



REVIEW ARTICLES

Surgical Safety Checklist: An Element of Work Organization in the Operating Theater

Lista de verificação de segurança cirúrgica: um elemento de organização do trabalho no bloco cirúrgico

Jacek Lorkowski¹

orcid.org/0000-0001-5985-9790
jacek.lorkowski@gmail.com

Izabella Maciejowska-Wilcock²

orcid.org/0000-0003-1131-6521
izabella.maciejowska@uj.edu.pl

Mieczysław Pokorski³

orcid.org/0000-0002-8710-9775
pokorskim@uni.opole.pl

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Abstract

Objectives: the surgical safety checklist (SSC) is a document that is intended to increase patient safety in the operating theater by eliminating avoidable errors. The original document has been published in English by the WHO which recommends its obligatory use. The document's name is often distorted when translated into European languages, for instance into the "surgical control list". This article aims to assess the consequences of the distortion of the originally intended meaning for the completion of SSC in the operating theater.

Methods: we compared the exactness of the meaning of translation in 29 European languages based on Google translator. Particular attention was paid to the presence of essential words such as "checklist" and "safety" in the translation.

Results: we found that in 15 out of the 29 languages, the translation of these two words was incorrect, particularly in Slavic languages. The most often mistranslation was the "control card" or "control list", which was a misnomer.

Conclusions: the translation of the SSC name into native languages is inadequate in about one-half of the cases, which may jeopardize its proper use by team members of the operating theater, and thus the patient perioperative safety.

Keywords: surgical safety checklist, operating theater, perioperative safety.

Resumo

Objetivo: a lista de verificação de segurança cirúrgica (SSC) é um documento que visa aumentar a segurança do paciente no centro cirúrgico, eliminando possíveis erros. O documento original foi publicado em inglês pela OMS que recomenda seu uso obrigatório. O nome do documento é frequentemente distorcido quando traduzido para idiomas europeus, por exemplo, na "lista de controle cirúrgico". Este artigo visa avaliar as consequências da distorção do significado originalmente pretendido para a realização do SSC na sala de cirurgia.

Métodos: para isso, comparamos a exatidão do significado da tradução em 29 idiomas europeus com base no tradutor do Google. Atenção especial foi dada para a presença de palavras essenciais como "lista de verificação" e "segurança" na tradução.

Resultados: descobrimos que em 15 dos 29 idiomas, a tradução dessas duas palavras estava incorreta, principalmente em idiomas eslavos. A tradução incorreta mais frequente era o "cartão de controle" ou "lista de controle", o que era um equívoco.

Conclusão: a tradução do nome do SSC para as línguas nativas é inadequada em cerca de metade dos casos, o que pode comprometer seu uso adequado pelos membros da equipe de centro cirúrgico e, portanto, a segurança perioperatória do paciente.

Palavras-chave: lista de verificação de segurança cirúrgica, bloco operatório, segurança perioperatória.



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¹ Central Clinical Hospital of the Ministry of Internal Affairs and Administration, Department of Orthopedics, Traumatology and Sports Medicine, Warsaw, Poland.

² Jagiellonian University, Jagiellonian Language Center, Cracow, Poland.

³ Opole University, Institute of Health Sciences, Opole, Poland.

Background

A common problem in interpersonal relationships is the lack of proper flow of information or its significant limitation. This process applies to all areas of social life, including information provided in science and health care which have an economic dimension. Failure to transmit information between cultures, regions, or generations makes it necessary to rediscover certain activities and social processes. Certain processes may be standardized in one industry while still being new in another. For proven processes, it is appropriate to use the acquired experience. New activities require creativity and flexible and heuristic thinking. Finding a balance between proven and new activities ultimately leads to the optimal use of time and human potential (1, 2, 3).

From the economic point of view, and therefore also from that of the employer, the employee's working time is a limited resource. Therefore, it should be used optimally. Time is also a limited resource from the point of view of an employee, the rational use of which gives the individual a chance for further development (4). Therefore, one should strive to standardize and optimize activities without the frustration caused by excessive bureaucracy and focus on strengthening heuristic activities and independence. This is especially true of workers whom employers call specialists.

Health care seems to be one of the leading domains of standardization and bureaucracy, which is not always part of the culture of openness and learning. Healthcare bureaucracy is a significant waste of valuable time that could be used to care for patients (5). Thus, the awareness of the need for optimal use of time is of particular importance in healthcare services. Further, these services require scrutiny and security which ensure a significant degree of optimization of activities. The optimization of healthcare followed the footsteps of the creation of algorithms and standardization in the economy of which the archetype is transportation. Particularly, air transport, due to the need to make quick decisions and repeat certain processes, requires standardization. Aviation, generally, requires the most outstanding stan-

dardization, checklists, and a culture of learning from error at the highest level (6).

Standardization, bureaucracy, and templates are also widely used in industry. Most organizations use them wisely, not to burden employees but to support continuous improvement. This approach was developed in the middle of the last century. It is known under various names: Maintaining Total Productivity, World Class Manufacturing, Lean Manufacturing, Continuous Standards, etc., allowing to save energy and brainpower for important matters such as problem-solving and improving procedures and standards. Understandably, management would like a significant degree of standardization. However, some standardization may not be needed or recommended. It is impossible to predict all the details and make everything uniform from top to bottom. Too much top-down standardization creates extra work, demotivates people, and does not produce the desired results. Good manufacturing companies understand that each plant or department may have specific needs. A balance must therefore be found between the level of standardization that meets the highest expectations of management and the provision of some freedom for individual customization (7, 8, 9). It is an extensive and thoroughly researched topic. Even Max Weber, a great supporter of procedures and standards, had doubts. He praised the bureaucracy, which he saw as the most effective and rational way of human activity leading to the rationalization of society. He also understood the limitations and dangers of bureaucracy resulting from its excessive development. He saw the bureaucracy as a threat to freedom, leading to the "icy darkness of the polar night" that imprisons individuals in the soulless "iron cage" of bureaucratic control (10). There is a debate among sociologists about whether the Weberian bureaucracy contributes to economic growth. It is worth drawing conclusions from history and extrapolating them to situations other than production organization (11). The modern manufacturing philosophy recognizes the need for both standards and empowerment. Those companies, including healthcare institutions,

which manage to strike a balance between them become winners. Nonetheless, individualization seems to have remained in the vogue. So, while organizations remember and recognize the value of standardization, they are also very careful that it does not inhibit creativity and effectiveness. On the background described above, standardization in medicine has taken shape, with the overriding goal of increasing the patient's safety and management outcomes through empowering the care providers to optimally use professional skills and resources.

Surgical Safety Checklist (SSC) of the World Health Organization (WHO)

Checklists are an example of standardization. They are also introduced in medicine. An example of a checklist introduced in the last dozen or so years in medicine is the SSC. The WHO created this document probably based on the aviation checklist. The SSC is intended to increase patient safety in the hospital. The purpose of SSC is to prevent the occurrence of adverse events and above all from making simple mistakes. The SSC was obligatorily introduced in the treatment centers in most countries (12). It defines six basic perioperative safety procedures, the implementation of which must be strictly supervised. Eighteen main points of SSC should be checked in three successive parts: before the procedure of anesthesia, before and after the surgical procedure, and before the patient leaves the operating theater (13, 14). Many authors emphasize that the design of SSC is correct, and its introduction has saved lives by preventing perioperative complications (15). Like in many non-medical areas, SSC consolidates the team in the operating theatre, increases the readiness for surgery, and ensures that nothing important has been omitted. The SSC is particularly helpful in the case of a team whose members do not permanently work together (16).

The evaluation of SSC used in various countries shows that local language translations may not exactly be in line with the checklist creators' intentions. Treating the surgical safety checklist as a surgical control list changes its meaning

and application. In English, there is a difference in the meaning of "check" and "control" which is not reflected in some languages. Additionally, the original name of SSC includes "safety", the word essential for understanding the sense of the document's existence, which is not always included in the official translations. Therefore, this article aims to assess the consequences of the distortion of the originally intended meaning for the completion of SSC in the operating theater.

Transcreation of SSC in local languages

The collection of data was performed in October-November of 2021. Based on the Google translator, after consulting native speakers, the intactness of translating the English terms "checklist" and "control list" was compared in 29 European languages. The word "checklist" is defined as a list of required things to do or points to consider, which is used as a reminder. On the other hand, the word "control list" carries unhappy or annoying connotations of a report of the activities performed and as such is often taken as yet another bureaucratic nuisance. We found that in 15 out of the 29 languages, the "checklist" and "control list" terms were used interchangeably and synonymously. These languages included Belarusian, Bulgarian, Croatian, Czech, Estonian, French, Greek, Lithuanian, Polish, Russian, Serbian, Slovak, Slovenian, Ukrainian, and Hungarian. On the other hand, a difference in the connotation of "checklist" and "control list" was found in the remaining 14 languages: English, Danish, Finnish, Spanish, Irish, Icelandic, Luxembourgish, Dutch, German, Norwegian, Portuguese, Romanian, Swedish and Italian. The difference appeared more often in the West Germanic group of languages such as German, English, and Scandinavian than in Slavic languages.

We then searched through the Google browser for the availability of website versions of SSC in the corresponding 29 countries. The SSC was available in 15 countries. In nine out of the 15 countries, the document was provided in native languages directly by the WHO (12) whereas in the remaining six it was translated from the original

WHO's English version at the national levels by surgical or anesthesiologic societies. We investigated the linguistic syntax of the WHO's original wording of "Surgery Safety Checklist" in the 15 languages. Attention was paid to whether all three words were included on a word-for-word basis and conveyed the original meaning. The terms "checklist" and "control list" were used in eight

and seven languages, respectively. The former was notoriously absent in Slavic languages but present in the West Germanic and Romance languages. The word "safety" was missing in Croatian, Finnish, Polish, and Ukrainian (Table 1). Finnish was the only language that used the unfavorably connoted "control list", despite being able to differentiate it from "checklist".

TABLE 1 – Terms used in the national translations of the WHO's Surgery Safety Checklist (SSC) document.

Language	Checklist	Control list	Safety
English*	+		+
Croatian		+	-
Dutch	+		+
Finnish		+	-
French*		+	+
German*	+		+
Italian*	+		+
Norwegian*	+		+
Polish		+	-
Portuguese*	+		+
Russian*		+	+
Slovenian		+	+
Spanish*	+		+
Swedish ⁸	+		+
Ukrainian		+	-

*depicts documents edited by WHO (12).

Discussion

The "checklist" is an English word that was given life after a plane crash on October 30 of 1935 in Dayton, Ohio, when a Boeing 299 aircraft piloted by Major Ployer Peter Hill crashed. After analyzing the causes of this tragedy, standards of conduct in aviation were established, the observance of which ensures the safety of aviators. A checklist for aviation has been created which, after changes enforced by technological progress, functions in the aviation world to this day (17).

Some languages and some organizations have adopted the term "checklist" or its exact translation. In other languages, it is rather translated as a "control list". A nuanced distinction between the two terms is not reflected in some translations.

Here we show that in seven out of the 15 European languages investigated, the SSC becomes just another control document required to be filled out. The synonymous translation of the "control" and "checklist" defies the original intention of SSC's creators meant as a list of required things to do or points to consider to be used as a reminder of the completeness of preparations to achieve the best outcome in the operating theater, ultimately to enhance the patient's safety (12, 13, 14). The word "control list" carries a connotation of a report of the activities performed and is often taken as yet another bureaucratic nuisance, which distorts the intended meaning of SSC. Further, in four of these documents, the term "safety" also is removed, which changes the SSC's character.

For instance, the translation back from Polish into English renders the name "Perioperative Control Card". Thus, the idea of verification and checking was transformed into the control procedure. The assumption arises that such documents are produced to satisfy and comply with the formal requirement in the event of an inspection rather than to check and ensure the patient's safety, which may have to do with the cultural and social aptitude in some countries.

According to the original idea of what the SSC is supposed to convey, it is not yet another filler paper. It should be placed in a visible place, for instance, hung on the wall as a kind of instruction that someone reads aloud, and the team members reply "yes" or "no". The SSC template should be used in each hospital ward and be adapted to specific needs and procedures. From the logistic standpoint, the list should be read to keep a close check on the activities performed. The only documentation to be completed should be the answer to one question: has the checklist been read and all answers are "yes"? The SSC founders emphasized the grass-roots nature of the document and its possible further modifications by those who collaboratively use it daily in the operating theatre. Thus, WHO encourages additions and modifications tailored to local needs and hazards. These essential aspects are often lost in the translation that emphasizes the fixed character of SSC in every hospital. Instead, modifications are added centrally although not all physicians concerned agree with them. Individual surgeons receive such a centrally prepared SSC renamed to the "Control List" or "Control Card" without mentioning the possibility of adaptation to local needs, but ready to be filled out and with the annotation "implemented".

Manufacturing organizations since Edwards Deming's time have advocated the value of manually filling paper charts by drawing results on the Visual Performance Management tables (18). Many continue to do so as it is considered a valuable effort. Nonetheless, in health care as in other walks of life, algorithms are now improved by implementing the revolutionary 4.0 solutions

using artificial intelligence. That eliminates paper consequently reducing environmental degradation. Doing away with the old-fashioned filling out yet another obligatory document in a rigid time framework of the operating theater undoubtedly makes the surgeon more attentive to the patient needs and procedures, enabling the doctor to use time and energy for better patient outcomes and saving lives.

Perception of SSC

There is a consistent impression in the literature that SSC, despite any possible misgivings, bears a profound advantageous influence on the general safety culture, patient safety, and quality of hospital care, particularly during surgical procedures. That has been elegantly shown in a major multi-center study performed in 2009 on the effects of the implementation of SSC (13). The study was performed across different ethnicities of various socioeconomic levels. There were close to four thousand patients studied in two separate groups: before and after the SSC implementation. The use of SSC led to a reduction in complications from 11% to 7%, including fatal complications from 1.5% to 0.8%, and surgical site infections and reoperations. The reductions were about twice greater in countries with high Gross Domestic Product per capita when compared with poorer countries. The advantageous results of the use of SSC were confirmed by others, although they were somewhat less evident in countries with lower Gross Domestic Product and languages not belonging to the six WHO official languages (14). The outstanding effects of the implementation of SSC raised some misgivings expressed in other studies (19, 20, 21, 22). One issue refers to the possibility of making a priori false assumptions about the influence of SSC on the patient's safety, which could lead to either correct or false results (23). Another appears to be the time-proven Hawthorne Effect, which is also alluded to in the 2009 analysis above mentioned. This effect consists of behavior modifications by the people who are being observed, which could render measurable improvements in work

efficiency. However, the contribution of this effect to the evaluation of treatment results involving the use of SSC is difficult to estimate. Despite the doubts surrounding the exact role of SSC in the patient's safety, it seems indisputable that the checklist has created a new element of collective consciousness in surgical and anesthetic teams, it focuses the interest on the patient's perioperative safety and integrates the surgical teams' work from the organizational standpoint. The role of SSC comes down to a kind of multifaceted interactive coaching to enhance knowledge and skills through the holistic psychological approach. The proposed algorithms help the team members introduce changes on their own and learn from each other in an atmosphere of respect for themselves and their patients. Moreover, the algorithms stimulate heuristic, creative thinking by asking questions and obtaining answers owing to acquired experiences, self-reflection, and training, while the degree of steering by the "coach" is minimized. The collective awareness of surgical teams increases the patient's safety and improves the comfort of medical personnel's work. In effect, the teams' cognitive and professional resources are better engaged to make the most rational decision-making, the treatment outcome is better, and perioperative complications are fewer (24, 25, 26, 27). Training with a coach in the operating theater is supposed to not disturb the medical procedures. However, it would likely be better performed outside the active surgical duties, which is also indicated by the WHO training document. The presence of additional persons in the operating room may sometimes be risky for the patient management. The medics' wisdom suggests that the best work performance takes place in permanent, well-coordinated team composition without strangers. That might be compared to a perilous circumstance when an outsider enters the cockpit at a critical moment of an aircraft flight (12, 13, 14).

The algorithms required to perform a final check in the operating theater rather than the sheer act of marking the checkboxes are what matters. A question then arises if the SSC com-

pleting algorithm is appropriate. Would it be optimal to perform the actions recommended by the checklist only? When in doubt, the algorithm should be tested. However, it should be kept in mind that the time lost is an economic loss, just like the loss of machines and materials (28). A helpful solution may be the use of an algorithm introduced by artificial intelligence to fill out SSC (29, 30). This review shows differences in the form of SSC translation in various countries. The implication is that, aside from cultural differences and the way an organization operates, one should consider the specificity of a national language while assessing algorithms and elements of documentation. When a straightforward translation is not possible, a transcreation from "Checklist" to "Control Card", although aiming to communicate the same thing in the target language, may distort the meaning and ideas conveyed by the original text. Thus, cross-cultural translations must consider the conceptual definition of the wording applied.

We conclude that the translation of the SSC name into native languages is inadequate in about one-half of the cases, which may jeopardize its proper use by team members of the operating theater and thus the patient perioperative safety. A complex structure of thought must be thoroughly reflected in the translated wording to prevent the reader from obtaining confusing information that raises new or mistaken associations leading to misunderstanding.

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The authors declare no competing interests relevant to the content of this study.

Authors' contributions

All the authors declare to have made substan-

tial contributions to the conception, or design, or acquisition, or analysis, or interpretation of data; and drafting the work or revising it critically for important intellectual content; and to approve the version to be published.

Availability of data and responsibility for the results

All the authors declare to have had full access to the available data and they assume full responsibility for the integrity of these results.

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Jacek Lorkowski

MD from the Jagiellonian University Medical Cracow, Poland; DSc at Warsaw Medical University, Warsaw, Poland; Associate Professor at the Central Clinical Hospital of the Ministry of Internal Affairs and Administration in Warsaw, Poland.

Izabella Maciejowska-Wilcock

MA from Jagiellonian University in Cracow, Poland; Lecturer at the Jagiellonian Language Center in Cracow, Poland.

Mieczysław Pokorski

MD from Warsaw Medical University, Warsaw, Poland; PhD, DSc, and a full professorship at the Medical Research Center in Warsaw, Poland. Professor at Opole University, Opole, Poland.

Mailing address

Mieczysław Pokorski

Opole University, Institute of Health Sciences

Katowicka Street 68

Zip code 45-060

Opole, Poland

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