

DISINFECTION AND STERILIZATION IN OUTPATIENT OCCUPATIONAL HEALTH SERVICES

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ABSTRACT: This study aimed to investigate the process of disinfection and sterilization of materials in outpatient occupational health units, in the Brazilian states of Santa Catarina, Rio Grande do Sul, and Mato Grosso do Sul. It is a case study undertaken in 15 outpatient occupational health units, in June – September 2013, with a questionnaire applied individually to the professionals working in the area of sterilization in the company's head office. All the units use the autoclave as the method of sterilization, undertaken in the medical-dental procedure rooms. The following were identified: there is a lack of standardization of products' labeling, validation tests and records of the sterilizations undertaken. The quality and safety of the sterilization process are compromised in the units studied, and require intervention in the physical structure and redefinition of the processes of monitoring and recording the sterilizations for improvement of the health conditions, and of the worker's safety. **DESCRIPTORS:** Sterilization; Occupational Nursing; Occupational Health; Occupational risks.

DESINFECÇÃO E ESTERILIZAÇÃO EM SERVIÇOS AMBULATORIAIS DE SAÚDE DO TRABALHADOR

RESUMO: Este estudo teve por objetivo conhecer o processo de desinfecção e esterilização de materiais em unidades ambulatoriais de saúde do trabalhador, dos estados de Santa Catarina, Rio Grande do Sul e Mato Grosso do Sul. Trata-se de estudo de caso realizado em 15 unidades de atendimento ambulatorial de saúde do trabalhador, no período de junho a setembro de 2013, com questionário aplicado individualmente aos profissionais atuantes na área de esterilização na sede da empresa. Todas as unidades utilizam autoclave como método de esterilização, realizada nas salas de procedimentos médico-odontológicos. Foram identificados: falta padronização de rotulagem dos produtos, testes de validação e registros das esterilizações realizadas. A qualidade e segurança do processo de esterilização estão comprometidas nas unidades pesquisadas, necessitando de intervenção na estrutura física e redefinição dos processos de monitoramento e registro das esterilizações para melhoria das condições sanitárias e de segurança do trabalhador. **DESCRIPTORES:** Esterilização; Enfermagem do Trabalho; Saúde do Trabalhador; Riscos Ocupacionais.

DESINFECCIÓN Y ESTERILIZACIÓN EN SERVICIOS DE AMBULATORIOS DE SALUD DEL TRABAJADOR

RESUMEN: Este estudio tuvo el objetivo de conocer el proceso de desinfección y esterilización de materiales en unidades de ambulatorios de salud del trabajador, de los estados de Santa Catarina, Rio Grande do Sul y Mato Grosso do Sul. Es un estudio de caso realizado en 15 unidades de atendimento de ambulatorio de salud del trabajador, en el periodo de junio a septiembre de 2013, con cuestionario aplicado individualmente a los profesionales actuantes en el área de esterilización en la sede de la empresa. Todas las unidades utilizan autoclave como método de esterilización, la cual es realizada en los locales de procedimientos médico-odontológicos. Se identificaron: falta de estandarización de etiquetaje de los productos, testes de validación y registros de las esterilizações realizadas. La cualidad y seguridad del proceso de esterilización están comprometidas en las unidades investigadas, necesitando de intervención en la estructura física y redefinición de los procesos de monitoreo y registro de las esterilizações para mejorar las condiciones sanitarias y de seguridad del trabajador. **DESCRIPTORES:** Esterilización; Enfermería del Trabajo; Salud del Trabajador; Riesgos Ocupacionales.

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● INTRODUCTION

Sterilization is a process which completely eliminates microorganisms, it being important for nursing professionals to know all the procedures, such as cleaning and handling, selection of packaging, packaging, the method of sterilization, the storage of products for health, and tests and records for the validation of the sterilization process. All the professionals involved in this process must be prepared to undertake these procedures safely. As a result, the health services must have available professionals, articles, and a set of measures which are safe in order to offer the appropriate care, without any risk to the service user or to the professional of the health services⁽¹⁻³⁾.

Studies have indicated weak points in the processes of this sterilization of materials, sometimes not complying with Brazilian legislation and the minimum recommendations or safety and validation of the sterilization, placing at risk the safety both of workers and of the individuals who use these services⁽⁴⁻⁶⁾. One study undertaken with 18 nursing workers in a public hospital in Porto Alegre, in 2011, identified that some participants do not have adequate knowledge regarding all the stages which permeate the process of sterilization of products for health⁽⁷⁾.

Disinfection and sterilization are processes which can eliminate or significantly reduce the risks of infection^(2,6). Taking into account that the Central Supply Department (CSD) is made up of dirty, clean and sterile areas^(5,7-8), the health professional has great responsibility, as she must distinguish the area of work and the potential risk of transmission of infection through instruments and materials used. For this, actions such as cleaning, drying, preparation, sterilization and the appropriate storage of the materials are fundamental^(4-5,8-9).

According to the international safety rules, the team working in the sterilization processes is obliged to make use of the personal protective equipment (PPE)⁽⁸⁻⁹⁾, which must always be available to the team, such as aprons, facemasks, gloves, boots and hats, among others, thus reducing the probability of contamination^(1,10).

According to Brazilian legislation, all units which produce products for health require rigorous control⁽¹¹⁾, the aim being to avoid compromising the well-being of the individuals assisted in the health care services⁽²⁾.

In this regard, one study indicates the advances in the Brazilian national occupational health policy, and reinforces the importance of education at work for minimizing work-related illnesses, as well as the commitment of managers, workers and employees to the quality of the work and to the valorization of the workers⁽¹²⁾.

Based in this context, the question is raised: how is the process of disinfection and sterilization in outpatient occupational health services? It is based on this question that this study is proposed in order to investigate the process of disinfection and sterilization in outpatient occupational health services, in a company in the food sector, with branches in the states of Santa Catarina, Rio Grande do Sul and Mato Grosso do Sul.

Considering the potential for contamination which exists in the health services, above all in the CSD, it is necessary to adopt measures for infection control in the healthcare networks and in the public and private ambit⁽¹¹⁾.

● METHOD

A case study involving the application of a questionnaire developed based on the guidelines recommended by the Brazilian Society of Surgical Center Nurses (SOBECC)⁽¹³⁾ and legislation of the Brazilian National Health Surveillance Agency (ANVISA)⁽¹¹⁾ regarding the processes of disinfection and sterilization of materials. This study addressed the areas of the central supply department, the flow of the products for health, types of wrappings and sterilization methods, validation tests and the recording of the different stages of the process, besides the storage conditions and distribution of the reprocessed products.

The following were considered to be inclusion criteria: to be a nursing professional, and to be working in the process of sterilization of products for health, to be responsible for the area of sterilization of materials, with a minimum of six months' work in outpatient occupational health units linked to a company in the food sector, headquartered in the west of the state of Santa Catarina.

The business center, with its headquarters in the state of Santa Catarina, has branches distributed across the states of Santa Catarina (n=11), Rio Grande do Sul (n=3) and Mato Grosso do Sul (n=1), totaling 15 outpatient occupational health units; all have reprocessable materials. Currently, each unit has one nursing professional responsible for the process of sterilizing materials.

The study participants were all the nursing professionals working in the area of sterilizing products for health, in outpatient occupational health services, representing the 15 outpatient units, which are responsible for the process of disinfection and sterilization, there being one professional per unit. It is necessary to clarify that some units have a nurse, while others have auxiliary nurses and nursing technicians responsible for the sterilization process. However, all the occupational health outpatient centers in question undertake actions for the prevention of harm to health and outpatient first-aid attendance, while five units (33.33%) provide dental care to the workers.

Data collection was undertaken through the use of a questionnaire, filled out by the participants themselves at the headquarters of the food company, in the presence of two researchers, who explained doubts which emerged during the filling out of the questionnaire, such as the description of the flow of the dental-medical-hospital materials in the physical structure of each unit.

The professionals were advised as to the study objective and invited to participate in the study, filling out the Terms of Free and Informed Consent (TFIC), and were informed about the study's approval by the Research Ethics Committee of Santa Catarina State University (UDESC), under N. 397.394/2013.

The study was undertaken in June – September 2013, on the company's property. After the data collection, the professionals participated in a training session. It is worth emphasizing that the service was viabilized and paid for the professionals' transport so that it would be possible to undertake the training on the process of disinfecting and sterilizing health products, shortly after the data collection.

The data collected were tabulated and analyzed using the Microsoft Word Excel® program and the Statistical Package for the Social Sciences (SPSS) program, version 18.0, through the use of descriptive statistics.

At the end of the data collection, training was undertaken at the request of the company, lasting four hours, being an opportunity in which the researchers addressed various phases of the sterilization process, namely: areas which make up the central supply department; the flow of the materials during the processing; wrappings, and methods of disinfection and sterilization; storage conditions and distribution of the reprocessed products; validation tests; and recording of the different stages of this process.

At the end of the study, the results were made available to the nurse coordinating the company's outpatient occupational health services for the monitoring of the changes agreed collectively during the training.

● RESULTS

Of the professionals, (n=13) stated that the nurse is responsible for the processes of sterilizing materials, however, in n=14 units, the person who undertakes the activities is the nursing technician. In one of the outpatient centers, however, the participant stated that the person who undertakes the sterilization is the assistant of the dental consulting room.

The participants (n=15) consider the role of nursing to be important in the processes of sterilization of materials, as it assists in minimizing or eliminating the risks of contamination and, in this way, offers a quality service to the health services' users.

The participants defined disinfection as being a process undertaken in materials used in less invasive procedures, not involving contact with mucosas, characterizing the semi-critical instruments. In relation to the materials which would pass through the sterilization process, the participants indicated the invasive materials, which enter into contact with mucosas, blood and other secretions, in this way defining the critical materials. All the participants stated that some instruments, according to their usage and type of material, must initially undergo the process of disinfection and, later, sterilization.

Table 1 shows that the materials sterilized most in the units are the packets of dressings and the materials used for removing stitches, followed by the surgical instruments and dental material.

In Table 2, one can observe the materials which undergo the processes of disinfection. The materials which are disinfected most are the tips of otoscopes, the stethoscopes, thermometers and furniture, such as patient trolleys, armchairs and working surfaces. All the outpatient centers have the elements described in Table 2. Not all, however, undertake the disinfection process – and when they do, they use alcohol 70%.

Table 1 - Materials which undergo the process of sterilization in outpatient occupational health centers. Chapecó, SC, 2013

Sterilized Materials	n	%
Cloth	2	13.33
Surgical instruments	9	60
Packets of dressings	15	100
Removal of stitches	15	100
Dental material	5	33.33
Others*	7	46.66

Table 2 - Materials which undergo the process of disinfection in outpatient occupational health centers. Chapecó, SC, 2013

Disinfected Materials	n	%
Stethoscopes	10	66.66
Tips of otoscopes	15	100
Thermometers	7	46.66
Sinks	1	6.66
Furniture	6	6.66

*Cotton, gauze, absorbent cotton, speculums, tongue depressors.

Regarding the workers' exposure to occupational risks during the processing of dental-medical-hospital materials, all said that the exposure of the worker to the occupational risks exists, indicating exposure to biological, chemical and physical risks. Of the participants, 14 (93.3%) recognize the existence of biological and chemical risk, 12 (80%) the presence of physical risk in the work environment, and one (6.7%) perceives the ergonomic risk in the sterilization area.

The participants emphasize that the use of PPE protects the professional. All the workers of the CSD make use of, at least, two PPE, among these emphasizing gloves, boots, overalls (apron), mask and goggles. However, the workers participating in the present study stated that the PPE are not used concomitantly.

Regarding the flow of materials in the CSD, two participants presented a unidirectional flow, and 11 detailed an incorrect flow, that is, that did not follow in a single direction between the areas which make up the CSD. Two professionals did not answer the question and stated, in this question, that they did not know how to explain the flow of materials in the CSD as there is no standard defined in the unit. In 13 units researched, the material enters and leaves through the same door.

The pre-washing, washing and drying of the instruments, and the packaging, sterilization and storage of the materials takes place in all the units. However, the units do not have a specific place for the process of sterilizing materials, and, for this reason, process the materials in the same rooms meant for the dental consultations and the medical procedures.

The storage of the reprocessed materials, in all the units, takes place in cupboards or in drawers. Such situations, according to the participants, are the result of there being a low flow of attendances, and – because of it being a company center – there being financial questions which directly influence

the professional conduct in relation to the reprocessing of the materials. Only one of the 15 outpatient occupational health units records the processes of the sterilization of materials.

The wrappings (packagings) used in the 15 units are surgical grade paper. Table 3 shows the items used for the identification of the package by the professionals.

Regarding the identification of the package, 12 professionals stated that they identify it with the date, seven with the time, five identify it with the professional's name, one puts the period of validity, four identified it with the name of the material, and two do not identify anything on the packaging to be reprocessed. One must take into consideration that the participants answer mentioning more than one item for the identification of the material.

Of the interviewees, 11 mention undertaking tests for controlling the process of sterilization, while the others state that they do not undertake any tests for validating the sterilization process. Of the tests undertaken, 10 undertake physical tests with a heat resistant tape, and eight report undertaking a biological test using the Clean-up Biotechnology clean test. Of those who do not undertake tests, four report being in the period of acquiring the clean test. Four of these professionals are waiting for the confirmation of the tests in order to liberate the material for use.

In this study, the method of sterilization used by the units studied was moist heat under pressure (Autoclave). Considering the method of sterilization used, the professionals mentioned a wide variety in relation to the sterilization's period of validity, this varying from seven days to one year according to the data in Table 4. In addition to this, four participants reported that there is no period of validity defined in the outpatient center where they work, and one professional said that she does not control the time of sterilization due to the high turnover of the materials; because of this they term it "continuous flow" when the materials do not remain in storage for very long. It is necessary to state here that none of the services researched mentioned differing the periods of validity according to the product for health to be sterilized.

Table 3 – Labeling of the reprocessed material in outpatient occupational health centers. Chapecó, SC, 2013

Labeling/Identification items	n	%
Date of Sterilization	12	80
Time of Sterilization	8	53.33
Professional's Signature	5	33.33
Period of Validity	1	6.66
Name of Material	4	26.66
Does Not Identify the Reprocessed Material	2	13.33

Table 4 – Period of validity of the sterilization process of materials in outpatient occupational health centers. Chapecó, SC, 2013

Validity of the sterilization process	n	%
7 days	4	26.66
30 days	2	13.33
60 days	1	6.66
365 days	3	20
Depending on use	1	6.66
No period of validity defined	4	26.66

* The participants do not differentiate periods of validity according to the products for health.

● DISCUSSION

The reprocessing of materials ensures the effectiveness of the sterilization process, making it possible for the material to be ready to be used again⁽¹⁴⁾, the presence of trained and qualified professionals being extremely important, always improving the undertaking of the processes so as to contribute to the control of infections and ensure safe and appropriate care for the patient⁽³⁾.

The study showed that the nurse does not undertake the reprocessing of the materials, but is responsible for the process. This information is significant, as, through working in the processes of sterilization of materials, the nurse mainly exercises management, which covers different functions, such as planning, administration of material and human resources, and the supervision of the services,

among others⁽¹⁵⁾. It is thus re-asserted that the professional who works in the processes of the sterilization of materials is generally the auxiliary nurse or nursing technician; however, such processes must be led and inspected by the nurse⁽¹⁶⁾.

The essence of nursing is the practice of care, reflected in different actions, acting directly or indirectly with the patient, both being of great relevance. The present study evidenced that the indirect care undertaken in the CSD requires time for preparation and knowledge in order to support the direct care with safety, such as the provision of materials free of contamination⁽¹⁵⁾. The direct care encompasses all and any care provided to the patient, while the indirect care covers care with the environment and processes for the work of nursing, as happens in the CSD⁽¹⁵⁾.

Disinfection is a process based in the immersion of the material in a chemical germicide⁽³⁾. ANVISA⁽¹¹⁾ has suspended processes of sterilization through immersion in chemical products, in surgical instruments and products used for procedures in general. Nevertheless, for the process of disinfection, the products used are glutaraldehyde 2%, formaldehyde-alcohol solution 8%, formaldehyde solution 10%, chlorhexidine 2%, Polyvinylpyrrolidone iodine (PVP-I), and alcohol 70%⁽³⁾. However, in this study, the product indicated for the disinfection of materials was alcohol 70%, the products for health not being immersed, as indicated by the literature⁽³⁾.

All services investigated in this study used moist heat under pressure (autoclave), considered to be the most-used, safest and most reliable process for sterilizing materials⁽²⁾, defined as sterilization using saturated steam under pressure, used in instruments which are not sensitive to heat or to steam⁽²⁾.

The CSD is considered to be a complex environment because of the variety of activities undertaken, and the diversity of materials processed – which favors the exposure of the worker to possible occupational risks, given that she enters continuously into contact with organic fluids, heat and chemical substances, in closed environments, and with exhausting routines⁽¹⁷⁾. Although, in the results of this study, the professionals' recognition of the occupational risk factors has been identified, another study states that the chemical, physical, biological and ergonomic risks require particular care, in the prevention and control of accidents⁽¹⁸⁾, with physical risk being the most frequent, identified as heat and failure to use PPE⁽¹⁷⁾.

There are gaps to be filled in the physical structure, as the sterilization process takes place in medical and dental procedure rooms. In Brazil, the Directors' Collegiate Resolution (RDC) N. 50, of ANVISA, regulates this physical structure and provides guidance for the composition of the areas which make up the CSD⁽¹⁹⁾. However, not all the CSD follow these recommendations, highly probably for financial and structural reasons and due to technical issues⁽²⁰⁾.

RDC N. 15, of March 15th 2012, of ANVISA, stipulates the use of a technical barrier when there is no physical barrier between the dirty area and a clean area, in the same way that it recommends a technical barrier between the clean and sterile areas. In addition, the disinfection area must be restricted to this activity⁽¹¹⁾.

In this study, the outpatient occupational health services are not in conformity with the recommendations of the Brazilian Society of Surgical Center Nurses, Recovery from Anaesthesia, and Central Supply Department (SOBECC) and ANVISA, which argue for a unidirectional flow during the stages of reprocessing, encompassing cleaning/decontamination, the packaging and preparation of the materials, the sterilization, the storage and the distribution of the products for health⁽²¹⁾. These stages aim to avoid contact with dirty, clean and sterilized materials, as well as stopping professionals from passing through or working in specified areas at the same time⁽¹³⁾. The incorrect flow of the materials can result in the crossing of clean and dirty materials, making possible the contamination of materials which have already been reprocessed⁽²¹⁾.

The articles received in the CSD must enter through the reception area or washing/drying area, where the washing process takes place⁽²¹⁾, and are sent on to the preparation area for inspection, preparation and labeling in accordance with the sterilization process practiced. For storage, the material processed must be stored, observing the rules for minimum distance from the floor, which is 20 cm, from the ceiling, which is 45 cm, and from the wall, which is 5 cm⁽¹³⁾. However, the results of this study diverge from these recommendations, indicating weak points which need intervention for the construction of

improvement in the sterilization process.

For storage, the locale must be restricted to this purpose, clean, free of dust, and dry, with temperatures between 18°C and 22 °C, and air humidity from 35% – 60%, without open windows or doors, exposed tubing, and the shelves must be made of steel⁽¹⁶⁾. This is not the case of this study's findings, as the sterilization area is not exclusively for this purpose, there is no control of temperature or humidity, and neither is there adequate safekeeping of the products for health which have already been reprocessed.

The rooms where sterilized materials are kept and stored, generally, are shared with the sterilization area⁽²⁰⁾. At the end of the process, the autoclaves liberate a large quantity of steam and the physical structure compromises the sterilization of the materials, as it changes the environment's levels of humidity and temperature⁽²⁰⁾. In this regard, the results found indicate the compromising of the sterilization process, both through the liberation of humidity in the area of storage and distribution of materials, which take place in the same physical space as the sterilization, and because of the flow of people, given that the sterilization process takes place in the medical/dental procedure room.

This study's results reinforce what is indicated in the literature: that the stages of records of the processes of sterilization in small-scale health centers may not take place precisely because they have a low flow and because they undertake the reprocessing immediately after the use of the instruments⁽²¹⁾. One study shows that records, in nursing, when they exist, but are incomplete, can negatively influence the care process⁽²²⁾. Records allow communication within the health team, promote care with efficiency, quality and safety, and assist in the advance of the science of nursing through the development of new experiences and knowledges⁽²³⁾.

According to SOBECC, surgical grade paper is currently the most-indicated wrapping for the sterilization processes of materials in autoclaves⁽¹³⁾. The aim of the wrappings is to protect the material after the sterilization process, helping in the article's sterility up to the point of use and allowing aseptic and safe technique; they must allow adequate identification of the wrapped articles⁽³⁾, minimizing the hospitalizations or other costs in the health services, which arise from infectious processes resulting from the poor quality of the assistance provided⁽⁶⁾. As a result, the services investigated are found to be adequate in relation to the choice of the wrapping, conferring safety and stability of the sterilization up to the point of use.

The labeling of the product for health is of extreme importance for identifying its origin, and must contain the following data: the correct name of the article or kit; the lot control number; the date of sterilization; the name of the member of staff who packed the article; and, furthermore, the type of sterilization process⁽³⁾, which diverges from this study's results, in which there is no standardization of the elements of the labeling.

For these services, each unit is advised to establish periods of validity for the reprocessed products. However, it is good to emphasize that variables such as air temperature and humidity, and the conditions of the wrappings and storing are important for this material's quality⁽³⁾, and their control needs to be implemented in all the outpatient centers investigated in this study.

The dental-medical-hospital products require rigorous control, if the patient's health is not to be compromised through hospital infection⁽²⁾. Among these, physical control is undertaken through the measuring of specific parameters during the sterilization, through the inspection of the performance of the sterilizer, such as the temperature and pressure manometers. These must receive frequent maintenance, and be calibrated when necessary, so as not to compromise the reliability of their readings^(3,5).

Some latest-generation sterilizers function with automatic cycles, fixed and controlled by a microprocessor; at the end of each cycle, printed records are obtained of the process's parameters⁽³⁾. Although the services studied have automatized sterilizing equipment, as the sterilization cycles are previously programmed, the equipment does not give printouts with data regarding the sterilization process, which requires the professional to control the physical parameters of this process.

The services investigated do not undertake biological controls, which consist of standardized

preparations of bacteria and spores which, after passing through the sterilization process and having access to a culture medium are incubated in temperatures of 37°C to 56°C, with effective and rapid results⁽⁵⁾. In this process, if there is proliferation and growth of the microorganism, the culture responds with a change in its coloration, which indicates failure in the sterilization process. When the color remains unchanged, the product has been sterilized^(3,5).

Another control which is not undertaken, according to the participants in this study, is the microbiological test, an indicator which may be read fast in the validation tests and the routine autoclave tests, with high reliability in the readings, safety in the liberation of the batches, and low risks of infection. Its use is recommended daily or weekly in a single package in the coldest place, in the first load of the day⁽³⁾. There is a shortfall in professional updating in health services centers, resulting from unawareness of new technologies of care, which are constantly changing⁽⁶⁾.

● CONCLUSIONS

Through investigating the practice of the professionals who work in an outpatient occupational health center, one can perceive that there is a long road to be traveled in order to improve the conditions of disinfection and sterilization of the materials in these units. Weak points were identified, both in physical structure, which should allow a unidirectional flow of the reprocessed materials, and in the processes which permeate the disinfection and sterilization of the dental-medical-hospital materials, which can compromise the safety of the professionals and of those who use these services.

The outpatient occupational health units have a continuous flow of attendance, thus requiring a reorganization of the processes, with a view to the implementation of specific areas for the reprocessing of materials in the units studied. Furthermore, it is possible to perceive a gap in the preventive maintenance of equipment in the units, failing to comply with the legislation currently in place in Brazil.

In this regard, the authors advise the development of protocols for procedures for each area of the CSD, so as to allow the standardization of the processes and, consequently, the minimization of the costs, and improvement of the worker's health conditions and safety.

The implantation of physical, chemical and biological tests is recommended for the validation of the sterilization process, as is the recording of this process in all the units, thus making it possible to track the reprocessed materials. The appropriate disinfection and sterilization process, and its faithful recording, besides offering safety to the workers, provides legal support for the company and the professionals who work in these areas.

This study reveals the need for continuous education at work, with a view to keeping up with the development of new technologies of care and implementing strategies for good practices regarding the process of disinfection and sterilization. Furthermore, the results evidence the shortage of structural and procedural reorganization in relation to disinfection and sterilization of products for health, in order to respond minimally to the Brazilian legislation currently in place.

In accordance with Regulatory Norm NR 32/2002, which rules on safety and health at work in the health services, it is necessary to practice continuous education, a fundamental requirement for training the professionals from the area of health who carry out the reprocessing of materials, as well as the undertaking of further studies which measure the effect of the training undertaken in the health services.

However, the technical responsibility for the process of sterilization must be taken on by professionals trained for this purpose, with a view to improving the quality of the health services provided to the workers in company outpatient centers.

● REFERENCES

1. Potter PA, Perry AG. Fundamentos de enfermagem. 5. ed. Rio de Janeiro: Guanabara Koogan; 2004.
2. Mozachi N, Souza VHS. O hospital: manual do ambiente hospitalar. 3. ed. Curitiba: Ed. Curitiba; 2009.
3. Possari JF. Centro de material e esterilização: planejamento, organização e gestão. 4. ed. São Paulo: Iátria; 2010.
4. Paurosi DR, Ascari RA, da Silva OM, Ascari TM. Diretrizes operacionais para uma central de Material e esterilização odontológica: Uma proposta da enfermagem. Revista UNINGÁ Review. Maringá. 2014; 17(2) [acesso em 08 jan 2015]. Disponível: http://www.mastereditora.com.br/periodico/20140129_171733.pdf
5. Berlet LJ, Ascari RA, da Silva OM, Trindade LL, Krauzer IM, Jacoby AM. Factors that influence the quality of the sterilisation process. J Nurs UFPE on line. 2014; 8(7) [acesso em 07 jan 2015]. Disponível: http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/view/5780/pdf_5484
6. Maldaner C, Berlet LJ, Ascari RA, Klein ML, Savian BA, da Silva OM. Invólucros para Esterilização de Materiais odonto-médico-hospitalares. Rev Saúde Pub Santa Catarina. 2013; 6(3) [acesso em 02 fev de 2015]. Disponível: <http://esp.saude.sc.gov.br/sistemas/revista/index.php/inicio/article/viewFile/180/223>
7. Ouriques CM, Machado MÉ. Nursing in the process of sterilization of materials. Texto contexto - enferm. 2013; 22(3) [acesso em 20 jan 2015]. Disponível: <http://dx.doi.org/10.1590/S0104-07072013000300016>
8. Ascari RA, Vidori J, Moretti CA, Perin EMF, da Silva OM, Buss E. O processo de esterilização de materiais em Serviços de Saúde: uma revisão integrativa. Braz. J. Surg. Clin. Res., 2013; 4(2) [acesso em 22 dez de 2014]. Disponível: http://www.mastereditora.com.br/periodico/20130831_181149.pdf
9. Bianchi EC, da Silva EJ, Cezar FAG, Aguiar PR, Bianchi ARR, Freitas CA, Riehl H. Aspectos microscópicos da influência dos processos de esterilização em pontas diamantadas. Mat Res. 2003;6(2) [acesso em 14 nov 2014]. Disponível: <http://dx.doi.org/10.1590/S1516-14392003000200015>
10. Ministério do Trabalho e Emprego(BR). Norma Regulamentadora N° 32 – Segurança e Saúde no Trabalho em Estabelecimentos de Saúde. Ministério do Trabalho e Emprego, 2011. [acesso em 14 nov 2014]. Disponível: <http://portal.mte.gov.br/legislacao/normas-regulamentadoras-1.htm>
11. Ministério da Saúde (BR). Agência Nacional de Vigilância Sanitária – ANVISA. RDC N. 15 de 15 de março de 2012 que dispõe sobre requisitos de boas práticas para o processamento de produtos para saúde e dá outras providências [acesso em 22 ago 2013]. Disponível: http://portal.anvisa.gov.br/wps/wcm/connect/7599770043e684468b198f45f7d4e4/rdc0015_15_03_2012.pdf?MOD=AJPERES
12. Ascari RA. Retrospectiva das políticas de saúde do trabalhador no brasil: avanços e desafios do sistema único de saúde – SUS. Acta IUS – Periódico de Direito. 2014; 4(1) [acesso em 20 abr 2015]. Disponível: http://www.mastereditora.com.br/periodico/20150411_124642.pdf
13. Sociedade Brasileira de Enfermeiros de Centro Cirúrgico, Recuperação Anestésica e Centro de Material e Esterilização (SOBECC). Manual de práticas recomendadas da SOBECC. 6ª ed. São Paulo; 2013.
14. Psaltikidis EM, Graziano KU, Frezatti F. Cálculo dos custos do reprocessamento de pinças de uso único utilizadas em cirurgia video-assistida. RevEscEnferm USP. 2006; 40(2). Disponível: <http://dx.doi.org/10.1590/S0080-62342006000200012>
15. Bartolomei SRT, Lacerda RA. Trabalho do enfermeiro no centro de material e seu lugar no processo de cuidar pela enfermagem. RevEscEnferm USP. 2006; 40(3) [acesso em 20 nov 2014]. Disponível: <http://dx.doi.org/10.1590/S0080-62342006000300014>
16. Moura MLPA. Enfermagem em centro de material e esterilização. 10ªed. São Paulo: SENAC; 1994.
17. Espindola MCG, Fontana RT. Riscos ocupacionais e mecanismos de autocuidado do trabalhador de um centro de material e esterilização. Rev. Gaúcha Enferm. 2012; 33(1) [acesso em 16 fev 2015]. Disponível: <http://dx.doi.org/10.1590/S1983-14472012000100016>

18. Sulbacher E, Fontana RT. Concepções da equipe de enfermagem sobre a exposição a riscos físicos e químicos no ambiente hospitalar. *RevBrasEnferm.* 2013; 66(1) [acesso em 18 nov de 2014]. Disponível: <http://dx.doi.org/10.1590/S0034-71672013000100004>
19. Ministério da saúde(BR). Agência Nacional de Vigilância Sanitária – ANVISA. RDC N°. 50, de 21 de fevereiro de 2002 que aprova o Regulamento Técnico destinado ao planejamento, programação, elaboração, avaliação e aprovação de projetos físicos de estabelecimentos assistenciais de saúde. ANVISA, 2002. [acesso em 17 out 2014]. Disponível: <http://portal.anvisa.gov.br/wps/wcm/connect/ca36b200474597459fc8df3fbc4c6735/RDC+N%C2%BA.+50,+DE+21+DE+FEVEREIRO+DE+2002.pdf?MOD=AJPERES>
20. Bruna CQM, Graziano KU. Temperature and humidity in the storage area of sterile materials: a literature review. *Rev. esc. enferm. USP.* 2012; 46(5) [acesso em 22 nov 2014]. Disponível: <http://dx.doi.org/10.1590/S0080-62342012000500025>
21. Ascari RA, Silva OM, Azevedo Junior L, Berlet LJ, Maldaner C, Mai S. Fluxo de materiais odonto-médico-hospitalares durante o seu reprocessamento em unidades básicas de saúde. *RevUdesc em Ação.* 2012; 6(1) [acesso em 20 dez 2014]. Disponível: http://www.revistas.udesc.br/index.php/udescemacao/article/viewFile/2486/pdf_102
22. Marques PA, Melo ECP. The working process of a neonatal intensive care unit. *Rev. esc. enferm. USP.* 2011; 45(2) [acesso em 18 dez 2014]. Disponível: <http://dx.doi.org/10.1590/S0080-62342011000200011>
23. Barra DCC, Dal Casso GTM. Padrões de dados, terminologias e sistemas de classificação para o cuidado em saúde e enfermagem. *RevBrasEnferm.* 2011; 64(6) [acesso em 15 fev 2015]. Disponível: <http://dx.doi.org/10.1590/S0034-71672011000600023>