PATH ADEQUACY OF DENTAL EQUIPMENT AT MATERIAL STORAGE CENTER
ADEQUABILIDADE DO PERCURSO DE INSTRUMENTAIS ODONTOLÓGICOS NA CENTRAL DE MATERIAL E ESTERILIZAÇÃO
ADECUACIÓN DEL RECORRIDO DE INSTRUMENTALES ODONTOLÓGICOS EN LA CENTRAL DE MATERIAL Y ESTERILIZACIÓN
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ABSTRACT
Objective: analyze the path adequacy of dental equipment at the material storage center. Method: quantitative, descriptive, observational study, developed at 10 dental units with material storage center. A questionnaire was used to collect the data, analyzed by means of simple descriptive epidemiology based on tables. Results: dental services without appropriate physical facilities for material processing were predominant; without a specific entry door for contaminated materials; none of the services performs visual inspection with a magnifying glass during cleaning; and the packing of the sterilized tools was appropriate. As to the sterilization confirmation tests, the monthly chemical test was predominant. Conclusion: the services do not comply with the minimal health surveillance requirements for quality in the processing of dental equipment. Descriptors: Sterilization; Dental Research; Public Health Dentistry.

RESUMO
Objetivo: analisar a adequabilidade do percurso de instrumentais odontológicos na central de material e esterilização. Método: estudo quantitativo, descritivo, observacional, realizado em 10 unidades odontológicas com central de material e esterilização. Foi utilizado um questionário para a coleta de dados, analisados pela epidemiologia descritiva simples a partir de tabelas. Resultados: predominaram unidades odontológicas que não apresentam espaço físico adequado para processamento de materiais; não apresentam porta de entrada específica para materiais contaminados; nenhuma faz inspeção visual com auxílio de lupa na limpeza; e a embalagem dos instrumentais esterilizados foi adequada. Quanto aos testes para confirmações de esterilização, houve prevalência do teste químico mensal. Conclusão: as unidades não atendem às exigências mínimas da vigilância sanitária para qualidade no processamento de instrumentais odontológicos. Descritores: Esterilização; Pesquisa em Odontologia; Odontologia em Saúde Pública.

RESUMEN
Objetivo: analizar la adecuación del recorrido de instrumentales odontológicos en el centro de material y esterilización. Método: estudio cuantitativo, descriptivo, observacional, desarrollado en 10 unidades odontológicas con centro de material y esterilización. Fue utilizado un cuestionario para la recolección de datos, analizados por la epidemiología descritiva simple a partir de tablas. Resultados: predominaron unidades odontológicas que no presentan espacio físico adecuado para materiales contaminados; ninguna efectúa inspección visual con ayuda de lupa en la limpieza; y el embalaje de los instrumentos esterilizados fue adecuado. Respecto a las pruebas para confirmaciones de esterilización, prevaleció la prueba química mensual. Conclusión: las unidades no cumplen con las exigencias mínimas de la vigilancia sanitaria para la calidad en el procesamiento de instrumentales odontológicos. Descriptores: Esterilización; Investigación Dental; Odontología en Salud Pública.

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INTRODUCTION

In the 1980s, as from the earliest cases of the Acquired Immunodeficiency Syndrome (AIDS), there was greater interest in breaking the paradigms related to infection control in the health field, encompassing the dental offices, considered as one of the great potencies in the transmissibility of this disease due to the direct work with oral mucosa, a site of great cell proliferation.¹

According to Resolution 50 of the National Health Surveillance Agency (ANVISA), sterilization is the process of destroying or eliminating all forms of microbial life present, through physical, chemical or biological processes, preventing cross infections and contributing to biosafety.²

Biosafety is a new, multidisciplinary science that emphasizes actions to prevent, reduce or eliminate risks inherent in the activity. In dentistry, biosafety involves greater knowledge, responsibility, determination, organization and discipline than complex reasoning and techniques that are difficult to execute. Therefore, dental surgeons’ knowledge needs periodical updating.³

The physical control of the material processing comprises the monitoring of the critical parameters of each process, through manual registering or a printer connected to the sterilizer. The physical processes include sterilization by saturated steam under pressure and by dry heat - Pasteur oven. For chemical control, indicators and integrators are used with different forms in the market. These are: process indicator (zebra tape), indicator for use of specific tests (Bowie Dick test), single-parameter indicator, multi-parametric indicator, integrating indicator, and emulator or simulator indicator. Biological indicators are characterized by a standardized preparation of bacterial spores designed to produce suspensions with 105 to 106 spores per filter paper units. Bacterial species differ according to the sterilization process.⁴

In the preparation of the instruments, it is of fundamental importance for the sterilization to carefully inspect the cleaning and functionality of the materials, besides being one of the critical points for the material to be reused, as organic and inorganic residues can prevent the contact of the sterilizing agent or disinfectant.¹

In view of the above, the following question arises: what is the suitability of the dental instruments’ path in the material storage center?

OBJECTIVE

- To analyze the path adequacy of dental equipment at the material storage center.

METHOD

Article from the monograph << The path of the instruments after use in dental procedures >>, presented to the Nursing Department of Faculdade de Saúde e Desenvolvimento Humano Santo Agostinho / FASA. Montes Claros (MG), Brazil. 2015.

This is a quantitative, descriptive, observational study carried out in dental clinics in Montes Claros, Minas Gerais, Brazil, which are qualified to perform the following procedures: general practice, implantology, orthodontics and endodontics. To perform these procedures, the dental offices possess a set of equipment, such as: dental chair; photopolymerizer; amalgamator; high-rotation pen; micromotor; contra-angle; straight piece; intraoral chamber; autoclave and specific instrument kit.

The sample consisted of ten dental units, which were selected by convenience, being two clinics (one with four offices and one with three offices) and eight dental offices from the private network, totaling 15 offices. The following inclusion criteria were adopted for participation in the study: institution registered in the National Register of Health Establishment (CNES) and professional duly registered in the Regional Council of Dentistry of Minas Gerais (CRO-MG); Customer Service; and presenting a Material Storage Center (MSC).

The research universe for this study consisted of two dental clinics from the public network and eight offices from the private network. At these clinics from the public network, five dentists work at one and seven at the other; at the private offices, which are individual, the owner delivers the care; and at three public offices, care provision alternates with more than one professional. The ten units provide general care, but three are specialized in orthodontics and implantology, and seven in endodontics and prosthetics.

For the data collection, an observational script formulated by the researchers was...
used. A pre-test was carried out in order to verify the feasibility of the data collection instrument, with no need for alterations. The office where the pre-test was performed is not part of the study sample. Data collection took place in July and August 2014, when the researchers manually filled out the script, they observed whether the instruments, after use, went through the recommended health surveillance processes, these being: cleaning; visual inspection; packing; sterilization; monitoring and storage. No questions were directed to service staff.

After the data collection and ordering, the analysis and interpretation of these data were performed. Data were analyzed and discussed through simple descriptive epidemiology. The data were statistically represented in tables. Data was processed using Microsoft Excel® 2003.

The study complied with the ethical precepts established in Resolution 466/2012 of the National Health Council (CNS), which regulates research involving human beings. The research project received approval from the Research Ethics Committee of Faculdades Integradas Pitágoras de Montes Claros (CEP FIPMoc) by means of consolidated opinion 606.919 / 2014, Certificate of Presentation for Ethical Assessment (CAAE) 28772514.2.0000.5109.

Table 1. Observation profile of instrument path adequacy of dental services concerning infrastructure and material resources at MSC. Montes Claros, 2014. (n=10)

<table>
<thead>
<tr>
<th>Variables observed</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilities for material processing concerning presence of washing and sterilization.</td>
<td>01</td>
<td>09</td>
</tr>
<tr>
<td>Specific entry door for contaminated dental material.</td>
<td>02</td>
<td>08</td>
</tr>
<tr>
<td>Visual inspection with magnifying glass in instrument cleaning.</td>
<td>00</td>
<td>10</td>
</tr>
<tr>
<td>Appropriate packing of sterilized equipment.</td>
<td>07</td>
<td>03</td>
</tr>
<tr>
<td>Compliance with preset sterilization standards concerning time, temperature and pressure.</td>
<td>10</td>
<td>00</td>
</tr>
<tr>
<td>Equipment monitoring during sterilization process.</td>
<td>02</td>
<td>08</td>
</tr>
<tr>
<td>Storage of sterilized materials.</td>
<td>07</td>
<td>03</td>
</tr>
</tbody>
</table>

The monitoring of sterilization should include the physical, chemical and biological assessments of the sterilization processes. To confirm the sterilization through the chemical and biological test phase, 80% of the units perform chemical tests and 20% biological. In 80%, the tests are used once per month while, in 20%, no tests were used during the two-month observation period (Table 2). The Ministry of Health (MH) and the Health Surveillance recommend the weekly execution of the biological test.
DISCUSSION

The physical facilities of the MSC should permit the establishment of a continuous and one-way flow of medical-hospital and dental equipment, avoiding the crossing of dirty with clean and sterilized items, and also preventing the passage of workers from the contaminated area through clean areas and vice versa. 4, 6 In this study, most dental units do not comply with these determinations, as there is no separation between the contaminated area and the clean area, facilitating the transmission of a cross infection.

The operator has to visually inspect all instruments, using a magnifying glass attached to a table with a magnifying lens of at least four times, 7 checking the areas of greatest access difficulty, such as racks (toothed pieces), indentations, grooves, etc., with mechanical removal if necessary. 8, 9 This does not occur in the study in question in any of the units surveyed, so that there is no guarantee of effective sterilization.

Individual dental offices may not possess a simplified MSC and have, in the same environment, a washbasin and sterilization equipment, provided that routines are established for the asepsis and handling of materials to be sterilized. 9

There are many reasons why packing the instruments is necessary. The main issue is to keep the instrument sterile until it is unpacked for use. Thus, any article that will be sterilized, stored and transported should be packed in carefully selected packaging for the safety of the process. 8 In most units, the instruments are properly packed as recommended by ANVISA. There is a small part of the sample that does not meet this requirement though, which may negatively affect the sterilization process.

RDC 50 determines that the storage of the materials is one of the critical points to maintain their sterility and there are recommendations regarding the environmental conditions in the storage area. Among these, the control of the temperature (°C) and the relative humidity of the air are emphasized. 2 Sterilization follows an ideal time, temperature and pressure, so that the process is effective and does not cause damages to the instruments and the autoclave. All clinics maintain this pattern as observed in the study.

Ideally, the instruments should be stored in closed Formica-coated cabinets with shelves that are solely used for this purpose. They should be easy to clean (weekly) and kept in a cool, dry, airy place, free from odors and humidity. 8 The findings of this study are consistent with the recommendations in most of the units observed.

The effectiveness of sterilization of each processed article, whatever the method used, should be tested through constant monitoring by means of chemical, biological and integrating indicators. 10 The most commonly used confirmation test was the chemical test. The most practiced type in this process is the integrating indicator (internal indicator, monitors all the critical parameters of the sterilization process). This is executed at least once a month. There are units that perform these tests annually and compromise the quality of the sterilized material.

According to the Hospital Infection Control Coordination of the University Hospital Clementino Fraga Filho of Universidade Federal do Rio de Janeiro (CCIH / HUCFF / UFRJ), the physical tests involve the observation of the parameters during the sterilization process. Temperature and pressure should be read regularly during the sterilization phase itself in autoclaves. Manometers and equipment recorders need to be validated periodically. The chemical tests can be classified as specific indicators of temperature or indicators of multiple process parameters (time, temperature and steam), the latter
called integrators. These indicators should not be used as a single criterion of sterilization efficiency. Their routine use provides immediate reading of equipment failures with respect to vapor penetration or ethylene oxide concentration (C\textsubscript{2}H\textsubscript{4}O). The chemical tests are subdivided into: external, indicating that the steam has come into contact with the exposed surface; and internal, indicating that the steam has penetrated the inside of the package.\textsuperscript{11}

**CONCLUSION**

Considering the sterilization process, professionals who work in the units surveyed demonstrate that they are knowledgeable on the steps involved in this process. It is noted that there are doubts and insecurities during the process though, as well as the certainty that, in most cases, the environment and procedures are not appropriate, compromising the effectiveness of sterilization.

Most of the clinics observed showed nonconformities in the physical environment because there were no physical barriers capable of separating the clean from the dirty area, resulting in the finding of possibly contaminated articles. Therefore, raising these professionals’ awareness on the adequacy of these nonconformities is fundamental, in view of changes in legislation, in order to offer the client a quality service.

Being an under-explored subject with a lack of publications, the discussion and comparison of the results of this with other studies related to the topic. Thus, it is important to invest in studies about the proposed topic, in order to truly reveal its relevance and minimize infection figures.

Therefore, the result of this present study proved that the dental clinics of Montes Claros do not meet the minimum requirements of ANVISA for quality in the processing of dental instruments.

**REFERENCES**


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Path adequacy of dental equipment at...


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