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Hospital waste- Recycling for hospital energy feedback

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ABSTRACT

Considering the view of hospital waste as dangerous and potentially infectious, the treatment given may be diffuse and inadequate. In this context, this work aimed to investigate the possibility of adapting recycling methods to various hospital waste, to generate energy to feed back the hospital building. Solid waste, especially health waste, is today a major pollutant of the environment and the legislation exempts the State from responsibility for its illegal disposal in common landfills. Hospital administrators may package and store in a way that does not consider the type of collection, transportation, treatment, and destination system. The current legislation lacks more in-depth research in the area to work in a more functional way and consider the possibility of recycling to generate products that can be used again, with minimal dumping and damage to the environment. Currently, hospital buildings do not have processes that enable total efficiency of their structure and ways to feed back into the building itself. It is still necessary, in most cases, to use extra power generators and dispose of water, garbage and other materials that can be reused. It was only in 2010 that the law establishing the National Solid Waste Policy was approved, after twenty years of discussions in the National Congress. This law establishes that environmental education is a fundamental instrument for success in this purpose of changing a culture in relation to waste disposal. In fact, garbage is a word that has already been proscribed by law, and today we speak of waste and rejects, because everyone should take advantage of this material. There is also a concern with improving the quality of life of human beings, the maintenance of life on the planet and the survival of the ecosystem. Doubts arise about what to do with the production and with what has already been produced of waste so that it does not cause further irreversible damage to the environment. It is these doubts that arose for the research theme. To support the answers to the questions raised in this study, the buildings of the Regional Hospital of Taguatinga (HRT - DF) and the Regional Hospital of Santa Maria (HRSM - DF) were studied, as references. Also the ENSP-FIOCRUZ Thesis, 2008 – Araujo, E. P. quality of life, clean energy production, necessary changes in legislation and their applications in architectural design. In the end, a booklet was prepared for the user campaign and an architectural project with the appropriate space in the hospital for the storage of the waste until the destination, thus being able, in various ways, to feed back into the building.

Keywords: Hospital waste, Clean energy, Feedback.

LIST OF ABBREVIATIONS:

ABNT - Brazilian Association of Technical Standards
AIDS - Acquired Immunodeficiency Syndrome (Síndrome da Imunodeficiência Adquirida)
ANTT - National Land Transport Agency ANVISA - National Health Surveillance Agency IDB - Inter-American Development Bank
IBRD - International Bank for Reconstruction and Development (World Bank)
CEBES - Brazilian Center for Health Studies CME - Sterile Material Center
CNEN - Norm of the National Nuclear Energy Commission CONAMA - National Council for the Environment
CONTRAN - National Traffic Council
CTNBio - National Technical Commission on Biosafety ECP - Pollution Control Equipment
EPA - Environment Protection Agency - USA EPC - Collective Protective Equipment
ENSP-FIOCRUZ - National School of Public Health EPI - Personal Protective Equipment

MSDS - GMC Chemical Safety Data Sheet - Common Market Group
HIV - Human Immunodeficiency Virus (Vírus da Imunodeficiência Humana) HRT - Hospital Regional de Taguatinga
HRSM - Hospital Regional de Santa Maria
IPANEMA - Outsourced Hygiene, Cleaning and Segregation Company of the Department of Health
MMA - Ministry of the Environment MS - Ministry of Health
NBR - Brazilian Registered Standard
ILO - International Labour Organization
UN - United Nations OS - Polystyrene
PB - Paraíba
PC - Sharps
PEAD - PEBD High Density Polyethylene - Low Density PET Polyethylene - Polyethylene Terephthalate
PCMSO - Occupational Health Medical Control Program PGRSS - Health Services Waste Management Plan
PP - Polypropylene
PPRA - Environmental Risk Prevention Program PNRS - National Solid Waste Policy
PVC - Polyvinyl Chlorite
RDC - Collegiate Board Resolution
REFORSUS - Reinforcement of the Reorganization of the Unified Health System RSS - Health Services Waste
MSW - Urban Solid Waste SUS - Unified Health System
SVS - Health Surveillance Secretariat

1 INTRODUCTION

Health Service Waste (HCW) is all that waste generated in any human or animal medical care service, or similar establishments as defined by ANVISA RDC Resolutions No. 306/2004 and CONAMA No. 358/2005.

Based on the theme Hospital Waste – Recycling for hospital energy feedback, the initiative was taken to carry out research, campaign and proposal of architectural project, with the objective of studying concepts, legislation and existing works on the subject, and identifying what is possible to do so that by recycling waste, it is possible to elaborate an architectural project that is not only sustainable, but also sustainable. but self-sustaining.

As a proposal, the advantages of the correct classification and typological separation of medical waste will be presented; the benefits for the administrator in terms of energy gains by feeding back to the hospital with what it produces; theoretical data that help in architectural design, the gains in terms of environmental health and quality of life of the population and data to complement the existing waste manual (2010) and open the discussion on legislation on the subject.

Hospitals have the function of treating their patients, so it is necessary to be careful with the environment, so that it is healthy and does not generate diseases for its environment.

It must be able to manage its inputs, recycle them, make them productive. Reduce the impact caused by soil, water and air pollution that damages people's health. It should never be a focus of unhealthiness or a commercial institution with the sole purpose of treating patients and making financial gain from them, but rather to improve the conditions and quality of life in order to increase the number of healthy people.

Therefore, this work began with the intention of improving the quality of life for future generations, reducing the impact caused by excessive production and improper disposal of medical waste. In an attempt to make people and the environment suffer less and that the hospital can sustainably sustain itself. The idea for the research was born out of the difficulty in finding hospital building projects that can also "cure" their own "disease", because garbage is becoming a "cancer" for the planet. There is a growing concern of society and the authorities involved in relation to environmental issues and sustainable development. By considering this question, this work brings to light what is gained from recycling waste of particular concern.

Every day tons of garbage are generated, sometimes they are brought (imported) clandestinely, thrown into common landfills, reused inappropriately, which is a crime against human beings and the environment.

Today, architects, biologists, urban planners and several other professionals from various areas defend the idea of humanized, sustainable, functional architectural projects that satisfy the user, among other characteristics that a building must have. The project must foresee the possibility of a construction that minimizes the damage caused to the environment, but it must not stop only at the choice of materials that meet the requirements, but at the research of how they were produced and will be used, it must extend and verify the possibility of this building continuing to generate minimal damage or no damage to the environment, Therefore, it must be researched what to do with what will be produced in this building. If what is produced is sick, it must be treated so that it can be reinserted into its environment in a healthy way and can have the maximum use in this reinsertion process.

Architecture must be designed in such a way that it sustains and maintains the sustainability of life on the planet. If the production of waste is excessive and without any means to guarantee its elimination, the problem will be not only for the owner, but for everyone. With recycling, it is possible to have energy gains by reducing expenses and damage.

2 LEGAL GUIDELINES

In Brazil, Law No. 12,305/2010, Anvisa's RDC No. 306/2004 and Conama Resolution No. 358/2005 are the main legal norms related to the management of health service waste.

Law No. 12,305/2010 establishes the National Solid Waste Policy (PNRS), providing for its principles, objectives and instruments, as well as guidelines related to the integrated management and management of solid waste, including hazardous waste, the responsibilities of generators and public authorities and the applicable economic instruments. It was regulated by Decree 7,404, of December 23, 2010, which, among other measures, establishes the Interministerial Committee of the National Solid Waste Policy, hereinafter referred to as the Committee. The purpose of this Committee is to support the structuring and implementation of the National Solid Waste Policy, through the articulation

of government agencies and entities, in order to enable the fulfillment of the determinations and goals set forth in Law No. 12,305 and in the Decree itself.

It is incumbent upon the Committee, which is coordinated by the Ministry of the Environment (MMA), to prepare and evaluate the implementation of the National Solid Waste Plan, and the preparation of the version of the Plan must be based on studies that support it.

The National Solid Waste Plan (PNRS) is valid for an indefinite period and has a horizon of 20 (twenty) years, with updating every 04 (four) years and the content as described in items I to XI of Article 15 of Law 12,305/2010. In Article 19, Item X of the PNRS, which states the importance of, in this order of priorities, the following:

1. Reduce Waste Generation - in line with the perception that waste and, especially, excess waste mean process inefficiency, which is typical of today's consumer society. This concept involves not only behavioral changes, but also new positions of the business sector, such as investment in eco-design and eco-efficiency projects, among others.
2. Reuse – increasing the useful life of materials and products and combating planned obsolescence, among other medium and long-range actions. It is important to expand the relevance of the concept, which is often confused and limited to the implementation of small actions to reuse materials that result in objects or products with low added value, disposable and/or no real economic or environmental value. These practices have been commonly disseminated as a solution to the serious problem of excessive generation and inadequate disposal of waste and often make up a large part of what is considered environmental education in schools and communities.
3. Recycle – valuing the segregation of materials and the proper disposal of dry and wet waste, thus supporting selective collection projects and reducing the amount of waste to be disposed of in line with the guidelines of the National Solid Waste Policy.

Anvisa's RDC No. 306/2004 provides the rules for the elaboration of a waste management plan, highlighting the guidelines for waste management. It is primarily concerned with the prevention of accidents and the preservation of public health. It also defines recycling as "the process of transforming waste that uses processing techniques for reprocessing or obtaining raw materials for the manufacture of new products."

To prove the fundamental concepts contained in this work, the main federal legislations will be presented, as well as technical standards of ABNT. In addition to these, any existing state and municipal legislation must be observed and complied with.

The main general legislations are:

- Constitution of the Federative Republic of Brazil – Title III (On the Organization of the State), Chapter II (On the Union) – Articles 23 and 24.

- Constitution of the Federative Republic of Brazil – Title IV (Municipalities) – Article 30.
- Constitution of the Federative Republic of Brazil – Title VIII (Social Order), Chapter VI (Environment) – Article 225.
- Law No. 6,938, dated 08.31.1981, provides for the National Environmental Policy, its purposes and mechanisms for formulation and application, and provides other provisions.
- Law No. 9,605, dated 02.12.1998 (Environmental Crimes Law), provides for criminal and administrative sanctions derived from conducts and activities harmful to the environment, and provides other provisions.
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- Decree No. 3,179, dated 09.21.1999, provides for the specification of sanctions applicable to conducts and activities harmful to the environment, and provides other provisions.
- RDC ANVISA No. 50, dated 02.21.2002, provides for the technical regulation for planning, programming, elaboration and evaluation of physical projects of health care establishments.
- RDC ANVISA nº 305, of 14.11.2002: "The entry and commercialization of raw material and finished products, semi-elaborated or in bulk for use in human beings, whose starting material is obtained from tissues/fluids of ruminant animals, related to the classes of medicines, are prohibited throughout the national territory, while conditions that constitute a risk to health persist. cosmetics and health products, as itemized."
- Normative Instruction of the National Technical Commission on Biosafety/Ministry of Science and Technology CTNBio nº 7, of 06.06.1997.
- Ordinance of the Secretariat of Health Surveillance/Ministry of Health SVS/MS 344, of 05.12.1998, approves the technical regulation on substances and medicines subject to special control.
- Decree-Law No. 2,657, of 07.03.1998, promulgates Convention No. 170 of the International Labor Organization – ILO, on safety in the use of chemical products at work, signed in Geneva, on 06.25.1990.
- General guidelines for containment work with biological material – Ministry of Health, 2004.

In accordance with the solid waste legislation specified by theme:

- Civil Construction – CONAMA Resolution No. 307, of 07.05.2002, establishes guidelines, criteria and procedures for the management of construction waste, disciplining the necessary actions in order to minimize environmental impacts.

- Chemicals – Legislative Decree No. 67, of 04.05.1995, approves the text of Convention No. 170, of the International Labor Organization, on the safety of the use of chemical products at work, adopted by the 77th Meeting of the International Labour Conference, in Geneva, in 1990. CONAMA Resolution No. 23, of 12.12.1996, regulates, in the Brazilian territory, the application of the provisions of the Basel Convention, defining the wastes whose import and/or export are allowed or prohibited, as well as the conditions for them to be carried out. CONAMA Resolution No. 316, of 10.29.2002, regulates the processes of thermal treatment of waste and corpses, establishing operational procedures, emission limits and criteria for performance, control, treatment and final disposal of effluents, in order to minimize the impacts on the environment and public health resulting from these activities.
- Radioactive Materials – Standard of the National Nuclear Energy Commission – Nuclear Standard CNEN-NE-06.05 defines general criteria and basic requirements related to the management of radioactive waste in radioactive facilities. CNEN-NE-3.05 defines the radiation protection and safety requirements for nuclear medicine services. Standard CNEN-NE-6.01 provides for the requirements for the registration of professionals for the preparation, use and handling of radioactive sources. Standard CNEN-NE-6.02 defines the process related to the licensing of radioactive facilities, according to the competence assigned by Law No. 6,189, of December 16, 1974. Standard CNEN-NE-3.03 defines the basic requirements for the certification of the qualification of radiation protection supervisors. Law No. 10,308, dated 11.20.2001, provides for site selection, construction, licensing, operation, inspection, costs, indemnity, civil liability and guarantees related to deposits of radioactive waste of low and medium levels of radiation. CNEN-NE- Standard 3.01 Defines the basic guidelines for the radiological protection of people in relation to exposure to ionizing radiation.
- Transportation of dangerous goods – Decree-Law No. 2,063, dated 10.06.1983, provides for fines to be applied for violations of the regulations for the execution of the road transport service of dangerous goods or cargo, and provides other provisions. Resolution of the Common Market Group GMC 82.02 - Mercosur - which approves the Instructions for the Supervision of the Rail Transport of Dangerous Products in Mercosur. Decree No. 96.044, of 05.18.1988, approves the Regulation for the Road Transport of Dangerous Products, and provides other provisions. Decree No. 98.973 of 02.21.1990, which approves the Regulation of the Railway Transport of Dangerous Products. Decree No. 875, of 19.07.1993, promulgates the text of the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Decree No. 1,797, dated January 25,

1996, provides for the Partial Scope Agreement for the Facilitation of the Transport of Dangerous Products in Mercosur. CONAMA Resolution No. 23, of 12.12.1996, provides for the transboundary movement of hazardous waste. Decree No. 2,866, dated 12.07.1998, approves the Regime of Infractions and Sanctions Applicable to the Land Transport of Dangerous Products in Mercosur. Resolution of the National Traffic Council/Ministry of Justice Contran/MJ 91, of 04.05.1999, provides for Specific and Complementary Training courses for Drivers of Road Vehicles Transporting Dangerous Products. Decree No. 4,097, dated January 23, 2002, amends articles 7 and 19 of the regulations for road (Decree No. 96,044/88) and rail (Decree No. 98,973/02) transportation of dangerous products. MT Ordinance No. 349, of 06.10.2002, approves the Instructions for the Inspection of Road Transport of Dangerous Products at the National Level. Resolution of the National Land Transport Agency ANTT-MT No. 420, of 02.12.2004, approves the Complementary Instructions for the Inspection of Road Transport of Dangerous Products at the National Level.

- Occupational health – NR 7 – Occupational Health Medical Control Program – PCMSO – Ministry of Labor. Establishes the obligation to prepare and implement the Medical Health Control Program Occupational – PCMSO. NR 9 – Environmental Risk Prevention Program PPRA – Ministry of Labor. Establishes the obligation to prepare and implement the Environmental Risk Prevention Program – PPRA. NR 32 – Occupational Safety and Health in Health Services – Ministry of Labor. Establishes basic guidelines for the implementation of measures to protect the safety and health of workers in health services.
- Waste batteries and light bulbs – CONAMA Resolution No. 257, of 06.30.1999, provides for the use of batteries that contain lead, cadm, mercury and their compounds in their compositions, necessary for the operation of any type of appliances, vehicles or systems, mobile or fixed, as well as electrical and electronic products that contain them integrated into their structure in a non-replaceable form. and makes other arrangements.
- Waste from health establishments and sanitary barriers – CONAMA Resolution No. 6, of 19.09.1991, exempts the incineration or any other burning treatment of solid waste from health establishments, ports and airports, except in the cases provided for by law and international agreements. ANVISA RDC No. 342, dated 12.13.2002, establishes and approves the term of reference for the preparation of the Solid Waste Management Plans for Ports, Airports and Borders to be submitted to ANVISA for analysis and approval. RDC ANVISA No. 306, dated 11.25.2004, provides for the technical regulation for the management of waste from health services.
- Recyclable waste – CONAMA Resolution No. 275, of 04.25.2001, establishes color codes

for different types of waste in selective collection.

- Treatment system – CONAMA Resolution No. 316, of 10.29.2002, provides for procedures and criteria for the operation of waste thermal treatment systems.
- Technical Standards – Symbology – NBR 7500 – Risk and handling symbols for the transport and storage of material.
- Packaging – NBR 9191 – Specification. Plastic bags for packaging. NBR 9195 – Test methods. Plastic bags for packaging. NBR 9196 – Determination of resistance to air pressure. NBR 9197 – Determination of ball impact strength. Plastic bag for garbage packaging – determination of ball impact strength. NBR 13055 – Determination of volumetric capacity. Plastic bag for packaging – determination of volumetric capacity. NBR 13056 – Transparency verification. Plastic films for packaging bags – transparency check. NBR 13853 – Requirements and test methods for collectors for sharps or sharps waste.
- Collection and transportation – NBR 12980 – Defines terms used in the collection, sweeping and packaging of urban solid waste. NBR 13221 – Specifies the requirements for the land transport of waste, in order to avoid damage to the environment and protect public health. NBR 13332 – Defines the terms related to the solid waste collector-compactor, coupled to the chassis of a road vehicle, and its main components. NBR 13463 – Classifies the collection of urban solid waste from the equipment intended for this collection, the types of work system, the packaging of this waste and the transshipment stations. NBR 14619 Establishes the chemical incompatibility criteria to be considered in the inland transport of dangerous goods. NBR 12810 – Establishes the procedures required for the internal and external collection of health service waste, under conditions of hygiene and safety. NBR 14652 – Establishes the minimum requirements for the construction and inspection of group A road collectors-transporters of health service waste.
- Storage – NBR 12235 – Establishes the conditions required for the storage of hazardous solid waste in order to protect public health and the environment.
- Waste sampling – NBR 10007 – Establishes the requirements for solid waste sampling.
- Management – NBR 15051 – Establishes the specifications for the management of waste generated in clinical laboratories. Its content covers the generation, segregation, packaging, preliminary treatment, treatment, transport and presentation to the public collection of waste generated in the clinical laboratory, as well as guidance on the procedures to be adopted by laboratory personnel. NBR 14725 - Chemical Product Safety Data Sheet – MSDS.

3 MANAGEMENT PLANNING

The planning of the management of the HCW should have as its starting point the reality of the municipalities, with regard to the management of solid waste produced in the community. Punctual solutions, which observe only the internal environment of health facilities, should be avoided, considering the form of final disposal to be adopted.

Solid waste management in Brazil is still flawed, with major deficiencies in treatment and final disposal. This has entailed considerable environmental and health risks. Due to the size of the problem, it can be predicted that the solutions should be gradual. Thus, it is important that any HCW management solution seeks to present proposals that improve the situation in the municipality in an integrated way.

Changes in habits, in order to reduce or minimize the generation of waste, have a very positive impact on management. Thus, it is necessary to adapt products, equipment and procedures, aiming at the non-generation and minimization of the production of HCW.

The proper management of HCW may be costly at first, but in the long run it becomes economically viable, as it reduces the rates of occupational accidents and illnesses. In addition, correct management converges in the defense of three fundamental rights:

- Everyone can enjoy health facilities without running the risk of contracting infections;
- Workers in health facilities must be safe to perform their tasks;
- The entire community should live in a healthy environment.

Based on these considerations, the following alternatives should be evaluated:

- Pre-treatment in the generating unit itself for later final disposal; or
- Differentiated collection with centralized treatment and final disposal.

The pre-treatment in the generating unit itself, including the appropriate segregation, allows the final disposal to be made together with the other municipal solid waste. This alternative is possible when segregation and pretreatment result in a final waste classified in Group D.

When the HCW has not undergone pre-treatment, in order to be classified as Group D, the collection should be differentiated from that of urban solid waste. This alternative implies the subsequent treatment and appropriate final disposal of the RSS of Groups A, B, and C.

4 FUNDAMENTAL CONCEPTS

Solid waste and garbage are terms used interchangeably by authors of publications, but in everyday language the term waste is rarely used.

Garbage is used to designate everything that is no longer useful and waste is mostly used to designate surplus (refuse) from the processing of industrialized products.

Health Service Waste (HCW) is waste generated in health establishments during the provision of care and diagnostic services, and can become a risk to public health and the environment due to its

characteristics. It consists mostly of syringes, needles, gloves, probes, catheters and other disposable materials. These wastes pose a major health hazard as they can be contaminated with disease-causing microorganisms. Therefore, the creation of a waste management plan was essential to mitigate such risks.

The health services waste management plan (PGRSS) is a set of procedures that must be adopted by hospital medical establishments in order to reduce or eliminate the production of waste and provide the waste generated with a safe and efficient route, aiming at the protection of workers and the preservation of public health and the environment. As stipulated in ANVISA RDC No. 306/04 and CONAMA Resolution No. 358/05, every generator must prepare and implement the Health Service Management Plan – PGRSS.

HSW management is all the actions carried out to manage waste inside and outside hospital medical establishments, from the moment it is generated until its final disposal. Therefore, all public servants and employees who carry out actions related to waste management are responsible for such actions. The steps in the management of HCW are:

- Segregation;
- Packaging;
- Identification;
- Intermediate treatment;
- Internal transportation;
- Temporary storage;
- External storage;
- Final treatment;
- Final disposition.

Both the minimization of waste and the segregation of recyclable materials are directly related to the change in habits of the people involved in the generation of waste. In this sense, environmental education can be an important tool in the adoption of standards of conduct that are more appropriate to the new models of waste management and, therefore, should receive special attention in the continuing education program aimed at employees. The implementation of this program provides the conditions for professionals to clearly know their responsibilities in relation to the environment, inside and outside the health unit, and their roles as citizens.

Minimization consists of the reduction of common, hazardous or special waste in the generation stage, before the treatment and storage phases or disposition. The first way is to reduce the amount of waste generated, looking for ways to combat waste, that is, to generate the minimum. This procedure applies to all materials used - food scraps and leftovers, chemicals, etc. Another way is to reuse the discarded material for the same purpose as the previous one, for example, jars and containers, after a

disinfection and cleaning process. The third way to minimize is to recycle waste, which consists of forwarding recyclable materials for reuse.

All processes involving reduction, reuse and recycling must be carefully planned and operated, considering the precautionary principle, to avoid endangering the health of the workers involved, as well as that of the patients, or even preventing contamination of the environment.

Segregation is one of the fundamental operations to allow the fulfillment of the objectives of an efficient waste handling system and consists of the separation of waste at the time and place of its generation, according to its chemical and biological characteristics, its physical state and the risks involved.

In each specialized service, there is one or more types of waste generated. In order to carry out the management based on the principle of minimizing the additional risks of the MW, the manager must adopt segregation procedures according to the type of waste, at the generation site itself. The advantages of practicing segregation at source are:

- Reduction of risks to health and the environment by preventing potentially infectious or special waste, which is usually small fractions, from contaminating other waste generated in the hospital;
- Reduction of expenses, since only a fraction will have special treatment and not all;
- Increased recycling efficiency.

Packaging consists of the act of packing the segregated waste in bags or containers that prevent leakage and resist puncture and rupture actions.

According to RDC ANVISA 306/04, identification consists of a set of measures that allow the recognition of the residues contained in bags and containers, providing information on the correct handling of HSW.

The identification must be affixed to the packaging bags, to the internal and external collection containers, to the internal and external transport containers, and to the storage places, in an easily visible place, in an indelible way, using symbols, colors and phrases, meeting the parameters referenced in the NBR 7.500 standard of ABNT, in addition to other requirements related to the identification of content and the specific risk of each group of waste. The identification of storage bags and transport containers may be made by adhesives, provided that their resistance to the normal handling processes of bags and containers is guaranteed. (Table 1)

TABLE 1 - IDENTIFICATION SYMBOLS OF WASTE GROUPS

Identification symbols for waste groups	
Group A wastes are identified by the infecting substance symbol, with a white background label, black design and outlines.	
Group B waste is identified by the associated risk symbol and with chemical substance breakdown and risk phrases.	
Group C is represented by the international symbol of the presence of ionizing radiation (magenta trefoil) on labels with a yellow background and black outlines, plus the expression RADIOACTIVE MATERIAL.	
Group D waste can be recycled or reused. When recycling is adopted, its identification must be made on the containers and container storage shelters and container storage shelters, using color coding and their corresponding names, based on CONAMA Resolution No. 275/01, and recyclable material type symbols. For the other waste in group D, the color gray or black should be used in the containers. It can be followed by a color determined by the City Hall. If there is no segregation process for recycling, there is no requirement for color standardization containers.	 **GLASS, PLASTIC, PAPER, METAL, ORGANIC**
Group E products are identified by the infective substance symbol, with white background labels, black design and outlines, plus the inscription SHARPS WASTE, indicating the risk posed by the waste.	

Intermediate treatments are processes carried out in medical and hospital facilities that modify the physical, chemical or biological characteristics of waste, reducing or eliminating the risk of

contamination, work accidents or damage to the environment. Some wastes require intermediate treatment, according to their classification.

Example: Bacterial cultures, before the final treatment, are subjected to autoclaving (Figure 1), which is a treatment process, carried out in the laboratory, for the destruction of bacteria at a temperature of 121º C. Attention: In the bacteriology sector of the laboratory there is a white trash can on top of the bench where materials containing bacteria or fungi are placed. This trash can not be collected by the cleaning staff, as this material has not yet passed through the autoclave. Only the material from the white bins that are on the floor should be collected by the cleaning staff.

Figure 1 - RSS Autoclave

Source: Healthcare Waste Management

The collection and internal transportation of the RSS consist of the transfer of waste from the generation points to the place destined for external storage, with the purpose of making it available for collection. The collection must be done separately, according to the group of waste and in specific containers for each group of waste. The collection and transportation must comply with the previously defined itinerary and must be done at times, not coinciding with the distribution of clothing, food and medicines, periods of visit or greater flow of people or activities. The internal transport of containers must be carried out without excessive effort or risk of accident for the employee. Before and after collection, the employee must wash their gloved hands, remove them and place them in their proper place.

For the correct transport of the RSS, properly packaged, it is necessary to have wheeled trolleys, resistant, rigid or semi-rigid, with lid, chamfered, smooth, waterproof, without recess or edges and easy to store, clean and disinfect, with an anti-theft system. The main function is to reduce the risk of spills of the RSS during transport or storage.

It is important to take the following precautions:

- Carts carrying waste should not carry clothing or other utensils;

- Transport the RSS containers of groups A, B, C, and D separately in specific carts;
- Establish shifts, schedules and frequency of collection;
- Consider the chemical compatibility of the waste and do not carry together substances that could cause a violent chemical reaction;
- Do not drag containers or plastic bags on the ground;
- Move the collection trolley as close as possible to the place from which the containers are to be collected;
- Packaged HSW should not be transferred from one container to another;
- When collecting the bags, the cleaning staff must lift them and keep them away from the body, in order to avoid cuts and possible accidents with improperly packed sharps.

The personnel in charge of the management of HCW must be vaccinated against hepatitis B and tetanus, as well as use personal protective equipment (PPE) (Figure 02) that prevents direct contact with the HSW and protects against possible occupational accidents. It is recommended to:

- Wear a uniform appropriate to the function;
- Wear a waterproof apron over the uniform;
- Fully secure the hair;
- Wear only closed shoes;
- Avoid the use of props such as costume jewelry and jewelry;
- Keep them short;
- Wear goggles;
- Wear nitrile gloves with reinforcement in order to avoid punctures;
- Wear flexible boots, made of PVC or rubber, with long shafts;
- Wear a respirator mask.

The collection carts must be washed five times a week, and the professionals who perform this washing must wear PPE: boots, waterproof apron, gloves, goggles and mask. (Figure 2)

Figure 02 - PPE's

Source:http://reidasplacas.com.br/site/Produtos.asp?Act2=&Pagina=41&Categoria=33&SubCategoria=&TextSearch=&Act=Next

The temporary storage of the MW consists of the temporary storage of the containers containing the waste already packed, in a place close to the generation points, in order to speed up the collection within the establishment until the external collection. Depending on the distance between the waste generation points and the external storage, temporary storage may be dispensed with, and the shipment is directly to the storage for external collection.

Temporary storage cannot be made with direct disposal of the bags on the floor or on the floor, and it is mandatory to store the bags in packaging containers. When temporary storage is carried out in an exclusive location, it must be identified as a waste room, which can be a compartment adapted for this, if it was not designed in the construction, as long as it meets the legal requirements for this type of environment. Room with a minimum of eight square meters, signposted, ventilated and easily accessible to cleaning and conservation personnel, not being allowed the entry of unauthorized people, as well as the use of this area for other purposes.

In temporary storage, it is not allowed to remove waste bags from inside the collection containers parked there.

Easily drilled waste that may be collected for a period of more than 24 hours after its storage must be kept refrigerated. As for chemical waste, the temporary storage place must be made of masonry, closed, equipped with screened openings for ventilation, with a device that prevents direct sunlight, floors and walls made of washable materials with a liquid retention system.

External storage consists of packing the waste in a shelter, in appropriate collection containers, in an exclusive environment and with easy access for the collection vehicles, while waiting for the external collection stage to be carried out.

Final treatment of solid waste is understood as any manual, mechanical, physical, chemical or

biological processes that alter the characteristics of the waste, aiming at minimizing the risk to health, preserving the quality of the environment, and the safety and health of the worker. According to ANVISA Resolution 306/04, treatment consists of the application of a method, technique or process that modifies the characteristics of the risks inherent to the waste, reducing or eliminating the risk of contamination, occupational accidents or damage to the environment.

The treatment can be carried out in the generating establishment or in another location, observing, in these cases, the safety conditions for transport between the generating establishment and the place of treatment. The systems for the treatment of HSW must be subject to environmental licensing, in accordance with CONAMA Resolution No. 237/97 and are subject to inspection and control by health and environmental surveillance agencies.

There are several ways to carry out the treatment: chemical or thermal disinfection (autoclaving, microwave, incineration), detailed below.

Disinfection for the treatment of group A waste – The most well-known disinfection technologies are autoclaving, microwave and incineration. These alternative technologies for the treatment of waste from health services allow the treated waste to be sent to the normal circuit of municipal solid waste (MSW), without any risk to public health.

According to the EPA, USA, Technical Assistance Manual: State Regulatory Oversight of Medical Waste Treatment Technology (Chart 1), there are several levels of microbial inactivation. For healthcare waste treatment technologies, it is necessary to achieve at least level 3.

TABLE 1 - Microbial inactivation level according to EPA, USA

Microbial inactivation level according to Evironment Protection Agency – EPA, EUA	
Inactivation level	Description
Level 1	Inactivation of vegetative bacteria, fungi and lipophilic viruses with a reduction greater than or equal to 6 Log10
Level 2	Inactivation of vegetative bacteria, lipophilic and hydrophilic fungi and viruses, parasites and microbacteria with a reduction greater than or equal to 6 log10 and inactivation of B. staerotermophilus or B spores. subtilis with a reduction greater than or equal to 4 Log10.
Level 3	Inactivation of vegetative bacteria, lipophilic and hydrophilic fungi and viruses, parasites and microbacteria with a reduction greater than or equal to 6 log10 and inactivation of B. staerotermophilus or B spores. subtilis with a reduction greater than 4 Log10.
Level 4	Inactivation of vegetative bacteria, lipophilic and hydrophilic fungi and viruses, parasites and microbacteria and inactivation of B. staerotermophilus spores or B. subtilis with a reduction greater than or equal to 6 Log10.

Source: Technical Assistance Manual: State Regulatory Oversight of Medical Waste Treatment Technologies – State and Territorial Association on Alternate Treatment Techonologies – abril1994.

Decontamination with the use of steam at high temperatures (autoclaving) – It is a treatment that consists of keeping the contaminated material in contact with water vapor, at a high temperature, for a period of time sufficient to destroy potential pathogens or reduce them to a level that does not constitute a risk. The autoclaving process includes compression and decompression cycles in order to facilitate contact between the steam and the waste. The usual pressure values are in the order of 3 to 3.5 bar and the temperature reaches 135ºC. This process has the advantage of being familiar to health technicians, who use it to process various types of hospital materials.

The normal autoclaving process basically involves the following operations:

- Initial pre-vacuum: negative pressure conditions are created so that in the next phase the steam comes into contact with the residues;
- Steam intake: introduction of steam into the autoclave and gradual increase in pressure in order to create conditions for contact between steam and waste and for the destruction of enclosures that limit steam access to all surfaces;
- Exposure: maintaining high temperatures and pressure for a certain period of time until the decontamination process is completed.
- According to the load to be treated, the operator sets the time and temperature of each cycle;
- Slow exhaust: gradual release of steam passing through a porous filter with a mesh fine enough to prevent the passage of microorganisms to the outside of the autoclave. Gradual decrease in pressure up to the pressure of 1 atmosphere;
- Charge cooling: reducing the load to a temperature that allows the removal of waste from the autoclave.

To verify the operating conditions of these units, a test can be carried out in order to reach inactivation level 3, as defined by the EPA. This treatment system must be licensed by the competent environmental agency.

After being processed, these treated solid wastes must be sent for final disposal licensed by the competent environmental agency.

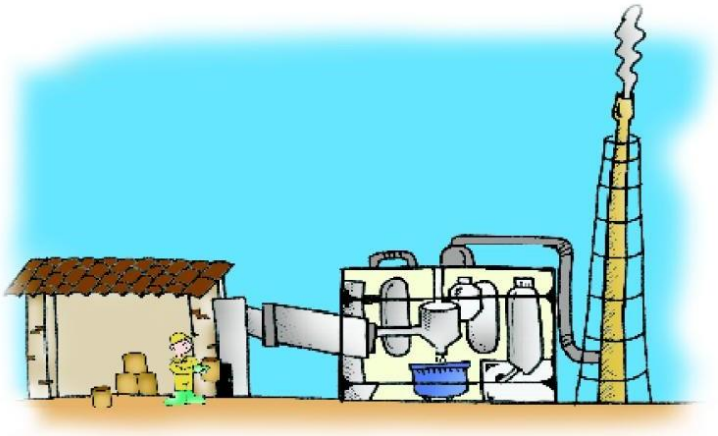
After being processed, this solid waste is treated, if necessary, and meets the emission limits of pollutants established in the current environmental legislation, before its release into a body of water or sewage system. Treatment with the use of low or high frequency microwaves – It is a relatively recent technology for the treatment of waste from health services and consists of the decontamination of waste with the emission of high or low frequency waves, at a high temperature (between 95 and 105ºC). The waste must be subjected to a shredding process beforehand and humidification. To verify the operating conditions of these units, a test can be carried out in order to reach level 3, as defined by the EPA. This treatment system must be licensed by the competent environmental agency. After being

processed, this treated waste must be sent to a sanitary landfill licensed by the environmental agency.

Heat treatment by incineration – It is a solid waste treatment process that is defined as the chemical reaction in which combustible organic materials are gasified, in a predetermined period of time. The process is oxidized by the waste with the help of the oxygen contained in the air.

Waste incineration is a physicochemical process of oxidation at high temperatures that results in the transformation of materials with a reduction in the volume of waste, destruction of organic matter, especially pathogenic organisms (Figure 3).

Figure 3 - RSS Incineration System



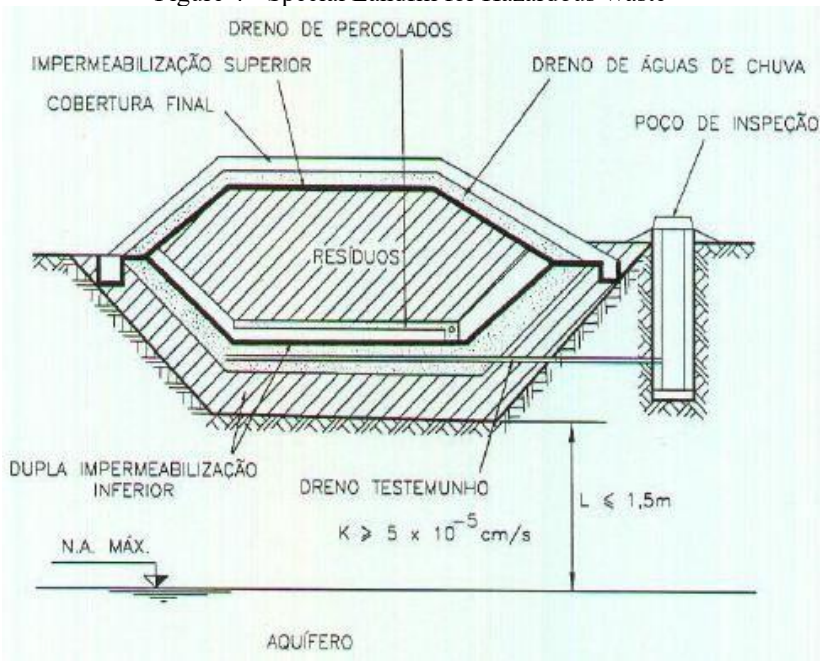
Source: Healthcare Waste Management

The design of two-stage incineration follows the following principles: temperature, resistance time and turbulence. In the first stage, the waste in the waste incineration chamber is subjected to a minimum temperature of 800ºC, resulting in the formation of gases that are processed in the combustion chamber. In the second stage, temperatures reach 1000ºC- 1200ºC.

After incineration of the MSW, the gaseous pollutants generated must be processed in pollution control equipment (ECP) before being released into the atmosphere, meeting the emission limits established by the environmental agency. Among the pollutants produced are hydrochloric acid, hydrofluoric acid, sulfur oxides, nitrogen oxides, heavy metals, particulates, dioxins and furans.

In addition to the gaseous effluents generated in the incineration systems, ash and slag from the incineration chamber generate waste and other solid pollutants from the ECP, as well as liquid effluents generated from the activity of this treatment system. Ashes and slags, in general, contain heavy metals in high concentrations and therefore cannot go to landfills, requiring a special landfill for hazardous waste (Figure 4). The liquid effluents generated by the incineration system must comply with the pollutant emission limits established in the current environmental legislation (Table 2).

Figure 4 - Special Landfill for Hazardous Waste



Source: Mercury Waste Management in Health Services

TABLE 2 - Recommended Treatment Methods and Final Disposal

METHODS OF TREATMENT	RSS GROUP		
	BIOHAZARD GROUP	GROUP B CHEMICAL RISK	GROUP C RADIOACTIVE WASTE
Incineration	X	X	
Autoclave	X		
Chemical Treatment	X		
Microwaves	X		
Irradiation	X		
Decay			X

Fonte: Training Guide – Management and Management of Hospital Solid Waste (1996).

Incineration consists of destroying waste (biological and chemical) through a combustion process in which it is reduced to ashes (id., 1996).

Incinerators can burn most hazardous solid waste, including pharmaceuticals and organic chemicals, except for radioactive waste and pressurized containers.

Modern incinerators are equipped with two combustion chambers (primary and secondary) equipped with burners capable of achieving complete combustion of waste and extensive destruction of harmful and toxic chemicals (dioxins, furans, etc.). In the secondary combustion chamber, temperatures of around 1,100ºC are reached and operating with a residence time of at least two seconds. To treat the flow of gases and the entrained particles, before they are released into the atmosphere,

chemical washing towers, cyclones, filters, etc., are added.

The advantages of incineration are:

- Destroys any material than Contains carbon organic including pathogens;
- It produces a significant reduction in the volume of waste (80% to 95%);
- Leftovers are unrecognizable and definitely not recyclable;
- Under certain conditions, it allows the treatment of chemical and pharmaceutical waste;
- It allows the treatment of anatomical and pathological waste.

Autoclave consists of subjecting biological waste to heat treatment, under certain pressure conditions in a sealed chamber (autoclave), for a certain time and with prior extraction of the present air (GUÍA..., 1996).

All types of microorganisms can be killed by heat (dry or wet) if they are exposed to a temperature adapted to a temperature adapted to their level of resistance. For bacterial spores, these are temperatures above 100ºC (SWITZERLAND, 1994).

Steam autoclave is an appropriate method of treating microbiology laboratory waste, blood waste, human organic liquids, sharps and animal waste, which cannot be shredded. On the other hand, this method is not suitable for treating human and animal anatomical waste.

The efficiency of the waste decontamination operation depends on the temperature to which they are subjected and also on the duration of contact with the steam. Considering that the waste is heated by steam penetration and thermal conduction, it is necessary that all the air is extracted and that the containers containing the waste can easily let the steam penetrate. Usual operating conditions consist of a temperature of at least 121ºC for more than 60 minutes (id., 1994). In checks in Brasilia hospitals, the usual methods of treating RSS are autoclave and incineration.

The final disposal of the RSS consists of the definitive disposal of waste in the soil or in places previously prepared to receive it. According to Brazilian law, the disposal must comply with technical criteria for construction and operation, for which environmental licensing is required in accordance with CONAMA Resolution No. 237/97. The project must follow ABNT standards.

The forms of final disposal currently are landfills and ditches Septic. Unfortunately, in Brazil, what predominates are uncontrolled landfills, better known as dumps, in which waste is disposed of on the ground without any criteria, exposing the population to the risk of diseases and harming the environment.

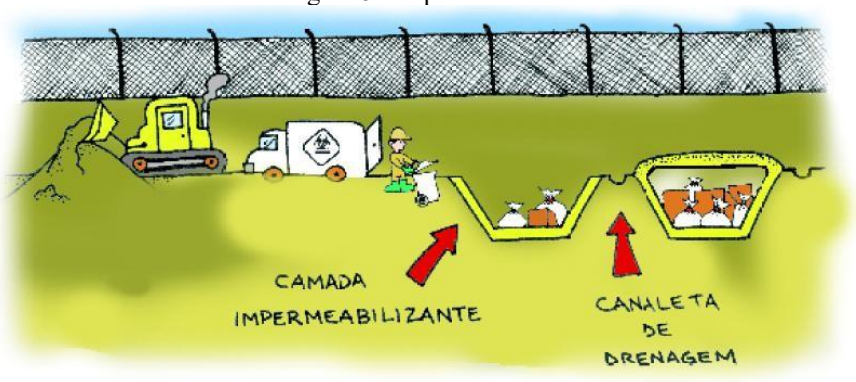
Once the RSS have undergone prior segregation and treatment, the final destination of the resulting product is a landfill. This method of final disposal consists of confining the waste in the smallest possible volume (by means of compaction carried out by narrow treaters or compactors) and isolating the waste from the open air, by covering it daily with a layer of soil, preferably clay. This method consists of compacting the waste in a layer on the properly sealed soil (using, for example, a

bulldozer) and controlling liquid effluents and gaseous emissions. It is covered daily with a layer of soil, compacted with a thickness of 20 cm, to prevent the proliferation of flies; appearance of rodents, flies and cockroaches; scattering of papers, garbage, in the surroundings; pollution of surface and groundwater. The main objective of the landfill is to dispose of waste in the soil in a safe and controlled manner, ensuring environmental preservation and health.

The controlled landfill is an improved landfill. In this system, the waste is discharged into the soil, covering a layer of inert material, daily. This form does not avoid pollution problems, as it lacks drainage systems, treatment of liquids, gases, waterproofing and etc.

Septic ditching is the technique with soil waterproofing according to the ABNT standard, it is called Special Cell of RSS and is used in small municipalities. It consists of the procedure of waterproofed excavated trenches, with width and depth proportional to the amount of garbage to be filled (Figure 5). The earth is removed with a backhoe or tractor that must be close to the ditches and later be used in the daily coverage of the waste. The collection vehicles deposit the waste without compaction directly inside the ditch and, at the end of the day, it is covered with earth, which can be done manually or by machine.

Figure 5 - Septic Trenches



Source: Healthcare Waste Management

5 MANAGEMENT PLANE

The correct management of HCW involves the reduction or minimization of the waste generated, the prevention of the health of the workers involved in the process and the guarantee of the maintenance of environmental quality. To this end, it is necessary to implement the Health Services Waste Management Plan.

The PGRSS shall contemplate the quantities and characteristics of the waste generated, classification, segregation conditions, packaging, temporary storage, transportation, treatment technologies, forms of final disposal and source control programs (3R - Reduction, Reuse and Recycling), aiming at the elimination of practices and procedures incompatible with the relevant legislation and technical standards.

Article 1 of CONAMA Resolution No. 5/93 defines a Solid Waste Management Plan as: a document that is part of the environmental licensing process, which points out and describes the actions related to the management of solid waste, within the scope of the establishments, contemplating aspects related to generation, segregation, packaging, collection, storage, transportation, treatment and final disposal. as well as the protection of public health.

Reducing the waste generated to a minimum is the goal that the PGRSS must necessarily pursue. It is possible that, at the beginning of its implementation, the results may be far from the expected target and reach proportions of 55% common waste and 45% deserving waste special treatment. But, certainly, with a good system of personnel training, control and progressive corrections, it will be possible to achieve the expected results.

The main objectives of the segregation of RSS are:

- Reduce risks: as long as RSS (common and hazardous) are managed together, the entire mass of waste produced is potentially hazardous.
- Lower management costs: minimizing the mass of waste that needs specialized treatment due to its hazardousness.
- Allowing recycling: the separation between RSS in Groups A, B and C and common waste (Group D) allows the latter to be handled without any special precautions and eventually recycled.

5.1 STEPS FOR THE IMPLEMENTATION OF A PGRSS

The elaboration of a Health Services Waste Management Plan presupposes the following steps:

1st – Identification of the problem;

2nd - Constitute the work team; 3rd – Mobilization of the organization;

4th – Diagnosis of the situation of the RSS;

5th – Definition of goals, objectives, implementation period and actions basic;

6th – Preparation of the PGRSS.

(Suggestions for recording the information required for the PGRSS – Annex I)

6 SOLID WASTE CLASSIFICATION

The classification of HCW has undergone a continuous process of evolution, as new types of waste are introduced in health units and as a result of the knowledge of their behavior in relation to the environment and health, as a way to establish a safe management based on the principles of risk assessment and management involved in its manipulation. The benefit of the correct classification of health service waste (HSW) lies in enabling the correct handling by generators, without posing risks to workers, public health and the environment. RSS are classified according to their characteristics and

consequent risks they may pose to the environment and health.

ANVISA RDC No. 306/04 and CONAMA Resolution No. 358/05 classify HCW according to distinct risk groups that require specific forms of management.

The groups are:

- Group A – Residues with the possible presence of biological agents that, due to their characteristics, may present a risk of infection (Chart 3);
- Group B – Chemical Waste (Table 4);
- Group C – Radioactive Waste (Table 5);
- Group D – Common Waste (Table 6);
- Group E – Sharps (Table 7).

6.1 HEALTH SERVICE WASTE GROUPS

TABLE 3 - GROUP A - POTENTIALLY INFECTIOUS WASTE

Group A – Potentially infectious waste
Residues with the possible presence of biological agents that, due to their characteristics, can present a risk of infection.
A1 – milky white bag • Cultures and stock of microorganisms, residues from the manufacture of biological products, except blood products, disposal of live or attenuated microorganism vaccines, culture media and instruments used for transfer, inoculation or mixing of cultures, residues from genetic manipulation laboratories. • Residues resulting from the health care of individuals, or animals, with suspicion or certainty of biological contamination by agents of risk class 4, microorganisms with epidemiologically important relevance or whose transmission mechanism is unknown. • Transfusion bags containing blood or blood components rejected due to contamination or poor conservation, or with an expired expiration date, and those resulting from incomplete collection. • Leftover laboratory specimens containing blood or body fluids, containers, and materials resulting from the health care process, containing blood or fluids Corporeal in free form.
A2 – milky white bag • Carcasses, anatomical parts, viscera and other residues from animals subjected to an experimentation process with inoculation of microorganisms, as well as their linings, and the carcasses of animals suspected of being carriers of microorganisms of epidemiological relevance and with risk of dissemination that have or have not been subjected to anatomopathological study or diagnostic confirmation.
A3 – red bag • Anatomical parts (limbs) of the human being, product of fertilization without vital signs, weighing less than 500 grams or stature less than 25 centimeters or gestational age less than 20 weeks, which have scientific or legal value and there has been no requisition by the patient or family members.
A4 – milky white bag • Arterial and intravenous line kits and dialyzers, when discarded. • Air filter and gas contaminated area aspirators; filter membrane for medical, hospital and research equipment, among other similar products. • Leftover laboratory samples and their containers containing feces, urine, and secretions, from patients that do not contain and are not suspected of containing risk agents 4, and do not present epidemiological relevance and risk of dissemination, or microorganisms that cause an emerging disease that becomes epidemiologically important or whose transmission mechanism is unknown or suspected of being contaminated with prions. • Waste of adipose tissue from liposuction, liposculpture or other plastic surgery procedure that generates this type of waste. • Containers and materials resulting from the health care process, which do not contain blood or bodily fluids in free form. • Anatomical specimens (organs and tissues) and other residues from surgical procedures or anatomopathological

studies or diagnostic confirmation. • Carcasses, anatomical parts, viscera and other residues from animals not subjected to experimentation processes with inoculation of microorganisms, as well as their linings. Empty transfusion bags or those with residual volume after transfusion.
A5 – red bag • Organs, tissues, organic fluids, sharps or scarifiers and other materials resulting from the health care of individuals or animals, with suspicion or certainty of prion contamination.

Group A wastes that require treatment must initially be packaged in a manner compatible with the treatment process to be used. Waste from groups A1, A2 and A5 should be packed after treatment as follows (Figure 9):

- If there is physical decharacterization of the structures, they can be packaged as group D waste;
- If there is no physical decharacterization of the structures, they must be packed in a milky white bag.

  Group A1 and A2 wastes should be treated in equipment that reduces or eliminates the microbial load.

  Group A3 waste that has no scientific or legal value and that has not been handled by the patient or his/her family should be sent for burial or treatment. If they are referred to the treatment system, they must be packed in red bags with the inscription "anatomical parts". The competent environmental agency in the States, Municipalities and the Federal District may approve other alternative disposal processes.

  Group A4 waste does not require treatment.

  Group A5 waste must be incinerated.

Biological waste (group A) should be placed in a milky white bag (Figure 6) and separated into white collectors (Figure 8) and/or a red bag (Figure 7) with the infectious substance symbol;

Figure 6 - Milky White Bag

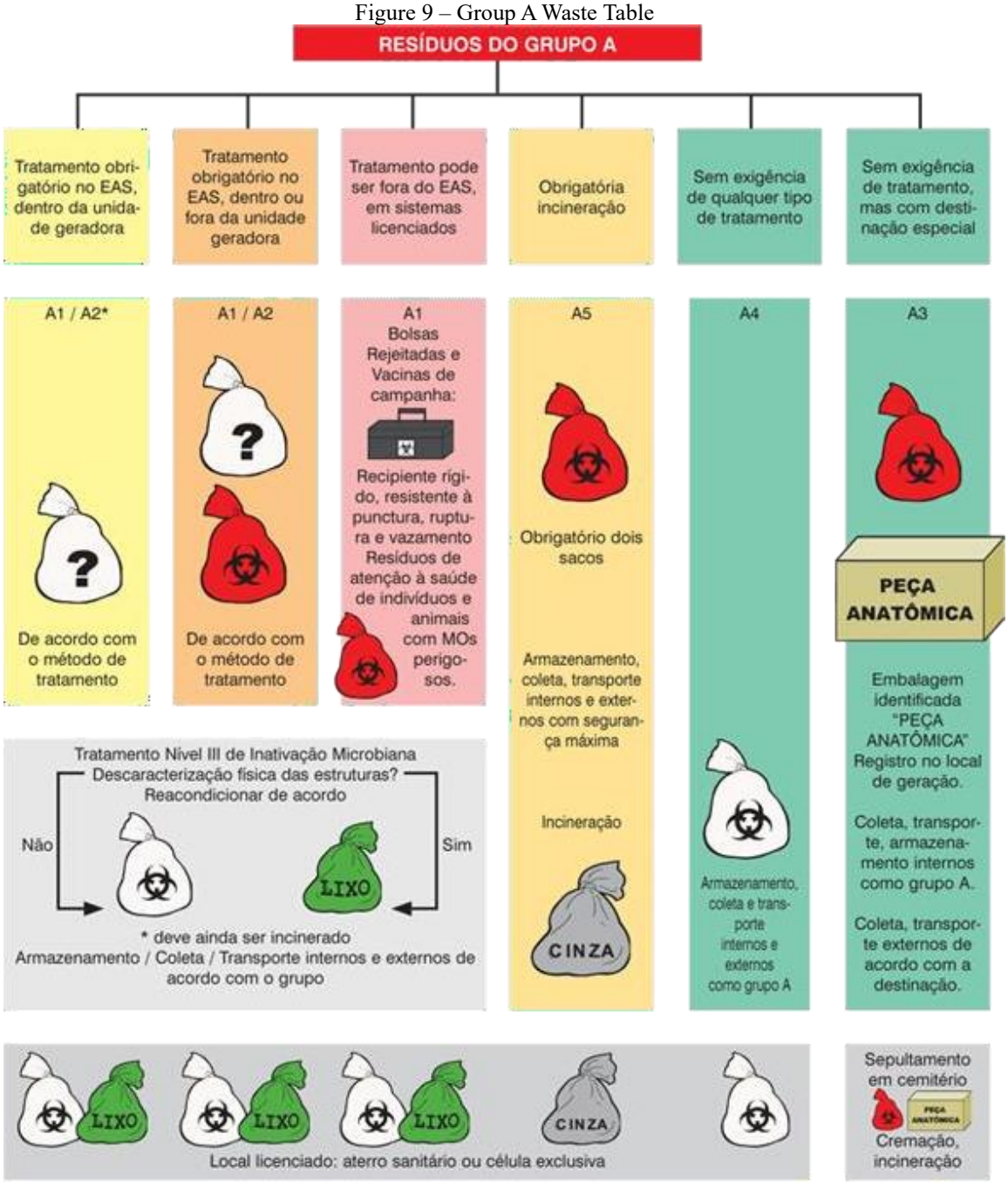
Source: http://catalogohospitalar.com.br/saco-plixo-hospitalar-100-lt-c100-1.html

Figure 7 - Red Bag

Source: http://www.fiocruz.br/biosseguranca/Bis/lab_virtual/descarte-residuos-grupo-a.htm

Figure 8 - White Trash Can (Group A) Source: Personal Collection

Figure 9 – Group A Waste Table



Source: http://www.resol.com.br/cartilha11/gerenciamento_etapas.php

The bags for packaging group A waste must be contained in a container made of washable material, resistant to puncture, rupture and leakage, impermeable, with a lid equipped with a non-manual contact opening system, with rounded corners, as shown in (Figure 8). They must be tip-over resistant and the weight limits of each must be respected shell. The bags must be identified with the symbology of the infecting substance. It is forbidden to empty the bags or reuse them.

TABLE 4 - GROUP B - CHEMICAL WASTE

Group B – Chemical waste
Waste containing chemicals that may present a risk to public health or the environment, depending on its characteristics of flammability, corrosiveness, reactivity and toxicity.
• Hormonal products and antimicrobial products; cytostatic; antineoplastics; Immunosuppressants; Digitalis; immunomodulators; antiretrovirals, when discarded by health services, pharmacies, drugstores and drug distributors or seized, and the residues and pharmaceutical inputs of drugs controlled by Ordinance MS 344/98 and your updates.
• Waste from sanitizers, disinfectants, disinfectants; waste containing heavy metals, laboratory reagents, including containers contaminated by them.
• Effluents from image processors (developers and fixers).
• Effluents from automated equipment used in clinical analysis.
• Other products considered dangerous, according to the classification of NBR 10004 of ABNT (toxic, corrosive, flammable and reactive).

Hazardous substances (corrosive, reactive, toxic, explosive and flammable) must be packaged based on the manufacturer's specific recommendations for packaging and disposing of them. They can be found on the labels of each product (Figure 10).

Figure 10 – Chemical Example – Caustic Soda

Source:http://www.prevencaonline.net/2010/07/cuidados-para-manipulacao-da- war.html

Laboratories, which are the main generators of this group of wastes, are the ones that can best establish specific precautions regarding its management, since they have knowledge about its hazardous characteristics.

Sharps contaminated with chemical residues must be packed in rigid containers, filled up to

two-thirds of their volume. The container must be placed in a milky white plastic bag, with the inscription "Sharps" and the universal symbol of toxic substances. The inscription "Chemical Hazard" is suggested (See page 22).

Solid waste must be packed in containers of rigid material, suitable for each type of chemical substance, respecting its physicochemical characteristics and its physical state, and must be identified according to its specifications.

Liquid waste should be stored in containers made of material compatible with the stored liquid, resistant, rigid and watertight, with a screw-on lid and seal (Figure 11). They must be identified according to their specifications.

Figure 11 - Chemical Waste Container (Group B)

Source: http://www.bio-brasil.com/familiaclean/produtos.html

According to ANVISA RDC No. 306/04, they must be packed in rigid material containers, suitable for each type of chemical substance, respecting their physicochemical characteristics and physical state, and identified in accordance with item 1.3.4 of the RDC in order to avoid chemical reaction between them, as well as the weakening or deterioration of such packaging, or the possibility that its material is permeable to the components of the waste. When the packaging containers are made of high-density polyethylene (HDPE), the compatibility between the substances must be observed.

Secondary packaging, which has not come into contact with the product, must be physically decharacterized and packaged as group D waste. Primary and secondary packaging and chemically contaminated materials must be treated in the same way as the chemicals that contaminated them.

Waste containing mercury (Hg) (Figure 12/13) should be stored in water-sealed containers and sent for recovery.

Figure 12 – Example of chemical material containing Mercury (Hg)

Source: Mercury Waste Management in Health Services

Figure 13 – Summary of suitable alternatives for Mercury-containing Waste Management

RESÍDUOS	ESTRATÉGIAS DE GERENCIAMENTO
Termômetros, Esfigmomanômetros	Embale-os cuidadosamente, para que não se quebrem no transporte. Se já estiver quebrado, o termômetro bem como as gotículas de mercúrio derramado deve ser guardado em um recipiente com tampa de vedação eficaz (um pote plástico, por exemplo). Evitar potes de vidro que se quebram facilmente.
	Tratamento: Recuperação do Hg
Amálgamas dentários	Segregação na fonte
	Coletar os resíduos em recipiente dotado de boca larga e de material inquebrável. Deixar um lâmina de água sobre o resíduo. Manter o recipiente hermeticamente fechado e em local de baixa temperatura, isento de luz solar direta
	Tratamento: Recuperação do Hg
Lâmpadas	Segregação na fonte
	É recomendável que as lâmpadas a descartar sejam armazenadas em local seco, nas próprias caixas de embalagem original, protegidas contra eventuais choques que possam provocar sua ruptura.
	Tratamento: Recuperação do Hg
Químicos	Segregação na fonte
	Acondicionamento em embalagem identificada
	Armazenagem temporária em local fechado
	Disposição final: aterro para resíduos perigosos
Eletroeletrônicos	Segregação na fonte
	Acondicionamento em embalagem identificada
	Armazenagem temporária em local fechado
	Tratamento: Reciclagem

Source: Mercury Waste Management in Health Services

Diskettes that are no longer used should be packaged as recyclable, in order to recycle the plastic and metal in them. For print cartridges, whenever possible, you should look for companies that provide refill services. If it is not possible to recharge, it must be packaged as group D waste.

Fluorescent lamps (Figure 14) should be stored separately from the rest of the waste, since they contain mercury (a highly toxic and polluting substance). If they are not disposed of correctly, they will be thrown in the common garbage, ending up in the landfill and contaminating the soil, thus reaching the water table.

Figure 14 - Packaging of fluorescent lamps

Source:http://meioambiente.culturamix.com/blog/wp-content/gallery/1-274/como-reciclar-uma- fluorescent-lamp-2.jpg

General Precautions:

- Packaging solid waste and liquids separated;
- Do not discharge them into the wastewater or wastewater collection system;
- Do not mix incompatible materials in the same container or in the same plastic;
- Do not put corrosive or reactive chemicals in metal cans;
- Fill containers only to 90% of their capacity;
- Ensure that the lids are securely closed before packing them into containers or bags to be collected.

Chemically hazardous waste, due to its possible commercial value, must be sent to a safe final destination, which prevents its recovery by garbage collectors or other unqualified persons.

TABLE 5 - GROUP C - RADIOACTIVE WASTE

Group C – Radioactive waste
Any materials resulting from human activities that contain radionuclides in quantities above the exemption limits specified in the CNEM rules and for which re-use is improper or unforeseen.
• This group includes radioactive waste or waste contaminated with radionuclides, from clinical analysis laboratories, nuclear medicine and radiotherapy services, according to CNEM-6.05 Resolution.

Radioactive waste must be stored in lead containers (Figure 15), with shielding appropriate to the type and level of radiation emitted, and must be labeled radioactive. Solid radioactive substances must be packed in rigid material containers, lined internally with a resistant plastic bag and identified according to item 12.2 of RDC ANVISA 306/04.

Figure 15 - Lead Container for Radioactive Waste

Source: www.cearensizando.com.br

Liquid waste must be packed in bottles of up to two liters or in drums of material compatible with the stored liquid, whenever possible made of plastic, resistant, rigid and watertight, with a screw-on lid and seal. They must be accommodated in trays of unbreakable material and deep enough to contain, with the appropriate safety margin, the total volume of the tailings, and be identified with specific symbols.

Unlike other hazardous materials, group C wastes are not vulnerable to degradation by external chemical and physical processes. Disposal in landfills or discharge into water bodies poses a risk to health and the environment. The only system capable of eliminating the characteristics of hazard is the decay of its radioactivity, and the time required for this varies according to the half-life of each radioactive element. After the radionuclide decays, they become waste and will be classified according to the material to which the radionuclide is associated.

TABLE 2 - DECAY TIME OF THE MOST COMMON RADIOISOTOPES

CHARACTERISTICS	ISOTOPE	HALF-LIFE	TIME OF SAFETY
Isotopes most commonly used in establishments Health	TC99 Ga67 I130 I125 Cr51	6 hours 3.26 days 8 days 60.20 days 27.80 days	60 hours 32.60 days 80 days 602 Days 278 Days
Other isotopes	Ti201 Fe59 In198 Co57 Ni63 Si90 C14 Cs137 Lr192 Am241	3.08 days 45.60 days 2.69 days 270 days 92 years old 27.70 years 5.73 years 30 years 5 years 458 years	30.80 days 456 Days 26.90 days 2,700 days 920 years 277 years 57.30 years 300 years 50 years 4,580 years

Fonte: Training Guide – Management and Management of Hospital Solid Waste, (1996)

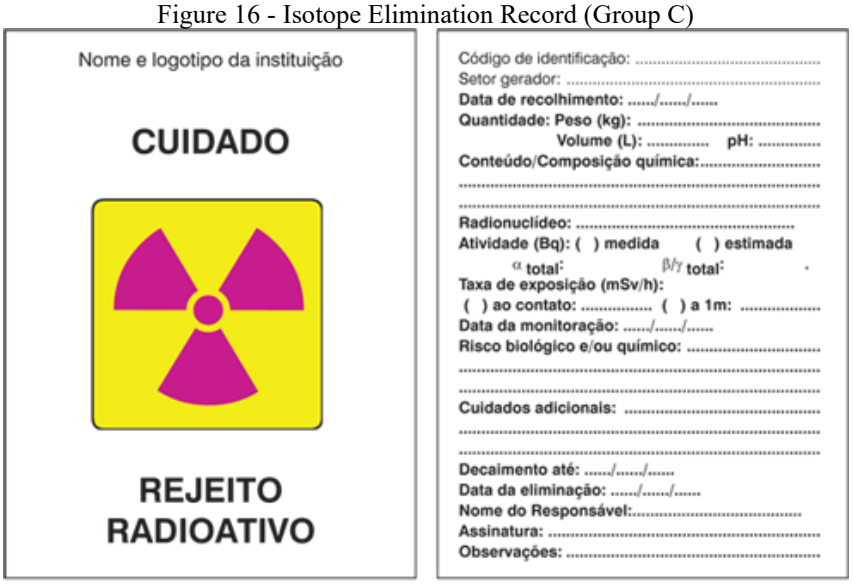
Every radioisotope endangers people and the environment according to its own characteristics. Radioactive waste is considered to have lost its hazardous characteristics when it has been stored or stored for decay for a time 10 times longer than its half-life.

A record of isotope elimination (Figure 16) should be kept near the decay area, or the suitable

decay container, on which the following information should be noted:

- Username;
- Area or service of origin;
- Storage date;
- Tipo de isótopo;
- Activity;
- Method/Form from elimination (decay, dilution fuel and non-combustible); Date of decay.

Figure 16 - Isotope Elimination Record (Group C)



Source: SILVA, E.M.P., CUSSIOL, N.A.M Management of radioactive waste from health services in Belo Horizonte: Center for the Development of Nuclear Technology, 1999 (CDTN - 857/99)

TABLE 6 - GROUP D - WASTE EQUIVALENT TO HOUSEHOLD WASTE

Group D – Waste equivalent to household waste
Waste that does not present a biological, chemical, or radiological risk to health or the environment environment, and can be equated with household waste.
• Sanitary paper and diapers, sanitary napkins, disposable garments, patient food remains, material used in antisepsis and hemostasis of venoclysis, serum and other similar equipment not classified A1.
• Leftovers from food and food preparation.
• Food remnants from the cafeteria.
• Waste from administrative areas.
• Residue from sweeping, flowers, pruning and gardens.
• Gypsum residue from health care.

Common waste should be packed in black (Figure 17) or transparent waterproof plastic bags and handled in accordance with the standards of the local urban cleaning services. To facilitate possible

recycling operations (paper, plastic, metal and glass) it is advisable to install special containers for segregation in the same place where they are (Figure 18). This practice facilitates recycling because the materials will be cleaner and, consequently, have greater potential for reuse.

Figure 17 - Black Plastic Bag

Source: http://dpsa.com.br/sacos-plasticos/saco-plastico-lixo-preto-200-litros-reforcado-90x110/

Figure 18 - Collectors of Recyclable Materials (Group D)

Source: http://ambientalistasemrede.org/como-e-porque-separar-o-lixo/

Paper (group D recyclable) must be separated in a blue collector identified with the inscription "paper"; plastics (recyclable group D) must be separated in a red collector identified with the inscription "plastic"; metals (recyclable group D) must be separated in a yellow collector identified with the inscription "metals"; glass (recyclable group D) must be separated in a green collector identified with the inscription "glass" and other waste (non-recyclable group D), such as paper towels, food scraps, etc., must be separated in a gray collector identified with the inscription "common garbage" (Figure 19).

Figure 19 - Gray Trash Bin (Group D - Non-Recyclable)

Source: Personal Collection

GLASS – Recyclable glass waste must be deposited in suitable green containers, exclusively for this type of waste. (Figure 18)

Glass containers that have been used to store chemicals can only be disposed of as recyclable glass if they have undergone a decontamination process. Otherwise, they should be considered as hazardous chemical waste and placed in containers intended for Group B waste.

PLASTIC – Recyclable plastic waste must be deposited in a suitable red container. (Figure 18)

Today there are about 40 different families of plastics, classified into two groups: thermoplastics and thermosets. Only thermosets are recyclable. The main resins are:

- High Density Polyethylene (HDPE);
- Low Density Polyethylene (LDPE);
- Polystyrene (OS);
- Polyvinyl Chlorite (PVC);
- Polypropylene (PP);
- Polyethylene Terephthalate (PET).

METALS – Recyclable metals must be deposited in a yellow container. (Figure 18)

Cans, both tinplate and aluminum, are the main scrap metal today and can be recovered in large quantities by segregation at source. Just to give an example, each ton of steel recycled represents a saving of 1,140 kg of iron ore, 154 kg of coal and 18 kg of lime. In aluminum recycling, on the other hand, the energy savings are 95% compared to the primary process, replacing the extraction of 5 tons of bauxite per ton recycled, not to mention all the non-generation of mining waste.

PAPER – Recyclable paper must be deposited in its own blue container. (Figure 18)

ORGANIC – Organic waste (food leftovers, fruits, vegetables, flowers, gardening pruning, etc.) must be separated at the generating sources and stored in their own brown containers (Figure 20). They can be used to generate energy, organic fertilizer gas, through the composting or biodigestion process.

Figure 20 - Proper Container for Organic Waste

Source: http://ambientalistasemrede.org/como-e-porque-separar-o-lixo/

TABLE 7 - GROUP E - SHARPS WASTE

Group E – Sharps residue
• Sharps or scarifying materials, such as: razors, needles, scalps, glass ampoules, drills, endodontic files, diamond tips, scalpel blades, lancets; capillary tubes; micropipettes; laminae and coverslips; Spatulas; and all broken glass utensils in the laboratory (pipettes, blood collection tubes, and Petri) and the like.

The pre-packaging of the RSS of group E must be in a rigid, watertight container, resistant to puncture, rupture and leakage, waterproof, with lid (Figure 21), containing the symbology of the substance (See page 22). Sharps (sharps) must be stored separately, at the place where they are generated, immediately after use.

Figure 21 - Sharps Collectors (Group E)

Source: http://www.bio-brasil.com/familiaclean/produtos.html

It is strictly forbidden to empty these containers for reuse. It is forbidden to re-engrave or manually remove the deferrable needles. The containers that are used in the CP must be discarded when the filling reaches 2/3 of its capacity or the filling level is 5 cm away from the mouth of the container, and its emptying or reuse is prohibited.

Group E waste, generated by home care services, must be packaged and collected by the care agents themselves or by a person trained for the activity, collected by the home care service, responsible for managing this waste.

Sharps contaminated with biohazard residues should be packed in rigid containers, which should not be filled to more than two-thirds of their volume. The containers must be placed in white plastic bags and labelled with the universal symbol of infectious substance and with the inscriptions "Biohazard" and "Sharps".

If specific sharps containers are not available, they can be placed in cans with lids or sturdy plastic bottles reused, then placed in white plastic bags and labelled with the inscriptions specified above.

Sharps, once placed in their containers, should not be removed for any reason.

7 IMPACTS ON HEALTH, SAFETY AND THE ENVIRONMENT

Health Service Waste (HSW), commonly associated with the name "Hospital Waste" is a strong risk to health and the environment. Generated and managed inappropriately in the environment, solid waste, in general, can contribute to biological, physical and chemical pollution of soil, water and air, subjecting people to various forms of environmental exposure, in addition to direct or indirect contact with biological and mechanical vectors. The HCW, despite representing a small portion of solid waste, is composed of different fractions generated in health facilities, ranging from sharps contaminated with biological agents, anatomical parts, toxic chemicals and hazardous materials (solvents, chemotherapy, photographic chemicals, formaldehyde, radionuclides, mercury, etc.), to empty glass, cardboard boxes, office paper, etc., single-use plastics and food waste which, if not managed properly, represent potential sources of negative impact on the environment and the spread of disease, and can pose a danger to healthcare workers, as well as patients and the wider community.

According to research carried out by the "Regional Program for Solid Hospital Outcomes" in Central America, the main deficiencies identified in HCW management practices are:

- The lack of segregation of biological waste, or its inadequate execution, increases the amount of contaminated waste. Common waste, when in contact with contaminated waste, is infected, increasing the risk to the personnel who handle it and to the population in general;
- The lack of adequate segregation of sharps waste is a direct cause of the highest number of accidents;
- The practice of dumping HSW in dumps along with municipal waste creates a serious risk to the health of waste pickers, to public health in general, and to the environment.

The main problems generated by inadequate management of HCW healthy:

- Infectious lesions caused by sharp objects;
- Risks of infection outside hospitals;
- Nosocomial infections due to inadequate waste management.

It is important to remember that any carelessness in the management of HCW puts the workers and operators of this system at risk.

Epidemiological evidence in Canada, Japan and the United States has established that biological waste from hospitals is a direct cause of the transmission of the HIV agent that produces AIDS and, even more frequently, of the virus that transmits Hepatitis B or C, through injuries caused by needles and other sharps (COAD, 1992).

Those responsible for the management of HCW must be vaccinated against hepatitis B and tetanus, as well as use personal protective equipment (PPE) that prevents direct contact with HCW and protects against possible occupational accidents. It is recommended to:

- Wear a uniform appropriate to the function;
- Wear a waterproof apron over the uniform;
- Fully secure the hair;
- Wear only closed shoes;
- Avoid the use of props such as costume jewelry and jewelry;
- Keep them short;
- Wear goggles;
- Wear nitrile gloves with reinforcement in order to avoid punctures;
- Wear flexible boots, made of PVC or rubber, with long shafts;
- Wear a respirator mask.

8 RECYCLING WASTE TO FEED BACK INTO THE BUILDING WITH ENERGY

Fortunately for nature and for man, waste can generally be recycled and partially used, which brings great benefits to the community, such as the protection of public health and the saving of foreign exchange and natural resources.

The benefits of recycling are:

- Reduction of the amount of waste to be disposed of in the soil;
- Energy saving;
- Preservation of natural resources;
- Financial resources generated by recycling to feed back into the hospital in various ways.

8.1 RECYCLING OF WASTE GROUPS

Waste that is often used in recycling is: organic matter; paper; plastic; metal; glass; and rubble. The following is a summary of each.

Recycling of organic matter – composting – Composting is the decomposition of organic matter from animal or plant waste, through microbial biological processes. The final product is called compost and is applied to the soil with the aim of improving its characteristics, without compromising the environment. The characteristics of the compost must follow the specific legislation of the Ministry of Agriculture. In a health care facility, organic matter for composting can be found in food scraps from the kitchen, tree pruning, gardens, etc.

Paper recycling – It is the technique that uses used paper to manufacture new paper. Most papers are recyclable. In a health care establishment, the raw material is in packaging, office paper, including letters, notepads, copiers, printers, magazines and brochures.

Glass recycling – Glass is a non-porous material that resists high temperatures, without losing its physical and chemical properties. Glass packaging can be reused several times. Glass is 100% recyclable. Thus, all glass containers, which do not present biological, radiological and chemical risks, found in a health service establishment, can be recyclable.

Metal recycling – Encompasses both ferrous and non-ferrous metals. The one with the greatest interest and commercial value is the non-ferrous metal, as it is in great demand by the largest industries. Some packaging, however, cannot be used for recycling, such as cans for canned food, oil, water-based paint, beverages, etc.

Recycling of construction waste – It is the reuse of fragments or remains of brick, concrete, mortar, steel, wood, etc., from waste in the construction, renovation and/or demolition of building structures, found in health establishments under construction or under renovation.

Other waste – Waste such as batteries, fluorescent lamps and toxic waste, contained in packaging (paint cans, etc.), x-ray plates are also subject to recycling and have specific regulations.

8.2 FEEDBACK

As previously explained, recycling can and does bring many benefits and as proposed by this research, from recycling we can feed back the building in order to generate energy gains with what it itself produces.

On a visit to the HRSM, we found that before the waste committee took over the work, the hospital generated approximately 80% of infectious waste and the rest of the common waste. This means that, in addition to not having the correct segregation, generating all this infected waste, the hospital spent a lot in terms of cost to collect all this waste, considered potentially dangerous. After the entry of the commission, with a work of environmental awareness and education, with the people who

worked and dispose of this waste, the HRSM hospital managed to reduce the infectious waste by 80% and with this reduction, The recycling of common waste was cost-effective, feeding back to the hospital itself.

Most of the garbage generated in Brazil is organic matter, mainly food scraps. In health establishments, the ideal is that, through correct segregation, the waste with the largest amount generated is common. The decomposition of this waste causes the appearance of leachate, the juice of the garbage, a dark, toxic liquid that can contaminate groundwater. In most landfills in the country, there is no proper treatment for leachate. One of the proposals found and researched is that through the technology of protection and recovery of the environment, we can transform leachate, that liquid resulting from the decomposition of garbage, into pure water. This technology has shown positive and revolutionary results in Brazil, and in the future it can supply industries and various establishments that provide services, such as health care.

The Cariacica landfill, in Espírito Santo, is an exception, with a totally Brazilian technology that transforms 130,000 liters of leachate per day into treated water and fertilizer. "95% of the leachate turns into water and the other 5% is transformed into waste, in the form of solid sludge, and this waste can be used in composting processes so that they can be transformed into organic fertilizer," says engineer Walter Plácido.

Another landfill in São Gonçalo, in the Metropolitan Region of Rio, the treatment of leachate is more sophisticated. It has been proven that it is cheaper to treat leachate by this German technology than to take the material for treatment in a sewage plant.

The leachate collected from the landfill is pumped into a mini-treatment plant that fits in a container. State-of-the-art equipment filters the leachate. Micro membranes only let water molecules through. The result of the process is astonishing. Pure, distilled water. What used to be a problem became a solution. A saving of R$ 300 thousand in just two months.

"The noblest uses of this water should be industrial uses. Industries that need water with a high standard of demineralization, a high standard of distillation", points out engineer Walter Plácido.

For now, the distilled water is used to lower the dust in the landfill itself, until new businesses can transform this water source into revenue for those who take care of the garbage and consequently feed back energy to industries, health establishments, etc.

Composting is a technique that transforms waste into fertilizer, which is essential in agriculture. As a proposal, the transformation of this waste into fertilizer meets the need of the administrator of the care facility, who intends to reduce the volume of the material to be managed, in addition to stabilizing a polluting material.

Another proposal already used in some hospitals is the recycling of papers. Bond paper, drafts, photocopies, and magazines, common in most hospital environments, can be recycled, as well as other

materials classified in group D, previously described. The recycling of paper generates financial resources and feeds back to the hospital energetically. This money is used in various ways to meet the needs of hospitals.

9 HRT ANALYSIS

Based on the norms, already mentioned in the previous texts, the Regional Hospital of Taguatinga - HRT has been working so that the Hospital establishes that waste is handled correctly from generation to final disposal, meeting the requirements of the Health Service Waste Management Plan: segregation, packaging, identification, internal transport, storage, treatment, collection, external transport and final disposal.

During the visit, we found that the HRT still has difficulty in following the Health Service Waste Management Plan, due to several factors. Initially, the lack of information is crucial for everyone to separate correctly in the offices, before the garbage goes to the shelter. Then, the structure for the packaging of this waste does not correctly accommodate the amount generated. According to the General Directorate of the Hospital, the HRT concentrates efforts for the correct management of waste from health services.

Waste from groups A, B, D and E is generated in the HRT, and does not have group C (radioactive). The weight in 2008, according to data collected by the General Activities Center, is 1300 kg, of which 1119 kg are infectious risk and 168 kg are common waste.

The waste is stored in white and green bags, there is no separation at the time of generation.

The internal collection is unique for the two types of waste, and different internal transport carts are not used for each color of bag.

The waste with chemical risk produced in general in all hospitalization areas, and in the sectors where there is handling of chemical products and use of cleaning products, there is no weight, packaging, or specific transport for this type of waste, with the exception of sharps that are stored in cardboard boxes and collected separately by employees of IPANEMA (Third-Party Hygiene Company, Cleanliness and Segregation of the Department of Health).

Common hazardous waste is generated in the administrative area, bathrooms, pantries and service stations, etc., and stored in green plastic bags.

The sharps are discarded in places close to their generations and are collected and separated from other waste. The final destination is incineration or, in some cases, autoclaving.

The treatment used autoclaving is for materials with chemical hazards-group B and/or associated biological hazards, which cannot be removed from the place of generation without the inactivation of the chemical elements and reduction of the biological agents, Group A1 and A4 of the CONAMA classification, as they cause major impacts to nature.

Autoclaving consists of the action of saturated water vapour at high pressures that lasts an average of 1 hour 30 minutes, done at a temperature of 160° C for 45 minutes.

The process of transforming group A waste into common waste that, in a way, is already proposed to generate energy, is absolutely clean, the cycle control is automatic. The Epidemiological Surveillance forwards to the Central Sterile Material (MSC) from the hospital, sharps with chemical risk to be autoclaved.

In observation and field analysis at the Regional Hospital of Taguatinga - HRT, the external shelter (Figures 22, 23 and 24) is in precarious conditions and needs to be adjusted to meet the norms and specifications of CONAMA and Anvisa Resolution, RDC No. 306, of December 7, 2004.

Figure 22 – Exterior photo of the current HRT shelter.

Source: Personal collection

Figure 23 – Blue container for recycling paper generated in the HRT.

Source: Personal collection.

Figure 24 - HRT's external shelter

Source: Personal Collection.

It has enough drums for the amount of garbage produced (Figure 25), however, the way in which the separation is done and the place where they are placed is not adequate. It has enough containers, but it does not have cleaning of the place and the types of waste are mixed.

Figure 25 - Thermoplastic drums.

Source: Personal Collection.

The bags are identified by each sector in the hospital, so it is possible to easily identify which sector is collecting the incorrectly.

The collection of medical waste is done in the external shelter itself, a place that should be free of insects, made of masonry and closed. It is located outside the hospital. In this unit, the waste is separated correctly and in the following way, form:

The green bag is intended for non-contamination-free type waste such as: papers in general,

adhesive tape, disposable cups, saline solution bottles, expired materials, wrappers and others.

The white bag is used to dispose of materials with biological waste, cotton, transfusion bag, bag segments, hemodialysis tubes with samples, gloves, gases, lab coats, contaminated equipment, syringes and others.

The descartex is a box made with two layers of cardboard, a place to dispose of sharps such as needles, ampoules, scalps. The garbage truck (Figure 26) to collect the waste does not collect according to the need and quantity. According to nurse Edna, who is also responsible for the HRT's Waste Commission, it is necessary to schedule a day and time with the company to make the collection. There are days when there is a lot of garbage and days when there is not. Stericycle is a service company specialized in protecting people and reducing risks through the management of waste generated by the customer and it is the one who collects it. However, this was not what we found during the visit. The person responsible for the collection, on the day of the visit, was not properly dressed for the risk, with gloves, mask and rubber boots and an identified company uniform. The collection is done as follows: the waste from the health system is packed in thermoplastic drums (Figure 25) with the appropriate reinforcements for handling and transport, previously sent to the generators. Preparation and packaging are carried out by the generator itself, ensuring minimal contact of the collectors and no exposure of RSS.

Figure 26 - Waste collection truck from groups A, D and E.

Source: Personal Collection.

The drums have the capacity to store volumes of 20, 50 and 200 liters, according to the amount

of waste generated. In some locations, 20-liter cardboard boxes are also provided.

After use and removal of their contents, the drums are sanitized with chlorine-based bactericidal products and sent back to health units for reuse, another way that supports the research's recycling proposal.

The collection of waste in the health units, properly packed in drums and containers (Figure 25/27), is carried out in a mechanized and "door-to-door" manner, meeting the pre-defined schedule and the frequencies established between the Stericycle and the generator, adequate and safe ways for its handling.

The hospital unit adopts measures to reuse administrative papers and uses this money for local needs.

The final disposal of biological waste is incinerated at the P. Sul Sanitary Landfill, the ashes and slag are taken to septic ditches at the Jockey Club.

Common waste is taken to Estrutural's landfill.

Figure 27 - Containers.

Source: Personal Collection.

10 PROPOSAL FOR EXTERNAL SHELTER FOR WASTE STORAGE

The shelter must be sized according to the volume of waste generated, with storage capacity compatible with the collection periodicity of the local urban cleaning system. It should be built in an exclusive environment, with at least one separate environment to serve the storage of waste containers from group A together with group E and an environment for group D (Figure 28).

The location of this external RSS storage must have the following characteristics:

Accessibility: the environment must be located and constructed in such a way as to allow easy

access for transport containers and collection vehicles;

- Exclusivity: the environment must be used only for the storage of waste;
- Safety: the environment must have adequate structural physical conditions, preventing the action of the sun, rain, winds, etc., and that unauthorized people or animals have access to the site;
- Hygiene and sanitation: there must be a place to sanitize carts and containers; The environment must have good lighting and ventilation and have floors and walls covered with materials resistant to cleaning processes.

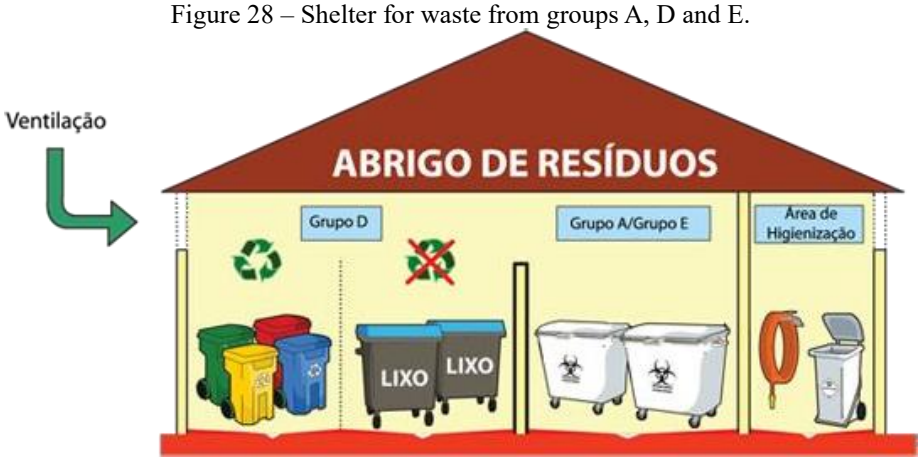
We should also follow some specific recommendations: The group A waste shelter must meet the following

Requirements:

- Be built in masonry, closed, equipped only with openings for ventilation, screens, which allow a minimum ventilation area of 1/20 of the floor area and not less than 0.20 m²;
- Be covered internally (floor and walls) with smooth, washable, waterproof, traffic and impact resistant material;
- Have a door equipped with a screen to protect against rodents and vectors, with a width compatible with the dimensions of the external collection containers;
- Have identification symbols, in an easily visible place, according to the nature of the waste. (See table on pages 23 to 24);

Have a specific sanitation area for simultaneous cleaning and disinfection of collection containers and other equipment used in the management of RSS. The area must have a roof, dimensions compatible with the equipment that will be subjected to cleaning and sanitization, smooth, waterproof, washable floors and walls, be provided with lighting points and electrical outlets, a water point, wastewater drainage pipes directed to the establishment's sewage network and a siphon drain provided with a cover that allows its sealing.

Figure 28 – Shelter for waste from groups A, D and E.



Source: http://www.resol.com.br/cartilha11/gerenciamento_etapas.php

The establishment that generates health service waste, whose weekly production does not exceed 700 litres and whose daily production does not exceed 150 litres, may opt for the installation of a reduced shelter. It must have the following characteristics, contained in RDC No. 306/2004:

- Be exclusively for the temporary storage of RSS, properly packed in containers;
- Have floors, walls, doors and ceilings made of smooth, waterproof, washable, impact-resistant material;
- Have minimum ventilation of two openings of 10 cm x 20 cm each (located one 20 cm from the floor and the other 20 cm from the ceiling), opening to the external area. At the discretion of the health authority, these openings may lead to internal areas of the establishment;
- Have a floor with a minimum trim of 2% to the opposite side of the entrance, and it is recommended to install a siphon drain connected to the sanitary sewer network;
- Have identification on the door with a symbol according to the type of waste stored;
- Have such a location that it does not open directly to areas where people stay, giving preference to places with easy access to external collection.

The group B waste shelter (Figure 29) shall be designed, constructed and operated in such a way that:

- Be made of masonry, closed, equipped only with screened openings that allow an adequate ventilation area;
- Be covered internally (floor and wall) with smooth finish material, resistant to traffic and impact, washable and waterproof;
- Have a door equipped with lower protection, preventing the access of vectors and rodents;
- Have a floor with a drape in the direction of the gutters or drains;
- Be identified, in an easily visible place, with safety signs – with the words CHEMICAL WASTE – with a symbol (see page 23 to 24);
- Provide for the shielding of internal electrical energy points, when flammable waste is stored;
- Have a device in order to avoid direct sunlight;
- Have a fire suppression system by means of CO2 extinguishers and PQS (dry chemical powder);
- Have an emergency kit in case of spillage or leakage, including absorbent products;
- Store the Waste Constituted from goods corrosive and flammable hazards near the floor;
- Observe the recommended safety measures for chemicals that can form peroxides;
- Do not receive or store unidentified waste;

- Organize or storage from agreement with Criteria compatibility, segregating waste into trays;
- Keep a record of the waste received;
- Keep the place locked, preventing access by unauthorized persons.

Figure 29 – Group B waste shelter.

Source: http://www.resol.com.br/cartilha11/gerenciamento_etapas.php

As a shelter proposal for the HRT, the waste storage site was dimensioned according to the amount generated by the hospital, respecting the standards of constructive aspects contained in ANVISA RDC No. 306/2004, ANVISA RDC No. 50/2002, RDC No. 307/2002 and ANVISA RDC 189/2003.

(Annex III – Plan of the external area of the HRT)

(Annex IV – Proposal for a basic project for the HRT shelter)

11 CAMPAIGN PROPOSAL

Due to the various cases mentioned above related to the incorrect separation of organic waste and recyclables, and the inadequate disposal for the RSS. We suggest a health and environmental awareness campaign to alert and make everyone aware of the need to dispose of garbage correctly.

An illustrative and explanatory folder was produced with the following information: what is RSS? legal guidelines, classification of HCWs, how to separate the waste produced in health facilities? segregation, packaging and PPE's.

(Appendix I)

12 THEORETICAL REFRENCIAL

In Brazil, half of the world's population currently lives in urban regions. According to data from the United Nations (UN), this rate will be 60% in 2030 and will reach close to 70% in 2050. In Brazil, 85% of the population lives in cities. As cities grow in size and population, so do the difficulties in maintaining the spatial, social and environmental balance in their territories. Consequently, the generation of waste from human action has been growing at a faster pace than nature's absorption capacity. However, the technological advancement of the last decades has enabled achievements in the field of science, but on the other hand, it has contributed to produce a significant increase in the diversity of products with components and materials that are difficult to degrade and have greater toxicity. Among them, medical waste.

Solid waste management in Brazil is still flawed, with major deficiencies in treatment and final disposal. This has entailed considerable risks to the environment and health. Silva (2004) considers that the concern with waste from health services goes beyond health services, leading to discussions about the environment, suggesting mechanisms for proper management, minimizing pollution of the planet.

The main idea of HSW management is to promote their follow-up, from their generation to their final disposal, going through stages and distinguishing them, aiming at minimizing or blocking the effects caused by HSW in the sanitary, environmental and occupational spheres. Confortin (2001) consolidates this statement when he states that the purpose of management is to establish all stages of the system, from the generation to the final disposal of the RSS.

Management refers to the articulated set of normative, operational, financial and planning actions based on sanitary, environmental, social, political, technical, educational, cultural, aesthetic and economic criteria for the generation, management, treatment and final disposal of solid waste. Mandelli (apud SCHNEIDER, 2001).

This definition summarizes well the concept of management, since it encompasses the fundamental bases for the implementation of management techniques, the criteria to be followed and the field of action of the same.

The management aims at the best use of the areas destined for the disposal of waste and the implementation of techniques for the minimization, reuse, reuse and recycling of the same, in addition to providing protection to public health and the environment.

Schneider (2001) points out that management is a vital factor for urban planning, although it has not occupied the discussion scenario with the vigor that would be desirable.

The Technical Regulation for the Management of Waste from Health Services, recently republished in harmony with the federal standards of the Ministries of the Environment, through CONAMA (Resolution No. 358 of 04/29/2005), and of Health, through ANVISA (Resolution No. 306

of 12/07/2004), referring to the management of waste from health services, defines management as the set of management procedures, planned and implemented based on scientific and technical, normative and legal bases, with the objective of minimizing the production of waste and providing the waste generated with a safe route, in an efficient way, aiming at the protection of workers, the preservation of public health, natural resources and the environment.

Confortin (2001) states that, in Brazil, the changes and concerns with the management of RSS occurred due to facts such as:

- Discovery of AIDS, which forced changes in the conduct of hospital hygiene.
- When the residues came into contact with patients, they were considered infectious.
- Small hospital incinerators have given way to centralized systems, due to environmental constraints and the increase in the amount of waste considered infectious.
- Since 1989, a new philosophy has emerged in waste management and several countries have established rules in which only a small portion of RSS is defined and treated as special.

Finally, the correct management of solid waste means not only controlling and reducing risks, but also achieving their minimization, from the point of origin, observing the rules regarding packaging, intra and extra unit collection, disposing of them in a safe and environmentally appropriate way, also increasing the quality and efficiency of services. Medical waste should be treated appropriately and, if possible, processed or recycled.

Cristina Lucia Sisino and Rosália Maria de Oliveira (2000), in their book Solid Waste, Environments and Health, A Multidisciplinary Vision, state that there must be changes in the patterns of consumption, production and generation of waste. Some strategies could be outlined based on the Agenda 21 programs, such as: minimization of waste production; maximization of waste treatment and disposal systems compatible with environmental preservation and expansion of the coverage of collection and final destination services. Waste is divided into household municipal solids; hospital, health and industrial services. Sisino and Oliveira discuss the environmental impact of Large Urban and Industrial Waste Dumps; bioremediation of affected areas; among other topics.

Sandro D'mato Nogueira (2008) in the book Meio Ambiente do Trabalho – O Princípio da Conservação na vigilância e na saúde ambiental. "In the hospital environment, energy in the form of electricity is a source of life." It is the energy that maintains the appliances that are often sustaining the patient's life. According to this author, a rationalized analysis of the infectious disease issues of medical waste as a whole is necessary.

Law No. 12,305/2010 established a deadline for the elimination of landfills and the environmentally appropriate final disposal of tailings until 2014. In 2012, the garbage dump in Gramacho, a poor neighborhood in Duque de Caxias that had been operating for 34 years and housed

about 1600 workers, officially closed in Rio de Janeiro, according to the Minister of the Environment, Izabella Teixeira, saying that the site will be an example of recovery of environmental liabilities. With the degradation of the environment and the decrease in the accelerated quality of life, today there is a greater concern that, in a way, is still not much This is noticeable in the way in which the issue of sustainability, the recycling of what is produced and the minimization of production is dealt with in Brazil. It is extremely important to dispose of this waste in a less harmful way.

In Brazil, the National Health Surveillance Agency (ANVISA), which in turn regulates, controls and inspects products and services that involve health risks, and the National Council for the Environment (CONAMA) have assumed the role of guiding, defining rules and regulating the conduct of the different agents with regard to the generation and management of waste from health services. with the aim of preserving health and the environment, ensuring its sustainability. CONAMA Resolution No. 005/03 was published, which defined the obligation of health services to prepare a waste management plan. After this effort, it reflected on the present day, with the publications of RDC ANVISA nº: 306/04 and CONAMA nº: 358/05.

Bill No. 7,047 of 2006, Solid Waste Management, talks about the legal certainty necessary for the solid waste sector.

Bill No. 203 of 1991 talks about packaging, collection, treatment, transportation and final disposal of health waste "Art. 16, II, give adequate final destination to the collected waste".

The Journal Saúde em Debate - CEBES (2005) deals with the minimization of waste production, increased production and the use of disposables after the industrial revolution. "The main causes of the progressive growth in the rate of generation of solid waste from health services (HCW) is the continuous increase in the complexity of care and the increasing use of disposable materials."

13 METHODOLOGY

Firstly, we read the dissertation works of the Postgraduate course in urban engineering of the Federal University of Paraíba – Study on the Management of Solid Waste of the Health Services of the Hospitals of João Pessoa – PB and (Thesis of ENSP-FIOCRUZ, 2008 – Araújo, E.P.) published and analyzed the case studies, projects and works developed in hospitals and treatment centers.

Afterwards, visits were made to the HRT, HRSM and Health Centers 01 and 02 of Taguatinga, for analysis and evaluation of the recycling methods used and possibilities of adaptation of existing projects or construction of new buildings.

Subsequently, an appropriate place was designed for the storage of the waste until the final destination.

14 DISCUSSION AND ANALYSIS OF RESULTS

This chapter aims to present and discuss the main observations made during the course of the work of this research, while answering whether the objectives initially planned were achieved and whether the questions throughout the research were answered. In addition, some difficulties encountered in the elaboration of the research are included.

Initially, when the theme was presented, for the development of the project, the only view was that hospital waste is potentially dangerous and infectious, and that there was no proper and adequate treatment. With the development of the project, the research showed us the concepts regarding waste and that in addition to recycling, there is the possibility of adapting these recycling methods to the various hospital waste, in order to generate energy to feed back the building itself. The advancement of research and the help of the advisor made it possible for us to visit hospitals and health centers, to see up close how waste should be processed, stored and collected. The research also showed us the proper treatments and the diversity of existing waste. In addition, we have seen that there are norms, laws, and responsible and supervisory bodies. However, during the visits, we found that the process of segregation to minimize waste is not exactly as it should be, because there are difficulties and specific needs of each hospital and health centers, which prevent the procedure from happening correctly.

In most of the visits we made to hospitals and health centers, we had difficulty finding people specialized in the field of RSS who would inform us how the stages from segregation to destination take place final. As a solution, in some informal preliminary conversations with the cleaning staff of the establishments visited, we found that there was no general planning of the stages that the HCW undergoes, nor an awareness of the professionals responsible for the disposal of each group of waste.

15 FINAL THOUGHTS

From this research and data collection regarding solid waste in general and waste from health services, we conclude that there is still a lack of initiatives to encourage policies and management to raise awareness in society in relation to this important and indispensable theme for sustainable development. We have seen that initiatives such as the creation of laws and inspections have been created to try to solve the obstacle, but there are still constant problems. Recycling is still a highly recommended method and solution of paramount importance to continue the economy, sustainable development and energy efficiency.

According to the National Solid Waste Policy, it established that environmental education is a fundamental instrument for the success of this purpose of the government and society, to change a culture in relation to the disposal of waste. In fact, in the law, there is no mention of garbage, which is a word proscribed by the law, but residue or reject, which allows us to use all the material. To change this, it is important to know what is already being done in society so that we have a policy that is in

tune with the solutions that the population has been finding.

As a result, we understand how hospital architecture needs to be humanized, being able to have better energy use and thus work on its sustainability; We also raise elements that can benefit, in addition to the health institution, the population and the environment.

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ATTACHMENTS

ANNEX I

Seqüência dos passos para elaboração do PGRSS

Passo 1 - Identificação do problema

Abrange o reconhecimento do problema e a sinalização positiva da administração para início do processo.

O que fazer

- Definir, provisoriamente, um responsável pelas tarefas.
- Analisar os contextos local, estadual e nacional no qual deverá se inserir o PGRSS, nos aspectos econômico, social, político, jurídico etc.
- Identificar as políticas nacionais em vigor no campo de resíduos sólidos.
- Levantar o que já é realizado na gestão de resíduos nos serviços públicos, Ongs, grupos de base, iniciativas locais.

- Estudar a documentação existente: relatórios internos, literatura sobre o assunto, estatísticas oficiais, alvarás, autos, licenciamento, etc.
- Realizar uma avaliação preliminar dos resíduos de serviços de saúde - RSS gerados pelo estabelecimento e da gestão destes.
- Mapear todas as áreas do estabelecimento envolvidas com RSS.

- Elaborar uma estratégia de trabalho.
- Obter o respaldo da direção da instituição.
- Discutir com a direção todas as etapas de trabalho.

Resultado do passo 1:

- *conhecimento preliminar do problema;*
- *plano preliminar de trabalho;*
- *aprovação da Diretoria.*

Passo 2 - Definição da equipe de trabalho

Abrange a definição de quem faz o que e como.

O que fazer

- Designar profissional para a elaboração e implantação do PGRSS. Os requisitos para a função são:
  - ter registro ativo junto ao seu conselho de classe;
  - apresentar a Anotação de Responsabilidade Técnica - ART, ou o Certificado de Responsabilidade Técnica, ou documento similar quando couber.
- Compor uma equipe de trabalho, de acordo com a tipificação dos resíduos gerados.

Tome nota: a escolha da equipe

O responsável legal é aquele que consta do alvará sanitário emitido pela vigilância sanitária. O responsável pelo PGRSS deve atender às exigências do capítulo IV da RDC nº306/04. O responsável técnico dos serviços de atendimento individualizado pode ser o responsável pela elaboração e implantação do PGRSS.

Quanto mais complexos forem os processos encontrados no estabelecimento, maiores são as exigências técnicas da equipe que deverá elaborar e implementar o PGRSS. Em estabelecimentos maiores, o grupo deve ser multidisciplinar.

O sucesso de qualquer trabalho depende muito da maneira como são escolhidos os membros de uma equipe e de como estes utilizam os recursos, como dividem o trabalho e normatizam sua relação interna (para a comunicação, a gestão de conflitos e outros processos). Por isso, recomenda-se que a escolha dos membros da equipe deve estar respaldada em:

- *formação técnica para as tarefas;*
- *responsabilidades: qualificações para as atribuições e funções;*
- *avaliação das competências de cada um e sua melhor utilização.*

A equipe de trabalho deve ser treinada adequadamente para as tarefas e participar de todas as etapas do plano. O responsável pelo PGRSS deve elaborar, desenvolver, implantar e avaliar a aplicação do PGRSS, de acordo com as especificações legais já mencionadas e supervisionar todas as etapas do plano.

Resultado do passo 2:

- *responsável pelo PGRSS definido;*
- *equipe de trabalho composta e treinada.*

Passo 3 - Mobilização da organização

Abrange o envolvimento da organização para a realização do PGRSS. Objetiva sensibilizar os funcionários sobre o processo que será iniciado, disseminando informações gerais e específicas sobre RSS e o PGRSS.

O que fazer

- Promover reuniões com os vários setores para apresentar a idéia, o possível esquema de trabalho e o que é esperado de cada unidade.
- Promover atividades de sensibilização sobre a temática, como, por exemplo, conferências, oficinas, filmes e outras.
- Criar formas permanentes de comunicação com os funcionários, como, por exemplo, um painel que seja regularmente atualizado com informações

sobre temáticas ambientais e o desenvolvimento do PGRSS.

- Organizar campanhas de sensibilização sobre necessidade do PGRSS.
- Preparar um questionário para levantar a percepção dos funcionários sobre o meio ambiente, de forma a identificar eventuais questões chaves relacionadas aos resíduos de serviços de saúde.
- Divulgar os resultados da pesquisa a todos os funcionários, por meio de cartazes, folhetos e outros meios disponíveis na organização.

Tome nota:

Todas estas sugestões podem e devem ser interligadas, fazendo parte de um plano de comunicação. Assim, terão maior eficácia.

Resultado do passo 3:

- *conhecimento, por todos os funcionários, da importância de se gerenciar os RSS e do que é o PGRSS;*
- *envolvimento dos funcionários na execução, implantação e manutenção do PGRSS.*

Passo 4 - Diagnóstico da situação dos RSS

Abrange o estudo da situação do estabelecimento em relação aos RSS. A análise identifica as condições do estabelecimento, as áreas críticas. Fornece os dados necessários para a implantação do plano de gestão.

Tome nota:

É necessário efetuar o registro preciso e cuidadoso de todas as informações obtidas que serão utilizadas no próximo passo.

O que fazer

Levantamento das atividades

- Proceder ao levantamento de todas as atividades do estabelecimento, com visitas às áreas administrativas, setores ou unidades especializadas e outras.

Tome nota:

As atividades devem ser informadas pelo profissional da saúde responsável pelo setor.

O profissional que está realizando o levantamento deve ter capacidade técnica para relacionar os possíveis tipos de resíduos em função do tipo de atividade daquele setor.

Identificação dos resíduos

- Identificar os resíduos, classificados nos grupos definidos - A, B, C, D, E, recicláveis (papel, plástico, metal, vidro, matéria orgânica) - (PARA SABER MAIS, ver capítulo 3 e anexo 3). É importante verificar detalhes sobre os tipos de resíduos, bem como condições específicas em que são gerados no estabelecimento.

Tome nota:

Em situações excepcionais, mas não raras, pode-se ter um determinado resíduo de origem desconhecida. Nestes casos, deve-se proceder da seguinte maneira:

1. *Avaliar as características do resíduo, em relação à sua periculosidade.*
2. *Identificar os possíveis riscos associados para a adoção de medidas de controle.*

Acondicionamento dos resíduos (PARA SABER MAIS, consulte o anexo 5)

- Identificar que tipos de recipientes são utilizados como contenedores dos RSS.
- Identificar os tipos de embalagens: sacos, plásticos, bombonas, caixa de papelão, caixa para perfurocortantes etc.
- Verificar se a quantidade de embalagens é compatível com os resíduos gerados.

- Identificar e verificar se existe definição e padronização dos contenedores e embalagens.
- Verificar se estão sendo respeitados os limites de preenchimento dos contenedores e embalagens.
- Verificar a adequação das embalagens para os resíduos químicos perigosos, em função das suas propriedades físicas.
- Verificar a existência de acondicionamento em recipiente adequado para os perfurocortantes.
- Verificar se os contenedores são de material lavável, resistente à punctura, ruptura e vazamento, com tampa provida de sistema de abertura, com cantos arredondados e resistentes ao tombamento.

Coleta e transporte interno

- Verificar se a coleta está sendo feita separadamente de acordo com o grupo de resíduos e em recipientes específicos a cada grupo de resíduos.
- Descrever as coletas abordando sua forma em função do grupo de resíduos, tipos de recipientes, carros de coleta, equipe, quantidade, freqüência, fluxos de resíduos etc.
- Verificar se o dimensionamento da coleta está adequado ao volume gerado, número de funcionários disponíveis, número de carros de coletas, equipamentos de proteção individual - EPIs necessários conforme as normas de saúde e segurança do trabalho e demais ferramentas e utensílios utilizados na coleta.
- Verificar se existe padronização de turnos, horários e freqüência de coleta para os diferentes tipos de resíduos.
- Verificar a técnica do manuseio da coleta: fechamento dos sacos, transporte dos sacos, uso de EPIs.
- Verificar se o tipo de resíduo está compatível com a cor do saco.
- Verificar se, para o transporte manual, os recipientes estão adequados.
- Verificar o transporte mecânico e uso de carro de coleta.
- Verificar se os carros de coleta estão devidamente identificados com símbolos de segurança.
- Verificar o estado de conservação dos carros de coleta.

Fluxo da coleta interna

- Verificar o traçado e desenhar os roteiros (itinerários) das coletas até o abrigo externo.
- Levantar as freqüências, fluxo, nível de ruído e horário das coletas.
- Levantar e sistematizar as características de cada roteiro para os diversos resíduos.
- Verificar a compatibilidade de roteiros previamente definidos para cada tipo de resíduo e horários das coletas em função da distribuição de roupas, alimentos e medicamentos, períodos de visita ou de maior fluxo de pessoas ou de atividades.

Quantificação dos RSS

- Levantar a quantidade de cada tipo de resíduo gerado por setor, por meio de volume ou pesagem;
- Estabelecer um período de coleta dos dados, ou seja, turno/dia/semana/mês.

Armazenamento interno e externo

- Verificar as condições de armazenamento existentes.
- Verificar o armazenamento dos resíduos de acordo com a regra de segregação por tipo de resíduo (PARA SABER MAIS, consulte o anexo 1).
- Verificar se as embalagens com resíduos estão contidas em recipientes devidamente fechados.
- Verificar se o número de contenedores é compatível com a quantidade e tipos de resíduos gerados.
- Verificar se os ambientes disponíveis para guarda temporária atendem aos requisitos mínimos de dimensionamento, equipamentos e segurança.
- Verificar se as salas de resíduos e abrigos estão compatíveis com tipos de resíduos gerados e sua quantidade.
- Verificar como é efetuada a limpeza do ambiente de armazenamento interno e externo.
- Verificar como é realizado o processo de coleta externa.
- Verificar quais os tipos de contenedores existentes no abrigo de resíduos.
- Verificar se a construção do local de armazenamento externo é exclusiva para resíduos.
- Verificar se os abrigos possuem símbolo de identificação (ver tabela à pág. 43), em local de fácil visualização, de acordo com a natureza do resíduo.
- Verificar a existência de abrigos com separação para os diferentes tipos de resíduos.
- Verificar o armazenamento dos resíduos químicos perigosos considerando as medidas de segurança recomendadas.
- Verificar a existência de resíduos sem identificação.
- Verificar se o abrigo de resíduo químico do grupo B perigoso está projetado, construído e é operado de acordo com as normas de segurança e higiene.
- Verificar para onde está sendo encaminhado o efluente da lavagem do abrigo e da área de higienização.

Área de higienização

- Verificar se o abrigo possui área de higienização para carros de coleta interna e demais equipamentos utilizados, dotada de ventilação, cobertura, iluminação artificial, ponto de água (preferencialmente quente e sob pressão), piso impermeável, drenagem e ralo sifonado.

Coleta e transporte externo

- Verificar quais são as empresas coletoras e se as mesmas emitem

certificação de conformidade com as orientações do órgão de limpeza urbana.

- Verificar o sistema de coleta adotado, se em contenedores basculáveis mecanicamente ou manualmente, freqüência de coleta, se ocorre disponibilização dos contenedores pela empresa.
- Verificar os tipos de veículos utilizados de acordo com sua adequação às normas.
- Verificar se o veículo possui sistema de contenção para líquidos.
- Verificar o procedimento da coleta pelos funcionários da equipe de coleta, quanto ao rompimento de sacos, liberação de líquidos ou contaminação do ambiente.
- Verificar o uso de EPIs pelos funcionários da empresa.

Tratamento

- Verificar se o estabelecimento possui tratamento prévio ou tratamento interno ou se o serviço é terceirizado.
- Verificar quais são os tipos de tratamento dispensados aos resíduos.
- Verificar se os resíduos do grupo A, que requerem tratamento prévio à disposição final, estão sendo tratados em equipamentos adequados e licenciados e quais não estão sendo tratados.
- Identificar as empresas tratadoras de resíduos de serviços de saúde e se as mesmas emitem certificação de conformidade com as orientações do órgão ambiental.
- Verificar se as empresas terceirizadas que cuidam do tratamento dos resíduos estão licenciadas pelo órgão ambiental.
- Verificar quais resíduos químicos perigosos estão sendo submetidos a tratamento, quais estão sendo dispostos em aterro, e quais estão sendo submetidos a processo de reutilização, recuperação ou reciclagem.
- Verificar a existência de rede coletora com tratamento de esgoto.
- Verificar o processo para decaimento de rejeitos radioativos (se houver).

Disposição final

- Verificar quais os tipos de disposição final existentes.
- Caso a disposição final seja o aterro sanitário ou célula especial de RSS, verificar se os mesmos possuem licenciamento ambiental.

Política de gestão ambiental

- Verificar a existência de política de gestão ambiental no estabelecimento.
- Verificar a existência de gestão de riscos ambientais.
- Verificar a existência de Sistema de Gestão Ambiental - SGA.
- Verificar a necessidade de adequação do espaço físico do estabelecimento para atender normas, legislações e facilitar o correto gerenciamento dos RSS.

- Propor adaptações ao PGRSS, onde for necessário, considerando a avaliação feita e outras auditorias internas e externas.
- Discutir com a equipe e o setor responsável pelas adaptações propostas e considerá-las no orçamento.

Tome nota:

Além de verificar o andamento do projeto em seus elementos tangíveis, uma boa avaliação deve:

- *ser uma ferramenta de gestão mais do que uma ferramenta de controle;*
- *inserir-se num processo de informação, de comunicação e de busca de educação ambiental e melhoria;*
- *melhorar a capacidade da instituição de compreender as realidades nas quais intervém, agir e se organizar de maneira eficaz e eficiente;*
- *facilitar a avaliação de maneira que as equipes e os responsáveis tenham uma idéia clara da gestão dos RSS;*
- *aperfeiçoar os indicadores identificados durante o planejamento para avaliar o desempenho da implantação.*

Resultado do passo 8:

- *PGRSS avaliado;*
- *modificações, adaptações e redefinições;*
- *propostas implantadas.*

Capacitação e treinamento

- Levantar cursos, treinamentos e campanhas voltados a todos os envolvidos no gerenciamento, bem como suas freqüências, onde o foco é a questão ambiental (abastecimento de água, resíduos sólidos, esgotos, poluição do ar, sustentabilidade e outros).

Avaliação global dos dados levantados

- Elaborar um relatório baseado em fatos comprobatórios e na pesquisa realizada seguindo os passos acima listados.
- Abordar, no relatório, as seguintes questões: a descrição de todos os procedimentos relacionados à gestão dos RSS; os aspectos problemáticos; as referências às legislações, regulamentos, normas etc.
- Apresentar formalmente o relatório de diagnóstico ao gestor do estabelecimento para o esclarecimento de dúvidas e ajustes pertinentes.

Tome nota: Os cuidados na elaboração do relatório

Para garantir que a análise seja eficaz para a elaboração do plano, é preciso que o relatório de diagnóstico seja:

- sintético, de leitura fácil, que ressalte a informação essencial, eliminando o que for dispensável para a ação;

- preciso, com os caminhos descritos de forma clara e emblemática, sem proselitismo;

- estruturado, de forma a contemplar as grandes linhas de orientação;

- coerente, garantindo a lógica da sucessão de ações descritas com títulos compatíveis com o conteúdo, argumentos claros e pertinentes;

- comprobatório, evitando conclusões frágeis e difíceis de serem provadas;

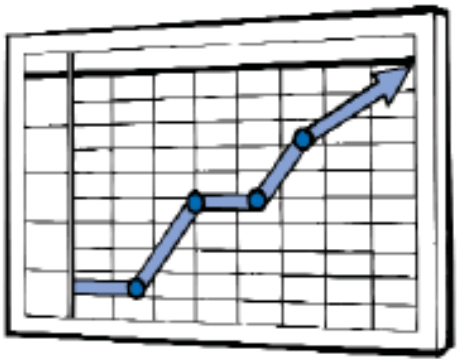
- impessoal, evitando críticas e citações de pessoas da organização relacionadas a áreas com problemas.

Resultado do passo 4:

- *Relatório contendo a análise da situação atual do serviço de saúde quanto à gestão dos RSS e identificação de situações críticas, semi-críticas e não críticas.*

Passo 5 - Definição de metas, objetivos, período de implantação e ações básicas

Corresponde à organização e sistematização de informações e ações que serão a base para a implantação contínua do PGRSS.



O que fazer

- Delimitar o quadro de intervenção e a dotação financeira preliminar para a seqüência dos trabalhos.

Tome nota:

O PGRSS pode ser feito por meio de gestão direta ou em parceria. Para definir isso, é preciso saber em que campo se deseja atuar e quais as grandes linhas metodológicas e as implicações de se fazer diretamente ou não.

- Decidir quais as metas a serem atingidas.
- Indicar o momento adequado para se dar início à execução do plano e definir cronograma.
- Construir os objetivos que levarão ao atingimento das metas.
- Dimensionar a equipe de trabalho, relacionando número de empregados, cargos, formação e responsabilidade técnica.
- Dimensionar espaços necessários, materiais e equipamentos.

Tome nota:

A finalidade principal do PGRSS é estabelecer as condições necessárias para a segurança do processo de manejo dos resíduos. Outras finalidades específicas de cada estabelecimento podem ser nomeadas, para cumprir as metas que forem estipuladas. Abaixo, exemplos de objetivos:

- *Criar práticas de minimização dos resíduos.*
- *Substituir os materiais perigosos, sempre que possível, por outros de menor periculosidade.*
- *Reduzir a quantidade e a periculosidade dos resíduos.*
- *Propiciar a participação e envolvimento dos funcionários do estabelecimento.*
- *Atrelar ao gerenciamento um trabalho de responsabilidade, co-responsabilidade e responsabilidade social.*
- *Conhecer a realidade local ou regional da coleta, tratamento e disposição final dos resíduos sólidos.*
- *Conhecer os diferentes tipos de resíduos gerados nas várias áreas de um estabelecimento prestador de serviços de saúde, propiciando a diminuição dos riscos à saúde e a preservação do meio ambiente, por meio de medidas preventivas e efetivas.*
- *Criar coleta seletiva de materiais recicláveis.*
- *Criar o manual de boas práticas em manejo dos resíduos sólidos.*
- *Criar procedimentos básicos e adequados para o correto gerenciamento dos resíduos sólidos.*
- *Criar procedimentos de auditoria interna e supervisão.*
- *Melhorar as medidas de segurança e higiene no trabalho.*
- *Minimizar os riscos sanitários e ambientais derivados dos resíduos sólidos (contaminação do solo, água, catadores etc.).*
- *Desenvolver um trabalho de prevenção contra os riscos potenciais decorrentes do manuseio dos resíduos sólidos, com o pessoal da coleta.*

Investimentos econômico-financeiros

- Relacionar e quantificar os investimentos necessários para a implantação e avaliação do PGRSS (ver modelo 1 anexo a este capítulo).

Cronograma de implantação e execução do PGRSS

- Ordenar as propostas de ação em função de sua prioridade.
- Definir, para todas, o que fazer, quando e como.

Tome nota:

Cada proposta de ação deve incluir:

- *Descrição da ação*
- *Resultados esperados*
- *Recursos humanos necessários*

- *Materiais necessários*
- *Recursos econômicos necessários*
- *Data de implementação e cronograma.*

- Definir os recursos necessários para implantar as ações, como compra de contenedores e outras que não dependem de obras.
- Elaborar projetos para as obras civis necessárias, de acordo com especificações técnicas e orientações de normas técnicas do Ministério do Trabalho, do órgão de vigilância, do órgão de controle ambiental e da legislação sanitária e ambiental em vigor, assim como das normas e padrões estabelecidos pelos serviços públicos (por exemplo, de água e esgoto).
- Obter, dos órgãos públicos, aprovação para construção de abrigos, ampliação de sala de resíduos, tratamento e outras obras estabelecidas no plano de ação.
- Obter os recursos necessários.

Resultado do passo 5:

- *metas, objetivos e período de realização do PGRSS definidos;*
- *relatório contendo todas as ações propostas, com indicação de recursos e tempo para implantação.*

Passo 6 - Elaboração do PGRSS

Abrange o plano para o gerenciamento contínuo dos resíduos de serviços de saúde.

O que fazer

- Hierarquizar os problemas diagnosticados, verificando: sua gravidade ou urgência; os custos de sua resolução (financeiros, humanos e materiais); o

prazo e o esforço necessários para isso; a facilidade de envolvimento da organização no processo de mudança.

- Verificar a efetividade dos programas de prevenção ambiental e promoção da saúde existentes.
- Seguir um roteiro para a construção do plano de acordo com as legislações sanitárias e ambientais.

Tome nota:

Cada PGRSS é único, mesmo que se tratem de estabelecimentos com as mesmas atividades. O que os diferencia é estar de acordo com o diagnóstico específico. Grande parte das informações necessárias ao roteiro de elaboração do PGRSS vem, portanto, das análises da situação existente obtidas no diagnóstico.

Não é incomum, ademais, mudanças no PGRSS ou até mesmo substituição do plano inicial, no decorrer da pesquisa, diagnóstico e desenho das primeiras propostas. É aí que reside o valor do plano, constituindo-se em uma base sólida para acertos e ajustes.

Dados sobre o estabelecimento

- Informar os dados gerais do estabelecimento (ver modelo 2, anexo a este capítulo).
- Informar os componentes da equipe e/ou empresa que elabora e implementa o PGRSS, com identificação da ART e números de registro dos conselhos de classe, quando for o caso (ver modelo 3 anexo a este capítulo).
- Informar a caracterização do estabelecimento (ver modelo 4 anexo a este capítulo).
- Informar quais são as atividades e serviços predominantes no estabelecimento (ver modelo 5 anexo a este capítulo).

Caracterização dos aspectos ambientais

Abastecimento de água

- Informar qual o sistema de abastecimento (rede pública ou solução alternativa - poço, caminhão-pipa etc.). No caso de poço, informar a licença de uso e outorga.
- Informar se existe aplicação de produtos químicos na água para o abastecimento.
- Informar se existe o controle interno ou externo de qualidade da água .

Efluentes líquidos

- Informar a forma de esgotamento sanitário dos efluentes.
- Informar se existe tratamento ou não dos efluentes no estabelecimento ou na rede coletora.

Emissões gasosas

- Informar se existe geração de vapores e gases, identificar e localizar os pontos de geração.

Tipos e quantidades de resíduos gerados

- Identificar e quantificar os tipos de resíduos gerados ou a serem gerados no estabelecimento em cada setor (unidade) gerador (ver modelo 6 anexo a este capítulo).

Segregação

- Informar as formas de segregação que serão adotadas para os grupos A, B, C, D, incluindo os recicláveis, e E.
- Informar quais os EPIs e EPCs a serem utilizados.

Tipo de acondicionamento

- Descrever os tipos de acondicionamento que serão adotados em função dos grupos de resíduos, suas quantidades diárias e mensais.
- Identificar a forma de acondicionamento que será adotada para a segregação proposta.
- Informar quais os EPIs e EPCs necessários.
- Descrever como e onde serão acondicionados os resíduos dos grupos A, B, C, D e E, considerando os tipos de contenedores, sacos plásticos, bombonas, salas de resíduos, abrigo e suas identificações em função do tipo de resíduos nas áreas internas e externas do estabelecimento.
- Informar as cores e símbolos padronizados para cada tipo de resíduos.

Coleta e transporte interno dos RSS

Coleta interna

- Informar o método de coleta e transporte que será adotado.
- Descrever as formas de coleta em função dos grupos de resíduos, tipos de recipientes, carros de coleta, equipe, freqüência e roteiros adotados.
- Informar se a coleta adotará o armazenamento temporário.
- Determinar a rotina e freqüência de coleta para cada unidade ou setor do estabelecimento.
- Informar os EPIs e EPCs utilizados para realizar a coleta do resíduo.
- Informar como serão higienizados os carros coletores, produtos utilizados e freqüência.

Roteiros de coleta

- Determinar os roteiros de coleta, de acordo com o volume de resíduos gerados por tipo de grupo.

Tome nota:

A rota de coleta interna deve observar as outras rotinas de fluxo de material limpo, evitando, sempre que factível, o chamado roteiro cruzado. Um roteiro pode ser traçado, buscando-se, através de tentativas, a melhor solução que atenda simultaneamente a condicionantes tais como o sentido, freqüência e horário, evitando-se, assim, o já mencionado fluxo cruzado e percursos duplicados ou improdutivos.

- Informar a rotina e freqüência de coleta para cada unidade ou setor do estabelecimento.

Transporte interno

- Informar como serão os transportes internos de resíduos, se separadamente em carros ou recipientes coletores específicos a cada grupo de resíduos.
- Definir os tipos e quantidade de carros coletores que serão utilizados para o transporte de cada grupo de resíduos, capacidade dos carros, identificação, cores etc.

Armazenamento temporário dos RSS

- Caso seja adotado, identificar a localização, tipos de resíduos a serem armazenados, freqüência de coleta.
- Informar os tipos e quantidades de coletores para a guarda temporária de resíduos e as sinalizações para identificação dessas áreas.
- Informar como serão higienizados esses espaços e freqüência de limpeza.

Armazenamento para a coleta externa dos RSS

- Informar a quantidade de contenedores a ser utilizada para cada grupo de RSS, capacidade volumétrica de cada um e disposição na área.
- Informar a rotina do armazenamento externo do estabelecimento de saúde.
- Descrever a rotina de recepção dos RSS das coletas internas.
- Informar como são higienizados o abrigo, os contenedores, carros coletores e com que freqüência.
- Informar os EPIs e EPCs a serem utilizados.

Coleta e transporte externo dos RSS

- Informar se a coleta externa é realizada pelo setor público ou empresa contratada ou sob concessão.
- Informar o tipo de veículo utilizado para o transporte.
- Informar a rotina e freqüência de coleta externa do estabelecimento para os diferentes tipos de resíduos gerados.
- Informar o destino dos resíduos coletados, por tipo.
- Anexar os documentos comprobatórios (licenças, alvarás e outros) das

empresas coletoras, dos transbordos, quando houver (ver modelo 7 anexo a este capítulo).

Tratamento dos RSS

- Descrever o tratamento interno para os resíduos, especificados por tipo de resíduo (ver modelo 8 anexo a este capítulo).
- Descrever o sistema de decaimento de rejeitos radioativos.
- Descrever os tipos de tratamento externo adotados para cada grupo de resíduos e quais os equipamentos e instalações de apoio, incluindo os seguintes aspectos: tecnologias de tratamento adotadas; nome da empresa responsável pela operação do sistema; localização das unidades de tratamento, endereço e telefone; responsável técnico pelo sistema de tratamento, nome, RG, profissão e registro profissional.
- Informar os EPIs e EPCs necessários.
- Anexar os documentos comprobatórios (licenças, alvarás, documentos de monitoramento definidos pelo órgão ambiental) dos sistemas e tecnologias adotados.

Disposição final dos RSS

- Informar as formas de disposição final dos RSS e especificar por tipo de resíduos.
- Informar quais as empresas que executam a disposição final dos RSS.
- Anexar os documentos comprobatórios (licença ambiental, documentos de monitoramento, definidos pelo órgão ambiental) de que a empresa está apta a realizar o serviço.
- Indicar a localização das unidades de disposição final adotadas para cada grupo de resíduos e seus respectivos responsáveis técnicos (nome, RG, profissão, registro profissional, empresa ou instituição responsável e telefone) (ver modelo 9 anexo a este capítulo).

Outras avaliações de riscos

- Informar o mapa de risco do estabelecimento, se houver.

Serviços especializados

- Informar se o estabelecimento possui SESMT, CIPA, PPRA e PCMSO.

Recursos humanos, CCIH, CIPA, SESMT e Comissão de Biossegurança

- Abordar as inter-relações entre as diversas estruturas existentes no estabelecimento (CCHI, CIPA etc.).
- Fazer um resumo das responsabilidades e qualificações de cada um (ver modelo 10 anexo a este capítulo).

Capacitação

- Descrever as capacitações a serem realizadas, nas formas inicial e de

educação continuada (ver modelo 11 anexo a este capítulo).

Controle de insetos e roedores

- Informar e descrever as medidas preventivas e corretivas do programa de controle de insetos e roedores.

Situações de emergência e de acidentes

- Descrever as ações a serem adotadas em situações de emergência e acidentes. Por exemplo: procedimento adotado em caso de derramamento, greve de funcionários etc.

Identificação e locação em esquemas ou fluxogramas

- Informar os locais de geração de resíduos por grupo, os fluxos e os roteiros a serem executados por tipo de resíduos, locais de armazenamento, contenedores etc.

Indicadores de execução e avaliação

- Especificar o que se quer avaliar, quais as mudanças propostas e mensuráveis, levando em conta o objetivo ou resultado fixado.
- Informar quais os indicadores para acompanhar a execução/ implementação do PGRSS e medição do impacto do plano (ver modelo 12 anexo a este capítulo que contém os indicadores mencionados na RDC ANVISA nº 306/04).

Tome nota: O que são indicadores

O monitoramento e avaliação do progresso de qualquer gestão de resíduos sólidos devem ser baseadas em instrumentos de aferição, denominados indicadores, que servem para saber a qualquer momento qual é a situação em relação ao que foi planejado. Os indicadores são descrições operacionais (em quantidade, em qualidade, de acordo com o público-alvo ou localização) dos objetivos e resultados do PGRSS e que podem ser medidos de maneira confiável.

Os indicadores, portanto, devem servir para avaliar resultados. Eles podem medir o desempenho do PGRSS (estágio de andamento do projeto ou de uma atividade, durante a fase de execução) ou o impacto do PGRSS (efeitos que o plano gerou na população-alvo ou no meio socioeconômico).

Um número limitado de indicadores e de fontes de verificação pode substituir uma infinidade de dados e de estatísticas acumuladas nos projetos e, ao mesmo tempo, aumentar a qualidade do acompanhamento. Muitas vezes, os bons indicadores só são "descobertos" durante a ação. Assim, não se deve hesitar em rever os indicadores durante as revisões periódicas do PGRSS. Em certos casos, não é necessário inventar indicadores, estes já existem.

• Especificar a fonte de informação ou o meio de coleta da informação necessária para a avaliação.

Tome nota:

Um bom indicador deve ser:

- *sensível: capaz de registrar diversos tipos de modificações num dado período de tempo;*
- *específico: atribuído a um objetivo/ resultado. O mesmo indicador geralmente só pode ser utilizado uma vez;*
- *mensurável: seja em termos quantitativos ou qualitativos;*
- *exeqüível: os dados necessários para sua leitura estão à disposição podendo ser obtidos no tempo necessário e mediante recursos proporcionais ao objetivo a ser medido;*
- *plausível: as mudanças medidas estão diretamente ligadas às intervenções do PGRSS;*
- *confiável: quando utilizado por várias pessoas, num contexto idêntico, chega ao mesmo resultado.*

Validação

• Após a redação de todo o plano, obter a validação deste pelo gestor do estabelecimento ou instituição.

Tome nota:

O PGRSS é um documento de referência para que o estabelecimento implante o plano, explique-o interna e externamente e para quaisquer outras ações de gestão de resíduos de serviços de saúde.

Resultado do passo 6:

- *PGRSS elaborado;*
- *forma de avaliação definida;*
- *documento contendo relatório validado pelo gestor.*

Passo 7 - Implementação do PGRSS

Abrange as ações para a implementação do PGRSS, com base no documento contendo o plano validado pelo gestor do estabelecimento ou instituição.

O que fazer

- Estabelecer, das ações, procedimentos e rotinas concebidos no PGRSS, os prioritários, indispensáveis ao início da operação.
- Estabelecer um plano de contingência até que todas as ações necessárias para implantar o plano estejam prontas.
- Executar as obras planejadas.
- Fazer o acompanhamento estratégico e operacional das ações.

Tome nota:

Para a implementação do PGRSS é indispensável observar os seguintes requisitos:

- *a disponibilidade de recursos financeiros;*
- *se a equipe técnica está capacitada;*
- *o comprometimento de todos os funcionários, iniciando com a alta diretoria até os serviços menos representativos.*

Resultado do passo 7:

- *PGRSS implantado.*

Passo 8 - Avaliação do PGRSS

Estabelece os períodos e formas de avaliação do PGRSS, de acordo com indicadores.

O que fazer

- Verificar se os resultados esperados foram ou serão atingidos e, se existirem diferenças, quais as razões.
- Verificar se outros indicadores, com melhor desempenho e mais pertinentes que os estabelecidos, podem ser utilizados na continuidade do plano.
- Elaborar um quadro de acompanhamento apontando o resultado da avaliação.

ANNEX II

Sugestões para registro das informações necessárias para o PGRSS

Modelo 1 - Dados gerais do estabelecimento

Razão social	
Nome fantasia	
Tipo de estabelecimento	
Propriedade	pública ( ) filantrópica ( ) privada ( ) outro ( )_____
CNPJ	
Endereço	
Bairro	
Município	
Estado	
Fone(s)	
Fax	
Site	
E-mail	
Horários de funcionamento	24h ( ) diurno ( ) noturno ( ) emergência ( )
Responsável legal	
Data de fundação	

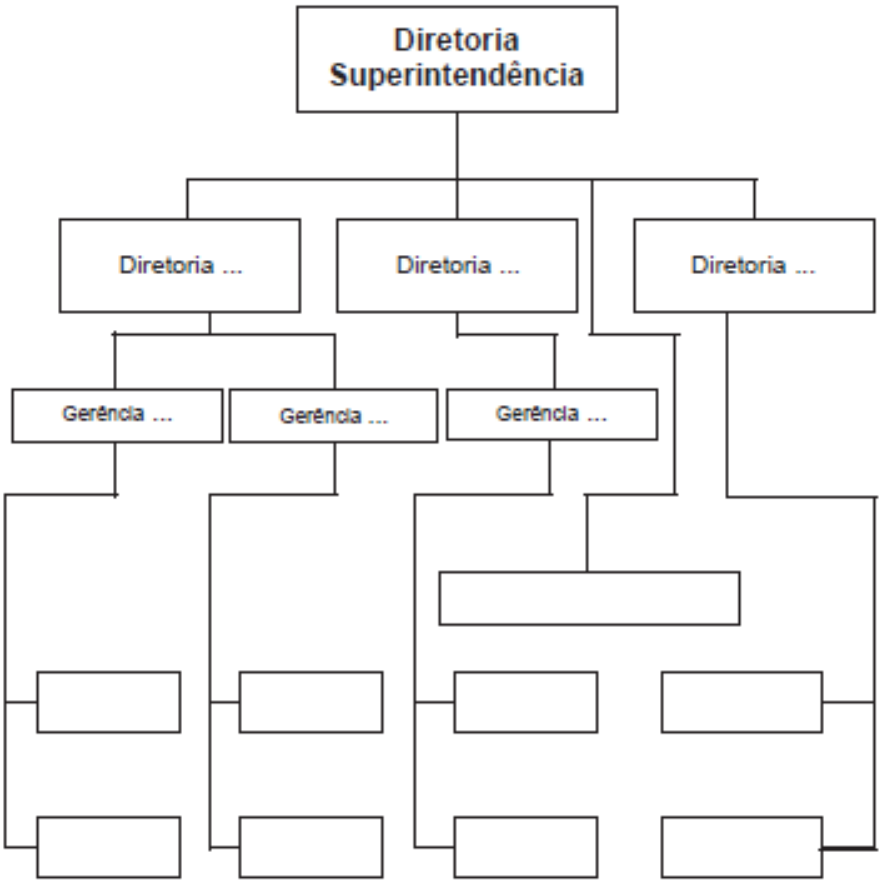
Modelo 2 - Componentes da equipe de elaboração

Responsável pelo PGRSS	
Identificação ART do responsável	
Número do conselho de classe	
Nome dos técnicos/ cargos	
Nome da empresa contratada	
Identificação ART da empresa	
Número do conselho de classe	

Modelo 3 - Caracterização do estabelecimento

Número total de funcionários	existentes: _____ a serem contratados: _____ total: _____
Condição de funcionamento do estabelecimento Tipo de serviços terceirizados Número total de funcionários de empresas terceirizadas Área total construída Área total do terreno	em atividade ( ) em implantação ( ) em expansão/modernização ( ) em relocalização ( ) manutenção ( ) limpeza ( ) serviços clínicos ( ) outros ( ) _____
Alvará sanitário	nº. _____ Data de validade: _____
Licença ambiental (quando exigido)	nº. _____ Data de validade: _____
Horários de funcionamento Estrutura física	 tipo de construção: _____ número de pavimentos: _____
Abastecimento de água	tipo: concessionária ( ) captação própria ( ) consumo interno (quantidade): _____ número de reservatórios: _____
Condições urbanas do entorno	condições de acesso: _____ risco de enchentes: _____ risco de deslizamento: _____
Coleta de esgoto sanitário	Coleta e tratamento público_____ Só coleta: _____ Sem coleta: _____ Tratamento próprio: _____

Modelo 4 - Exemplo de organograma do estabelecimento



Modelo 5 - Caracterização das atividades e serviços do estabelecimento

Tipos de especialidades médicas e/ou assistenciais	
Número de atendimentos/dia	
Número de leitos por especialidade (hospitais)	
Número de profissionais	
Tipo de contrato dos profissionais	direto ( ) terceirizado ( ) misto ( )

Modelo 6 - Tipos de resíduos gerados

Quantidade de resíduos coletados por unidade

Unidades	Grupos de resíduos										Medido	Estimado
	A1	A2	A3	A4	B	C	D	E	RE	ES	t/mês	l/mês

A = resíduos do grupo A.
B = resíduos do grupo B.
C = rejeitos do grupo C.
D = resíduos do grupo D.
E = resíduos perfurocortantes.
RE = resíduos recicláveis (papelão, vidro, metais, outros).
ES = resíduos específicos (entulho, móveis, eletroeletrônicos, lâmpadas fluorescentes etc.).

Quantidade de resíduos coletados por grupo de resíduos

Grupos	Total de resíduos (kg/mês)
A	
B	
C	
D	
E	
Recicláveis	
ES	

Modelo 7 - Informações sobre coleta e transporte externo

Empresas coletoras de serviços

Nome(s) das empresa(s)	CNPJ/ CPF	Tipos de resíduos	Documentos legais

Freqüência de coleta

Tipo de resíduos	Diariamente	Dias alternados	Semanal	2 x ao dia	Outra freqüência

Tipos de veículos utilizados na coleta

Tipos de resíduos	Tipos de veículos				
	Saveiro	Basculante	Baú	Compactador	Outros, especificar

Modelo 8 - Tipos de tratamento interno e externo dos resíduos

Grupos de resíduos	Tipos de tratamento	
	Interno	Externo
A		
Sub-grupo		
A1		
A2		
A3		
A4		
A5		
B		
C		
D		
E		

Modelo 9 - Informações sobre a destinação final dos resíduos

Tipo de disposição final	Empresa – endereço	Grupo de resíduos			
		A	B	D	E

Modelo 10 - Responsabilidades e qualificações das equipes de CCIH, Cipa, SESMT e Comissão de Biossegurança

Nome do funcionário	Cargo	Formação	ART ou similar
Total			

Modelo 11 - Capacitação da equipe de implantação do PGRSS

Nome do funcionário	Treinamentos realizados		Treinamentos a realizar
	Próprios	Terceirizados	

Modelo 13 - Equipamentos necessários e recursos correspondentes

Equipamentos	Unidade	Quantidade	Valor unitário (R$)	Valor total (R$)
Obras civis	Discriminar os tipos de obras necessárias			
Equipamentos de coleta	Discriminar os tipos de equipamentos, modelo, fabricante etc.			
Equipamentos de informática	Discriminar os tipos de equipamentos, modelo, fabricante etc.			
Outras máquinas e equipamentos	Discriminar os tipos de equipamentos, modelo, fabricante etc.			
Móveis e utensílios	Discriminar o mobiliário e os utensílios necessários			
Recursos humanos	Discriminar as pessoas necessárias por área de formação e atuação			
Outros	Discriminar outros investimentos (ex.: gastos com treinamento, aquisição de manuais técnicos etc.)			

APPENDAGES

(FRONT)

LIXO INFECTANTE (GRUPO A)

Descartar na LIXEIRA BRANCA E SACO BRANCO LEITOSO. Esses resíduos são altamente perigosos, logo, são encaminhados para incineração.

LIXO QUÍMICO (GRUPO B)

Devem ser acondicionados com base nas recomendações específicas do fabricante para condicioná-los e descartá-los.

LIXO RADIATIVO (GRUPO C)

Devem ser acondicionados em recipientes de chumbo, com blindagem adequada ao tipo e ao nível de radiação emitido e ter simbologia de radiotativo.

LIXO COMUM (GRUPO D)

Descartar na LIXEIRA CINZA E SACO TRANSPARENTE. Fraldas, sobras de alimentos, peças descartáveis de vestuário, plásticos, materiais de assistência ao paciente NÃO contaminados com sangue ou secreção, são exemplos de resíduos desse grupo.

LIXO PERFUROCORTANTE (GRUPO E)

Descartar imediatamente em recipiente resistente à ruptura e vazamento, que sejam vedados, identificados e com alça para transporte seguro.

ATENÇÃO!!!

NÃO DESCARTAR AGULHAS EM SACOS PLÁSTICOS PARA EVITAR ACIDENTES

EQUIPAMENTOS DE PROTEÇÃO INDIVIDUAL (EPI's)

*LUVAS;
*ÓCULOS;
*BOTAS;
*MÁSCARA;
*AVENTAL;
*JALECO.

ALUNAS/PESQUISADORAS: INGRID C.S.B.LOPES E PRISCILLA B.S.DOMENECH
FONTE: RDC 306/04 ANVISA E CONAMA 358/05

COMPANHA DE CONSCIENTIZAÇÃO À SAÚDE E AO MEIO AMBIENTE

RESÍDUOS DE SERVIÇOS DE SAÚDE

UniCEUB - PROJETO DE INICIAÇÃO CIENTÍFICA
AGOSTO/2014

(BACK)

O QUE SÃO RESÍDUOS DE SERVIÇOS DE SAÚDE - RSS?

São detritos gerados nos estabelecimentos de saúde durante a prestação de serviços assistenciais e de diagnóstico, podendo tornar-se risco à saúde pública e ao meio ambiente.

DIRETRIZES LEGAIS

ANVISA - RDC nº 306/04: Regulamento Técnico para o gerenciamento dos resíduos de serviços de saúde;
CONAMA - Resolução nº 358/05: tratamento e disposição final do RSS;
PNRS - nº 12.305/2010 - Prevê a prevenção e a redução na geração de resíduos, tendo como proposta a prática de hábitos de consumo e a destinação ambientalmente adequada dos rejeitos sustentável e um conjunto de instrumentos para propiciar o aumento da reciclagem e da reutilização dos resíduos sólidos.

ATENÇÃO!!!

É RESPONSABILIDADE DO PROFISSIONAL DE SAÚDE, A SEGREGAÇÃO E O ACONDICIONAMENTO CORRETOS DOS RESÍDUOS PRODUZIDOS!!

CLASSIFICAÇÃO DOS RSS:

GRUPO A: Resíduos contaminados com sangue ou secreção em forma livre, assim como produtos de assistência a isolamento de contato por microorganismos de relevância epidemiológica.

GRUPO B: Resíduos contendo substâncias químicas que podem apresentar risco à saúde pública ou ao meio ambiente, dependendo de suas características de inflamabilidade, corrosividade, reatividade e toxicidade. Ex.: resíduos de medicamentos e ou medicamentos vencidos.

GRUPO C: Quaisquer materiais resultantes de atividades humanas que contenham radionulídeos em quantidade superiores aos limites de isenção especificados nas normas de CNEN e para os quais a reutilização é imprópria ou não prevista.

GRUPO D: Resíduos que não apresentam risco biológico, químico ou radiológico à saúde ou ao meio ambiente, como por exemplo, papel de uso sanitário, fraldas, restos alimentares de paciente, entre outros.
PAPEL - COLETOR AZUL
METAL - COLETOR AMARELO
VIDRO - COLETOR VERDE
PLÁSTICO - COLETOR VERMELHO

GRUPO E: Materiais perfurocortantes ou escarificantes, tais como: agulhas, pontas diamantadas, lâminas, vidros quebrados no laboratório ou outros similares.

COMO SEPARAR OS RESÍDUOS PRODUZIDOS NOS ESTABELECIMENTOS DE SAÚDE?