



CHAPTER H1. GENERAL BIOSAFETY RULES AND PROCEDURES APPLICABLE AT HCVC

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1. OBJECTIVES AND DEFINITIONS

The international definition of biosecurity in the context of animal health is quite broad:

"Biosecurity is the implementation of measures that reduce the risk of introduction (bioexclusion) and dissemination of infectious agents (biocontainment); the adoption of a set of attitudes and behaviors by individuals is required to reduce the risk in all activities related to domestic animals, wildlife, exotic animals, wild birds, and their derivatives" [World Organization for Animal Health (WOAH), 2008].

For the care and maintenance of public health, considering it as a global concept (one world, one health), it is essential to ensure biosecurity, as well as the prevention and control of infectious diseases, in all activities related to healthcare, education, and research; all these activities are carried out at the HCVC.

Excellence in clinical activity and education is achieved not only through impeccable patient care. It is necessary to minimize the risk of contracting or spreading infectious diseases, paying special attention to nosocomial infections and zoonoses. Teaching and raising awareness among students and staff on how to minimize these risks are fundamental aspects of our tasks, as well as improving the effectiveness of implemented measures.

Objectives in the HCVC Biosecurity Program are to:

1. Protect personnel, students, and clients from exposure to zoonotic agents.
2. Create an environment that minimizes the risk of nosocomial infections for patients.
3. Include activities related to biosecurity, prevention and control of infectious diseases and zoonoses, as well as activities related to health surveillance, in educational activities with students.
4. Provide information about the prevention and control of infectious and parasitic diseases to both clients and anyone accessing the HCVC.

Standards for the Prevention and Control of Infectious Diseases

The aim of these standards is to prevent the transmission of infectious diseases from patients to staff, from staff to patients, from patient to patient, and among staff. This overall objective is broken down into the following points to:

- Optimize hygiene measures, including handwashing, appropriate attire, and personal protection, minimize unnecessary contact with patients, and clean, disinfect, and dispose of contaminated infectious material.

- Interrupt the transmission cycles of infectious and parasitic diseases through the use of hygiene measures and the creation of barriers that prevent both direct and indirect transmission. These measures should take into account the circulation of patients, students, staff, and anyone accessing the HCVC.
- Include health surveillance measures and promote research.
- Raise awareness and educate about zoonotic and nosocomial risks.

1.1. DEFINITIONS

Antiseptic: A chemical substance applied to epithelial surfaces that causes the destruction or inhibition of microorganisms, preventing their growth and multiplication without harming the patient.

Contagious Disease: A disease that can be transmitted from one animal to another.

Containment Measures: Materials and measures used to prevent and avoid cross-contamination through clothing, footwear, or the body. Their objective is to minimize the risk of transmission to other patients. They are used in isolation areas (class 4 of the HCVC classification) and in patients with a special risk of shedding infectious agents (class 3 of the HCVC), young patients, or immunocompromised patients. Special care must be taken not to contaminate materials or surfaces with hands or clothing.

Disinfectant: A chemical substance that eliminates microorganisms or prevents their growth on inanimate material (surgical equipment, floors, tables, or clinical material).

Disinfection: A procedure to reduce the number of microorganisms to a level where they are not harmful to health.

Multidrug-Resistant Microorganisms: Bacteria, fungi, or parasites that have developed the ability to survive in the presence of multiple antibiotics. This occurs when the microorganism can reduce or eliminate the effectiveness of drugs used to treat the infections they cause. Often, antibiotics capable of eliminating these pathogens are toxic to animals, and the treatment arsenal is limited. This phenomenon is especially studied in the case of bacteria; examples of antibiotic-resistant bacteria include



some strains of *Salmonella enterica*, methicillin-resistant *Staphylococcus aureus* (MRSA), or vancomycin-resistant *Enterococcus* spp.

Nosocomial Infection: An infection that occurs in a hospital setting, which was not present or in the incubation period before admission to the hospital.

Personal Protective Equipment: Material that a person wears to protect themselves from acquiring or transmitting a microorganism or disease or to prevent exposure to harmful chemical agents. It includes gloves, masks, protective eyewear, gowns, shoe covers, etc.

Personnel: All individuals working in the hospital environment, including employees, students, researchers, visiting veterinarians, visiting students, or volunteers.

Sterilization: A procedure that eliminates all microorganisms, including their resistant forms such as spores, from objects and inert surfaces.

Subclinical Infection: A disease caused by the invasion of a microorganism that does not produce symptoms. It can be an initial phase of an infectious disease or a mildly symptomatic infectious disease, and signs and symptoms are not clinically detectable; sometimes, diagnostic laboratory tests may not yield sufficient results.

Work Apparel: Clothing, footwear, and any other equipment used in clinical activities, whether in the HCVC or in outpatient clinic activities.

Zoonosis: A disease that can be transmitted from animals to humans or vice versa.

1.2. CLASSIFICATION OF RISK CATEGORIES

Infectious diseases in hospitalized animals at the HCVC are categorized into the following levels (Table I), based on the transmissibility of the agent to other animals and/or its potential for zoonotic transmission. Personnel in charge of the care of animals with infections of class 3 and class 4 will avoid contact with animals in clinical risk situation (Table II).

Table I. Classification of risk categories.

<u>CLASS 1:</u> NORMAL HOSPITALIZATION	Infectious diseases caused by agents with no possibility of transmission to other animals and without risk to human health	e.g., coccidiosis, demodicosis
<u>CLASS 2:</u> NORMAL HOSPITALIZATION	Infectious diseases caused by agents with a low risk of transmission. Infectious diseases due to bacteria without multidrug resistance	e.g., leishmaniasis, ehrlichiosis
<u>CLASS 3:</u> CONTAINMENT MEASURES	Subclass A: Resistant Bacteria. Infections caused by bacteria with a pattern of high antibiotic resistance	e.g., urinary tract infections caused by multidrug-resistant bacteria; non-zoonotic but highly transmissible respiratory diseases among animals
	Subclass B: Infectious diseases caused by agents with a moderate risk of transmission and/or being pathogens for humans	e.g., distemper, feline leukemia.
<u>CLASS 4:</u> ISOLATION	Infectious diseases caused by agents with a high risk of transmission and/or considered extremely pathogenic for humans	e.g., tuberculosis, toxoplasmosis

Table II. Parameters Used to Define Clinical Risk Situation.

Species	Fever (rectal temperature)	Leukopenia (cells x 10 ³ /ml)	Neutropenia (cells x 10 ³ /ml)
Bovine	> 39,0°C (adulto) > 39,5°C (ternero)	< 5,0	< 0,6
Canine	> 39,5°C	< 6,0	< 3,0
Caprine	> 40,5°C	< 4,0	< 1,2
Equine	> 38,5°C	< 4,0	< 2,5
Feline	> 39,5°C	< 5,0	< 2,0
South American Camelids	> 39,5°C	< 7,5	< 4,6
Ovine	> 40,0°C	< 4,0	< 0,7

1.2.1 Isolation Areas

Animals with a presumptive or confirmed diagnosis of suffering from an infectious and contagious disease (classes 3 and 4) will be kept in isolation areas. Only authorized personnel have access to these areas.

Access to the isolation areas by authorized personnel will be limited to the strictly necessary, controlled by an entry log. Personnel must enter with disposable protective equipment (gown, shoe covers, gloves), which will be accessible before entering the isolation area. Upon exit, this equipment will be removed and discarded in designated containers.

All necessary clinical activity materials must be located within the isolation area, and no exchange of any kind of material with the outside is allowed. Containers for used materials should also be exclusive to this area.

In the case that equipment external to the facility is required, necessary means for its protection, cleaning, and disinfection will be provided once the procedures are completed.



2. GENERAL MEASURES

2.1. HAND WASHING

Handwashing is the most important measure to reduce the risk of microbial transmission. Personal accessories (rings, bracelets, etc.) that impede this measure shall not be used.

Hands shall be washed:

- Before and after examining a patient
- After coming into contact with blood, any body fluids, and/or contaminated material, even if gloves were worn
- Immediately after removing gloves on any occasion
- Between each procedure applied to the same patient to prevent cross-contamination between different body areas
- After handling laboratory samples or cultures
- After cleaning cages or areas where animals have been housed
- Before eating, drinking, or smoking
- Before leaving the workstation
- Before and after being in rest areas

Recommended technique:

- Damp hands and forearms with warm water
- Place 3-5 ml of soap in the palm of the hand, equivalent to 1-2 doses from a dispenser
- Rub both sides of the hands up to the wrists for 30 seconds; clean carefully between the fingers and under the nails
- Rinse thoroughly with warm water
- Dry with single-use paper towels or an air dryer
- In cases where handwashing is not possible, use alcohol-based wet wipes or sanitizers as soon as possible.

Use of hand sanitizer:

- Apply a dose the size of a thumbnail
- Spread it on the opposite hand, including the interdigital spaces
- Do the same with the other hand
- Rub hands vigorously until the sanitizer is dry
- Do not rinse

Nails should be short for cleaning procedures to be effective. This measure must be followed by all hospital staff and students.

2.2. CONTAINMENT MEASURES

These measures should be chosen based on the type of procedure being performed and the risk it poses. They must be applied when handling tissues or body fluids, animals in cages or stables, cleaning cages or stables where animals with infectious diseases have been housed, and when handling the corpses of animals that may have died from an infectious disease or zoonosis.

- Wear gloves and disposable protective clothing (gown or coveralls and apron) when handling patients suspected of being infected with microorganisms from classes 3 or 4.
- In procedures that generate aerosols, bone splinters, or the appearance of blood, also wear gloves and protective glasses. If there is a needle-stick or any other injury, the glove should be replaced with a new one as soon as possible.
- Washable boots and the use of disposable shoe covers and boots increase biosecurity levels.
- When necessary, personal protective equipment should include full face shields or respirators.

Use of Gloves

Gloves are an important barrier to prevent the transmission of microorganisms. They shall be used whenever there is contact with blood, skin lesions, or organic excretions/secretions. Also, when cleaning cages or surfaces the following instructions should be followed:

- Avoid contact between unprotected skin and the external surface of the glove.
- Avoid contact of the gloved hand with any surface commonly used by people without gloves (pay special attention to door handles, computer equipment, phones, etc.).
- Also, avoid the contamination of personal items such as pens, phones, documents, etc.
- Gloves should be removed as soon as possible after use. They should be removed whenever: an animal intervention is finished, when working with the same animal moving from "dirty" to "clean" areas or procedures, or after contacting significant volumes of blood or organic excretions/secretions.
- After removing the gloves, they should be immediately discarded in specific containers, appropriately marked, and hands should be washed immediately.



Use of Work Clothing

A standard should be established in clothing to differentiate people working in different areas of the HCVC. All staff and students will wear their identification card. If they do not come dressed correctly, they will not be allowed to stay in the HCVC.

- Veterinarians and technicians in the surgical area: Scrubs
- Veterinarians and technicians in consulting rooms and hospitalization: White coat over scrubs
- Students: Coveralls in the large animal area, scrubs in the surgery and hospitalization areas, and white coat in consulting rooms and laboratories.
- Disposable clothing (gown, scrubs, coveralls, shoe covers, etc.) over scrubs in isolation areas.

Additional Points:

- Work clothing cannot be used in other activities.
- The necessary clothing must be available in each area at all times, for example, boots or protective footwear when working with large animals.
- Shoes must be closed, secure, protective, and washable. Due to the possibility of contamination in certain environments, they cannot be made of porous or absorbent materials. Cleaning and disinfection should be easy.
- Footwear and clothing used in the large animal area should not be used in the small animal area and vice versa.
- Each person should always have a complete set of clean work clothing available in case a change is needed.
- Work clothing that poses a biological risk should not be washed in private homes. Work clothing should be washed in the HCVC's laundry facilities designed for this purpose.

Sending Clothing to the Laundry:

Clothing should be sent to the laundry after pockets have been checked and emptied, paying special attention to sharp objects, which should be discarded in appropriate containers. It should be sent without hangers. Customers' clothing should not be washed in the hospital laundry, nor should personal items such as personal or student clothing.

Other Measures:

- Individuals with long hair should tie it back.



- Bracelets and rings should not be worn during clinical activity for hygiene and safety reasons. Long earrings, necklaces, or any other accessory that could cause accidents in people handling animals are also not allowed.
- The no-smoking rule in the workplace must be respected.

2.3. PATIENT CARE

2.3.1 Patient Hygiene

Patients should arrive at the HCVC in the best possible hygiene conditions and, in any case, free of ectoparasites. They should be housed in clean cages or boxes. Accommodations must be kept clean during the animal's stay, and once vacant, they should undergo thorough cleaning. After cleaning, products indicated to eliminate ectoparasites should be applied. If necessary, depending on the product, surfaces should be rinsed after the specified exposure time in each case.

Drinkers and water containers should be cleaned as needed.

The water in the drinkers should be changed frequently, at least once a day.

Whenever an animal urinates/defecates in them, they must be cleaned, rinsed, and refilled with clean water.

When a patient defecates outside its box or cage, the feces should be removed, and the floor should be cleaned and dried immediately afterward. If the patient urinates, the urine should be removed with single-use absorbent material, and the floor should be cleaned and dried.

Owners should be informed of the need to remove the feces if their animals defecate in the vicinity of the HCVC.

The areas around cages or boxes should be kept clear, without items, remnants of medication, or any other material. Students and staff should not stay in these areas longer than necessary to attend to the patients.

2.3.2 Minimize Unnecessary Contacts with Patients

Clinical and teaching activities require frequent contact with patients. However, it is important to remember the risk of transmission of infectious or zoonotic agents. Contact with patients should also be minimized to prevent nosocomial disease transmission, especially by individuals not responsible for their care.

Students can participate in clinical activities as much as possible, but always strictly adhering to handwashing measures every time they attend



a different patient. Instruments used in examinations, as well as stethoscopes, should be regularly cleaned with alcohol or hand sanitizer.

To prevent the spread of infectious agents, movements of students and staff between different areas of the hospital, such as between the medicine department and the surgery department of each area, should be limited. Movements between the large animals area and the small animals area should also be avoided.

Access to areas with potential risk of contamination with infectious agents, as well as the care of animals at risk of infectious diseases, should be performed last, after attending other patients. When it is suspected that a patient has an infectious disease, both staff and students attending to them should not have subsequent contact with other patients.

The care of infectious patients should minimize physical contact. If possible, monitoring of infectious patients should be done with cameras. In the boxes, access is only allowed when strictly required, and animals should only be touched if essential.

2.4. FOOD AND DRINKS

It is not allowed to consume or store food or drinks in areas where there are animals. Eating and drinking are also prohibited in areas where medication is prepared or stored, or biological specimens are manipulated. This prohibition extends to hallways, reception, consulting rooms, the induction area, and surgery rooms.

Consuming and storing food is only allowed in the following areas:

- Dining area of vending machines for food and drinks
- Kitchen in each apartment
- Designated dining areas
- Offices for technicians and clinicians
- Outside clinical areas

In areas where food and drinks are consumed, the presence of animals, medication, biological specimens, or the storage or preparation of animal food is not allowed.

The storage of food and drinks for human consumption should be done in refrigerators exclusively for this purpose, and the same applies to heating them in microwaves designated for human food use.

Faculty Cafeteria

Entering the cafeteria with work attire or equipment (medical scrubs, gown, boots, stethoscope, etc.) is prohibited. The entry of domestic



animals (except guide dogs) is also not allowed. **These rules must be strictly followed.**

3. MEDICATIONS

3.1. STORAGE AND ACCESS

Medications must be stored under the required conditions in each case (following the storage conditions described on the packaging), always in the dark, without sudden changes in temperature or humidity. The pharmacy warehouse should be organized for efficiency and operability. Opened medications should be stored separately.

Access to the pharmacy and first aid kits is restricted to authorized personnel. Under no circumstances should access to the pharmacy warehouse be allowed for individuals not working in the hospital, children, or pets. It must be ensured that insects or rodents cannot enter.

Euthanizing agents, opioid narcotics, and ketamine must be guarded and stored independently. Access to them will be through a card or key and will only be allowed for authorized personnel.

Chemotherapeutic agents shall be stored separately.

3.1.1 Expiry Date

Medications, including those used in fluid therapy, should be marked with a waterproof marker indicating the date of opening. They shall be discarded immediately after the expiration date or earlier if the instructions printed on the packaging indicate so.

3.1.2 Return to the Pharmacy Warehouse

Unused medication leftovers that cannot be returned to the pharmacy warehouse should be discarded in yellow containers placed in all areas where medication is regularly administered. These containers should be regularly removed and replaced with new, empty ones.

3.2. MEDICATION PREPARATION

It should be prepared by, or under the direct supervision of, technicians or clinical staff. Contamination with other drugs should be avoided, and the rubber cap of containers for parenteral medication shall be cleaned with alcohol before and after each use. The alcohol should be allowed to



evaporate before inserting the needle. Each dose should be prepared with new and sterile syringes and needles. Syringes and needles should always be single-use, except for syringes used to administer medication orally. In this case, they can be reused if cleaned thoroughly after each use.

During the preparation of medication containing hazardous substances, personal protective equipment must be worn, and individuals without them cannot be present. Depending on the substance, it may be necessary to wear gloves, a mask, protective eyewear, and/or to prepare it in vacuum conditions. This medication must be labeled and administered immediately.

Medications based on drugs that do not produce stable solutions cannot be prepared or diluted in advance (e.g., sodium penicillin, ampicillin). The name of the drug must always be labeled with a waterproof marker on each syringe if not administered immediately after preparation.

4. WASTE DISPOSAL (LARGE AND SMALL ANIMALS)

Each department must compile a list of the generated waste to dump. To prevent needle injuries, the needle cap should never be replaced. Needles and other sharp materials, such as scalpel blades, shall be discarded in containers designated exclusively for sharps disposal.

Waste can be stored in small quantities in the area where it is produced until it is collected. In cases where specific regulations exist, they must be rigorously adhered to.

Waste from animals not suspected of having infectious diseases should be placed in containers for biological material (currently black with a yellow lid) used exclusively for this purpose until removal by the contracted waste management service or its destruction. In case of waste from animals suspected of having infectious diseases, it must be disposed of in yellow containers, also used exclusively for this purpose.

All waste from isolation areas should also be disposed of in yellow containers.

Biological samples from animals with infectious diseases, before being sent to the laboratory, shall be placed in containers that will be sealed and labeled with all necessary information. Special care should be taken not to contaminate the exterior of the container.

The dressing of wounds suspected of being infected [e.g., with Methicillin-Resistant *Staphylococcus aureus* (MRSA) or any other antibiotic-resistant



microorganism] should be carried out in low-traffic areas that can be cleaned and disinfected immediately. Containment measures shall be taken to prevent environmental contamination through fluids, aerosols, or dressing materials.

Biological material from animals (feathers, hooves, skeleton) should not remain in the hospital unless for diagnostic or teaching purposes, and once done, it should be promptly destroyed.

5. CLEANING AND DISINFECTION

Both staff and students must be familiar with basic cleaning and disinfection procedures, as well as the activity and interactions of disinfectants commonly used in the HCVC.

Organic matter inactivates most disinfectants; the possibility of its presence must be taken into account.

There is a wide variety of disinfectants. Generally, protozoa like *Cryptosporidium*, bacterial spores, non-enveloped viruses, *Mycobacterium* spp. are quite resistant to their action.

For the disinfection procedure to be correct, the product must be used at the appropriate dilution and for the necessary contact time (usually 10-15 minutes).

Although most disinfectants are used for a short period, their residual activity can persist on treated surfaces for longer periods.

Before use, surfaces must be rinsed, and residues from previous disinfectant treatments must be removed.

5.1. CORRECT CLEANING

Appropriate protective clothing and equipment (mask, face shield, goggles, impermeable clothing, and boots) should be worn while applying detergents and disinfectants to protect against accidental splashes.

Before applying the disinfectant, organic residues must be removed as their presence inhibits the disinfectant's action. Aerosol production and subsequent dissemination of infectious agents should be avoided.

Areas to be treated should be cleaned with detergent or soap. Mechanical rubbing should be done to eliminate organic residues and prevent them from inhibiting the disinfectant's action.



Detergents can also inhibit the action of disinfectants and must be removed by thorough rinsing with water.

Surfaces should be allowed to dry to prevent dilution of the disinfectant when applied.

To apply the disinfectant, dampen the surfaces to be treated with the working dilution of the disinfectant and leave it in contact for 15 minutes, especially if the presence of an infectious agent is suspected.

After the necessary time has elapsed, excess should be removed with water and wiped away with a mop, paper towels, or a cloth.

Before placing an animal in a freshly disinfected cage or box, it must be completely dry.

All areas where animals are examined or treated should be cleaned and disinfected immediately after use, regardless of the health status of the examined or treated animal.

During any procedure, contact of blood or body fluids with mucous membranes or non-intact skin should be avoided.

After applying the disinfectant, remove the clothing and personal protective equipment used and wash hands.

When the disinfection procedure used is not routine (e.g., when applying Virkon™), it should only be done by trained personnel wearing personal protective equipment. This personnel will be the only ones accessing areas where this work is being carried out.

5.2. DISINFECTANTS

A variety of disinfectants are used in the HCVC to reduce the risk of infectious agent transmission. Several factors must be considered to choose a specific disinfectant (see section 5.2.1).

Disinfectants have different levels of irritation and toxicity for animals and humans. Generally, for contact with skin and mucous membranes, alcohols, povidone-iodine, and chlorhexidine solutions are used. For inert surfaces, Virkon, hypochlorites, and phenols are used.

Disinfectants must be applied to clean, non-porous surfaces to be effective. Some materials, such as untreated wood, cannot be disinfected. They also do not act in the presence of organic matter, grease, biofilms, or biological residues.

5.2.1 Summary of the main approved detergents and disinfectants for use in the HCVC

Detergents and disinfectants used have been chosen based on the

regulations outlined on the following pages:

https://www.woah.org/fileadmin/Home/eng/Health_standards/tahc/2018/en_chapitre_disinfect_disinsect.htm

https://www.aemps.gob.es/cosmeticosHigiene/cosmeticos/docs/relacion_desinfectantes.pdf

https://www.aemps.gob.es/informa/notasInformativas/cosmeticosHigiene/biocidas/2012/docs/NI-COS_03-2012.pdf

5.2.2 Footbaths and Mats

In the floor and environment where infected animals are present, viable microorganisms may be found.

The disinfectant solutions in the footbaths should be changed every morning and whenever they contain dirt or material from the animals' stabling area. They should be refilled whenever they are dry or when the volume of the disinfectant solution has decreased. These last two tasks are the responsibility of all staff and should be done by the first person who notices.

Disinfectant mats should be changed daily. Footbaths and mats should be used every time access is gained to an area where they are placed at the entrance. Feet do not need to be completely submerged; the solution should simply come into contact with the sole of the footwear and its surroundings, and therefore, the footwear must be waterproof.

5.3. DISINFECTION PROTOCOL FOR INSTRUMENTS AND EQUIPMENT

- **Equipment**

All equipment used in the HCVC must be cleaned of any traces of grease and dirt residues and decontaminated before storage to minimize the risk of infectious disease transmission. Equipment used in large and small animal areas should be stored separately. Refer to section 5.2.1 for proper use of disinfectants.

- **Thermometers**

The use of glass thermometers is prohibited to avoid the risk of injuries and exposure to mercury in case of breakage. Instead, electronic thermometers are used. They should be disinfected after each use with alcohol or chlorhexidine wipes, and their plastic case should be regularly submerged in a disinfectant solution. Thermometers used for monitoring a patient (e.g., during anesthesia) should be cleaned to remove

adhered feces and disinfected with chlorhexidine. Patients with a high risk of infectious disease transmission (HCVC class 3 and 4) should have exclusive thermometers for their use, cleaned, and disinfected as needed.

- **Endoscopes**

Endoscopes must be disinfected with appropriate products after each use. This task should be performed by HCVC staff.

- **Stethoscopes**

Stethoscopes should be regularly washed with soap and water and disinfected with hand sanitizer. For patients at high risk of infectious disease transmission (class 3 and 4), a dedicated stethoscope shall be used for each, cleaned, and disinfected as needed.

6. INTERRUPTION OF TRANSMISSION CYCLES

6.1. CLIENTS AND VISITS TO HCVC

6.1.1 Visits

HCVC plays a significant social role: educating people about the important role veterinarians play in society. Allowing visits to HCVC contributes to fulfilling this mission. However, it is essential to consider that individuals entering HCVC are entering an environment where safety regulations must be observed, and concepts of public health must be managed to prevent the spread of infectious agents from the hospital setting.

- Visitors must be supervised at all times during the visit. Physical contact with patients is not allowed.
- The route should be designed by the Biosafety Committee and managed by trained personnel.
- Visitors are not permitted to enter isolation areas.
- The personnel in charge of the visit must provide instructions regarding the risk of nosocomial and zoonotic disease transmission associated with contact with hospitalized animals.
- Access to anesthesia, emergency, and surgery room areas is not allowed for visitors.
- Researchers or visiting veterinarians requiring access to these areas must obtain permission from the Hospital Director or the Biosafety Committee.



- Visitors are not allowed to gather or stay in hospitalization or intensive care areas.
- Eating, drinking, and smoking are not permitted during the visit.
- Pets are not allowed during the visit.

6.1.2 Clients

Clients can stay in the waiting room, rest areas, library, and cafeteria. To access other areas of the hospital, they must be accompanied by staff or students. Biosafety personnel may restrict access to patient care areas to minimize the risk of nosocomial or zoonotic disease transmission. Clinicians may also restrict access to certain areas at their discretion to maintain safety and best practices in the workplace.

If deemed necessary by the clinician, clients can wait with their animals in an examination room, but not in a treatment room or areas where animals are housed. Clients should be reminded not to touch other animals. Clients are not allowed to visit patients housed in isolation areas unless there are exceptional circumstances, such as for euthanasia or in cases of extreme distress, applying necessary biosecurity measures.

Clients must always respect and adhere to biocontainment measures related to animal housing and biosafety. Visiting hours may be restricted at the discretion of different HCVC services, unless expressly authorized by the clinician. Both staff and students responsible for patient care must inform owners about nosocomial and zoonotic risks associated with animal hospitalization.

6.1.3 Children

In the HCVC environment, there are significant risks to both personal and biological safety. Children (under 18 years old) cannot stay in the hospital unless supervised at all times by an adult. Biosafety personnel may restrict access to patient care areas for children to minimize the risks of zoonosis transmission. Clinicians may deny entry to children (under 18 years old) to these areas if they believe it disrupts safety rules or work routines.

All visitors are prohibited from touching any animal except their own. This rule is particularly important for children due to the risk of physical harm and zoonotic transmission.

6.1.4 Pets

There are numerous risks associated with the presence of pets that are not patients at HCVC. Animals shall only be present in clinical areas when they require veterinary assistance. The presence of healthy animals is only allowed if they are guide dogs, blood donors, part of a research project,



or used for teaching. Contact between healthy and sick animals must be avoided in all these cases.

In the HCVC environment, dogs must be on a leash. Clients, staff, and students must adhere to these rules.

6.2. TRANSMISSION PATHWAYS OF DISEASES

Most pathogens can survive for an extended period in the air, on surfaces, and in organic matter. Pathogens can be transmitted from animal to animal, from animal to human, and from human to animal. Transmission occurs through inhalation, ingestion, contact with oral and nasal mucosa, and with organic remains or vectors. Understanding these disease transmission pathways can help minimize the risk.

6.2.1 Aerosol Transmission

Aerosol transmission is possible in a veterinary hospital due to close contact between animals and between animals and humans. Infectious agents can be found in aerosols produced recently (e.g., a cat sneezing and releasing respiratory viruses) and can also be generated by re-aerosolization during the cleaning of cages, stables, etc., with pressurized water (e.g., *Coxiella burnetii*). Aerosol transmission occurs when a pathogenic agent contained in an aerosol is transmitted between susceptible species. Most pathogens do not survive for long periods in aerosol droplets, so close physical proximity between animals is needed for transmission to occur. The temperature, humidity, and ventilation play crucial roles in pathogen transmission.

6.2.2 Oral Transmission

Oral transmission involves exposure to infectious agents through the gastrointestinal tract. It can occur inadvertently during the inhalation of aerosols and their ingestion after passing through the nasopharynx. Contaminated objects, including dishes, glasses, and any object an animal may lick or chew, can transmit infectious agents. Water and food contaminated with urine or feces are common transmission routes for infectious agents. In people, the oro-fecal route, through contact between contaminated hands and the mouth, is the most common route. Therefore, the importance of good hand hygiene among students and staff should be emphasized. Patients with diarrhea should be separated from others and handled with special care to prevent the spread of infectious agents. All materials in contact with these animals should be cleaned with special care.

6.2.3 Direct and Indirect Contact Transmission

For direct contact transmission to occur, an infected animal or person must have contact with a healthy animal or person. Indirect contact transmission occurs through inert surfaces contaminated with biological material (blood, urine, feces, wound exudates, saliva, respiratory aerosols, genital and urinary secretions, etc.). It is important to remember that patients in the hospital can become infected with pathogens as surfaces may be contaminated with a variety of microorganisms. The most effective way to prevent this is to separate infected animals from others and minimize contact with them. Due to the potential lack of clinical signs in infected animals, it is necessary to segregate patients into groups (e.g., outpatient and hospitalized patients) and minimize contact between them. Clinical materials should not be shared between these two groups.

6.2.4 Fomite Transmission

Fomites are objects that act as intermediaries in the transmission cycles of diseases; even a person providing care can act as a fomite. Examples include door handles, folders, phones, thermometers, stethoscopes, hoses, dog leashes, brushes, shovels, hoses, etc. All of these can be contaminated with infectious agents and contribute to their spread. Portable objects can become contaminated by being near a patient and become a source of contamination for other patients, staff, students, and other areas of the hospital. Transmission is avoided through proper cleaning and disinfection, the use of containment measures, as well as identifying and separating potentially infectious animals. Whenever possible, clinically ill animals should be handled and treated after attending healthy animals.

6.2.5 Vector Transmission

Vector transmission occurs when an arthropod acquires a pathogen and transmits it to another animal. Common vectors include flies, mosquitoes, ticks, and fleas. Diseases such as leishmaniasis, ehrlichiosis, West Nile fever, or filariasis are examples of vector-borne diseases. To minimize vector transmission, the most effective measures involve reducing or eliminating the vector population and avoiding contact between the vector and the host.

6.3. ZOONOSES

The majority of the population is generally at low risk of contracting a zoonosis. However, for veterinarians and other individuals in contact with animals, this risk increases significantly.



Individuals who have been in contact with animals suspected or confirmed to have a zoonoses must report it to the Biosafety Committee and the Hospital Director. Any suspicion of exposure to zoonotic agents in a patient must be communicated by the attending veterinarian to the Biosafety Committee and the Hospital Director.

The head of the Biosafety Committee and the clinician in charge of the case should work together to contact all potentially exposed individuals and, if necessary, report it to health authorities.

The Hospital Director can inform staff, students, and their physicians about professionals and specialized health resources in zoonoses and other veterinary occupational diseases.

All HCVC personnel and students must be urged that, in the event of potential exposure to potentially zoonotic agents, they should immediately inform their supervisor and consult their primary care physician. Family and friends may also be potentially exposed and should be aware of it.

6.3.1 Situations of Special Health Risk

People with compromised immune system are at higher risk when exposed to zoonotic agents. This group at special risk includes children under 5 years old, pregnant women, and the elderly.

The highest-risk situation corresponds to AIDS patients, but there are also other conditions and diseases that can compromise the immune system, such as pregnancy, organ failure, diabetes, alcoholism, liver cirrhosis, malnutrition, or autoimmune diseases.

Certain treatments can also cause immunosuppression, such as radiation therapy, chemotherapy, corticosteroid treatments, immunosuppressive therapy associated with bone marrow or organ transplantation, implantation of medical devices (heart valves, pacemakers, probes, etc.), splenectomy, and renal dialysis.

Affected individuals should communicate this information when necessary. All HCVC personnel, including students, must inform the hospital director and their supervisor if they are in one of these situations of special risk before having contact with patients. This information will be considered confidential. However, to minimize transmission risks, it needs to be known by the Biosafety Committee, and necessary measures should be implemented at the educational and clinical levels.

7. RISK COMMUNICATION

Risk communication must be efficient, given the complexity of clinical



care provided to patients at HCVC and the large number of people who visit HCVC daily. Proactive risk communication significantly reduces the likelihood of contracting a nosocomial disease or a zoonosis. This communication includes information about potential risks faced by everyone in contact with animals, as well as measures to take to be protected against these risks.

- All patients visiting HCVC must be examined by a veterinarian to assess the risk of zoonotic agent transmission. Veterinarians with more experience should advise other staff on the risks of contracting zoonoses inherent in participating in hospital activities and establishing and ensuring compliance with safety protocols.
- THE BIOSAFETY WORKING GROUP MUST REPORT ALL RISKS (KNOWN OR SUSPECTED). This includes, among others, diseases with zoonotic potential, diseases caused by bacteria with multidrug resistance (e.g., those caused by methicillin-resistant bacteria (MRSA) or vancomycin), those caused by highly resistant or difficult-to-eliminate agents through routine procedures, or diseases subject to specific legislation (notifiable diseases).
- Notification should be made by the veterinarian responsible for the case as soon as possible.
- All significant risks of infectious diseases must be communicated to HCVC staff, students, and clients. This ensures more efficient risk management, both in people and animals that have been in contact with the potentially infectious patient.
- The patient's status regarding disease transmission may change during their stay at HCVC. Any such changes must be communicated promptly.

7.1. BIOSAFETY COMMUNICATION

HCVC will use email lists to facilitate risk communication.

- Purpose: Provide communication and improve the management of patients at higher risk of spreading infectious diseases and/or zoonoses at HCVC.
- Who can send an email to the list? Open lists for essential and necessary personnel when a patient is isolated.
- Who can receive an email? People from the biosafety working group, cleaning staff, personnel from large animal areas, small animal areas, diagnostic laboratories, and students.

7.2. HCVC COLOR CODES

Color marks must be placed to delineate different areas of the hospital.



This makes these divisions visible to students, clients, and visitors. The color determines whether access to the delimited area is allowed, restricted, or prohibited:

- Green: Allowed without restrictions.
- Yellow: Restricted (e.g., hospitalization or laboratories).
- Red: Prohibited except for authorization from a clinician (e.g., surgical area, isolation zone, or cadaver storage).

An informative sign must be placed next to each of these marks indicating the precautions to take.

8. SPECIFIC PROTOCOLS

8.1. PROTOCOL FOR ADMISSION STAFF

If a client over the phone reports that their pet is acutely experiencing vomiting, diarrhea, ataxia, abortion, coughing, or sneezing, there should be suspicion of an infectious disease.

An appointment will only be scheduled once approved by a clinician and confirmed that there is an isolation area (cage or box) available for the patient (see section 8.1.1 for criteria for admitting or rejecting a patient at HCVC).

The appointment details should include "acute diarrhea," "acute vomiting," "acute cough," etc., as well as "suspected infectious disease."

The client must wait outside the hospital with their pet until it is examined by a veterinarian. Based on the examination and clinical judgment, the patient will be either referred to the infectious diseases ward or an isolation area (see chapter 8.1.1 on admission and/or hospitalization exclusion criteria).

Depending on the risk category and circumstances, the patient will be taken to an examination room or the isolation area. For small animals, it is recommended to use a carrier for transportation to reduce contamination in the HCVC.

If the owner of a patient suspected of having an infectious disease presents directly at the reception counter, the receptionist must immediately coordinate their transfer to the infectious diseases consulting room or isolation area.

8.1.1. Exclusion Criteria for Admission and/or Hospitalization of Patients

When there is suspicion of a notifiable disease in Spain (see section 9.2.) or if the risk to the staff or other hospitalized animals is very high compared



to the risk for that individual animal, a decision may be made not to admit or hospitalize them at HCVC. Exclusion criteria should be specified in each HCVC service.

The decision should always be made by a clinician, never by admission staff or students.

8.2. STUDENT PROTOCOL

In the case of a potential infectious disease, students should follow these steps:

- To include in the appointment notes: "acute diarrhea," "acute vomiting," "acute cough," etc., and "suspected infectious disease."
- The client must wait outside the hospital with their pet until examined by a veterinarian. Based on the examination, the patient will be directed either to the infectious diseases ward or an isolation area (see section 8.1.1).
- Depending on the risk category and circumstances, the patient will be taken to an examination room or the isolation area. For small animals, it is recommended to use a carrier for transportation to reduce contamination in the HCVC.
- Contact with the patient should be done with protective equipment, avoiding contact with other HCVC patients.
- To minimize the risk of contagion, only a limited number of students, at the discretion of the responsible clinician, will be allowed contact with that animal.
- After examining the animal and once the room is vacated, areas and equipment contaminated with blood, feces, or body secretions of the patient must be immediately cleaned and disinfected by students or personnel in charge of the patient.
- The door of the room where the patient was treated should have a sign to prevent access and use until the room is properly disinfected.
- It is the obligation of students to be aware of and follow biosecurity protocols in clinical cases with suspected infectious diseases.

8.3. LABORATORY SAMPLES

All biological samples received in microbiology and parasitology, biopathology, pathological anatomy, and reproduction laboratories must be handled as potentially infectious material. They shall always be properly identified, and it will be ensured that the containers are securely closed and leak-proof. They should always be handled with gloves.

8.4. HOSPITALIZATION OF LARGE ANIMALS: EQUINES AND FOOD ANIMALS

Cages and boxes of animals with infectious diseases and the surrounding area must be clearly and comprehensibly labeled, indicating the potential risk. At least, the following information should be visible:

- Classification of the disease regarding the risk category (Table I).
- Name of the suspected or diagnosed disease.
- Disinfection protocols to be applied.
- Containment and hygiene measures to be observed.
- Indication of whether there is a zoonotic risk or not.

Containment measures should be visible to notify the patient's status. Both staff and students in charge of patients with infectious diseases must ensure that the information reaches the Biosecurity mailing list.

9. HEALTH SURVEILLANCE. BIOSAFETY

A protocol must be established to monitor and identify the spread of infectious diseases in the HCVC. Environmental and patient samples must be collected for culture in the Microbiology Laboratory. The microorganisms involved in environmental contamination, the presence of microorganisms in both the environment and patients with multiple antibiotic resistances, and patients with syndromes associated with nosocomial diseases and their complications must be known.

In general:

- Clinicians must inform the Biosecurity Committee as soon as possible of the occurrence of a nosocomial disease case.
- The Biosecurity Committee must be informed if the incidence of nosocomial diseases increases, even if the consequences in patients are mild.
- Any suspicion or certainty of zoonoses that has arisen in the HCVC must be reported to the Biosecurity Committee.
- Clinicians must use appropriate diagnostic methods to investigate the presence of nosocomial diseases even if the results do not affect the patient's condition.

Traceability of infected animals and animals that have been in contact with them is essential. The software used for patient management in the HCVC should contain contact information for owners, veterinarians who have previously treated these animals, and the medications they have received. The traceability of patients and their clinical data must be



ensured at all times. Clinicians, technical staff, and students must handle information about infectious disease cases with confidentiality.

9.1. LABORATORY DIAGNOSIS OF INFECTIOUS DISEASES

Laboratory techniques used for the diagnosis of infectious diseases and/or zoonoses provide valuable information for clinical evolution and patient treatment. Additionally, they allow obtaining the necessary information for the proper management of other animals and maintaining health in people. This information is also fundamental to understanding and protecting the HCVC's patients, staff, students, and visitors from biosafety risks.

These diagnostic tests should be performed, if deemed necessary, on all hospitalized patients if there is a reasonable risk of infectious and/or zoonotic diseases. Conducting diagnostic tests is essential for the level of quality in patient care and for minimizing biosafety risks in the HCVC. Once there is a well-founded suspicion of risk, tests will be performed on each patient. The animal will be classified as class 3 or 4, and both the diagnostic test fees and the expenses associated with the stay in isolation at the HCVC will be paid by the owner.

The responsibility of informing owners about the inherent risk of the presence of infectious and/or zoonotic agents should be entrusted to an experienced veterinarian who will be in charge of the patient. This veterinarian is responsible for collecting the necessary samples for laboratory analysis and taking necessary biosafety measures.

They are also responsible for promptly notifying the Biosecurity Committee if the animal may be infected with any of the microorganisms on the WOAHA lists; this notification must be made in person.

9.1.1 Official Diagnostic Techniques in Infectious Diseases

All necessary information can be found on the WOAHA page: <https://www.woah.org/es/inicio/>

In the HCVC, special attention must be given to the following microorganisms and processes:

- Acute diarrhea in dogs and cats (*Salmonella*, *Campylobacter*, *Cryptosporidium*, *Giardia*, Parvovirus, Coronavirus).
- Canine Distemper Virus
- *Chlamydia psittaci* (birds)
- Equine Herpesvirus Type 1 (neurological form)
- Influenza (birds)
- Leptospirosis
- Rabies

- *Streptococcus equi subspecies equi*
- *Salmonella* (large animals)

9.1.2 Health Surveillance against Salmonella in Large Animals

Samples from Stalls and Cages

- Samples must be taken after routine cleaning and disinfection and before being used by another patient in cages and stalls where animals positive for Salmonella have been.
- Technical staff and veterinarians must know and inform the Biosecurity Committee that these accommodations must remain vacant until it is verified through the culture of the samples taken that they are negative for Salmonella.
- The results of the analyzed samples must be communicated by the Microbiology Laboratory to the Biosecurity Committee. It should also be communicated when the results are negative, and therefore, the accommodations can be used again.

Routine Environmental Samples

- Every 6 months, routine samples should be taken from mops for floor cleaning and wipes for surface cleaning. In areas where Salmonella has been isolated on occasion, samples of this material should be taken every 3 months.
- The Biosecurity Committee must be informed of positive results for Salmonella as soon as possible.
- All results from routine sampling should also be reported.

9.1.3 Antimicrobial Resistance and Antibiotic Use

This is one of the most significant health challenges to face in the 21st century. Any program aimed at controlling infectious diseases must take into account the existence of this phenomenon and its impact on patients. The HCVC Biosecurity Committee will be responsible for promoting the rational use of antibiotics in treatments prescribed at the HCVC, both for hospitalized and ambulatory patients.

The Biosecurity Committee should be aware of the antibiotics used at the HCVC. The Microbiology Laboratory should produce periodic reports on patterns of bacterial resistance detected among commonly isolated bacteria and submit these reports to the Biosecurity Committee.

It is important to note that the results correspond to bacteria isolated from patients attending the HCVC and are therefore not extrapolatable to the rest of the pet bacterial population, which generally exhibits fewer bacterial resistances.

9.1.4 Management of Patients Infected or Colonized by Multiresistant Antibiotic Bacteria

This type of patient poses a risk to other patients, visitors, students, and HCVC staff. Biosecurity precautions (class 3 microorganisms) must be increased to prevent the spread of these bacteria in the hospital environment (Table I).

9.2. INFECTIOUS DISEASES OF MANDATORY DECLARATION IN SPAIN

Royal Decree 779/2023, of October 10, which establishes the list of diseases of animals subject to mandatory declaration and regulates their notification (Official State Gazette number 255, Wednesday, October 25, 2023), and REGULATION (EU) 2020/2002 of 7 December 2020 laying down rules for the application of Regulation (EU) 2016/429 of the European Parliament and of the Council with regard to Union notification and Union reporting of listed diseases, to formats and procedures for submission and reporting of Union surveillance programmes and of eradication programmes and for application for recognition of disease-free status, and to the computerized information system.

Diseases of terrestrial animals
— Foot and mouth disease — Infection with rinderpest virus — Infection with Rift Valley fever virus — Infection with lumpy skin disease virus — Infection with <i>Mycoplasma mycoides</i> subsp. <i>mycoides</i> SC (Contagious bovine pleuropneumonia) — Sheep pox and goat pox — Infection with peste des petits ruminants virus — Contagious caprine pleuropneumonia — African horse sickness — Infection with <i>Burkholderia mallei</i> (Glanders) — Classical swine fever — African swine fever — Highly pathogenic avian influenza — Infection with Newcastle disease virus, excluding when diagnosed in: — Columbiformes unless kept as poultry; or — wild animals of listed species — Infection with rabies virus — Infection with epizootic haemorrhagic disease virus — Anthrax — Surra (<i>Trypanosoma evansi</i>)



- Ebola virus disease
- Equine infectious anaemia
- Dourine
- Venezuelan equine encephalomyelitis
- Infestation with *Aethina tumida* (Small hive beetle)
- Infestation with *Tropilaelaps* spp.
- Infection with *Batrachochytrium salamandrivorans*
- Japanese encephalitis
- West Nile fever
- Equine encephalomyelitis (Eastern and Western)

- Infection with *Brucella abortus*, *B. melitensis*, *B. suis*
- Infection with *Mycobacterium tuberculosis* complex (*M. bovis*, *M. caprae*, *M. tuberculosis*) (MTBC)
- Infectious bovine rhinotracheitis/infectious pustular vulvovaginitis (IBR/IPV)
- Bovine viral diarrhoea (BVD)
- Enzootic bovine leukosis (EBL)
- Infection with Aujeszky's disease virus (ADV)

- Infection with bluetongue virus (serotypes 1-24) ('infection with BTV') by serotype
- Infestation with *Varroa* spp.
- Infestation with *Echinococcus multilocularis*

Diseases of aquatic animals

- Epizootic haematopoietic necrosis
- Infection with *Mikrocytos mackini*
- Infection with *Perkinsus marinus*
- Infection with Taura syndrome virus
- Infection with yellow head disease virus

- Viral haemorrhagic septicaemia
- Infectious haematopoietic necrosis
- Infection with HPR deleted infectious salmon anaemia virus
- Infection with *Marteilia refringens*
- Infection with *Bonamia exitiosa*
- Infection with *Bonamia ostreae*
- Infection with white spot syndrome virus ('infection with WSSV')

Use of animals for teaching and research

- Biosecurity regulations must also be adhered to in the use of animals for teaching and research purposes.
- These animals should not be housed or allowed to move through



areas of the HCVC where they may come into contact with patients.