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Pitfalls in Sterilization: The Core Role of Nursing

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ABSTRACT

Sterilization is a critical process in healthcare settings, ensuring that medical instruments and environments are free from harmful microorganisms. However, despite stringent protocols, various pitfalls in sterilization practices can compromise patient safety and healthcare outcomes. Nurses play a pivotal role in the sterilization process, from overseeing the correct application of sterilization techniques to educating and training healthcare staff. This review examines common pitfalls in sterilization, including equipment failure, human error, and improper adherence to protocols. It also explores the core responsibilities of nurses in mitigating these risks and ensuring the highest standards of infection control. Through continuous education, vigilant monitoring, and adherence to best practices, nurses can significantly reduce the incidence of sterilization-related infections and enhance overall patient care.

Keywords: Pitfalls, Sterilization, Nursing.

INTRODUCTION

Sterilization is a fundamental component of infection control in healthcare settings. It involves eliminating all forms of microbial life, including bacteria, viruses, fungi, and spores, from medical instruments and environments to prevent healthcare-associated infections (HAIs). Despite its importance, several pitfalls can undermine the effectiveness of sterilization processes, posing significant risks to patient safety. Nurses, being at the forefront of patient care, have a crucial role in ensuring proper sterilization practices are followed. Each surgical and medical procedure involves contact by a medical device or surgical instrument with patients' sterile tissue or mucous membranes. A major risk of all such procedures is the introduction of pathogenic microbes, which can lead to infection. Failure to properly disinfect or sterilize equipment may lead to transmission via contaminated medical and surgical devices (eg, carbapenem-resistant *Enterobacteriaceae* (1)(2). Achieving disinfection and sterilization through the use of disinfectants and sterilization practices is essential for ensuring that medical and surgical instruments do not transmit infectious pathogens to patients. Because it is not necessary to sterilize all patient-care items, health care policies must identify whether cleaning, disinfection, or sterilization is indicated based primarily on each item's intended use, manufacturers recommendations, and guidelines. However, several pitfalls can undermine the sterilization process, leading to potential outbreaks of infections. Nurses play a vital role in maintaining and overseeing sterilization protocols, as their expertise and

vigilance are crucial in identifying and addressing these pitfalls.

1. Common Pitfalls in Sterilization

1.1. Improper Cleaning of Instruments

- **Issue:** Residual organic matter on instruments can protect microbes from being effectively sterilized.
- **Role of Nursing:** Nurses must ensure that all instruments are thoroughly cleaned before sterilization. This involves using appropriate detergents and ultrasonic cleaners when necessary (3).

1.2. Incorrect Loading of Sterilizers

- **Issue:** Overloading or incorrect placement of instruments in sterilizers can prevent adequate exposure to the sterilizing agent.
- **Role of Nursing:** Nurses should be trained to load sterilizers correctly, ensuring that steam or other sterilizing agents can circulate freely around all items (4)

1.3. Inadequate Sterilization Cycle

Issue: Running sterilizers on incorrect cycles or durations can result in ineffective sterilization.

Role of Nursing: Nurses need to understand the appropriate settings for different types of equipment and ensure that sterilization cycles are correctly followed(5) .

1.4. Failure to Monitor Sterilization Efficacy

Issue: Without regular monitoring, it's impossible to ensure that sterilization processes are working as intended.

Role of Nursing: Nurses should regularly use biological indicators, chemical indicators, and integrators to verify that sterilization processes are effective. They should also maintain records of these tests(6).

1.5. Lack of Maintenance of Sterilization Equipment

Issue: Sterilization equipment that is not regularly maintained can malfunction, leading to ineffective sterilization.

Role of Nursing: Nurses should ensure that sterilization equipment undergoes regular maintenance and calibration. They should report any malfunctions immediately and ensure that alternative sterilization methods are available(7) .

2. The Core Role of Nursing in Sterilization

Nurses are at the frontline of patient care and play a pivotal role in preventing HAIs through effective sterilization practices. Their responsibilities include:

2.1. Education and Training

- Nurses must stay updated with the latest sterilization guidelines and techniques. Ongoing education and training programs help maintain high standards of practice(3).

2.2. Policy Implementation

- Nurses are responsible for implementing and adhering to hospital policies and protocols related to sterilization. This includes ensuring compliance with national and international standards (3).

2.3. Quality Control

- Nurses should participate in quality control initiatives, including regular audits of sterilization practices and equipment. They should be involved in incident reporting and corrective actions when sterilization failures occur(6)

2.4. Interdisciplinary Collaboration

- Effective sterilization requires collaboration between nursing staff, infection control teams, and central sterile processing departments. Nurses should facilitate communication and teamwork to ensure comprehensive sterilization practices (8)

2.5. Patient Education

- Nurses also play a role in educating patients about the importance of sterilization and infection prevention. This includes providing information on postoperative care and signs of potential infections (9).

CONCLUSION

Sterilization is a cornerstone of infection control in healthcare settings, and nurses play an essential role in ensuring its effectiveness. By addressing common pitfalls and adhering to best practices, nurses help maintain a safe environment for patients. Continuous education, strict adherence to protocols, and collaborative efforts are key to overcoming challenges in sterilization and minimizing the risk of HAIs.

REFERENCES

1. Wendorf KA, Kay M, Baliga C, Weissman SJ, Gluck M, Verma P, et al. Endoscopic Retrograde Cholangiopancreatography-Associated AmpC Escherichia coli Outbreak. *Infect Control Hosp Epidemiol*. 2015;36(6).
2. Epstein L, Hunter JC, Arwady MA, Tsai V, Stein L, Gribogiannis M, et al. New Delhi metallo- β -lactamase-producing carbapenem-resistant escherichia coli associated with exposure to duodenoscopes. *JAMA - J Am Med Assoc*. 2014;312(14).
3. Centers for Disease Control and Prevention. Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008; Miscellaneous Inactivating Agents. CDC website. 2013;(May).
4. Comprehensive guide to steam sterilization and sterility assurance in health care facilities. In: ANSI/AAMI ST79:2017/(R)2022; Comprehensive guide to steam sterilization and sterility assurance in health care facilities. 2017.
5. Centers for Disease Control and Prevention (CDC). Guideline for disinfection and sterilization in healthcare facilities: Updated 2017. *Healthc Infect Control Pract Advis Comm*. 2017;(May).
6. Joukar F, Yeganeh S, Naghipour M, Hassanipour S, Nikbakht HA, Mansour-Ghanaei F. Validation of omron hbp-1100-e professional blood pressure measuring device according to the american association for the advancement of medical instrumentation protocol: The persian guilan cohort study (PGCS). *Med Devices Evid Res*. 2020;13.
7. The Joint Commission. Comprehensive Accreditation Manual for Hospitals. *Patient Saf Syst*. 2021;1(January).
8. Fitzgerald B. Developing a flash sterilization education program for perioperative assistants. *OR Nurse*. 2010;4(5).
9. Schardt CM. Going beyond information management: Using the Comprehensive Accreditation Manual for Hospitals to promote knowledge-based information services. *Bull Med Libr Assoc*. 1998;86(4).