

CASE REPORT ARTICLE

USE OF PERSONAL PROTECTION EQUIPMENT IN AN ENDOSCOPIC UNIT*
UTILIZAÇÃO DE EQUIPAMENTOS DE PROTEÇÃO INDIVIDUAL EM UNIDADE ENDOSCÓPICA
USO DE EQUIPO DE PROTECCIÓN PERSONAL EN UNIDAD ENDOSCÓPICA

Rosaura Soares Paczek¹, Débora Machado Nascimento do Espírito Santo², Carina Galvan³

ABSTRACT

Objective: to describe the use of personal protective equipment in an endoscopic unit. **Method:** this is a descriptive study, of the experience report type, in a teaching hospital, carried out by nurses working in the endoscopic area on the use of personal protective equipment. **Results:** it is noted that endoscopy is an invasive exam to view body cavities through an endoscope, allowing biopsies, fluid aspiration and even tumor removal. It is reported that workers in an endoscopic unit are exposed daily to biological risks, being able to acquire infections through blood and body fluids, and also exposed to chemical risk due to the processing of equipment, radiation and muscle injuries. It is recommended that professionals working in the endoscopic area should be trained in how to act in the face of exposure to blood and other potentially infectious materials. **Conclusion:** it is concluded that, even with modern and complex equipment, such as washing machines for reprocessing endoscopes, the decontamination principles remain the same and the use of personal protective equipment is essential. **Descriptors:** Endoscopy; Personal Protective Equipment; Occupational Health; Occupational risks; Prevention; Nursing.

RESUMO

Objetivo: descrever o uso de equipamentos de proteção individual em uma unidade endoscópica. **Método:** trata-se de um estudo descritivo, do tipo relato de experiência, em um hospital de ensino, realizado por enfermeiras atuantes na área endoscópica sobre a utilização de equipamentos de proteção individual. **Resultados:** nota-se que a endoscopia é um exame invasivo para visualizar cavidades corporais por meio de um endoscópio, permitindo realizar biópsias, aspiração de líquidos e até remoção de tumores. Informa-se que os trabalhadores de uma unidade endoscópica estão expostos diariamente a riscos biológicos, podendo adquirir infecções por meio de sangue e fluidos corpóreos, e, também, expostos ao risco químico devido ao processamento dos equipamentos, radiação e lesões musculares. Recomenda-se que os profissionais que atuam na área endoscópica devem ser capacitados em como atuar frente à exposição de sangue e outros materiais potencialmente infecciosos. **Conclusão:** conclui-se que, mesmo com equipamentos modernos e complexos, como lavadoras para o reprocessamento de endoscópios, os princípios de descontaminação continuam os mesmos e a utilização dos equipamentos de proteção individual é indispensável. **Descritores:** Endoscopia; Equipamentos de Proteção; Saúde do Trabalhador; Riscos Ocupacionais; Prevenção de Acidentes; Enfermagem.

RESUMEN

Objetivo: describir el uso de equipos de protección personal en una unidad endoscópica. **Método:** este es un estudio descriptivo, del tipo de informe de experiencia, en un hospital universitario, realizado por enfermeras que trabajan en el área endoscópica en el uso de equipos de protección personal. **Resultados:** se observa que la endoscopia es un examen invasivo para ver las cavidades corporales a través de un endoscopio, lo que permite biopsias, aspiración de líquidos e incluso extirpación de tumores. Se informa que los trabajadores en una unidad endoscópica están expuestos diariamente a riesgos biológicos, pudiendo adquirir infecciones a través de sangre y fluidos corporales, y también expuestos a riesgos químicos debido al procesamiento de equipos, radiación y lesiones musculares. Se recomienda que los profesionales que trabajan en el área endoscópica reciban capacitación sobre cómo actuar ante la exposición a la sangre y otros materiales potencialmente infecciosos. **Conclusión:** se concluye que, incluso con equipos modernos y complejos, como lavadoras para el procesamiento de endoscopios, los principios de descontaminación siguen siendo los mismos y el uso de equipos de protección personal es esencial. **Descritores:** Endoscopia; Equipo de Seguridad; Salud Laboral; Riesgos Laborales; Prevención de Accidentes; Enfermería.

^{1,2,3}Porto Alegre Clinical Hospital/HCPA. Porto Alegre (RS), Brazil. ¹<https://orcid.org/0000-0002-4397-1814> ²<https://orcid.org/0000-0003-0533-0335> ³<https://orcid.org/0000-0003-2111-5432>

*Article extracted from the Undergraduate Thesis << Use of personal protective equipment in an endoscopic unit >>. Dom Alberto College. 2019.

How to cite this article

Paczek RS, Espírito Santo DMN da, Galvan C. Use of personal protective equipment in an endoscopic unit. J Nurs UFPE on line. 2020;14:e243993 DOI: <https://doi.org/10.5205/1981-8963.2020.243993>

INTRODUCTION

Inspection of organs and body cavities is performed through endoscopy. It is noticed that digestive endoscopy has advanced a lot in the last decades, mainly due to technical advances. It is an invasive procedure, through an endoscope, for diagnostic and therapeutic purposes, with the performance of the medical and nursing staff.¹

It is explained that, as endoscopic devices come into contact with mucous membranes, they must be handled with protective measures and subjected to a high-level disinfection process. It is detailed that the workers of an endoscopic unit are exposed daily, during their work activities, to biological risks, being able to acquire infections through blood and body fluids. Furthermore, they are also exposed to chemical risk due to the processing of equipment, radiation and muscle injuries and, therefore, universal precautions with organic fluids must be followed, the correct use of personal protective equipment being one of the most important ways to minimize risks to exposure, in addition to continuing education, structure and adequate working conditions.

It is known that biological, chemical, physical, ergonomic and psychosocial occupational risks are present in the daily life of the health worker and exposure to these risks can lead to withdrawal from the activity, causing a partial or total loss of the ability to exercise profession.²

Personal protective equipment (PPE) is a device or product for individual use intended to protect against risks to health and safety at work.³ It is reported that, due to the growing number of endoscopic exams, with the advancement of technologies for the processing of devices, with several recommendations, added to the improvement in quality and safety in care, the concern arose in studying this subject.

Digestive endoscopy has an important risk factor for the transmission of superbugs associated with the patient's morbidity and mortality, especially after endoscopic cholangiopancreatography, and it is challenging to clean and disinfect the devices according to the manufacturer's guidelines and according to the guidelines published by professional organizations, and the reprocessing currently carried out with high-level disinfection is suitable for preventing the transmission of bacteria. Training and monitoring of the professionals who perform the reprocessing are recommended, observing the cleaning with appropriate brushings.⁴

OBJECTIVE

- To describe the use of personal protective equipment in an endoscopic unit.

METHOD

This is a descriptive study, type of experience report, carried out by the authors of this study who work as nurses in the endoscopic area of a teaching hospital in southern Brazil, on the use of personal protective equipment.

It is noteworthy that the hospital's endoscopic unit has procedure rooms and a room for cleaning, disinfecting and storing endoscopic devices. It is reported that there is one nurse per shift in the sector, two nursing technicians per shift in each procedure room, one nursing technician per shift in the endoscopic cleaning room, considered a dirty area, and one Nursing technician per shift in the area cleaner to perform device processing in automated washers, drying and storing devices.

It is noted that PPE is available in all the procedure rooms and in the cleaning and processing room of the devices, in places with easy access and visualization, being used by all nursing and medical staff during the performance of the procedures and during the cleaning and disinfecting devices. Guidance and training on the importance of using PPE was carried out. Nurses provide assistance to patients, administrative activities and the supervision of the Nursing team.

RESULTS

Diagnostic and therapeutic procedures are performed in the endoscopic unit, on an outpatient basis and in inpatients of the following specialties: Gastroenterology; Proctology; Urology; Pulmonology and Otorhinolaryngology. Available to the entire unit team in each procedure room: aprons; gloves; masks; goggles and ear protector. For the examination, a pair of nursing technicians and an assistant nurse responsible for the unit are needed. The unit consists of six rooms for carrying out the procedures and an area for cleaning and disinfecting materials and equipment, with dirty and clean areas separated from each other by a window with a bench through which the equipment passes.

The use of PPE is part of the routine in a hospital service, and should also be used during the procedure and after the end, for cleaning and disinfecting the devices, in endoscopies of the respiratory, digestive and urinary tracts. It is explained that, during the procedure, both the medical and nursing staff use a mask, glove, apron and goggles, as possible splashes of secretions may occur and, after the procedure is over, all material must be passed on cleaning and disinfection, preventing the drying of organic matter. Initially, manual cleaning is performed with brushing of all channels to remove dirt and rinse, and then the devices are placed in reprocessing machines for high level disinfection; the third step is drying and storing them. It is observed that the use of PPE

must also be maintained throughout the cleaning, drying and storage process of endoscopic devices.

DISCUSSION

It is pointed out that endoscopy can be respiratory, gastrointestinal or urinary, and consists of visualization of the respiratory, digestive or urinary systems, respectively, and can be performed in an outpatient setting, used for diagnosis or treatment, and the devices have powerful cameras, which that allows a thorough examination of the organs.

Due to contact with blood or bodily fluids, health professionals are constantly exposed to the occupational risk of acquiring infections during their activities, especially in sectors considered critical of the hospital environment where nursing professionals have the potentialized risk. With the discovery of the Human Immunodeficiency Virus (HIV), occupational exposure has gained prominence in the scientific world, culminating in the creation of standard precautions, an important measure of biosafety, demanding, from the professional, motivation, technical-scientific knowledge and appropriate attitudes.⁵

In 2006, due to the need for disinfection of endoscopic devices, by the National Health Surveillance Agency (ANVISA), with the Brazilian Society of Nursing in Gastrointestinal Endoscopy (SOBEEG), National Program for the Control and Prevention of Viral Hepatitis / PNHV and National STD / AIDS Program, the Manual for Cleaning and Disinfecting Endoscopic Devices, with the objective of standardizing the high-level chemical cleaning and disinfection processes and / or sterilizing the material used in endoscopic procedures, where asepsis rules were instituted.⁶

It is detailed that disinfection is a process that aims to eliminate microorganisms present on surfaces and health products. High-level disinfection is recommended for semi-critical products, such as endoscopes, as these come into contact with the mucosa, and some injury may occur during the procedure. All materials used in health care, which are not disposable, must be reprocessed safely before reuse. Reprocessing is understood as the process applied to the products to be reused, which includes cleaning, preparation, conditioning, disinfection or sterilization, carrying out biological and chemical tests, in addition to the analysis of possible sterilizing residues.⁷

It is necessary, for the material to be disinfected or sterilized, that adequate cleaning and rigorous inspection of health products be carried out. Cleaning must remove organic and inorganic dirt from the materials in order to reduce microorganisms and remove residues, using water or soap or detergent, manually or automatically, taking care of cleaning accessories, handling and preparation of materials.⁸

The inherent risks to which workers are exposed are minimized using PPE. PPE is described by Regulatory Standard - 6 (NR-6): every device or product used by the worker, for individual use, intended to protect risks that may threaten their safety and health, being the employer obliged to supply the protective equipment, and the worker oriented to use the PPE according to the risks, taking care of the equipment.

Protective equipment is used to interrupt the transmission of microorganisms, and should be used in endoscopic procedures, as there is a risk of exposure to infectious microorganisms, such as Mycobacterium tuberculosis, hepatitis B and C virus, human immunodeficiency virus (HIV), herpes simplex, in addition to enteric pathogens. Barriers must be used to protect the professional, such as gloves, apron, mask, glasses, face shield, with emphasis on hand washing and care with sharps.^{9,10}

The endoscopic unit presents exposure to biological and chemical material for health professionals. Studies have shown that health care workers in different categories do not adequately use personal protective equipment when carrying out examinations and also during the reprocessing of devices, presenting direct or indirect exposure to blood and excretions, permanent education is necessary to develop cognitive, psychomotor and attitudinal skills in order to overcome obstacles related to adherence to standard precautions.⁹⁻¹¹

It is believed that personal protective equipment is essential for the development of the work of health professionals, in order to guarantee minimum safety standards in the health establishment, in order to prevent occupational accidents involving biological material.¹¹

The use of PPE depends on the supply and availability of these by the institutions, in addition to knowledge and adherence by professionals. It has been reported by authors that, after training, biological accidents decrease and there is a greater adherence to standard precautionary measures, as the team is sensitized to behavior change. However, it was found that there is a decline after some training time, emphasizing the need for training on a systematic and periodic basis.¹²

It was also observed in another study that professionals do not fully adhere to standard precautions as recommended, although standard precautions are the main strategy for protecting workers from exposure to transmissible pathogens¹² and, like the patient, adherence is below recommended. They stand out as factors that contribute to low adherence: lack of knowledge; lack of training; time; habit; forgetfulness; lack of PPE; impact on technical skill; uncomfortable equipment; skin irritation; conflict between the need to provide care and self-protection; distance between PPE and place of use.

According to a study that aimed to verify

adherence to the use of PPE by professionals during the endoscopy exam and in the reprocessing of endoscopic articles, there was greater adherence to the use of procedure gloves, fabric apron and shoes closed, which occurred both during the exams and during the reprocessing.⁹

The use of low-adhesion goggles was presented in both situations, showing that professionals use PPE inappropriately, which proves the lack of knowledge regarding the risk and use of PPE indicated for each type of procedure. Added to this is the absence of certain equipment, the discomfort in use and the daily behavior of endoscopy services, leading to an unsafe work environment, revealing vulnerability in professional practice.

Through educational strategies, it is possible to promote awareness of risks, with the development of cognitive, psychomotor and attitudinal skills, for adherence to safety equipment. Adequate structure and conditions must be offered for endoscopy services and professionals must assume an ethical commitment to quality of care, recognizing the risks present in the work environment.

CONCLUSION

Standard precautionary measures should be applied to care for all patients in a hospital environment and these should also be used in the handling of contaminated equipment and articles or under suspected contamination whenever there is a risk of contact with blood, body fluids, secretions and excretions, with the exception of sweat, as well as with the skin in solution of continuity and mucous membranes. It should be added that the use of PPE - gloves, apron, masks and eye protectors - must also observe hand hygiene before and after contact with the patient and body fluids.¹²

It is known that occupational diseases affect productivity, quality and health of workers and there are several causes of accidents, such as carelessness, patient conditions, failure to observe preventive measures, inadequate materials, equipment and structure, haste, risk inherent to the profession, overconfidence and work overload. It is observed that, if basic protection measures were adopted, many accidents could be avoided.¹¹

In the endoscopic unit, professionals are exposed daily to biological, chemical and radiation risks, and they may suffer damage to their health. Universal precautions must be followed, and the correct use of PPE is one of the most important ways to minimize risks to exposure, in addition to adequate structure and working conditions.

This study serves as an alert on the importance of the use of personal protective equipment by professionals working in endoscopic units, avoiding risks for professionals, generating lower costs for

services and better quality in the development of work activity, and education continuous monitoring is of paramount importance for the awareness and use of protective equipment.

REFERENCES

1. Akyüz N, Keskin M, Akyolcu N, Cavdar İ, Özbaş A, Ayoğlu T, et al. How and how much do endoscopy professionals protect themselves against infection? *Int J Surg.* 2014 July;12(7):720-4. DOI: [10.1016/j.ijssu.2014.05.065](https://doi.org/10.1016/j.ijssu.2014.05.065)
2. Batista OMA, Moura MEB, Sousa AFL, Andrade D. Occupational risk between critical sectors nursing professionals and adherence to standard precaution. *Rev Cubana Enferm* [Internet]. 2017 Mar [cited 2019 Aug 10]; 3(3). Available from: <http://revenfermeria.sld.cu/index.php/enf/article/view/1169>
3. Martínez J, Aparicio JR, Peña A, Casellas JA, Sociedad Valenciana de Patología Digestiva. The current situation of digestive endoscopy units in the Valencian Community. *Rev Esp Enferm Dig.* 2019 July;111(7):556-62. DOI: [10.17235/reed.2019.5676/2018](https://doi.org/10.17235/reed.2019.5676/2018)
4. Ministério da Saúde (BR), Agência Nacional de Vigilância Sanitária. Resolução da Diretoria Colegiada - RDC nº 6, de 10 de março de 2013. Dispõe sobre os requisitos de Boas Práticas de Funcionamento para os serviços de endoscopia com via de acesso ao organismo por orifícios exclusivamente naturais [Internet]. Brasília: Ministério da Saúde; 2013 [cited 2019 Dec 10]. Available from: http://bvsms.saude.gov.br/bvs/saudelegis/anvisa/2013/rdc0006_10_03_2013.html
5. Carrara D, Shirahige CA, Braga ACPV, Ishioka S, Sakai P, Takeiti MH, et al. Is endoscope disinfection with peracetic acid during ten minutes effective? *Rev. SOBECC* [Internet]. 2013 Out/Dec [cited 2019 Aug 10];18(4):38-46. Available from: <https://pesquisa.bvsalud.org/portal/resource/pt/bde-26548>
6. Costa C, Pina E, Ferreira E, Ramos S, Cremers MI, Figueiredo P, et al. Guidelines for reprocessing in digestive endoscopy. *J Port Gastroenterol* [Internet]. 2012 Sept [cited 2019 Aug 10];19(5):241-50. Available from: <http://www.scielo.mec.pt/pdf/ge/v19n5/v19n5a06.pdf>
7. Damasceno AP, Pereira MS, Souza ACS, Tipple AFV, Prado MA. Occupational accidents with biohazards: the perception of the injured worker. *Rev Bras Enferm.* 2006 Jan/Feb;9(1):72-7. DOI: [10.1590/S0034-71672006000100014](https://doi.org/10.1590/S0034-71672006000100014)
8. Ferreira LA, Peixoto CA, Paiva L, Silva QCG, Rezende MP, Barbosa MH. Adherence to standard precautions in a teaching hospital. *Rev Bras Enferm.* 2017 Feb; 70(1):96-103. DOI: [10.1590/0034-7167-2016-0138](https://doi.org/10.1590/0034-7167-2016-0138)

9. Hashimoto CL, Ramos JSD, Fang HL, Schulz RT, Bonadiman AA, Marson FP, Nahoum RG. Diretrizes da Sobed - Sedação em Endoscopia Gastrointestinal II: Preparo, Monitorização, Medicações, Alta Hospitalar [Internet]. São Paulo: SOBED; 2017 [cited 2019 Aug 10]. Available From: https://diretrizes.amb.org.br/_DIRETRIZES/SEDA%20EM%20ENDOSCOPIA%20GASTROINTESTINAL%20II%20PREPARO/files/assets/common/downloads/publication.pdf
10. Muscarella LF. "Risk of transmission of carbapenem-resistant Enterobacteriaceae and related "superbugs" during gastrointestinal endoscopy. World J Gastrointest Endosc. 2014 Oct ;6(10):457-74. DOI: [10.4253/wjge.v6.i10](https://doi.org/10.4253/wjge.v6.i10).
11. Neves HCC, Souza ACS, Barbosa JM, Ribeiro LCM, Tiple AFV, Alves SB, et al. The use of personal protective equipment by professionals at endoscopy units. Rev Enferm UERJ. 2010 Jan/Mar;18(1):61-6. Available from: <https://docplayer.com.br/51492105-O-uso-de-equipamentos-de-protecao-individual.html>
12. Ribeiro LCM, Souza ACS, Barbosa JM, Barreco RASS, Tiple AFV, Neves HCC, et al. Occupational risk for the glutaraldehyde exposition in endoscope services workers. Rev eletrônico enferm. 2009 Sept ;11(3):509-17. DOI: [10.5216/ree.v11.47091](https://doi.org/10.5216/ree.v11.47091)
13. Selhorst ISB, Bub MBC, Girondi JBR. Protocol for embracement and attention to users that underwent upper gastrointestinal endoscopy and persons accompanying them. Rev Bras Enferm. 2014 Aug;67(4):575-80. DOI: [10.1590/0034-7167.2014670412](https://doi.org/10.1590/0034-7167.2014670412)
14. Sociedade Brasileira de Endoscopia Digestiva, Departamento de Endoscopia da Associação Médica Brasileira. Processamento de produtos médicos utilizados em endoscopia digestiva [Internet]. São Paulo: SOBED; 2013 [cited 2019 Feb 18]. Available from: <https://docplayer.com.br/11719962-Processamento-de-produtos-medicos-utilizados-em-endoscopia-digestiva.html>

Corresponding author

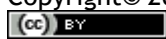
Rosana Soares Paczek

Email: rspaczek@gmail.com

Submission: 2019/01/15

Accepted: 2020/02/18

Copyright© 2019 Journal of Nursing UFPE on line/JNUOL.

 This is an Open Access article distributed under the terms of the [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/). This license lets others distribute, remix, tweak, and build upon your work, even commercially, as long as they credit you for the original creation. Recommended for maximum dissemination and use of licensed materials.