Validation of surgical checklist to prevent surgical site infection

Validação de *checklist* cirúrgico para prevenção de infecção de sítio cirúrgico

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Abstract

Objective: To design and validate a surgical checklist to improve patient safety and prevent surgical site infection.

Methods: This quantitative study was carried out to validate an instrument created and used for surgical safety. Seven experts validated the instrument. For agreement among experts, was used Kendall's concordance coefficient; if their opinions differed significantly, the Cochran's test was adopted. An instrument is validated when concordance among experts is achieved and its clarity is significant.

Results: In the first assessment of the instrument, Kendall's concordance coefficients were 0.230 in terms of pertinence and 0.390 for clarity. These results cauded a reformulation in the checklist. After reformulation, an absolute concordance was achieved for pertinence and no significant difference was seen in terms of clarity. After instrument validation, was created an information system to input data collected.

Conclusion: The instrument was validated. It can help improve patient safety and prevent surgical site infection.

Resumo

Objetivo: Construir e validar *checklist* cirúrgico para segurança do paciente e prevenção de infecção de sítio cirúrgico.

Métodos: Pesquisa quantitativa realizada para validar instrumento criado e utilizado em cirurgia segura. O instrumento foi validado por sete peritos. Para concordância entre os juízes utilizou-se o coeficiente de concordância de *Kendall* e para verificar se a opinião dos juízes diferiu significativamente, o teste de *Cochran*. O instrumento é validado se houver concordância entre os juízes e a clareza for significante.

Resultados: Na primeira avaliação do instrumento, obteve-se *Kendall* de 0,230 para pertinência e 0,390 para clareza, o que implicou em reformulação do *checklist*. Após a reformulação, obteve-se concordância absoluta para pertinência e não houve diferença significativa para clareza. Com o instrumento validado, foi criado um sistema informatizado para inserção dos dados coletados.

Conclusão: O instrumento criado foi validado e pode auxiliar na segurança do paciente e prevenção de infecção de sítio cirúrgico.

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Introduction

Risks for patients are a reality in surgical care, and health teams have the responsibility to propose strategies and establish barriers to guarantee patient safety.

The program implemented by the World Health Organization (WHO) in 2008, "Safe Surgery Saves Lives," presents a global challenge to increase quality of surgical care standards in health service worldwide. This program is focused on fundamentals and surgical safety practices and emphasizes the need to invest in quality improvement and guarantee safety in surgical interventions, while progressively saving more lives and causing less harm to patients.[1]

This challenge describes four areas of action: prevention of surgical site infection (SSI), general anesthesia, safety surgical teams, and indicators of surgical care.[1]

In a strategy to consolidate surgical safety, the WHO proposes that surgical teams follow ten basic and essential objectives when performing any surgical procedure. It also establishes the following as the program main objective: a set of demographic statistics for surgery that incorporate structural measures and results that track process effort, such as use of a safety checklist in the operating room.[1]

The surgical safety checklist is considered a key element for reducing adverse events[1-6] and aims to guarantee that surgical teams consistently follow critical safety measures to increase surgical procedure safety, reinforce accepted safety practices and promote better communication and work among the surgical team. However, the list proposed by the WHO is only a basic one. For this reason, adaptations and changes in this instrument are highly encouraged and recommended.[1-3]

Healthcare-associated infections are those acquired on or after the third day of hospital admission at healthcare institutions.[7] SSI is the most frequent complication in patient who have undergone surgery.[8] It contributes to about 31% of all healthcare-associated infections[9] and to about 37% of infections in surgical patients acquired in the hospital.[1,10]

In Brazil, SSI is ranked third among all healthcare services–associated infection. It makes up 14% to 16% of infections seen in hospitalized patients. A national study by Brazilian National Health Ministry in 1999 identified an SSI rate of 11% among the total surgical procedures analyzed.[10]

Considering the important role of surgical procedures, the WHO established a goal to reduce SSI rates by 25% by 2020; this reduction will significantly decrease morbidity and mortality.[1]

SSI is one of most feared complication from surgical procedure because it is a severe episode that involves high costs and is associated with morbidity and mortality.[1,10] Infected patients have twice the risk for death or admission to the intensive care unit and a five times greater chance of readmission after discharge.[9-13]

From professional experience at a surgical center, was identified the need to evaluate areas in which to act using ten objectives proposed by the WHO program. The relationship of existing risk between surgical procedure and SSI occurrence, which refers to the sixth objective of the program ("*Team will use in a systematic manner known methods to reduce risk of surgical site infection*") was highlighted and recommendations to be developed by surgical teams and health institutions.[1] Therefore, the strategy to establish barriers and promote improvement in surgical care included a checklist, proposed by the WHO, consisting of steps to verify safety in prevention of SSIs during care in the surgical environment. This study aimed to design and validate an instrument to verify surgical safety to increase patient safety and prevent SSIs.

Methods

This quantitative study sought to validate a surgical safety checklist designed to improve patient safety and prevent surgical site infection. The instrument was based on the checklist created by the WHO in 2009 (presented in Appendix 1), scientific literature published on the subject and the professional experience of researchers who work at health institution which is consolidation process of the implementing

a patient safety protocol. After the instrument was designed, its content was evaluated and then validated by experts.

Elaboration of the instrument

The validation of the instrument was soughted in order to optimize its use in the institution where this study was carried out; the WHO has proposed that health units develop lists that address the practice needs.

The model proposed by the WHO entails three points during surgery within the operating room: identification, confirmation and recording. The purpose of this list verification is to collect data before anesthesia infusion, before surgical incision and before the patient leaves the operating room (Appendix 1).

In the instrument in our study, patient identification was collected in the first line of the instrument. Next, were established five points at which surgical context was to be investigated: admission at the surgical center, before anesthesia infusion, before surgical incision, before patient leaves the operating room and before post-anesthesia recovery. This objective sought to check not only that the right procedure was being performed but also to verify the right surgical location and right patient, as noted in the WHO list. Was also aimed to emphasize prevention of SSI, which is an avoidable complication.

The first version of the instrument consisted of 48 items divided into six sections. Each section was designed to verify safety items related to care delivery according to the specificity of the period that the patient was experiencing. The top line was completed when the patient entered the surgical preparation room (where admission to surgical center takes place) and collected data to identify and characterize the patient, the surgery and the surgical team.

Data collected upon admission to surgical center included conditions for which the patient was admitted, his/her preparation for the procedure, patient knowledge about the surgery, marking of the surgical site (if necessary), verification of safety items (such as patient ID wristbands), printed labels with patient information to be placed on samples or exams performed during the surgery, and presence of invasive devices.

After these checks, the infection prevention process was initiated. The adequacy of the process and structure required for surgical procedure based on established guidelines[1] was verified. In addition, were checked preoperative bathing, hair removal and patient's temperature.

Anesthesia and distribution of the surgical field occur when the patient enters in the operating room. One the reasons is to check information obtained in the preparatory room about identification and adequacy of organizing the room for the procedure proposed for the patient. At this time, data to guarantee a safety surgery are sought, such as equipment functioning, measures to prevent iatrogenesis associated with electrosurgery, surgical position, and monitoring of the sterilization process and the patient's metabolic condition. The infection-prevention process included measuring the patient's glycaemia and indicators of sterilization of materials.

The period before surgical incision occurs before the team begins the surgery. At this stage specific data are collected about the health team working on the procedure and the use of prophylactic antibiotic administration, when necessary, is checked.

The period before the patient leave the operating room occurs after the surgery. The goal during this period is to verify possible intercurrences during the surgery and specific safety items, such as counting compresses and needles and checking the number of instruments. the next check was the placement of labels to identify patient's samples and exams. The last check occurs before the patient leaves the surgical center, the point at which care for patients in the surgical center ends. This checking can occur within the operating room for patients who will be directly referred to specialized inpatient units or within the post-anesthesia care unit. The last check is mainly meant to observe the presence of invasive devices and occurrence of possible specific recommendations in specific surgeries.

The instrument also identifies professionals who participate in the surgery.

Validation of instrument content

Validation concerns the degree to which an instrument measures what it supposed to measure. The three types of validation of an instrument are content validity, construct validity, and validity related to a criterion.[14]

In this study, was validated the content by assessing the representativeness of items in relation to what was proposed to be evaluated. The assessment include how representative the questions of the instrument are within the universe of all questions that can be formed for the topic.[14,15]

The assessment was carried out by a group of experts with proven experience in the area and with publications in the studied area or with experience in validation of instruments. The instrument was judged by experts and evaluated in terms of pertinence, clarity and coverage of its items.

Was considered pertinent the domain that evaluated whether items really reflected the involved concepts and whether they were relevant and adequate to achieve the objectives proposed by the study. The clarity criterion was considered as the domain that evaluates whether the item wording is adequate, whether the language used to describe the items was properly organized to be understood and whether the language expressed exactly what was expected to be measured. Coverage is the domain in which the overall instrument is evaluated; have been evaluated whether each main topic contains an adequate set of items and whether all dimensions were included.[14-16]

Characterization of experts

The instrument was evaluated by the following seven experts:

1. MD, post-doctorate degree, surgeon, consultant at Pan American Health Organization/WHO, and Brazilian Health Surveillance Agency (ANVISA) of Safety Surgery 2007-2013, professor at *Universidade Pública Federal de Pernambuco located in the municipality of Recife*-PE, with experience in patient care, teaching, research and consulting in surgery and health.
2. MD, PhD, surgeon, professor at *Universidade Pública Estadual* located in the municipality of *Campinas*-SP, with experience in patient care, teaching, research, and surgery.
3. MD, PhD, infectious disease specialist, responsible for the Nosocomial Infection Control Committee, with experience in patient care and health service management.
4. Nurse, PhD in public health and epidemiology, professor at *Universidade Pública Estadual* located in the municipality of *São Paulo*-SP, with experience in teaching in nosocomial infection and perioperative nursing.
5. Nurse, PhD in nursing, professor at *Universidade Pública Estadual* located in the municipality of *Ribeirão Preto*-SP, with experience in patient care and teaching in clinical and surgical nursing.
6. Nurse, master's degree, manager at private health service, with experience in patient and surgical center management.
7. Nurse, master's degree, working at private health service, with experience in surgical center and sterilized material center.

Demographic characteristics of experts were as follows: Four (75%) were women aged 30 to 73 years, with seven to 50 years of experience. The group was heterogeneous in terms of work specialty; professionals worked with patient care, teaching, research, consulting and management. It is important to highlight that four experts of the research were also professors.

Validation of the instrument process

The process began with contact over the phone to invite the expert to participate. After the experts accepted, they were sent by email or postal mail (per participant's preference) a letter presenting the project, other presentations of instrument and instructions to proceed and evaluate the instrument. All items of the instrument were left blank for experts to make suggestions and comments.

In the first evaluation, the seven experts returned the material with their analyses and sugges-

tions. With these data, we constructed an electronic spreadsheet to evaluate the validation process. Experts were categorized as P1 to P7 and for each item that the expert's score was recorded.

Data analyses

Data obtained were submitted to descriptive statistical analysis using Microsoft Excel® for characterization of the group of experts. Concordance between experts was assessed and statistical analyses were carried out using SAS® software, version 9.2.

Kendall's coefficient of concordance (W) was used to evaluate the concordance among experts in criteria pertinence, clarity, and coverage of the instrument. This coefficient can vary from 0 to 1. The higher the W value (W ≥ 0.66), the greater the agreement among the experts.[17] For items of clarity, we used Cochran's Q test to verify whether the experts' opinion significantly differed; this can be understood as discordance among them. We considered the variation from -1 to 1 (1 meant that the option is clear and -1 meant that the option was unclear). To incorporate experts' suggestions for evaluated items of the instrument, we considered the concordance obtained for each item. As acceptance criteria for the item, we established that those with concordance percentage (CP) greater than 80% for pertinence or clarity would be accepted and those that obtained concordance lower than 80% were excluded or changed. To calculate CP among experts, the following formula was used:

$$CP = \frac{\text{nº of experts that checked the options (1)} * 100}{\text{total number of experts}}$$

The significance level considered was 5%.

Development of this study followed national and international ethical and legal aspects of research on human subjects.

Results

First assessment of the instrument

In the first assessment, the value of Kendall's concordance test was 0.230 (p=0.000) for pertinence and 0.390 for clarity (p=0.015). Because no concordance among experts was achieved concerning the evaluated criteria in the first version of the instrument, changes were made according to suggestions and observations presented.

In terms of pertinence, four items of the instrument had concordance level below 80%. The variation from 43% to 100% necessitated the exclusion of three items: *"Was the trans-operative questionnaire presented? (43%), "Was the responsible surgeon in the room? (71%), "Was body temperature between 36 and 36.5%?" (57%).* The item *"Do all professionals wear hat, mask, gloves and apron accordingly during the procedure?"* had a significance level of 71%. However, even with the low index, it was not excluded but reformulated because of its relevance for preventing SSIs.

In clarity assessment, the CP varied from 43% to 100%. Of 15 items that obtained concordance below 80%, given that one was excluded, 10 were reformulated and three were maintained. The item "Infection control area" was excluded because it had 71% concordance based on experts' evaluation and notes made by experts P1, P2 and P5. The reformulated items were: *"HC"* (57%)," *which became "Record number".* The items *"Did the patient take the pre-operative bath with antiseptic?"* (71%) and *"Does the patient considered under specific safeguard measures?"* (57%) were included in a field to describe the product used and the specific type of safeguard measures. The item *"Removal of hair" (43%)* was excluded, along with the type of device used; the item *"Were patient's name and HC checked?* (57%) was replaced with *"Was the patient's name and record number checked?"* The item *"Are required materials present?* (57%) became *"Are materials and required materials present?"* The item *"Within sterilization deadline?"* (71%) was replaced with *"Were validation of indication and expiration date of sterilization of surgical instruments checked?"* In the item "*Is scalpel plate positioned?"* (57%) and *"Is surgical field sterilized?"* (57%), a field was inserted to describe the location of plate placement and the product used. The item *"Does patient have any skin lesion associated with positioning or surgery?" (71%)* also received a field to describe the location of injury.

In terms of clarity, the item *"surgical center admission"* at the time of checking was not evaluated

by experts P1 and P4; as a result, one CP was lower than 80%. However, this item was maintained because of its function in the outline. The item *"Use of antibiotics within the last 24 hours?"* (57%) was questioned by experts P3 and P7 with regard to its relevance; for expert P6 the item "was unclear" but no suggestion was made. The item was maintained because it is related to the checking process of antibiotic prophylaxis that comes before the surgery, which is an important aspect in SSI prevention. Expert P3 had "no opinion" on the item *"Can essential diagnostic images be visualized?"* (71%), and P6 recommended that this item be "removed" because the item does not apply. However, we decided to keep the item because it is important for correct assessment of the imaging exams, which in turn is essential for the adequate performance of the surgery.

For the items that had concordance greater than 80%, all suggestions and comments by the experts were accepted. Nine items were changed: *"Age"* (100%) was replaced with *"Date of birth"; "Marked surgical site?"* became *"Demarcated surgical site"; "Consent form"* (86%) was replaced with *"Was surgical consent form presented?"; "Labels identifying medical record"* (86%) was revised to *"ID labels for the patients in the medical record"; "Before the anesthesia and distribution of fields (in the operating room)"*(100%) was replaced with *"Before anesthesia initiation and distribution of fields"; "Difficult airways/Aspiration risk"* (86%) became *"Difficult airway/Bronchoaspiration risk?"; "Considerable risk for blood loss"* (86%) was changed to *"Considerable risk of blood loss (>500 ml or 7 ml/kg in children)?"*; "Regional Nursing Board" (86%) was replaced with *"Regional Nursing Board Certification: _____ Anesthesiologist – Regional Medical Board_____ Surgeon - Regional Medical Board:_____"*; *"and Before leaving the SC"* (86%) was revised to *"Before leaving the Surgical Center"*.

For item coverage, concordance was over 80% for all items.

Second assessment of the instrument

After modifications, the reformulated instrument was again forwarded for the assessment of four experts who directly worked with patient safety. We obtained the absolute concordance for pertinent criteria. For the clarity criterion, the opinion of experts did not differ significantly (Cochran's Q test, p=0.112).

Regarding clarity, one of the experts had suggested that, in the case of a positive response for the following items: *"Are there critical events expected for the procedure?* and *"Any specific recommendation for the immediate post-operative period?"* a space should be added to describe the event that occurred. We considered that incorporating this suggestion would make the item more clear and would facilitate the ability to quantitatively measure the findings. Therefore, we modified those items accordingly.

Concerning coverage, all experts agreed with all items.

The final version of the instrument was composed of 44 verification items distributed over five points at which to be performed, from admission to the surgical unit through discharge (Appendix 2).

Information system for safety surgery checklist

Using a web-based platform, we developed an information system to house final version of the instrument in a partnership with our institution information technology team. The aim was to establish a tool to monitor the checklist execution to prevent SSIs as a strategy to monitor indicators in real time (Appendix 3).

Discussion

The health care system cannot disregard the human factor with all the possibilities for variation and fallibility. This factor is the foundation of all processes need for the patient care. These conditions cannot be changed, but prevention strategies can be established to ensure working processes are adequate to avoid adverse events and guarantee the improvement of quality and patient safety.[18]

Similar to the situation with aviation in the 1970s, when great catastrophes mobilized leaders to

recognize the limitations of human performance in this segment and to evaluate how this affected the safety of users and the sustainability of the sector, the healthcare area has identified risk factors and unsafe conditions that permeate processes. [1] Adverse events occur in 4% to 16% of every 100 hospital admissions around the globe. Of these, more than half originate from surgical care.[1]

It is important to highlight that, unlike aviation, in which a serious event often can be seen rapidly in the media, in healthcare several severe events can be silent, discovered only through meticulous investigation. The method with which to conduct this investigation has been retrospective analysis for assessment studies of adverse events. However, in many health institutions in the world, a medical record containing events that occurred during surgery procedures is still not incorporated into daily practice. This lack of information prevents the rapid gathering of information about adverse events.

The evident need to establish controls and safety standards for healthcare is the basis for the incorporation of a systematized proven method to verify safety in terms of people and equipment: a checklist for each procedure.[1] However, the main focus of this model in aviation is in the relationship between human and machine. A different model is needed for healthcare because the relevant interactions are not just between humans and technology but also, more importantly, in interaction and communication among members of the health care team with the patient.[19,20]

The pioneering use of a checklist helps prevent errors and human failure in this interaction process.[1,2] However, in the healthcare environment it is important to highlight that the first principle to be considered is variability. There is a single standard of patient or structural resources, institutional norms and teams available to assist in an individual manner. Each institution has its own reality and context. Teams should understand the variability of the environment and evolve in order to systematize their actions as much as possible in a scenario where each procedure has its own particularities. This justifies the recommendation of making changes and adaptions to the WHO's instrument.[1]

However, to improve the method, it is important to consider the complexity that surgical care scenarios present to individuals who participate in this process. The technological apparatus and material resources needed to perform the surgical procedure are associated with interaction and constant communication among individuals, services, and equipment. To professionals working at the surgical center, pursuing only technical skill is not enough; they should also, if not primarily, be able to efficiently communicate, recognize limitations, learn from mistakes and work in teams in order to guarantee the continuous improvement of quality and safe patient care.[19,20]

Use of a checklist in surgical procedures has the goal of allowing surgical teams to systematically follow the critical steps for safety.[1] The checklist is associated with systematization of data to identify points to be reinforced or changed to improve care standards, to reduce morbidity and mortality rates and surgical complications, and to prevent infection and reduce the number of errors due to lack of team communication.[2-6]

However, in contrast to studies that have found benefits to implementing a checklist,[1-6] a study carried out in Ontario, Canada[21] on use of a checklist in 130 hospitals in an institutionalized format showed no significant improvement in mortality or surgical complications after three months of implementation. According to the authors, this finding could be partly attributed to the mandatory introduction of a checklist.[21]

Another relevant situation considered in our study was already observed in the use of checklist - not only within the operative room but to expand opportunities to improve patient safety during the entire perioperative period. A checklist model with inclusion of pre-entrance point in the operating room, called check-in, was proposed by the Association of Perioperative Registered Nurses (AORN). [22] In this model, items related to the patient's preparation are

checked, along with materials and equipment. In addition, the presence of specific documents to perform the procedure is verified. Compared with the instrument from AORN, our validated checklist has more items for working process control considered pertinent by experts at the time of check-in. The validated instrument also contributes to the safety of the surgical patient and includes a database designed from the gathering of checklists that can support management decisions to improve working processes.

Another model already used is the Surgical Patient Safety System (SURPASS),[23] which was developed to be applied during delivery of all surgical care to the patient, i.e., all activities from admission to discharge. Its goal is to verify surgical safety in a global and multidisciplinary format. In addition to use related to surgical safety, SURPASS has been used to prevent legal actions due to poor surgical practice, especially because it covers all care process delivery to the surgical patient. A study reported that use of a checklist can prevent poor surgical practice; of 94 incidents of permanent incapability or death, 30% can be prevented with the use of SURPASS.[24] Although SURPASS covers more areas and shows potential to improve patient safety, this system is not considered for surgical situations with their specific risks, such as risk of bleeding, and because SURPASS is a system there is cost-relationship involved.

Experience suggests that success of implementing a checklist and good results are linked to participation, involvement and engagement of teams.[19,20] For this reason, to implement a prevention strategy for interventionist working processes specific to surgical patients, the use of a validated checklist can optimize possible obtained results. To include the check-in (patient admission to the surgical center) and the check-out (patient discharge) stages in the instrument was meant to close the loop of surgical care to include patients who returned home after the procedure.

Based on this scenario and according to recommendations of the WHO,[1] in addition of introducing the check-in and check-out, we also analyzed and validated, along with the multidisciplinary team, the items specific to prevent SSI.[1]

This direction was given to the instrument based on the evidence of care practice associated with literature findings on assessment of surgical care results, which showed that SSI is an avoidable complication of surgery.[1,8-10,25] The prevalence of SSI is higher among healthcare-associated infections.[25]

After instrument design and before effective care, scientific validation is required. We emphasize that the composition of the panel of experts for this study included specialists in three areas of knowledge: patient care, teaching and research. Another important factor in the selection and composition of the experts was their heterogeneity; they worked with patient care in areas of infection, management, sterilization processes and surgical intervention. In addition, the experts were professionals with experience in surgery or providing support during surgery.

Experts' contributions enabled us to develop an instrument that, unlike the instrument proposed by the WHO, considers that surgery must be done in the right patient, in the right place and for the right procedure. It also verifies the steps recognized in the literature for preventing SSI in the perioperative period.[1]

An additional part of our validated instrument was the design of an on-line form that included all checklist items. This enables the inputting and recording of data in real time during surgical safety checking. This on-line form eliminates the need to transfer information written on paper to a database, allows for ease of daily indicators analysis of the effective use of the checklist, and permits auditing of factors that compromise patient safety and prevention of SSIs.

Despite the variability seen in the study, simple recommendations to prevent SSIs[1,7,10,25] can help reduce infections at health institutions. Leaders have the role to establish valid strategies and make decisions based on systematized data in order to improve working processes in such a way that may guarantee the best results for the patient. If these

actions are taken, we can structure a sustainable pathway fort the healthcare system.

Conclusion

We validated the content of modified checklist based on the model of the WHO instrument. This checklist can help prevent mistakes and complications in surgical patient and addressed the needs of the institution where the study took place. The items that make up the instrument were considered relevant, clear and comprehensible, and as a result the instrument can be used in the care of surgical patients.

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Collaborations

Ferraz EM contributed to drafting of the manuscript, critical review relevant for the intellectual content and approval of proofs. Roscani ANCP, Oliveira-Filho AG and Freitas MIP contributed to the conception of the study, analysis, interpretation of data, drafting of the manuscript, critical review relevant for the intellectual content and approval of proofs.

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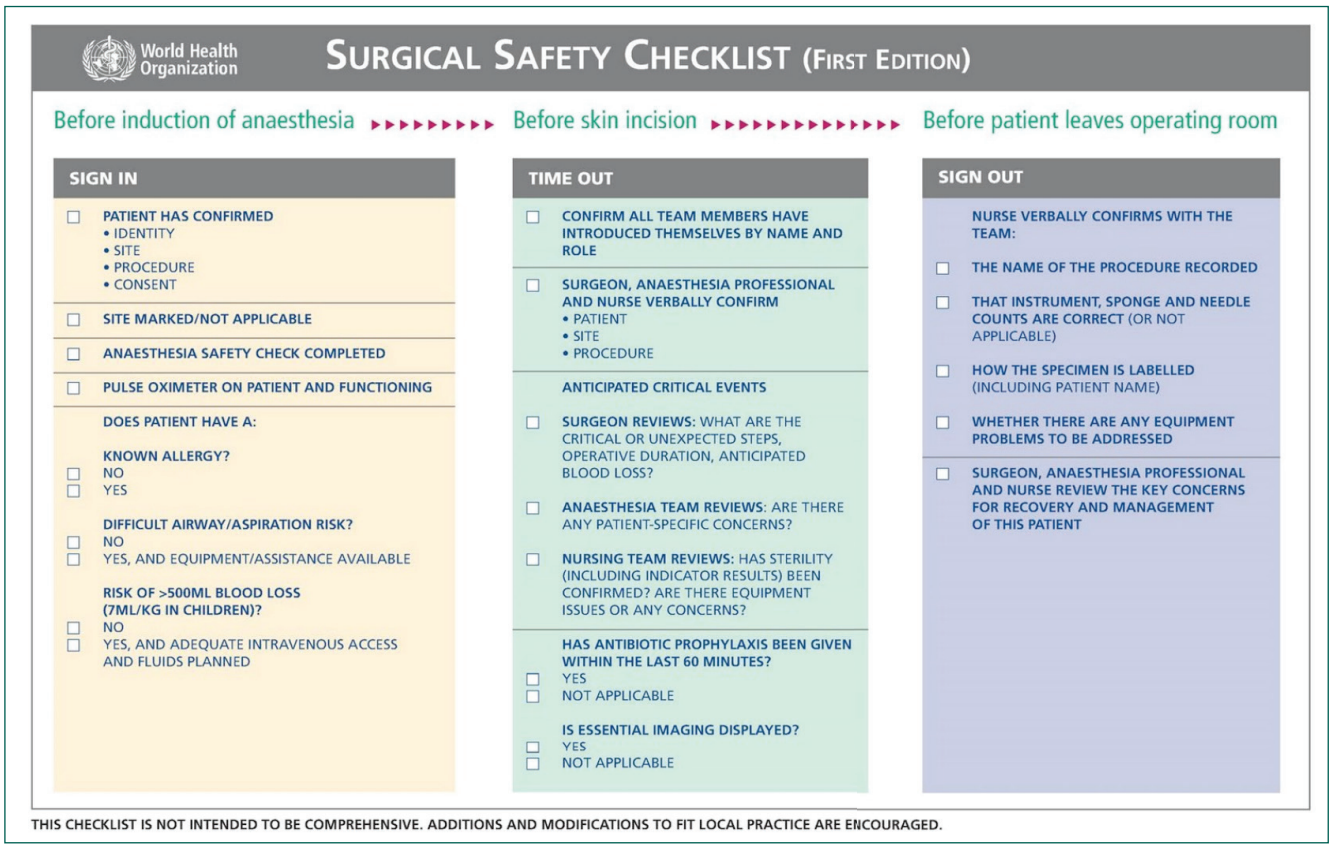
Appendix 1



World Health Organization

SURGICAL SAFETY CHECKLIST (FIRST EDITION)

Before induction of anaesthesia ▸▸▸▸▸▸▸▸▸ Before skin incision ▸▸▸▸▸▸▸▸▸▸▸▸▸ Before patient leaves operating room

SIGN IN

☐ PATIENT HAS CONFIRMED
- IDENTITY
- SITE
- PROCEDURE
- CONSENT

☐ SITE MARKED/NOT APPLICABLE

☐ ANAESTHESIA SAFETY CHECK COMPLETED

☐ PULSE OXIMETER ON PATIENT AND FUNCTIONING

DOES PATIENT HAVE A:

KNOWN ALLERGY?
☐ NO
☐ YES

DIFFICULT AIRWAY/ASPIRATION RISK?
☐ NO
☐ YES, AND EQUIPMENT/ASSISTANCE AVAILABLE

RISK OF >500ML BLOOD LOSS (7ML/KG IN CHILDREN)?
☐ NO
☐ YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED

TIME OUT

☐ CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE

☐ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM
- PATIENT
- SITE
- PROCEDURE

ANTICIPATED CRITICAL EVENTS

☐ SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?

☐ ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS?

☐ NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?

HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?
☐ YES
☐ NOT APPLICABLE

IS ESSENTIAL IMAGING DISPLAYED?
☐ YES
☐ NOT APPLICABLE

SIGN OUT

NURSE VERBALLY CONFIRMS WITH THE TEAM:

☐ THE NAME OF THE PROCEDURE RECORDED

☐ THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE)

☐ HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME)

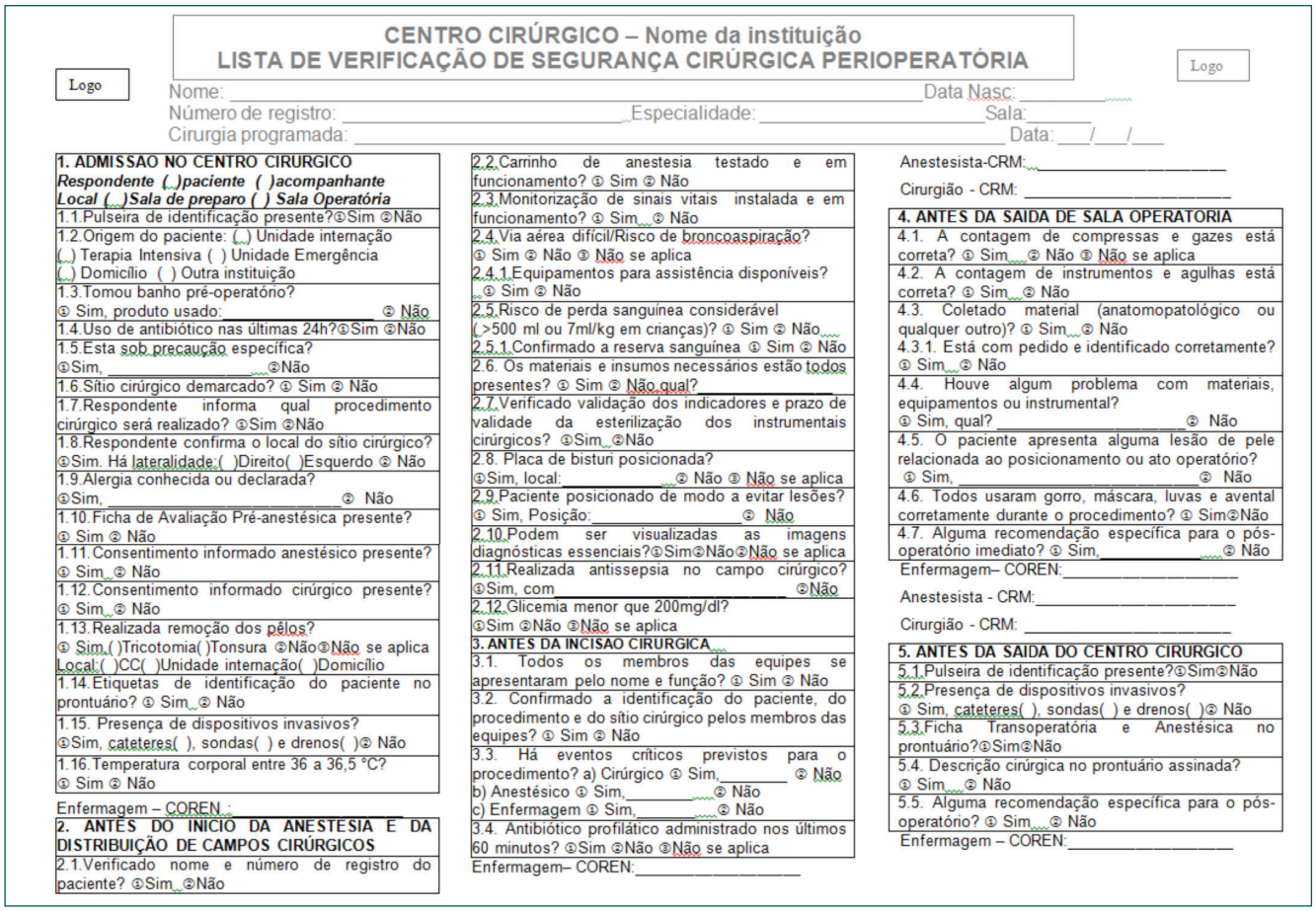
☐ WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED

☐ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT

THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.

Source: http://proqualis.net/sites/proqualis.net/files/2169_Chelist.pdf

Appendix 2



CENTRO CIRÚRGICO – Nome da instituição
LISTA DE VERIFICAÇÃO DE SEGURANÇA CIRÚRGICA PERIOPERATÓRIA

Logo

Logo

Nome: _____ Data Nasc: _____
Número de registro: _____ Especialidade: _____ Sala:_____
Cirurgia programada: _____ Data: ___/___/___

1. ADMISSÃO NO CENTRO CIRÚRGICO
Respondente ( )paciente ( )acompanhante
Local ( )Sala de preparo ( ) Sala Operatória

1.1.Pulseira de identificação presente?①Sim ②Não
1.2.Origem do paciente: ( ) Unidade internação ( ) Terapia Intensiva ( ) Unidade Emergência ( ) Domicílio ( ) Outra instituição
1.3.Tomou banho pré-operatório? ① Sim, produto usado: _____ ② Não
1.4.Uso de antibiótico nas últimas 24h?①Sim ②Não
1.5.Esta sob precaução específica? ①Sim, _____ ②Não
1.6.Sítio cirúrgico demarcado? ① Sim ② Não
1.7.Respondente informa qual procedimento cirúrgico será realizado? ①Sim ②Não
1.8.Respondente confirma o local do sítio cirúrgico? ①Sim. Há lateralidade:( )Direito( )Esquerdo ② Não
1.9.Alergia conhecida ou declarada? ①Sim, _____ ② Não
1.10.Ficha de Avaliação Pré-anestésica presente? ① Sim ② Não
1.11.Consentimento informado anestésico presente? ① Sim ② Não
1.12.Consentimento informado cirúrgico presente? ① Sim ② Não
1.13.Realizada remoção dos pêlos? ① Sim,( )Tricotomia( )Tonsura ②Não③Não se aplica Local:( )CC( )Unidade internação( )Domicílio
1.14.Etiquetas de identificação do paciente no prontuário? ① Sim ② Não
1.15. Presença de dispositivos invasivos? ①Sim, cateteres( ), sondas( ) e drenos( )② Não
1.16.Temperatura corporal entre 36 a 36,5 °C? ① Sim ② Não

Enfermagem – COREN:_____

2. ANTES DO INÍCIO DA ANESTESIA E DA DISTRIBUIÇÃO DE CAMPOS CIRÚRGICOS

2.1.Verificado nome e número de registro do paciente? ①Sim ②Não
2.2.Carrinho de anestesia testado e em funcionamento? ① Sim ② Não
2.3.Monitorização de sinais vitais instalada e em funcionamento? ① Sim ② Não
2.4.Via aérea difícil/Risco de broncoaspiração? ① Sim ② Não ③ Não se aplica
2.4.1.Equipamentos para assistência disponíveis? ① Sim ② Não
2.5.Risco de perda sanguínea considerável (>500 ml ou 7ml/kg em crianças)? ① Sim ② Não
2.5.1.Confirmado a reserva sanguínea ① Sim ② Não
2.6. Os materiais e insumos necessários estão todos presentes? ① Sim ② Não qual?
2.7.Verificado validação dos indicadores e prazo de validade da esterilização dos instrumentais cirúrgicos? ①Sim ②Não
2.8. Placa de bisturi posicionada? ①Sim, local: _____ ② Não ③ Não se aplica
2.9.Paciente posicionado de modo a evitar lesões? ① Sim, Posição: _____ ② Não
2.10.Podem ser visualizadas as imagens diagnósticas essenciais?①Sim②Não③Não se aplica
2.11.Realizada antissepsia no campo cirúrgico? ①Sim, com _____ ②Não
2.12.Glicemia menor que 200mg/dl? ①Sim ②Não ③Não se aplica

3. ANTES DA INCISÃO CIRÚRGICA

3.1. Todos os membros das equipes se apresentaram pelo nome e função? ① Sim ② Não
3.2. Confirmado a identificação do paciente, do procedimento e do sítio cirúrgico pelos membros das equipes? ① Sim ② Não
3.3. Há eventos críticos previstos para o procedimento? a) Cirúrgico ① Sim, _____ ② Não
b) Anestésico ① Sim, _____ ② Não
c) Enfermagem ① Sim, _____ ② Não
3.4. Antibiótico profilático administrado nos últimos 60 minutos? ①Sim ②Não ③Não se aplica

Enfermagem– COREN:_____

Anestesista-CRM:_____
Cirurgião - CRM: _____

4. ANTES DA SAÍDA DE SALA OPERATÓRIA

4.1. A contagem de compressas e gazes está correta? ① Sim ② Não ③ Não se aplica
4.2. A contagem de instrumentos e agulhas está correta? ① Sim ② Não
4.3. Coletado material (anatomopatológico ou qualquer outro)? ① Sim ② Não
4.3.1. Está com pedido e identificado corretamente? ① Sim ② Não
4.4. Houve algum problema com materiais, equipamentos ou instrumental? ① Sim, qual? _____ ② Não
4.5. O paciente apresenta alguma lesão de pele relacionada ao posicionamento ou ato operatório? ① Sim, _____ ② Não
4.6. Todos usaram gorro, máscara, luvas e avental corretamente durante o procedimento? ① Sim ② Não
4.7. Alguma recomendação específica para o pós-operatório imediato? ① Sim, _____ ② Não

Enfermagem– COREN:_____
Anestesista - CRM:_____
Cirurgião - CRM: _____

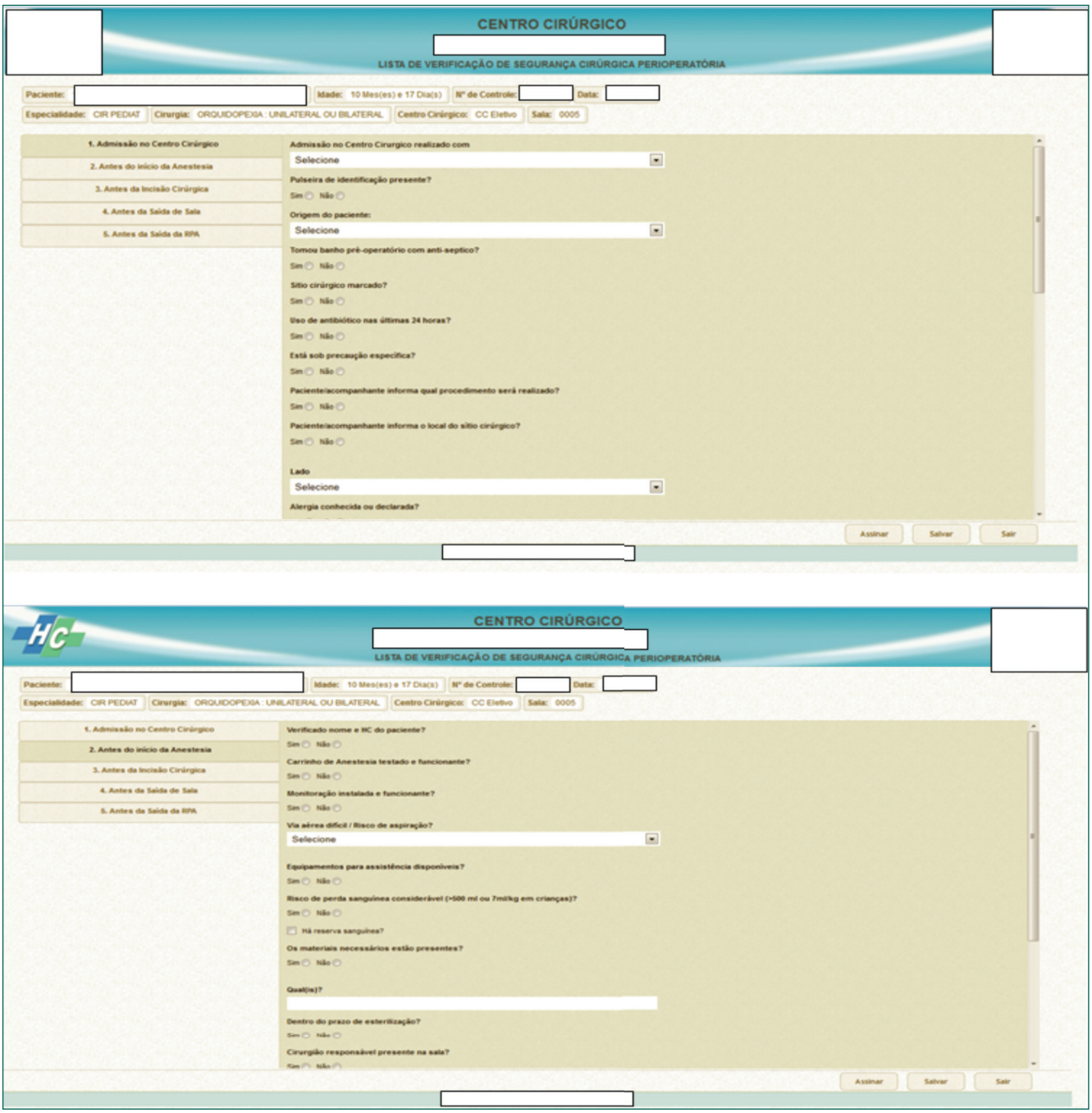
5. ANTES DA SAÍDA DO CENTRO CIRÚRGICO

5.1.Pulseira de identificação presente?①Sim ②Não
5.2.Presença de dispositivos invasivos? ① Sim, cateteres( ), sondas( ) e drenos( )② Não
5.3.Ficha Transoperatória e Anestésica no prontuário?①Sim ②Não
5.4. Descrição cirúrgica no prontuário assinada? ① Sim ② Não
5.5. Alguma recomendação específica para o pós-operatório? ① Sim ② Não

Enfermagem – COREN:_____

Source: Roscani, Alessandra Nazareth Caine Pereira. Perioperative surgical safety and surgical site infection prevention indicators in patients submitted to myocardial revascularization. 2015. 153 f. Thesis (Ph.D.) - Universidade Estadual de Campinas, Faculdade de Ciências Médicas, Campinas, SP.

Appendix 3



Source: Roscani, Alessandra Nazareth Caine Pereira. Perioperative surgical safety and surgical site infection prevention indicators in patients submitted to myocardial revascularization. 2015. 153 f. Thesis (Ph.D.) – Universidade Estadual de Campinas, Faculdade de Ciências Médicas, Campinas, SP..