

Code of Biosafety Practices

Master in Veterinary Medicine

Elaborated by the “Núcleo de Biossegurança do Mestrado Integrado em Medicina Veterinária” (NB-MIMV)



utad

UNIVERSIDADE DE TRÁS-OS-MONTE S E ALTO DOURO

July 2022

Code revision history

Version	Chapters	Description of the Amendments	Date
1	1 to 9	First version of the document	October 2014
2	1 to 9	General revision	July 2022

Preliminary note

The present Code of Biosafety Practices for the MSc course in Veterinary Medicine has been elaborated and revised by the “Núcleo de Biossegurança do Mestrado Integrado em Medicina Veterinária” (NB-MIMV).

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The BU-IMVM status is defined by the respective Regulation published in the “Diário da República” 25, 2013 (2ª Série, no 228, pp. 34504-34505).

Index

1. Biosafety in the MSc course in Veterinary Medicine	1
2. Biosafety	2
2.1. What are the biological risks and biosafety?.....	2
2.2. What are the basic biosafety procedures that must be met at MIMV?.....	4
3. Handling needlestick and sharp material	7
3.1 How to perform the disposal of needlestick and sharp material.....	7
4. Hands hygiene	9
4.1. When should you wash your hands?	9
4.2. What is the hands washing technique?	10
4.3. What is the importance of hands hygiene with alcohol-based products.....	11
4.4. How to perform hands hygiene using alcohol-based products.....	11
4.5. When should we do hands hygiene?.....	12
4.6. What factors may influence hands hygiene?.....	12
4.7. What care should be taken after hands hygiene?.....	13
5. Personal protective equipment (PPE)	14
5.1. What PPE are available and how should they be used?.....	14
5.1.1. Gowns and pajamas.....	14
5.1.2. Gloves.....	15
5.1.3. Caps	16
5.1.4. Face protection (masks and goggles)	16
5.1.5. Respiratory protection.....	16
5.1.6. Footwear.....	17
6. Waste management and disposal	18
6.1. What are medical wastes?	18
6.2. What are the four biohazard waste groups?	19
6.3. How to do the sorting and packaging of biohazardous wastes according to their group....	19
7. Emergency procedures for biohazardous material spills	21
7.1. How to clean spills.....	21
8. Useful contacts	23
9. References	24

1. 1. Biosafety in the MSc Course in Veterinary Medicine

This code arises from the need to implement a set of biosafety rules and procedures, bringing together useful information on biosafety practices. It's consultation, which is meant to be easy and rapid, intends to facilitate the work of students, teachers, technicians or other personnel in different activities of the MSc in Veterinary Medicine (MIMV) when faced with the biohazard level 2. However, the present code does not exclude the prior consultation and knowledge of the "Code of Good Practices in Biosafety" published by the UTAD Biosafety Commission (CB-UTAD).

The present code aims to contribute to a biosafety culture in MIMV, by introducing rules and general biosafety standards. It should be noted that this type of short publication cannot address all the biosafety aspects, so that if a specific risk practice is not mentioned in this manual, its omission cannot be used to the unaccountability of the individuals that perform it.

Any doubt about the contents of this manual can be clarified with the MIMV "Núcleo de Biossegurança" or the Biosafety Committee of UTAD.

2. 2. *Biosafety*

Students, teachers, technicians or other personnel performing activities at the MIMV should be responsible for their actions and should avoid attitudes, practices and behaviors that can result in potential accidents or injury to them and others. They should also be aware against the potential risk of accidents caused by colleagues. The vast majority of accidents result from an attitude of indifference, lack of common sense, failure to satisfy the protocols and recommendations or hurry in getting results. Accidents with biological hazards can be avoided or their impact minimized when proper precautions are taken. It should be noted that biosafety at work cannot depend only on the institutions' Biosafety Committees, but rather depends on the students, teachers and technicians collective effort.

2.1. **What are the biological risks and biosafety?**

To better understand how we should protect ourselves, the concepts associated with biosafety must be acknowledged.

Risk agent - any component of physical, chemical, biological or radioactive nature that may compromise the health of humans, animals, the environment or the quality of the work performed.

Biosafety (or biological safety) - prevention of risks associated with biological agents or their derivatives with importance in the health of humans, animals and the environment. It is the term used to describe the principles of containment, techniques and practices implemented to prevent unintentional exposure to pathogens or their accidental release.

Accident risk - any factor that put workers in danger and that may affect their physical or mental well-being. Example: machinery and equipment without protection, among others.

Ergonomic risk - any factor that might interfere or harm physically or psychologically the worker, causing illness or discomfort. Examples: poor posture, excessive work, repetitive movements, lifting or transporting heavy weights, among others.

Physical Risk - any physical factor in the premises or in the surrounding environment where work is being developed. These include various forms of energy, for example, noise, vibration, abnormal pressures, extreme temperature and radiation, among others.

Chemical risk - any compound or product that can enter the organism through the respiratory tract (dusts, fumes, gases or vapors) or that, depending on the nature of the work being developed, may enter in contact or be absorbed into the organism through the skin or digestive tract.

Biohazard - bacteria, fungi, parasites, and viruses among others, that have the capacity to produce adverse effects in humans, animals and the environment. Biohazardous agents can be divided into four classes 1-4, in ascending order of risk, and are classified according to the following criteria: pathogenic for humans, virulence, transmission routes, the existence of prevention measures and effective treatment.

Biological Hazard Class 1 - the risks for the individual and the community are low. It is applied to well known biologic agents that have zero or low probability of causing infections in humans or healthy animals. The potential risk for professionals handling these agents and the environment is minimal.

Biological Hazard Class 2 - the risk is moderate for the individual and limited for the community. It is applied to biological agents that cause infections in humans or animals, and whose risk of spreading to the community or into the environment is limited, so that does not constitute a serious threat to those handling them in containment

conditions. They are also agents for which effective therapeutic and prophylactic measures exist. Example: the fungus *Microsporium canis*.

Biological Hazard Class 3 - the risk is high for the individual, but limited for the community. It is applied to biological agents that cause serious or life-threatening infections in humans and animals, and represent a serious threat to those handling them. These agents also present a serious risk of spreading in the community and the environment and can spread from person to person. However, treatment and/or prevention measures generally exist. Example: *Bacillus anthracis*.

Biological Hazard Class 4 - the risks for the individual and the community are high. It is applied to biological agents that are highly pathogenic for humans, animals and the environment, and can easily spread. These agents present a high risk to those handling them, spreading easily by aerosol or by unknown transmission routes, and for which no therapies or prophylactic measures are known. Example: the Ebola virus.

Biosafety Level - the level of restraint necessary to enable the work with biological materials safe to humans, animals and the environment. It is the combination of practices, procedures and safe equipment within the adequate facilities.

2.2. What are the basic biosafety procedures that must be met at MIMV?

It is possible that in some situations at MIMV UTAD, students, teachers, technicians or other personnel may be exposed to biohazard level 2. At UTAD planned or scheduled activities that may involve biohazard level 3 or 4 are not allowed. Biosafety at MIMV depends on the information about biological risks, knowledge of the general signs, procedures, practices and behaviors, as well as the specific signs, procedures, practices and behaviors of a particular class or research activity. The activities organization and the implementation of general procedures both contribute to the prevention of biological risks when handling biological products and specific equipment and, as such, must always be complied. The general biosafety procedures are listed below.

They should be adopted at the beginning, during or after the conclusion of any activity in a laboratory, livestock, or hospital facility (Veterinary Hospital of UTAD, HVUTAD). Additional specific standards and procedures indicated by the director of a facility or section must also be complied:

1. Keep personal items (wallets, bags, jackets, mobile phones) in the existing cabinets or hangers.

2. Bring to the laboratory / livestock facility or the HVUTAD only the necessary to carry out the work.

3. Always wear appropriate clothing: for laboratories, white coat (mixture of cotton and fiber) until the knees, with long sleeves and preferably with zipper; for livestock facilities overalls and rubber boots; for the HVUTAD the clothing indicated by the hospital (surgical pajamas, overalls and rubber boots, or other).

4. Wear safety goggles / face shields when developing work procedures for which their use is advised, or when the formation of splashes, aerosols and droplets are expected.

5. Do not work with contact lenses in a laboratory, anatomy room or autopsy room as they can absorb infectious and chemical agents and cause damage to the eye. In the case of not being able to work without contact lenses, always wear protective glasses.

6. Do not smoke, do not drink, do not eat, do not apply cosmetics, or take any kind of medication in any of the premises where the work develops.

7. Do not work with loose long hair, which must be tightened.

8. Do not wear watches, bracelets or rings, while working on the premises. These should be removed, stored and used only after hands hygiene.

9. To acknowledge the risks of the biological samples, cultures, body fluids and / or animals being handle.

10. To acknowledge the physical and chemical properties and toxicity of the reagents and / or drugs before performing the work.

11. Never pipette using the mouth. Use automatic or manual pipettors.

12. Do not take the hands to the mouth or the eyes when working.

13. Never leave jars with biological products or reagents opened.

14. Take care and clean properly the material used to not contaminate reagents.

15. Never leave containers with flammable reagents in the proximity of a flame.

16. When diluting a concentrated acid, add the acid to the water stirring slowly, and never the opposite.

17. When heating a substance, never turn the container opening towards the user or the people nearby.

18. Strictly follow the classes', research work or extension work's protocols, and not improvise, as improvisations can cause accidents.

19. Read, understand and follow the rules, use personal protective equipment required for each class, research or extension work.

20. Be aware that all substances are potentially toxic, depending on their concentration and absorption route.

21. Never trust the appearance of a product, seek to know its physicochemical properties prior before manipulating it.

22. Avoid skin contact with biological materials or reagents.

23. Always use the "hotte" when the release of gases or vapors is expected.

24. When working with dangerous, explosive or toxic products or with an unknown danger always use the "hotte" and be ware if there is a fire extinguisher near the place where the work will be performed.

25. Do not pour any biological material (blood, urine or other) or insoluble material in the wash sinks. Use a suitable storage container for waste or the appropriate sinks.

26. Do not pour solvent residues in the washing sinks. Waste from the reactions should be inactivated and stored in suitable containers.

27. Never put in the trash reactions surpluses.

28. After work verify that water and gas taps are closed and electrical devices have been properly shut down.

29. Avoid working alone and at nonconventional hours.

30. In case of accident, as is insignificant as it may seem, immediately report to the facility's teacher or technician.

31. Learn how to use the extinguisher before the fire happens.

32. Use the devices only after you have read and understood the respective instructions.

33. Take note of the location and operation of the framework of electricity.

34. Separate medical wastes according to their biohazard level.

3.3. Handling Needlestick and Sharp Material

Instruments and materials contaminated with blood, body fluids, secretions and excretions should be handled to prevent contamination of the skin and mucous membranes (eyes, nose and mouth), clothing and also to prevent transmission of microorganisms to humans, other animals and environment. All reused instruments have a reprocessing routine. Check them before their use to assure that they were properly cleaned and disinfected/sterilized. It is also our responsibility to make sure that the single-use disposables are actually being disposed and in the appropriate location/containers.

3.1 How to perform the disposal of needlestick and sharp material

A higher degree of caution in biosafety should always be adopted when handling, cleaning, transport or dispose of any potentially contaminated needlestick and sharp material. These materials include needles and syringes, scalpels, razors, scissors, pipettes, capillary tubes and broken glass. When handling these materials we must comply specific biosafety rules:

1. Cutting and perforating objects, including hypodermic needles and syringes, Pasteur pipettes, scalpel and razors, contaminated glass or broken glass, are disposed in containers resistant to punctures and treated as a biological waste.

2. Needles and syringes or other sharp instruments are of restricted use and should only be used when there is no alternative, such as parenteral injection or body fluids sampling.

3. The cutting and perforating instruments should be kept in sight at all times and should not be abandoned.

4. The syringe with separate needle or needle syringes units (ie when the needle is part of the syringe) are often used for injection or sampling of potentially infectious materials in MIMV. After used, these devices should not be folded, cut, broken,

reencapsulated, removed or withdrawn (in the case of disposable syringes), or otherwise manipulated before disposal. Instead, they should be disposed conveniently and carefully in puncture-proof containers (specifically designed for the disposal of sharp objects).

5. The needles and other sharp objects should be placed conveniently and carefully in puncture-proof containers (sharps container). These containers should only be filled up to 2/3 of their capacity.

6. The cutting and perforating objects that are reusable and not disposable should be placed in a container with rigid material, resistant to transport damage and should be moved to the area of decontamination or the autoclave.

7. Broken glass should not be manipulated directly by hand. It is advised to remove it by mechanical means such as broom and dustpan, tongs, or forceps.

4. 4. Hands Hygiene

Hands hygiene is the responsibility of all individuals involved in health care. Hands are our primary tool, and are involved in the vast majority of activities associated with MIMV. As we touch the objects, materials and animals we come in contact with a high number of microorganisms, thus contaminating our hands. These microorganisms can be pathogenic and enter the body via any mucosal or skin lesion, as well as contaminate other animals, objects and materials. Only hands hygiene will remove these microorganisms and prevent their transfer to other animals and surfaces. Hands hygiene is considered one of the most important measures of biosafety and infection control. An effective hands hygiene eliminates or removes microorganisms on the skin, while maintaining the health of the skin. Sterilization of the hands is not a routine objective of hands hygiene, nor it would be beneficial to the health of the skin. The objective is to reduce the number of microorganisms that are part of the skin's transient microbiota, which includes most opportunistic pathogens of the hands. There are two methods for the removal /elimination of microorganisms on the hands: (a) washing hands with soap and running water or (b) using an alcohol-based solution.

4.1. When should you wash your hands?

1. Hands should be washed when they are visibly dirty.
2. Hands should be washed after contact with infected animals and surrounding environment, as well as after contact with blood, body fluids, secretions and excretions, or after contact with contaminated equipment and materials.
3. All teachers, students and staff coming into contact with potentially infected animals (with a suspected or confirmed infectious disease) must have short fingernails, no nail-polish, and should not wear rings, bracelets or watches.
4. Hands hygiene with alcohol-based products is very effective against bacteria and some viruses and can be used when hands are not visibly dirty.

5. Wipes impregnated with an antimicrobial substance can be used followed by the application of an alcohol-based gel if no running water is available.

6. Liquid soaps should be preferred. The soap bars are not acceptable due to the potential transmission of pathogens between users.

4.2. What is the hands washing technique?

1. Remove all accessories (jewelry and watches, among others) of the hands and arms.

2. Wet hands with warm water, preferably. Do not use hot water since it may damage the skin and leads to dehydration and further damage.

3. Apply liquid soap or foam.

4. Rub vigorously all surfaces of the hands for at least 15 seconds, ideally for 40-60 seconds. This is the minimum time that enables the mechanical removal of transient bacteria.

5. Pay special attention to the ends of the fingers (the nail base, between this and the cuticle), interdigital spaces, backs of the hands and base of the handles. These are often forgotten areas.

6. Remove the excess soap with warm water. The presence of residual soap can lead to skin drying and damage.

7. Gently dry your hands with a paper towel or automatic dryer. Rubbing vigorously can damage the skin.

8. If the tap does not have non-manual command, use the paper for drying hands to close it.

9. If there are hand dryers, non-manual command water taps are needed since wipes to avoid recontamination of the hands are not available.

4.3. What is the importance of hands hygiene with alcohol-based products?

1. Hands hygiene with alcohol-based products is, with some exceptions, the preferred method for decontaminating hands when they are not visible dirty.

2. It eliminates microorganisms on the skin more efficiently when compared to hands washing. It can be quickly performed, it is unlikely to cause skin damage, and can easily be available anywhere within the premises.

3. It is faster than handwashing with soap and water.

4. Alcohol-based hands hygiene products should contain 70-90% alcohol.

5. The cleaning with alcohol-based products, especially in the form of an alcoholic gel, causes less skin damage, less irritation and dehydration.

6. You should not use alcohol-based products for hand hygiene when there is a suspicion/confirmation of the following viral infections: Norovirus, Rotavirus, Parvovirus; or the following sporulated bacteria infections: *Bacillus anthracis*, *Clostridium difficile* or protozoa such as *Cryptosporidium*.

4.4. How to perform hands hygiene using alcohol-based products?

1. Remove all accessories (jewelry, watches or other) of the hands and arms.

2. Ensure that the hands are visibly clean (if dirty, follow hand washing steps).

3. Apply 1-2 pumps of 2-3 cm in diameter of the product in your palm. Please note that the amount necessary may vary depending on the type / brand of product.

4. Spread the product over the entire surface of the hands concentrating on the ends of the fingers and fingernails, between fingers, back and palms. Use enough amount of product to allow a minimum of 15 seconds contact.

5. Wait for the product to dry on the hands (it takes 15-20 seconds). Hands must be completely dry before touching the animal, equipment or surfaces and to eliminate the risk, although minimal, of combustion in the presence of oxygen enriched environment (eg. anesthetic machines with gas).

4.5. When should we do hands hygiene?

Hands hygiene should be made whenever deemed necessary, although it is mandatory in the following occasions:

1. Before and after contact with animals, particularly prior to making invasive procedures.
2. Before contacting sterilized equipment and surfaces.
3. After contact with contaminated equipment and surfaces.
4. Before putting gloves.
5. After removing gloves.
6. Before eating.
7. After using the bathroom.
8. After any procedure that may be a source of hands contamination.

4.6. What factors may influence hands hygiene?

Some factors may influence hands hygiene, and should be taken into account for proper hygiene:

a) Skin Condition - the skin is the first line of defense against bacteria and it is easier to clean if no damage, cut, abrasion, inflammation or other lesions are present.

b) Nails - natural nails with more than 3-4 mm in length are difficult to clean, can damage the gloves and store more microorganisms than short nails. Artificial nails or "manicure" nail (including nail-polish) should not be used by anyone who is directly involved in the care of the animal or works with biohazard level 2. In humans, there are studies showing the association between nails condition and the transfer of microorganisms.

c) Jewelry and watches - are very difficult to clean, physically protect bacteria and viruses from the antiseptic action of alcohol-based products and mechanically

interfere with the soap and running water action, as well as increase the risk of damaging gloves. During the contact with the animal, rings, bracelets or watches should not be used.

4.7. What care should be taken after hands hygiene?

One of the most important aspects regarding hands hygiene is the state of the skin. If skin health is an issue, you must contact the dermatologist. The use of skin lotions can help in maintaining the health of skin but it is important to use a lotion which does not interfere with the material gloves are made off. Petroleum-based products can damage latex gloves and increase their permeability. Lotions that contain oil / vaseline should only be used at the end of the working day. Instead, during the working day, products based on water should be use.

5. 5. Personal Protective Equipment (PPE)

Personal protective equipments (PPE) are very important elements in routine infection control and biosafety. PPE are designed to reduce the risk of clothes contamination, the exposure of the skin and mucous membranes to pathogens and also to reduce the transmission of pathogens to humans and animals. However, the use of PPE does not eliminate the need for infrastructures designed to prevent the spreading of infection, such as separating areas according to their biohazard.

PPE should be inspected regularly and replaced whenever signs of deterioration are present. However, it should be notice that although protecting the user from occupational diseases and injuries that may occur as a result of a work accident, PPE cannot prevent accidents.

5.1. What PPE are available and how should they be used?

5.1.1. Gowns and pajamas

1. Pajamas and gowns protect clothes from contamination, but generally not fluid-resistant and should not be used if splashes or contact with infectious fluids are expected.

2. They should be changed when they are visibly dirty or contaminated with fluids as well as at the end of the working day.

3. Gowns used in the laboratories should not be used in the hospital and vice versa.

4. Gowns used during handling of potential infectious agents should be washed after each use, since it is virtually impossible to remove, store and reuse contaminated gowns without contaminating hands, clothing and the environment.

5. Gowns should not be used outside the working place, ie they must be removed when moving to the cafeteria, bathrooms and outdoor space that doesn't include a practical clinical setting.

6. Disposable gowns should not be reused. When using disposable gowns always wear gloves. After removing the gown remove also the gloves.

7. Hands should be washed immediately after the disposal of gloves.

8. Non-waterproof gowns and pajamas must be replaced by waterproof material if contact with infectious fluids is expected.

9. The waterproof disposable gowns should always be used whenever splashing or contacts with large amounts of fluids are expected.

10. Disposable gowns are not reusable.

11. When using disposable gowns always wear gloves.

12. All users must learn how to remove the gowns and aprons appropriately, in order to prevent self-contamination and environmental contamination.

13. The outer surface (potentially contaminated) of an apron should always be handled with gloves.

5.1.2. Gloves

Gloves reduce the risk of pathogens transmission, providing a protective barrier.

1. Should always be used when in contact with blood, body fluids, secretions, excretions, pure bacterial and fungal cultures or infected animals.

2. Gloves should always be used when cleaning the facility.

3. They should be removed immediately after use, avoiding contact between skin and the outer surface of the gloves.

4. Hands with gloves should not touch surfaces that will also be touched by people with bare hands.

5. When using gloves, avoid touching personal items such as phones, keys, pen-drives, computers, among others.

6. After removing the gloves, hands should be immediately cleaned (by washing or using products based on alcohol).

7. Disposable gloves should not be washed and reused.

8. Gloves are not a substitute for proper hands hygiene.
9. Remove the gloves and wash the hands whenever there is movement of an animal from contaminated areas to uncontaminated areas.

5.1.3. Caps

1. They must be used if contamination or infection of the hair and scalp are expected.

5.1.4. Face protection (masks and goggles)

1. Facial protection prevents exposure of mucous membranes of the eyes, nose and mouth to infectious materials. It usually includes the use of masks "nose and mouth" (eg. surgery masks) and goggles or a complete face mask that should be used to prevent exposure to droplets and aerosols.

5.1.5. Respiratory protection (Respirators- Disposable N95 Filtering Facepiece Respirators, FFR)

1. Disposable respirators should be used in specific animal infections (eg birds with avian influenza, avian chlamydiosis, etc.). They should also be used when transmission via aerosol may occur.
2. The N95 device is a relatively inexpensive respirator, easy to use, providing an adequate respiratory protection.
3. N95 devices are used to protect the respiratory tract from infectious zoonotic agents transmitted by the air, but are of limited use in veterinary medicine since air-borne agents are not very common.
4. Users need to learn how to use N95 devices.
5. Surgery masks do not replace N95 devices.

5.1.6. Footwear

Closed toe footwear should be used in all facilities, in order to reduce the risk of injury associated with materials and equipment that may fall on the floor (scalpels, needles, scissors or other), as well as to reduce injuries that may be caused by animals (scratches, bruises or other). This footwear also enhances the protection when in contact with potentially infectious substances (feces, bodily fluid discharges or other).

1. Rubber footwear or disposable material such as "foot-covering" are needed in areas where infectious materials may be present in the floor, in order to prevent their spread to other areas. This is extremely important in veterinary medicine since animals and people working with them have more contact with the ground, contrary to what occurs in human medicine.

2. The "foot-covering" disposable material must be removed when the person leaves the contaminated area and should be immediately placed into the trash or left at the entrance of the contaminated area.

3. All personnel entering a specific facility must learn how to properly remove the footwear in order to avoid self-contamination and environmental contamination.

6. 6. Waste Management and Disposal

Waste management and disposal are one of the major problems in educational facilities. The term "waste" defines any substance or object that the holder disposes or is required to dispose of. Waste disposal must be made according to international and national regulations. It should be conducted to avoid any risk for the health of MIMV students and personnel or for personnel collecting and handling it. It should also not constitute a source of environmental contamination. According to the legislation, the liability of biological waste management is attributed to its producer, that is, we all have responsibility in waste management and disposal.

6.1. What are medical wastes?

In laboratories, animal housing facilities and veterinary hospital, biological sampling and other practices give rise to a particular type of waste, called "medical waste". By definition, medical waste is "the residue from medical activities in health care facilities, from activities of prevention, diagnosis, treatment, rehabilitation and research related to human beings or animals, from pharmacies, from forensic medicine and educational activities or any other activity involving invasive procedures such as acupuncture, "piercing" or tattoos. Medical waste is produced in:

- Hospitals, health centers, public and private clinics.
- Hemodialysis clinics, dental clinics, medical and veterinary care centers and other medical facilities.
- Clinical laboratories or pathology, biology, microbiology, biochemistry laboratories, among others.
- Education and Research units at universities, laboratories, or companies related to water analysis, water-wastes and food products.

It is necessary to pack, store, transport and treat these wastes in a safe and effective manner, not only due to their infectious nature, but also because chemical and radioactive waste materials may also be generated in such medical facilities.

6.2. What are the four biohazard waste groups?

Biohazardous waste should be separated into four groups for different treatment. The four groups are listed in the European Waste Catalogue and Hazardous Waste List (Directives 94/37 / EEC and 94/904 / EEC Council) and are:

a) Group I - equivalent to household wastes (eg paper, cardboard, plastic, office supplies);

b) Group II - non-hazardous medical waste that may be treated as household wastes (eg paper towels without blood);

c) Group III - medical biohazard wastes (eg materials with blood and other body fluids, tissues and unidentifiable body parts);

d) Group IV - specific medical wastes, that require mandatory incineration (eg, needles, catheters, invasive materials, chemicals, identifiable body parts, placentas, experimental animal carcasses, cytostatics and all the materials used in handling and drug delivery).

6.3. How to do the sorting and packaging of biohazardous waste according to their group?

The sorting and packaging of biohazardous waste must be conducted in order to allow a clear identification of its origin and group, in accordance with the legislation (“Despacho 242/96 de 13 de agosto; Despacho 761/99 de 31 de março; Decreto-Lei nº 178/2006, de 5 de setembro; Portaria 43/2011 de 20 de janeiro”):

a) black container: groups I and II wastes.

b) white container, with written indication of biohazard: group III wastes.

c) red container: group IV wastes (with the exception of sharp materials).

d) sharps container: needles and other sharp medical instruments, such as an IV catheter or lamina-lamella, broken glass, etc.

e) Suitable containers for liquid wastes.

Containers used for storage and transport of group III and IV wastes should be easily manageable, resistant, leak-proof, and must remain sealed. If they are of multiple usages they must be washable and enable disinfection.

7. 7. Emergency Procedures for Biohazardous Material Spills

These procedures should be performed by competent and trained personnel. They must always be applied in cases of infectious or potentially infectious materials spilling:

1. Isolate the area and create a security perimeter.
2. Prevent the access of unauthorized personnel
3. Identify the substance and, if possible, notify the relevant authorities.
4. Do not touch or walk on spilled material unless wearing appropriate clothing and footwear.
5. Take particular care with broken glass or sharp objects that may cause cuts or abrasions, leading to an exposure increase.
6. Damaged packages containing solid carbon dioxide as a refrigerant may produce ice or water by condensation with air. Do not touch in these liquids, they may be contaminated by the package contents.
7. The liquid nitrogen may be present and cause severe burns.

7.1. How to clean spills

In the case of potentially infectious material spilling, the following cleaning procedure should be used:

1. Use gloves and protective clothing, including, if necessary, protection for the face and eyes.
2. Cover the spilling material with paper towels or cloth, to prevent its spreading.
3. Place an appropriate disinfectant over the paper towels and the immediately surrounding area (generally 5% bleach solution is indicated, but in specific situations, eg spills on aircrafts, quaternary ammonium disinfectants are recommended).
4. Apply the disinfectant product concentrically, starting from the outside of the spill area and move towards the center.

5. After an appropriate time period (e.g. 30 minutes), remove all the materials. When broken glass or other sharp objects are present, use a plastic device or a piece of stiff cardboard to collect the material and place it in a sharps container for disposal.
6. Clean and disinfect the spill area (if necessary, repeat steps 2-5).
7. Dispose of contaminated materials into an appropriate waste disposal container.
8. After disinfection, inform the appropriate authorities that the area has been decontaminated.

8. 8. Useful Contacts

All phones in the facilities must have placed near them the following highlighted phone numbers [Vila Real, Portugal (00351)]:

- Operator - 9 (using the internal phone)
- Firefighters headquarters (green cross) - 259330510
- Firefighters headquarters (white cross) - 259340900
- National Institute for Medical Emergencies (INEM) - 112
- Vila Real Hospital - 259300500
- Police - 259330240
- Poison Information Center (CIA) - 808 250 143

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