

**THE APPLICATION OF SURGICAL SAFETY CHECKLIST
AT THE DEPARTMENT OF ANESTHESIOLOGY,
CAN THO UNIVERSITY OF MEDICINE AND PHARMACY HOSPITAL**

Nguyen Hong Thiep¹, Nguyen Thi Thanh Truc^{1},
Mai Nguyen Thanh Truc, Ngo Thi Dung¹, Vu Van Kim Long¹,
Le Vu Linh¹, Quach Vo Tan Phat¹, Le Thi Kim Chi²*

*1. Can Tho University Medicine and Pharmacy
2. Can Tho University Medicine and Pharmacy Hospital*

**Corresponding author: nttruc@ctump.edu.vn*

Received: 31/9/2024

Reviewed: 18/11/2024

Accepted: 25/11/2024

ABSTRACT

Background: Surgery is a complex medical procedure, and errors during surgery can lead to serious consequences, even death, for the patient. Using a surgical safety checklist is an important and effective measure to ensure safety and quality in surgical procedures. **Objectives:** To evaluate the results of implementing the surgical safety checklist at the Department of Anesthesiology, Can Tho University of Medicine and Pharmacy Hospital. **Materials and methods:** A cross-sectional descriptive study was conducted on 359 cases at the Department of Anesthesiology from December 2023 to September 2024 at Can Tho University of Medicine and Pharmacy Hospital. Our study used a questionnaire developed by WHO in 2009 and adjusted to comply with the regulations of Can Tho University of Medicine and Pharmacy Hospital. The checklist included three stages corresponding to 28 items: before anesthesia (11 items), before skin incision (9 items), and before the patient leaves the operating room (8 items). **Results:** The highest implementation rates (100%) were recorded for 4 out of 11 items in the pre-anesthesia stage and 1 out of 8 items in the stage before the patient left the operating room, 1/8 items in the stage before the patient left the operating room, respectively. **Conclusion:** The surgical safety checklist plays an important role in identifying incorrectly performed steps and rectifying errors before, during, and after surgery.

Keywords: Surgical safety, anesthesiology, checklist.

I. INTRODUCTION

The surgical safety checklist is considered one of the most effective measures to minimize incidents and medical errors related to surgery [1]. In Vietnam, many hospitals, particularly in the surgical and anesthesiology departments, are often crowded and overloaded with patients. Numerous accidents occur due to shortcomings in patient preparation and management before, during, and after surgery, such as performing surgery on the wrong body part or leaving gauze and instruments inside patients [2]. These complications can be effectively controlled and minimized through strict adherence to standardized procedures. According to the results of many studies, using the WHO checklist reduced mortality and surgical complications by more than one-third in all eight hospitals selected for the pilot implementation. Complication rates decreased from 11% to 7%, and mortality rates significantly decreased [3].

At the Department of Anesthesiology, Can Tho University of Medicine and Pharmacy Hospital, there has been a growing focus on ensuring patient quality and surgical safety in recent years. To provide a scientific database on the implementation of the surgical

safety checklist, assist managers in addressing existing issues, and ultimately enhance surgical safety for patients, we conducted a study aimed at evaluating the results of implementing the surgical safety checklist in the Department of Anesthesiology at Can Tho University of Medicine and Pharmacy Hospital.

II. MATERIALS AND METHODS

2.1. Materials

Surgical cases were conducted at the Department of Anesthesiology, Can Tho University of Medicine and Pharmacy Hospital from December 2023 to September 2024.

Inclusion criteria: Scheduled and emergency surgical cases at the Department of Anesthesiology, Can Tho University of Medicine and Pharmacy Hospital.

Exclusion criteria: Specific procedures.

2.2. Methods

- **Study design:** Cross-sectional descriptive study.

- **Sampling size:**

$$n = \frac{Z_{1-\frac{\alpha}{2}}^2}{d^2} p. (1-p)$$

Our study included 359 cases, calculated using a 5% significance level, with an estimated checklist compliance rate of 62.7% (according to Le Thi Hang [4]) and a 5% margin of error.

- **Sampling technique:** Convenience sampling method.

- **Research questionnaire:** Our study used a questionnaire developed based on the WHO "surgical safety checklist" version 2009. This questionnaire includes 27 questions which were used to evaluate the application of surgical safety checklist at 3 time points: before induction of anaesthesia (10 items), before skin incision (9 items), before patient leaves operating room (8 items). In addition, we collected characteristics of the surgical cases including type of surgery, time frame of surgery, and ASA classification (American Society of Anesthesiologists).

- **Data analysis:** Data were entered and processed on SPSS 26.0 software. Frequency and percentage were used to describe the data.

- **Ethics approval:** The study strictly complied with ethical regulations in biomedical research. The study had been approved by the Ethics Council of Can Tho University of Medicine and Pharmacy in Decision No. 23.016.GV/PCT-HDDD dated December 26, 2023. All information provided was kept confidential and used only for scientific research purposes.

III. RESULTS

Table 1. General information about surgery

Contents		Frequency (n)	Percentage (%)
Type of surgery	Scheduled	342	95.3
	Emergency	17	4.7
Time frame of surgery	Office Hours	337	93.9
	Outside Office Hours	22	6.1
ASA classification	1 st	86	23.9
	2 nd	249	69.4
	3 rd	24	6.7

The majority of surgical cases were scheduled surgeries 342/359 (95.3%), surgeries were performed during office hours 337/359 (93.9%) and surgical cases were classified as ASA level 2 24/359 (69.4%).

Table 2. The rate of implementing pre- anesthesia surgical safety checklist (n=359)

No.	Contents	Yes		No	
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
1	Confirm patient's name, age, gender and medical record number	359	100	0	0
2	Confirm incision site	202	56.3	157	43.7
3	Confirm planned surgical procedure	357	99.4	2	0.6
4	Confirm surgical consent	359	100	0	0
5	Mark surgical site	175	48.7	184	51.3
6	Anesthetic drugs and equipment have been fully checked	359	100	0	0
7	Oxygen saturation monitor is attached to patient and functioning properly	359	100	0	0
8	Take patient's allergy history	348	96.9	11	3.1
9	Assess risk of airway obstruction/aspiration risk	350	97.5	9	2.5
10	Assess risk of blood loss greater than 500ml	345	96.1	14	3.9

Before the anesthesia stage, the surgical safety checklist implementation rate reached 100%. This included confirming patient information (full name, age, gender and medical record code), surgical consent and fully checking anesthesia drugs and equipment. The oxygen saturation meter was attached to the patient and functioning normally, with a compliance rate of 100% as well.

Table 3. The rate of implementing pre-incision surgical safety checklist implementation rate (n=359)

No.	Contents	Yes		No	
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
1	Members introduce themselves and their duties	340	94.7	19	5.3
2	Identify the patient's name, surgical method, and incision site	359	100	0	0
3	Implement prophylactic antibiotics 60 minutes before anesthesia	121	33.7	238	66.3
4	Surgeon anticipates surgical abnormalities	95	26.5	264	73.5
5	Expect surgery duration	359	100	0	0
6	Predict risk of blood loss	241	67.1	118	32.9
7	Doctor/anaesthetist anticipates surgical abnormalities	187	52.1	172	47.9
8	Nurse confirms sterile surgical instruments	359	100	0	0

No.	Contents	Yes		No	
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
9	Nurse checks equipment and instruments	359	100	0	0

Before the skin incision stage, the highest rate of applying the surgical safety checklist was 359/359 (100%). This included identifying the patient's name, the surgical method, and the skin incision location; estimating the surgery time; confirming the sterile status of instruments by the nurse; and checking equipment and instruments.

Table 4. The rate of applying surgical safety checklist implementation before leaving the operating room and in the postoperative period (n=359)

No.	Contents	Yes		No	
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
1	Complete Counting of Needles, Gauze and Surgical Instruments	359	100	0	0
2	What Instrument Issues Need to be Resolved	44	12.3	315	87.7
3	Label Specimens with Full Information	359	100	0	0
4	Ensure Safety and Sterility of Drainage Systems	359	100	0	0
5	Do Surgeons, Anesthesiologists and Technicians Identify Key Issues in Resuscitation and Postoperative Care	350	97.5	9	2.5
6	Operative Report	342	95.3	17	4.7
7	Stamp and Label High-Tech Instruments	315	87.7	44	12.3
8	Prescribe Postoperative Medications	307	85.5	52	14.5

Before leaving the operating room and in the postoperative period, the surgical safety checklist implementation rate was 100% in the terms of “completing counting of needles, gauze and surgical instruments”, “Label Specimens with Full Information” and “ensuring safety and sterility of the drainage system” respectively.

IV. DISCUSSION

For the pre-anesthesia/anesthesia stage, our study recorded a 100% implementation rate for determining the patient's full name, age, gender, and medical record code; confirming surgical consent; ensuring that anesthesia drugs and equipment were fully checked; and attaching the oxygen saturation monitor to the patient, which was functioning normally. This result is consistent with the study by Phan Thi Dung (2022) [5]. The implementation rates were also quite high, nearly 100%, for other items, including determining the expected surgical method (99.4%), assessing the risk of difficult airway/aspiration (97.5%), reviewing the patient's allergy history (96.9%), and evaluating the risk of blood loss over 500 ml (96.1%). However, these rates are lower than those reported in previous studies by Luong Thi Hoa (2018), Pham Thanh Thao, and Phan Thi Dung (2022) [5], [6], [7]. Medical staff need to continue raising awareness and regularly

practice these important items to ensure optimal preparation of medical and resuscitation equipment when necessary. Additionally, our study identified two areas of poor implementation: determining the skin incision site (56.3%) and marking the surgical site (48.7%). These findings are consistent with the studies by Pham Thanh Thao and Phan Thi Dung [5], [7]. Accurately determining the skin incision site and marking the surgical area are crucial to ensure that the patient undergoes surgery at the correct location, thereby avoiding errors related to the surgical organ. This is vital, as accurate marking of the surgical area can significantly reduce the risk of operating on the wrong site.

For the pre-incision stage, 100% of medical staff identified the patient's name, surgical method, and incision site; estimated surgery time; confirmed the sterile status of surgical instruments; and checked equipment and tools. This result is higher than that reported by Phan Thi Dung and Pham Thanh Thao, and similar to the findings of Luong Thi Hoa [5], [6], [7]. Reconfirming the patient's identity and the surgical method is extremely important to avoid operating on the wrong patient or at the wrong location, thereby preventing medical errors. The fact that nurses conducted 100% sterilization checks on instruments and necessary tools indicates their awareness of the importance of adhering to aseptic principles. However, our study found that the rates of surgical team members introducing their names and roles, predicting the risk of blood loss, and anticipating abnormalities during surgery were 94.7%, 67.1%, and 52.1%, respectively. These results are lower than those in previous studies. This may be due to the surgical team being from the same hospital and knowing each other well, leading to a subjective decision to skip introductions. Additionally, team members might have communicated frequently, thus bypassing this important check. The lower rates in predicting surgical abnormalities could be attributed to a shortage of anesthesiologists, which results in an insufficient anesthesiologist-to-operating table ratio that does not meet the high safety standards set by the Ministry of Health regarding surgical safety assessment criteria [8]. This situation can compromise patient safety during surgery and needs to be addressed by recruiting more anesthesiologists to ensure a 1:1 ratio of anesthesiologists to operating tables. Accurately predicting the risk of blood loss and identifying potential surgical abnormalities are critical for effective planning, preparation for resuscitation, and optimal postoperative care, all of which contribute to surgical success. In our study, the two areas with the lowest implementation rates were surgeons predicting surgical abnormalities (33.7%) and administering prophylactic antibiotics 60 minutes before anesthesia/numbness (26.5%). These results are lower than those reported in other studies [4], [5]. Proper use of prophylactic antibiotics, as outlined in the regimen established by the Ministry of Health, is essential for preventing surgical infections, reducing the risk of postoperative complications, and facilitating quicker patient recovery and shorter hospital stays.

Regarding the stage before leaving the operating room and during the postoperative period, 100% of medical staff completed the counting of needles, gauze, and surgical instruments; labeled specimens with complete information; and ensured the safety and sterility of all systems. Our study shows higher rates than those reported by Luong Thi Hoa, Pham Thanh Thao, Phan Thi Dung, Le Thi Hang, and Vu Thi La [4], [5], [6], [9]. Nurses recognize the importance of confirming the count of needles, gauze, and instruments before closing the abdomen, as this is crucial for ensuring patient safety and reducing the risk of medical complications. They also view labeling specimens with complete information as a vital activity to prevent confusion among patient specimens and to uphold the principle of

ensuring the sterility of all drainage systems. The content with lower implementation rates involved physicians identifying the main issues related to resuscitation and postoperative care, with a rate of 97.5%. This result is higher than those found in the studies by Luong Thi Hoa and Phan Thi Dung [5], [6]. Identifying the main issues related to resuscitation and postoperative patient care contributes to optimal care outcomes and increases the success rate of surgeries. The completion rate for surgical reports was 95.3%, while postoperative medication prescriptions stood at 85.5%. This may be due to surgeons performing consecutive surgeries, which may prevent them from completing surgical reports and medication prescriptions immediately at the end of each procedure. Additionally, preoperative antibiotics are required to be administered within 60 minutes, and most surgeries average between 30 and 90 minutes, including time for pain relief before closing the wound. The stamping and labeling of high-tech instruments had a rate of 87.7%. This may be attributed to a shortage of nursing staff responsible for caring for the instruments, leading to oversight in labeling. These factors can affect health insurance reimbursements for patients upon discharge, including the complete reporting of surgical progress, postoperative medication orders, and labeling of high-tech medical supplies. Therefore, medical staff need to fully and strictly implement these protocols. Meanwhile, issues with instruments requiring attention were reported at a rate of 10.9%, primarily due to malfunctioning electric knives, ultrasonic scalpels, surgical lights, and endoscopes. It is essential to have a maintenance plan for instruments and equipment to ensure that surgeries are performed quickly and safely.

V. CONCLUSION

The research results showed that the surgeries were generally performed in accordance with the surgical safety checklist. However, in some cases, certain checklist items were not fully adhered to, including marking the surgical site, identifying the skin incision site, administering prophylactic antibiotics, anticipating surgical abnormalities, predicting the risk of blood loss, and addressing equipment-related issues. Therefore, based on the above results, we recommend that medical staff comply with the correct technical procedures to avoid medical incidents for patients. Medical equipment needs to be regularly maintained and checked for operation before surgery. All surgeries should be evaluated using the standardized checklist to ensure full compliance with procedural steps at each surgical stage.

REFERENCES

1. Haugen, A. S., Sevdalis, N. & Søfteland, E. Impact of the World Health Organization Surgical Safety Checklist on Patient Safety. *Anesthesiology*. 2019. 131(2), 420-425, <https://doi.org/10.1097/ALN.0000000000002674>.
2. Pham Duc Muc. Overview of patient safety and building a health system that ensures patient safety <http://hoidieuduong.org.vn/files/1386860661>. 2014.
3. Haynes, A. B. A surgical safety checklist to reduce morbidity and mortality in a global population. *N Engl J Med*. 2009. 360(5), 491-9 <https://doi.org/10.1056/nejmsa0810119>.
4. Le Thi Hang, Pham Ngoc Do. Compliance with surgical safety procedures of medical staff at department of plastic and rehabilitation surgery in the National Hospital of Dermatology in 2020. *Viet Nam Medical Journal*. 2023. volume 526(1A), 308-313, <https://doi.org/10.51298/vmj.v526i1A.5353>.

5. Phan Thi Dung. Evaluation of the compliance with surgical safety checklist for patients among healthcare workers. *Vietnam Journal of Obstetrics & Gynecology*. 2022. 20(4), 62-67. <https://jbdmp.vn/index.php/yhthvb/article/view/11>.
6. Luong Thi Thoa, Nguyen Thi Lan Phuong, Dang Quang Dung, Dang Hoang Nga. Assessing the compliance of surveying safety in safety tests in Thai Nguyen Central Hospital Health Center. *Journal of Nursing Science*. 2018. (4), 64–71, <https://jns.vn/index.php/journal/article/view/123>.
7. Pham Thanh Thao. Evaluation of compliance with the surgical safety checklist at the resuscitation surgery department of the Orthopedic Trauma Hospital 2021. *Science and Technology Project, Orthopedic Trauma Hospital*. 2021. <https://doi.org/10.51298/vmj.v545i1.12180>.
8. Ministry of Health. Decision no. 7482/QĐ-BYT dated 18/12/2018. Appendix to the set of quality criteria for assessing surgical safety <https://thuvienphapluat.vn/van-ban/The-thao-Y-te/Quyet-dinh-7482-QD-BYT-2018-Bo-tieu-chi-chat-luong-danh-gia-muc-do-an-toan-phau-thuat-403790.aspx>, accessed time:05/1/2025.
9. Vu Thi La. Evaluation of the compliance with surgical safety checklist at District Medical Center in 2022. *Vietnam Medical Journal*. 2024. 3, 157-162, <https://doi.org/10.51298/vmj.v540i3.10480>.
