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Are medical students aware of surgical checklist and basics of patient safety in the OR? - Medical University of Lublin experience

Authors: Maria Golebiowska¹, Beata Golebiowska² MD, PhD,

¹ Student, I Faculty of Medicine, Medical University of Lublin

² Pediatric Neurology Department, III Chair of Pediatrics,

Medical University of Lublin

Abstract:

WHO Surgical Checklist is a tool created for the operating teams in order to provide a surgical safety track of procedures, unified in a worldwide scale. Patient safety is still the biggest challenge of healthcare, despite the introduction of newest technology and medicine overcoming plenty of surgical challenges in modern surgery. Among 8% of all adverse events are surgical adverse events, and nearly half of them could be easily preventable. That is why the aim of our study is to examine the awareness and knowledge level of medical students about surgical safety procedures.

For this purpose, the survey on the basic understanding of surgical checklist and patient safety within surgical procedures was distributed during surgical workshops both basic and advanced skills in years 2015-2016 for 115 students. Respondents age, country of origin, year

of study, previous attendance to surgical procedures information was also obtained. Our study proved, that the vast majority of medical students interested in surgical fields as their future profession are unaware of surgical safety procedures and its basic terminology (85% of respondents). The highest response of correct answers was noted within sign out procedures - post surgical check-up within the OR (74%).

The Surgical Safety Checklist unifies the process of avoiding human error in surgery at all costs. However, despite 15 years of introduction to the surgical field, the medical education methods among undergraduate students are still insufficient. This should be changed in order to save more lives and provide better health care for all, with the most important principle in mind - first, do no harm.

Keywords MeSH: patient safety, surgical checklist, surgery

Introduction

From the beginning of the history of medicine, health professionals have been successfully fighting battles with epidemics, war wounds, safe child delivery, later in 19th century - disorders with surgical means and lately - with diseases of today's civilization, such as tumors or cardiovascular diseases. The generations of physicians kept always in mind, in the beginning sworn by Apollo the Healer in Hippocratic Oath, lately pledged on the Declaration of Geneva, the foremost promise - "First, do no harm" and "Health and well-being of my patient will be my first consideration". [1;2] The beginning of modern surgery and anaesthesia- painless operations, along with introduction of nearly harmless procedures done by less-invasive equipment, announced that the last obstacle of old iatrogenic mistakes has gone. With the newest technology and pharmacotherapy, what could possibly go wrong in the operating theatre?

It is confirmed that the occurrence of adverse events in medicine is still high, up to 8%. Among them, the surgical mistakes occur in up to 25% of patients, in developing countries - to 50%. [3] Half of surgical iatrogenic events could be preventable. We need to remember, that healthcare is not equal in all regions and that the Universal Health Coverage is still a goal rather than reality, which expresses in eg. mortality from general anaesthesia in Africa, which is reported to be as high as 1:150. Also, surgical interventions account for an estimated 13% of the world's total disability-adjusted life years, known as DALYs. [4;5]

Modern medicine distinguishes several Patient Safety Goals, most of them known among public in terms of antimicrobial resistance, health care associated infections, or unregulated polypharmacy, however studies show that still - interpersonal communication, patients identification and proper usage of monitoring and surgical equipment are vital steps sensitive to human error and failure. [6] Therefore, starting from 2002, World Health Organization and World Alliance for Patient Safety joint forces in campaign Safe Surger Saves Lives, which resulted in preparation of the Surgical Safety Checklist in 2008. [7]

Surgical Safety Checklist

Surgical safety checklist is a safety check procedure, which can be performed in any of the operating theatres. The checklist consists of 3 parts: sign in, time out and sign out, which should happen respectively before induction of anaesthesia, before skin incision and before patient leaves the operating room. [8]

Within sign in part, the patients identity is being confirmed for the first time, as well as the site of the surgery is marked. Anaesthesiologist team performs the anaesthesia safety check, and pulse oximeter is checked as well. Its confirmed if the patient has any significant allergies, if there is an airway difficulties, aspiration risk and estimated blood loss risk. For the time out procedures, the operating team should confirm the roles and names within the team, as well as all 3 sub-teams of Surgeon/Anaesthesia/Nurse confirm Patient-Side-Procedure details. Briefly all critical events possibilities from all teams are being described. The check up includes the antibiotic prophylaxis within last 60 minutes, as well as the availability of the necessary imaging equipment. Lastly, during sign out, nurse finally confirms the procedure

performed, amount of instruments used, the proper labeling of specimen, also any problems or key concerns from all the subteams are being discussed before patient leaves the OR.

Aim of the study

The aim of our study is to determine if medical students, interested in pursuing surgical career in the future, are thoroughly taught and aware of the surgical patient safety procedures withing surgical safety checklist.

Materials and methods

Study group consisted of 115 international medical students of Medical University of Lublin, attendees of basic and advanced surgical suturing training workshops in years 2015-2017. Respondents age, country of origin, year of study, previous attendance to surgical procedures information was also obtained. Knowledge on safety procedures was measured within 15-questions test. Questions related to general terms of patients safety in surgery, as well as specific aspects, such as eg. *“how many times patients identity, site of surgery and type of procedure should be confirmed during surgical preparations and surgery?”*, or *“What amount of blood loss is checked during anaesthesiological check up before surgery (for adults)?”*. Results then were divided depending on the type of question (general terminology, sign in, time out or sign out questions).

Results

Within our study group, students of faculty of medicine of all years took part in the questionnaire. Most of the students attended their 4th year of medicine (38%), 52% women and 48% of men. The average age of the respondents was 23 years old. Participants of the workshops were chosen on basis: first come, first served within a google registration form. 45% of respondents claimed to start or already attended surgery course as part of their studies, and 64% stated that they already attended surgical procedures during classes or summer internships. The geographic distribution among participants presented as following, with biggest group of East Asian respondents (63%).

Polish Division	10%
American Programme	20%
Arabic Programme	7%
Asian Programme Thai Students	9%
Asian Programme Taiwanese Students	54%

Table 1. Geographic distribution of participants. Prepared by the authors.

When it comes to knowledge performance, unfortunately 85% of students didn't know the meaning of the term surgical checklist as well as basic terms associated with it. Among all parts of the questionnaire, the questions about sign out procedures were the ones with best performance rate (74%).

type of question	% of correct answer
basic understanding of the terminology	25%
sign in	11%
time out	16%
sign out	74%

Table 2. Performance of correct answers depending on the type of question. Prepared by authors.

Discussion

Implementation of the surgical checklist is a theoretical, ideal situation of behavior and standards in surgical health care. However, there are several challenges in implementation of its steps, starting from the basic lack of resources, such as medical equipment, time consuming aspect in emergency situations, to lastly - difficulties in communication, patriarchal system of work and hierarchy, which discourages the communication in the field. [7] Despite those aspects, the main question is if we should strive in achieving excellence in surgical safety. The studies confirm, that among surgical teams, 38% of respondents had experienced uncertainty of patient identity, 81% had experienced uncertainty of the surgical site or side, 60% had prepared for the wrong procedure. [8] Several studies prove the effectiveness of implementation of surgical safety checklist, especially in emergency surgeries (eg. 12,390 neurosurgical patients in years 2007-2010 - no errors after implementation of the

checklist, among 1602 surgeries significant reduction in infectious adverse events in emergency surgeries). [9;10]

The study faced several limitations. First of all - only the knowledge students interested in surgical fields was measured, while we believe that all students should have the basic understanding on those aspect of health care. However, despite that fact, the results are still unsatisfactory and they call for a change within medical education. Secondly, we examined the knowledge of particular parts of the checklist. Within next steps, after suggesting and executing improvements within formal or non-formal education means, we would like to measure the understanding of the process as a whole.

Conclusions

The Surgical Safety Checklist unifies the process of avoiding human error in surgery at all costs. However, despite 15 years of introduction to the surgical field, the medical education methods among undergraduate students is still insufficient. This should be changed in order to save more lives and provide better health care for all, with the most important principle in mind - first, do no harm.

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