patients who use the surgical unit, in addition to encouraging the participation of everyone in this new initiative.

Most of the study subjects stated that they did not perceive any improvement in interpersonal communication when using the tool; however, in the author's view there were changes in communication, especially in the second part of the checklist (that is, in the surgical time out), when conversations took place between the surgery coordinator and the anaesthetist regarding the clinical condition of the patient.

Although some subjects did not perceive improvement in safety and interpersonal communication during the surgical procedure, all of them would like the checklist to be applied in their operating room.

The WHO guidelines indicate modifications in the structure of the checklist according to the reality of each institution. In this sense, in the studied institution, the authors suggested the following modifications: 1) asking “Which prophylactic antibiotic has been administered and what time was it given?”, instead of asking whether it was administered in the last hour; 2) in terms of expected blood loss, charting which hemocomponents were planned and communicated to the blood bank; 3) regarding the sample for anatomy, writing down what the sample was and whether the surgeon made the request, instead of only confirming whether it is identified; and 4) the registration of the procedure must be checked before the patient leaves anesthetic recovery, since requiring registration to be made before leaving the operating room there may be a delay in freeing the room to be cleaned and the start of the next surgery, generating unnecessary arguments between the teams.

These suggestions for modifications were presented to the unit where the study was developed as per the request of the unit supervisor. Afterwards, the checklist was evaluated as feasible to be implemented in this unit by the nurse in charge.

The researcher was invited by the nurse, the technical supervisor of the surgical unit, to train the professionals regarding the application of the checklist. A first meeting has already taken place with this team.

Study limitations include the fact that four surgical specialties (plastic surgery, gynecology, orthopedics and urology) were not included in the study, which could have led to other results. Nevertheless, in the implementation of this safety model all specialties will be included, which will increase the likelihood of safe surgeries in this institution.

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