

Health Services Waste Management: Analysis of the Management Plan of a Private Hospital Located in Southern Brazil

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ABSTRACT: The study aimed to analyze the procedures used to carry out the management of Health Services Waste in the hospital sector, considering as a study the Health Services Waste Management Plan (PGRSS) of the year 2020 of a private hospital in the interior of Rio Grande do Sul. Of a qualitative and analytical nature, bibliographic research was used as a research strategy, especially in scientific articles, dissertations and theses on the subject, in addition to the minimum legal-legal framework necessary to carry out the management of waste from the services of health (RSS). Documentary research and analysis of information explained in the Health Solid Waste Management Plan, base year 2020, of the hospital unit was undertaken, in light of the precepts required by specific and current legislation. The results show that, in general, the institution meets the necessary requirements for managing the RSS, lacking minor adjustments, such as improving the official illustrations contained in the informational posters in order to give a didactic sense to the entire process, despite the importance to incorporate these procedures into the corporate culture.

KEYWORDS: Solid Waste, Waste from Health Services, PGRSS, Public Health, Environment.

I. INTRODUCTION

A theme that came to have significant relevance in world organizations, giving rise to several studies, was solid waste management. In Brazil, despite specific legislation, there is still a considerable lack of policies and guidelines that effectively regulate the disposal of waste, and the existing ones are configured as limited and generic, due to the lack of resources and inadequate mechanisms. The incorrect handling of such materials causes waste, environmental damage, risks to public health and implications for the

quality of life of society (Schalch, Leite, Fernandes Junior & Castro, 2002).

Waste from Health Services (RSS), classified as solid waste, when incorrectly managed, entail potential negative impacts on the environment, such as pollution, contamination and changes in biological, chemical and physical aspects, in addition to serious risks to public health. Despite constituting only 1% of the total waste produced in Brazil, it constitutes an imminent danger for those who handle it, thus requiring adequate treatment (Delevati, Castro, Ries, Limberger & Rocha, 2019).

Thus, there is an urgent need to apply an appropriate methodology to this waste, instituting guidelines for its correct management, in order to prioritize the constant improvement of the procedures of the entire process, from segregation, temporary storage and disposal, thus avoiding damage environmental and social.

In this context, this article aims to analyze the procedures used to carry out the management of Health Services Waste in the hospital sector, considering as a study the Health Services Waste Management Plan (PGRSS) of the year 2020 of a private hospital located in the interior of the state of Rio Grande do Sul.

The problematization of this work consists of the following question: How is waste management carried out in the hospital segment? In view of this conjecture, analysis criteria were defined that enabled the verification of the methods used in the management of waste from the health sector, which promote the correct disposal of such materials and the investigation of bottlenecks that still exist in its guidelines that impact the environment and society's quality of life.

This study assumes that the management of hospital waste still has some aspects to be improved, and that there should be greater government demand in its sectorial legislation. Its

justification lies in the relevance of the works related to the importance of proper management of waste from health services, in view of the potential negative impacts it has.

II. LITERATURE REVIEW

2.1 Hospital Management

Hospitals are complex corporations and, as such, they suffer constant external interference, making up a complex sector as well. The changes faced by hospital institutions, especially with regard to the quality of services offered, in addition to the change in the demand profile of users of these services, are issues that managers must be continually aware of (Borba; Kliemann Neto, 2007).

In hospital entities, decision-making is ambiguous: on the one hand, leaders are concentrated, composed of technicians and specialists in the health area (nursing assistants and technicians, nurses, doctors, etc.); on the other, the managerial power, which develops the control of activities that are not of a medical nature. Thus, it is clear that the structure is composed of converging decision-making fields, causing management to face constant challenges (Vendemiatti, Siqueira, Filardi, Binoto & Simioni, 2007). In hospitals of reference in management, procedural analyzes are often performed, consisting of steps of control and knowledge, based on the organization's own actions, repeating successes and learning from mistakes (Burmester, 2012).

In a way, hospital administration does not detach from the general management model. The aspects covered, despite their individuality, encompass the management of people, processes and society. The economy is treated separately, because there are public and private entities. Burmester (2012) believes that the "profit" coming from the public sector is social, as it is related to the satisfaction of resource providers, and also of users, who, when they are satisfied with the service, add value to the entity.

2.2 Solid Waste Management

Solid waste is any type of material, generated through human or animal activity, and which has no use for the holder, and is therefore subject to disposal, but which still has potential for reuse (Russo, 2003).

Mannarino, Ferreira and Gandolla (2016) point out that, since the approval of the National Solid Waste Policy – Federal Law n°. 13,305, of August 2, 2010 – Brazil has undergone changes in relation to waste management. This policy was based on concepts used in developed countries,

mainly in Europe, and aims to establish guidelines related to "integrated management and solid waste management, the responsibilities of generators and public authorities and the applicable economic instruments". From this, the government has promoted actions, at the federal level, to improve solid waste management processes, in particular, final disposal in landfills and negotiations of sectorial agreements in order to implement reverse logistics. State governments are also mobilizing to transfer resources to municipalities in search of solutions to this highly complex issue.

2.2.1 Classification of Solid Waste

According to ABNT NBR 10.004, solid waste is classified into 2 classes, namely:

- a) Class I waste – Hazardous: is waste composed of flammable, corrosive elements or that pose potential risks to public health and the environment;
- b) Class II waste - Non-hazardous: this class is divided into two sub-classes:
 - Class II A waste – non-inert: waste in this group may have properties such as: biodegradability, combustibility or solubility in water. They also don't fit into any of the other classes;
 - Class II B waste – Inert: any waste that does not pose a risk to health or the environment and that, in contact with distilled or deionized water, at room temperature, does not present solubilization that compromises its potability.

2.3 Health Services Waste Management

According to Resolution No. 358, of April 29, 2005, of CONAMA - National Council for the Environment, waste from health services (RSS) is all those that result from activities carried out in the services of human or animal health care and that, due to their singularities, they need different procedures in their management, having, many times, the need for a previous treatment before their final disposal.

Hospitals, in turn, are the largest generators of RSS, and for this reason, such waste is popularly called hospital waste (Uehara, Veiga & Takayanagui, 2019; Cafure & Patriarcha-Gracioli, 2015). According to Resolution - RDC No. 222, of March 28, 2018, of ANVISA - National Health Surveillance Agency, hospital waste is classified into 5 groups: Group A (waste with biological risk), Group B (waste with chemical risk), Group C (waste with radioactive risk), Group D (common waste, which does not present biological, chemical or radiological risk to health or the environment) and Group E (waste with sharp risk).

As they are potentially dangerous, the aforementioned legal provisions establish that all services that generate RSS must prepare a Health Services Waste Management Plan – HSWMP, following environmental regulations and legislation. The HSWMP is a document that points out and describes the actions related to the handling of waste, covering a set of management mechanisms, with the objective of minimizing the generation and providing a safe and efficient management of waste, aiming at the protection of workers, health public, natural resources and the environment (Brazil, 2018).

Pursuant to ANVISA Resolution n°. 222/2018, management is a set of operations whose purpose is to manage health waste and comprises the following steps:

1. Segregation: Separation of waste at the time and place of its generation (according to physical, chemical, biological, physical state and risk characteristics);
2. Packaging: Packaging of waste (in suitable bags or containers, which prevent leakage and resist puncture, rupture and tipping);
3. Identification: Measures that allow the recognition of the risks of waste contained in bags and containers, and must be in a clear and legible form;
4. Collection and Internal Transport: Collection and transfer of waste from generation points to a place destined for temporary or external storage;
5. Temporary Storage: Temporary storage of waste collectors in an environment close to the generation points;
6. External Storage: Guard of waste collectors, with easy access to the external collection stage;
7. External Collection and Transport: Removal of RSS from external storage to the treatment unit or for final destination or disposal;
8. Treatment: Application of a process that modifies the characteristics of the waste, reducing or eliminating the risk of damage to the environment or public health;
9. Destination or Final Disposition:
 - Environmentally Appropriate Final Disposal: Disposal of waste that does not present risks, for reuse, recycling, composting, recovery, energy use, reverse logistics, or other destinations allowed by Organs competent;
 - Environmentally Appropriate Final Disposal: Disposal of tailing in landfills, observing operational standards, in order to avoid damage and minimize adverse environmental impacts.

Thus, it is imperative that hospital managers are aware of the importance of planning and managing,

in a cautious and responsible manner, the waste arising from this activity (Silva; Pereira, 2020).

2.4 Legislation

Resolution - RDC n°. 222, of March 22, 2018, by Anvisa, is the main resolution regarding the management of health services waste in Brazil, which contains all the necessary practices for an effective management and management of hospital waste. The same came into effect from the revocation of Resolution – RDC n°. 306, of December 7, 2004; bringing more didactic, objective standards and including new issues related to RSS.

Another legislation related to RSS is CONAMA Resolution n°. 358, of April 29, 2005, which presents the provisions on the treatment of health waste, with the aim of preserving public health and the environment. This resolution revoked the old one, n°. 283, of July 12, 2001.

Paragraph 3 of Art. 4 of RDC n°. 222/2018 of Anvisa, establishes that every RSS generator service must have an RSS Management Plan and those new generators have a period of 180 days, from its operation, to present the document. If the generating company has radioactive installations, it must meet the specific issues of the CNEN (National Nuclear Energy Commission).

Article 94 of the same resolution establishes that failure to comply with the rules presented constitutes a sanitary infraction, considering Law n° 6.437, of August 20, 1977, on violations of federal sanitary legislation, without prejudice to civil, administrative and criminal liabilities applicable.

Law n°. 6.437, of August 20, 1977, deals with infractions related to federal health legislation, presenting, in Article 2, the sanctions of a civil or criminal nature, the main ones being:

- Warning;
- Fine (double applied in case of recurrence);
- Cancellation of the company's operating permit;
- Cancellation of the establishment's business license;

In Article 4, sanitary infractions are classified as mild, serious and very serious. The light ones are those in which the offender is benefited by a mitigating circumstance; the serious ones are those in which an aggravating circumstance is verified; and the most serious refer to those in which the existence of two or more aggravating circumstances is verified.

Given that the scope of the legal-legal framework referring to waste from health services is high, it is not uncommon for there to be

overlapping of the devices, increasing the complexity and, in many cases, increasing the difficulty for managers in the correct management of this waste. As Oliveira (2010) points out, the lack of experience on the part of municipal public administrations, aggravated by the lack of qualified technical professionals, added to the complex, diffuse and sometimes conflicting information of standards and legislation, made it possible for the issue of solid waste management in general and solid health waste (SHW) in particular were left to the background.

III. METHODOLOGY

Considering that the methodology consists of a grouping of techniques disposed to achieve the objectives of a study (Cervo, Bervian & Silva, 2007), bibliographic research was used in this work as a research strategy (Martins, 2016), which, according to Fontelles, Simões, Farias and Fontelles (2009), aims to bring the researcher closer to the topic to be studied, through the verification of studies already published in books, articles and journals. Macedo (1994) states that in this research, bibliographic information is sought, documents that relate to the research problem are selected. As for the approach, considered of a qualitative nature, that is, the research is carried out through descriptions, interpretations and comparisons of information.

Thus, in order to carry out the bibliographical research, a search for publications related to the management of health services waste was carried out, at first. We also sought to clarify the legislation covering waste management and its implications for the hospital sector in general. In the initial research, studies were considered in a comprehensive way, with the works of interest, giving priority to full texts. As inclusion criteria, national works that encompassed the mentioned themes were superimposed.

In the conception of Sá-Silva, Almeida and Guindani (2009), the use of documents in research should be appreciated and valued. The wealth of information that can be extracted and retrieved from them justifies its use in various areas of the Human and Social Sciences, as it allows to broaden the understanding of objects whose understanding needs historical and sociocultural contextualization, in addition to analytical treatment or that can still be re-elaborated in accordance with the objective of the research, in the molds proposed by Gil (2008). The document used as the object of analysis was the Health Services Solid Waste Management Plan (HSSWMP), base year 2020, of a private hospital

located in the interior of the state of Rio Grande do Sul, published and available on its institutional website.

IV. RESULTS AND DISCUSSION

4.1 National Confederation of Medical Cooperatives - Unimed

The National Confederation of Medical Cooperatives (UNIMED) is a Brazilian cooperative organization that operates in the health sector. The current system is broad and includes 345 cooperatives, with 116 thousand cooperating physicians, resulting in a total of 17 million beneficiaries throughout Brazil. Unimed offers emergency care, medical assistance (ambulances and laboratories) and hospital services. In addition, the company obtains 37% of operation in the national health plan market (Unimed, 2021).

Among the health units belonging to the Unimed group, the Hospital located in the interior of the state of Rio Grande do Sul, informs that it has a considerable number of 440 direct and outsourced employees, who are responsible for providing Oncology, Neonatal ICU services, Adult ICU, Tomography, Mammography, Hemodynamics, ICD, Bone Densitometry, Clinical Surgery and Obstetrics.

The activities carried out at the unit provide monthly support to approximately 5,626 members of health plans. The establishment with a total of 3,518.06 m² of built area and 51 clinicians, namely: obstetric, pediatric and surgical; 7 adult ICU and 9 neonatal ICU. Services are provided at any time, operating 24 hours a day, every day of the week.

4.2 Characterization of Environmental Aspects

The institution's water supply occurs through the public supply network, COMUSA, which is in charge of all water distribution in the establishment. Cleaning, disinfection and physical-chemical analyzes of water reservoirs are carried out every six months on a scheduled basis. Sanitary sewage is directed to the sump and filter, before being sent to the COMUSA treatment plant. This procedure is in line with CONAMA Resolution No. 358/2005, which establishes that, in order to be discharged into the public sewage system, liquid effluents from health services must comply with the guidelines established by the competent sanitation and environmental agencies.

4.3 Amount of Health Service Waste produced

Approximately 40,000l of Group A waste are produced monthly. According to Anvisa Resolution RDC n°. 222/2018, Group A waste is

those that may contain the presence of biological agents capable of causing infection risks. At the institution, both infectious waste (gloves, gauze, probes, among others) and waste from anatomical parts (members of the human body) are produced.

There is the disposal of 3,000l of waste per month from Group B, that is, those with chemical risk, which demonstrate a potential risk to public health and the environment (Brazil, 2018). Examples are expired medicines and cleaning products.

There is also the monthly production of 85,000 l of Group D, waste considered common, as it does not present contamination risks (Brazil, 2018), namely: recyclable materials (packaging, sheets of paper, glass bottles) and organic waste/rejects (food scraps, diapers).

Finally, there is the production of 100l of cooking oil rejects and 1,000l of Group E waste, characterized as materials that can cut or perforate – scalpels, needles, scissors. Table 1 presents the main groups of waste and their approximate amounts of generation.

Table 1: Approximate amount of waste collected by waste group

Groups	Total Waste (liters/month)
A	40.000
B	3.000
D	85.000
E	1.000
Kitchen oil rejects	100

4.4 RSS Management Steps







Regarding the management of health services waste, the PGRSS of the analyzed institution describes the procedures performed at each stage of their handling, in accordance with what is required by Article 6, item II, of RDC No. 222/2018 of Anvisa, which establishes that the HSWMP must describe the procedures related to the generation, segregation, packaging, identification, collection, storage, transport, treatment and final disposal of environmentally appropriate waste.

In the first step (segregation) the unit informs that the generating rooms and environments have collectors and Descarpack (sharp-sharp waste collector) necessary, meeting the requirements of Art. 11 of RDC n°. 222/2018 of Anvisa, which establishes that service waste must be segregated at the time of their generation, according to their classification. However, the institution's HSWMP does not inform, in greater detail, how waste is separated according to its

classification, it only reports that the rooms have the necessary collectors. It would be recommended that after mapping the residues of that category, a description was drawn up that could remain posted in the place with better visibility. In addition, the HSWMP could describe, in more detail, how waste is segregated.

Regarding the packaging stage, Article 7 of Resolution n°. 358/2005 of CONAMA, informs that the RSS must be stored in compliance with the legal requirements and norms of the Brazilian Association of Technical Standards – ABNT; however, there is no specification of which NBR should be followed. In the PGRSS, the unit informs that it follows the standards of ABNT NBR 9191 - Plastic Bags for Packaging Waste, which contains information for the packaging of infectious waste. It also follows CONAMA Resolution n°. 275/2001 - Color coding for the different types of waste, using the following colors of plastic bags for the respective waste (Table 2):

Table 2: Colors of plastic bags for packaging

Color	Types of Waste
	Biological Waste
	Chemical Waste
	Organic Waste
	Glasses
	Anatomical Parts (Group A3)
	Recyclable

Regarding subgroup A3, it is informed that this type of waste is packed in red bags and identified with the inscription "ANATOMIC PARTS", when sent for incineration. The unit follows Art. 52 of RDC n°. 222/2018 of Anvisa, which determines that when sent for incineration, the RSS of Subgroup A3 must be packed in red bags and identified with the inscription "ANATOMIC PARTS".

In the Identification stage, the unit informs, via the Solid Health Waste Management Plan, that it follows the standards of ABNT NBR-7500 regarding the identification of waste, using the following images (Figure 1). According to Annex II of RDC n°. 222/2018 of ANVISA, group A and E must be identified by the biological risk symbol, with a white background label, black design and contours, plus the corresponding expression "infectious waste" or "sharps".

However, the institution uses the same identification for both types of waste, with the expression "contaminated", following the ABNT

NBR-7500 standard, for “infecting substance/residue”. Group B must be identified through a symbol and risk phrase associated with the hazardousness of the chemical residue. And group D must be identified as defined by the urban sanitation agency.

Figure 1: Identification of RSS in the analyzed unit



According to Art. 22 of RDC nº222/2018 of Anvisa, the identification must be affixed to the collection cars, in the storage places and in the bags that contain the waste. However, the bags that store Group D waste do not need to be identified (Paragraph 1, Art. 22 of RDC nº. 222/2018 of Anvisa).

It is noticed, however, that the resolution of the image made available in the institution's document is of low quality, compromising the clarity and consequent comprehension of the text that accompanies the figures. In addition, the unit does not inform if the identification is affixed in a visible place, in a clear and legible way (according to the requirement of paragraph 2, Art. 22 of RDC 222/2018 of Anvisa) nor if the identifications are printed (the use of adhesives – paragraph 3 of Art. 22 of RDC 222/2018 of Anvisa).

In the Internal Collection and Transport stage, it is informed that the route, the collection of waste and dirty clothes takes place at pre-established times. At this stage, the unit meets the prerogatives of Art. 25 of RDC nº. 222/2018 of Anvisa, which determines that the internal transport of waste must be carried out according to defined routes and times. The institution informs that this process is carried out by the hosting team, using personal protective equipment (PPE), which forwards waste and dirty clothes to temporary storage. Afterwards, the bags of waste are removed from the purge and sent to the Waste Center, while the bags of clothes are sent to the Laundry Room.

With regard to transport, it is stated that the waste is transported from the generating units to the purges, as required, using collection cars. According to item XVII of Article 3 of RDC nº. 222/2018 of Anvisa, "collection cart is a container

with wheels used to store and transport internally the bags with waste". Art. 26 of RDC nº. 222/2018 of Anvisa, states that collectors for internal transport are "of smooth, rigid, washable, waterproof material, provided with a hinged cover to the body of the equipment, corners and rounded edges." And, according to the Sole Paragraph of Article 26, "collectors with more than four hundred liters of capacity must have a drain valve at the bottom."

The collection carts are made of rigid material, white, washable, waterproof and equipped with a hinged cover, rounded corners and edges, and the wheels are covered with material that reduces noise. In addition, they have a bottom drain valve and are cleaned and disinfected three times a week, or more if necessary. The specifications informed about the collection carts follow current regulations.

In the Temporary Storage stage, the waste is stored in colored plastic bags, inside boxes or under pallets made of washable material, in a covered place and restricted to employees. According to Art. 27 of RDC nº. 222/2018 of Anvisa, it is mandatory to maintain the bags packed inside collectors with the lid closed in temporary and external storage; thus, it is clear that keeping the bags on pallets is not the recommended way. However, the institution does not inform which waste remains in boxes and which remains on pallets.

External Storage is carried out at the Waste Center; a place that has separate shelters for hazardous waste (such as biological, sharps and chemical), organic and recyclable waste, hazardous waste (such as light bulbs) and electronic waste. In addition, it is informed that the site is located in a covered area, in which it is identified and restricted to employees. It has a smooth, waterproof floor and cleaning occurs weekly. Regarding on-site packaging, 1000l containers, 200l plastic drums, wooden boxes, cardboard and pallets are used.

The institution complies with Article 34 of RDC nº. 222/2018 of Anvisa, which determines that the outdoor shelter “must have, at least, an environment to store Group A waste collectors (may contain group E waste), and another exclusive environment to store the waste collectors from group D health services”. Also following item IV of Article 35, which establishes that the external shelter must be “built with a floor, walls and ceiling of resistant material, washable and easy to clean”; as well as item VI, which determines “restricted access to people involved in the management of RSS”.

The external collection and transport stage is carried out by outsourced companies, according to the table in the HSWMP (Table 3). The institution does not inform the full names of the outsourced companies, being added by the authors in order to better understand the information.

Table 3: Types of waste, contracted companies and collection frequency

Waste Type	Company	Frequency
Group A and E	Servioeste - Environmental Solutions for Health Waste	Weekly
Group B	Servioeste - Environmental Solutions for Health Waste	Weekly
Group D Organic	City Hall	3 x week
Group D Recyclable	Trashin - 360° Waste Management	3 x week
Battery	Reverse Waste Management	According to the necessity
Fluorescent Lamps		
Electronic Waste		
X-Ray Vests		
X-Ray and Plates		
Uniforms		
Personal Protective Equipment		
Mouse Pad		
Oil	Coletto - Recycling and Collection of Vegetable Oils	

In the last step, Treatment and Final Disposal, methods and processes are applied to eliminate the risks of contamination of each waste. Those that can be reused are destined for this purpose - recycling, co-processing or reverse manufacturing -; and those that are not, are sent to the licensed landfill. Table 4 shows the table in the document, containing information on the type of waste, contracted company, type of treatment and the final disposal. Again, the institution does not inform the full names of the outsourced companies,

being added by the authors in order to better understand the information.

Table 4: Types of waste, contracted companies, types of treatment and final disposal

Waste Type	Type of Treatment	Final Disposition
Group A and E	Autoclaving	Licensed landfill
Group A3	Incineration	Licensed landfill
Group B	Co-Processing	Licensed landfill
Group D Organic	Screening	Licensed landfill
Group D Recyclable	Screening	Recycling
Battery	Decontamination	Recycling
Electronic Waste	Reverse Manufacturing	Reuse
Uniforms	Co-Processing	Licensed landfill
PPE	Co-Processing	Licensed landfill
Mouse Pad	Co-Processing	Licensed landfill

According to Article 40 of RDC n°. 222/2018 of Anvisa: "WSR that do not present biological, chemical or radiological risk may be sent for recycling, recovery, reuse, composting, energy use or reverse logistics", as seen in table, in which electronic waste, used batteries and group D – Recyclable, are destined for recycling or reuse. The remaining residues are sent to the licensed landfill, as they are considered tailing or hazardous.

In addition, FEPAM Ordinance n°. 087/2018 establishes the obligation of the document "Waste Transport Manifest (WTM)" for the disposal of waste in the state of Rio Grande do Sul. The unit informs that the document contains information about the typology, quantity, generator, conveyor, final destination and form of waste treatment. It is also informed that, for the collection of waste from healthcare services of Group A, B and E, the Environmental and Sustainability Analyst or Assistant issues the WTM 24 hours in advance. The document is sent by e-mail to the professional who monitors the collection at the unit, is printed, checked and signed by him, and is delivered to the employee of the company that collects the hazardous waste.

4.5 Other Waste

With regard to other waste generated, the unit informs that they come from activities related

to the institution's operation and that they have different types of treatment, taking into account their specifications.

Liquid chemical waste must be kept in its original packaging, after being originated in processes that involve nursing, according to article RDC n°. 222/2018 of Anvisa. However, the unit does not inform how its management is carried out, only informing that it follows the guidelines of the

Chemical Product Safety Data Sheet (CPSDS) provided by the manufacturer.

A liquid spill must be treated with what is stated in IT-GER-2.0039 - Use of the Emergency Kit for Spills (company internal document), and there are two emergency kits in the unit for situations that fall into this type of occurrence. The kit consists of solidifying powder, cord, blankets, pillow and absorbent fiber.

The diagnostic imaging procedures generate residues that are classified in group B (chemical), which are later separated between paper and plastic films. According to the Health Services Waste Management Plan, a company is hired for collection when the storage location is at the limit of its capacity. Outsourced collection is also done for the collection of uniforms and PPE that are no longer in good condition or not being used.

Batteries, whose expiration date has expired, are sent to an ecological collector, and then sent to cardboard boxes for disposal, decontamination and final disposal. Burnt light bulbs, on the other hand, are disposed of in the hazardous waste center and are also stored in boxes for the marketing and sustainability sector to direct their correct disposal.

Regarding civil construction waste, disposal follows what is recommended in PN-GER-2.001 - Civil Construction Waste Management Plan (company's internal document). In addition, the unit informs that it is possible for the public to receive donations of materials and equipment from the unit. Confirmation of the exchange depends on the write-off of assets and authorization from the management, from the completion of FM-SUP-11.0001, according to PR-SUP-11.02 - Management of Fixed Assets (company's internal document).

Regarding the disposal of materials and equipment, the unit informs that it follows Law 12,305/2010 - National Policy on Solid Waste, with disposal being evaluated on a case-by-case basis. Each request follows the deadline of PR-GER-1.09 - Integrated Communication (company's internal document), and is sent for disposal depending on its characteristics.

4.6 Environmental Risks

The environmental risks arising from the waste generated by the unit are grouped according to the molds created by ANVISA and CONAMA through RDC n° 222/2018 and Resolution n° 358/2005, respectively, which establish 5 groups for classification of these residues. In addition, two more groups that refer to electronic waste and PPE are presented.

The groups are divided by type of material and are represented by letters from "A" to "E", each of which presents the types of risks present and their level of potential impact in case of incorrect handling by the involved.

Group A is composed of biological and/or contaminated waste with a high potential for impact. Group B is composed of chemical residues, too, with high-risk potential. The plan does not include group C, which would be composed of radioactive waste. Group D is composed of waste that does not pose a risk of contamination and can be compared to household waste. Group E is composed of sharp materials with high impact potential. The group of batteries and electronic waste contains a high potential for risk due to the composition of the materials. And, finally, the group of PPEs with medium risk potential.

The preventive control of insect and rodent infestations is carried out by a third-party company, once a week, and it issues monthly reports, which are stored in electronic folders. The training of employees follows the precepts of Art. 91 of RDC ANVISA n° 222/2018. They address the laws in force, the identification, management and ways to reduce the generation of waste and preventive care against accidents, in particular, focus on the use of PPE.

Finally, frequent monitoring of all plan activities is carried out, which are annually evaluated by technical personnel. Any record generated from this must be stored for at least 5 years, either in physical or electronic files, following the definitions of ANVISA Resolution RDC n°. 222, of March 28, 2018, which determines this period as the minimum necessary.

V. CONCLUSION

The context of solid waste management goes beyond the correct disposal of these materials. The management of Waste from Health Services, due to its potential risk to health and the environment, involves a series of processes stipulated by current legislation, which guide specific steps for the treatment and proper disposal of this waste.

This article sought to analyze the procedures used to carry out the management of Health Services Waste in the hospital sector, based on the Health Services Waste Management Plan (HSWMP), year 2020, of a hospital located within the state of Rio Grande do Sul.

The analysis of the unit's HSWMP made it possible to verify the procedures carried out by the establishment that are in compliance with the law. The treatment of liquid effluents is carried out before they are released into the public sewer system, there is preventive control of insect and rodent infestations on a weekly basis, constant training takes place with employees related to waste reduction and preventive care against accidents, waste collection they are carried out at pre-established times, transport follows current guidelines and there is frequent monitoring of all plan activities. However, the plan could address each step in more detail, such as offering more details that the waste segregation step is carried out and identifying these wastes in accordance with ANVISA's RDC n°. 222/2018.

Thus, it is seen that due to the complexities involved in this sector and the requirements of legislation, it is extremely important that the hospital administrator is aware of the legislation in the area and that he constantly updates in order to obtain adequate compliance with the standards, which directly impact the quality of life of the population and the preservation of the environment.

The work has limitations, especially regarding the fact that it is restricted to the documental analysis of the HSWMP, with no field research process having been undertaken in order to give greater breadth to the work, as well as the verification of the veracity of the information, among other important observations that could be done in person. Furthermore, the study intends to contribute to stimulate a research agenda that includes extremely relevant themes in the context of private and public management, especially regarding public health and other relevant guidelines.

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