Published online: 2020-04-02



# Impact of the "Mind the risk" Campaign of Sociedade Brasileira de Ortopedia e Traumatologia on Risk Perception and Use of the Surgical Checklist by Brazilian Orthopedists*

## *Impacto da campanha "Considere o Risco", da Sociedade Brasileira de Ortopedia e Traumatologia, na percepção do risco e na utilização do checklist cirúrgico por ortopedistas brasileiros*

Germana Lyra Bähr[1] Geraldo da Rocha Motta Filho[1]

[1] Division of Traumatology and Orthopedics, Instituto Nacional de Traumatologia e Ortopedia (Into), Rio de Janeiro, RJ, Brazil

Rev Bras Ortop 2021;56(2):218–223.

**Address for correspondence** Geraldo da Rocha Motta Filho, MD, MSc, Instituto Nacional de Traumatologia e Ortopedia (into), Rua Raimundo de Magalhães, 92, Gávea, Rio de Janeiro, RJ, 22451-150, Brazil (e-mail: geraldomotta@terra.com.br).

## Abstract

**Objective** To analyze the impact of the educational actions included in the "Mind the Risk" campaign of Sociedade Brasileira de Traumatologia e Ortopedia (Brazilian Society of Traumatology and Orthopedics, SBOT, in Portuguese), to increase the perception of the risk involved in the surgical activity and the use of the surgical checklist.

**Methods** A comparative research was performed during the 50th Brazilian Congress on Orthopedics and Traumatology (50° CBOT, in Portuguese) in November 2018, using a questionnaire similar to the one used in previous two versions.

**Results** The number of participants was 730, corresponding to 18,7% of the total of 3,903 enrolled in the 50° CBOT. Among the participants, 542 orthopedists (74,2%) reported having experienced errors within the surgical units and 218 (29,8%) surgeries in wrong sites. In total, 624 participants (85,5%) reported marking the surgical site and 402 (55%) using the surgical checklist systematically.

**Conclusion** In the sample studied, it was evidenced that SBOT's efforts to disseminate the World Health Organization (WHO) protocol were effective, reducing the number of orthopedists who were unaware of it from 65.3% (in 2012) to 20.7% (in 2018), and expanding its use. In 2018, 402 participants (55%) reported the systematic use of the protocol, compared with 301 (40,8%) in 2014. These data confirm the need

**Keywords**
- patient safety
- medical errors
- surgical procedures
- checklist

* *Work developed at Instituto Nacional de Traumatologia e Ortopedia (Into), Rio de Janeiro, RJ, Brazil.*

**received**
June 24, 2019
**accepted**
October 30, 2019
**published online**
April 2, 2020

**DOI** https://doi.org/10.1055/s-0040-1701285.
**ISSN** 0102-3616.

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for educational campaigns and systematic training, not only to promote behavioral change, but especially a cultural change.

## Resumo

**Objetivo** Analisar o impacto das ações educacionais inseridas na campanha "Considere o Risco", da Sociedade Brasileira de Traumatologia e Ortopedia (SBOT), para aumentar a percepção do risco envolvido na atividade cirúrgica e a utilização do *checklist* cirúrgico.

**Métodos** Realização de pesquisa comparativa, durante o 50° Congresso Brasileiro de Ortopedia e Traumatologia (50° CBOT), em novembro de 2018, utilizando questionário semelhante ao de duas versões anteriores.

**Resultados** O número de participantes foi de 730, correspondendo a 18,7% do total de 3.903 inscritos no 50° CBOT. No total, 542 ortopedistas (74,2%) relataram já ter vivenciado erros dentro do centro cirúrgico e 218 (29,8%) cirurgias em locais errados; 624 participantes (85,5%) afirmaram marcar o local da cirurgia e 402 (55%) utilizar regularmente o checklist cirúrgico.

**Conclusão** Na amostra pesquisada, ficou evidenciado que os esforços da SBOT para a disseminação do conhecimento do protocolo da Organização Mundial de Saúde (OMS) foram efetivos, reduzindo a quantidade de ortopedistas que o desconheciam de 65,3% (em 2012) para 20,7% (em 2018), e ampliando sua utilização. Em 2018, 402 ortopedistas (55% da amostra) referiram fazer uso frequente do protocolo no ambiente cirúrgico, em comparação com 301 (40,2%) em 2014. Estes dados confirmam a necessidade de campanhas educacionais e treinamentos sistemáticos, não apenas para promover uma mudança de comportamento, como também, principalmente, uma mudança cultural.

**Palavras-chave**
- segurança do paciente
- erros médicos
- procedimentos cirúrgicos
- lista de verificação

## Introduction

Concern about the risks involved in the medical practice date to antiquity, as shown by the *primum non nocere* principle (first, do no harm) attributed to Hippocrates.

Medical societies around the world have recognized this concern and led a movement to curb medical errors and establish safe surgery concepts. The American Academy of Orthopedic Surgeons (AAOS) began its efforts with the "Wrong-Site Surgery" initiative as early as the 1980s, publishing its preliminary results in 1984.[1–3]

In 2000, the Institute of Medicine's (IOM) publication *To Err is Human: Building a Safer Health System*[4] raised awareness among the public, the media, politicians and medical professionals, and consolidated the interest regarding this topic.

In 2002, the member countries of the World Health Organization (WHO), recognizing the need to reduce harm and suffering to patients and families resulting from medical errors, agreed on a resolution to increase patient safety within a public policy. In 2004, the WHO created the World Alliance for Patient Safety, which, starting in 2005, set the priority issues to be addressed every two years, known as "Global Challenges."[5]

Between 2007 and 2008, the second global challenge (Safe Surgery) aimed to improve safety in the surgical environment, raising quality and safety standards for surgical care through 4 important actions: 1) prevention of surgical site infections; 2) safe anesthesia; 3) safe surgical teams; and 4) surgical care indicators.[5] These actions were the basis for the "Safe Surgery Saves Lives" campaign in WHO member countries.

In 2008, the Brazilian Ministry of Health joined the campaign, whose main objective was the adoption, by hospitals, of a standardized 19-item checklist designed to improve communication between surgical team members, reduce the risk of patient harm and errors, and minimize surgery-associated complications and deaths. The surgical checklist must be employed in all surgeries, in three phases: before anesthesia (Sign In), before skin incision (Time Out), and before the patient leaves the operating room (Sign Out) (►**Figure 1**).[6]

The use of the WHO surgical checklist has been mandatory in the United States, Canada, England and Jordan, but it is only suggested in many countries, including Brazil.

Two important retrospective studies[7,8] suggest that at least 50% of surgical adverse events are preventable. Most of these events are not caused by technical issues, but rather by lack of teamwork, leadership, communication, decision-making and situational awareness, as even the simplest procedures involve dozens of critical steps, with countless opportunities for failure and huge potential for errors resulting in patient injury.[9,10]

The most critical obstacle to increase safety in the surgical environment is the lack of risk perception by most professionals, especially surgeons. In addition, poor communication between team members can interfere with their performance and patient safety. A team working together to use their knowledge and skills to benefit the patient, combining technical accuracy and safety, is able to prevent a considerable proportion of life-threatening complications.[9,10]

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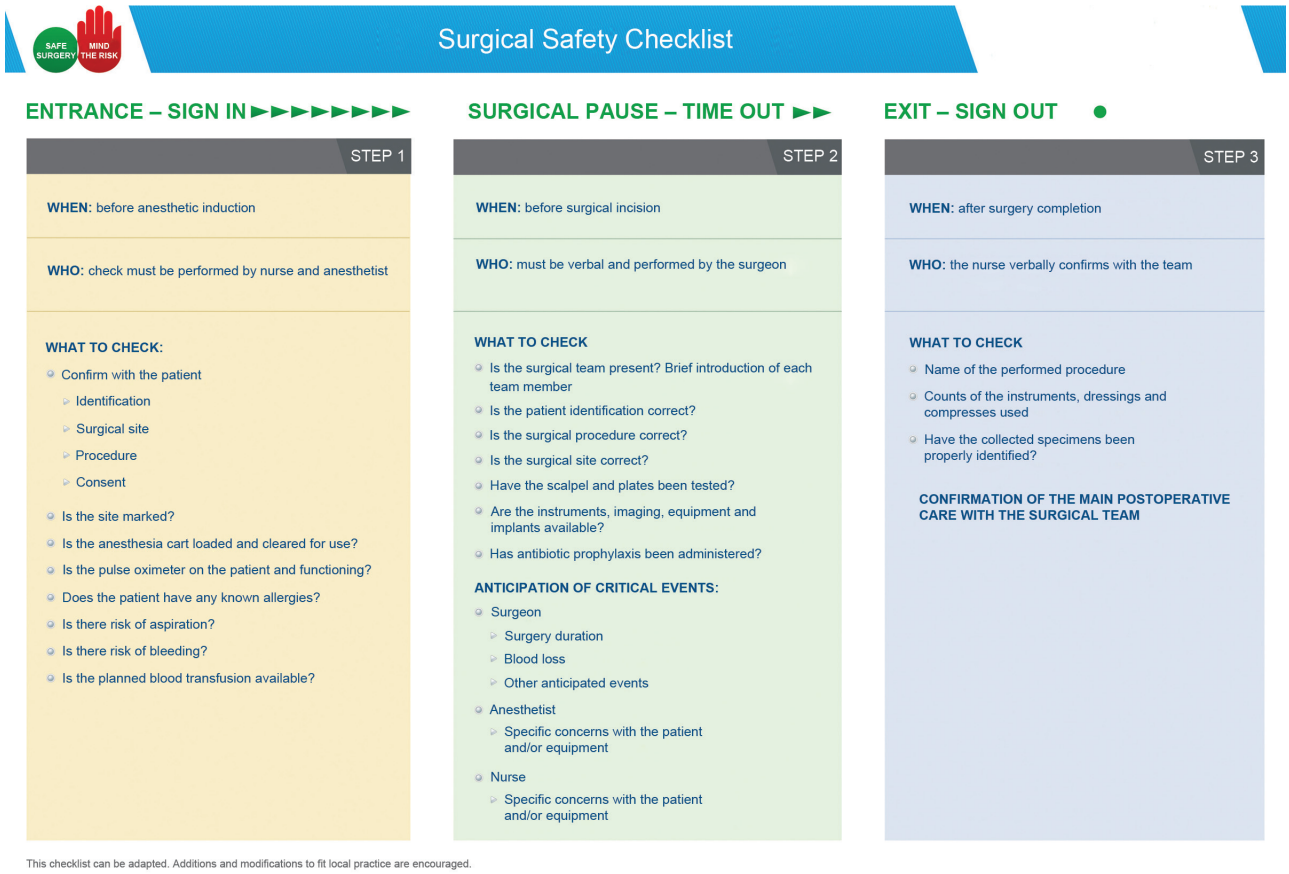


**Fig. 1** Surgical checklist proposed by the World health Organization (WHO) and adapted for use at our institution.

Therefore, the correct use of tools such as the WHO Safe Surgery Protocol can help achieve this goal, including improving communication among surgical team members.[11]

According to a study[12] published at the *Journal of Bone and Joint Surgery Reviews* in 2016, the actual incidence of misplaced surgeries in orthopedics is unknown due to the lack of the exact number of procedures performed and the absence of an infrastructure to standardize error reporting. However, the study reveals that 21% of hand surgeons, 50% of spine surgeons, and 8.3% of knee surgeons reported having performed at least one surgery in the wrong site during their career. The study concludes that every orthopedic surgeon is at risk of performing surgery in the wrong site during their practice, and that prevention should be a priority in orthopedics. Moreover, it suggests that, in addition to factors such as surgeon leadership, commitment and ongoing vigilance, processes encouraging effective team communication, checklists, data collection and analysis should be used in orthopedic surgical settings to improve patient safety.

To diagnose the perception of safety in the surgical environment and the degree of use of the WHO Safe Surgery Protocol by orthopedic surgeons in Brazil, a survey was conducted in November 2012, during the 44th Brazilian Congress on Orthopedics and Traumatology ( CBOT, in Portuguese). This survey showed that 328 respondents (65,3%) were partially or totally unaware of the protocol, and that 123 (70,5%) of those who knew it, had no training to use it.[13]

Based on these results, Sociedade Brasileira de Ortopedia e Traumatologia (Brazilian Society of Orthopedics and Traumatology, SBOT, in Portuguese) launched in 2012 the "Mind the Risk" educational campaign, aiming not only to increase the awareness of orthopedic surgeons regarding surgical risks, but also to disseminate the use of the WHO surgical checklist as an error-prevention barrier. The campaign encompassed various educational actions to disseminate information about safety in the surgical environment, including lectures at congresses, discussion forums and instructive materials, which were available at the SBOT website and were published in medical journals, banners and folders.

The present study aimed to analyze the impact of the educational actions included in SBOT's "Mind the Risk" campaign to increase awareness on surgical risks and to encourage the use of the surgical checklist as a protective barrier against errors six years after its introduction.

## Materials and Methods

The present is an exploratory, quantitative research using a questionnaire about "Safe Surgery" applied to 3,903 orthopedists participating in the 50th CBOT, organized by SBOT, in the city of Rio de Janeiro, Brazil, in November 2018. The questionnaire, which was similar to the questionnaires applied to Brazilian orthopedic surgeons in 2012, at the

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44th CBOT, and in 2014, at the 46th CBOT, was based on the questionnaire used by the AAOS, which, in turn, was based on the material used by the American Academy of Otolaryngology – Head and Neck Surgery (AAO-HNS) and modified to comply with the orthopedics and traumatology pratices.[14,15]

The research project was approved by the Ethics in Research Committee of Instituto Nacional de Traumatologia e Ortopedia (Into), Rio de Janeiro, Brazil, under CAAE (Sisnep) number 36204914.0.0000.5273.

The SurveyMonkey (SurveyMonkey, San Mateo, CA, US) data collection and analysis tool was used and enabled an efficient and rapid evaluation of the results. Questionnaires were distributed by e-mail to all congress participants in 3 moments at 10-day intervals, in case there was no response on the first submission. The deadline to send the filled-out questionnaire was one month after the first submission.

The professionals who filled out the questionnaire were not selected by any specific criteria other than their willingness to participate in the study. Thus, the sample size was random.

## Results

The 50th CBOT was attended by 3,903 orthopedists, but only 730 questionnaires were filled out, representing 18.7% of the total.

Most respondents, 237 (32,5%) were experts on general orthopedics. The most common subspecialties were knee surgery with 133 (18,2%), followed by orthopedic trauma with 65 (8,9%) and hip surgery with 59 (8,1%).

As for geographic region, the respondents worked in almost every Brazilian state, except for the states of Sergipe, Rondônia, Amapá and Roraima. The state of São Paulo had the highest representation in the sample, with a total of 199 orthopedists (27,3% of the respondents), followed by Rio de Janeiro with 197 (27%) and Minas Gerais with 73 (10%).

Among these 730 orthopedists, 572 (78.4%) reported having completed residency in orthopedics and traumatology.

Regarding professional experience, 278 respondents (38,1%) had less than 5 years, 89 (12,2%) had 5 to 10 years, 151 (20,7%) had 10 to 20 years and 212 (29%) had over 20 years of practice.

Most respondents (551; 75.5%) were specialists accredited by SBOT.

In total 423 orthopedists (58%) who spontaneously filled out the questionnaire were not involved in the scientific activities of the congress.

Most orthopedists (624; 85.5%) reported marking the surgical site before referring the patient to the operating room, while almost the same number of professionals (599; 82%) reported checking the implant material and equipment conditions before anesthesia.

The most frequent error category was related to incomplete or damaged surgical material identified after the beginning of the procedure, corresponding to 418 cases (72,3% of the total), followed by problems with equipment or instruments in the operating room with 395 cases (68,3% of these incidents). 413 incidents (71,4%) were notified, so that improvements could be implemented.

**Table 1** Professionals that do not mark the surgical site

| | 2012 | 2014 | 2018 |
|---|---|---|---|
| **Total number of respondents** | **502** | **748** | **730** |
| Do not mark the surgical site | 183 (36.5%) | 269 (36%) | 106 (14.5%) |

Most respondents (542, 74.2%) reported having experienced an error within the operating room during their practice; 218 (29.8%) experienced surgery in the wrong site, and 36 (4.9%) witnessed surgery in the wrong patient.

Despite the recognition of the surgical risk and the WHO protocol as a safety barrier for patients, physicians and institutions by 505 (87.2%) out of 579 respondents who reported knowing the protocol in 2018, 151 (20.7%) orthopedists also reported full or partial unawareness of such document; in addition, 365 (50%) reported not having been trained in its use. However, 402 (55%) orthopedists reported using this tool regularly.

Six years after the launch of the SBOT campaign, the present study revealed that: **1.** 106 surgeons (14,4%) still do not mark the surgical site in 2018, compared to 183 (36,5%) in 2012 (►**Table 1**); **2.** 151 (20,7%) are still unaware of the WHO Safe Surgery Protocol in 2018, compared to 328 (65,3%) in 2012 (►**Table 2**); **3.** 505 (69,1%) recognize the surgical checklist as an important safety barrier in the surgical environment, compared to 174 (34,7%) in 2012 (►**Table 3**); and **4.** 402 of the respondents (55%) reported using the tool regularly in 2018, against 301 (40,2%) in 2014 (►**Table 4**).

## Discussion

Researches involving specific populations have limitations. Here, although survey participation was restricted (18.7%; 730), it was higher than in those performed by the AAO-HNS (18.6%), the AAOS (16.6%)[15] and the SBOT in 2012 (15,5%, 502). (15.5%).[13] The use of standards employed by these three societies was intended to increase the consistency of the information collected and to enable the comparison of the findings, especially among the 3 SBOT surveys, which were carried out in 2012, 2014 and 2018.

The respondents were concentrated in the states of São Paulo, Rio de Janeiro and Minas Gerais (64.3%), which is consistent with the geographic distribution of orthopedists in Brazil. Similarly, specialists with medical residency accounted for 78.4% of the respondents, which corresponds to the number

**Table 2** Professionals declaring not knowing the World Health Organization (WHO) Guidelines on Safe Surgery

| | 2012 | 2014 | 2018 |
|---|---|---|---|
| **Total number of respondents** | **502** | **748** | **730** |
| Do not know the guidelines | 328 (65.3%) | 341 (45.6%) | 151 (20.7%) |

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**Table 3** Professionals who know the World Health Organization (WHO) Guidelines on Safe Surgery and recognize them as a safety barrier

| | 2012 | 2014 | 2018 |
|---|---|---|---|
| **Total number of respondents** | **502** | **748** | **730** |
| Do know the guidelines and recognize them as a safety barrier | 174 (34.7%) | 407 (54.4%) | 505 (69.1%) |

**Table 4** Professionals regularly using the World Health Organization (WHO) Guidelines on Safe Surgery

| | 2012 | 2014 | 2018 |
|---|---|---|---|
| **Total number of respondents** | **502** | **748** | **730** |
| Regularly use the guidelines | No data | 301 (40.2%) | 402 (55.0%) |

of SBOT members who usually attend the Brazilian congress. The number of professionals who reported having experienced a surgery in a wrong site or patient at some point in their careers represented 34,7% of the total (253 cases). Errors related to surgery on the wrong site accounted for 59,1% of incidents in the AAOS survey, 56% in the study by the Joint Commission on The Accreditation of Healthcare Organizations (JCAHO) and 40,8% (205 cases) in the 2012 SBOT study.[13]

Reports from American subspecialty societies also corroborate these findings. The American Society for Surgery of the Hand (ASSH) reported 21% of surgeries in wrong sites.[17] In spine surgery, according to a survey by the American Academy of Neurologic Surgeons, this number is even more alarming, with 50% of respondents reporting having had surgery at the wrong level at least once.[18,19] A survey from the American Academy of Foot and Ankle Surgeons also showed a 13% incidence of surgery in the wrong site.[20]

The present study concludes that members of subspecialties presenting higher frequency of surgeries in the wrong site, such as hand, spine and foot and ankle surgeons, represented a smaller percentage of the respondents. This piece of information corroborates the idea of pay more attention to these subspecialists because the literature shows that anatomical features from these regions favor errors.[17–20]

The number of respondents with less than 5 years of experience (28.9%) was a surprise, as younger professionals were expected to be more aware of safety culture, an undeniably current theme.

In total, 58% of the orthopedists who spontaneously filled out the questionnaire were not involved in the scientific activities of the congress. The premise that speakers, who are traditionally closer to academic circles, would be more interested in participating and transmitting knowledge on the subject of "Patient Safety" was not confirmed, as only 307 (42%) of the respondents acted as speakers.

Most orthopedists (624; 85.5%) reported marking the site to be operated before referring the patient to the operating room, while almost the same percentage, 599 (82%), reported checking the implant material and the functioning of the room equipment before anesthesia, which shows a certain maturity in risk perception.

The most frequent error category was related to incomplete or damaged surgical material identified after the beginning of the procedure, followed by problems in operating room equipment or instruments. According to the AAOS, in developed countries, equipment-related errors are the most common failure, accounting for 29% of the total, followed by communication errors (24.7%).[15] On the other hand, the most frequent error category in the Brazilian orthopedic environment, that is, incomplete or damaged surgical material, is not a significant concern in the United States.

In total, 151 (20.7%) orthopedic surgeons reported being totally or partially unaware of the WHO protocol, and 365 (50%) mentioned that they had not been trained in its use. These figures reveal that training regarding the use of the WHO protocol is still required.

Our results suggest that the educational campaign had a positive impact on improving safety in the surgical environment, but SBOT still has a long way to go, as the regular use of error barriers is a cultural change only possible through awareness actions and systematic training, involving both surgeons and all surgical staff.

A similar study[21] conducted in the United Kingdom in 2010 had already shown that educational programs can significantly increase the use of checklists and the positive perception related to them by staff members.

An initiative to update orthopedic surgeons on the safety principles and fundamentals of the surgical practice, recognizing significant opportunities for improvements in the quality, safety and value of child care, conducted by the Pediatric Orthopedic Society of North America (POSNA) in 2016, signals that SBOT is on the right track in advocating this cultural change.[22]

Moreover, results from a systematic review conducted by POSNA in 2018, in which 36 scientific papers were selected according to the degree of contribution for the improvement of safety and quality of care, clearly demonstrate the importance of such initiatives.[23]

Another striking initiative of this kind would be the inclusion in the syllabus of quality and safety as topics in the training and qualification of residents.[24] Although commitment and excellence at an individual level are essential, orthopedists should be concerned with systems and protocols that provide greater value to care.

As such, SBOT published a textbook on orthopedics and traumatology with an entire chapter dedicated to "Patient Safety,"[25] which, in addition to highlighting the importance of the subject, is of great value for the formation of new orthopedists.

## Conclusions

Medical errors do occur and pose a risk to patient safety. Applied research has shown that the surgical environment

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requires a cultural change to improve safety not only for patients, but also for professionals and institutions.

The first step in this cultural change is to recognize the errors and the possibility of learning from them. As such, researches indicate a degree of maturity on the part of the orthopedists, since more than 70% the of respondents on all surveys reported experiencing errors in the surgical environment.

The present study also shows that SBOT's efforts to increase surgical risk perception by advocating the use of the WHO surgical checklist as a safety barrier through the "Mind the Risk" campaign had a positive impact, significantly increasing the number of orthopedists who recognize the Safe Surgery Protocol as a safety barrier and frequently use it.

At the same time, the research also indicates that topic-related guidance, systematic training and education are required, especially for young, less experienced orthopedists, to promote a cultural change in the surgical environment.

This change, achievable only through systematic actions directed not only to surgeons, but also to all surgical staff, is especially indicated and desired in orthopedics and traumatology, which are responsible for most surgical adverse events, most of them preventable with the WHO Safe Surgery Protocol.

Conflict of interests

The authors have no conflict of interests to declare.

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