FACULDADE DE MEDICINA VETERINÁRIA
UNIVERSIDADE DE LISBOA

Biossecurity

Standard Operating Procedures

FMV-ULisbon, 2025

INDEX

LIST OF ABBREVIATIONS

A3ES - Agência de Avaliação e Acreditação do Ensino Superior

AEFMV - FMV Students' Association (Associação de Estudantes da FMV)

AMEG - *Antimicrobial Advice Ad Hoc Expert Group* of the European Medicines Agency

AMR – Antimicrobial resistance

ARSLVT - Regional Health Administration of Lisbon and Tagus Valley (Administração Regional de Saúde de Lisboa e Vale do Tejo)

ASF – African Swine Fever

AU – FMV's Anatomy Unit

BSE - Bovine Spongiform Encephalopathy (BSE)

BRC - *British Retail Consortium*

CAMV - Veterinary Medical Care Centres (Centro de Atendimento Médico-Veterinário)

CGQ-FMV - Quality Assurance Council of the Faculty of Veterinary Medicine (Conselho de Garantia da Qualidade da FMV)

CHB - Hygiene and Biosecurity Committee (Comissão de Higiene e Biossegurança)

CFSPH - *Center for Food Security and Public Health* da Iowa State University

CNAVES - National Council for the Evaluation of Higher Education (Conselho Nacional de Avaliação do Ensino Superior)

CR1 - Risk Class 1 (Classe de risco 1)

CR2 - Risk Class 2 (Classe de risco 2)

CR3 - Risk Class 3 (Classe de risco 3)

CR4 - Risk Class 4 (Classe de risco 4)

CRO - Official Animal Collection Centers (Centro de Recolha Oficial de Animais Errantes)

DGAV - Directorate-General for Food and Veterinary (Direção-Geral de Alimentação e Veterinária)

DGS - Directorate-General for Health (Direção-Geral de Saúde)

EAEVE - *European Association of Establishments for Veterinary Education*

EBL - Enzootic Bovine Leukosis

ECG - Eletrocardiogram

ECOVE - *European Committee of Veterinary Education*

EEB - Bovine Spongiform Encephalopathy (Encefalopatia Espongiforme Bovina)

EHV - Equine Herpesvírus

ENQA - *European Association for Quality Assurance in Higher Education*

FCV - Feline Calicivirus

FMV – Faculty of Veterinary Medicine of the University of Lisbon

FVE - Federation of Veterinarians of Europe

HACCP - *Hazard Analysis and Critical Control Points*

HE – FMV's Teaching Hospital (Hospital Escolar da FMV)

HE-AC - Companion Animal Teaching Hospital (Hospital Escolar de Animais de Companhia da FMV)

HE-EP - Farm Animal Teaching Hospital (Hospital Escolar de Espécies Pecuárias (Serviço Ambulatório) da FMV)

HE-EQ - Equine Teaching Hospital (Hospital Escolar de Equinos da FMV)

HPAI - Highly Pathogenic Avian Influenza

ICU - Intensive Care Unit

IFS - *International Featured Standard*

INIAV - National Institute for Agrarian and Veterinary Research (Instituto Nacional de Investigação Agrária e Veterinária)

IEP - Internal Emergency Plan

ISO - *International Organization for Standardization*

IVMP - Integrated Vector Management Program

LACPMBF - Professor Manuel Braço Forte Clinical Analysis Laboratory (Laboratório de Análises Clínicas Professor Manuel Braço Forte)

MIMV - Integrated Master's Degree in Veterinary Medicine (Mestrado Integrado em Medicina Veterinária)

MOODLE - e-Learning Plataform

MRSA – Methicillin resistant *Staphylococcus aureus*

NSST - Occupational Safety and Health Unit of FMV (Núcleo de Segurança e Saúde no Trabalho)

PAU – FMV's Pathological Anatomy Unit

PBR – FMV's Resident Cattle Park (Parque de Bovinos Residentes da FMV)

PEMV - Electronic Veterinary Prescription System (Prescrição Médico-Veterinária Eletrónica)

PNCUM - National Plan for the Control of the Use of Medicines and Veterinary Medicines (Plano Nacional de Controlo de Utilização de Medicamentos e Medicamentos Veterinários)

PPE - Personal protective equipment

QVET - Veterinary Management Software

RBS - Multi-purpose alkaline detergents

SIGQ-ULisboa - Integrated Quality Management System of Universidade de Lisboa (Sistema Integrado de Gestão da Qualidade da Universidade de Lisboa)

SOP – Standard Operative Procedures

SPC - Animal Disease Control and Prevention System (Sistema de Controlo e Prevenção de Doenças Animais)

SSO - Occupational Health Service (Serviço de Saúde Ocupacional)

STPA - Section of Animal Products Technology (Secção de Tecnologia dos Produtos Animais)

SUPHT - Department of Safety, Hygiene and Occupational Health

TAC - Computed Tomography

TELEVET - Telemetry ECG System for Veterinary Medicine

UICB-AC - Small Animal Isolation and Biological Containment Unit (Unidade de Isolamento e Contenção Biológica de Animais de Companhia)

UICB-EQ - Equine Isolation and Biological Containment Unit (Unidade de Isolamento e Contenção Biológica de Equinos)

USP - Public Health Unit (Unidade de Saúde Pública)

VRE – Vancomycin resistant *Enterococcus*

WOAH - World Organisation for Animal Health

YOPI - *Young, Old, Pregnant, Immunocompromised*

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1. GENERAL BIOSECURITY PROCEDURES

General Policies and Standard Operating Procedures (SOPs) for Biosecurity applicable to all sectors of the Faculty of Veterinary Medicine

According to the World Health Organization and the Food and Agriculture Organization of the United Nations[1], biosecurity is "*a strategic and integrated approach that encompasses the policy and regulatory frameworks (including instruments and activities) that analyse and manage risks in the sectors of food safety, public health, animal life and health, and plant life and health, including associated environmental risk.*" The most frequent definition of biosecurity is the one that encompasses the rules of the 5Bs: (1) limit the risk of introduction (**bioexclusion**). (2) limit the spread of pathogens within the facility, for example, by isolating excreting animals (**biocompartmentalization**). (3) limit the spread of pathogens out of the facility (transmission between herds) (**biocontainment**). (4) prevent the risk of transmission to people (**bioprevention**) and (5) prevent any environmental contamination and the persistence of the pathogen (**biopreservation**) (Saegerman et al, 2023).

Philosophy of the Faculty of Veterinary Medicine of the University of Lisbon regarding Infection Prevention and Control

Biosecurity, prevention, and infection control are essential functions in all teaching, research, and service provision activities of the Faculty of Veterinary Medicine of the University of Lisboa (FMV), including the Teaching Hospital (HE), a structure that brings together three hospitals: Companion Animal Teaching Hospital (HE-AC), Equine Teaching Hospital (HE-EQ), and Farm Animal Teaching Hospital (HE-EP), an Ambulatory Service.

Good infection prevention and control practices are not the only indicator defining excellence in veterinary care, but it is impossible to achieve excellent patient care without implementing logical and standardized infection control procedures. The biosecurity rules, infection prevention, and control procedures implemented at FMV aim to reduce the risk of healthcare-associated infections (HAIs), and zoonoses, being specifically oriented to deal with threats of contagious diseases.

Objectives of the Biosecurity Program

- Protect workers, students, HE clients, and FMV visitors from exposure to zoonotic pathogens.
- Create a safe environment in the HE, where patient care can be optimized, mitigating the risk of nosocomial infections.
- Optimize students' educational experiences regarding biosecurity and infection control by carrying out appropriate infection prevention and control practices, and disease surveillance.
- Offer clients and share with the community information on the control and prevention of infectious and parasitic diseases in animals and people.
- Protect FMV operational capabilities.

Principles of Infection Prevention and Control

The procedures gathered and described in this document were developed based on the principles described below. These measures help prevent the transmission of infections from professionals and students to the patient, between patients, and from the patient to students and professionals.

[1] https://www.fao.org/4/a1140e/a1140e01.pdf

- **Optimize the hygiene** of areas through standardized interventions, including hand washing and sanitization, use of appropriate clothing and passage through hygiene locks, minimal contact with patients, appropriate disposal of infectious materials, and proper cleaning and disinfection of facilities.
- **Break chains of transmission** through the effective use of hygiene protocols and implementation of sanitary barriers against direct and indirect transmission of pathogens. This concept involves analysing patient circulation routes and housing locations, as well as the circulation paths of people (staff, students, and visitors) within the faculty.
- **Specify and reinforce infection prevention and control procedures** through monitoring and surveillance routines.

Increase education and awareness of the risks of HAIs and zoonoses, optimizing communication regarding the objective of these guidelines and procedures.

1.1. Faculty Hygiene and Biosecurity Committee

1.1.1. Mission and Scope of Action

The Faculty Hygiene and Biosecurity Committee (CHB) is a permanent counselling body, created in 2019, with the mission to:

1. Provide recommendations and advise on biosecurity measures to implement, and define procedures allowing the assessment and management of biological risks within the scope of teaching, research, and service provision activities.
2. Update and ensure compliance with procedures gathered in the manuals of "General and Specific Procedures for Safety, Hygiene and Health in the Training and Workplace", safeguarding compliance with legislation, the adequacy of measures to epidemiological scenarios of infectious disease occurrences, and respect for recommendations from internal University bodies, such as the Department of Safety, Hygiene and Occupational Health (SUPHT), or external ones, such as the Directorate-General for Food and Veterinary (DGAV), the Directorate-General for Health (DGS), the European Association of Establishments for Veterinary Education (EAEVE), and the European Committee of Veterinary Education (ECOVE).
3. Update the Biosecurity SOP available on the FMV website.
4. Monitor, in partnership with the Pedagogical Council, the Biosecurity content of the programs of different curricular units of the various study cycles taught at FMV.
5. Hold a seminar on good biosecurity practices in force at FMV, in the first week of classes of the academic year, for all freshmen.
6. Promote the celebration of the World Day for Safety and Health at Work (April 28), aimed primarily at workers.
7. Elaborate crisis scenarios and contingency plans, whenever necessary.

Evaluate, in collaboration with relevant Departments and the Presidency, the human and logistical resources necessary to achieve the objectives referred to above (Strategic and Action Plan).

1.1.2. Composition of the CHB

The coordinator and members of the CHB are appointed by the President of the Faculty for a 4-year term. Each FMV Department is represented in the CHB.

The CHB currently has the following composition:

- Prof. Virgílio da Silva Almeida – Associate Professor, Department of Animal Health, Vice-President of FMV who coordinates the Commission.
- Prof. Maria Manuela Castilho Monteiro de Oliveira - Full Professor, Department of Animal Health, Head of the Bacteriology and Mycology Laboratories.

- Prof. Luís Ressano Garcia Pardon Lamas - Associate Professor, Department of Clinical Medicine, Director of the Equine Teaching Hospital.
- Prof. Luísa Maria Freire Leal Mateus - Associate Professor, Department of Clinical Medicine, Coordinator of the Diagnostic Services.
- Prof. Marília Catarina Leal Fazeres Ferreira - Assistant Professor, Department of Animal Production and Food Safety, Food Technology and Food Safety Laboratory.
- Professor Ana Catarina Belejo Mora Torres - Assistant Professor of the Clinical Department, Manager of Resident Animal Facilities.
- Dr. Mafalda Pires Gonçalves – Manager of the Companion Animal Teaching Hospital.
- Engineer José António Martins Silvestre - Coordinator of the Technical Services and Maintenance Office of the FMV.
- Engineer Petra Carina de Jesus Morgado - Occupational Health and Safety Unit.

1.1.3. Operation of the CHB

The CHB meets at least twice a year, and in any situation that requires it, to treat ongoing topics and evaluate presented issues. A report is written by the coordinator and transmitted to the Presidency and any interested party on the treated topics, after validation by all CHB members.

1.1.4. Response of the CHB to the "Full Visitation Report" elaborated by EAEVE experts on 29/09/2024

The visit, on September 23-27, 2024, by EAEVE and ECOVE experts, detected non-conformities in infrastructure and procedures regarding biosecurity at FMV. On October 25, 2024, a Task Force was created composed of nine Working Groups (GT):
GT 1 - Update of Biosafety Manuals (Virgílio Almeida, Luísa Mateus, Manuela Oliveira, Telmo Nunes).
GT 2 - Isolation and Biological Containment Units (Virgílio Almeida, Luís Lamas, Solange Gil, Telmo Nunes).
GT 3 - Common outdoor area of Equine Intensive Care, Anatomy, Pathological Anatomy and Isolation and Biological Containment Units (Virgílio Almeida, Luís Lamas, Solange Gil, Graça Pires, Jorge Correia, Telmo Nunes).
GT 4 - Anatomy and Pathological Anatomy (Virgílio Almeida, Graça Pires, Jorge Correia, Rute Noiva, Luísa Mateus, José Meireles, Miguel Cardo, Telmo Nunes).
GT 5 - Teaching Laboratories of buildings C and D (Virgílio Almeida, Luísa Mateus, Manuela Oliveira, Marília Ferreira, Telmo Nunes).
GT 6 - Clinical Skills Training Center - buildings D, G and H (Virgílio Almeida, Luís Costa, Berta Braz, Lisa Mestrinho, Telmo Nunes).
GT 7 - Companion Animal Teaching Hospital (Virgílio Almeida, Esmeralda Delgado, Ana Mafalda Lourenço, Rodolfo Leal, Mafalda Gonçalves, Luís Lamas, Telmo Nunes).
GT 8 – Production Animal Species Hospital (Outpatient Service) (Virgílio Almeida, George Stilwell, Ricardo Bexiga, Fernando Boinas, Manuel Joaquim, Telmo Nunes).
GT 9 - Sanitary Inspection (Virgílio Almeida, Miguel Cardo, João Cota, Telmo Nunes).

These Working Groups mobilized 24 professors and HE managers who advised the CHB and the Presidency in 2025 on decision-making regarding interventions to be carried out in FMV areas where non-conformities were signalled, to correct them.
This vision implied:
1. Construction of new buildings, namely a new Equine Isolation and Biological Containment Unit (UICB-EQ).
2. Reformulation of access to the Small Animal Isolation and Biological Containment Unit (UICB-AC).

3. Installation of hygiene locks in Anatomy and Pathology rooms.
4. Conversion of a kennel into a General Locker Room.
5. Conversion of a Metabolic Pavilion into a Garage for washing and disinfecting vehicles used in field classes.
6. Construction of a new Waste Storage Pavilion.
7. Acquisition of new equipment.
8. Acquisition of more lockers.
9. Reinforcement of Biosecurity posting.

Drafting of "Biosecurity SOP applied to the Faculty of Veterinary Medicine, Lisbon University, Portugal", a document complementary to existing safety manuals.

1.2. Definitions

Antiseptic: Chemical product that can be applied to epithelial surfaces and causes the destruction or inhibition of microorganisms, preventing their growth or multiplication, without causing lesions to the animal.

Hygiene lock: Equipment and practices that act as barriers to prevent cross-contamination of patients, people, and inanimate objects (fomites), e.g., clothing and footwear, which in turn decreases the risk of nosocomial disease transmission. Hygiene lock precautions are used in Teaching Hospital isolation units (Class 4), in patients with special needs, e.g., immunocompromised patients, young animals without vaccination history, etc. (Class 3).

Table 1 refers to the parameters used in defining clinical status in the three FMV hospitals.

Table 1
Parameters Used in Defining the Clinical Status of Animals
(adapted from Liège University)

Species	Fever (rectal temperature)	Leukopenia (cells $\times 10^3$/ml	Neutropenia (cells $\times 10^3$/ml
Bovine	> 39,0ºC (adults) > 39,5ºC (calves)	< 5,0	< 0,6
Canine	> 39,5ºC	< 6,0	< 3,0
Caprine	> 40,5ºC	< 4,0	< 1,2
Equine	> 38,5ºC	< 4,0	< 2,5
Feline	> 39,5ºC	< 5,0	< 2,0
Ovine	> 40,05ºC	< 4,0	< 0,7

Biocide (Sanitizer): Chemical product that reduces the number of microorganisms present on inanimate surfaces to a level considered safe, without eliminating them completely.

Biofilm: Complex community of bacteria adhered to surfaces, involved in an exopolysaccharide matrix, resulting in a thin residue after cleaning. These bacterial communities are highly resistant to disinfection.

Biosecurity: All measures with the objective of (1) limiting introduction risk (bioexclusion), (2) mitigating spread within a facility (biocompartmentalization), (3) reducing spread out of a facility (biocontainment), (4) preventing human contamination risk (bioprevention), and (5) preventing environmental contamination (biopreservation).

Contagious disease: Infectious disease caused by agents such as viruses, bacteria, fungi, or parasites, which can be transmitted between people, between animals, and at the animal-person interface, by direct or indirect contact.

Disinfectant: Chemical agent that prevents or inhibits microorganism growth on fomites, e.g., surgical equipment, floors, tables.

Disinfection: Process that eliminates or reduces the number of pathogenic microorganisms on fomites to levels not harmful to health.
Team: Refers to all persons working or present in the FMV environment in any function (professors, students, staff, researchers, vets, clients, visitors, etc.).
Personal Protective Equipment (PPE): Barriers used to protect against pathogenic microorganisms or harmful chemicals (e.g., gloves, masks, goggles, gowns).
Sterilization: Process eliminating all forms of microbial life.
Hospital-acquired infection (HAI): Also known as Healthcare-Associated Infection, an infection developing after 48 hours of hospitalization or stay in a health unit that was not present or incubating at admission.
Nosocomial infection: A localized or systemic condition resulting from an adverse reaction to the presence of an infectious pathogen or toxin that was not present or incubating at admission.
Subclinical infection: Invasion of the organism without observation of clinical signs.
Multidrug Resistance: Bacteria that have developed the ability to survive in the presence of various antibiotics.
Zoonosis: Disease transmissible between vertebrate animals and humans.

1.2.1. Classification of microorganisms based on biological risk

Decree-Law No. 102-A/2020 of December 9, which transposes Directives (EU) 2019/1833 and 2020/739[2], amends the minimum requirements for the protection of the safety and health of workers against the risks of exposure to biological agents during work, and Directive (EU) 2000/54[3] classifies human, animal and plant pathogens into four risk classes.
The classification of a microorganism considers the risk to human health, the community and animals, as well as the possible economic impact. The following definitions are defined for animal pathogens[4]:

- **Risk Class 1 (CR1):** Microorganisms known as non-pathogenic for animals and people and not harmful to the environment.
- **Risk Class 2 (CR2):** Microorganisms that can cause disease in animals. Limited geographic importance. Generally effective vaccines/treatments available.
- **Risk Class 3 (CR3):** Microorganisms that can cause serious diseases or epidemic outbreaks in animal populations. Interspecies spread can be important.
- **Risk Class 4 (CR4):** Microorganisms causing pandemics or extremely serious epidemics in animal populations, with very high mortality rates or dramatic economic consequences.

Table 2 exemplifies some microorganisms, according to their risk classes in people and animals.

[2] https://files.dre.pt/1s/2020/12/23801/0000200050.pdf
[3] https://eur-lex.europa.eu/legal-content/PT/ALL/?uri=CELEX%3A32000L0054
[4] https://www.biosafety.be/content/contained-use-definitions-classes-biological-risk

Table 2
Examples of microorganisms according to risk classes

	CR2 HUMANS	CR2 ANIMALS	CR3 HUMANS	CR3 ANIMALS	CR4 HUMANS	CR4 ANIMALS
Bacteria						
Borrelia burgdorferi	×	×				
Clostridium perfringens	× (T)	×				
Brucella abortus			×	×		
Yersinia pestis			×	×		
Fungi						
Coccidioides immitis	×	×				
Histoplasma capsulatum var. capsulatum	×	×				
Parasites						
Fasciola hepatica	×	×				
Toxocara canis	×	×				
Leishmania brasiliensis			× (*)	×		
Taenia solium			× (*)	×		
Virus						
Feline Calicivirus		×				
Equine Infectious Anaemia		×				
Rabies			×	×		
Venezuelan Equine Encephalitis			×	×		
Foot and Mouth Disease						×
Classical Swine Fever						×
African Swine Fever						×

CR = Risk class. T = Toxin production. * = Class 3 biological hazard pathogens that may present a limited risk of infection to humans and animals, as they are not normally infectious via the airborne route.

1.2.2. Categories or risks used at FMV

At FMV, a specific risk categorization is implemented. Infectious diseases of hospitalized animals are classified into the following classes, based on the transmissibility of the pathogen to other animals and/or its zoonotic potential.

Table 3 lists the four risk classes present in HE-AC and HE-EQ.

Table 3
Risk Classification in Companion Animal and Equine Hospitals

CLASS 1: GENERAL HOSPITALIZATION
Infectious diseases without probability of transmission to other animals or people.
CLASS 2: GENERAL HOSPITALIZATION
Infectious diseases with low transmission level, including non-multiresistant bacterial infections.
CLASS 3: HYGIENE LOCK
Subclass A: Multiresistant bacteria (MDR). Infections caused by bacteria with high levels of antibiotic resistance, as determined by laboratory testing. **Subclass B**: Infectious diseases caused by pathogens with a moderate degree of transmission and/or that are potentially zoonotic.
CLASS 4: ISOLATION
Infectious diseases caused by pathogens with a high degree of transmissibility and/or that cause serious illness in people. Diseases subject to mandatory reporting fall into this risk class.

Examples related to specific animal species are listed for each class in the corresponding School Hospital Unit.

1.3. General Rules

1.3.1. Hand Hygiene

Hand hygiene is one of the most effective measures to prevent the transmission of pathogens in a hospital setting.

- **Hands must be washed (or at least sanitized if not macroscopically dirty)**:

- Before and after handling each patient.
- After contact with fluids, secretions, or contaminated equipment.
- Immediately after removing gloves.
- Between different procedures on the same patient.
- After handling biological samples.
- Before eating/smoking/leaving work.
- Before and after using the bathroom.

- **Recommended technique for hand washing:**

- Wet your hands and forearms with warm water.
- Add at least 3 to 5 ml (1 to 2 full portions) of soap to the palm of your hand.
- Lather and vigorously rub each side of your hands, including your wrists, for 10 to 30 seconds, cleaning between your fingers and under your nails.
- Rinse in warm water until all soap residue is removed.
- Dry your hands with a paper towel or in a hot air dryer.
- If it is not possible to wash your hands immediately, you should use alcohol-based wipes until you have access to warm water and soap.
- If you cannot wash your hands immediately, use alcohol-based wipes until you have access to warm water and soap.

• Recommended method for using hand sanitizer:

- Apply a thumbnail-sized amount to the palm of your hand.
- Apply the sanitizer to the fingertips of the opposite hand and then to the rest of the hand.

- Repeat with the opposite hand.
- Rub vigorously until dry and do not rinse.

Students and staff at FMV who have direct contact with patients or who handle biological samples are encouraged to keep their nails short and not wear jewellery on their hands to minimize contamination and improve hand hygiene. In addition, any skin lesions on the hands and forearms should be covered with a waterproof bandage.

1.3.2. Hygiene Lock Precautions

Hygiene lock precautions should be appropriate to the type of procedure performed and the type of exposure anticipated. These guidelines apply to working with infected tissues or body fluids, handling animals in cages/pens, cleaning facilities that have been occupied by infectious animals, or handling the corpse of an animal diagnosed with an infectious/zoonotic disease.

- Use gloves and protective clothing (laboratory coat, apron, or coveralls) when handling patients with or without suspected infectious or zoonotic diseases (Class 3 or 4).
- Gloves, surgical masks, and eye protection must be used during procedures that generate droplets, bone fragments, or splashes of blood or other body fluids.
- If a glove is torn, or following a needlestick injury or any other wound, the glove must be removed and replaced with a new one as soon as patient safety allows.
- Washable boots or shoes, or disposable shoe covers, should be used to enhance the ability to mitigate the spread of infectious material.
- Additional protection, such as face shields or FFP3 masks, may be required depending on the disease involved and the specific circumstances.

1.3.3. Standard Dress Code

FMV has a dress code aimed at ensuring biosafety and promoting professionalism (for further details, please refer to the remaining chapters of this document).

TEACHING HOSPITAL

- <u>Veterinarians:</u>
- Surgery: **Green surgical scrubs**.
- Medical consultations and general hospitalization:
  - Small Animals: **Blue-violet hospital scrubs**.
  - Equines: **Dark blue hospital scrubs**.
  - Farm Animals: **Impermeable blue overalls**.
- <u>Veterinary Nurses:</u>
  - Small Animals: **Dark blue hospital scrubs**.
  - Equines: **Dark blue hospital scrubs**.
- <u>Students:</u>
  - Labs/Anatomy: **White cotton lab coat**.
  - Pathology: **Cobalt-blue Delphis apron**.
  - Small Animal/Equine Hospital:
    - Consultations and general hospitalization: **Navy-blue hospital scrubs**.
    - Surgery: **Green surgical scrubs**.
  - Farm Animals Hospital (Outpatient Service): **Impermeable blue overalls**.
  - Isolation Units (Class 3/4):

- Companion animals: **burgundy scrubs + disposable green gown + disposable PPE** (Class 3)
- Companion animals: **burgundy scrubs + disposable white coverall + disposable PPE** (Class 4)
- Equine: **burgundy scrubs + disposable green gown + disposable PPE (Class 3)**
- Equine: **burgundy scrubs + disposable white coverall + disposable PPE (Class 4)**.

• The use of specific clothing is the first line of defence against the spread of pathogens outside the HE facilities.
• Workers and students wear specific clothing for the HE, i.e., clothing, footwear, and PPE exclusive to the FMV and the Equine and Production Species Outpatient Clinic.
• In all practical classes, the use of shorts, long skirts (below the knee), or skirts without leggings or tights is not permitted.
• In all practical classes, footwear must be closed, secure, protective, clean, and washable. Dirty or contaminated footwear must be cleaned and disinfected and must not be made of porous or absorbent material.
• In all practical classes, long hair must be tied back.
• At least one extra set of clean PPE must always be available.
• In practical classes with reusable PPE, it must always be clean and disinfected (for more details, see the other chapters of this document).

NOTE: Depending on the specifics and scope of the practical training, there are specific requirements regarding clothing, footwear, and PPE, which are listed in the corresponding **section.**

1.3.4. Patient Care

1.3.4.1. Patient Hygiene

• For basic hygiene reasons and to reduce infection pressure, it is of utmost importance that patients are housed in a cage/pen that is kept as clean as possible.

• Buckets or bowls of water and food should be changed and cleaned regularly.

• If animals defecate outside their enclosures (inside or outside a building), the faeces must be removed and the floor cleaned and sanitized immediately after defecation. If patients urinate inside (and not outside a building), the urine must be removed and the floor cleaned and dried as quickly as possible.

• The cage/pen space must be clean, organized, and tidy, meaning no medications or materials are scattered around, no beds are outside the pen, and students' personal belongings are not present. Teachers and students are expected to tidy up and put away used materials and leave the area in its original condition.

• Specific sector requirements in terms of patient hygiene are listed in the corresponding section of the Teaching Hospital.

1.3.4.2. Minimizing unnecessary contact with patients

• Providing patient care and student learning require frequent contact with multiple patients in routine activities. However, it is important to remember that such contact can contribute to generating chains of transmission of infectious and/or zoonotic pathogens.

• Teachers, clinical instructors, and students should minimize contact with patients to limit the risk of hospital exposure to infectious and/or zoonotic pathogens.

• Teachers and clinical instructors may, at their discretion, allow and encourage student contact with animals for educational purposes. Whenever students perform examinations or assist in procedures on multiple patients, they should systematically wash and disinfect their hands between patients. Stethoscopes and other equipment should be regularly cleaned with alcohol or hand sanitizer.

• Teachers, clinical instructors, and students in contact with patients suspected/confirmed of having a contagious disease should limit contact to those essential for adequate patient care.

• When appropriate, animals should be monitored by observation, without physical contact, if possible using video surveillance cameras.

• To reduce the spread of pathogens, professors, clinical instructors, and students should also minimize, whenever possible, movement to areas shared by different services. For example, whenever possible, professors, clinical instructors, and students of Internal Medicine should minimize visits to the surgical block. Professors, clinical instructors, and students assigned to the Equine Teaching Hospital should avoid visiting the Companion Animal Teaching Hospital, etc.

• Teachers, clinical instructors, and students should enter cages/stalls only when necessary (e.g., avoid entering cages/stalls during rounds) and should avoid touching or petting animals when passing by.

• Whenever possible, teachers, clinical instructors, and students should work last in areas with the highest risk of contamination, after attending to other patients.

1.3.5. Food and Drinks

• Food or beverages should not be stored or consumed where animals are housed and examined and treated.

• Teachers, clinical instructors, and students are prohibited from storing food, and from eating and drinking in areas where biological samples are handled or medications are stored or reconstituted. This includes registration rooms, hallways, operating rooms, examination rooms, or reception areas.

• It is permitted to store and consume food and beverages in:

- Cafeterias.

- Department break rooms.

- Offices of teachers, clinical instructors, and technicians.

- Outside the spaces of the Clinical Department.

- Dormitories of students on call.• Como comer e beber é permitido nas áreas referidas na secção anterior, não é permitida a presença de animais nem de amostras biológicas e medicamentos nas mesmas.

• As eating and drinking is permitted in the areas mentioned in the previous section, the presence of animals or biological samples and medications is not permitted in them.

• The storage of food and beverages is not permitted in refrigerators/freezers used to store medications or biological samples.

• Microwaves used to heat food for animals should not be used to heat food for people

1.3.5.1. Cafeterias

• Teachers, clinical instructors, HE staff, and students are prohibited from wearing professional clothing and carrying professional equipment (e.g., lab coats, hospital scrubs, and stethoscopes) in bars.

• Cafeteria staff must ensure that these hygiene rules are followed.

• Pets are not allowed in bars.

1.3.6. Medications

• Each hospital has a medication storage area reserved for hospitalized animals and maintains a medication register, in accordance with legislation. Any acquisition of medications for the storage area is recorded in an entry book, and each release from the storage area must be recorded in an exit book

1.3.6.1. Storage and Access

• Medications must be stored under ideal conditions (see label), in a clean environment, and must not be subject to significant variations in temperature and/or humidity.

• Medications must be arranged in an orderly manner (e.g., alphabetically/by class).

• Opened medication vials must be physically separated from the stock in another room or location.

• The Pharmacy must not be accessible to people who are not FMV workers, children, or animals (hospitalized or not, including pests). Students are prohibited from entering the Pharmacy, except with express authorization and/or accompanied by professors or clinical instructors.

• Opioid narcotics, ketamine, and euthanasia products must be stored in a secure room or safe. Access is limited to active clinical professors and instructors, via code or key.

1.3.6.2. Expiry Date

The opening or sterility seal breaking date must be clearly indicated on medications, including fluids, with a water-resistant marker.

• The medication should be discarded 24 hours after opening or earlier if specified on the label.

1.3.6.3. Medication Preparation

• Medication preparation should be performed by technicians, professors, and clinical instructors or under their direct supervision. During preparation, contamination with other medications or dirt should be avoided. For parenteral medications, the rubber stoppers of the vials should be cleaned with alcohol before each puncture. New (sterilized) syringes and needles should be used for medication preparation. Needles and syringes for administering medications should never be reused, neither for other patients nor for the same patient (exception: syringes for oral administration of liquid medications and liquefied foods may be reused after rinsing and cleaning).

• Recapping needles is prohibited, as it can cause accidents. After preparation, a new needle will be used for the injection.

• The preparation of toxic or hazardous medications must be carried out under safe circumstances, i.e., with the use of appropriate PPE (depending on the medication: e.g., gloves, mask, protective eyewear), and never in the presence of unprotected persons.

• The medication must be coded on the QVET computer platform immediately after use.

• Some medications (e.g., sodium penicillin, ampicillin) should not be prepared in advance due to their short stability.

• The name of the medication must be clearly identified with a waterproof marker on each syringe if it is not administered immediately after preparation.

1.3.6.4. Medication Return

• Discontinued or unnecessary medications that cannot be returned to the pharmacy should be disposed of in the yellow waste containers.

1.3.7. Cleaning Service / Waste Disposal

1.3.7.1. General Considerations

• Discard sharp objects in the yellow, puncture-resistant waste containers before sending your clothes to the Laundry and equipment or instruments to the respective service.

• Do not mix garbage, hay or animal bedding materials, sharp objects or anatomical parts with soiled laundry.

• Remove all organic matter from surgical instruments or equipment before returning them to the respective service.

• Buckets, pumps and tubes need to be cleaned or rinsed. Oil residues must be removed before returning the aforementioned equipment to the Waste Pavilion.

• The Laundry will not wash personal items such as student gowns and scrubs.

• The Laundry will not wash clients' belongings, e.g., blankets.

1.3.8. Waste Disposal

• Care should be taken to avoid injuries from needles, scalpels and other sharp objects. To prevent needle stick injuries, recapping needles is prohibited. Students and staff should avoid intentionally bending or breaking needles. Sharp objects should be disposed of in specific, puncture-resistant containers. Once full, these puncture-resistant containers should be placed in a yellow waste container for disposal.

• Waste should be disposed of in the area where it was generated, in accordance with the regulations described in this chapter. For specific waste types, please refer to the specific chapters for the three hospitals associated with HE.

• FMV waste is stored in black bags (Group I waste), white bags (Group II and III waste), and red bags (Group IV waste). Subsequently, it is collected weekly by a certified specialist company (ITS | etsa).

• Biological samples collected from potentially contagious patients should be sealed in impermeable plastic bags (double packaging) and labelled with the associated information and risks before being sent to diagnostic laboratories. Care should be taken to avoid contamination of the outside of the plastic bags.

• Dressings for wounds infected with pathogens of concern, e.g. (for example, MRSA or multidrug-resistant bacteria), should be performed in low-traffic areas that can be easily cleaned and disinfected. Good sanitary practices should be used to avoid contamination of hands, clothing, and surfaces. Environmental disinfection and disposal of these materials should be carried out in accordance with the procedures described in this document.

• Biological samples, removed tissues, or cadavers may not leave the areas assigned to the Teaching Hospital except for complementary diagnostic tests or incineration.

1.4. Basic Cleaning and Disinfection

• Students and staff who use detergents and disinfectants are expected to be familiar with the concepts described in this chapter in order to understand their activity and potential interactions with other products used in FMV.

• Organic material rapidly deactivates most disinfectants, so the potential presence of residual organic material should be considered when choosing a surface disinfectant.

• Disinfectants vary widely in their spectrum of activity. As a general rule, protozoa such as *Cryptosporidium* spp., bacterial spores, mycobacteria, and non-enveloped viruses are very resistant to disinfectants.

• Ensuring optimal decontamination requires adherence to the manufacturer's recommendations regarding dilutions and contact times (generally 10 to 15 minutes minimum).

• Although most disinfectants are used for their short-term decontamination activity, some retain residual disinfectant activity on surfaces for longer periods.

• It is essential to rinse and remove all residues from previous products (detergent and disinfectant).

1.4.1. Proper Cleaning

1.4.1.1. General protocol for environmental cleaning and disinfection, including contaminated surfaces

• Whenever using disinfectants, appropriate clothing should be worn and additional PPE (mask, face shields or protective goggles, waterproof clothing and boots) should be put on when there is a likelihood of splashing.

• Remove all visible residues before disinfection. The presence of organic matter will inactivate most disinfectants. If you use a hose, care must be taken to minimize aerosolization and the spread of pathogens.

• Clean contaminated areas with water and detergent or soap. Friction, manual or mechanical, is always necessary to remove biofilms and residues that hinder or inhibit the disinfection process.

• Rinse the cleaned area thoroughly to remove any detergent residue, as some disinfectants can be inactivated by detergent residue.

• Allow the area to drain or dry as much as possible to avoid diluting the disinfectant solutions.

• Thoroughly wet the area with the disinfectant solution. Ideally, the disinfectant should remain in contact with the surfaces for at least 15 minutes, following the manufacturer's instructions.

• Remove excess disinfectant with water, wipes, a mop, or a squeegee.

• The disinfectant should be rinsed from all cage/pen surfaces or allowed to dry for a sufficient amount of time (see disinfectant label) before housing a patient.

• All multi-purpose areas (e.g., tables, scales, etc.) where animals are examined or treated must be cleaned and disinfected immediately after use by staff and students responsible for the patient, regardless of their infectious status.

• When performing the cleaning/disinfection process, you must avoid any contact of blood or body fluid with non-intact skin or mucous membranes. Non-intact skin should be protected, e.g., with a waterproof bandage.

• After disinfection, remove PPE and wash your hands.

• For non-routine disinfection measures, only staff trained to use the necessary PPE are permitted to access the areas to be disinfected.

1.4.2. Disinfectants

• A variety of disinfectants are used at FMV to decrease the likelihood of pathogen transmission. Several factors were considered in the selection of disinfectants. Please also refer to the following pages for a summary of detergents and disinfectants approved for use in FMV.

• Disinfectants vary in their toxic and irritant potential to animals and people. In general, ethyl alcohol, iodopovidone, or chlorhexidine-based disinfectants are used when contact with skin or other tissues is likely or necessary. Other disinfectants, such as sodium hypochlorite (bleach), phenols, quaternary ammonium compounds, hydrogen peroxide, and aldehydes, are applied only to equipment, facility surfaces, and footbaths and footbath mats for disinfecting shoe soles.

• Disinfectants are effective when applied to clean, non-porous surfaces. Some materials, such as unstained/unvarnished wood and soil, cannot be disinfected or decontaminated through routine procedures. Furthermore, non-porous surfaces will not be reliably decontaminated if disinfectants are applied in the presence of dirt, oil, biofilms, and biological materials.

• Non-routine protocols applied in specific cases, e.g., *Cryptosporidium* spp., *Leptospira* spp., and mycoses, are described in the chapters corresponding to the three hospitals of the HE.

1.4.3. Footbaths and footbath mats

• Pathogens are frequently isolated from the floor of facilities where infected animals are housed.

• Footbaths or footbath mat sheets for disinfecting shoe soles should be changed every morning by staff, students, or veterinarians, and whenever they contain excessive amounts of dirt, bedding debris, shavings, hay, etc.

• Footbaths should be replaced by anyone who notices that they are low or dry. Footbath mat sheets should be replaced whenever they no longer adhere to the soles of shoes. This task is the responsibility of EVERYONE working in the area (students and staff).

• Students and staff should use footbaths/footbath mats properly whenever they encounter them.

• Footbaths do not require full immersion of the feet, as they are designed to disinfect the soles and sides of shoes. However, the top and sides of shoes are frequently splashed, so waterproof footwear is strongly recommended for those working in areas where footbaths are placed.

1.4.4. Instrument and Equipment Disinfection Protocol

• All equipment in Teaching Hospitals must be properly cleaned and disinfected before storage to mitigate the risk of pathogen transmission. Equipment specific to small or large animals will be discussed in their respective chapters. The following pages contain a summary of detergents and disinfectants approved for use in the FMV.

• Thermometers

- Digital thermometers must be carefully cleaned and disinfected between patients using alcohol and/or chlorhexidine wipes. Glass thermometers are not used to avoid the physical hazards associated with broken glass and mercury exposure.

- Thermometer probes used for continuous temperature monitoring (e.g., during anaesthesia) must be carefully cleaned and disinfected between patients by wiping and washing them to remove faeces and immersing them in alcohol and/or chlorhexidine solutions.

- For patients in risk classes 3 and 4 in the Isolation and Biological Containment Units of HE-AC and HE-EQ, thermometers exclusive to the respective hospitals are used.

- Immediate cleaning and disinfection are necessary when thermometers are visibly soiled and systematically after each patient examination.

• Endoscopes

- Endoscopes must be cleaned and disinfected after each use with quaternary ammonium compounds, and only by professors, veterinarians, veterinary nurses, and technicians.

• **Stethoscopes**

- It is recommended to disinfect stethoscopes daily with hydroalcoholic gel.

For patients in risk classes 3 and 4 in the Isolation and Biological Containment Units of HE-AC and HE-EQ, stethoscopes exclusive to the respective hospitals are used.

- In addition, immediate cleaning and disinfection are necessary when stethoscopes are visibly soiled and systematically after examining a class 3 or 4 patient.

1.4.5. Summary of the main detergents and disinfectants approved for use in the FMV

• The detergents and disinfectants used in the FMV (Table 4) are selected from the list of veterinary biocides approved by the DGAV [5].

Table 4
Main detergents and disinfectants used in Veterinary Medicine
(adapted from: Linton et al., 1987)

Disinfectants and their dilutions	Activity in the presence of organic matter	Activity spectrum	Comments
Chlorhexidine 0.05%-0.5% Used for disinfecting items in contact with skin and mucous membranes (e.g., muzzles, endotracheal tubes). Dilutions: 60 ml of a 2% solution per 3.79 l of water = 0.06% solution. Immersion barrels: 256.4 ml of a 2% solution per 10 l of water = 0.05% solution (23.79 ml per litter of water is used in the anaesthesia of horses in immersion barrels). Contact time: at least 15 minutes.	It is rapidly reduced.	- Mycoplasmas: very effective. - Mycobacteria: variable. - Gram-positive bacteria: very effective. - Gram-negative bacteria: very effective. - Pseudomonas: limited activity. - Rickettsia: limited activity. - Enveloped viruses: limited activity. - Chlamydia: limited activity. - Non-enveloped viruses: no activity. - Fungal spores: no activity. - Bacterial spores: no activity. - Cryptosporidium: no activity. - Prions: no activity.	- Extended antibacterial spectrum, but limited effectiveness against viruses. - Used for disinfecting items in contact with skin and mucous membranes (e.g., muzzles, endotracheal tubes). - Easily inactivated by soaps and detergents. - Low toxicity potential. Usual dilutions are not irritating even in contact with mucous membranes. - Inactivated by anionic surfactants. - Bactericidal activity on the skin is faster than with many other compounds, including iodophors. - The residual effect on the skin reduces regrowth. - Works only within a limited pH range (5-7). - Toxic to fish (cannot be released into the environment).
Iodopovidone Used for decontamination and disinfection of the skin (e.g., preparation for surgery).	It is rapidly reduced.	- Mycoplasmas: very effective. - Mycobacteria: limited activity. - Gram-positive bacteria: effective. - Gram-negative bacteria: effective. - Pseudomonas: effective. - Rickettsia: effective.	- Broad spectrum. - Very low toxicity potential. Appropriate dilutions are indicated for disinfecting fabrics and materials in contact with skin and mucous membranes. - People may become sensitive after skin contact.

[5] https://www.dgav.pt/wp-content/uploads/2021/01/LISTA-DE-BIOCIDAS-DE-USO-VETERINARIO-AUTORIZADOS-dezembro-2020.pdf

		- Enveloped viruses: effective. - Chlamydia: effective. - Non-enveloped viruses: limited activity. - Fungal spores: effective. - Bacterial spores: effective. - Cryptosporidium: no activity. - Prions: no activity.	- Dilution of iodophors increases the concentration of free iodine and antimicrobial activity. - May stain fabrics and plastics. - Stable in storage. - Inactivated by organic residues and quaternary ammonium compounds. - Requires frequent application. - Corrosive.
Alcohol 90% isopropanol or 70% denatured ethanol. Used for disinfecting items that come into contact with skin and mucous membranes, e.g. (harnesses, instruments, hands, etc.).	Reduced.	- Mycoplasmas: very effective. - Mycobacteria: effective. - Gram-positive bacteria: very effective. - Gram-negative bacteria: very effective. - Pseudomonas: effective. - Rickettsia: limited activity. - Enveloped viruses: effective. - Chlamydia: limited activity. - Non-enveloped viruses: no activity. - Fungal spores: limited activity. - Bacterial spores: no activity. - Cryptosporidium: no activity. - Prions: no activity.	- Broad spectrum. - Relatively low toxicity potential. Appropriate dilutions are indicated for disinfecting tissues and materials in contact with skin and mucous membranes. - Leaves no residue. - No residual activity on surfaces. - Fast-acting. - Evaporates quickly. - Extremely flammable.
Sodium hypochlorite (bleach) Used for disinfecting clean surfaces, especially to increase the spectrum of activity of disinfectants. <u>Dilutions</u>: - 1:64 = 15.85 ml per litter of water. Suitable for most applications in FMV. - 1:32 = 33.02 ml per litter of water. - 1:10 = 100 ml per litter of water. Very strong, limited use.	It is rapidly reduced.	- Mycoplasmas: very effective. - Mycobacteria: effective. - Gram-positive bacteria: effective. - Gram-negative bacteria: effective. - Pseudomonas: effective. - Rickettsia: effective. - Enveloped viruses: effective. - Chlamydia: effective. - Non-enveloped viruses: effective at high concentrations. - Fungal spores: effective. - Bacterial spores: effective. - Cryptosporidium: no activity. - Prions: no activity.	- Broad spectrum. - Relatively low toxic potential at appropriate dilutions. High concentrations or prolonged contact may irritate the skin and mucous membranes. - Extremely flammable. - Can be used in the presence of anionic surfactants. - Not affected by "hard" water with high concentrations of calcium and magnesium salts. - Inexpensive. - Bactericidal activity is reduced as pH increases, temperature decreases, and in the presence of ammonia or nitrogen, which is important to consider in the presence of urine. It is also inactivated by soaps/cationic surfactants, sunlight, and some metals. - Chlorine gas can be produced when bleach is mixed with other chemicals. - High oxidizing (bleaching) activity that can damage fabrics

			and be corrosive to metals such as silver and aluminium (not stainless steel). - Stored solutions have limited stability.
Quaternary Ammonium Compounds Most commonly used surface disinfectant in FMV (for spot and large area disinfection). Dilution: 1:256: 4 ml per litter of water. Contact time: at least 15 minutes.	Moderate.	- Mycoplasmas: effective. - Mycobacteria: variable. - Gram-positive bacteria: very effective. - Gram-negative bacteria: effective. - Pseudomonas: no activity. - Rickettsia: limited activity. - Enveloped viruses: effective. - Chlamydia: no activity. - Non-enveloped viruses: limited activity. - Fungal spores: limited activity. - Bacterial spores: no activity. - Cryptosporidium: no activity. - Prions: no activity.	- Broad spectrum. - Irritation and toxicity vary with the product, but as a general rule these compounds are non-irritating or have low toxicity at most frequent dilutions. - Inactivated by anionic surfactants. - Some residual activity after drying. - Stable during storage. - Less effective at low temperatures. - Inactivated by hard water. - Inactivated by soaps/detergents.
Oxidizing agents: (hydrogen peroxide) Used for disinfection by nebulization and in footbaths. Dilution: 10g per litter of water, 1% solution. Spray: add 5ml of powder (5g) to 500ml of water (1% solution). Contact time: at least 15 minutes.	Variable. Very good for potassium peroxymonosulfate and accelerated hydrogen peroxide.	- Mycoplasmas: very effective. - Mycobacteria: effective. - Gram-positive bacteria: effective. - Gram-negative bacteria: effective. - Pseudomonas: effective. - Rickettsia: effective. - Enveloped viruses: limited activity. - Chlamydia: effective. - Non-enveloped viruses: limited activity. - Fungal spores: effective. - Bacterial spores: effective. - Cryptosporidium: limited activity. - Prions: no activity.	- Extended spectrum. - Very low toxicity potential, but may irritate the skin if dried, especially in powder or concentrated solutions. - Other compounds not used in FMV may be very toxic, e.g. (e.g., chlorine dioxide). - Does not produce hazardous residues. - Residual activity on surfaces. - Low solubility in lipids. - Less effective at low temperatures. - Corrosive to steel, iron, copper, brass, bronze, vinyl. - Adding the powder to water facilitates mixing. - Use a mask and rubber gloves during solution preparation to avoid skin/mucosal irritation.
Phenols Used to disinfect instruments and necropsy rooms that may be contaminated with prions, e.g., Bovine Spongiform Encephalopathy and Scrapie.	Very good.	- Mycoplasmas: very effective. - Mycobacteria: variable. - Gram-positive bacteria: very effective. - Gram-negative bacteria: very effective. - Pseudomonas: very effective. - Rickettsia: effective. - Enveloped viruses: effective. - Chlamydia: limited activity.	- Broad spectrum. - Irritation potential varies with the compounds, but phenols are generally very irritating and should not be applied to surfaces in contact with skin and mucous membranes. - Concentrations above 2% are very toxic to animals, especially cats. - Activity is not affected by "hard" water. - Some residual activity after drying.

		- Non-enveloped viruses: limited activity. - Fungal spores: effective. - Bacterial spores: no activity. - Cryptosporidium: no activity. - Prions: limited activity, variable with the compounds.	- Effective over a very wide pH range. - Non-corrosive. - Stable in storage.

Table 5 summarizes the antimicrobial spectrum of disinfectants, adapted from Linton et al. (1987).

Table 5
Antimicrobial Spectrum of Disinfectants
(adapted from: Linton et al., 1987)

	CHEMICAL DISINFECTANTS									
	Acids (hydrochloric, acetic, citric acid)	**Alcohols** (ethyl, isopropyl)	**Aldehydes** (formaldehyde, paraformaldehyde, glutaraldehyde)	**Alkaline substances** (sodium hydroxide, ammonia hydroxide, sodium carbonate)	**Biguanides** (chlorhexidine)	**Halogens** Hypochlorite	**Halogens** Iodine	**Oxidizing agents** (hydrogen peroxide, peracetic acid)	**Phenolic compounds**	**Quaternary ammonium compounds**
Mycoplasmas	+	++	++	++	++	++	++	++	++	+
Bacteria Gram+	+	++	++	+	++	+	+	+	++	++
Gram-bacteria	+	++	++	+	++	+	+	+	++	+
Pseudomonas	+	++	++	+	±	+	+	+	++	-
Rickettsia	±	+	+	+	±	+	+	+	+	±
Enveloped viruses	+	+	++	±	±	+	+	+	±[a]	±
Chlamydia	±	±	+	+	±	+	+	+	±	-
Non-enveloped viruses	-	-	++	±	-	+	±	±	-	-
Fungal spores	±	±	+	+	±	+	+	±	+	±
Picornaviruses (e.g., FMD)	+	N	+	+	N	N	N	+	N	N
Parvovirus	N	N	+	N	N	+	N	N	N	-
Acid-fast bacilli	-	+	+	+	-	+	+	±	±	-
Bacterial spores	±	-	+	±	-	+	+	+[b]	-	-
Coccidia	-	-	-	+[c]	-	-	-	-	+[d]	-
Prions	-	-	-	-	-	-	-	-	-	-

Legend: ++ very effective. + effective. ± limited activity. – no activity. N= information unavailable. [a] Varies with a composition. [b] Peracetic acid is sporicidal. [c] Ammonium hydroxide. [d] Some have activity against coccidia. FMD= Foot-and-Mouth Disease

Table 6 compiles the characteristics of disinfectants and antiseptics, adapted from Linton et al. (1987) and the Center for Food Safety and Public Health (CFSPH) at Iowa State University (2023).

Table 6
Characteristics of selected disinfectants and antiseptics
(adapted from Linton et al., 1987 and CFSPH, 2023)

DISINFECTANT CLASS	Alcohols	Aldehydes	Biguanides	Halogen-Hypochlorite	Halogen-Iodine	Oxidizing agents	Phenolic compounds	Quaternary ammonium compounds
Examples of active ingredients	Ethanol Isopropanol	Glutaraldehyde Formaldehyde	Chlorhexidine (antiseptic)	Sodium hypochlorite	Iodopovidone (antiseptic)	Hydrogen peroxide Peracetic acid	Chloroxyphenol	Benzalkonium chloride
Mechanisms of action	It precipitates proteins. It denatures lipids.	It precipitates proteins. Alkylate nucleic acids.	It alters the permeability of the cell membrane..	It precipitates proteins.	It precipitates proteins.	It precipitates proteins, and lipids.	It precipitates proteins. It alters the permeability of the cell membrane.	It precipitates proteins. It binds to the phospholipids of the cell membrane.
Features	Fast-acting. Quick evaporation Leaves no residue or residual effect.	Broad spectrum. Non-corrosive. Unpleasant odour.	Broad spectrum.	Broad spectrum. Short contact time. Inexpensive. Degrades rapidly after preparation.	Stable during storage. Relatively safe.	Broad spectrum. Fast-acting. Low toxicity at low concentrations.	Non-corrosive. Stable during storage. Strong odour. Residual biofilm. May damage rubber and plastic.	Stable during storage. Effective at high temperatures and high pH (9-10).
Factors affecting effectiveness	Inactivated by organic matter.	Affected by organic matter, hard water, soaps/detergents, temperature, and relative humidity.	Effective within a limited pH range (5-7).	Inactivated by sunlight and heat. Requires frequent applications. Affected by pH and temperature.	Inactivated by quaternary ammonium compounds. Requires frequent applications.		Affected by temperature.	Affected by pH. Best in neutral or alkaline pH.
Health hazards	Skin irritation.	Carcinogenic. Very irritating to the skin and mucous membranes.		Irritating to skin, mucous membranes, and eye.		In powder form, it can irritate mucous membranes.	Irritating to skin, eyes, and respiratory tract.	It may cause irritation to the skin, eyes, and respiratory tract.
Precautions	Flammable.	Use only in well-ventilated areas. Flammable.	Toxic to fish (environmental concern).	Never mix with other products as it will release toxic chlorine gas.	Corrosive. Stains disinfected clothing and surfaces.	It can damage some metals (aluminium, copper, steel, etc.).	It can be toxic to animals, especially cats and pigs.	It can accumulate in the environment. It can damage some metals in high concentrations.
Vegetative forms of bacteria	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Variable
Mycobacteria	Effective	Effective	Variable	Effective		Effective	Variable	Ineffective
Enveloped viruses	Effective	Effective	Limited	Effective	Effective	Effective	Effective	Variable
Non-enveloped viruses	Variable	Effective	Limited	Variable	Limited	Effective	Variable	Ineffective
Spores	Ineffective	Effective	Ineffective	Variable	Limited	Variable	Ineffective	Ineffective
Fungi	Effective	Effective	Limited	Variable	Effective	Variable	Effective	Variable
Effectiveness in the presence of organic matter	Inactive	Reduced	?	Inactivated		Variable	Effective	Inactive
Effectiveness with "hard" water	?	Reduced	?	Variable	?	Variable	Effective	Inactive
Effectiveness with soaps/detergents	?	Reduced	Inactive	Inactive	Effective	?	Affected by cationic surfactants	Inactivated by cationic surfactants

1.5. Interruption of Transmission Chains

1.5.1. General Behaviour

• The smoking ban in the workplace must be respected.

• Dogs must be walked on a leash within FMV facilities.

1.5.2. Visitors

• Educating the public about the role of veterinarians in society is an important duty of the FMV, and allowing visitors limited access to faculty supports this mission. However, there are specific health and safety issues associated with exposure to the faculty environment, and visitors could potentially spread pathogens into the hospital environment.

• Patient handlers must be constantly supervised during their visit to the FMV. Physical contact with other patient animals is not permitted.

• Guided tours for the public are coordinated by the Presidency and conducted by trained staff.

• Visitors are not permitted to enter the Isolation and Biological Containment Units (Class 4).

• FMV staff supervising visitors must inform them of the risks of nosocomial and zoonotic diseases associated with hospitalized animals.

• Visitors should consult the Ordinance before entering FMV facilities.

• They should not be allowed to enter medical emergency rooms and anaesthetic preparation and surgery areas.

• Special authorizations can be obtained by contacting the Presidency to allow entry for visiting researchers or veterinarians into the aforementioned areas.

• Visitors may not gather in customer service areas.

• Smoking, eating, and drinking are not permitted.

• Visitors may not bring animals.

1.5.3. Clients

• Clients have free access to the waiting rooms of HE-AC and HE-EQ and the adjacent restrooms, and to the bars. They must be accompanied to other areas of the hospitals by students and staff.

• Access to patient care areas may be restricted whenever appropriate to mitigate the risks of nosocomial or zoonotic infections. In addition, professors and veterinarians may, at their discretion, exclude clients from care areas for safety reasons and whenever there is a risk of disruption to the work environment.

• At the discretion of the responsible veterinarian, clients may be left alone with their animals in the consultation rooms, however this is prohibited in general inpatient care. In addition, clients should always be instructed not to touch other animals.

• Clients are not allowed to visit patients housed in isolation units (Class 4). Permission is only granted, exceptionally, in terminal cases or euthanasia in accordance with biosafety measures.

• Clients must always adhere to sanitary prophylaxis measures.

• Visiting hours for hospitalized animals are restricted to specific periods determined by those responsible for HE-AC and HE-EQ, unless expressly authorized by the physician in charge of the case.

• The staff and students responsible for patient care are required to inform clients about the risks of nosocomial and zoonotic diseases associated with animal hospitalization.

1.5.4. Children

• There are specific health and safety risks in FMV spaces. It is unacceptable for a child to become ill or injured after contact with animals or environmental exposure.

• Children (under 18 years of age) of FMV workers and students are not allowed to remain in hospitals unless supervised by an adult.

• Children visiting FMV must always be supervised by an adult.

• All children must be prevented from touching any animal except their own, due to the risk of physical injury and/or zoonotic diseases.

• Access to patient care areas may be restricted whenever appropriate to mitigate the risks of zoonotic infections. In addition, veterinarians may, at their discretion, exclude children (under 18 years of age) from patient care areas for their own safety and whenever there is a risk of disruption to the work environment.

1.5.5. Pets at FMV (Employees/Students)

• The daily presence of companion animals at FMV is governed by the "Regulations for the presence and circulation of companion animals", P-R-01 of October 17, 2022.
• FMV is an institution with a pet-friendly workplace policy, and it is considered that the presence of employees' companion animals at the college increases the socialization, creativity, and productivity of the community, and improves the well-being of our companion animals. However, the presence and circulation of companion animals in the college's spaces are regulated to ensure safety and good coexistence between people and animals, safeguard public hygiene, and prevent the degradation of spaces and equipment.
• This regulation applies to all animals that frequent or visit the FMV facilities and outdoor spaces, except for hospital clients:

- Animals may only remain in the individual workspaces of their owners, and circulation within the FMV's internal and external spaces must be limited to routes considered indispensable, with the animals restrained by a leash or harness.
- Animals are not allowed in common areas, such as auditoriums, classrooms, technical rooms, laboratories, etc., except for guide dogs.
- Animals are prohibited from being in bars.
- Animal owners must clean up all solid and liquid waste as quickly as possible, whether in enclosed or open spaces, in order to minimize the presence of organic matter and avoid stains.
- Owners must prevent their animals from disturbing activities at FMV in any way, especially through noise.
- Owners must ensure that their animals do not endanger the safety of people and other animals, nor damage FMV facilities and equipment, and they will be held responsible for any resulting consequences.
- Failure to comply with these rules will result in the prohibition of animals from being on FMV premises.

• This Regulation does not apply to:

- Animals hospitalized as patients
- Animals used in academic activities
- Dogs with scheduled blood donations
- Animals participating in approved research projects.

• Contact between patient and healthy animals should be avoided, and patient animals should be housed in separate facilities.

• Workers and students must adhere to all FMV biosafety policies during the handling and stay of animals in hospitals.

1.5.6. Disease Transmission Routes

• Many pathogens can survive for long periods in suspension in air particles, on surfaces, and in organic matter.

• Pathogens can spread from animal to animal, from animal to person and vice versa, through inhalation, oral route, direct contact with mucous membranes, and indirectly through fomites or insect vectors.

• Knowledge of these disease transmission routes helps to mitigate their potential effects.

1.5.6.1. Aerosol Transmission

• Aerosol transmission occurs when pathogens are transmitted through aerosol droplets. Most pathogens do not survive for long periods in aerosol droplets. Therefore, proximity between infected and susceptible animals is necessary for effective transmission. The greater the distance between animals, the lower the probability of transmission.

• Aerosol transmission can occur in a veterinary hospital through close contact with animals and/or people. Pathogens may be recently aerosolized (e.g., through the sneeze of a cat infected with feline herpesvirus), may be aerosolized through high-pressure washing of cages/pens, or in dust particles dispersed by air currents (e.g., *Coxiella burnetii*). Temperature, relative humidity, and ventilation play an important role in the transmission of pathogens by aerosols.

1.5.6.2. Oral Transmission

• Oral transmission occurs through exposure to pathogens via the gastrointestinal tract. Another form of oral transmission involves inhalation and subsequent ingestion of aerosolized material.

• Contaminated equipment includes food and water bowls, and any other items that an animal may lick or chew (e.g., kongs). Food and water contaminated with faeces or urine are frequently responsible for oral infections.

• For people, contact of the oral mucosa with contaminated hands is frequently involved in the faecal-oral transmission cycle of pathogens, making frequent hand washing and disinfection relevant among people who work with animals. Proper handling and segregation of diarrheal patients, as well as rigorous cleaning and disinfection of feeders and waterers, will help reduce faecal-oral transmission chains.

1.5.6.3. Direct and Indirect Contact Transmission

• • Direct contact transmission requires an animal or person to come into direct contact with another infected animal or person.

• Indirect contact transmission occurs through contact with surfaces/materials contaminated by biological fluids, e.g., blood, wound exudates, saliva, nasal secretions or aerosolized respiratory droplets, genitourinary secretions, faeces, etc.

• The likelihood of hospitalized patients with infectious disease carrying contagious pathogens is considerable. Therefore, the probability of facility surfaces being contaminated is real. Segregating

infected animals and reducing contact with them are two essential measures to break chains of transmission by direct or indirect contact.

1.5.6.4. Fomite Transmission

• Fomites are inanimate objects that serve as intermediaries in transmission cycles. Virtually any object can play the role of a fomite, even a person (e.g., a handler). Door and cabinet handles, keyboards, telephones, clothing, thermometers, stethoscopes, hoses, collars, brushes, etc., are objects that can be contaminated and transmit pathogens to animals and people.

• The main measures to control the transmission of pathogens by fomites include proper cleaning and disinfection, the application of sanitary prophylaxis measures, the use of exclusive equipment for contagious patients, as well as the proper identification and segregation of patients.

• Whenever possible, animals showing clinical signs of infectious disease should be handled and treated after healthy patients.

1.5.6.5. Vector Transmission

• Vector transmission occurs when an arthropod acquires a pathogen from one animal and transmits it to another animal, e.g., Dirofilariasis and West Nile Fever are diseases transmitted, respectively, to dogs and horses, by mosquito bites.

• Fleas, ticks, flies, and mosquitoes are common vectors of pathogens.

• The most effective means of preventing the transmission of pathogens by vectors are controlling insect populations using insecticides and reducing contact between the vector and the host through the use of repellents. Practical measures are referred to in the Pest Control Chapter.

1.5.7. Zoonotic Infections

• Although the risk of contracting a zoonotic disease among the general population is, on average, low, professionals who have routine contact with animals are at greater risk of exposure.

• In case of exposure to a suspected or confirmed zoonotic pathogen, all clients, workers and students of FMV must be registered and reported to CHB, biosseguranca@fmv.ulisboa.pt.

• The CHB Coordinator and the veterinarian responsible for the sporadic case/epidemic outbreak will work together to ensure that all potentially exposed persons are contacted, as well as the local health authority, Dr. Ana Gaspar, Coordinating Health Delegate of the Public Health Unit (USP) of Western Lisbon, T: 214 540 814 usp.lxocidoeiras@arslvt.min-saude.pt.

• Any individual with a suspected or confirmed occupational disease is strongly encouraged to seek medical attention immediately after notifying their direct manager and reporting to the CHB.

• Any suspected or confirmed exposure to a zoonotic pathogen must be reported to the CHB Coordinator and the Clinical Director of HE-AC (aferreira@fmv.ulisboa.pt), HE-EQ (llamas@edu.ulisboa.pt) and HE-EP (stilwell@fmv.ulisboa.pt) by the veterinarian who attended the patient.

Ms. Petra Morgado, head of the Occupational Safety and Health Unit of FMV (NSST), (pmorgado@fmv.ulisboa.pt), should be informed for subsequent referral for consultation at the Occupational Health Service (SSO) (https://www.arslvt.min-saude.pt/servico-de-saude-ocupacional/) of the Regional Health Administration of Lisbon and Tagus Valley (ARSLVT).

• Students and staff at FMV, as well as their family and friends who may be at higher risk of contracting zoonoses or who have concerns about any exposure to zoonotic pathogens, are strongly encouraged to contact their family physician.

1.5.8. Special Risks Regarding Infectious Diseases

• Anyone with a compromised immune system is at higher risk of exposure to zoonotic diseases. In addition to causes of immunosuppression related to disease or medication, other physiological conditions affect the quality of the immune system's response, e.g., children under 5 years of age, the elderly, pregnant women, and immunocompromised individuals. These categories of people are called YOPI, an acronym for Young, Old, Pregnant, Immunocompromised, used in health contexts.

• Numerous diseases and conditions can compromise or alter immune function, including HIV/AIDS, organ failure, diabetes, alcoholism and liver cirrhosis, malnutrition, or autoimmune diseases.

• Several therapies can induce immunosuppression, including radiotherapy, chemotherapy, corticosteroids, or immunosuppressive therapy associated with bone marrow or organ transplants, implantation of medical devices, splenectomy, or long-term haemodialysis.

• Some of these diseases/conditions may have a social stigma, making it difficult to share confidential health information.

• All students and staff must inform their supervisor, before participating in patient consultations/interventions, about any health condition/problem they have (e.g., pregnancy, immunosuppression, etc.) that may increase the risk or severity of infections from zoonotic pathogens.

• This information is confidential. However, communication between team members may be necessary to implement appropriate precautions and/or adapt clinical or teaching procedures.

1.6. Risk Communication Regarding the Contagious Status of Patients

• Effective communication about the risk of spreading contagious pathogens is essential, given the complexity of patient care and the number of people who study and work in teaching hospitals. Effective and proactive communication about patients in the infectious period reduces the likelihood of chains of transmission of nosocomial or zoonotic diseases.

• Regarding biosecurity, risk communication involves adequate notification and education about the risks for all individuals in contact with infectious patients and about the prophylactic measures necessary to break the spread to other animals and people and to disinfect contaminated equipment and areas.

• It is the responsibility of the Clinical Director of HE-AC, HE-EQ and HE-EP, or a veterinarian from their teams with delegated skills for the task, to assess the risk of transmission of contagious diseases and implement appropriate infection control measures, consistent with the “FMV Biosecurity SOP”.

• The CHB MUST BE NOTIFIED OF ALL IMPORTANT INFECTIOUS RISKS (SUSPECTED OR CONFIRMED), which include, but are not limited to, notifiable diseases (e.g., dermatophytosis), potentially zoonotic diseases (e.g., avian influenza), highly contagious diseases (e.g., salmonellosis), highly pathogenic diseases (e.g., leptospirosis), infections caused by multidrug-resistant bacteria (e.g., MRSA or VRE), and pathogens that are highly persistent in the environment or difficult to eradicate with routine hygiene practices (e.g., anthrax). This notification must be made by the responsible veterinarian as soon as possible, via the following email address: biosseguranca@fmv.ulisboa.pt.

• All risks of contagion must be adequately communicated to FMV students, staff, and clients to effectively manage the threat of infection to animals and people in contact.

• A patient's infectious state may evolve during hospitalization, and risk communication must be updated and adjusted.

1.6.1. Biosafety Email Lists

• FMV uses email lists to facilitate communication about the risks of infectious diseases among teaching hospital professionals, e.g., biosseguranca@fmv.ulisboa.pt, medicos@fmv.ulisboa.pt, enfermeiros@fmv.ulisboa.pt, amendes@fmv.ulisboa.pt

• **Objective**: To promote communication and raise awareness about patients at increased risk of contagious diseases and/or zoonoses.

• **Email senders**: Open to all, mandatory when patients are admitted to class 4 (Isolation Units).

• **Email recipients**: Presidency, CHB members, members of the Occupational Health and Safety Unit, Hospital School workers and cleaning staff.

1.6.2. Floor markings

• To make access more visible to students, workers, clients, suppliers and visitors, lines have been painted on the floor of specific areas of the FMV. The colour of the line corresponds to the circulation authorization:

- **Green**: no restriction, passage is permitted.

- **Yellow**: passage is restricted (e.g., entry into a support laboratory for teaching hospitals).

- **Red**: passage is not permitted without prior authorization (e.g., surgical centres or biological isolation and containment units).

1.6.3. Hospitals – Companion Animals, Horses and Ruminants

• The infectious risk must be clearly identified in the cages/stalls housing contagious patients, as well as in the surrounding space. The following information must be included:

- Disease Risk Class (see Table 2).

- Suspected/confirmed diagnosis (name of the disease/condition).

- Appropriate disinfection procedures for disease/condition control.

- Applicable sanitary prophylaxis measures.

- Hygiene lock.

- Potential zoonotic risk.

• The team responsible for contagious patients must ensure that the specifics of the hygiene lock are properly communicated to other people working with patients or in the contaminated space. Furthermore, they must ensure that the information is promptly communicated to CHB (biosseguranca@fmv.ulisboa.pt)..

1.6.4. Protocol for the Reception Teams of the Companion Animal and Equine Hospitals

• During patient triage, whether in person or by phone, if a client mentions clinical signs consistent with contagious disease (e.g., vomiting, diarrhoea, ataxia, abortion, cough, sneezing, etc.):

- The receptionist will schedule an appointment at the Isolation and Biological Containment Unit for the respective animal species, AFTER approval from the unit's responsible veterinarian, and if an isolation cage/pen is available.

- The reason for the suspicion will be indicated on the schedule (e.g., unvaccinated puppy with haemorrhagic diarrhoea).

- "Suspected Contagious Disease" will be written next to the complaint.

- The client will be asked to keep the animal inside the vehicle in the parking lot until a veterinarian performs a clinical evaluation of the patient to determine the risk before referring it to the respective Isolation and Biological Containment Unit or authorizing the client to enter the respective hospital with the animal. According to the risk category and circumstances, the animal will be taken directly to a consultation room (Class 1 and 2) or to the isolation unit (Class 3 and 4). Pets should preferably be transported in a carrier (cats and small and medium-sized dogs) or on a stretcher (only large dogs). Equines are transported in the owner's horse trailer to mitigate the risk of contamination of FMV spaces.

1.6.5. Protocol for Students

• The admission of potentially contagious patients is organized as follows:

- The reason for the consultation will be recorded on the Clinical Record (e.g., diarrhoea, vomiting, sneezing, etc.).

- The Clinical Record should state "Suspected Contagious Disease".

- The client will be asked to keep the animal inside the vehicle in the parking lot until a veterinarian assesses the patient to determine the risk before denying or authorizing its entry into the hospital. According to the decision and risk category, the animal will be taken directly to a consultation room or transported to a Biological Isolation and Containment Unit. Pets should preferably be transported in a carrier (cats and small and medium-sized dogs) or on a stretcher (only large dogs). Equines are transported in the owner's horse trailer to mitigate the risk of contamination of FMV spaces.

- Direct contact between the animal suspected of having a contagious disease and other patients or resident animals of the FMV is not permitted.

- To reduce risks to students and other patients of teaching hospitals, only a minimum number of students (designated by the professor/clinical instructor) may accompany consultations/examinations of potentially contagious patients.

- After the consultation room is vacated, areas or equipment contaminated by faeces and/or body fluids must be cleaned and disinfected immediately by the student and/or assistant.

- An appropriate sign must be placed on the door, and the room cannot be used by another patient until cleaning and disinfection are complete.

- Students must be trained and informed (through seminars and in-person practical classes of various curricular units of the Departments of Animal Health and Clinical Medicine for training in good Biosafety practices, the teaching-learning materials available on the FMV Moodle and the “FMV Biosafety SOP” available on the FMV website) to follow the biosafety protocol in case of contact with contagious patients..

1.6.6. Exclusion criteria for admission and/or hospitalization

• A patient suspected of having a notifiable disease (see section 1.7.6) can only be admitted to the Isolation and Biological Containment Unit (companion animals and equines) of the respective HE, to which they are immediately transported.

• Patient admission may be denied if the risks to other patients or to students and staff are too high compared to the risk to the animal itself.

• Specific refusal criteria for each animal species are listed in the corresponding HE hospital chapter.

• Only veterinarians have the authority to refuse admission to an animal.

1.7. Biosecurity Measures Surveillance

• This program was established to monitor and identify the spread of infectious diseases in the Veterinary Medical Center (FMV). Environmental and patient samples are analysed for general environmental contamination and microorganisms associated with transmissible and hospital-acquired diseases.

• In general, veterinarians should alert the Veterinary Medical Center (CHB) as quickly as possible to:

- Occurrence of suspected or confirmed nosocomial events.

- Any trends of suspected nosocomial events, even if the clinical consequences are not serious.

- All suspected or confirmed zoonotic infections believed to have been contracted after exposure in the FMV;

• Physicians are encouraged to use appropriate diagnostic tests to determine the aetiology of nosocomial events, even if the results do not affect the patient's clinical outcome.

• Traceability of infected animals and their network of contacts is relevant for surveillance. In HE-AC and HE-EQ, the QVET IT platform provides a complete database of all received cases, contact information for the owner(s) and the responsible veterinarian(s), as well as the tests and medications used in the treatment of patients.

• Client and patient information are confidential. Its use for research depends on informed consent from clients and authorization from the FMV Ethics Committee.

1.7.1. Diagnostic tests required in case of suspected infection

• Confirmation of clinical suspicion of infection is fundamental for the proper clinical management of infectious patients, especially when dealing with zoonotic agents. Laboratory tests benefit both the patient and the client, allowing for proper home management (protection of human health in the case of zoonotic agents). They also allow the FMV to correctly manage the risk for all parties involved, e.g. (e.g., patients, workers, and students.)

• Therefore, it is highly recommended to test patient animals if a contagious or zoonotic pathogen is included in the differential diagnosis. If the owner is reluctant to bear the costs of the test, the animal will automatically be classified as a Class 4 patient and the resulting financial impact will be charged to the owner.

• The veterinarian responsible for the patient must ensure that information on infectious and/or zoonotic pathogens is provided to the owner.

• The veterinarian responsible for the patient must ensure that biological samples are sent to the laboratory for testing and that appropriate biosecurity measures for the treatment of the patient are implemented.

• If the veterinarian responsible for the patient suspects one of the situations indicated in 1.7.2., they must notify the CHB as soon as possible. This notification can be made via the following email address: biosseguranca@fmv.ulisboa.pt.

1.7.2. Diseases for which testing is mandatory

• • Laboratory testing of appropriate samples is mandatory if The disease/condition is included in the differential diagnosis. A complete description of tests, management, diagnosis, and information is available on the World Organisation for Animal Health (WOAH) website):

- Animal Disease Fact Sheets (N=208): https://www.woah.org/en/what-we-do/animal-health-and-welfare/animal-diseases/

- Terrestrial Animal Health Code: https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/

-Diagnostic Tests and Vaccines Manual for Terrestrial Animals: https://www.woah.org/fileadmin/Home/eng/Health_standards/tahm/A_summry.htm

• In FMV, special attention should be given to the following diseases:

- Diseases Common to Several Animal Species

- Brucellosis
- Campylobacteriosis
- Cryptosporidiosis
- Avian influenza
- Leptospirosis
- Rabies
- Salmonellosis

- Specific diseases of companion animals (including exotic and zoo animals)

- Systemic feline calicivirus
- Avian chlamydiosis
- Acute diarrhoea in dogs and cats (e.g., parvovirus and Giardia spp.)
- Canine distemper

- Equines

- Equine infectious anaemia
- Strangles (*Streptococcus equi* subsp *equi*)
- Equine herpesvirus type 1 myeloencephalitis

- Ruminants

- Cryptosporidiosis

1.7.3. Environmental Surveillance of *Salmonella* spp. at the Equine Hospital

1.7.3.1. Microbiological Cultures of Stalls

• In a stall that housed a horse with a positive culture for Salmonella spp., samples must be collected for environmental analysis after routine cleaning and disinfection. The stall may only house another patient if bacteriological tests are negative for Salmonella spp.

• The technicians responsible for decontaminating the stall or the veterinarian responsible for the patient must notify the CHB when the stall is vacated to arrange for the collection of samples for environmental analysis.

• The team reports the results of bacteriological tests to the CHB as soon as the results are available, via the following email address: biosseguranca@fmv.ulisboa.pt.

• This data is compiled quarterly by the CHB and made available to those responsible for the three teaching hospitals.

1.7.3.2. Routine Environmental Surveillance

• Sample collection for environmental microbiological and parasitological surveillance should be carried out semi-annually at the Companion Animal Hospital and the Equine Hospital, except in the facilities of the Isolation and Biological Containment Units (Class 4), which, being more susceptible to contamination by Salmonella spp., should undergo environmental microbiological and parasitological analyses quarterly.

• The team reports the results of bacteriological examinations to the CHB as soon as the results are available, via the following email address: biosseguranca@fmv.ulisboa.pt.

• This data is compiled quarterly by the CHB and made available to those responsible for the three teaching hospitals.

1.7.4. Management of Patients Infected or Colonized by Multidrug-Resistant Bacteria

• Patients infected with/carrying multidrug-resistant (MDR) bacteria represent a potential risk to students, staff, clients, and other patients. As such, they are treated with enhanced biosafety precautions (Class 3) to prevent chains of transmission of these bacteria within and outside the college.

1.7.5. Antimicrobial Resistance and the Use of Antimicrobial Drugs

• Antimicrobial resistance is one of the most important and complex "One Health" challenges of the 21st century. An infection control program must consider the significant impact of antimicrobial resistance on the ability to provide quality medical care.

• The CHB promotes practices that help preserve the effectiveness of antimicrobials.

• HE-AC, HE-EQ, and HE-EP (Outpatient Service) routinely assess the antimicrobial resistance patterns of isolated bacteria and share a semi-annual report with the CHB. See Chapter 11 for additional information.

NOTE: These reports summarize the results of antimicrobial resistance found in animals investigated by the three FMV hospitals, including patients evaluated in second opinion and referral consultations, therefore the frequencies and resistance profiles are not representative of the true prevalence of MDR in animal populations, and are likely overestimated.

1.7.6. Notifiable Animal Diseases and Zoonoses in Portugal

• • It is FMV policy to investigate the possibility of any notifiable disease and, if suspicion is confirmed, to report it to DGAV at https://spc.dgav.pt.

• For animal species of interest to FMV, the notifiable diseases in Portugal, updated on April 22, 2024, are listed in Table 7 and are as follows (https://www.dgav.pt/wp-content/uploads/2024/04/ListaDDO.pdf).

Table 7
Notifiable diseases in Portugal of interest to the FMV

Diseases common to several species
Brucellosis (*Brucella abortus*)
Brucellosis (*Brucella mellitensis*)
Brucellosis (*Brucella suis*)
Anthrax (*Bacillus anthracis*)
Blackleg (*Clostridium chauvoei*)
Mycobacterium tuberculosis complex (*M. bovis, M. caprae, M. tuberculosis*)
Cowdriosis
Aujeszky's disease
Epizootic hemorrhagic disease
Japanese encephalitis
Eastern equine encephalomyelitis
Echinococcosis / hydatidosis (*Echinococcus multilocularis*)
Echinococcosis/hydatidosis (*Echinococcus granulosus*)
Vesicular stomatitis
Foot-and-mouth disease
Bluetongue disease
West Nile fever
Rift Valley fever
Q fever
Crimean-Congo hemorrhagic fever
Leishmaniasis
Chrysomya bezziana myiasis
Cochilomyia hominivorax myiasis
Paratuberculosis
Rinderpest
Rabies
Salmonellosis
Scabies
Trypanosoma evansi (Surra)
Tinea
Trichinellosis
Tuberculosis (mammals and birds) except CMT
Trypanosomiasis (*T. brucei, T. congolensis, T. simiae, T. vivax*)
Tularemia
Cattle Diseases
Bovine anaplasmosis
Bovine babesiosis
Bovine genital campylobacteriosis
Contagious nodular dermatosis
Bovine viral diarrhea
Diphtheria
Bovine spongiform encephalopathy
Bovine enzootic leukosis
Contagious bovine pleuropneumonia
Infectious bovine rhinotracheitis / Infectious pustular vulvovaginitis
Hemorrhagic septicaemia (*Pasteurella multocida*)
Theileriosis (*T. annulata, T. orientalis, T. parva*)
Trichomoniasis
Sheep and goat diseases

Enzootic abortion of sheep (Ovine Chlamydiosis)
Contagious agalactia
Caprine arthritis/encephalitis
Nairobi disease
Ovine epididymitis (*Brucella ovis*)
Maedi-Visna disease
Peste des petits ruminants
Caprine contagious pleuropneumonia
Salmonellosis (*Salmonella abortusovis*)
Scrapie
Theileriosis (*T. lestoquardi, T. luwenshuni, T. uilenbergi*)
Sheep and goat pox
Swine diseases
Cysticercosis
Swine vesicular disease
Nipah virus encephalitis
Transmissible gastroenteritis
Swine influenza
Erysipelas
African swine fever
Classical swine fever
Porcine reproductive and respiratory syndrome (PRRS)
Equine Diseases
Equine infectious anaemia
Equine viral arthritis
Dourine
Western equine encephalomyelitis
Venezuelan equine encephalomyelitis
Equine influenza
Epizootic lymphangitis
Equine contagious metritis
Glanders
Glanders (Burkholderia mallei)
Equine piroplasmosis
Equine trypanosomiasis
Equine rhinopneumonitis
Lagomorph Diseases
Rabbit hemorrhagic disease
Myxomatosis
Avian Diseases
Avian infectious bronchitis
Gumboro disease
Psittacosis
Avian cholera (*Pasteurella multocida*)
Avian diphtheria
Newcastle disease
Low pathogenic avian influenza
High pathogenic avian influenza
Duck viral hepatitis
Avian infectious laryngotracheitis
Avian mycoplasmosis (*M. gallisepticum / M. meleagridis*)
Avian mycoplasmosis (*M. synoviae*)
Salmonellosis (*S. pullorum, S. gallinarum, S. arizonae*)
Turkey rhinotracheitis
Salmonellosis (other species**)**

The following zoonoses must be reported by the Laboratory Manager as part of a laboratory analysis performed at the FMV Diagnostic Center:

• **Viral zoonoses**

- SARS-CoV-2 infection

• **Bacterial zoonoses**

- Brucellosis
- Campylobacteriosis
- Colibacillosis - Verotoxigenic *Escherichia coli* (VTEC)
- Lyme disease
- Salmonellosis
- Vibriosis
- Yersiniosis

• **Fungal zoonoses**

- Dermatophytoses

• **Parasitic zoonoses**

- Cysticercosis
- Cryptosporidiosis
- Echinococcosis
- Toxoplasmosis
- Trichinellosis

1.7.6.1. Biological Samples and Diagnostic Tests

• In case of doubt regarding biological samples and diagnostic tests related to notifiable diseases, consult:

- Animal Disease Data Sheets – WHO Disease Fact Sheets: https://www.woah.org/en/what-we-do/animal-health-and-welfare/animal-diseases/

-Manual of Diagnostic Tests and Vaccines for Terrestrial Animals: https://www.woah.org/fileadmin/Home/eng/Health_standards/tahm/A_summry.htm

1.7.6.2. Recommendations for Disease Control and Animal Trade

• For recommendations on disease control and trade, consult the WHO Terrestrial Animal Health Code: https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/

1.7.6.3. Animals for research and teaching

• Students and researchers who use laboratory animals, resident animals, and client animals for research purposes must follow all applicable biosafety procedures.

• Approval from the FMV Ethics Committee and the FMV Animal Welfare Agency must be obtained before commencing such activities.

• Teaching and research animals may NOT be housed in patient care and inpatient facilities or in isolation units for pets and equines with contagious diseases.

2. EQUINE HOSPITAL

2.1. General considerations regarding appropriate attire and conduct at the Equine Hospital

The FMV advocates the use of specific professional attire to be worn exclusively within the facilities associated with the Equine Teaching Hospital (HE-EQ), to control the potential dissemination of pathogenic agents to and from the external environment. Accordingly:

- All personnel must wear specific and clean professional attire, as well as footwear appropriate to the functions to be performed and Personal Protective Equipment (PPE).
    a. Students must wear their blue hospital scrubs and steel-toe boots (Poster 1). Scrubs must be washed in hot water after each use.
    b. Clinicians have available on a daily basis work clothing and laboratory coats washed on the FMV premises.
    c. Nurses have available on a daily basis work clothing and laboratory coats washed on the FMV premises.
    d. Animal handlers and auxiliary staff have available on a daily basis work clothing and laboratory coats washed on the FMV premises.
- Footwear must consist of resiatnt, water-washable boots, preferably with steel toe caps, waterproof and with non-slip soles. The use of lightweight footwear, high-heeled shoes, footwear made of porous and water- and biological-fluid-permeable materials, or flip-flops/slippers is not allowed. Footwear must be clean and free of mud or manure.
- Jewellery or adornments on the hands or arms are not allowed. Watches are permitted, provided they can be disinfected by complete immersion in a disinfectant agent.
- Any equipment that enters and exits the hospital (e.g. a stethoscope) must be disinfected with an alcohol-based disinfectant (e.g. Promanum, available at the door of each stall and throughout the HE-EQ facilities).
- Long hair must be tied back and secured away from the face.
- All horse owners and visitors wishing to access the HE-EQ facilities must be accompanied by a staff member who ensures their compliance with biosafety protocols.
- The HE-EQ includes facilities for animals in Intensive Care, Hospitalisation, Intermediate Care, and Isolation.

Poster 1 details the instructions that HE-EQ students must comply with whenever they have practical classes within the hospital facilities. This poster is displayed at the entrance of the HE-EQ.

Poster 1

Instructions for Students on the Standard Operating Biosafety Procedures in Force at the Equine Teaching Hospital

EQUINE TEACHING HOSPITAL

INSTRUCTIONS FOR STUDENTS

1 – Store your personal belongings in a locker at the Equine Teaching Hospital and secure it with your own padlock.

2 – Tie back long hair.

3 – Proceed to the CHANGING ROOM of the Equine Teaching Hospital. Remove your shoes and place them underneath the wooden benches.

4 – Put on your blue hospital scrubs and wear your steel-toe boots.

5 – Follow the designated entry and exit routes of the Equine Teaching Hospital.

6 – Disinfect your hands upon entering and leaving the Equine Teaching Hospital.

7 – Proceed to the Equine Teaching Hospital and wait for the lecturer, who will assign students to consultation rooms / general hospitalisation areas / diagnostic imaging facilities, etc.

8 – After the class, return to the CHANGING ROOM of the Equine Teaching Hospital, remove your blue hospital scrubs and store them, together with your steel-toe boots, in a clean bag, and put your shoes back on.

9 – Remove your personal belongings from the locker at the Equine Teaching Hospital, store your padlock, and leave the locker open.

10 – If you have any questions, scan the QR code on the poster to access more detailed information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

A - Personal, clean blue hospital scrubs.
B – Personal, clean steel-toe boots.
C – All other PPE, e.g. gloves, are provided by FMV.

2.2. Meals: food and beverages

- The consumption of food and beverages is not allowed within the HE-EQ facilities.
- Food and beverages may only be stored and consumed in areas of the faculty specifically designated for this purpose, namely cafeterias, leisure areas, and designated offices.
- The consumption of food or beverages in the UICB-EQ is strictly prohibited.

2.3. General considerations regarding cleaning and hygiene practices

2.3.1 Detergents and disinfectants approved for use at the HE-EQ

- **For hand asepsis**
  - Promanum
  - Hibiscrub
  - Soap.
- **For disinfection of floors, walls, surfaces, and equipment**
  - Hypochlorite solution
  - Quaternary ammonium compounds
  - Bleach
  - Virkon.

2.3.2 Patient hygiene

- For hygiene reasons and to reduce the risk of infection, it is essential that HE-EQ patients are housed in clean stalls. Animal handlers must prepare the bedding (remove faeces and soiled shavings) and clean the aisles daily.
- If a stall becomes dirty outside the animal handlers' working hours, students, interns, nurses, or clinicians must remove faeces and soiled bedding and add clean bedding material if necessary.
- After a horse is discharged, the stall must be cleaned, washed, and disinfected before another horse is admitted to the same stall.
- In the case of neonatal foals, hygiene is even more critical; therefore, animal handlers, students, and interns must remove faeces and urine whenever they are produced.
- Water buckets and/or automatic drinkers must be cleaned and disinfected between use by different patients.
- Whenever a horse is hospitalised, it must be confirmed that the drinker is clean and functioning properly, and the owner must be asked how water is normally provided to the horse (automatic drinker or bucket). If the horse is accustomed to using a bucket, it must be cleaned and refilled regularly.
- Feed bowls and hay nets must be cleaned regularly throughout the patient's hospitalisation period and must be washed and disinfected between patients.
- Any feed provided that has not been consumed must be removed from the stall prior to the admission of a new patient.
- Aisles within the stables must be kept clean, free of obstacles, and properly organised.
- Medications and medical materials must not be left outside their designated storage areas.
- Soiled bedding material must be removed from the floor.
- Clothing items, backpacks, or personal belongings can not be left on the floor of the stables.
- All members of the clinical staff, students, and employees must assist in cleaning and tidying up the equipment used and the area before leaving it.
- Whenever a horse defecates outside the stall, faeces must be removed immediately and the contaminated area must be cleaned.

- Shovels and brooms must be made available in the different areas where horses circulate.
- If a horse presents with diarrhoea, faecal material must be removed and the floor must be washed and disinfected. If a horse urinates inside a building, e.g. the Intensive Care Unit (ICU), stocks area, X-ray room, or corridors, the urine must be removed and the floor must be washed.

2.3.3 Cleaning and hygiene

Maintaining the facilities clean and adopting appropriate personal hygiene practices are the responsibility of all individuals working at the HE-EQ, including technical staff, clinical staff, and student.

2.3.4 General cleaning and disinfection protocol

Whenever disinfectants are applied, gloves and appropriate protective clothing must be worn. When there is a likelihood of fluid splashing during the disinfection process, additional PPE must be used, e.g. masks, face shields or protective goggles, waterproof garments, etc.

- All bedding material and faeces must be removed prior to stall disinfection. The presence of large amounts of organic matter and urine inactivates most disinfectants. If the use of a hose is necessary to remove persistent debris, measures must be taken to minimise aerosol formation and the potential spread of pathogenic agents.
- The stall, including walls, doors, drinkers, and feed troughs, must be washed with water and detergent or soap. Mechanical action (scrubbing with a brush or broom) may be required to remove films or persistent debris that may prevent or inhibit the action of the disinfectant.
- The washed area must be thoroughly rinsed to completely remove detergent residues. Note: multi-purpose alkaline detergents (RBS) and bleach may be inactivated in the presence of detergents or soap; therefore, careful rinsing prior to disinfectant application is essential.
- Allow the washed area to drain and dry completely to avoid dilution of the disinfectant solutions to be applied.
- A disinfectant, e.g. 2% bleach or Umonium Master, must be applied to all surfaces of the stall, including walls, doors, drinkers, and feed troughs. Manufacturer's instructions must always be followed, as some disinfectants must remain in contact with surfaces for at least 15 minutes, particularly when a contagious agent is suspected.
- Bleach must be completely rinsed off surfaces before the stall is used for the hospitalisation of a new patient.
- After disinfection, protective equipment must be removed and hands must be washed.
- Extraordinary disinfection measures, e.g. in horses with Class 3 and 4 diseases, must be carried out only by trained and authorised personnel equipped with appropriate PPE.
- All areas of the HE-EQ where horses are examined or treated, e.g. stocks area, X-ray room, and ICU treatment area, must be cleaned, tidied, and disinfected after use, regardless of the infectious risk category associated with the animal. Cleaning equipment must also be disinfected, including broom and shovel handles.

2.3.5 Footbaths

- Footbath solutions (Virkon) must be replaced daily by interns during the morning period.
- Footbaths must be cleaned and the solution renewed whenever excessive accumulation of bedding material or dirt is observed. This task must be carried out by any member of the HE-EQ team working in the area where the footbath is located.
- All HE-EQ staff and students must use the footbaths available within the facilities. NOTE: Footbath solutions may damage footwear, particularly if it is not waterproof.

2.3.6 Instrument and equipment disinfection protocol

• All instruments and equipment, such as nasogastric tubes, dental rasps, mouth gags, muzzles, twitch devices, endoscopes, brushes, clippers, and clipper blades, must be cleaned and disinfected between use on different patients.

• Materials that are sterilised between uses (surgical instruments and equipment) must be cleaned and washed with soap and disinfected with a 0.5% chlorhexidine solution immediately after use.

Autoclave sterilisation protocol for surgical instruments

• **Initial cleaning of instruments**

- Before sterilisation, all instruments must be carefully cleaned to remove organic matter (blood, tissues, secretions) and inorganic residues:

Initial immersion: place the instruments, immediately after use, in a container with enzymatic detergent or an appropriate neutral solution;

Manual brushing: carefully brush all surfaces, hinges, and grooves with a soft brush under running water;

Ultrasonic cleaning (optional): place instruments in an ultrasonic bath with cleaning solution for 10–15 minutes;

Final washing: in a dishwasher located in the instrument room or manually;

Drying: dry instruments completely using a clean cloth or compressed air. Wet instruments must not be sterilised.

• **Inspection and preparation**

- Visually inspect all instruments for remaining debris, corrosion, mechanical defects, or wear.
- Lubricate joints with an appropriate surgical lubricant (water-based and autoclavable).
- Group instruments by type or surgical procedure, avoiding overlap of blades or tips.

• **Packaging**

- Use self-sealing surgical-grade paper or perforated sterilisation containers with internal and external chemical indicators to package the material.
- Avoid overly tight packaging and allow steam circulation.
- Include an internal chemical indicator (strip or label) and an external indicator (on the package) to monitor sterilisation effectiveness.

• **Autoclave loading**

- Arrange packages in the chamber to allow free steam circulation.
- Ensure that the autoclave drain valves are clean.
- *Do not mix instruments with fabrics, gauze, or liquids*.

• **Sterilisation parameters**

  ○ **Cycle for plastic materials:**

- Temperature: 121 °C
- Pressure: ~1 bar (15 psi)
- Exposure time: 30 minutes.

  ○ **Pre-vacuum cycle (recommended):**

- Temperature: 134 °C
- Pressure: ~2 bar (30 psi)
- Exposure time: 3–5 minutes.

Attention*: Always verify the recommendations of the autoclave in use.*

• **Drying**

- Use the autoclave drying cycle (15–30 minutes).
- Never remove packages while still damp. Allow them to cool completely before handling.

• **Storage**

- Store sterilised packages in a clean, dry, closed, and well-ventilated cabinet.

- Label materials with the sterilisation date and expiry date (generally 30 days in sealed packaging).

• **Record keeping and monitoring**

- Maintain records of each sterilisation cycle (date, type of material, temperature, time, indicator results).
- Validate sterilisation effectiveness weekly using **biological indicators**.

Stethoscopes

• Must be cleaned with damp paper and disinfected with an alcohol-based solution (Promanum).
• The use of personal stethoscopes is permitted for patients with low to moderate infectious risk; these must be cleaned and disinfected regularly, including at the beginning and end of the working period.
• In the UICB-EQ, one stethoscope is assigned to each hospitalised animal. These stethoscopes remain allocated to the animal until discharge, staying in the stall during this period, and must be cleaned and disinfected before being used on another animal.

Thermometers

• Must be cleaned and/or washed with soap to remove faecal matter and subsequently disinfected with alcohol.
• Glass thermometers are not used to eliminate risks associated with broken glass and mercury exposure. Only digital thermometers are used.
• The use of personal thermometers is permitted in patients with low to moderate infectious risk and must be cleaned and disinfected after each use.
• Any visibly soiled thermometer must be cleaned immediately.
• In the UICB-EQ, one thermometer is assigned to each hospitalised animal. These thermometers remain allocated to the animal until discharge, staying in the stall during this period, and must be cleaned and disinfected before being used on another animal.

Hoof picks

• One hoof pick is assigned to each hospitalised horse.
• Hoof picks must be washed weekly with soap to remove dirt and subsequently disinfected.
• Hooves must be cleaned before horses leave the stalls.
• Hoof picks must be cleaned and disinfected immediately after use on horses with bacterial or fungal hoof infections.
• Hoof picks must be cleaned and disinfected at the end of each horse's hospitalisation period before being used on another animal.

Brushes

• One brush is assigned to each hospitalised horse.
• Brushes must be cleaned to remove excessive dirt. Brushes used on horses with external parasites (e.g. mange) must be disinfected with an antiparasitic compound; brushes used on patients with fungal infections must be treated with an antifungal compound (e.g. Imaverol) before being disinfected again with a biocidal compound.
• Brushes must be disinfected by immersion in alcohol or in a chlorhexidine solution.
• Horses must be brushed regularly by clinical staff or students.
• In the UICB-EQ, one brush is assigned to each hospitalised animal in this unit. These brushes remain allocated to the animal until discharge, staying in the stall during this period, and must be cleaned and disinfected before being used on another animal.

Twitch devices

- Twitch devices must be washed with soap to remove coarse dirt.
- Twitch devices must be disinfected weekly by immersion in a chlorhexidine solution.
- Twitch devices used on high infectious-risk patients must be cleaned and disinfected immediately.

Other instruments

- Other instruments, such as haemostatic forceps or scissors, may be used on different patients, but must be cleaned and disinfected with an alcohol-based solution (Promanum) between patients.

2.3.7 Cleaning and disinfection protocols for HE-EQ facilities

2.3.7.1 External horse admission area, external area surrounding the stables, and trailer parking area

- These areas must be cleaned daily by animal handlers and the HE-EQ maintenance team using shovels and brooms.

2.3.7.2 Hospital lobby, outpatient horse stalls, and stocks area

2.3.7.2.1 Lobby

- The lobby must be cleaned, washed with detergent, and disinfected weekly, or whenever it is visibly dirty.
- This cleaning must be carried out by the maintenance team or, if necessary, by other members of the HE-EQ team.

2.3.7.2.2 Outpatient horse stalls

- These stalls must be completely cleaned, washed, and disinfected between horses, in accordance with the general cleaning and disinfection protocol (see 2.3.4).
- Reduced quantities of shavings must be used for bedding in these stalls in order to minimise waste.
- Buckets and feed bowls used in these stalls must be cleaned, washed, and disinfected between patients, in accordance with the general cleaning and disinfection protocol (see 2.3.4).

2.3.7.2.3 Stocks area

- The stocks area must be cleaned and washed by the clinical staff after each use, in accordance with the general cleaning and disinfection protocol.
- Cleaning of the stocks area must be performed by the respective users immediately after completion of medical procedures.
- The stocks area must be washed and disinfected weekly by the HE-EQ cleaning and maintenance team, or whenever necessary.
- The container intended for faeces collection in the stocks area must be emptied at least every two days by the HE-EQ cleaning and maintenance team. After emptying, the container must be washed with water and detergent.

2.3.7.3 Cleaning of stalls in the Equine Hospital

- Disinfectants must be applied at the dilutions recommended by the manufacturer, ensuring optimal disinfectant action and not promoting the dissemination of resistant strains.
- To ensure effectiveness, disinfectants must be applied to clean surfaces.
- During stall cleaning, measures must be adopted to avoid contamination of equipment or other areas, e.g. when cleaning bedding, avoid contaminating floors outside the stalls with manure.

Cleaning procedures for stalls housing hospitalised horses

- Bedding must be cleaned daily by animal handlers. New bedding must be added whenever necessary.
- Appropriate protective clothing and/or equipment must be used when carrying out these procedures, e.g. in the case of equids housed in Intermediate Care.
- Faeces and shavings removed from the HE-EQ must be discarded in the daily collection containers. Faeces and bedding shavings from the ICU, inpatient stalls, outpatient stalls, and the faeces collection container in the stocks area may be discarded in the general waste container.
- Debris removed from UICB-EQ stalls must be placed in biobox bags and disposed of in the specific container for incineration.
- During stall cleaning, any contact between horses and the lift bucket used for the collection of faeces and soiled bedding must be avoided.
- Equipment used for bedding cleaning in ICU stalls, inpatient stalls, and outpatient stalls must be cleaned, washed, and disinfected weekly, or whenever visibly dirty (particularly handles). Equipment used for bedding cleaning in UICB-EQ and Intermediate Care stalls must be cleaned, washed, and disinfected after each use.
- Heavy equipment or materials used in ruminant facilities must not be used in HE-EQ facilities and vice versa.
- The central corridor of the ICU must be washed and disinfected at least daily.
- The central corridor of the Inpatient Unit must be washed and disinfected at least weekly.
- All stable corridors and areas surrounding the stables must be cleaned, washed, and disinfected whenever contaminated with diarrhoeic faeces, wound secretions, nasal discharge, blood, or other secretions. This cleaning is the responsibility of all members of the clinical staff, who may contact the HE-EQ cleaning and maintenance team if necessary.

General procedure for cleaning a stall after discharge of a hospitalised horse

- Stalls must be cleaned, washed, and disinfected as soon as possible after being vacated, e.g. following medical discharge or euthanasia.
- In the case of the UICB-EQ, the stall must be marked with a red card bearing the message "Disinfect", which may only be removed after authorisation by the clinician responsible for the case, so that the clinician has the opportunity to assess the need for collection and analysis of environmental samples for relevant infectious agents, e.g. *Salmonella* spp. If the hospitalised patient is suspected or confirmed to be carrying a specific pathogen, the following disinfection protocols must be applied:

- See the general cleaning and disinfection protocol in section 2.3.4.
- Routine disinfection protocol: 2% bleach.
- Foals with *Rhodococcus equi* infection: the stall must be washed with detergent and subsequently disinfected with RBS, Foglyam, or a quaternary ammonium compound.
- Horses with parasitic skin diseases: the stall must be washed with detergent and subsequently disinfected with Sarnacuran (active ingredient: phoxim) and bleach.
- Foals with rotavirus diarrhoea: the stall must be washed with detergent and subsequently disinfected with a quaternary ammonium compound and bleach.

- Removal of bedding material and washing and disinfection of UICB-EQ stalls must be carried out by animal handlers as soon as possible, preferably after cleaning stalls occupied by horses without infectious disease.
- Admission of horses to UICB-EQ stalls is not permitted without authorisation from the clinician responsible for the case and removal of the red "Disinfect" card.
- Bedding from stalls occupied by horses with low infectious risk, e.g. ICU, Inpatient Unit, and outpatient stalls, must be completely removed and the stall area must be washed with detergent and disinfected with bleach after use by each patient.

Weekly routines

- The floors of the ICU hay/concentrate feed room, the equipment storage area used in the Inpatient Unit, and the equipment storage area located near the outpatient stalls must be cleaned weekly and disinfected prior to the receipt of new deliveries of concentrate feed.
- Washbasins in the ICU and the stocks area must be washed and disinfected at least weekly by nurses or by the HE-EQ cleaning and maintenance team.

Monthly routines

- Areas that are difficult to access, e.g. high walls and stable windows, must be cleaned monthly by the HE-EQ cleaning and maintenance team to prevent dust accumulation.
- Walls that are dirty or affected by mould must be washed and disinfected monthly with bleach by the HE-EQ cleaning and maintenance team.

Biannual routines

- Stable windows and walls must be washed and disinfected twice a year by the HEEQ cleaning and maintenance team, specifically at the beginning of May and at the beginning of September, to allow adequate drying of the walls.

2.4. Rules for the Admission and Management of Patients

2.4.1. Outpatients (patients admitted for consultation, not hospitalised)

- Upon arrival, the client must report to reception and complete the check-in process before unloading the horse.
- After check-in, a preliminary physical examination must be performed by a member of the clinical staff to determine the infectious risk category assigned to the animal.
- According to the assigned risk category, clinical history, and the circumstances of the case, the horse may be directed to:

- One of the outpatient stalls located in the atrium;
- The stocks room;
- The X-ray room.

- In exceptional situations, if there is no availability in the designated outpatient areas, the patient may be temporarily housed in one of the hospitalisation stalls.
- If the clinical staff considers that the horse presents a high infectious risk that prevents admission (e.g. suspicion of strangles without imminent risk to life), the animal may be sent back to its home premises. This decision must be recorded.
- After check-in, the horse's passport must be requested from the client and kept at the reception desk for the entire period of hospital stay.

2.4.2. Hospitalised patients

- Upon arrival, the client must report to reception and complete the check-in process before unloading the horse.
- After check-in, a preliminary physical examination must be carried out by a member of the clinical staff to determine the animal's infectious risk category.
- According to the assigned risk category, clinical history, and the circumstances of the case, the horse may be directed to:

- The stocks room;
- Sala de raio-X;
- The Intensive Care Unit (ICU);

- The Hospitalisation Unit (UICB-EQ).

• If, during the clinical evaluation, an unexpected high infectious risk is identified that prevents safe hospitalisation, the clinical staff may decide to return the horse to its home premises. This decision must be justified and recorded.

• After check-in, the horse's passport must be requested from the client and kept at the reception desk throughout the entire hospitalisation period.

2.4.2.1 Stall allocation

• The allocation of animals to stalls is the responsibility of the clinical staff and grooms. Students must confirm with the responsible clinician or the grooms which stall has been assigned to each newly admitted patient.

Stalls for outpatients

• These stalls must be used exclusively for outpatients, during the waiting period for consultation or medical procedures, or while recovering from sedation prior to discharge.

Stalls for patients in Risk Classes 1 and 2

• Patients to be directed to the ICU:

- Horses diagnosed with medical colic and horses in the postoperative period following colic surgery;
- Horses with laminitis;
- Neonatal foals requiring intensive care;
- Patients with non-infectious medical conditions requiring continuous care and fluid therapy, and without infections caused by multidrug-resistant bacteria.

• Patients to be directed to the Hospitalisation Unit:

- Patients undergoing elective orthopaedic or ophthalmological surgeries;
- Patients with non-infectious medical conditions (e.g. equine asthma, neoplasia);
- Patients under perinatal monitoring.

Patients to be directed to the Hospitalisation Unit with sanitary filtering:

- Horses with suspected or confirmed contagious or zoonotic diseases;
- Horses with bacterial infections caused by multidrug-resistant bacteria (e.g. *Klebsiella pneumoniae*, *Escherichia coli*, MRSA) may, exceptionally and upon indication of the responsible clinician, be housed in the Hospitalisation Unit instead of the UICB-EQ when the latter is fully occupied;
- These animals should be housed, whenever possible, in the stalls located at the northern end of the Hospitalisation Unit (large stalls). The movement of animals and people in this area must be restricted using physical barriers, isolating stalls in pairs by blocking the adjacent corridor.

• Patients to be directed to the UICB-EQ:

- Horses with suspected high infectious risk or with a confirmed diagnosis of an infectious or zoonotic disease caused by a high-risk infectious agent.

2.4.2.2 Medical records and medication

• Daily physical examination and medication administration sheets must be available on the clipboard affixed to the door of each stall. Once duly completed, these sheets must be filed by the reception desk in the individual drawer corresponding to each horse. Each sheet must include the main differential diagnosis.

• Medication and other medical materials used for each patient must be stored in the pharmacies of the respective clinical units:

- ICU pharmacy;
- Stocks room pharmacy;
- Hospitalisation Unit cabinets;

- UICB-EQ pharmacy.
- All medication or equipment assigned to a horse must be clearly labelled with the animal's name and stored in an individual box in the pharmacy of the unit where the animal is hospitalised (e.g. ICU, Hospitalisation Unit, or UICB-EQ).
- Medical records must be transcribed into digital format (QVET or another electronic platform) at the end of each day. This task is the responsibility of the interns.

2.4.2.3 Feeding and water

- All concentrated feeds and/or other supplements, including those provided by owners, must be stored in containers with lids.
- Only a limited quantity of hay, concentrated feed, and bedding material should be stored at the HE-EQ to avoid contamination and the attraction of pests (e.g. rodents and birds).
- The floor of the hay and feeding room for ICU patients, as well as the feed and equipment storage areas for outpatient stalls, must be cleaned and disinfected before any restocking (see General Cleaning and Disinfection Protocol – Section 2.3.4).
- The feeding schedule and type of diet assigned to each horse must be clearly displayed, legible, and kept up to date on the door of the respective stall.
- For further information on the cleaning of waterers, buckets, feed bowls, and hay nets, consult Section 2.3.2 on patient hygiene.

2.4.2.4 Bedding

- Outside working hours, the preparation of bedding in stalls, as well as the provision of feed and water to newly admitted patients, is the responsibility of students, interns, or members of the clinical staff. During working hours, these tasks are performed by the grooms.
- Occupied stalls, including those of Class 3 (Intermediate Care) and Class 4 (UICB-EQ), must be cleaned daily by the grooms, with the addition of bedding material (shavings or straw). If a stall becomes particularly dirty or wet during the day, responsibility for cleaning and replenishing bedding is shared between students, grooms, and clinical staff.

2.4.2.5 Medical discharge

- Prior to discharge, clients must be informed about any infectious risks associated with their horse upon returning home, as well as the recommended control measures to minimise the risk of transmission to people and other animals.
- Grooms must be notified in advance of the expected discharge of patients to avoid unnecessary use of time and materials in cleaning stalls that will be vacated.
- At the time of discharge, all medical records must be collected at reception and archived according to internal procedures.
- Stalls used by horses in Classes 1 and 2 (low infectious risk) must be cleaned, washed, and disinfected in accordance with the General Cleaning and Disinfection Protocol (see Section 2.3.4).
- Stalls used by horses in Intermediate Care (Class 3) or Isolation (Class 4) must be marked with a red card labelled "Disinfect". These stalls may only be reused after complete disinfection and express authorisation from the clinician responsible for the previously hospitalised patient.
- Students, nurses, and members of the clinical staff are responsible for ensuring the cleaning, organisation, and/or disinfection of all objects and materials in the area surrounding the stalls, and must ensure appropriate disposal or hygiene of used items, as applicable.

2.4.2.6 Halters, lead ropes, rugs, and bandages

- Equipment belonging to owners must not be left at the HE-EQ, with the exception of halters.
- All equipment required during the horse's stay at the HE-EQ (e.g. muzzles, rugs, lead ropes) must be provided by the HE-EQ.

• Each horse's individual equipment must be stored near the respective stall whenever not in use.
• In front of each stall, a lidded, washable, and reusable container (e.g. biobox or rigid plastic container) must be placed, with sufficient capacity to store all patient equipment, including, if necessary, a rug. Containers must be easy to clean, resistant to disinfection, and securely closed in order to ensure organisation and prevent cross-contamination.
• All hospital equipment used for each patient must undergo thorough cleaning, washing, and disinfection, preferably by immersion in an appropriate disinfectant solution.

2.4.2.7 Walking and grazing

• Students are authorised to walk horses, provided this is always done in pairs and that one of the pair carries a mobile phone for safety reasons.
• The only horses that may be walked are those:
- have a clinical condition that allows it, according to prior indication from the clinical staff;
- are classified as low infectious risk (Classes 1 and 2).
• Horses in Intermediate Care (Class 3) must not be walked and may only leave the stall for essential medical procedures.
• It is strictly forbidden to walk horses hospitalised in Isolation (Class 4), except if the risk level is reviewed and reclassified to Class 3 or lower following clinical evaluation.
• Horses must always be handled by experienced personnel familiar with equine management.
• Horses may be walked in the following areas:
- Area surrounding the ICU;
- Exterior of the admission atrium;
- Exterior of the Hospitalisation Unit;
- Peripheral area of the paddock with green pasture.
• Horses may only graze in the paddock specifically designated for this purpose, located near the entrance of the HE-EQ.
• If a horse defecates or releases secretions during walking, these must be cleaned and disinfected as soon as possible.

2.4.3. *Salmonella* spp. surveillance protocol.

• Stalls that have housed horses with positive faecal culture results for *Salmonella* spp. must undergo two complete rounds of cleaning and disinfection, in accordance with the General Cleaning and Disinfection Protocol (see Section 2.3.4), with a minimum interval of 24 hours between each round.
• After the second disinfection, environmental cultures for *Salmonella* spp. must be performed, sampling the stall drain and the interior door handle of the respective unit. The stall may only be reused for hospitalisation after negative results are obtained from these cultures.
• An updated record must be maintained at the HE-EQ reception desk identifying animals hospitalised in Isolation and the history of environmental culture results associated with post-*Salmonella* disinfection.
• The results of environmental cultures performed as part of post-*Salmonella* surveillance must be communicated biannually to the CHB (by email to: biosseguranca@fmv.ulisboa.pt).

2.4.4. Routine environmental surveillance for *Salmonella* spp.

• Routine environmental surveillance cultures must be carried out every 6 months by sampling smooth floors, door and cabinet handles, taps, and light switches in the following HE-EQ areas:
- X-ray room;
- Outpatient stalls;

- Surgery and recovery room;
- Hospitalisation Unit.

• Surveillance must be more frequent in the ICU and the UICB-EQ, with sampling carried out every 3 months.
• A detailed record of sampled locations and corresponding laboratory results must be kept at the HE-EQ reception desk.
• The results of routine environmental cultures must be reported biannually to the CHB (by email to: biosseguranca@fmv.ulisboa.pt).

2.5. Management of Patients with Suspected Infectious Disease

• Strict precautions must be applied during the assessment, hospitalisation, and treatment of patients suspected or confirmed to be carriers of contagious pathogenic agents. Due to the increased risk of nosocomial infections, animals with acute gastrointestinal disease (e.g. diarrhoea), acute respiratory infections, acute neurological disease, abortions, or infections caused by multidrug-resistant bacteria are of particular concern.
• High-risk patients (Class 4) must be admitted exclusively to the UICB-EQ and should be discharged as soon as possible. Initial assessment must be carried out in the UICB-EQ stall designated for this purpose, followed by direct admission to a UICB-EQ stall.
• During contact with Class 4 patients, clinical staff must wear the PPE available in the UICB-EQ.
• When patients with moderate infectious risk are hospitalised in the ICU or in a dedicated area of the Hospitalisation Unit, prophylactic/barrier containment measures (Intermediate Care) must be implemented. These measures include:
- Installation of functional footbaths at the entrance of each stall;
- Physical delimitation of the intermediate care stall area using barriers and an additional footbath at the exit;
- Avoidance, whenever possible, of hospitalising horses in adjacent stalls (opposite/side).
• In cases of detection of multidrug-resistant bacteria, mandatory registration must be made at the HE-EQ administrative office, including the animal's name, sample origin, and laboratory culture result, which must be immediately communicated to the CHB (email: biosseguranca@fmv.ulisboa.pt).
• All HE-EQ cases involving multidrug-resistant bacteria must be reported biannually to the CHB (email: biosseguranca@fmv.ulisboa.pt).

2.5.1. Classification of Patients with Suspected or Diagnosed Infectious Disease

• Infectious diseases diagnosed in hospitalised animals must be classified according to their transmissibility and zoonotic potential, and assigned to one of the following infectious risk categories (Classes 1–4).

Class 1: Standard Stabling – green

• Includes non-infectious diseases or infectious diseases caused by pathogens that are not transmissible to other animals and have no zoonotic potential.
• The following criteria must be met: absence of fever and respiratory signs at admission, and no compatible clinical history within the previous two weeks.
• Includes the following conditions:
- Patients with trauma or wounds;
- Pre- or post-operative patients;
- Patients with colic without contagious complications;
- Patients with ophthalmic disease;
- Neonates without contagious disease;

- Other conditions of similar risk.

Class 2: Standard Stabling – green

• Includes infectious diseases caused by pathogens with low transmissibility and bacterial infections caused by antibiotic-susceptible strains.
• Includes the following conditions:
- Patients with infected wounds caused by antibiotic-susceptible bacteria;
- Patients with bacterial pneumonia or pleuropneumonia without suspicion of contagion;
- Patients with corneal ulcers infected by susceptible bacteria;
- Other conditions of similar risk.

Class 3: Intermediate Care – orange

• This class is subdivided into two subclasses:
- Subclass A: animals with infections caused by multidrug-resistant bacteria, confirmed by culture and antimicrobial susceptibility testing (TSA);
- Subclass B: animals with infectious diseases caused by pathogens with moderate transmissibility and/or potential zoonotic risk.
• Whenever possible, Class 3 animals should be hospitalised in stalls located at the north end of the Hospitalisation Unit or in the ICU.
• Indications for intermediate care hospitalisation include:
- Fever and/or leukopenia of unknown origin;
- Viral respiratory disease with recent clinical signs (< 2 weeks): cough, nasal discharge, associated with fever;
- *Rhodococcus equi* infection in foals under 10 months of age with respiratory signs and fever;
- Acute diarrhoea with or without fever and/or leukopenia;
- Non-surgical digestive disease with haemorrhagic or non-haemorrhagic reflux associated with fever and/or leukopenia;
- Infections caused by MRSA or other multidrug-resistant bacteria;
- Contagious dermatological infections, including:
○ Dermatophytosis;
○ Dermatophilosis (*Dermatophilus congolensis*);
○ Chorioptic mange;
○ Pediculosis;
○ Other transmissible cutaneous parasitoses.

Class 4- Isolation – Red

• Includes infectious diseases caused by highly contagious pathogens and/or those with high zoonotic potential.
• Class 4 patients must be hospitalised exclusively in the UICB-EQ.
• Exceptionally, when the Isolation Unit is at full capacity, patients may be housed in the north end of the Hospitalisation Unit, provided that the area is physically isolated and equivalent protocols to those applied in the UICB-EQ are implemented (use of PPE, strict cleaning and disinfection routines for the area and equipment).
• Indications for Class 4 hospitalisation include:
- Strangles (strong suspicion or confirmed case): submandibular lymphadenopathy, nasal discharge, cough, fever, or suspected guttural pouch empyema/chondroids;
- Salmonellosis: acute diarrhoea associated with leukopenia and/or fever;
- Acute, rapidly progressive neurological disease, or acute neurological disease with fever (e.g. suspected EHV-1 encephalomyelitis);
- Abortion between 150 and 300 days of gestation;

- Perinatal death (>300 days of gestation) not attributable to dystocia, premature placental separation, congenital anomaly, or twin pregnancy;
- Notifiable zoonotic diseases, e.g. Rabies, Glanders (*Burkholderia mallei*), Brucellosis, Anthrax, and Tuberculosis caused by *Mycobacterium bovis* or *M. tuberculosis*.

• Horses that have had direct or indirect contact with an animal suspected or diagnosed with an infectious disease must be considered potentially contagious until laboratory testing excludes the diagnosis or the maximum incubation period has elapsed without clinical signs.

• It must be considered that some horses may be asymptomatic carriers and continue to shed pathogens in the absence of clinical signs (e.g. *Streptococcus equi* subsp. *equi*, *Salmonella* spp.).

2.5.2 Exclusion Criteria for Admission and/or Hospitalisation

• Notifiable animal diseases in Portugal must be reported to DGAV, in accordance with national legislation.

• When the risk of pathogen transmission to other patients or people outweighs the health risk to the animal itself, admission or hospitalisation may be refused. This decision lies exclusively with the clinical staff and cannot be made by interns.

• Refusal criteria include, but are not limited to:

- Suspected viral respiratory infection (cough, nasal discharge, fever within the previous 2 weeks) without life-threatening risk;
- Suspected strangles (submandibular lymphadenopathy, nasal discharge, cough, fever), suspected guttural pouch empyema and/or presence of chondroids without surgical indication or imminent life-threatening risk;
- Suspected neurological form of EHV-1 (acute ataxia with fever or recent history of fever or contact with confirmed/suspected cases), without life-threatening risk;
- Abortion without life-threatening risk to the mare. In these cases, placenta and fetus should, whenever possible, be submitted for pathological examination.

2.5.3 Communication Requirements for Intermediate Care, ICU Isolation, and Hospitalisation

• All stalls housing Class 3 (Intermediate Care) or, exceptionally, Class 4 (Isolation) animals must be clearly marked with an **orange** card “Intermediate Care” or a **red** card “Isolation”.

• Signage must be placed visibly on the stall door and removed only after complete disinfection and explicit authorisation from the responsible clinician.

• All clinical staff and students involved in hospital activities must be immediately informed of the infectious classification of hospitalised patients.

• Animal handlers, cleaning staff, and maintenance teams must also be informed of the risk level associated with each patient and reminded of mandatory precautions.

2.5.4 Handling and Treatment Rules for Patients with Suspected or Diagnosed Infectious Disease

• Strict compliance with hygiene rules, correct use of PPE, and adherence to UICB-EQ regulations is essential for effective control of contagious pathogens.

• Hands must be washed with soap and water and disinfected with an alcohol-based solution (Promanum) before and after examining each patient.

• Any surface or equipment contaminated with faeces, secretions, blood, or other biological fluids must be immediately cleaned and disinfected by the clinical staff or students responsible for the patient.

• Contamination of objects and surfaces with dirty hands, gloves, or boots must be avoided.

• All footbaths must be used obligatorily, respecting the correct entry/exit sequence.

- Environmental hygiene is the responsibility of all professionals and students working in the UICB-EQ or intermediate care areas, and all must participate in general cleaning and maintenance.
- In the UICB-EQ, contamination of anterooms with straw or manure must be strictly avoided.
- Students and interns responsible for Class 3 and 4 patients must ensure daily cleaning and organisation of the anteroom, including cleaning and disinfection of counters, door handles, replacement of footbaths as needed, and verification/restocking of disinfectant materials. A HE-EQ staff member must perform a daily inspection of cleanliness and replace missing materials.
- Consumption of food is prohibited in all HE-EQ areas, including the UICB-EQ, due to zoonotic risk.
- When working in the UICB-EQ, anterooms, and isolation stalls, the use of clean examination gloves at all times is mandatory, with compulsory glove changes between patients.

2.5.5 Access Control Rules for Intermediate Care Areas and the Isolation Unit (UICB-EQ)

- Access to the UICB-EQ and to intermediate care areas must be strictly limited to situations that are absolutely necessary.
- Entry into stalls should only occur when direct contact with the patient is indispensable. Clinicians may, exceptionally and for pedagogical purposes, authorise student entry; such access must be kept to the minimum necessary and carried out in full compliance with personal protective equipment (PPE) and biosafety measures.
- Only clinicians, students, nurses, and cleaning staff specifically assigned to the care of isolation patients are authorised to enter the unit.
- Whenever possible, dedicated teams should be assigned exclusively to isolation and intermediate care areas in order to avoid crossover with other hospital sectors (ICU, general hospitalisation, ambulatory care, surgery).
- If it is necessary to provide care in different hospital areas, professionals and students must:

- Strictly follow the movement sequence, attending first to Class 1 and 2 patients and lastly to Class 3 and 4 patients;
- Avoid contact with immunocompromised patients (leucopenic animals, neonates, very young or elderly animals) after interacting with infectious cases;
- Change PPE between areas and strictly comply with hand and footwear hygiene rules;
- The clinician responsible for the case is accountable for ensuring that all appropriate care measures and precautions are fully implemented.

Class 3: Intermediate Care

- The rules concerning protective equipment and safety barriers apply to the entire intermediate care area, not only to individual stalls:

- Mandatory footbaths at the entrance and exit of the isolated area and of each individual stall;
- Hand washing and disinfection upon entry and exit of the isolated area and each individual stall;
- Disposable gown (single use);
- Examination gloves (single use).

- PPE must be stored in washable and disinfectable containers positioned at the entrance of each stall.
- Only direct owners (not friends, farm staff, or referring veterinarians) may visit horses, only under specific circumstances and always under supervision of the responsible clinician. Entry into the stall is not permitted.
- Owners must be informed of the risk of contagion to other animals in their usual environment.
- Owners are not permitted to access other areas of the HE-EQ.

Class 4 - Isolation

- The following measures are mandatory for any person entering the UICB-EQ:

- Change clothes upon entry in the unit's changing rooms, donning a clean burgundy surgical scrub suit;
- Use the external footbath of the anteroom;
- Perform hand washing and disinfection in the anteroom;
- Put, in the anteroom, a water-resistant disposable coverall;
- Put, in the anteroom, examination gloves (single use);
- Wear, in the anteroom, dedicated boots covered with disposable plastic boot covers;
- Put, in the anteroom, a respiratory mask and safety goggles, when indicated.

- Owners are not permitted to enter the UICB-EQ, except in exceptional cases with explicit authorisation from the lead clinician and must always be accompanied by a staff member throughout their stay.

2.5.5.1 Equipment and Materials

- Materials used in isolation areas (Class 4) or intermediate care areas (Class 3) must be cleaned and disinfected locally whenever possible.
- Materials used in the isolation unit (Class 4) must not be transferred to other hospital areas, except in exceptional circumstances in which a strict disinfection protocol can be followed. In such cases, a first on-site disinfection is mandatory, consisting of a 24-hour immersion in Umonium prior to any movement outside the unit.
- Equipment or materials not used or not discarded within the UICB-EQ (e.g. medication vials, intravenous fluids) intended for use in other hospital areas must undergo complete disinfection, including the initial 24-hour Umonium immersion.
- Any material that enters an anteroom (Class 4) or an intermediate care stall (Class 3) must be dedicated exclusively to the corresponding patient and, if not used, must be discarded.
- Introduction of non-essential equipment or materials into isolation or intermediate care areas should be avoided whenever possible.
- Medications that enter an anteroom or intermediate care stall and are not used before the patient's discharge or euthanasia must be discarded (cannot be reused) and charged to the client.
- All medications dispensed for home use must be supplied in appropriate containers with a complete prescription label.
- Additional cleaning products and disinfectants are stored in the UICB-EQ.
- PPE, syringes, needles, and miscellaneous consumables are stored in the UICB-EQ pharmacy and are regularly replenished in the anterooms as needed.

Class 3: Intermediate Care

- Each Class 3 patient must be assigned the following individual-use instruments: thermometer, hoof brush, and hoof pick.
- These instruments are HE-EQ property and are stored during hospitalisation in an individual, identified bag placed in front of the corresponding stall.
- After patient discharge, all equipment must be carefully cleaned and disinfected before storage or reuse.
- Personal stethoscopes belonging to clinicians or students may be used, provided they are rigorously disinfected after each use on Class 3 patients.

Class 4: Isolation

- Each Class 4 patient must be assigned the following individual-use instruments: stethoscope, thermometer, stocks, hoof brush, and hoof pick.
- These instruments are property of the UICB-EQ and are stored during hospitalisation in an individual, identified box located in the corresponding stall anteroom.

• Equipment must remain within the UICB-EQ throughout hospitalisation and be thoroughly cleaned and disinfected after patient discharge.

2.5.6 Entry and Exit Procedures for Staff and Students in Isolation Areas

• Cleaning staff and/or handlers must strictly comply with all institutional policies regarding clothing and PPE use when working in intermediate care (Class 3) or the UICB-EQ (Class 4).
• Frequently touched surfaces, such as door handles and automatic blind cords, must be disinfected regularly.
• When entering a Class 3 stall or Class 4 box, all necessary materials must be taken in a single entry to minimise the number of movements.
• Procedures with higher contamination risk (e.g. contact with mucous membranes, MRSA-infected wounds, rectal temperature measurement, rectal palpation, drainage of *Streptococcus equi* subsp. *equi* abscesses) must be performed last, after other patient care activities.
• Dragging straw, faeces, or other contaminated materials into corridors or anterooms when exiting a Class 3 or Class 4 stall must be avoided. This is particularly important for handlers during waste removal.
• Sharps and biological waste must be disposed of appropriately in designated contaminated waste containers (yellow containers).

Class 3: Intermediate Care

• Sequence of procedures for entry into the intermediate care area:
- Use the footbath located at the entrance;
- Put on a clean disposable gown stored near the patient's stall.
• Sequence of procedures for entry into an intermediate care stall:
- Put on and fasten a clean disposable gown;
- Wash and disinfect hands with an appropriate biocidal agent;
- Put on a new pair of disposable gloves;
- Use the footbath located in front of the stall.
• Anyone handling, examining, or feeding more than one patient in intermediate care stalls must change disposable gowns, replace examination gloves, and thoroughly wash hands with soap and water followed by disinfection with an appropriate biocidal agent.
• Sequence of procedures for exit from an intermediate care stall:
- Use the footbath at the stall entrance;
- Clean and disinfect with Promanum any equipment not exclusively assigned to the patient;
- Wash hands with soap and water followed by disinfection with Promanum;
- Complete clinical documentation and process biological samples only with clean hands and outside the stall.
• Sequence of procedures for exit from the intermediate care area:
- Remove and discard the disposable gown in the appropriate waste container located at the stall entrance;
- Discard examination gloves in the appropriate waste container;
- Use the footbath at the entrance of the intermediate care area.

Class 4: Isolation Unit

• The UICB-EQ door must remain locked, with access restricted to clinical staff and handlers.
• Entry must be limited to the minimum necessary to ensure biosafety.
• Whenever possible, treatment times should be synchronised between cases to minimise entries and exits.
• Clinical procedures in the UICB-EQ must be carried out after procedures on other hospitalised patients, as well as after stall cleaning.

Entry Procedures for the UICB-EQ

- Upon entry, changing clothes and footwear to burgundy surgical scrubs and UICB-EQ-dedicated footwear is mandatory.
- Watches, jewellery, and personal accessories must be removed.
- Mobile phones may only enter the UICB-EQ pharmacy; their entry into anterooms, stalls, and examination rooms is prohibited.
- The UICB-EQ provides surgical scrubs and coveralls in appropriate sizes and quantities for all team members.
- Each changing room has lockers for clean clothing and bags for dirty laundry to mitigate cross-contamination.

UICB-EQ Pharmacy

- Medications and clinical records for each patient must be prepared in advance in the pharmacy before accessing stalls.
- The pharmacy must permanently contain frequently used equipment (glucometer, lactate meter, microcentrifuge, refractometer, I-Stat, ultrasound unit, refrigerator, microwave, freezer or ice machine).
- Adequate PPE stock must be available for systematic replenishment of anteroom supplies.

Entry and Stay in the Anteroom of a UICB-EQ Stall

- Upon entering the anteroom, PPE must be donned, including a disposable isolation gown or white disposable coverall depending on clinical risk. In suspected or confirmed EHV-1 or strangles cases, the white disposable coverall is mandatory.
- Disposable examination gloves and disposable footwear protection must then be donned.
- Each anteroom must be equipped with: a waste container dedicated to the stall, a washable/disinfectable UICB-EQ clock, a sink with antiseptic soap (Hibiscrub, BBraun), examination gloves (S, M, L), disposable gowns/coveralls, and footwear protection. Supplies should be limited to short-term needs to avoid waste.
- Each anteroom must contain a limited supply of syringes, needles, and sampling tubes (EDTA tubes, plain tubes, urine cups), replenished daily.
- After treatment, all disposable materials must be discarded in the anteroom container.
- Prepared medication not used must be discarded locally and not returned to the pharmacy. Unopened vials or fluid bags are exceptions and must be disinfected before return.
- All electronic equipment (e.g. ultrasound, ECG, portable X-ray) must be disinfected before leaving the anteroom.
- Protective barriers (e.g. plastic probe covers) should be used whenever possible.
- Protective equipment for electronic devices is stored in the UICB-EQ pharmacy.

Exit from the Isolation Stall and Anteroom

- Blood, faecal, or other biological samples must be disinfected with Promanum and placed in a clean ziplock bag before leaving the anteroom.
- Feeding equipment, blankets, halters, leads, bandages, or horseshoes must not exit directly to the corridor. They may only leave after cleaning, washing, disinfection, bagging, and direct transport to appropriate areas.
- Clipboards and pens must be non-porous and disinfected before leaving the anteroom.
- Upon exiting the stall to the anteroom, disposable footwear covers must be removed and discarded unless re-entering the same stall. Gloves must be removed and hands washed before handling clean material.

- Upon exiting the anteroom to the main corridor, disposable gowns/coveralls and gloves must be removed and discarded. Hands must be washed with Hibiscrub and the footbath must be used.
- Under no circumstances may PPE be worn from a stall into the main UICB-EQ corridor.
- Footbaths must be cleaned and replenished daily or whenever contaminated with organic matter.

2.5.7 Protocols for Transfer of Horses to Intermediate Care or the UICB-EQ

- Facilities must be fully prepared before admission of any intermediate care or isolation patient.
- Functional footbaths with appropriate disinfectant (e.g. Virkon) must be prepared.
- PPE appropriate to the patient's risk class must be prepared.
- Transfers should minimise contact with other hospitalised equines and involve two people whenever possible:

- One wearing full isolation PPE to prepare the stall and receive the patient;
- One accompanying the horse from its original location.

- Any surface contaminated during transport must be immediately cleaned and disinfected.
- A **red** "Disinfect" marker card must be placed at the entrance of the horse's original location.
- The responsible person must ensure complete organisation and disinfection of the original space before reuse.

Class 3: Intermediate Care

- Personal protective equipment (PPE) must be stored and readily available in the pharmacy of the stocks and the ICU.
- Whenever possible, horses admitted for intermediate care should be directed straight to the Class 3 stall, avoiding contact with other areas of the HE-EQ, people, or other horses.

Class 4: Equine Hospital Isolation Unit

- The specific PPE for the anterooms of the UICB-EQ (e.g., disposable coveralls or gowns, gloves, and footwear protection) are available in the unit's storage room.
- Whenever possible, horses that need to be isolated should be transported directly to the UICB-EQ, preferably using the transport provided by the owners themselves.

2.5.8. Cleaning of Stalls and Feeding of Horses in Intermediate Care (Class 3) and Isolation (Class 4)

2.5.8.1. Stall Cleaning

- Handlers must clean bedding daily and walls whenever contaminated with diarrhoeic faeces, blood, or other secretions.
- Footbaths must be changed daily in the morning by handlers and additionally throughout the day as needed.
- Feeding may be performed by clinical staff or students as required.
- Students and interns responsible for a case must clean the area in front of their patient's stall whenever necessary.

Class 3 – Intermediate Care

- Each stall must have dedicated cleaning tools (minimum: pitchfork, broom, shovel), stored in front of the stall.
- Bedding must be cleaned daily, preferably in the morning.

Class 4 – Isolation

- Each stall must have dedicated cleaning tools stored in the anteroom, as well as a hose with pressurised water.
- Bedding must be cleaned daily, preferably at the end of the day.
- Walls must be cleaned immediately when contaminated.
- A lidded waste container dedicated to bedding waste must be placed outside each occupied stall.

2.5.8.2 Feeding of horses in the UICB-EQ

- The preparation of feed for each horse (hay and/or concentrated feed) must be carried out in the hay/feed room by a clinician, nurse, or handler, after putting on the unit-specific clothing and footwear.
- Hay and/or concentrated feed must be pre-packaged individually for each horse in clean plastic bags or in rectal palpation sleeves and taken to the anteroom of the respective stall.
- The preparation of soaked hay or mash must be carried out exclusively in the anteroom of the stall where the horse for which it is intended is housed.
- Any leftover feed (hay or concentrate) that has not been consumed must be discarded at the time of the daily stall cleaning and must not be reused or transferred between horses.

2.5.9 Protocols for the movement of contagious patients from intermediate care or from the UICB-EQ in cases of discharge or need for diagnostic tests or treatment

- Before leaving the stall, the horses' hooves must be properly cleaned.
- Whenever patients are taken to the stocks room, X-ray room, or surgery, the hooves must be washed and scrubbed with a 0.5% chlorhexidine solution, previously prepared in buckets dedicated to the UICB-EQ.
- All team members involved in moving the patient must wear appropriate PPE according to the patient's risk class.
- During patient transport, staff must avoid touching doors, gates, or other surfaces with contaminated gloves. When unavoidable, those surfaces must be disinfected immediately.
- It is the responsibility of the clinical team to ensure that the animal's handlers/owners receive clear information regarding the risks of zoonotic infection or transmission between animals, as well as practical guidance on mitigating these risks during contact with the animal.
- Horses hospitalized in intermediate care (Class 3) or in the UICB-EQ (Class 4) must not be walked or exercised.

Class 3: Intermediate Care

- Patients housed in intermediate care stalls (Class 3) must not move through the hospital corridors, except in strictly necessary situations, e.g., access to surgical rooms.
- When corridor movement is absolutely necessary, those responsible must take strict measures to avoid contact with other patients and people.
- When intermediate care patients are housed in the Hospitalization Unit, exit must be through the North gate, avoiding crossing the entire sector and contact with other hospital areas.
- Diagnostic or therapeutic procedures to be performed outside the stall, e.g., in stocks, X-ray, or the surgical suite, should preferably be scheduled for the end of the day.
- After these procedures are performed, all potentially contaminated surfaces and floors must be immediately cleaned and disinfected to reduce the risk of nosocomial transmission.

Class 4: Equine Hospital Isolation Unit (UICB-EQ)

- All diagnostic and therapeutic procedures must be performed within the unit, unless it is absolutely necessary to carry them out elsewhere.

• If a surgical intervention is required, it will be performed in the UICB-EQ (Class 4) whenever possible or, exceptionally, in the HE-EQ operating theatre.
• Procedures for removing a horse from the UICB-EQ:
- The patient must be groomed and cleaned in the stall before leaving, by the responsible person, with special attention to removing feces and bodily excretions/secretions;
- Before leaving the stall, the animal's coat must be carefully cleaned from head to tail using a cloth soaked in chlorhexidine solution, and the hooves must be washed and scrubbed with a 0.5% chlorhexidine solution, previously prepared in buckets dedicated to the unit;
- The person responsible for moving the patient must wear all PPE appropriate to the associated biological risk;
- During transport, contact of contaminated gloves or hands with surfaces such as doors, gates, or handrails must be avoided;
- All surfaces and floors contaminated with feces, urine, or other bodily fluids during transport must be cleaned and disinfected immediately;
- The floor of all indoor areas of the HE-EQ traversed by the horse must be sprayed with a surface disinfectant solution immediately after its passage.

Surgery
• Whenever possible, surgeries for patients coming from the UICB-EQ should be scheduled for the end of the day.
• Throughout the surgical procedure, all persons present in the operating theatre must wear appropriate PPE.
• Return to the UICB-EQ after surgery:
- Before leaving the anesthesia recovery box, the patient's hooves must be washed and carefully scrubbed with a 0.5% chlorhexidine solution, previously prepared in buckets dedicated to the isolation unit;
- The person responsible for transporting the patient must wear full appropriate PPE.
- During the return journey, all persons involved must avoid contaminating doors, gates, handles, and other surfaces with contaminated gloves or hands;
- Surfaces and floors contaminated with organic fluids or feces during patient transport must be cleaned and disinfected immediately;
- The floor of all indoor areas of the HE-EQ traversed by the horse must be sprayed with a surface disinfectant solution immediately after its passage;
• After the procedure, both the anesthesia recovery box and the operating theatre must be considered contaminated areas. Their cleaning and disinfection must be complete and rigorous before any further use;
• It is expressly forbidden to perform any new surgical procedure in these areas before their decontamination.

Poster 2 summarises the instructions that HE-EQ students must comply with whenever they have practical surgical classes. This poster is displayed at the entrance to the HE-EQ surgery suite.

Poster 2

Instructions for Students on the Standard Operating Biosafety Procedures in Force at the Equine Teaching Hospital Surgery Centre

EQUINE TEACHING HOSPITAL – SURGERY CENTRE

INSTRUCTIONS FOR STUDENTS

1 - Store your personal belongings in a locker at the Equine Teaching Hospital and secure it with your own padlock.

2 - Long hair must be tied back and secured.

3 - Proceed to the Equine Teaching Hospital changing room carrying a bag containing your blue hospital scrubs and your hospital clogs. Remove your shoes and place them under the wooden benches.

4 - Put on your blue hospital scrubs and your hospital clogs.

5 - Follow the designated entry and exit circuits of the Surgery Suite.

6 - Disinfect your hands upon entry to and exit from the Surgery Suite.

7 - Proceed to the Surgery Suite and wait for authorisation from the supervising clinician before entering.

8 - After the class, return to the Equine Teaching Hospital changing room, remove your blue hospital scrubs and store them together with your hospital clogs in a clean bag. Put on your shoes.

9 - Remove your belongings from the locker, store your padlock, and leave the locker open.

10 - If you have any questions, scan the QR Code on the poster to access more detailed information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

A - Blue hospital scrubs, personal, clean.
B - Hospital clogs, personal, clean.
C - All other PPE, e.g. gloves, are provided by FMV.

2.5.10. Protocol for Performing Diagnostic Tests and Surgical Treatments in Patients with Suspected Infectious Disease

- Performing diagnostic tests for the isolation and identification of pathogenic agents (including zoonotic agents) is essential for the appropriate clinical management of infected patients. These tests provide direct benefits to patients and owners by enabling effective management of other animals and protection of the household. They also contribute to the safety of the HE-EQ team and patients by enabling adequate risk management.
- Diagnostic testing of hospitalised patients is strongly recommended whenever infection with a contagious or zoonotic pathogen is suspected. Diagnostic testing is an essential part of case management and will therefore be charged to the client.

- The Clinical Director or a veterinarian with delegated authority responsible for the patient must ensure that appropriate samples are collected and submitted for analysis, and that adequate biosafety precautions are implemented during patient handling.
- The CHB Coordinator must be notified as soon as possible whenever a hospitalised patient has, or is suspected of having, a Class 3 or Class 4 infectious disease (biosseguranca@fmv.ulisboa.pt). For this purpose, a Class 4 occupancy log is available through the HE-EQ administrative office, where the suspected or confirmed disease must be duly recorded for each patient.
- Whenever possible, diagnostic, surgical, or other procedures should be carried out in the facilities where high-risk patients are housed, avoiding transfer to common areas.
- All procedures required for patients isolated in the UICB-EQ (Class 4) must be performed in the unit's treatment room, unless it is not feasible to perform them in the stall itself.
- During all diagnostic or therapeutic procedures, all team members and students must strictly comply with UICB-EQ biosafety rules.
- If the patient requires examinations or treatments that can only be performed in the main hospital facilities (e.g. computed tomography, magnetic resonance imaging, or surgery), these procedures should be scheduled for the end of the day whenever possible.
- The responsible clinician must report the suspected infectious agent and indicate the containment measures to be implemented, including cleaning and disinfection after procedures.
- In general, all isolation precautions applicable to the patient's stall must be applied whenever the patient is handled.
- Instruments, equipment, and the environment must be thoroughly cleaned and disinfected after each procedure, regardless of where it was performed.
- The responsible clinician must ensure that all team members involved in procedures are fully informed about the confirmed or suspected pathogen and the specific precautions to be taken, including correct PPE use and isolation procedures.
- In patients with diarrhoea, one person must lead the animal while another accompanies it to collect any faecal material and immediately clean and disinfect contaminated areas.
- The responsible clinician is also accountable for ensuring that the environment and equipment are properly cleaned and disinfected after procedures, including anaesthetic induction areas, the operating theatre, the recovery box, and any other involved areas

2.5.11. Ultrasound, Endoscopy, Radiography, and ECG in Intermediate Care (Class 3) and UICB-EQ (Class 4) Patients

- ECG examinations must be performed using the Televet system. The device and electrode cables may be taken into the anteroom and the designated procedure box of the UICB-EQ. However, the transport case, disposable electrode packaging, and protective pouch must remain in the unit pharmacy (Class 4) or outside the intermediate care area (Class 3 in Hospitalisation or ICU).
- After ECG acquisition, electrode cables must be cleaned and disinfected with gauze soaked in 0.4% chlorhexidine solution and Promanum before leaving the anteroom or intermediate care area. The Televet device must likewise be disinfected with Promanum-soaked gauze and dried before leaving these areas.
- After endoscopy, the endoscope and endoscopy tower must be cleaned and disinfected in the UICB-EQ treatment room.
- Upon return to the stocks room, the endoscope and tower must be disinfected again according to the recommended protocol.
- Portable X-ray equipment should preferably be used in horses with confirmed or suspected infectious disease.
- For radiographic examinations, the cassette must be placed in a plastic bag, which must be removed by a person with clean hands prior to processing.

- The X-ray unit and cassette must be disinfected with gauze soaked in alcohol-based disinfectant (Promanum) before leaving the UICB-EQ anteroom, treatment room, or intermediate care area.
- For ultrasonography, the Vscan probe must be used, protected with a disposable glove. After use, the probe must be carefully disinfected. The ultrasound display must be kept inside a ziplock bag and disinfected (with Promanum-soaked gauze) before leaving the isolation anteroom. The ziplock bag must be immediately discarded.
- Only strictly necessary material must be taken into intermediate care (Class 3) and UICB-EQ (Class 4) areas. Alcohol and ultrasound gel must be kept within the respective units.

2.5.12. Biological Samples from Suspected or Confirmed Infectious Disease Patients

- Samples from high-risk patients must be properly identified and labelled and placed in a ziplock bag (preferably double-packaged).
- Samples must be placed carefully inside the bag, avoiding contamination of the exterior surface.
- The suspected disease or pathogen must be clearly identified on submission forms.
- Samples from patients with zoonotic disease must be double-packaged, and the suspected disease or pathogen must be clearly identified on all submission forms.

2.5.13. Preparation of Intermediate Care (Class 3) and UICB-EQ (Class 4) Areas for Disinfection

- Cleaning staff must be contacted immediately after patient discharge so that stall cleaning and disinfection can be performed before admission of another patient.
- Prior to disinfection, cleaning staff must be informed of the specific pathogen involved and the associated PPE precautions.
- To allow complete cleaning and disinfection of the area, the responsible clinician, intern, and assigned student are responsible for:

- Placing all disposable materials in yellow biohazard waste containers;
- Closing all waste bags, which must remain in the UICB-EQ until removed by cleaning teams;
- Cleaning and disinfecting all medical equipment before removal from the unit (e.g. stethoscope, thermometer, watch, nasogastric tube) and subsequently storing it appropriately;
- If admission of another patient is required before the stall has been disinfected by handlers, this procedure becomes the responsibility of the intern, responsible clinician, or technical staff assigned to the case.

- No other patient may enter the stall unless it has been adequately disinfected.

2.5.14. Downgrading of Patients in Intermediate Care (Class 3) or Isolation (Class 4)

- In general, horses isolated in the UICB-EQ (Class 4) remain in the unit until the end of hospitalisation.
- Horses in intermediate care (Class 3) may, on a case-by-case basis, be transferred to lower risk classes according to clinical evolution.
- The decision to reclassify Class 3 patients lies with the responsible clinician and, when necessary, the CHB Coordinator.

2.6. Management of Patients with Multidrug-Resistant Bacterial Infections

- Patients infected with multidrug-resistant bacteria represent a potential risk to human and animal health. They are therefore classified as Class 3 patients, and reinforced biosafety precautions are implemented to prevent dissemination of these microorganisms within the facilities, including mandatory PPE use and footbaths.

- Treatment of wounds infected with multidrug-resistant bacteria (e.g. MRSA) must take place in low-traffic areas that can be easily cleaned and disinfected after each procedure.
- Whenever a clinician receives a positive culture result for multidrug-resistant bacteria (e.g. *E. coli*, *Klebsiella* spp.), this must be recorded in a logbook kept at the HE-EQ administrative office, including patient details, stall, hospitalisation date, and culture results

2.7. Biosafety Precautions for Mares and Foals

- Neonatal foals hospitalised at the HE-EQ are frequently at high risk of infection due to concurrent disease or compromised immune status. Additionally, foals and their dams may shed enteric pathogens during the periparturient period.
- If foals or mares show signs of contagious disease, or originate from premises with infectious disease outbreaks, they must be hospitalised in intermediate care or the UICB-EQ, with full compliance with mandatory protocols.
- Animals without clinical signs of contagious disease, or originating from premises without reported outbreaks, may be housed in the ICU or Hospitalisation, according to the following protocols:

- Foals ≤ 21 days of age: mandatory use of disposable gloves and footbaths at stall entry for all persons entering or contacting the animals;

- Examination gloves must be discarded immediately upon exiting the stall to prevent contamination of other areas;

- Access to stalls must be restricted to essential care. Responsible clinicians may authorise student entry for pedagogical purposes, but this should be minimised;

- All persons entering the stall must use appropriate precautions.

2.8. Surgery and Anaesthesia

- The operating theatre is considered a clean area, with specific biosafety and professional conduct rules. Its access, use, and maintenance require rigour, responsibility, and adherence to established standards to ensure patient, staff, and student safety.
- **Access and Authorisation**

Access to the operating theatre is restricted to authorised personnel. Students may only participate with prior authorisation from the responsible clinician, and all access must be recorded.

- **Hygiene and Preparation**

Appropriate surgical attire is mandatory, including clean green surgical scrubs, cap, mask, and boots or clogs with boot covers. Entry with external clothing is prohibited, except in emergencies where patient welfare is prioritised. Hands must be washed according to the surgical asepsis protocol displayed in the theatre.

- **Equipment Organisation**

All surgical material must be prepared and checked before the horse enters. Instrument, drug, and consumable lists must be verified in advance. After procedures, used materials must be washed, immersed in enzymatic solution, and disinfected or sterilised according to protocol. Nurses and assistants are responsible for monitoring these processes.

- **Patient Handling**

Horses must be prepared according to the surgeon's instructions, including fasting, clipping, and washing. Handling of sedated or anaesthetised horses is restricted to trained personnel. Anaesthetic induction, positioning, and recovery phases are critical and require silence, focus, and concise communication.

- **Prohibitions**

Eating, drinking, or food storage in the operating theatre is strictly prohibited. Unnecessary movement, crossing sterile zones during procedures, and the use of adornments (e.g. rings, earrings, watches, painted or long nails) by those directly involved in surgery are forbidden.

- **Cleaning and Closure**

After each surgery, the theatre must be fully disinfected, including floors, tables, and equipment. Each user is responsible for leaving the space clean and organised. Any damage or equipment malfunction must be reported immediately.

- **Contamination Monitoring**

Quarterly swabbing of critical surfaces (e.g. surgical table, lights, monitors, door handles) must be performed, as well as after septic surgeries. Samples must be submitted for microbiological analysis and results archived. If clinically relevant positive cultures are detected, disinfection protocols must be reinforced and sampling repeated.

2.9. Colic Cases

- Colic cases represent increased risk due to the likelihood of *Salmonella* carriage.
- Colic patients must be hospitalised in the ICU or, depending on clinical evolution (diarrhoea, fever, leukopenia, positive *Salmonella* sample, surgical wound with multidrug-resistant bacteria or MRSA), placed in intermediate care (Class 3) or transferred to the UICB-EQ (Class 4).

2.9.1. Equipment Used in Colic Patients

- If the patient has a nasogastric tube, all necessary equipment (including pump, tubing, and bucket) must be placed beside the stall.
- Once the equipment is no longer required, it must be carefully cleaned, washed, disinfected by immersion in a biocidal solution, rinsed, and dried.

2.9.2. Walking and Grazing of Colic Patients

- If the horse defecates during walking, faeces must be immediately collected and the affected surface cleaned.

2.9.3. Visiting Hospitalised Colic Patients

- Clients must remain with their own horse and must not circulate within the hospital or interact with other patients.
- The number of visitors per patient must be limited.
- Clients must strictly comply with all biosafety procedures, including correct use of footbaths and hand washing and disinfection

2.10. Management of Deceased Patients

- Handlers must be informed as soon as possible when a patient dies or is euthanised.
- The patient's medical records must be archived at the HE-EQ administrative office.
- All patient equipment must be properly bagged and stored for later return to the owner. For intermediate care or isolation patients, equipment must be washed and disinfected according to the specific risk class protocol.
- The stall must be cleaned and disinfected according to the procedures defined for the patient's risk class.

2.10.1. Carcass Disposal

- If the horse dies or is euthanised in the stall/box, the carcass must be removed as soon as possible.
- If euthanasia occurs in the general anaesthesia induction room, the carcass must be removed promptly, and the induction room cleaned and disinfected.
- During euthanasia and carcass removal, the unit must be closed to limit visibility to nearby owners.
- The carcass must be transported as soon as possible to the Pathology Unit using the freight lift:

- During working days and hours, immediate transport is mandatory;

- Overnight or at weekends, transport must occur the following morning. Carcasses must be stored in the Pathology cold room.

- A Class 3 or Class 4 patient carcass must remain in the stall/box until direct transport to Pathology.
- A Class 4 patient carcass with a notifiable disease must be stored in the Pathology cold room and subsequently removed according to DGAV instructions.
- After carcass transport, the freight lift must be carefully cleaned and disinfected at the entrance to the Pathology Unit.

2.11. Recommendations to Break Transmission Cycles at the HE-EQ

- HE-EQ visiting hours are from 14:00 to 18:00 on weekdays and from 10:00 to 12:00 on weekends and public holidays. Under no circumstances are owners allowed to stay overnight at the HE-EQ with their horses.
- All visitors must check in at HE-EQ reception upon arrival. Clients must be accompanied to their horse's stall by a student, clinician, or nurse.
- Clients must strictly comply with all biosafety measures applicable to their animal if they enter the stall or touch the horse.
- All visitors must be informed that hand washing and disinfection are mandatory after leaving hospitalisation areas.
- Clients may visit their animals but must not circulate freely within the facilities. Touching other patients or consulting clinical records displayed on stall doors is strictly prohibited. All information regarding other patients, including diagnoses, is confidential and must not be disclosed.
- General public access to HE-EQ hospitalisation areas is not permitted. Guided visits may be organised in special circumstances with prior authorisation.
- Visits to hospitalised patients are reserved exclusively for their owners. Third parties may not visit animals without explicit owner consent.
- For horses housed in intermediate care (Class 3), owners may only visit from outside the stall perimeter. Entry into the stall and visits by other associated persons are not permitted. Owners must be informed of the risk of pathogen transmission to other equines outside the hospital. As with any other client, owners are not authorised to circulate in other hospital areas.
- Client visits to patients hospitalised in the UICB-EQ (Class 4) are only permitted in exceptional circumstances, such as prolonged hospitalisation or imminent euthanasia. In such cases, visitors must fully comply with established biosafety procedures and must always be accompanied by the responsible veterinarian.
- Entry of dogs or other companion animals into the HE-EQ is not permitted.

2.12. Access and Exit Routes of the UICB-EQ and Rules for Patient Movement

• The infectious diseases area, where the Equine Biological Containment and Isolation Unit (UICB-EQ) is located, is intended for the hospitalization and monitoring of horses with suspected or confirmed risk of contamination to other patients or hospital areas and has therefore differentiated and mandatory physical routes designed to ensure separation between patients, personnel, and functional flows, thereby minimizing the risk of cross-contamination.

2.12.1. Access and exit of all personnel to the UICB-EQ

• Access for students and staff to the UICB-EQ is through the front door at the end of Building H, after the lifting barrier.

• Once you pass the barrier, you are entering a restricted access area limited to authorized personnel only.

• Circulation to the UICB-EQ is carried out wearing regular clothing or hospital surgical scrubs.

• All clinical equipment must enter through this door and be received by a member of staff inside the unit.

• In the first changing room, red scrubs must be worn. Upon entering the orange zone, after the separating bench, personnel must wear the plastic clogs available in the unit. Street shoes must under no circumstances cross the dividing barrier (see infographic displayed on the wall).

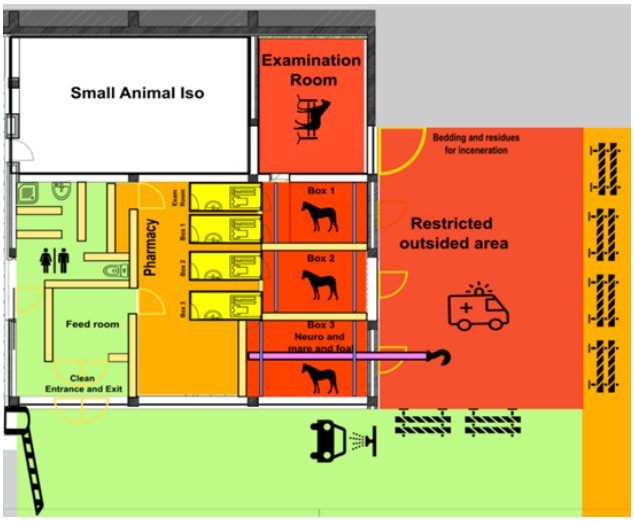


Figure 1. Equine Biological Containment and Isolation Unit

2.12.1.1. Contact with patients

• Entry into stalls and the examination room must be made through the respective decontamination antechamber.

• In each antechamber (yellow areas), the appropriate Personal Protective Equipment (PPE) for the required isolation level must be worn (disposable green gown, full-body PPE suit, face shield or goggles, if indicated). Gloves must be worn in all cases, as well as the available orange rubber boots.

• Exit from each decontamination area must be carried out by discarding the used PPE in the designated containers, followed by appropriate hand washing and disinfection. The orange rubber boots must remain in the antechamber.

2.12.2. Patient access and exit routes

- Patients admitted under isolation criteria must be directed to the UICB-EQ via the route indicated in the map below.

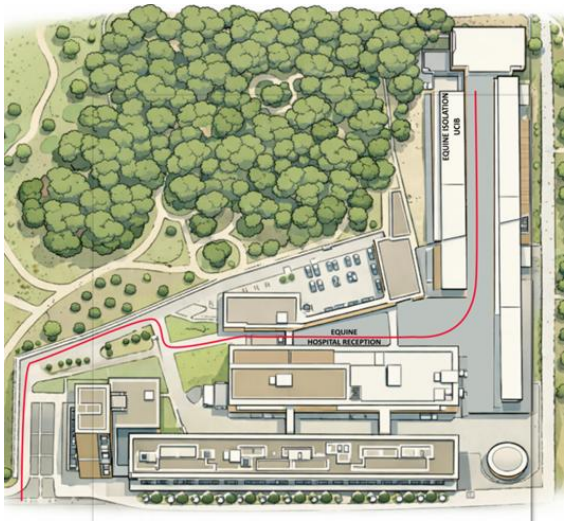


Figure 2. Patient access circuit to UICB-EQ (red line)

2.12.2.1. Route and Access Rules to the UICIB-EQ

- Only vehicles with a trailer and a maximum height of 2.7 meters are authorized to transport and deliver horses to the UICB-EQ.
- Only horses presenting one or more of the following clinical signs should be directed to the UICB-EQ: fever, diarrhoea, nasal discharge, or acute neurological symptoms, namely ataxia.
- Vehicles, owners, and drivers must proceed directly to the UICB-EQ, strictly following the route indicated on the map, without intermediate stops or circulation through other areas of the Faculty.
- Patients are unloaded in the outside restricted area by the clinician or member of staff on duty.
- After unloading the patient, all wheels of both the vehicle and the trailer must be washed and disinfected using the hose with disinfectant solution available at the unit.
- Strict compliance with these rules is mandatory and essential to prevent contagion and disease spread, thereby protecting other animals, professionals, students, and visitors.

2.12.3. Rules for the movement of patients for complementary examinations and surgeries

- All animal movements outside the restricted area of the UICB-Equines must be authorized by the Clinical Director of the Equine Hospital. Such movements must be kept to an absolute minimum and only considered in exceptional circumstances, as they may lead to the closure of several hospital areas for prolonged periods.

2.12.3.1. General Provisions

- Strict compliance with the defined routes and rules is mandatory for all students, professionals, and services involved.
- Any deviation from the established routes constitutes a breach of biosafety regulations and must be reported to the coordination of the UICB-EQ.
- Circulation routes and areas are subject to regular cleaning and disinfection in accordance with institutional protocols and the associated biological risk level.

3. RUMINANTS

3.1. Introductory note

- The FMV does not have a teaching farm nor an experimental ruminant unit because it does not have sufficient space for that purpose at the ULisboa campus in Alto da Ajuda.
- It maintains a **Resident Cattle Park** (PBR) with 18 adult cows, used exclusively for teaching purposes. These animals are acquired from farms with an officially tuberculosis-free, brucellosis-free and enzootic bovine leukosis-free health status. During their stay at the FMV they never leave the PBR nor have contact with cattle from other sources. They are therefore considered low-risk animals for infection.
- The person responsible for the Resident Animals Facilities is Prof. Dr. Ana Catarina Belejo Mora Torres. The Clinical Lead responsible for the ruminants housed in the PBR is Professor Dr. George Stilwell. The Animal Health Lead is Professor Dr. Fernando Boinas.
- In turn, the Teaching Hospital does not provide medical services nor hospitalisation for cattle, but it has an **Ambulatory Service** that provides healthcare in a private network of ruminant farms with which the FMV has collaboration agreements.
- For these reasons, this chapter is subdivided into two sections: (3.2.) biosafety practices applicable to the PBR, used in practical classes of Animal Behaviour, Welfare and Handling, Animal Production, Agriculture and Environment, Pharmacology, Pharmacy and Pharmacotherapy, Medical Propaedeutics and Clinical Practice, and Reproduction and Obstetrics; (3.3.) biosafety practices applicable to the ambulatory service on private ruminant farms during practical classes of Epidemiology, Infectious Diseases and Preventive Medicine, Reproduction and Obstetrics, Farm Animal Clinical Practice and Population Medicine.

3.2. Biosecurity Practices in the Resident Cattle Park

3.2.1. General clothing and footwear

- Coveralls are the mandatory personal garment for activities in the PBR. They must be worn by everyone to mitigate the risk of transmitting pathogens to people or animals outside the PBR.
- Students store their personal belongings in the lockers and take a bag containing their blue coveralls and their white rubber boots.
- They then proceed to the Sanitary Filter adjacent to the PBR.
- Students take a pair of shoe covers, remove their shoes, put on the shoe covers and place their shoes on a shelf. Then, they put on their coveralls, put on their rubber boots and place their bag on the shelf next to their shoes. They sit on the low wall, rotate 180°, disinfect their hands with alcohol gel and proceed to the stables.
- Students, teaching staff and employees must pass through a footbath located at the entrance to the PBR, fully immersing footwear, and only then may they enter the PBR.
- Students who do not arrive properly equipped may not participate in the class. They will be warned, will have to return to the Sanitary Filter, and come back with the appropriate clothing and footwear.
- After the practical class, students follow the reverse route: they leave the PBR, pass through the footbath, and access the Sanitary Filter where they wash the boots at the boot-washing station and disinfect them. They remove the boots and the coveralls. They remove the shoe covers and place them in the rubbish bin. They sit on the low wall and rotate 180°. They store their boots and coveralls in their bag. They take their shoes from the shelf, put them on, and proceed to the General Changing Room where they remove the coveralls, store them in a personal bag, retrieve their

personal belongings from the lockers, disinfect their hands with alcohol gel, and leave the General Changing Room.

- The student's bag containing the coveralls must be kept in their personal locker or in their backpack. The coveralls must be washed whenever they are dirty.
- Coveralls must be washed at 60°C with a detergent with disinfectant action. Students wash the coveralls at home (e.g., OMO Sanitises & Cleans, effective against bacteria and viruses).
- Poster 3 summarises the instructions that students must follow whenever they have practical classes at the PBR. This poster is displayed at the entrance to the PBR

Poster 3

Instructions for students on the Standard Operating Procedures for Biosafety in force in the FMV Resident Animals Park

FMV STABLES

INSTRUCTIONS FOR STUDENTS

1 - Store your belongings in a locker in the General Changing Room.
2 - Tie back long hair.
3 - Take a bag with your blue coveralls and your white rubber boots.
4 - Lock the locker in the General Changing Room with your padlock.
5 - Follow the entry and exit routes of the Sanitary Filter installed in the changing room adjacent to the room with the cattle stocks/crushes.
6 - If you bring a water bottle, place it in a locker in the Sanitary Filter.
7 - In the Sanitary Filter, take a pair of shoe covers, remove your shoes, put on the shoe covers and place your shoes on a shelf. Put on your coveralls and put on your rubber boots. Place your bag on the shelf next to your shoes. Sit on the low wall, rotate 180° and proceed to the stables.
8 – Disinfect your hands when entering and leaving the Stables.
9 - When the class ends, wash your boots at the boot-washing station. Proceed to the Sanitary Filter and remove the boots and the coveralls. Remove the shoe covers and dispose of them in the rubbish bin. Sit on the low wall and rotate 180°, store your boots and your coveralls in your bag. Take your shoes from the shelf and put them on.
10 - Proceed to the General Changing Room, open your locker, take your belongings, store your padlock, leave the locker open and leave.
11 - If you have doubts, read the QR Code on the poster to consult more detailed information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

A - Cotton coveralls, blue, personal, clean.
B - White rubber boots, personal, clean.
C - PPE, e.g., gloves, is provided by the FMV.

- Teachers' coveralls are delivered by a staff member from the respective department to the FMV Laundry, where they are washed with liquid bleach with antibacterial, antifungal and

antiviral properties (e.g., Peracid Asepsis) in an industrial washing machine and subsequently dried in an industrial dryer.

- Staff may wear specific sturdy and washable work footwear when not in contact with animals or their excreta. This footwear must be used exclusively at the FMV.

3.2.2. General Cleaning and Hygiene

- People entering the PBR must use the entrance accessed through the Sanitary Filter.
- Hands must be washed and disinfected with alcohol gel before and after examining each bovine.
- Disposable gloves must be worn when handling cattle.
- There is a boot washer outside the PBR, available whenever needed.
- If, during a practical class, a surface or piece of equipment becomes contaminated with organic matter, e.g., blood, it must be cleaned and disinfected immediately by the teacher(s) or students. Cleaning is the responsibility of all PBR users.
- All equipment or materials (e.g., thermometers, stethoscopes) must be disinfected before and after use.
- Equipment such as buckets must be cleaned and disinfected with 0.5% chlorhexidine after use.
- Animal transporters comply with Regulation (EC) No 1/2005 of 22 December 2004 and Decree-Law No 265/2007 of 24 July, amended by Decree-Law No 158/2008 of 8 August, which establish the obligations of transporters, organisers and keepers during animal transport, as well as Decree-Law No 142/2006 of 27 July and its amendments, which establish the mandatory cleaning and disinfection of animal transport vehicles at facilities approved by the Directorate-General for Food and Veterinary Affairs (DGAV).
- The wheels of trucks used to transport cattle are washed and disinfected outside the PBR, in front of the garage of the Farm Animal Clinical Practice and Population Medicine vehicles, using a high-pressure washer. A card is then attached specifying which disinfectant was used, to ensure the correct contact time (e.g., Aldekol DES FF, bactericidal and yeasticidal activity in 5 minutes, virucidal activity in 60 minutes).

3.2.3. Proper Cleaning

- It is of paramount importance for ruminant hygiene and to reduce potential transmission chains of parasitic and infectious agents that the park remains clean. For this purpose, faeces must be removed regularly, and the park cleaned and washed periodically.
- Caretakers clean the park and corridors daily to remove faeces and leftover feed.
- Caretakers wash the park and corridors monthly.
- If an area of the park becomes dirty outside caretakers' working hours, students and the veterinary team (teachers, clinicians and interns) must remove the faeces.
- In the case of neonates, hygiene is crucial and therefore, as soon as there is a pile of faeces or wet bedding, it must be removed by students or the veterinary team.
- Automatic drinkers must be cleaned regularly, ensuring they are functioning properly.
- Feed troughs must be cleaned every morning before feeding.
- Animals must be kept as clean as possible.
- The area around the PBR must be clean and organised, meaning no materials scattered and no personal belongings. All PBR users are expected to make an effort to tidy materials after use.

3.2.4. General Disinfection Protocol

• Since cattle remain permanently in the park due to the absence of an alternative temporary housing location, it is very important to use animal-safe and environmentally friendly disinfectants. Disinfectants based on potassium peroxymonosulfate (pentapotassium bis(peroxymonosulfate) bis(sulfate)) and oxygen-based bleach are good options because they are effective against a wide range of pathogens and are less toxic than traditional chlorine-based bleaches. Disinfectants containing quaternary ammonium compounds or based on peracetic acid are also options.

• Caretakers are trained in the proper use of these disinfectants and always follow the manufacturer's instructions for dilution and application to ensure safety.

• Examples of safe and effective disinfectants in this context:

- Virkon S: potassium peroxymonosulfate with bactericidal, fungicidal and virucidal activity. Does not stain, does not irritate skin or eyes, is biodegradable and harmless to users, animals (even newborns) and the environment;

- Roxycide: oxygen bleach–based, effective against bacteria, viruses and fungi;

- Hydroliq ANIMAL: peracetic acid–based, safe for humans, animals and the environment;

- Zoopan Kenocox: phenol-free disinfectant safe for animals and users.

• • Wear gloves that provide protection against chemical risks when handling disinfectants. Additional PPE (mask, face shield, goggles, waterproof clothing and boots) must be used whenever splashing is likely during the disinfection process.

• Wash the park, including walls, doors, feed troughs and automatic drinkers with Keno™san detergent (Cid Lines) applied as foam. Scrubbing is always necessary to remove residues and biofilms that inhibit or reduce the effectiveness of the disinfection process.

• Rinse the washed area thoroughly to remove any detergent residue (Note: some disinfectants can be inactivated by detergents or soap, therefore it is very important to rinse properly after cleaning).

• Allow the area to drain or dry as much as possible to avoid dilution of disinfectant solutions.

• Thoroughly wet floors, walls, doors, drinkers and troughs with disinfectant at the proper dilution. The disinfectant must remain in contact with surfaces for the required time.

• Remove excess disinfectant with water.

• After disinfection, remove protective clothing and wash hands

3.2.5. Footbaths and Mats

• The disinfectant solutions in the footbath installed at the entrance to the park are changed every morning by the caretakers and whenever they contain excessive dirt or are dry.

• Everyone must use the footbath. Footbaths require full immersion of boots.

3.2.6. Disinfection Protocol for Instruments and Equipment

• All instruments and equipment must be cleaned and disinfected or sterilised between use on different animals.

• Materials that are sterilised between uses undergo:

- an initial wash in a dishwasher (long cycle);

- sterilisation in a dry heat oven (180 °C for 3 hours).

Stethoscopes

- Personal stethoscopes (teachers and students) may be used in the PBR but must be disinfected regularly with alcohol or hand disinfectant solution (recommended: at the beginning and end of the day).
- Immediate cleaning and disinfection are required when stethoscopes are visibly dirty.

Thermometers

- Glass thermometers are prohibited at FMV to avoid mercury exposure in case of breakage.
- Digital thermometers are used instead.
- After use, they must be carefully cleaned and disinfected with wipes soaked in alcohol and/or chlorhexidine.

3.2.7. Summary List of Detergents and Disinfectants Approved for Use in the Resident Ruminant Park

- Detergents and Soaps

- Baktolin Pure for hand washing;
- Zoopan Kenosan for surfaces.

- Disinfectants

- Virocid for footbaths/disinfectant mats;
- Virkon S in case of infectious disease;
- Keno™cox (Cid Lines) in cases of diarrhoea (e.g., calves with coccidiosis and cryptosporidiosis).

3.2.8. Food and Beverages

- Consumption of food or beverages is not permitted in the PBR.

3.2.9. Cleaning Protocols

Trucks Transporting Healthy Live Animals for Replacement / Culling

- The wheels and sides of transport trucks, whether carrying live animals or feed, are washed and disinfected with Mida Foam 193 before entering the PBR.
- The unloading area is cleaned and disinfected with Mida Foam 193 immediately after the truck leaves.
- The road in front of the PBR is swept and pressure-washed weekly by the cleaning team and disinfected with Mida Foam 193.

Resident Cattle Park

- Areas of the PBR contaminated with faeces, secretions and urine must be cleaned daily and disinfected monthly with Virkon S. Excessive use of disinfectants promotes the development of microbial resistance.
- To ensure effectiveness, disinfectants must be used on clean surfaces.
- Using the correct disinfectant dilution, as recommended by the manufacturer, provides optimal disinfectant action.
- Biofilms develop in areas with stagnant water and where disinfectant is left on dirty surfaces.

- Uneaten feed must be removed from the manger before adding new feed.
- The feed storage room must be cleaned weekly to mitigate rodent infestations.
- Rodent traps are installed in all feed storage areas (see Chapter 10 on “Pest control”).
- FMV provides halters and leads for the cattle. All tack is cleaned and disinfected by immersion in chlorhexidine solution. Tack is stored in the PBR when not in use.

3.2.9.1. Routine Cleaning of the PBR

- **Daily routines**

- Sweep the floor to remove debris.

- **Weekly routines**

- Clean and wash feed troughs.

- **Monthly routines**

- The PBR must be disinfected monthly with Virkon S.

- To ensure effectiveness, disinfectants must be used on clean surfaces.

- Using the correct disinfectant dilution, as recommended by the manufacturer, provides optimal disinfectant action.

- Biofilms develop in areas with stagnant water and where disinfectant is left on dirty surfaces.

- Brooms must be cleaned and maintained.

- **Biannual routines**

- PBR drains must be cleaned with detergent and then injected with disinfectant (Mida Foam 193). Do not fill the drain with disinfectant without cleaning it first.

3.2.10. Deceased Cattle

- In the event of the death of a resident bovine, unless otherwise indicated, a necropsy must be performed as soon as possible.
- The carcass must be transported by forklift to the Pathology Necropsy Room in a sealed, leak-proof container and stored in the cold chamber.
- If the animal dies or is euthanised outside working hours, the carcass will remain in the container covered with a heavy plastic sheet until transported to the Pathology Necropsy Room.
- After use, the heavy plastic sheet must be cleaned and disinfected.
- The forklift used to transport the carcass must be carefully cleaned and disinfected at the dock of the Pathology Necropsy Room with Mida Foam 193.

If the Pathology Service is closed (holidays and vacation periods), necropsies must be carried out by the Farm Animal Hospital team in the Necropsy Room.

3.2.11. Surveillance and Case Management

3.2.11.1. Routine Environmental Surveillance

- Routine environmental surveillance of smooth floors and hand-contact surfaces must be performed every 6 months.
- Culture results are recorded in the resident cattle database. Results are communicated to the CHB as soon as they become available

3.2.11.2. Management of Suspected or Confirmed Cases of *Salmonella* spp.

- If salmonellosis is suspected, the following measures are activated:

- The responsible veterinarian must notify the CHB as soon as possible (email sent to: biosseguranca@fmv.ulisboa.pt).

- Classes involving the use of PBR cattle are suspended until the sporadic case or outbreak is eliminated.

- The PBR may not receive new animals until the sporadic case or outbreak is eliminated.

- Isolation and treatment of the infected bovine in an isolation pen.

- Collection of individual biological samples from all cattle.

- Washing and disinfection of the PBR with Virkon S.

- After cleaning and disinfection, collection of environmental samples from PBR surfaces for bacteriological analysis.

- If cultures are positive for *Salmonella* spp., the cleaning and disinfection procedure must be repeated.

- The infected bovine(s) may only return to the PBR after three consecutive negative bacteriological results.

- The PBR may not receive new animals until the infected bovine(s) have three consecutive negative culture results.

- These results must be recorded in the resident cattle database.

- Suspected and confirmed salmonellosis cases must be reported by the responsible PBR veterinarian to DGAV (form 1728, sent to: secdspa@dgav.pt and secretariado.lvt@dgav.pt).

3.2.11.3. Management of Patients with Suspected Other Infectious Diseases

• Special measures are required in the management of patients with suspected or confirmed infection by contagious pathogens. Due to their transmission potential, the main conditions of concern include:

- Calves with acute gastrointestinal disorders (e.g., diarrhoea) suspected of cryptosporidiosis;

- Acute respiratory diseases of viral origin;

- Infections with multidrug-resistant bacteria.

• Any of the following clinical signs are indicative of infectious enteric disease:

- Fever

- Prostration

- Anorexia

- Weight loss

- Diarrhoea

- Hypoproteinaemia.

• Any of the following clinical signs are indicative of infectious respiratory disease:

- Fever

- Prostration

- Anorexia

- Nasal discharge

- Tachypnoea–dyspnoea

- Cough.

• Animals showing clinical signs compatible with infectious disease will be isolated in an isolation pen:

- The CHB must be notified as soon as possible (email sent to: biosseguranca@fmv.ulisboa.pt) so that it can assess whether appropriate biocontainment practices are being implemented;

- The isolation pen must be delimited with a sanitary barrier area;

- The potential contagious risk of isolated cattle must be indicated on a sign posted on the pen;

- The number of people in contact with the patient bovine must be limited;

- When a bovine with suspected or confirmed infectious disease leaves the isolation pen, a sign stating "Do not use, special cleaning and disinfection required" must be placed on the pen;

- Animals suspected or confirmed of having a notifiable disease in Portugal will be isolated in an isolation pen if the disease has direct transmission, that is, if it is neither Bovine Spongiform Encephalopathy (BSE) nor Enzootic Bovine Leukosis (EBL). According to WOAH, Portugal is currently officially free of EBL and has negligible BSE risk;

- Any suspicion of a notifiable disease must be reported by the responsible PBR veterinarian to DGAV (form 1728, sent to: secdspa@dgav.pt and secretariado.lvt@dgav.pt);

- Additional information for each disease can be obtained at the following links: https://www.dgav.pt/animais/conteudo/animais-de-producao/bovinos/saude-animal-em-bovinos/doencas-dos-bovinos/
https://www.woah.org/en/what-we-do/animal-health-and-welfare/animal-diseases/
https://www.cfsph.iastate.edu/diseaseinfo/factsheets/

- After medical discharge of the cattle, the isolation pen will be carefully cleaned and disinfected with Virkon S (30-minute contact time).

3.2.11.4. Classification of Cattle Suspected / Confirmed with Infectious Disease

3.2.11.4.1. General Rules

CLASS 1: NORMAL HOUSING – **GREEN**

• Non-infectious diseases or infectious diseases caused by pathogens that are not transmissible to other animal species and with no human infection potential:

- No fever and no respiratory problems

- No trauma or infected wounds

- Pre- and post-operative cattle, without known infectious complications

- Non-contagious newborn calves

CLASS 2: NORMAL HOUSING – **GREEN**

• Infectious diseases with low transmission level or caused by non-MRSA bacteria:

- Wounds infected with non-MRSA bacteria

- Bacterial pneumonia

CLASS 3: ISOLATION PEN HOUSING – **ORANGE**

• Infectious diseases caused by multidrug-resistant bacteria or moderately transmissible infectious diseases and/or potentially zoonotic:

- Fever and/or leukopenia of unknown origin

- MRSA or multidrug-resistant bacteria

- Viral respiratory diseases

- Diarrhoea without fever or leukopenia

- Diarrhoea in calves

- Infectious dermatological infections

CLASS 4: ISOLATION PEN HOUSING – **RED**

• Infectious diseases with high transmission level and/or pathogenic to humans. Most notifiable diseases fall into this category:

- Diarrhoea with fever and/or leukopenia

- Respiratory diseases with ulcers on oral/nasal mucosa, fever and/or leukopenia, cough, nasal discharge

- Abortion or perinatal death, or of unknown origin, with fever and/or leukopenia

- Zoonotic diseases (e.g., *Mycobacterium tuberculosis* complex — *M. bovis*, *M. caprae*, *M. tuberculosis*, brucellosis, anthrax)

3.2.11.5. Special Precautions (Class 3 and 4)

3.2.11.5.1. Movement of High-Risk Patients

• Movement of high-risk patients must be restricted as much as possible.
• Whenever possible, a bovine patient (Class 3 or 4) should be taken directly to the isolation pen, avoiding contact with other areas, animals and people.
• If the patient has diarrhoea, one person should lead the animal and another should follow with a waste bag to collect faeces. Contaminated areas must be immediately cleaned and disinfected.
• Entry of people into the isolation pen for Class 3 and 4 patients must be minimised and restricted to authorised staff and students.
• All faeces must be removed immediately after medical discharge.

3.2.11.5.2. Diagnostic Testing in Patients Suspected of Class 3 and 4 Infections

• Appropriate samples must be collected and sent as soon as possible to the National Institute for Agrarian and Veterinary Research (INIAV) (https://www.iniav.pt/).
• Biocontainment measures must always be applied by staff and students during diagnostic procedures.
• If the bovine patient requires diagnostic or other procedures (e.g., surgery), these should be performed at the end of the day whenever possible.
• The responsible veterinarian must be consulted before transferring any high-risk patient for diagnostic or surgical procedures, except when clinicians consider the transfer urgent (e.g., critical patient).
• The responsible veterinarian must notify the CHB team of the suspected infectious disease and the biocontainment procedures in place, including cleaning and disinfection (email sent to: biosseguranca@fmv.ulisboa.pt).
• In general, all biocontainment precautions apply whenever the patient is handled.
• Instruments and equipment must be cleaned and disinfected after procedures.
• The responsible veterinarian must ensure that all services involved in procedures are informed about the suspected/confirmed infectious disease and the required PPE.
• The responsible veterinarian is also responsible for ensuring that spaces are properly cleaned and disinfected after procedures, including anaesthetic induction and surgical areas, the recovery room and any other area.
• Whenever possible, surgery in these patients will be performed at the end of the day, after all other patients, except in emergencies.

3.2.11.5.3. Collection of Biological Samples from Cattle Suspected / Confirmed with Infectious Disease

- Biological samples collected from these animals must be properly identified and then placed in a ziplock or whirl-pak bag.
- Biological samples from cattle suspected of zoonosis must be double packaged.
- Care must be taken to avoid contaminating the outside of the bag when placing samples inside.
- The suspected disease or pathogen must be clearly specified on submission forms.

3.2.11.5.4. Special Guidelines for the Management and Care of Cattle with Suspected or Confirmed Infectious Diseases

General

- Strict hygiene and biosecurity are essential for the proper containment of infectious diseases.
- If a bovine presents diarrhoea, one person will lead the animal and another will follow with a waste bag to collect faeces and then immediately clean and disinfect contaminated areas with Virocid.
- Calves with diarrhoea that require complementary examinations at the Diagnostic Imaging Service are transported in a trailer that will be thoroughly cleaned and disinfected after use.
- Entry into the on-site isolation pen must occur only when necessary.
- Teaching staff and veterinarians may, at their discretion, allow students to access Class 3 patients for didactic purposes (e.g., in cases of salmonellosis or leptospirosis), always under their supervision and with appropriate PPE (disposable white coverall, masks and protective goggles).
- Only teaching staff and veterinarians may attend Class 4 patients.
- Whenever possible, under these circumstances only a limited number of handlers will be assigned to the hygiene of these spaces, and they will not care for healthy cattle in the PBR.
- Biosecurity measures must be complied with by everyone and are displayed on a board located outside the PBR.
- Before and after examining each patient, hands must be washed with soap and water and then disinfected with alcohol gel.
- Surfaces or equipment contaminated with faeces, other secretions or blood must be cleaned and disinfected immediately.
- Special precautions must be taken to prevent environmental contamination by dirty hands, gloves or boots.
- Use the footbaths (Class 3 – Virocid, Class 4 – Virkon S).
- Handlers will clean and change the bedding of the isolation pen once per day, but environmental hygiene is everyone's responsibility; therefore, avoid contaminating the anterooms with straw or manure and assist with general cleaning and maintenance whenever possible.
- Footbaths are refilled daily in the morning after cleaning by handlers and then as needed throughout the day.
- Handlers are responsible for feeding isolated cattle.
- If the patient requires complementary examinations or other procedures (e.g., surgery) that can only be carried out at the Teaching Hospital, these procedures must be performed at the end of the day. Ultrasound examinations, radiographs and endoscopies for Class 3 and 4 patients will be performed in the isolation pen using mobile equipment, which will be cleaned and disinfected after use.
- When Class 3 and 4 patients are isolated, the technical team must clean the "clean" and "dirty" zones of the sanitary barrier area once per day. They must restock any missing item (written

on a board in the clean zone) and ensure that cabinets contain the necessary stock of medications during the animal's isolation.

- A bovine is only allowed to leave the isolation pen, alive or dead, when any suspicion of a notifiable disease has been ruled out. If suspicion of a notifiable disease is confirmed, the animal may only leave the isolation pen after euthanasia and will then be collected by the contracted carcass collection company (ITS|etsa).

Equipment and materials

- Materials must be used exclusively on infected cattle or be discarded.
- If equipment or materials that cannot be discarded were used (e.g., infusion bags, halters/harnesses), these must be cleaned and disinfected before being returned to the Teaching Hospital's Farm Animal Section.
- No equipment or material (dressings, syringes, disinfectant) may be taken into the sanitary barrier area without prior consultation with the responsible veterinarian.
- Partially used medicines must be discarded. They may not be returned (including intravenous fluids) to the Pharmacy.
- Individual material dedicated to the Class 3 or 4 patient is available in a box containing a thermometer, a stethoscope and other materials. The box is kept in front of the isolation pen and must be cleaned and disinfected after medical discharge.

Procedures for entering and leaving the Ruminant Isolation Pen (Classes 3 and 4)

- The following recommendations also apply to all auxiliary services.
- Handlers and the waste collection team must wear specific PPE.
- When entering an isolation pen (Classes 3 or 4) you must:

- Use the footbath;

- Apply alcohol gel hand hygiene before entering the isolation pen;

- Bring all necessary equipment and materials when entering the isolation pen, to minimise traffic in and out;

- People who handle or examine different patients must discard gloves and other PPE and wash and disinfect hands between patients;

- Procedures involving highly contaminated sites must be performed last, e.g., rectal temperature measurement, rectal palpation, contact with mucous membranes and abscesses, MRSA-infected wounds;

- After use, clean and disinfect the material/equipment (e.g., stethoscope, thermometer) with alcohol and place it back in the box (Classes 3 and 4).

- When leaving an isolation pen (Classes 3 or 4):

- Remove the disposable white coverall and place it in the black biobox,

- Place disposable gloves and mask (if applicable), sharps and waste in the yellow biobox;

- If applicable, remove protective goggles, disinfect them with alcohol and hang them again next to the isolation pen;

- Avoid dragging bedding remnants or faeces into the corridor;

- Wash boots at the boot-wash station;

- Wash hands and then use alcohol gel;

- Use the footbath when exiting the isolation pen.

Diagnostic tests and surgical procedures required in patients with suspected infectious disease

- Diagnostic tests to detect pathogens and zoonotic agents provide essential information for appropriate clinical management of these animals and for the protection of other animals, students and workers. Therefore, it is highly recommended to test cattle whenever there is suspicion of a contagious and/or zoonotic pathogen.
- The responsible veterinarian must ensure that appropriate biological samples are collected and sent to the laboratory under strict biosecurity conditions.
- The CHB must be notified as soon as possible regarding the suspicion of a PBR bovine with a Class 3 or 4 pathogen (email sent to: biosseguranca@fmv.ulisboa.pt).

Dismantling of the Isolation Pen (Classes 3 and 4) prior to disinfection

- Contact the CHB focal point (Eng. Petra Morgado, pmorgado@fmv.ulisboa.pt) immediately after the bovine's medical discharge so that the CHB can supervise, together with the responsible veterinarian, the cleaning and disinfection of the isolation pen.

- Place all disposable materials in the bioboxes;

- Seal all bioboxes and leave them in the isolation pen to be collected by the Waste Team;

- All medical equipment must be immersed in a disinfectant solution for 24 hours before being removed from the isolation pen. It must then be returned to the Farm Animal Section and washed with detergent in the washing machine for 3 hours. The technical team will then carry out additional disinfection and proceed to final storage.

- If another bovine needs to be isolated before handlers are able to disinfect the isolation pen, it must be disinfected by the responsible veterinarian, intern student or technical team.
- After disinfection of the contaminated pen (Class 3 or 4), it must be inspected by the responsible veterinarian, who must approve the procedure before another bovine occupies it.
- For pens that housed adults infected with Salmonella spp., the efficiency of the cleaning and disinfection process must be assessed through bacteriological cultures of surfaces. The pen will not be released for a new patient until three consecutive bacteriological surface cultures are negative for Salmonella spp. If cultures are positive after the first cleaning/disinfection process, it must be repeated and cultures must be performed again until three consecutive negative results are obtained.

3.3. Biosecurity Practices in the Farm Animal Ambulatory Service of the Teaching Hospital

These rules aim to prevent the introduction and dissemination of pathogens between farms, between animals, and potential chains of transmission to people, safeguarding public health, animal health and welfare, the institution's prestige and that of its workers and collaborators.

3.3.1. General Clothing and Footwear

- Overalls are the mandatory personal protective garment for off-site practical classes in livestock farms within the curricular units of Epidemiology, Infectiology and Preventive Medicine, Reproduction and Obstetrics, and Farm Animal Clinical Practice and Population Medicine (Farm Animal Ambulatory Service of the Teaching Hospital).
- Overalls must be worn by everyone to mitigate the risk of transmission of pathogens to people or animals, within and between livestock farms.
- Overalls must have the following characteristics: washable overalls, waterproof under moderate rain for 2 hours.

3.3.2. Sequence of Procedures at FMV

- Students must store their personal belongings in the lockers in the General Changing Room.
- Students, teaching staff, clinicians and interns must go to the Garage of the Teaching Hospital Farm Animal Ambulatory Service (HE-EP):
- They must step on a disinfectant-impregnated mat located next to the Garage entrance door in front of the General Changing Room before entering the Garage.
- They must collect overalls provided by FMV, clean and disinfected, exclusive for these off-site practical classes. Personal overalls are not allowed in this area.
- They must collect a pair of washed and disinfected green rubber boots from the boot dryer. The boots are provided by FMV and must be heavy and resistant to protect feet from crushing injuries. Personal rubber boots are not allowed in this area.
- They must disinfect their hands with alcohol gel and proceed to the vehicles.
- When indicated, additional PPE (e.g., masks, face shields, boot covers) will also be provided by FMV.
- Students must bring a thermometer, stethoscope, flashlight, haemostatic forceps and bandage scissors.
- Wearing overalls during travel in the vans is prohibited.
- Eating or drinking is only permitted inside the vehicles or in areas designated by the farms.

3.3.3. Good Biosecurity Practices Upon Arrival at Livestock Farms

- Upon arrival at the livestock farm, students, teaching staff, clinicians and interns must put on overalls, wear rubber boots and disinfect their hands with alcohol gel. This procedure may take place in the farm parking area or in a changing facility, if available.
- Afterwards, boots must be fully immersed in the available footbaths before proceeding to the animal facilities.

3.3.4. Rules of Conduct on Livestock Farms

- Eating or drinking is only allowed inside FMV vehicles or in farm-designated areas (e.g., kitchen, dining room).
- Overalls must be removed during meals.
- Smoking or wearing personal objects (e.g., jewellery, watches, bracelets) during farm visits is strictly prohibited.
- Mobile phone use is limited to clinical records and must be previously authorised by the supervising lecturer. Students must use clean gloves when handling the phone, and its use should be alternated among colleagues.
- Taking photographs or videos requires prior authorisation from the farm manager and/or the supervising lecturer.
- Students must maintain a professional, cooperative attitude and follow the supervising lecturer’s instructions.

3.3.5. Good Biosecurity Practices on Livestock Farms

- The use of disposable latex gloves is recommended. Gloves are mandatory when working with calves and adult cows with infectious diseases such as mastitis, pneumonia or enteritis.
- Gloves must be changed between patients and whenever they become dirty or torn.
- Hands must be washed and disinfected with alcohol gel before and after examining each animal (refer to the handwashing protocol).

- Students and teaching staff must wash and brush boots between contact with different groups of animals (e.g., after contact with young animals and before adults) and after high-risk procedures.
- All instruments, including stomach tubes, mouth speculums, thermometers and California Mastitis Test paddles, must be cleaned and disinfected with alcohol after each use.
- Biological samples must be stored in the van in separate compartments, inside insulated containers under refrigeration and properly sealed, until delivery to laboratories.

3.3.6. Good Biosecurity Practices When Leaving Livestock Farms

- Equipment used on the farm must be cleaned, dried and disinfected before being stored again in the van.
- At the end of the visit, students, teaching staff, clinicians and interns must fully immerse boots in the available footbaths.
- Boots must be washed (scrubbed and rinsed) and disinfected with Virocid (Cid Lines) near the vehicles, using an FMV device transported in the vans.
- Overalls must be removed, boots taken off and personal shoes put on. Overalls and boots must be stored in a clean personal bag.
- Hands must be washed and disinfected with soap and water before entering the vehicles.

3.3.7. Good Biosecurity Practices Upon Return to FMV

- Vehicle wheels and sides must be washed and disinfected in the Garage of the HE-EP Ambulatory Service using a high-pressure washer. Students must perform this task under the supervision of the responsible lecturer.

A card must then be placed on the windscreen of each vehicle specifying which disinfectant was used, to ensure the correct contact time (e.g., Aldekol DES FF has bactericidal and yeasticidal activity after 5 minutes of contact time and virucidal activity after 60 minutes).

- Students and teaching staff must remove boots from their bags, brush them to remove organic debris, wash them in the boot-wash station, disinfect them with Virocid (Cid Lines) and place them in the boot dryer.

Students must place the overalls in a black biobox.

Students must wash and disinfect their hands with alcohol gel, leave the Garage, step on the disinfectant-impregnated mat, go to the General Changing Room, collect their personal belongings from the lockers, disinfect their hands with alcohol gel, and leave the General Changing Room.

- Teaching staff must place overalls in a black biobox, wash and disinfect their hands with alcohol gel and leave the Garage.
- Afterwards, student and staff overalls are delivered by a Department of Clinical staff member to the FMV Laundry, where they are washed with appropriate disinfectant in an industrial washing machine and then dried in an industrial dryer.
- Poster 4 summarises the instructions students must follow whenever they have off-site practical classes on farms. This poster is displayed at the entrance of the PBR.

Poster 4

Instructions for students on the Biosecurity Standard Operating Procedures in force during off-site practical classes on livestock farms

OFF-SITE PRACTICAL CLASSES ON LIVESTOCK FARMS

INSTRUCTIONS FOR STUDENTS

1 - Store your belongings in a locker in the GENERAL CHANGING ROOM and lock it with your padlock.
2 - Tie back long hair.
3 - Bring only a small backpack with 1 notebook and 1 pen or a tablet, a water bottle and an insulated lunch bag with a light meal.
4 - Go to the GARAGE located on the ground floor of Building D.
5 - Collect overalls from the shelves and a pair of green boots from the boot dryer.
6 - Enter the vehicle.
7 - Upon arrival at the farm, exit the vehicle with the lecturers, put on the overalls, wear the boots and comply with all biosecurity measures before entering the farm, e.g., disinfect hands and immerse boots in footbaths.
8 - Go to the animal facilities, following the lecturers and complying with the farm's biosecurity measures, e.g., passing through sanitary barriers.
9 - At the end of the practical class, when returning by the same route, again comply with the farm's biosecurity measures.
10 - Leave the farm, wash and disinfect the overalls and boots, remove the boots, take off the overalls, put on your shoes, disinfect hands and enter the vehicle.
11 - Procedures 7 to 10 must be repeated whenever practical classes take place on multiple farms.
12 - Upon arrival at the FMV Garage, assist the lecturers in washing the vehicle wheels and chassis.
13 - Then wash and disinfect the boots and place them in the boot dryer. Disinfect the overalls and hang them on the hangers.
14 – Wash and disinfect hands, and leave.
15 - For more information, scan the QR Code on the poster displayed in the Garage.

NOTE: Ask the lecturers whether eating and drinking are permitted on the farm.

PERSONAL PROTECTIVE EQUIPMENT (PPEs):

A - Waterproof overalls, green rubber boots and PPE (e.g., gloves, caps and boot covers) provided by FMV.
B - Personal steel-toe boots for Equine Clinical Practice classes.

3.3.8. Special Situations: Pig Farms and Poultry Farms

Pig Farms:

- Students and teaching staff must shower upon entering the pig farm, and sometimes upon leaving.
- Clothing and boots to be used will be provided by the pig farm.
- Bringing mobile phones or personal items is prohibited.
- Data collection is carried out using clipboards provided by the pig farm.

- Photographic records may only be taken using the lecturer's mobile phone.
- Clinical equipment to be used (e.g., ultrasound scanner, stethoscope) is exclusive to the pig farm.
- Vehicle wheels will be disinfected upon entry to and exit from the pig farm.

Poultry Farms:

- Rules similar to those for pig farms apply, with special attention to the risk of respiratory infections.
- The poultry farm may require the use of FFP2 masks and other PPE during visits taking place in epidemiological outbreak scenarios of Newcastle Disease or Avian Influenza in the region.
- Only poultry farms located in Avian Influenza–free zones should be visited

4. Companion Animal Hospital

4.1. Introduction

- It is essential that all students, clinicians, nurses, and staff are familiar with the basic principles of hygiene and personal protection. All individuals working in the Companion Animal Teaching Hospital (HE-AC) are responsible for maintaining cleanliness within the facilities.

4.2. General Attire

- FMV recommends the use of scrub attire for all staff and students in order to reduce risk and limit the potential exposure of people or other animals outside the HE-AC facilities.
- All staff and students must wear clean professional clothing, clean outer protective gowns, and clean, appropriate footwear at all times while working in the HE-AC.
- Uniforms must be protected with a white coat or a blue jacket/sweatshirt when outside the surgery rooms.
- Footwear must be disinfected during work using Klorkleen. Waterproof footwear is recommended to limit potential damage caused by disinfectant solutions.
- Outer protective gowns and footwear must be changed or cleaned and disinfected whenever soiled with feces, urine, blood, nasal discharges, or other body fluids.
- Upon arriving at the HE-AC, all staff, students, and trainees must change from their personal clothing into their designated scrubs and store them, along with their personal belongings, in individual lockers.
- Lockers are located in the corridor of the surgery changing room area.
- Changing clothes must take place in the surgery changing rooms.
- Each student or trainee must have a padlock to temporarily secure their locker.
- Each student/trainee must have their own petroleum-blue scrub set and rubber clogs or trainers for exclusive use within the HE-AC, which must be easily washable and disinfectable.
- Each student/trainee must have a spare scrub set to change into in case the first set becomes contaminated with organic matter during a class in the HE-AC.
- It is forbidden to store personal belongings such as backpacks, bags, or clothing anywhere other than the individual lockers.
- At the end of class, students/trainees collect their clothes and belongings from the lockers and change clothes in the surgery changing rooms, storing their scrubs and clogs in a clean bag.
- Whenever they need to return to the HE-AC for any reason, they must equip themselves in the same way

Poster 5 summarizes the instructions that students must follow whenever they have practical classes in the HE-AC. This poster is displayed at the entrance of the HE-AC.

Poster 5

Instructions for students regarding the Biosafety Standard Operating Procedures in force at the Companion Animal Teaching Hospital

COMPANION ANIMAL TEACHING HOSPITAL (HE-AC)

INSTRUCTIONS FOR STUDENTS

1 – Store your belongings in a locker on Floor 0 of the HE-AC, take a bag with your blue hospital scrubs and your hospital clogs or trainers, and lock the locker with your padlock.

2 – Tie back long hair.

3 – Go to the CHANGING ROOM on Floor 0. Remove your shoes and place them under the wooden benches.

4 – Put on your blue hospital scrubs and your hospital clogs or trainers.

5 – Go up the stairs to Floor 1 of the HE-AC. Always follow the marked entry and exit routes.

6 – Go to the room where your practical class will take place (e.g., consultation room, general hospitalization ward, X-ray, CT, etc.) and wait for authorization from the lecturer or clinical instructor before entering.

7 – Disinfect your hands when entering and leaving the HE-AC.

8 – After class, return to the CHANGING ROOM on Floor 0, remove your blue scrubs and hospital clogs or trainers, store them in your clean bag, and put your shoes back on.

9 – Remove your belongings from the locker on Floor 0 of the HE-AC, store your padlock, and leave the locker open.

10 – If you have any questions, read the QR Code on the poster to access more detailed information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

A - Personal blue hospital scrubs.
B - Personal hospital clogs or trainers for exclusive use in the HE, clean.
C - The remaining PPE, e.g., gloves, is provided by FMV.

4.3. Patient Hygiene

- For basic hygiene and reduction of infection pressure, it is very important that HE-AC patients are housed in a clean cage. Before housing a new patient in a cage, ensure that all organic fluids from the previous animal (feces, blood, urine, etc.) and soiled materials (pads, bedding) have been cleaned.

- The cleaning staff clean the corridors daily. Nurses, assistants, and students are responsible for cleaning and disinfecting cages, following current procedures. Feces or wet bedding must be removed immediately and the cage disinfected by students and/or nurses/assistants.
- Cages used for non-contagious patients are regularly emptied, cleaned, and disinfected between use by different animals.
- Water bowls must be cleaned regularly (at least twice daily or as needed) during an animal's hospitalization and must be cleaned and disinfected between use by different animals. The presence of water in the bowl must be checked regularly. The bowl must be refilled with fresh water at least twice daily after cleaning.
- Food bowls must be cleaned regularly (at least twice daily or as needed) during an animal's hospitalization and must be cleaned and disinfected between use by different animals. Leftover food must be discarded in the appropriate waste container.
- Patients must be kept as clean as possible; all excretions or secretions must be removed as soon as detected. Dirty patients must be washed, and all patients must be brushed regularly.
- The area around the cage must be tidy and clean, meaning no scattered medications or materials, no bedding outside the cage, and no student equipment.
- If patients defecate outside a cage (either inside Building D or in the walking area), feces must be collected immediately. If patients urinate inside Building D, the floor must be cleaned, disinfected, and dried.
- When a patient is discharged, the cage must be cleaned as soon as possible.
- Patients suspected or confirmed to be infected (Classes 3 and 4) are transported to the HE-AC Biological Isolation and Containment Unit (UICB-AC), where they are treated in isolation.

4.4. Food and beverages

- Food and beverages may only be stored and consumed outside the HE-AC, in the student cafeteria, in the rooms of veterinarians, nurses, and students, in staff offices, and in outdoor areas designated for this purpose.
- No medication, biological sample, or medical equipment may be stored in a refrigerator used for human food.
- No medication, biological sample, or other medical equipment may be stored in staff or student rest areas.
- It is strictly forbidden to store or consume food and beverages in patient care areas.
- Patients are not allowed in areas where food and beverages are stored or consumed.
- Food and beverages must not be left out for long periods, in order to avoid bacterial growth and the risk of foodborne illness.
- Refrigerators used to store patient food or medications must not be used to store human food or beverages.

4.5. Cleaning Procedures and General Hygiene

4.5.1. Cleaning Procedures

- Maintaining cleanliness of the HE-AC and personal hygiene are responsibilities of all staff members and students who study and work in the HE-AC.
- Hands must be washed and disinfected with an alcohol-based hand antiseptic before and after handling each patient.

- Hands must also be washed and sanitized when leaving the hospitalization ward, before working in other areas of the HE-AC.
- Disposable examination gloves must be used when triaging high-risk patients (Class 3 and 4) and during their transport to the UICB-AC, as well as when handling immunosuppressed animals or those with excretions, secretions, or wounds.
- Surfaces and equipment contaminated with feces, secretions, or blood must be cleaned and disinfected by the students/trainees/staff responsible for the patient. This is particularly important after triaging patients suspected of infection with Class 3 or Class 4 infectious agentes.

4.5.2. General Disinfection Protocol

- Clean and disinfect all equipment between patients (muzzles, speculums, forceps). Clean equipment may be returned for sterilization when necessary.
- Students' personal equipment (e.g., scissors, thermometer, stethoscope, and penlight) must be routinely cleaned and disinfected.
- If fleas or ticks are found on a patient, treat the animal with an antiparasitic spray.
- Appropriate clothing must be worn when using disinfectants. Additional PPE, such as gloves, masks, and disposable gowns, must be used whenever splashing is likely during the disinfection process.
- Remove all inorganic and organic material before disinfection. The presence of heavy contamination will inactivate most disinfectants. If organic material is removed using a hose, care must be taken to minimize aerosolization and the spread of potential infectious agents.
- Wash the cage, including walls, doors, feeding bowls, and water bowls, with water and detergent or soap. Scrubbing is essential to remove biofilms and residual debris that interfere with the disinfection process.
- Rinse the area thoroughly to remove detergent residues. Note: disinfectants may be inactivated by detergents or soap, so it is very important to rinse and remove detergent residues after use.
- Allow the area to dry as much as possible to avoid dilution of disinfectant solutions.
- Apply the disinfectant solution (prepared according to the manufacturer's instructions) to the walls and door of the cage. The disinfectant must remain in contact with the surfaces for several minutes (ideally 15 minutes, or according to the manufacturer's instructions).
- Remove excess disinfectant solution with water.
- Disinfectant must be removed from all surfaces before admitting another patient into the cage.
- After disinfection, remove PPE and wash hands.
- All multipurpose areas (e.g., examination rooms) must be tidied, cleaned, and disinfected after use by the staff and students responsible for the patient, regardless of infectious status

4.5.3. Instrument and Equipment Disinfection Protocol

- All instruments, equipment, and other items (e.g., gastric tubes, oral speculums, endoscopes, cleaning tools, clipper blades) must be cleaned and sterilized or disinfected between uses in different patients.
- Materials normally sterilized after use (e.g., surgical instruments) must be cleaned with enzymatic detergent and returned to the cleaning service for sterilization.
- Surfaces or equipment contaminated with feces, secretions, or blood must be cleaned and disinfected immediately by the staff and students responsible for the patient.

- **Stethoscopes**

- Staff and students' stethoscopes may be used on Class 1–2 patients but must be regularly disinfected with hydroalcoholic solution (Promanum), namely at the beginning and end of the day.

- **Thermometers**

- Thermometers must be carefully cleaned and disinfected after each patient using alcohol or Sterilium.

- Between patients, thermometers used for continuous temperature monitoring (e.g., during anesthesia) must be carefully cleaned (with a cloth or washing) to remove gross fecal material and disinfected by immersion in alcohol and/or chlorhexidine solutions.

- Other instruments and equipment belonging to staff and students (e.g., forceps, scissors) may be used on multiple non-contagious patients (Class 1 and 2) but must be cleaned and disinfected between patients with 70% isopropyl alcohol or Sterilium, available in various areas.

- Individuals walking dogs are responsible for cleaning feces from the ground. Paper bins and waste containers located in various areas of the HE-AC provide plastic bags in the animal walking areas around the hospital.

- All rooms must be kept clean and tidy at all times, including tabletops, counters, and floors. All students' personal belongings must be stored in lockers.

4.5.4. Walking Area

- This area must be cleaned daily and immediately after each defecation, which is the responsibility of the student/nurse/assistant who takes the dog for a walk.

4.6. Guidelines for the Admission and Handling of Small Animals

4.6.1. Outpatients

- Small animals without clinical signs of infectious disease may be accompanied by their owner in the waiting room.
- Outpatients may be hospitalized for a short period (if additional tests or procedures are to be completed), provided they are not Class 3 or 4 patients.
- Outpatients should be taken to hospitalization areas as little as possible.
- Students, nurses, and veterinarians are responsible for the immediate removal and proper disposal of feces from outpatient cages. If the patient urinates and/or defecates, the responsible staff must temporarily remove the animal from the cage and clean the area, rather than using a different cage.
- If an FMV bowl is used to give water or feed the patient, the student and the responsible team are in charge of cleaning and disinfecting it with chlorhexidine (following the manufacturer's instructions) after use.

4.6.2. Hospitaliized Patients

4.6.2.1. Cage Allocation

- Cages for hospitalized patients are preferably assigned by the nursing team or by the person responsible for the hospitalization area.
- Due to the risk of loss, contamination, or organic matter contamination, owners' bedding, blankets, collars, and leashes must be returned to them prior to hospitalization.

- If the owner insists on leaving bedding or a blanket for their animal, they must be informed that the item may not be returned.
- A clean cage must be located in the ward designated by one of the staff members mentioned above.
- A cage card must be prepared with the client/patient information detailing the animal's name, weight, and date of admission.
- Whenever justified, relevant information must be indicated on the cage identification (e.g., "Keep fasting", "Caution – bites").
- Diets containing raw meat or bones are not allowed at FMV.
- Fresh water must be provided unless otherwise instructed by the veterinarian.
- Animals must not be moved to another cage unless expressly indicated by the person responsible for hospitalization.
- When the patient is discharged, the cage must be immediately cleaned and disinfected by the student, trainee, or staff member. A "Clean" sign is then placed on the cage to indicate that it is available for another patient.
- To "reserve" a cage for day patients that will return (e.g., from the surgery room), a sign indicating "Cage in use" must be placed.

4.6.2.2. Patient Records and Medications

- For hospitalized patients, the respective medical record is available in the hospitalization software system.
- Medications and other materials used for hospitalized patients must be stored in the "corridor medication cabinet" or in the box attached to the patient's cage. All medications and materials dedicated to a patient must be clearly labeled with the patient's name.

4.6.2.4. Food and Water

- All food (including that provided by clients) must be stored in appropriate plastic bags, cans, or containers with tight-fitting lids.
- Only minimal quantities of food should be stored in the hospitalization refrigerator to prevent contamination.
- If a new can is opened, the opening date must be clearly indicated on the outside of the can, and a plastic lid must seal it before being stored in the refrigerator.
- All cans opened more than two days previously must no longer be used and must be discarded.

4.6.2.5. Bedding

- Students, nursing staff, and veterinarians are responsible for patient bedding at the time of admission and throughout hospitalization.
- Occupied cages are cleaned at least twice daily by students, technical staff, trainees, or veterinarians, and bedding is replaced if necessary.
- If cages are dirty or wet, students, technical staff, and veterinarians are responsible for checking, cleaning, and replacing bedding.

4.6.2.6. Discharge

- Quando o paciente tiver alta médica, a jaula deverá ser limpa o mais rapidamente possível.

- Before discharge, owners must be informed about potential infectious risks and receive recommendations for their control at home.
- The expected date and time of discharge must be recorded in the electronic record and communicated to the nurses, trainee, or veterinarian, in order to optimize patient hygiene at discharge.
- Students, nursing staff, and veterinarians are responsible for removing items around cages and ensuring they are discarded, stored, or cleaned and disinfected (fluids, brushes, protective aprons, papers).
- When the patient is discharged, the cage must be cleaned as soon as possible.

4.6.2.7. Owners' Items

- Owners' items must not be left with patients at the HE-AC.
- The HE-AC provides all necessary materials for patients.
- If an owner insists on providing their own materials, with exceptional approval from the veterinarian, they must understand that the items may not be returned.

4.7. Cleaning Protocols

4.7.1. Parking Area

- The parking area and adjacent lawns will be checked at least weekly for removal of any remaining feces. The area, including concrete surfaces, must be cleaned at least once a year.

4.7.2. Hospitalization Area

- Students, technical staff, and veterinarians clean and disinfect all cages in use at least daily and more frequently if necessary.
- Once vacated, cages are cleaned and disinfected as soon as possible and properly by the students, technical support team, or clinicians responsible for the patient.
- Occupied cages are thoroughly cleaned and disinfected daily, preferably while patients are being walked or undergoing diagnostic or therapeutic procedures, or during owner visits.
- Whenever a cage is excessively dirty or wet, students, veterinarians, and technical staff are responsible for cleaning, disinfecting, and replacing bedding.

4.7.3. Routine Cage Cleaning

- To be effective, disinfectants must be used on clean surfaces. Therefore, before disinfection, all organic material must be removed by scrubbing surfaces with detergent. The surface must be washed before disinfection. Biofilms develop in areas with stagnant water and where disinfectant remains on dirty surfaces.
- General cleaning principles: it is imperative to remember that when using disinfectants, more does not mean better. Using the correct dilution (as recommended by the manufacturer) provides optimal disinfectant action. Excessive use of disinfectants may promote microbial resistance.
- Special care must be taken when working in high-risk areas to avoid contaminating equipment or other areas.

Cleaning Procedures for an Unoccupied Cage That Housed Class 1 and 2 Dogs

- Wear appropriate clothing (protective clothing if necessary; place a sign on the cage).

- Remove all bedding to the appropriate waste container.
- Sweep and scrub the floor to remove all debris.
- Wash the floor and walls with water and detergent to remove gross debris. Scrub dirty areas with a brush and detergent.
- Wash and rinse the cage with water.
- Apply Virkon disinfectant.
- Allow the cage to dry (ideally for 15 minutes).
- Clean and disinfect the adjacent corridor.
- Cleaning utensils must be disinfected at the end of each day (including handles) and between corridors when necessary.

Daily Routines

- All procedures carried out by nurses must be performed by trainees and students when requested. Dirty cages are cleaned and animals are not transferred to another cage.
- When doing so, all unoccupied cages must be in perfect condition by 08:00.
- Sinks and drains in consultation rooms and the hospitalization area must be cleaned and disinfected daily.

Monthly Routines

- Areas not used daily (e.g., tops of walls, cages, windows, scales, sinks) must be cleaned monthly to prevent dust accumulation.

Biannual Routines

- All floors must be cleaned and disinfected.
- The isolation area must be emptied and thoroughly cleaned, scrubbed, and disinfected from top to bottom.

Annual Routines

- The entire hospitalization area must be thoroughly cleaned, scrubbed, and disinfected, including all equipment.
- A schedule must be prepared, and the work must be evaluated by the Head of Hospitalization.

4.8. Management of patients suspected of infectious disease

- Special precautions are required when treating patients infected with contagious pathogens. Due to their transmission potential, conditions of particular concern include: patients with acute gastrointestinal disorders (e.g., diarrhoea), acute respiratory tract infections, or infections caused by multidrug-resistant bacteria.
- Animals suspected of infectious disease should be treated on an outpatient basis whenever their clinical condition allows.
- Appointments for possible infectious diseases will be handled by receptionists, staff, and students, and cases will be received as follows:

- If the client mentions over the phone acute vomiting, cough, sneezing, or diarrhoea suspected to be caused by an infectious disease, the owner will be asked to keep their animal in the car in the HE-AC parking area until check-in. After that, the patient should preferably be transported on a

stretcher or in a cage/carrier to minimise contamination of the hospital environment, or to an examination room or to the UICB-AC, depending on the circumstances;

- The owner's description will be recorded in the schedule, including an indication that the patient may be suffering from an infectious disease;

- If the appointment is scheduled, the receptionist will call the service area to warn that a potentially contagious patient will be presented;

- If the client arrives at reception with the animal without prior notice, the receptionist must immediately contact the reception service and coordinate receiving the animal in an examination room or in the UICB-AC in order to minimise hospital contamination;

- Everything must be done to minimise direct contact between the patient and other HE-AC patients;

- Animals must be transported to the examination area in the HE-AC or in the UICB-AC via the most direct route to limit hospital contamination. Consider using a stretcher whenever possible to limit environmental contamination.

• Treatment and diagnostic areas, hospital equipment, and the clothing of staff and students must be cleaned and disinfected immediately after contact with potentially infectious patients.

• If infectious disease is suspected based on history, physical examination, or assessment of previously performed laboratory tests:

- Close the examination room;

- Place a sign "Do not use, disinfection required" on the door;

- Notify the cleaning staff of the suspected infectious agent and do not use the room until the signage is removed or until another appropriate cleaning/disinfection has been carried out.

• Class 3 patients are isolated in the Intermediate Area of the UICB-AC.

• If a notifiable and/or zoonotic disease is suspected/confirmed, this must be communicated to the CHB (email sent to: biosseguranca@fmv.ulisboa.pt) as soon as possible, so that they can supervise the case and notify the suspicion/confirmation to the DGAV (form 1728, sent to the following addresses: secdspa@dgav.pt and secretariado.lvt@dgav.pt).

• Any animal with a history of acute vomiting and diarrhoea, and/or a history of acute cough or respiratory signs suspected to be of infectious origin must be treated as a patient suspected of being contagious (Class 3 or 4).

• Hospitalised animals suspected of infectious gastrointestinal disease must be considered possible sources of hospital-acquired or zoonotic infections and therefore must not be walked in common areas. All waste must be disposed of appropriately, and contaminated surfaces must be properly cleaned, disinfected, and dried as quickly as possible.

• After discharge, staff and students must ensure that the instructions given to clients adequately address infectious hazards to other animals and human beings and provide recommendations to protect people and other animals.

4.8.1. Access and Exit Routes of the Biological Isolation and Containment Unit and Rules for Patient Movement

The infectious diseases area where the Biological Isolation and Containment Unit (UICB) is located, **intended for the hospitalisation and follow-up of companion animals**, has differentiated and mandatory physical routes designed to ensure separation between patients, people, and functional flows, minimising the risk of cross-contamination. Patient circulation for complementary diagnostic tests and surgery is integrated into these routes and subject to strict biosafety rules.

4.8.1.1. Access for Students and Staff

- Access of students and staff to the UICB is carried out **exclusively via a staircase leading to a door with exclusive access to the UICB**, which opens into the unit's sanitary facilities.
- Circulation on the staircase is carried out wearing **usual clothing (*street clothes*)**.
- The transport of patients, clinical materials, equipment, or waste through this route is **expressly prohibited**.
- Changing into uniforms and donning personal protective equipment (PPE) is carried out **only in the designated areas of the UICB**, according to the protocols in force

4.8.1.2. Patient Access and Exit Routes

The routes intended for patients are carried out via a **ramp with two lanes, physically separated by structural panels**, ensuring segregation of flows and biological containment

1. **RAMP FOR ACCESS TO HOSPITALISATION / INPATIENT CARE (Dirty Zone)**

- The main **ramp** providing access to the UICB hospitalisation/inpatient care area **leads to the UICB admission door**.
- **All patients admitted to the UICB must enter via this ramp**; this is the **only** authorised route for their arrival and admission to the unit.
- This route is also used **for the temporary exit of UICB patients** whenever there is a need for complementary diagnostic tests (e.g., X-ray, ultrasound, CT or magnetic resonance imaging) or surgical interventions.
- This ramp is considered a **Dirty Zone** and is subject to specific rules regarding circulation, use of PPE, and disinfection.

2. **RAMP FOR ACCESS TO THE CONSULTATION ROOM (RE-EVALUATIONS AND HOSPITAL DISCHARGE)**

- A parallel ramp, **physically separated from the hospitalisation ramp**, leads to the **consultation room** intended for clinical re-evaluations.
- Through this route:

- **Patients coming from the UICB descend for re-evaluation consultations**;
- **Patients discharged from the UICB ascend**, leaving the infectious diseases area.

- This ramp **must not be used** for initial admission of patients or for movements to complementary diagnostic tests or surgery

4.8.1.3. Rules for Patient Movement for Complementary Diagnostic Tests and Surgeries

- UICB patients **must always be transported on a stretcher and, whenever possible, inside a properly closed and disinfectable transport carrier/box** suitable for the animal species and clinical condition.
- Transport must be carried out **exclusively via the hospitalisation access ramp (Dirty Zone)**, avoiding any contact with clean routes or common areas of the HE-AC.
- Patient movement must be carried out **by a UICB staff member**, properly equipped with appropriate PPE according to the patient's biological risk level.
- **Whenever possible, these patients should be received last in the operation of the respective services** (complementary tests or surgical suite) to reduce the risk of contamination of other patients and areas.

- After the patient leaves, **the service used must be fully disinfected**, including surfaces, equipment, and contact areas, **using the designated biocide**, in accordance with the institutional protocols in force.
- Upon the patient's return to the UICB, **a second staff member from the unit must be present**, also equipped with appropriate PPE, responsible for receiving the patient and ensuring their safe entry into the UICB.
- The staff member who carried out the transport **must remove all PPE in the anteroom**, **disinfect hands, and only then may enter the common areas of the UICB**.
- After each movement, **the stretcher, the transport carrier/box, and any surfaces or equipment used must be properly disinfected** in accordance with the protocols in force

4.8.1.3. General Rules

- Strict compliance with the defined routes and rules is **mandatory for all students, professionals, and services involved**.
- Any deviation from the established routes constitutes a **breach of biosafety rules** and must be reported to the UICB coordination.
- Routes and circulation areas are subject to **regular cleaning and disinfection**, according to institutional protocols and the associated biological risk level.

4.8.2. Classification of suspected/confirmed infectious disease patients

4.8.2.1. General rules (Class 1, 2, 3 and 4)

- For patient classification, consult the initial chapter.
- This classification has implications for the possibility of owners visiting their animals, which must be explained at the initial consultation or as early as possible after assigning Class 3 or Class 4 status to an animal.
- Class 3 dogs, isolated in the Intermediate Area of the UICB-AC, may still be visited by owners, under stricter visiting rules and, if possible, in the hospitalisation cage or after transfer to a consultation room that will be disinfected after the visit.
- Class 4 dogs may only be visited under exceptional circumstances (e.g., during euthanasia). Even in such circumstances, the visit must be as brief as possible. If the owner insists, a brief visit to the UICB-AC, complying with barrier nursing rules, may be authorised by the responsible veterinarian.

4.8.2.2. Special care during hospitalisation

4.8.2.2.1. Movement of high-risk patients

- Class 4 patients must be transported directly to the UICB-AC.
- Patients transferred from the main hospital to the UICB-AC must follow a route that minimises exposure to other patients and contamination of the facilities.
- The FMV team moving these patients must apply barrier nursing precautions.
- Any areas or equipment contaminated during transport must be immediately cleaned with water and detergent and then disinfected.
- All movements must be minimised and, whenever possible, patients should be transported on a stretcher or in a cage/carrier rather than being carried in arms.
- All waste and faeces must be removed and all contaminated surfaces must be cleaned, disinfected, and dried as quickly as possible. Low-traffic areas should be preferred and, whenever possible, patients should be transferred at the end of the day, after other animals have been moved

4.8.2.2.2. Diagnostic tests required for a patient suspected of infection

• Diagnostic testing for infectious and/or zoonotic diseases provides essential information for proper patient management. Testing directly benefits patients and clients by allowing protection of human health. It also enables proper management of infectious risks for patients, staff, and students of the FMV.

• It is therefore mandatory that all hospitalised patients undergo diagnostic testing if a specific infectious or zoonotic disease is seriously considered. Diagnostic testing is an essential part of patient management at the FMV.

• It is the responsibility of the veterinarian in charge of the patient to ensure that appropriate biological samples are submitted for testing and that proper biosafety precautions are taken during their collection, packaging, labelling, and transport.

• The veterinarian responsible for the patient must be consulted before transferring any Class 3 or 4 patient for additional procedures.

• Whenever possible, diagnostic, surgical, or other procedures should be carried out wherever high-risk patients are housed, rather than transferring them to common examination and treatment areas.

• Barrier nursing precautions must be followed by all persons at all times during diagnostic or other procedures.

• If the patient requires diagnostic or other procedures (e.g., radiography, surgery) that can only be performed in the HE-AC, these procedures should be planned for the end of the day whenever possible:

- In general, all barrier nursing precautions required in the patient's housing area must be implemented wherever the patient is handled;

- Instruments, equipment, and the environment must be carefully cleaned, disinfected, and sterilised after the procedure, regardless of where the procedure was performed.

• The Director of the HE-AC must inform the CHB of any HE-AC staff member suspected of having contracted an infectious disease in the hospital environment (email sent to: biosseguranca@fmv.ulisboa.pt) as soon as possible, so that the CHB can follow the case..

4.8.2.2.3. Biological samples from patients suspected or confirmed to be contagious

• Biological samples must be handled with the same barrier nursing precautions as the patient (gown, gloves, mask).

• All biological samples from Class 3 or 4 patients must be stored in a sealed plastic bag, and the suspected infectious disease/agent must be indicated on the outside of the plastic bag.

• Special care must be taken to avoid contaminating the outside of the bag when placing samples inside.

• The suspected disease or pathogen must be clearly specified on all submission forms.

4.8.2.2.4. Use of ultrasound, radiography, or electrocardiography in Class 4 patients

• Auxiliary service staff must wear appropriate clothing and apply barrier precautions when handling Class 4 patients outside the UICB-AC.

• Any gross organic material must be cleaned before disinfection.

• After performing an ECG, staff must clean and disinfect the leads with a gauze pad soaked in disinfectant (Promanum), paying particular attention to clips and wires that were in contact with the patient.

- After performing endoscopy, the technical team will clean and disinfect the endoscope, light source, anaesthetic circuits, filters, and other equipment.
- All radiography equipment and materials must be cleaned and disinfected after use.
- Cassettes must be placed in plastic bags before use.

4.8.2.2.5. Surgery/Anaesthesia in isolated patients

- Auxiliary service staff must wear appropriate clothing and apply barrier precautions when handling Class 4 patients outside the UICB-AC.
- Clean any gross organic material before disinfection.
- After surgery, staff must clean and disinfect all materials and place them in a sealed plastic bag labelled with the suspected or confirmed pathogen/disease before sending the material for sterilisation.
- No other patient may enter the room before complete and rigorous cleaning and disinfection of all surfaces.
- Whenever possible, surgeries in Class 3 or 4 patients should be scheduled for the end of the day.
- A notice must be left for cleaning staff stating the suspected or confirmed infectious disease/pathogen and the recommended disinfection protocol.

4.8.3. Management of patients suspected/confirmed of infectious disease

Diseases/conditions

- Gastrointestinal infections: gastrointestinal pathogens of concern (nosocomial risks) include: parvovirus in unvaccinated or vaccination-naïve animals, panleukopenia virus, and *Salmonella* spp.
- Respiratory infections: respiratory pathogens of concern (nosocomial risks) include: influenza virus, canine distemper virus, *Aspergillus* spp., feline infectious rhinotracheitis complex.
- Neurological diseases: neurological pathogens of concern (nosocomial infection risks) include: rabies virus and canine distemper virus.

4.8.4. Management of patients infected or colonised with multidrug-resistant bacteria

- Patients infected with multidrug-resistant bacteria pose a potential hazard to other patients, students, faculty, HE-AC staff, and clients. As such, they are managed with enhanced biosafety precautions aimed at mitigating their spread within the HE-AC. They are classified as Class 3 and isolated in the Intermediate Area of the UICB-AC.

Poster 6 contains instructions for students on the Standard Operating Procedures for Biosecurity in effect at UICB-AC.

Poster 6

Instructions for students on the Biosafety Standard Operating Procedures in force at the Biological Isolation and Containment Unit of the Companion Animal Teaching Hospital

BIOLOGICAL ISOLATION AND CONTAINMENT UNIT OF THE COMPANION ANIMAL HOSPITAL

INSTRUCTIONS FOR STUDENTS / VETERINARIANS / NURSES AND ASSISTANTS (EMEAs)

1. Access to the UICB is **restricted to authorised personnel and EMEAs with prior biosafety training**, within supervised teaching activities and training for veterinarians, nurses, and assistants.
2. The use of tablets, laptops, or electronic devices is not permitted in the unit. Mobile phones must remain stored in the locker.
3. Go to the UICB **only via the designated circulation routes**, strictly respecting entry and exit pathways.

Entry into the UICB is exclusively **through the door designated for staff entry**. After entering through this door, **EMEAs** must go to the sanitary facilities, identified by gender, located in the corridor accessed by the door. In the sanitary facilities they must:

- Remove personal clothing and all personal belongings (including backpack, computer, tablet, and mobile phone) and store them in the designated locker.
- Put on the surgical scrubs provided by the UICB.
- No clothing other than personal underwear may be worn under the surgical scrubs.
- Put on the medical clogs provided by the UICB.
- Keep long hair fully tied back.
- Remove all personal adornments (necklaces, earrings, rings, bracelets, and watches) and store them properly.
- Keep nails short/trimmed and without nail polish, gel, or other artificial coverings.

4. After leaving the sanitary facilities, already wearing surgical scrubs and medical clogs, **EMEAs** must enter the UICB via the access corridor and step on the **disinfectant footbaths** located there before proceeding into the interior of the UICB.
5. **Circulation inside the UICB, in clean areas** (i.e., outside hospitalisation/inpatient rooms), must be carried out exclusively wearing the surgical scrubs and medical clogs for exclusive use within the unit.
6. Before entering any **hospitalisation/inpatient room** they must:

- Perform hand hygiene.
- Put on Personal Protective Equipment (PPE) in the following **order**:

1º Shoe covers
2º Disposable gown or disposable coverall if zoonotic agent risk
3º Surgical mask or FFP2 (or higher, if indicated)
4º Cap (hair fully covered)
5º Protective goggles/face shield whenever there is risk of splashes or aerosols or zoonotic agent risk
6º Disposable gloves

7. After fully donning PPE, **EMEAs** must step on the **disinfectant footbath** at the entrance of each hospitalisation/inpatient room and only then enter the room.
8. Each **EMEA** must strictly comply with **PPE change rules between patients**, as well as hand hygiene and disinfection of equipment used, according to prior training and the instructions of the supervising lecturer.

9. Circulation between rooms or handling more than one patient without **complete PPE change** is prohibited.
10. **At the end of the activity, inside the hospitalisation room**, remove PPE in the following order and discard it in the container located next to the room exit (**Contaminated Zone**):
    1º Disposable gloves
    2º Disposable gown or disposable coverall if zoonotic agent risk
    3º Perform hand hygiene
    4º Shoe covers.

Then leave the room, step on the disinfectant mat, remove goggles and face shield (to be disinfected), and discard the following PPE, in this order, in the container located outside the room (**Clean Zone**):
    1º Cap
    2º Mask

Perform hand hygiene in the UICB preparation area.
11. Go to the changing room to collect your belongings and leave the UICB following the **exit route**.
12. In case of doubt, always follow the instructions of the lecturer or the person responsible for the UICB, consult the signage, or scan the **QR Code** on the poster for more detailed information.

PERSONAL PROTECTIVE EQUIPMENT (PPE)
All PPE is provided by the UICB:
- Surgical scrubs and medical clogs
- Surgical masks or FFP2/FFP3, according to risk level
- Caps
- Disposable gowns
- Disposable coveralls
- Goggles or face shields
- Disposable gloves
- Shoe covers.

4.9. Surgery and anaesthesia of companion animals

4.9.1. Clothing for the clean areas of the Surgical Centre

- Clean green surgical scrubs, caps, clogs, and masks are required to access areas designated as “clean” within the surgical facilities, including scrub rooms and operating theatres, delimited by blue lines.
- Poster 7 summarises the instructions students must follow when attending practical classes in the HE-AC Surgical Centre. This poster is displayed at the entrance to the ground floor changing room of the HE-AC

Poster 7

Instructions for students on the Biosafety Standard Operating Procedures in force in the HE-AC Surgical Centre

SURGICAL CENTRE OF THE COMPANION ANIMAL TEACHING HOSPITAL (HE-AC)

INSTRUCTIONS FOR STUDENTS

1 - Store your belongings in a locker on floor 0 of the HE-AC, take a clean bag with your hospital clogs, and lock the locker with your padlock.
2 - Tie back long hair.
3 - Go to the Changing Room on floor 0. Remove your shoes and place them under the wooden benches.
4 - Take a green surgical scrub set from the cabinet, put it on, and wear your hospital clogs.
5 - Follow the entry and exit routes of the Surgery Room.
6 - Go to the Surgery Room and wait for the lecturer's permission to enter.
7 - Disinfect your hands when entering and leaving the Surgery Room.
8 - After class, return to the Changing Room on floor 0, remove the green surgical scrub set and place it in the designated container. Store your clogs in a clean bag and put on your shoes.
9 - Remove your belongings from the locker on floor 0 of the HE-AC, store your padlock, and leave the locker open.
10 - If in doubt, scan the QR Code on the poster to consult more detailed information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

A - Green surgical scrubs, provided by FMV.
B - Personal hospital clogs, clean.
C - Other PPE, e.g., gloves, are provided by FMV.

- Green surgical scrubs must only be worn in the "clean area" of the Surgical Centre. They may not be worn in other areas of the Surgical Centre unless protected by a closed white gown.
- Outside the "clean areas" of the Surgical Centre, all students and staff must wear a clean white coat over the green surgical scrubs. They must also remove clogs whenever leaving the "clean areas."
- All persons, including cleaning and maintenance staff, are required to adhere to all relevant clothing policies in the surgical facilities.

For Class 3 and Class 4 patients:

- The set of bedding dedicated to patients in the hospitalisation wing (in the cage for Class 3 animals and in the antechamber for Class 4 patients) must be used when transporting animals to the clean area.
- A different set of the same outer clothing must be worn in the "clean" zones of the small animal surgical facility.

• After the procedure, this final set may be left with the animal in the cage if still in good condition.

4.9.2. Hygiene for peri-operative animal management

• High standards of cleanliness and hygiene must be maintained throughout the operating block.

• The surgical team and the patient's surgical site must be prepared aseptically. Aseptic technique must be maintained throughout surgery.

• Movements of anaesthesia students and team members between the anaesthesia preparation area, the operating theatre, and the veterinary hospital must be minimised.

• The presence of non-essential persons is prohibited

For Class 3 and Class 4 patients:

• Whenever possible, clipping and surgical preparation should be carried out in the cage in the UICB-AC (Class 3 and 4). For this purpose, a brief surgical preparation will be performed in the clean area of the surgical facility.

• All waste must be disposed of immediately in appropriate waste containers and all surfaces must be immediately cleaned, disinfected, and dried

4.9.3. Guidelines for peri-operative animal management

• Peri-operative patient management can greatly influence the likelihood of infection occurring in the Surgical Centre or other hospital-acquired infections. Therefore, basic management procedures must always emphasise the use of barrier nursing precautions and maximise separation between patients. Hygiene standards for people, patients, and the environment in surgical and peri-operative areas must be among the highest at the FMV.

• Hands must also be washed and disinfected after contact with the patient to avoid contaminating hand-contact surfaces (e.g., doors, counters, equipment). Examination gloves must be used as a nursing precaution whenever necessary (e.g., contact with surgical sites) and discarded after each patient. The use of gloves does not replace hand washing and disinfection after removal.

• Hands must be washed and disinfected with an alcohol-based solution between patients.

• Faeces must be immediately removed from the anaesthesia preparation area or other operating block areas. If necessary, the floor must be washed between patients and disinfected.

• Equipment must be cleaned and disinfected after use.

• Routine environmental cleaning and disinfection (e.g., daily) must be carried out rigorously following prescribed protocols.

For Class 3 and Class 4 patients:

• The patient must be premedicated in its cage in the UICB-AC (Class 3 and 4).

• Transport to anaesthetic preparation must occur immediately before induction. A stretcher or transport cage must be used to minimise hospital contamination.

• A remote induction and preparation table must be used.

• All contaminated instruments and equipment must be cleaned and disinfected and then placed in a plastic bag labelled with the pathogen before being returned for sterilisation.

4.9.4. Anaesthesia induction area

- All suspected or confirmed contagious diseases/pathogens must be recorded on the anaesthetic form.
- The surgical site must be clipped immediately before surgery. Clipping the surgical site one day before surgery predisposes to colonisation by potentially pathogenic bacteria.
- Unless the responsible clinician decides otherwise, surgical patients will be transferred to the anaesthesia preparation area one hour before scheduled procedures (i.e., scheduled table time) and placed there until induction.
- Aseptically prepare the intravenous catheter site and place the catheter using aseptic technique.
- Class 1 and 2 dogs may recover in the anaesthesia preparation room.
- Patients must recover from anaesthesia in their own cage whenever possible (Class 3 and 4).
- The table used to transport the patient must be cleaned and disinfected (allowing a 15-minute contact time) and then thoroughly rinsed with water between uses.
- The oxygen insufflation tube used during recovery must be cleaned and sprayed with a chlorhexidine solution (allowing a 15-minute contact time). The distal end of the tube must be cleaned of debris with soap and water, soaked in chlorhexidine solution (allowing a 15-minute contact time), and washed between patients.

4.9.5. Other routine cleaning and disinfection procedures

- The operating theatre must be cleaned and disinfected immediately after surgery.
- All contaminated areas must be cleaned and disinfected immediately after the procedure.
- For Class 3 and 4 patients, all contaminated instruments and equipment must be cleaned and disinfected and then placed in a plastic bag labelled with the suspected pathogen before being returned for sterilisation.
- For Class 3 and 4 patients, all individuals in contact must carefully wash their hands, use alcohol gel, and remove contaminated clothing before handling other animals
- **Endotracheal tubes (ET)**

- Clean the inside and outside of the ET with water and neutral soap using a brush.
- Immerse the ET in a large container of chlorhexidine solution for at least 15 minutes.
- Rinse the ET thoroughly with warm water, taking care not to place it in the sink.
- Hang the ET to dry in the designated cabinet in the anaesthesia induction area.
- ET tubes are stored in this cabinet until needed.
- Any ET placed on the floor must be disinfected before use.

- Environmental samples should be regularly collected in recovery rooms and operating theatres and processed to detect the presence of pathogenic bacteria and quantify them.

4.9.6. Management of surgical patients with infectious disease

- It is the responsibility of the lead clinician to inform the anaesthesia and surgical team about imminent surgeries in animals with possible infectious diseases (particularly respiratory, gastrointestinal, and multidrug-resistant bacterial infections).
- An operating room with minimal cross-traffic must be selected.
- Surgery in animals with suspected infectious diseases should be avoided whenever possible. If absolutely necessary, surgery must be scheduled at the end of the day to minimise exposure of other patients.

- Students and clinicians assigned to surgical cases are responsible for identifying and communicating patients suspected/confirmed to be contagious.
- Students and clinicians assigned to these cases are responsible for ensuring that induction and recovery areas have been properly identified as potentially contaminated and that they have been properly decontaminated before being used by other patients.
- If the patient presents a high risk of transmission of a contagious pathogen, bathing with an antibacterial body soap (e.g., chlorhexidine soap) may be required, at the surgeon's discretion.

4.10. Biosafety in the Intensive Care Unit

4.10.1. General considerations for animal handling in the Intensive Care Unit

- Due to the intensive nature of nursing care provided in the Intensive Care Unit (ICU), it is essential to adhere strictly to hand hygiene and barrier nursing protocols.
- Thermometers must be cleaned and disinfected after each patient and stethoscopes must be cleaned and disinfected frequently, to minimise the risk of nosocomial transmission of pathogens.
- Minimise the number of staff and students who manage the cases.
- Whenever possible, students assigned to infectious patients should have no contact with immunosuppressed patients in other areas of the FMV (e.g., leukopenic patients, young animals, animals under immunosuppressive treatment, and diabetic patients). When the number of cases requires contact with suspected/confirmed infectious patients, treat other patients first.
- Class 3 or Class 4 animals requiring hospitalisation in the ICU (e.g., in the event of full capacity at the UICB-AC) will be placed in cages as far away as possible from other patients, insofar as the number of cases allows.
- A sanitary barrier around the animal housing area will be demarcated with adhesive tape placed on the floor in front of the cage.
- A footbath mat will be placed within the perimeter for use by anyone entering the Class 3 or 4 isolation area.
- Disposable protective gowns, a dedicated box containing gloves, a dedicated thermometer and a stethoscope will be available within the perimeter.
- Hospitalised patients with suspected or confirmed infectious diseases should urinate and defecate in the cage whenever possible.
- Waste must be promptly removed and contaminated surfaces must be appropriately cleaned and disinfected as quickly as possible.

4.10.2. General considerations for housing infectious/zoonotic patients in the ICU

- Patients with known gastrointestinal or respiratory disease must be identified at admission and communicated to ICU nurses and clinicians.
- Patients with confirmed canine parvovirosis, suspected/clinical signs of rabies, suspected/confirmed feline leukaemia, suspected/confirmed canine distemper, suspected/confirmed tularaemia, feline upper respiratory disease complex, or canine infectious tracheobronchitis (kennel cough), must be housed in the UICB-AC.
- Only the ICU supervisor may grant exceptional permission to house a Class 4 patient in the ICU (e.g., temporary closure of the UICB-AC for complete disinfection under sanitary void). In this case, the same level of biosafety will be applied.

4.10.3. Cleaning, disinfection and waste

- Immediately clean and disinfect any hospital equipment, stretchers and examination tables after contact with patients suspected/confirmed of infection, and follow general hygiene/cleaning guidelines.
- Clean and disinfect scales and examination tables used during the treatment of these patients immediately after the procedure. Every effort must be made to weigh and treat other animals before using shared equipment for potentially infectious patients.
- Staff and students must change any contaminated clothing after handling infectious patients.
- A separate mop and mop bucket will be provided for infectious patients.
- After handling the infectious patient, remove the barrier nursing gown and discard it as soiled. Remove and discard gloves, use the adhesive mat, disinfect clogs with Klorkleen, and then wash and disinfect hands.
- Appropriate waste containers must be used to collect all disposable materials that have been in contact with suspected infectious disease cases.

4.10.4. Additional disease-specific information

- It is strongly encouraged that all hospitalised patients undergo diagnostic testing if infection with a specific contagious or zoonotic agent cannot be excluded. Diseases for which testing is strongly encouraged include canine distemper, kennel cough, cryptosporidiosis, giardiasis, leptospirosis, parvovirosis and rabies. Diagnostic tests are considered essential for case management at the FMV and, therefore, patients will be classified as Class 4 if the owner refuses testing.

- **Patients carrying important antimicrobial-resistant bacteria (Class 3):**

- The CHB must be notified as quickly as possible of any bacterial infection showing an unusual antimicrobial resistance pattern, including surgical site infections, catheter-related infections and gastrointestinal infections.

- Whenever possible, these patients should be hospitalised in the UICB-AC. In an emergency, if ICU hospitalisation of patients with multidrug-resistant bacteria becomes necessary, they must be placed in cages distant from other patients, must be managed with strict barrier nursing precautions, and every effort must be made to discharge them as early as possible

4.11. Breaking transmission cycles

4.11.1. Visitors at the FMV

- Visiting hours for the General Hospitalisation service are from 15:30 to 20:00 daily. All visitors must check in at reception and remain in the waiting room to be escorted to their companion animal.
- All visitors must strictly adhere to biosafety precautions, if necessary.
- All visitors must be instructed to wash and disinfect their hands carefully after leaving hospitalisation areas.
- The general public is not authorised to visit hospitalisation areas for patients with multidrug-resistant bacteria. Special arrangements may be made to provide visits to visiting scientists by contacting the Head of Department or the HE-AC Director.

4.11.2. Clients at the FMV

- A student, clinician or nurse must escort clients to the animal's cage.
- Clients must comply with all applicable barrier nursing requirements in case of direct contact with their animal.
- Clients may visit their animals but are not authorised to circulate around the facilities and, specifically, are not authorised to touch other patients or read other animals' cards or treatment orders. Information about other patients is confidential, including diagnoses, and must not be disclosed.
- Owners may visit hospitalised patients. Other interested parties are not authorised to visit hospitalised patients without the owners' express authorisation.

4.11.3. Children at the FMV

- Children may not, under any circumstances, be left alone in the HE-AC.
- To avoid accidents and infectious risks, children must always be supervised by an adult.

4.11.4. Pets at the FMV

- Companion animals are not authorised under any circumstances to visit hospitalised patients.

4.12. Cadavers

4.12.1. Hygiene and disinfection of cages

- After a patient's death, the cage must be cleaned and all records collected.
- Cages used to house Class 1 and 2 patients must be cleaned and disinfected before housing a new patient.
- Cages used for Class 3 and 4 patients must be marked with a sign: "To be disinfected". No other animal is allowed to enter these cages before complete cleaning and disinfection, and verification by technical support staff, a nurse, or the responsible veterinarian.
- Students, nursing staff and clinicians are responsible for removing items around cages and ensuring they are discarded, filed, or cleaned and disinfected (fluids, brushes, protective aprons).

4.12.2. Cadaver storage

- If the animal dies or is euthanised in the cage, the cadaver must be removed as quickly as possible.
- Dead Class 3 or 4 patients must be stored in a sealed, waterproof and clearly identified bag to be transported to necropsy or cremation services.

4.12.3. Destination of cadavers

4.12.3.1. Anatomy and Pathology

- The cadaver must be taken to the Necropsy Service as quickly as possible, even during the night or weekends. Cadavers must not be stored in the HE-AC refrigerator.
- The animal will be placed:

- In the Pathology refrigerator if necropsy is required. The necropsy request form must be clearly present and attached to the cadaver. The patient status (Class 1–2, 3 or 4) must be clearly mentioned on the outside of the request form;

- or in the appropriate collection container if necropsy is not requested (no request form present). However, it must be clearly stated if the case has Class 3 or 4 status.

4.12.3.2. Cremation

- If the owner requests a cremation service for their animal, they may choose between individual or collective cremation.
- The company is authorised to transport cadavers. No other means of transport is accepted.
- While awaiting transport, the cadaver must be stored in the refrigerator.

4.13. Biological Isolation and Containment Unit (UICB-AC)

4.13.1. Introduction

- The Biological Isolation and Containment Unit (UICB-AC) is a specialised facility intended for the hospitalisation, diagnosis and treatment of patients with Class 3 and 4 diseases and plays a key role in controlling infectious risks in the HE-AC hospital environment.
- The UICB-AC operates under a negative-pressure system with HEPA filters, with restricted access to trained staff and strict compliance with biosafety protocols. All hospitalisation rooms have video surveillance. Patient flow occurs exclusively via a signposted route, in order to direct these patients straight to the UICB-AC, reducing contact with other areas of the FMV and avoiding contact with resident animals.
- The UICB-AC is organised into two distinct areas: an area dedicated to hospitalisation of Class 3 patients (designated Intermediate Area), and another area reserved for hospitalisation of Class 4 patients (designated Infectious/Contagious Area).
- The UICB-AC has 4 hospitalisation rooms, two for hospitalising patients with Class 3 diseases (Intermediate Area) and two for patients with Class 4 diseases (Infectious/Contagious Area)

- Room G0.29: cats with retroviruses (FIV and FeLV) without another concomitant Class 4 infectious disease. Feline Infectious Peritonitis. cats with doubtful health status. Class 3 diseases;
- Room G0.30: reserved for dogs with multidrug-resistant bacterial infections. Leptospirosis. Class 3 diseases;
- Room G0.28: cats with various infectious diseases such as Panleukopenia, Feline Infectious Upper Respiratory Disease. Class 4 diseases;
- Room G0.31: reserved for dogs with infectious gastroenteritis (e.g., canine parvovirosis) and other gastrointestinal diseases. Class 4 diseases;

- The UICB-AC also has a dedicated preparation room, a storage room and a work room for veterinarians, nurses and students.

4.13.2. General Biosecurity and Infection Control Guidelines

- Protect staff, students and visitors from zoonotic and nosocomial infections.
- Minimise cross-transmission between patients.
- Train students in infection control measures.
- Inform patient owners about infectious disease control in animals

4.13.3. Access and authorised personnel

- Access limited to authorised professionals trained in biosafety:

- Veterinarians, nurses and assistants on duty in the UICB-AC.
- Students under direct teaching supervision.

- Entry procedure:

- Entry through the sanitary facilities area;
- Changing from personal clothing into surgical scrubs provided by the UICB-AC;
- Before leaving the UICB-AC, surgical scrubs must be placed in a specific and clearly marked location, washed and disinfected

4.13.4. Personal Protective Equipment (PPE)

• To enter any hospitalisation room, PPE must be worn over the surgical scrubs (in order):

- Disposable cap;
- Surgical mask or FFP2 (or FFP3 in zoonotic cases);
- Protective goggles;
- Disposable gown or disposable coverall;
- Disposable gloves;
- Disposable shoe covers;

• PPE change is mandatory between patients:
- PPE must be fully discarded after each patient;
- Perform hand hygiene and put on new PPE before interacting with new patients;
- Immediately disinfect surfaces and instruments used with approved biocides

4.13.5. Isolation and cage distribution

• All cages are individual and are disinfected before use.
• In each hospitalisation room there is a minimum safety distance between cages.
• All hospitalisation rooms operate individually with negative pressure and HEPA-filter ventilation systems that ensure biocontainment of aerosols with microorganisms.

4.13.6. Cleaning, disinfection and quarantine

• In each hospitalisation room there are individual instruments per patient: thermometers, stethoscopes and others, with disposable protective covers.
• Daily cleaning of the floor throughout the UICB-AC is carried out with an appropriate disinfectant.
• After monitoring each patient, contact surfaces and any non-disposable instruments used are disinfected with a biocide, with an appropriate contact time.
• High-contact areas (handles, counters, sinks) are disinfected at the end of each shift and whenever necessary.
• Cage quarantine: after the patient is discharged, cages remain in quarantine for 72 hours, marked as “In quarantine”. After this period, deep disinfection is carried out before re-use and the cage is marked as disinfected.
• Annual disinfection and fumigation. The UICB-AC is closed one week per year for fumigation and disinfection of surfaces, equipment and storage areas. This operation is supervised by the OSH responsible, Eng. Petra Morgado (pmorgado@fmv.ulisboa.pt.

4.13.7. Microbiological monitoring

• Monthly testing is carried out using contact plates on critical surfaces.
• Results are analysed by the UICB-AC Coordinator (Professor Solange Gil).
• Positive results require validation and, if necessary, immediate corrective action and reassessment of protocols.

5. NEW COMPANION ANIMALS

5.1. General cleaning and hygiene

- Maintaining facility cleanliness and strict personal hygiene is the responsibility of everyone working in the Exotic Companion Animal specialty consultation of the Hospital Escolar de Animais de Companhia (HE-AC).
- Hands must be washed and disinfected with an alcohol-based hand disinfectant before and after handling each patient.
- Clean examination gloves must be worn when in contact with high-risk patients (i.e., suspected infectious disease), and safety goggles must be worn when handling parrots suspected of chlamydiosis or during hare necropsy.
- Surfaces or equipment contaminated with feces, secretions, or blood must be cleaned and disinfected immediately by the staff or students responsible for the patient. This responsibility is especially critical in cases of patients suspected of infection by pathogenic agents.
- All equipment (collars, speculums, and forceps) must be cleaned and disinfected after use on each patient. Students are expected to use their own basic equipment (scissors, blades, thermometer, stethoscope, flashlight, and hemostatic forceps), which must be routinely cleaned and disinfected.
- Whenever fleas or ticks are detected on a patient, the attending veterinarian must assess the situation and prescribe the most appropriate treatment.

5.2. General clothing for contact with Exotic Companion Animals

- All persons working at the HE-AC must wear clean professional clothing, including surgical scrubs, as well as clean and appropriate footwear whenever working in outpatient areas.
- Shoes that are easy to clean and disinfect or hospital clogs should be worn. Footwear must be disinfected regularly throughout the workday. Waterproof footwear is strongly recommended to minimize damage caused by disinfectant solutions.

5.3. Cleaning and disinfection

- Gloves and appropriate protective clothing must be worn whenever disinfectants are used. Examination gloves or rubber cleaning gloves (used during routine cleaning operations) provide adequate protection against these compounds.
- Gross contamination must be removed prior to disinfection. Material should be cleaned with water and detergent or soap and scrubbed when necessary to remove films and residual debris that may prevent or inhibit the disinfection process. The cleaned area must be thoroughly rinsed to remove any detergent residue. The area should be allowed to drain or dry as much as possible before applying the disinfectant solution to avoid dilution and ensure effectiveness.
- During the disinfection process, the disinfectant Koorklean must be used and should remain in contact with surfaces for 10 to 20 minutes (longer contact time for activity against non-enveloped viruses), especially if infection by a pathogenic agent is suspected. Excess disinfectant should be removed with water. The disinfectant must be completely removed from all surfaces before housing the patient in the cage.
- Examination tables must be cleaned and then disinfected after each patient.
- In cases of suspected Newcastle Disease or Avian Influenza, all materials and facilities must be disinfected with an appropriate disinfectant, for example, Virkon.

• After disinfection, protective clothing must be removed and hands washed. Only trained and authorized staff using appropriate PPE may access areas during non-routine disinfection procedures, such as hydrogen peroxide nebulization.
• All areas where animals are examined or treated (such as examination rooms) must be organized, cleaned, and disinfected after each use by the staff member or student responsible for the patient, regardless of the infectious status.

5.3.1. Instrument and equipment disinfection protocol

• All instruments, equipment, or other objects must be cleaned and disinfected or sterilized between uses on different patients.
• Materials must be cleaned with water and soap and disinfected with a 0.5% chlorhexidine solution after use on each patient.
• Necropsy materials must be sterilized daily. Initially, they must be cleaned and disinfected with Koorklean, then washed and, when applicable, sterilized in an autoclave according to the nature of the material.

5.4. Rules for admission and management of Exotic Companion Animals

5.4.1. Outpatients

Consultations

• It is essential that personnel responsible for scheduling appointments minimize as much as possible the risk of introducing animals with infectious disease into the HE-AC. If this procedure has not been followed, the consultation may take place under the following conditions:
- Entry into the room during the consultation is strictly prohibited;
- Introducing a patient into the consultation room before cleaning and disinfection of examination tables and equipment, performed by a staff member, is prohibited.
• At client and patient reception:
- The client and consultation record (electronic form in the system) must be completed before handling the animal, including date, owner details, and, if necessary, the referring veterinarian;
- A complete physical and clinical description of the animals must be recorded;
- Sex and species (in Latin) must be recorded. For reptiles, request assistance from specialized staff to determine sex and species. The introduction of venomous reptiles into the clinic is strictly prohibited. These patients will not be seen, even in the absence of students;
- If a serious infectious condition is suspected, a team member must be informed immediately;
- Pet birds must never be removed from the cage in the absence of a team member.
For other animals, if the physical condition and/or stress level or danger allows, a complete general clinical examination may be performed by the clinician or student, always under direct clinical supervision. If not possible, a staff member must be called to assist with handling and examination.

Necropsy

• Animals received for post-mortem examination must be considered high-risk infectious disease patients and must not be removed from their transport packaging.

5.4.2. Hospitalized patients

5.4.2.1. Cage assignment

• Cages for hospitalized patients will be assigned by the responsible team.
• The day or night duty team must be consulted for information about the location of newly admitted hospitalized patients.

5.4.2.2. Patient and medication records

• All clinical data and medications administered during hospitalization must be recorded in the hospitalization software system.

5.4.2.3. Food and water

• Only minimal amounts of forage and grains should be stored in the hospitalization area to reduce the likelihood of contamination.

5.4.2.4. Cage maintenance

• Nurses and physicians responsible for hospitalized patients are expected to maintain cages in perfect hygienic condition daily. Cages must be washed and disinfected with Koorklean and, when necessary, with Virkon (in cases of notifiable diseases). All contaminated waste must be disposed of in appropriate biological waste containers.
• Students must change gloves and wash hands between maintenance procedures for different animals. Sharing materials and equipment between cages is strictly prohibited.
• At the end of hospitalization, cages must be washed and disinfected following standard procedures (see point 5.3.) before housing new patients.

5.4.2.5. Discharge

• Before discharge, clients must be properly informed about infectious risks associated with the patients and receive recommendations for controlling these risks at home.
• Cages used to house patients suspected or diagnosed with infectious disease must be marked with a visible warning: “Do not use. Special cleaning required.” The associated pathogen (suspected or diagnosed) must be identified on white tape placed on the cage door until full disinfection.

5.5. Management of patients suspected of infectious disease

• Whenever possible, suspected respiratory, feather, neurological, or gastrointestinal infectious diseases must be triaged during phone contact with the client or in the waiting room before admitting the animal.
• Personal accessories (such as mobile phones) must not be taken into consultation rooms, hospitalization, or animal housing areas. Only pens, coats, and ID badges are permitted. If necessary, these objects must undergo chemical or thermal disinfection according to the type of infectious disease, even if there is a risk of material damage. The clinic is not responsible for any resulting damage.
• Removing any item from consultation or hospitalization rooms without formal staff authorization is prohibited.
• All contaminated waste must be placed in appropriate special containers.
• Removing feathers, beaks, skulls, or similar materials is strictly prohibited.
• In cases of suspected or diagnosed Rabbit Hemorrhagic Viral Disease, contact with susceptible animals must be avoided until shoe soles are disinfected and clothing washed.
• In cases of suspected or diagnosed Chlamydiosis, a very common disease in psittacines, consultations and examinations must be carried out using gloves and safety goggles unless the absence of the disease is confirmed. Wearing a mask is mandatory when handling animals suspected of Chlamydiosis. If flu-like symptoms develop 1 to 3 weeks after examining suspected birds, the person must consult their general practitioner and inform them about possible Psittacosis.
• In doubtful situations, it is important to immediately report the situation to a team member.

5.5.1. Diagnostic tests to be performed in patients suspected of infectious disease

• Any suspicion of infectious disease must be communicated by the responsible veterinarian to the animal's owner. The veterinarian will inform the owner about the need for sample collection and diagnostic testing to confirm or rule out the suspicion.

5.5.2. Biological samples from patients with suspected or confirmed infectious disease

• Samples from animals suspected of infectious disease must be packaged in a way that prevents any form of contamination, even in the event of rupture of the primary container (disinfected containers or plastic bags). Double packaging is mandatory.

5.5.3. Modification of biosecurity measures applied to patients

• Any adaptation of biosafety measures will be made according to the specific context and must be approved by a veterinarian.

5.5.4. Management of patients colonized or infected with multidrug-resistant bacteria

• Patients infected with multidrug-resistant bacteria represent a potential health risk to FMV staff, students, clients, and other patients. Therefore, they are managed with enhanced biosafety precautions aimed at preventing their spread within FMV.

• The administration of antibiotics to these patients without performing an antibiogram, at the owner's expense, is prohibited. The administration of third-generation quinolones or antibiotics intended for human use without a control antibiogram is prohibited.

5.6. Isolation of Exotic Companion Animals

• Use heated isolation cages whenever possible.

• When a diagnosis of infectious disease is confirmed, it must be indicated directly on the animal's cage using a specific notice sheet.

• Visitors are strictly prohibited from the isolation area.

• Equipment used for these animals must be stored in a labeled plastic bag placed next to the cage. It must never be used for another patient until properly cleaned and disinfected (autoclaved).

• Entering hospitalization/isolation areas without a disposable gown, mask, cap, and shoe covers is strictly prohibited. Wearing these protective items outside these areas is also strictly prohibited.

• Hand washing and disinfection are mandatory upon entering and leaving hospitalization/isolation areas.

• At the end of hospitalization/isolation, animals are returned to their owners in their own transport cage. Prior to this, the transport cage must be cleaned and disinfected by the students responsible for the case.

5.6.1. Use of ultrasonography, radiography, or CT in exotic companion animals

• Ultrasound, radiology, or computed tomography (CT) examinations in animals suspected of infectious diseases must be limited to patients in immediate life-threatening situations.

5.6.2. Surgery / anesthesia in isolated exotic companion animals

• Samples collected from high-risk patients must be properly identified and packaged in bags (double packaging is mandatory).

- Avoid contaminating the exterior of the first bag when placing samples inside.
- The suspected infectious disease must be clearly identified on all submission forms.

5.7. Surgery and anesthesia of Exotic Companion Animals

5.7.1. Clothing for "clean" areas of the exotic animal surgical facility

- For some surgeries, disposable gowns are available for staff and students at the entrance to the area.

5.7.2. Hygiene for perioperative management of exotic companion animals

- High standards of cleanliness and hygiene must be maintained throughout the operating suite.
- The surgical team and the patient's surgical site must be prepared aseptically. Aseptic technique must be maintained throughout the surgery.
- Non-essential persons are prohibited at all times, and no more than 6 students may attend surgery at the same time. Staff and students must wear clean examination gloves before placing intravenous catheters or examining mucous membranes.

5.7.3. Guidelines for perioperative management of exotic companion animals

- Hands must be washed and disinfected after handling each patient to ensure hand hygiene and prevent contamination of hand-contact surfaces (e.g., doors, counters, equipment). Gloves must be changed between patients, and hands must be systematically washed and disinfected after glove removal.
- Clean examination gloves must be worn whenever catheters are placed.
- Fecal material must be immediately removed from the anesthesia preparation area or other operating suite areas. Whenever necessary, tables, floors, cages, and other surfaces must be cleaned and disinfected according to established protocols.

5.7.4. Anesthesia Induction Area

- Anesthesia request forms should be completed the day before the procedures, whenever possible. Any known or suspected infectious disease must be clearly noted on the request form.
- Except in cases of extreme emergency, no anesthesia will be performed in parrots suffering from dyspnea or diarrhea without prior testing for *Chlamydia* spp.
- Feathers must never be plucked and animals must never be shaved without the express authorization of a staff member. Plucked feathers and clipped hair must be disposed of directly into the appropriate waste containers.

5.7.5. Management of Surgical Patients with Infectious Diseases

- Patients must return to their cages as soon as they recover from anesthesia.
- All anesthesia equipment and devices must be cleaned and disinfected as soon as surgical procedures are completed.

5.7.6. Maneio de pacientes cirúrgicos com doenças infecciosas

- With the exception of emergency surgical procedures (life-threatening situations for the patient), no surgical procedure will be performed on a contagious patient.

• Once the final diagnosis has been confirmed, the surgical procedure will be carried out according to the judgment of the Exotic Companion Animal veterinary team, who will apply appropriate and rigorous decontamination measures at the end of the procedure.

5.8. Visitors to the Exotic Companion Animal Service

Visitors are only permitted under the direct supervision of a veterinarian and must follow instructions.

5.9. Children in the Exotic Companion Animal Hospitalization Area

Except for the children of pet owners, who may remain with their animal under adult supervision, unaccompanied children are not permitted in the Exotic Companion Animal hospitalization facilities.

6. FOOD SCIENCE AND VETERINARY PUBLIC HEALTH: OFF-CAMPUS ACTIVITIES

6.1. Introduction

- This document describes routine procedures intended to minimize:

  - The risk of transmission of zoonotic agents by students and teaching and non-teaching staff from various facilities where they may be in contact with food-producing animals, poultry, companion animals, or contaminated food;

  - The potential risk of infection by zoonotic agents transmitted by animals or contaminated food products during teaching activities carried out at those facilities.

- The facilities include farms, dairy farms, pig farms, slaughterhouses, food processing units, collective catering establishments, the municipal dog and cat shelter, and other facilities where animals, food products, or unprocessed animal tissues, secretions or excretions (e.g., saliva), manure, urine, contaminated feed, dirty bedding, water, dirt, and milk may be present.
- Students visit several food industries as part of practical training in quality control and food safety. They also receive training in food processing in on-campus facilities, where general personal hygiene rules apply.
- Visits are organized for students to the following facilities: red meat and poultry slaughterhouses and their cutting rooms, rabbit slaughterhouses, fish markets and fish retail facilities, egg inspection and grading centers, honey extraction centers, meat, fish, and poultry processing industries, collective catering establishments, and the municipal dog and cat shelter.
- During visits to slaughterhouses, students closely observe official inspection tasks carried out on slaughter lines and perform detailed inspection of carcasses rejected by official veterinarians.
- During visits to other food sector establishments, students may come into contact with unprocessed food products originating from primary production farms.
- During visits to the municipal dog and cat shelter, students may come into contact with several animal species. Most animals are previously tested for zoonotic diseases, but recently admitted animals may carry infectious diseases.
- Students receive specific instructions before each visit and complete a questionnaire regarding their health status (medical history).

Poster 8 summarizes the instructions that students must follow whenever they have off-campus practical activities in Food Safety and Technology, Sanitary Inspection, and Veterinary Public Health. This poster is displayed in the entrance hall of the Food Safety and Technology Laboratory and in the Garage.

Poster 8

Instructions for students regarding the Standard Operating Biosafety Procedures in force during off-campus practical classes in Food Safety and Technology, Sanitary Inspection, and Veterinary Public Health

FOOD SAFETY AND TECHNOLOGY OF PRODUCTS OF ANIMAL ORIGIN, SANITARY INSPECTION AND VETERINARY PUBLIC HEALTH

INSTRUCTIONS FOR STUDENTS

1. OFF-CAMPUS PRACTICAL CLASSES:

a) Store your belongings in a locker in the General Changing Room and lock it with your padlock.
b) Tie back long hair.
c) Bring a backpack containing your white cotton lab coat and white rubber boots, a water bottle, and a small meal in a thermal lunchbox.
d) Go to the Garage located on the ground floor of Building D and enter a vehicle (e.g., Veterinary Public Health practical class at Casa dos Animais de Lisboa) or go to the FMV gate and board the bus (e.g., Sanitary Inspection practical class at a slaughterhouse).
e) Upon arrival at the facility to be visited (e.g., slaughterhouse, food industry, Casa dos Animais de Lisboa, etc.), leave the vehicle and follow the instructors.
f) In the facility's changing room, put on your white lab coat, wear a disposable apron, put on your white rubber boots and cover them with disposable boot covers.
g) Comply with all biosafety measures in force at the facility, e.g., hand disinfection, stepping on disinfectant footbaths, passing through sanitary barriers.
h) At the end of the practical class, go to the facility's changing room. Remove your boots and put on your shoes. Remove your lab coat. Store the coat and boots in a clean bag in your backpack. Dispose of disposable aprons and boot covers in the appropriate bins. Wash and disinfect your hands.
i) Leave the facility and enter the vehicle.
j) Upon arrival at the FMV Garage, assist instructors in washing the wheels and chassis of the vehicle.

2. ON-CAMPUS PRACTICAL CLASSES:

a) Follow the biosafety rules specific to the teaching space (e.g., the Pathology Room during Sanitary Inspection practical classes).
b) If in doubt, read the QR Code on the posters displayed at the entrance to the various teaching spaces.

3. PERSONAL PROTECTIVE EQUIPMENT (PPE)

A - Personal, clean white cotton lab coat.
B - Personal, clean white rubber boots.
C - Other PPE, e.g., disposable aprons, caps, boot covers, and gloves, are provided by FMV.

6.2. General Hygiene Principles

6.2.1. Students' Medical History

• If a student suffers from a contagious disease recognized as potentially harmful to food products or live animals, they must inform the teaching staff by completing a previously prepared questionnaire, which will be shared with the managers of the visited facilities.

• The questionnaires allow teaching staff and facility managers to be informed about any zoonotic risks that could be introduced into those facilities.

• When health conditions raising concerns are identified, students will not be allowed access to production areas of slaughterhouses, food processing units, or collective catering establishments.

6.2.2. General Hygiene Principles

• Students receive clear instructions on food hygiene (presented on the back of the questionnaire) with the aim of minimizing the risk of food contamination. Additionally, since most slaughterhouses and food industries visited are certified by the British Retail Consortium (BRC), International Featured Standard (IFS), or International Organization for Standardization (ISO), and follow Hazard Analysis and Critical Control Points (HACCP) plans, students must strictly comply with the internal hygiene standards of the facilities visited.

• A high level of personal hygiene is also required from students.

• General hygiene rules are communicated orally by the accompanying instructor. Students must sign the back of the questionnaire, declaring that they have understood the instructions. The rules include:

– Eating or drinking in slaughterhouses, food industry facilities, or the municipal dog and cat shelter is strictly prohibited;

– Any hand injury must be properly protected with an appropriate dressing or bandage;

– Smoking is prohibited in any area of the facilities;

– Wearing jewelry in slaughterhouses or food industry facilities is not permitted, including watches, earrings, piercings, and artificial nails;

– The use of mobile phones in slaughterhouses, food industry facilities, or the municipal dog and cat shelter is not permitted;

• Additionally, students may be required to complete a visitor logbook at the request of facility staff.

• Throughout the visit, the instructor is responsible for ensuring that students comply with hygiene protocols. In particular, students must avoid touching food products, except when necessary as part of an inspection.

• Clothing and footwear used to visit farms or food production facilities must be properly cleaned and disinfected before each entry.

• The questionnaire includes a section where students must declare whether they have visited livestock facilities, including animal shelters or areas where animal by-products are stored, within the previous 48 hours.

6.2.3. Handwashing

- Upon entering and leaving facilities, as well as after using the restroom, hands must be carefully washed and/or disinfected with antibacterial soap and water.
- Hands must be dried with disposable paper towels, which must be disposed of in an appropriate waste container.
- The use of disposable latex gloves may be adopted but does not replace proper handwashing.
- The use of disposable gloves is mandatory in case of hand injuries, even if covered by a dressing or bandage.
- Handwashing must be carried out at non-manual (hands-free) sinks.

6.2.4. Student Clothing

- Students must wear clean clothing and footwear.
- During practical classes in food processing units, students must wear a clean white cotton lab coat, over which they place a disposable white apron, a disposable cap or hairnet, and disposable boot covers.
- During practical classes in slaughterhouses, students must wear a clean white cotton lab coat, a disposable cap or hairnet, and clean white rubber boots.
- During practical classes at the municipal dog and cat shelter, students must wear a clean white cotton lab coat. In surgical areas and treatment rooms, they must also wear a disposable cap and boot covers.

6.3. Specific Procedures for Visited Facilities

- Upon arrival, students go to a designated room within the facility, where they put on the equipment referred to in section 6.2.4.
- Before entering food sector establishments (such as slaughterhouses, fish markets, egg collection and inspection centers, honey extraction centers, or food processing units), students must put on the required PPE, except for protective gloves. During visits to the municipal dog and cat shelter, PPE must be worn before entering housing areas or surgical rooms.
- Once properly equipped, students pass through a hygiene barrier where they must wash and disinfect their boots and hands before entering production areas.
- The visit follows a one-way flow: students begin in the clean sector and progressively move toward the dirty sector.

6.3.1. Visit to the Cutting Room

- The visit begins in the dispatch area and then proceeds to the cutting room, where students can observe the general hygiene procedures practiced by workers, as well as the infrastructure and workflow circuits.

6.3.2. Visits to Slaughterhouses

- The visit begins in the clean sector and ends in the dirty sectors ("forward flow"), meaning it proceeds from the cutting room to the slaughter area and ends in the lairage, in order to minimize the risk of cross-contamination.
- Students observe meat inspection alongside the teaching staff, who perform inspection on the slaughter line. For this, they must wear mandatory PPE (lab coat, cap, mask, and gloves).
- The visit ends in the lairage and in the area where ante-mortem inspection takes place.
- In the event of a cut or injury, the student must immediately stop inspection activities and wash their hands at a knee-operated sink. The wound must be disinfected at the slaughterhouse or, if necessary, the student will be referred to the nearest hospital for appropriate treatment.

6.3.3. Visits to Food Processing Units

- Visits follow the "forward flow," starting in the raw material reception area and ending in sanitary facilities and staff support areas.
- Students may observe compliance with prerequisite programs, good hygiene and manufacturing practices, and evaluate the food safety management system, as well as relevant preventive measures and technological foundations.
- Students must use appropriate PPE, including a white cotton lab coat, cap, and boot covers.

6.3.4. Visits to Collective Catering Establishments

- Visits follow the "forward flow," starting in the food reception area and ending in sanitary facilities and staff support areas.
- Students may observe compliance with prerequisite programs, good hygiene and manufacturing practices, evaluate the food safety management system, and complete a control checklist.
- Students must use appropriate PPE, including a white cotton lab coat, cap, and boot covers.

6.3.5. Visit to the Municipal Dog/Cat Shelter

- Students begin the visit in the laboratory and in the surgery and treatment rooms, then proceed to public access areas (animal adoption zones), and finally visit the quarantine area, infirmary, and isolation units.
- Students must wear a clean white cotton lab coat. During visits to the surgery room and treatment rooms, they must also wear a cap and boot covers.
- Student access is limited to the exterior of the quarantine area.

6.4. Cleaning and Disinfection of Equipment

- Equipment used by instructors and students in slaughterhouses and other food sector establishments is strictly dedicated to these classes and must not be used in other facilities, such as livestock farms, feed factories, or animal by-product processing plants.

6.4.1. Boots

- At each entry to and exit from establishments, boots are washed and disinfected at the footwear washing station. After use, they are stored by students in a designated area.
- Once a week, or whenever necessary, the teaching staff's boots are disinfected by immersion in a Virocid (Cid Lines) solution.
- In food processing units and collective catering establishments, boot covers are single-use and must be discarded after the visit.
- In the municipal dog and cat shelter, boot covers are single-use and must be discarded after the visit.

6.4.2. Lab Coats

- After visits, white cotton lab coats must be washed at 60 °C with a detergent that has disinfectant action. Students are responsible for washing their own lab coats at home (e.g., OMO Sanitiza & Higieniza, effective against bacteria and viruses). Teaching staff lab coats are delivered by a staff member from the respective department to the FMV laundry, where they are washed in an industrial machine using liquid bleach with antibacterial, antifungal, and antiviral properties (e.g., Peracid Asepsis), and subsequently dried in an industrial dryer.
- • In food processing units, white disposable aprons are discarded after use

7. ANATOMY AND PATHOLOGICAL ANATOMY

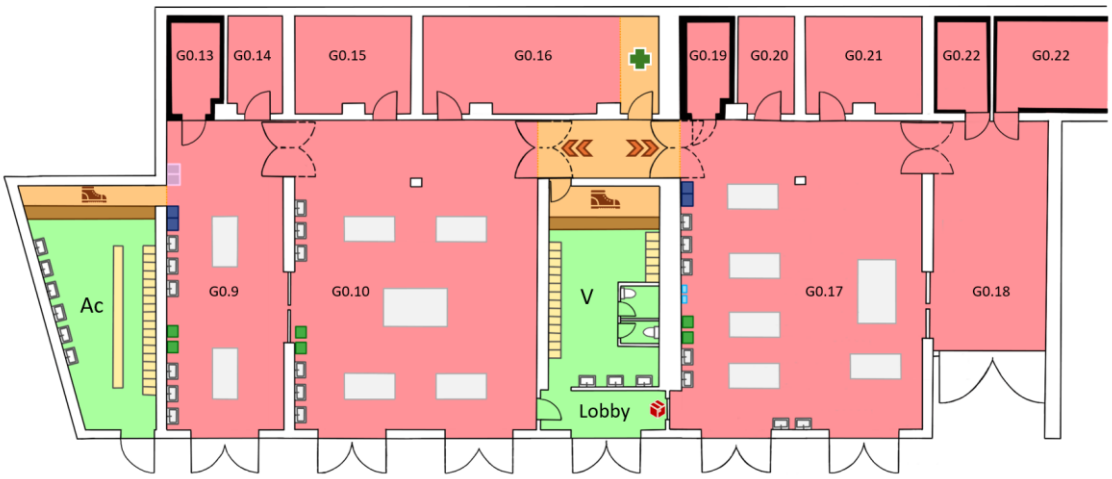


Figure 3. Simplified floor plan of the Anatomy Units (AU) and Pathological Anatomy Unit (PAU)

ANATOMY UNIT (AU)

7.1. General procedures in the Anatomy Unit

7.1.1. Access to the Anatomy Unit

- Access to the rooms of the Anatomy Unit (AU) G0.9, G0.10, G0.14, G0.15 and G0.16 outside teaching hours is controlled by teaching staff and operational technicians. Access to the AU is through the Antechamber (Ac) door of room G0.9. From this room it is possible to access rooms G0.9, G0.10, G0.14, G0.15 and G0.16.

- Only operational technicians and teaching staff may open the Antechamber (Ac) door and allow students or visitors to enter. Outside teaching periods, the door remains closed, as do the doors of rooms G0.9, G0.10 and the door providing access to the Lobby.

- During normal operation of the rooms, the doors providing direct access to the street in rooms G0.9 and G0.10 are opened only for the entry of cadavers and remain closed after their entry.

Poster 9 summarizes the instructions that students must follow whenever they have practical activities in Descriptive, Topographic and Imaging Anatomy. This poster is displayed at the entrance to the room.

Poster 9

Instructions for students regarding the Biosafety Standard Operating Procedures in force during practical classes of Descriptive, Topographic and Imaging Anatomy

DESCRIPTIVE, TOPOGRAPHIC AND IMAGING ANATOMY

INSTRUCTIONS FOR STUDENTS

1 – Store your belongings in a locker in the General Changing Room and lock it with your padlock.
2 – The use of shorts, long skirts (below the knee), or skirts without leggings or tights is not permitted.
3 – Tie back long hair.
4 – The use of tablets, PCs or equivalent devices is not permitted. Bring only one notebook and one pen. Mobile phones must be placed inside a ziplock bag before entering the room.
5 – Follow the entry and exit routes of the Room.
6 – Enter the Sanitary Filter. If you have a water bottle, place it in the locker. Take a pair of shoe covers, remove your shoes, put on the shoe covers and store your shoes in the locker. If it is your first class of that week, put on your white cotton lab coat; if it is your second class of that week, take the lab coat from the locker where you stored it in the previous class and put it on. Sit on the barrier and rotate 180°. Take a pair of white rubber boots from the boot dryer and put them on. Take an apron from a hanger and put it on. Put on a pair of plastic sleeve protectors. Take a hair cap and a pair of gloves and put them on.
7 – When the class ends, remove the apron, wash it in the apron washer and hang it on a hanger. Remove the sleeve protectors, wash the outer surface and place them in the designated location. Wash the boots in the boot washer, remove them and hang them in the boot dryer. Remove the hair cap and gloves and place them in the biohazard waste bag. Remove the shoe covers and place them in the trash bin. Go to the Sanitary Filter and sit on the barrier. Rotate 180°, take your shoes from the locker and put them on. Remove the lab coat. If you have another practical class that week, store your lab coat in the locker and lock it with your padlock; if it is your second class of that week, store your lab coat in a clean bag to wash it at home.
8 – Leave the Anatomy Room, go to the General Changing Room, remove your personal belongings from the locker and store your padlock. Leave the locker open.
9 – If you have doubts, read the QR Code on the poster to consult more detailed information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

A. Personal, clean cotton lab coat.
NOTE: This lab coat is stored in a locker in the Sanitary Filter of Descriptive, Topographic and Imaging Anatomy until the end of the second weekly practical class.
B. Apron, white rubber boots and PPE provided by FMV.

7.1.2. Mandatory entry route for staff and teaching personnel (see Figure 4)

• Technical staff and teaching personnel enter the AU through the Antechamber (Ac) of room G0.9 (point 1 in Figure 2). They leave their belongings there in lockers allocated for this purpose and put on a white cotton lab coat (point 2). They leave their shoes in the lockers (point 3), put on disposable shoe covers (point 4), and cross the barrier to access the lockers where their boots are stored (to be used for any activity involving manipulation of cadavers or animal-origin waste) or other rubber footwear (to be used for activities involving simple access and circulation outside class or dissection periods) (point 5). They also collect a ziplock bag in which they place their mobile phone (point 6).

• They then access room G0.9 (point 7) and move to room G0.14, where there are lockers containing aprons, gloves, washable sleeve protectors and disposable gloves, knife sterilizers and surgical material (point 8).

• Once properly equipped, they enter room G0.9 or G0.10 to carry out their activities (point 9).

• All material and equipment required for activities carried out inside the AU should ideally be dedicated for exclusive use within this unit and stored there. If they must be removed from the unit, effective disinfection must be ensured by the personnel responsible for the equipment before removal. Documents and illustrations brought into the contaminated area of the AU for demonstration must be laminated and cleaned at the end of each class (with water and soap), and then disinfected with Sterilium before being removed.

Figure 4. Mandatory entry route to the AU

7.1.3 Mandatory entry route for students (see Figure 4)

• Students leave their coats and backpacks in the lockers in the General Changing Room. They take their mobile phone and dissection kit. They lock the lockers with personal padlocks and proceed to the Anatomy Unit.

• Students may only access areas within the AU after the door providing access to the Antechamber (Ac) of room G0.9 has been opened (point 1 in Figure 4), under the supervision of teaching staff or the operational technician and in compliance with the procedures described below.

- Students enter this room (Ac) wearing only the clothing necessary to use personal protective equipment (PPE) and carrying their dissection kit.

- Documents and illustrations brought into the contaminated area of the AU for demonstration must be laminated and cleaned at the end of each class (with water and soap), and then disinfected with Sterilium before being removed. Rings, bracelets, and watches are not permitted in the AU; therefore, all such items must be stored in the General Changing Room. Other belongings (e.g., umbrella, coat) may be temporarily left in the Antechamber on shelves or hangers provided for this purpose.

- Students put on a white cotton lab coat provided by FMV (point 2). They leave their shoes in the lockers (point 3), put on disposable shoe covers (point 4) and, with long hair tied back with an elastic band or inside a cap, step over the barrier to access the boot dryer (point 5), where properly disinfected rubber boots provided by FMV are available. They put on a washable apron and sleeve protectors provided by FMV, and collect a ziplock bag in which they place their mobile phone (point 6). They then enter room G0.9 or G0.10 to carry out their activities (point 9).

7.1.4. Mandatory exit route for staff and teaching personnel (see Figure 5)

- At the end of teaching activities, used scalpel blades must be discarded and placed in the yellow sharps containers available in rooms G0.9 and G0.10.

- All dissection material must be washed with detergent and disinfected with appropriate disinfectants (Sterilium: alcohol-based solution) at the sinks designated for this purpose (point 1 in Figure 5).

- Gloves are placed in the appropriate containers (point 2) to be destroyed at the end of the week. Hands are then washed and dried (point 3), and properly washed and disinfected dissection material is returned to room G0.14 for storage and weekly sterilization (point 4). Boots are passed through the automatic boot washer (point 5) and cotton lab coats are placed in a specific container to be washed at high temperature (point 6).

- Immediately upon entering the passage corridor (identified with the icon in Figure 5), the mobile phone is removed from the ziplock bag, which is discarded in an appropriate container (point 7).

- The boots, already washed and disinfected, are removed and placed in the designated lockable cabinets (point 8). After stepping over the barrier, access is made to the clean area of the Antechamber (Ac), where shoe covers are removed and discarded, shoes are retrieved and put on (point 9). Finally, hands are washed and disinfected (point 10), and staff exit the AU through the Antechamber door (point 11).

Figure 5. Mandatory exit route from the AU

7.1.5. Mandatory exit route for students (see Figure 5)

- At the end of teaching activities, used scalpel blades must be discarded and placed in the yellow sharps containers available in rooms G0.9 and G0.10.

- All dissection material must be washed with detergent and disinfected with appropriate disinfectants (Sterilium: alcohol-based solution) at the sinks designated for this purpose (point 1 in Figure 3).

- Gloves are placed in the appropriate containers (point 2) to be destroyed at the end of the week. Hands are then washed and dried (point 3). Boots are passed through the automatic boot washer (point 5) and cotton lab coats are placed in a specific container to be washed at high temperature (point 6).

- Immediately upon entering the passage corridor (identified with the icon in Figure 5), the mobile phone is removed from the ziplock bag, which is discarded in an appropriate container (point 7).

- The boots, already washed and disinfected, are removed and placed on the designated rack (point 8). After stepping over the barrier, access is made to the clean area of the Antechamber (Ac), where shoe covers are removed and discarded and shoes are retrieved and put on (point 9). Finally, hands are washed and disinfected (point 10), and students exit the AU through the Antechamber door (point 11).

7.1.6. Access to restrooms (WC)

- The restrooms serving the AU are located in the Sanitary Filter (identified with V on the Unit floor plan).

- Gloves, aprons, and sleeve protectors must be placed in the appropriate containers in rooms G0.9 or G0.10, and boots must be passed through the automatic boot washer before entering the passage corridor (identified with the icon on the Unit floor plan) from room G0.10. In this corridor, the lab coat is temporarily hung on the hanger available there, and staff immediately proceed to the area delimited by the barrier in the Sanitary Filter (identified with the icon on the Unit floor plan). Here, boots are temporarily left on the floor before stepping over the barrier to access the clean area of the Sanitary Filter, where the restrooms are located.

- To return to the AU, it is necessary to step back over the barrier and put the boots on again, proceed to the passage corridor, put the lab coat back on, and return to room G0.10. All disposable material must then be requested from teaching staff or operational technicians.

7.2. Rules of conduct for students in the AU

- Students with long hair must tie it back with an elastic band or use a hair cover.
- Rings, watches, and bracelets are not permitted.
- Fingernails must be kept short.
- Students who wear headscarves or other hair coverings must wear a disposable cap or replace the covering with one available for exclusive use in the AU before activities begin. If privacy is required, they may use the recovery area in room G0.16.
- Wearing gloves is mandatory when handling cadavers and instruments within the contaminated area of the AU.
- Documents and illustrations brought into the necropsy room must be laminated and cleaned at the end of each class with water and soap, then disinfected with Sterilium.
- Surgical instruments used in the AU must be washed with detergent and disinfected with appropriate disinfectants (such as Sterilium, alcohol-based solution) at the end of activities, except for scalpel blades, which must be discarded in the yellow sharps containers.
- Smoking, eating, or drinking in the AU is prohibited.

7.3. Source of animals and anatomical specimens for learning in the AU

7.3.1. Animals

- Healthy sheep are obtained from farms officially free of brucellosis. Upon arrival at the institution, they are examined by veterinarians prior to euthanasia.
- Dogs and cats originate from Official Animal Collection Centers (CROs), accompanied by documentation confirming they died of old age or were euthanized due to aggressiveness.
- Animals whose clinical history is compatible with suspected or confirmed zoonotic disease are not used in classes.
- Animals that received chemotherapy treatment within 30 days prior to death are not used for teaching.

7.3.2. Peças anatómicas

- Various anatomical specimens are requested from slaughterhouses or originate from the Unidade de Anatomia Patológica with authorization for teaching use (e.g., from animals with no clinical history or necropsy findings compatible with zoonotic disease).
- Dissected specimens preserved in absolute alcohol (99.5%) are also used.

7.4. General Cleaning and Disinfection Protocol

7.4.1. People

All technical staff, teaching staff, and students may only leave the AU after washing and disinfecting their hands, which is done upon leaving the contaminated area and again in the Antechamber (Ac) of room G0.9.

7.4.2. Surgical and other materials

- All disposable material used (gloves and sleeve protectors) is discarded in bioboxes available in rooms G0.9 or G0.10 before leaving the AU.
- Rubber footwear (boots or other appropriate footwear) must be washed and disinfected in the Automatic Boot Washer located at the exit of room G0.9 and placed in the boot dryer (for students) or in the lockable cabinets located in the Antechamber (Ac) (for teaching staff and employees).
- All surgical instruments must be washed with detergent in a designated sink and disinfected before being taken outside the AU.

7.4.3. Rooms and dissection tables

- Dissection tables must be washed and disinfected daily with industrial detergents (Mida Foam 193 Christeyns) at the end of each teaching day.
- • The floors of rooms G0.9 and G0.10 are cleaned with a rotary machine and industrial detergents (Mida Foam 193 Christeyns) at the end of each teaching day.

7.5. Safety procedures in case of accidents in the AU

- Students must provide proof of tetanus vaccination at the time of enrollment in the Faculty.
- The use of sharp instruments in the AU may lead to cuts, even when safety measures are explained.
- If a cut occurs in staff, teaching personnel, or students, the activity must be interrupted so the injury can be washed and disinfected. If a student is injured, they must inform teaching staff so the wound can be inspected.
- If the wound is superficial, it must be washed and disinfected with povidone-iodine dermal solution and covered with an adhesive dressing to prevent contamination. The student must then wear two gloves or two sleeve protectors to protect the affected area (if the cut is on the hands or arms, respectively).
- For deeper wounds, hospital care may be required. Emergency telephone numbers, including that of the Occupational Health and Safety Unit, are posted in rooms G0.9 and G0.10.
- In case of ocular splashes, students must immediately use the eye-wash station located in room G0.9 of the AU.
- When it is necessary to remove a student from the contaminated area (due to fainting, dizziness, psychological emergency) without requiring hospital care, the student must be transferred to the designated recovery area in room G0.16 (identified with the icon ✚ on the Unit floor plan). Students recovering in this area must be accompanied for monitoring.

- Any incidents must be reported in writing by email to the Head of the Occupational Safety and Health Unit, Eng. Petra Morgado (pmorgado@fmv.ulisboa.pt), including the following information: full name of the affected person (and student number if applicable), date of occurrence, description of the incident, and measures taken.

7.6. Detergents and disinfectants approved for use in the AU

7.6.1. Tables and floors

Mida Foam 193 Christeyns: cleaning and disinfection.

7.6.2. Hands and materials

Lifo-Scrub: hand soap. Sterilium: alcohol-based hand disinfectant solution.

7.7. Guidelines for reception and disposal of cadavers

- The Anatomy service only acquires healthy animals.
- Animals that arrive alive at the institution are euthanized in a designated room by trained technicians.
- All animals are examined by veterinarians to detect zoonotic diseases, diagnose pregnancy, and assess welfare.
- All animals enter the AU through the doors of rooms G0.9 and G0.10, which are immediately closed.
- Anatomical specimens originating from the necropsy room must come from animals with no clinical history or with necropsy findings incompatible with zoonotic disease.
- Cadavers are stored in the refrigerator or freezer according to how soon they will be used for class.
- The cold room and freezer are regularly cleaned and disinfected.
- Dissected cadavers are washed, disinfected with H_2O_2, and placed in containers with absolute alcohol. Absolute alcohol must be added periodically to ensure specimens remain completely submerged.
- Cadavers not used for preservation are discarded at the end of each class and placed in bioboxes to be collected by the contracted company (ITS|etsa).

7.8. Measures to interrupt transmission cycles

7.8.1. Visitors

Visitors may only enter through the antechamber door of room G0.9 (Ac), accompanied by technical staff or teaching staff, and must follow the same entry and exit routes applicable to staff.

7.8.2. Children

The above rule also applies to children visiting the AU.

7.8.3. Animals

Access to the AU by any animal not used for diagnostic or teaching purposes is strictly prohibited. Staff, teaching personnel, and students are not authorized to enter AU facilities with companion animals.

7.9. Emergency exits

Emergency exits include the doors providing direct access to the street from the Antechamber (Ac) and from rooms G0.9 and G0.10, as well as the door providing access to the Lobby from room G0.10.

PATHOLOGICAL ANATOMY UNIT

7.10. Facilities of the Pathological Anatomy Unit

- The Pathological Anatomy Unit (PAU), located in Building G, comprises the Lobby, Changing Room, and rooms G0.17, G0.18, G0.20, and G0.21.
- The PAU has three distinct areas related to biosafety measures:

- The Lobby (identified as Lobby in Figure 6) is a clean entry and transit area. In the Lobby there is a connecting door to room G0.10 (belonging to the AU). This door remains closed and only allows exit, in emergency situations, for people coming from the AU.

- The Sanitary Filter (identified with V in Figure 4), up to the barrier that separates it from the boot dryer for the rubber boots used in the UAP, is a clean area. Boots are provided by the FMV and are for exclusive use inside the UAP. Boots may only be placed on the rack after being washed and disinfected. The area located beyond the barrier (identified with the icon in Figure 6) is an intermediate-risk transit area.

- A contaminated area, which includes the teaching room (G0.17), the storage room (G0.21) where materials and equipment necessary for UAP activities are kept, the refrigerated and freezing chambers (G0.19 and G0.22), the cadaver reception antechamber (G0.18), and the staff room (G0.20).

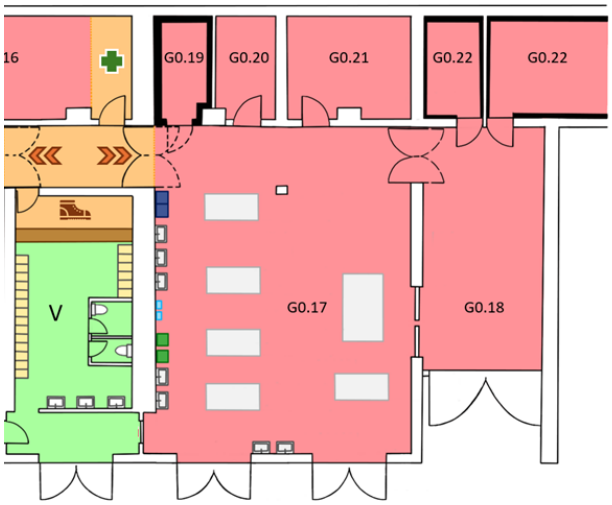


Figure 6. Simplified floor plan of the Pathological Anatomy Unit

Poster 10 summarizes the instructions that students must follow whenever they have Pathological Anatomy activities. This poster is displayed at the entrance to the room.

Poster 10

Instructions for students on the Biosafety Standard Operating Procedures in force during practical classes of Pathological Anatomy

PATHOLOGICAL ANATOMY

INSTRUCTIONS FOR STUDENTS

1 - Store your belongings in a locker in the General Changing Room and lock it with your padlock.
2 - The use of shorts, long skirts (below the knee), or skirts without leggings or tights is not permitted.
3 - Tie back long hair.
4 - The use of tablets, PCs, or similar devices is not allowed. Bring only 1 notebook and 1 pen. Mobile phones must be placed inside a ziplock bag before entering the room.
5 – Go to the Pathological Anatomy Room.
6 - Follow the designated entry and exit routes of the room.
7 - Enter the Sanitary Filter. If you have a water bottle, leave it in a locker.
8 - Take a pair of shoe covers, remove your shoes, put on the shoe covers, and store your shoes in a locker. Sit on the bench and rotate 180°. Take a pair of yellow boots from the boot dryer and put them on. Take a Delphis apron from a hanger and put it on. Take a hair cap and put it on. Enter the Necropsy Room.
9 - At the end of the class, remove the Delphis apron in the corridor leading to the changing room, wash it in the apron washer, and hang it on a hanger. Remove the cap and gloves and place them in the biohazard waste bag. Wash the boots in the boot washer, remove them, and hang them on the boot dryer. Go to the sanitary filter and sit on the bench, remove the shoe covers and place them in the trash bin. Rotate 180°, take your shoes from the locker and put them on.
9 - Leave the Pathological Anatomy Room and go to the General Changing Room. Collect your personal belongings from the locker and store your padlock. Leave the locker open.
10 - If you have any questions, scan the QR Code on the poster for more detailed information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

Delphis work apron and yellow rubber boots provided by the FMV, as well as other PPE, e.g., gloves and caps.

7.11. General procedures of the PAU

7.11.1. Access to the PAU

• Access to rooms G0.17, G0.18, G0.20, and G0.21 outside class hours is controlled by teaching staff and operational technicians. Entry to the PAU is through the Lobby door. From this

room it is possible to access the Sanitary Filter and, from there, rooms G0.17, G0.18, G0.20, and G0.21.

- Only operational technicians and teaching staff may open the Lobby door and allow entry to students or visitors. Outside class hours, doors remain closed.

- The doors providing direct street access from room G0.17 remain closed and are only used as emergency exits for people leaving the PAU.

- The door providing direct street access from room G0.18 is opened only for cadaver entry and removal of animal-origin waste, remaining closed at all other times. Only operational technicians, teaching staff, and duly authorized personnel may open this door.

7.11.2. Mandatory entry route for staff and teaching personnel (see Figure 7)

- Technical staff and teaching personnel enter the PAU through the Lobby (point 1 in Figure 5) and proceed to the Sanitary Filter (V), where they must leave their belongings in lockers provided for this purpose. In the Sanitary Filter they put on a white cotton gown (point 2). They leave their shoes on shelving racks (point 3), put on disposable shoe covers (point 4), and step over the barrier to access the rack (point 5) where boots are stored (to be used for any activity involving manipulation of cadavers or animal-origin waste) or other rubber footwear (to be used for simple access and circulation activities outside class or necropsy periods). They then proceed to the transition corridor (identified with the icon in Figure 7). In this corridor, they take a Delphis apron from the hanger (point 6) and a ziplock bag (point 7), in which they place their mobile phone.

- Once properly equipped, they enter room G0.17 to carry out their activities (point 8).

- All materials and equipment required for activities in the PAU should ideally be designated for exclusive use within this unit and remain stored there. If removed from the unit, effective prior disinfection must be ensured by the personnel responsible for the equipment. Documents and illustrations brought into the contaminated area of the PAU for demonstration must be laminated and cleaned with water and soap at the end of each class, and then disinfected with Sterilium before being taken elsewhere.

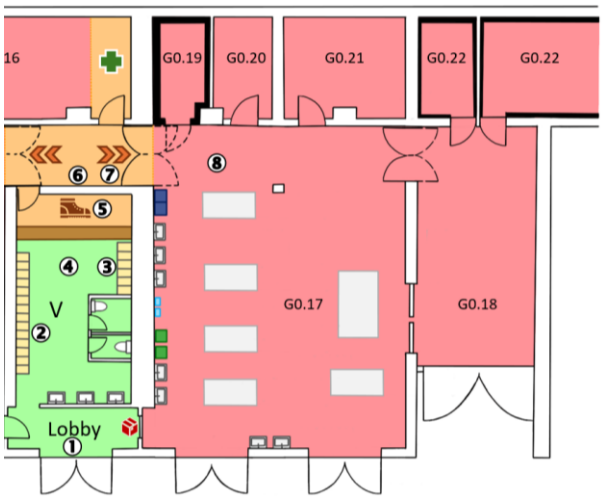


Figure 7. Mandatory entry route to the Pathological Anatomy Unit

7.11.3. Mandatory entry route for students (see Figure 7)

- Students leave coats and backpacks in the lockers of the General Changing Room. They take their mobile phone and dissection kit. They lock the lockers with personal padlocks, leave, and proceed to the PAU.

- Students may only access the interior of the PAU after the door giving access to the Lobby has been opened (point 1 in Figure 7), under the supervision of teaching staff or the operational technician and in compliance with the procedures described below.

- Students enter the Sanitary Filter (V) wearing only the clothing necessary to put on PPE.

- The use of rings, bracelets, or watches is not permitted in the PAU; therefore, all such items must be stored in the General Changing Room. Other belongings (e.g., umbrella, raincoat) may be temporarily left in the Sanitary Filter in lockers or on hangers provided for this purpose (point 2).

- Students must leave their shoes on shelving racks (point 3), put on disposable shoe covers (point 4), and, with long hair tied back with an elastic band or placed inside a cap, step over the barrier to access the rack (point 5), where properly disinfected rubber boots provided by FMV are available. They then proceed to the transition corridor (identified with the icon in Figure 7). In this corridor, students must take a waterproof Delphis apron from the hanger (point 6) and a ziplock bag (point 7), in which they must place their mobile phone, and put on gloves and washable sleeve protectors. Once properly equipped, students enter room G0.17 to take part in the practical class (point 8).

- All dissection and note-taking materials required for the activities are provided inside the PAU and must not be removed from the unit unless proper disinfection can be ensured. Notes taken by students during classes will later be made available to them in digital format, with the originals kept inside the PAU until destruction. Documents and illustrations brought into the contaminated area of the PAU must be laminated and cleaned with water and soap at the end of each class, and then disinfected with Sterilium.

7.11.4. Mandatory exit route for staff and teaching personnel (see Figure 8)

- At the end of practical classes, gloves must be placed in the appropriate containers (point 2 in Figure 6) to be disposed of at the end of the week. The waterproof gown must be washed and disinfected using the designated washing and disinfection stations (point 3).

- Hands must then be washed and dried (point 4), and boots passed through the automatic boot-washing machine (point 5).

- After moving immediately to the transition corridor (identified with the icon in Figure 8), the mobile phone is removed from the ziplock bag, which is discarded in an appropriate waste container (point 6).

- Upon returning to the area delimited by the barrier in the Sanitary Filter (identified with the icon in Figure 6), the waterproof vinyl gown is returned to the hanger (point 7) after washing and disinfection.

- The already washed and disinfected boots are removed and placed in the boot dryer (point 8).

- After stepping over the barrier, they access the clean area of the Sanitary Filter, where they remove and discard the shoe covers, put on their shoes, and hang the gown in the designated locker (point 9).

• Finally, they wash their hands (point 10) and leave the PAU through the Lobby door (point 11)

Figure 8. Mandatory exit route in the Pathological Anatomy Unit

7.11.5. Mandatory exit route for students

• At the end of classes, used scalpel blades must be discarded and placed in the yellow sharps containers available in room G0.17.

• All dissection material must be washed with detergent and disinfected with appropriate disinfectants (Sterilium: aqueous-alcoholic solution) at the sinks on the dissection tables or other sinks designated for this purpose (point 1 in Figure 8). These sinks are elbow-operated and equipped with sponges, scrubbers, or other cleaning materials.

• Gloves must be placed in the appropriate containers (point 2) for destruction at the end of the week.

• Students then wash the waterproof gowns using the designated washing and disinfection stations (point 3).

• Next, they wash and dry their hands (point 4) and pass their boots through the automatic boot-washing machine (point 5).

• After entering the transition corridor (identified with the icon in Figure 8), they remove their mobile phone from the ziplock bag and discard the bag in the appropriate waste container (point 6).

• The washed and disinfected gown is hung on the hanger (point 7).

• They return to the area delimited by the barrier in the Sanitary Filter (identified with the icon in Figure 8) to place the already washed and disinfected boots on the designated rack (point 8).

• They step over the barrier to access the clean area of the Sanitary Filter, where they remove and discard the shoe covers and put on their own shoes (point 9).

• They wash their hands again (point 10), collect all their belongings, and proceed to the General Changing Room through the Lobby exit door (point 11).

7.11.6. Access to restrooms (WC)

- The restrooms serving the PAU are located in the Sanitary Filter (identified with V on the unit plan).
- Before entering the transition corridor (identified with the icon on the unit plan), gloves must be placed in the appropriate containers in room G0.17, and boots must be passed through the automatic boot-washing machine. In this corridor, gowns must be temporarily placed on the available hanger before immediately moving to the area delimited by the barrier in the Sanitary Filter (identified with the icon on the unit plan). Here, boots are temporarily left on the floor before stepping over the barrier to access the clean area of the Sanitary Filter, where the restrooms are located.
- To return to the PAU, it is necessary to step over the barrier again, put the boots back on, go through the transition corridor, and put the gown back on before returning to room G0.17.

7.12. Rules of Conduct for Students in the PAU

- Students with long hair must tie it back with an elastic band or wear a containment cap.
- Rings, watches, and bracelets are not permitted.
- Fingernails must be kept short.
- Students wearing headscarves or other head coverings must use a disposable cap or change to coverings available for exclusive use in the PAU. If privacy is required, the recovery area in room G0.16 may be used.
- Gloves must be worn when handling cadavers and instruments inside the contaminated area of the PAU.
- Documents and illustrations brought into the necropsy room must be laminated and cleaned with water and soap at the end of each class, then disinfected with Sterilium.
- At the end of activities, surgical material brought into the PAU must be washed with detergent and disinfected with appropriate disinfectants (Sterilium: aqueous-alcoholic solution), except used scalpel blades, which must be discarded in yellow sharps containers.
- Smoking, eating, or drinking is prohibited in the PAU.
- Pregnant or immunocompromised students may not carry out activities in the contaminated area of the PAU.

7.13. Origin of cadavers for teaching in the PAU

- Animals used for necropsy classes, regardless of species, originate from donations from the Veterinary Teaching Hospital, clinics, or private individuals who bring a cadaver to the PAU.
- Animals arrive already deceased or, when logistics justify it, are euthanized in room G0.18 by a veterinarian.
- Animals with clinical histories compatible with suspected or confirmed active zoonotic disease are not used for teaching.
- Animals whose clinical history includes chemotherapy treatment within 30 days prior to death are not used for teaching.

7.12. General Cleaning and Disinfection Protocol

7.12.1. People

Technical staff, teaching staff, and students may only leave the PAU after washing and disinfecting their hands upon leaving the contaminated area and again in the Sanitary Filter.

7.12.2. Surgical and other materials

- All used disposable materials are discarded in bioboxes available in room G0.17 before leaving the PAU.
- Rubber footwear (boots or other appropriate footwear) must be washed and disinfected in the automatic boot washer located at the exit of room G0.17 and placed on the rack in the Sanitary Filter.
- All dissection and note-taking materials needed for activities are provided inside the PAU and must not be removed from the unit unless proper disinfection can be guaranteed.
- In the exceptional case that students must bring their own dissection material, all surgical instruments must be washed with detergent in designated sinks and disinfected before being taken outside the PAU.

7.12.3. Rooms and necropsy tables

- Dissection tables must be washed and disinfected daily with industrial detergents (Mida Foam 193 Christeyns) at the end of each teaching day.
- The floors of rooms G0.17 and G0.18 must be washed with a rotary machine and industrial detergents (Mida Foam 193 Christeyns) at the end of each teaching day.

7.13. Safety Procedures in Case of Accidents in the PAU

- Students must provide proof of tetanus vaccination at the time of enrollment at the Faculty.
- The use of sharp instruments in the PAU may result in minor cuts, even when safety measures are explained.
- If a cut occurs to staff, teachers, or students, the activity must be interrupted so the injury can be washed and disinfected. Students must inform teaching staff so the wound can be inspected.
- Superficial wounds must be washed, disinfected with povidone-iodine dermal solution, and covered with an adhesive dressing to prevent contamination. The student must then wear two gloves to protect the affected area (if the cut is on the hands).
- Deeper wounds may require hospital care. Emergency contact numbers, including that of the Occupational Health and Safety Unit, are posted in rooms G0.17 and G0.20 and in the Lobby.
- In case of ocular splashes, students must immediately use the eye-wash station located in room G0.21 of the PAU.
- If it is necessary to remove a student from the contaminated area (due to fainting, dizziness, or psychological emergency) without hospital referral, the student must be taken to the recovery area in room G0.16 (identified with the icon on the unit plan) and monitored.

All incidents must be reported in writing by email to the head of the Occupational Health and Safety Unit, Eng. Petra Morgado (pmorgado@fmv.ulisboa.pt), including: full name of the affected

person (and student number if applicable), date of occurrence, description of the incident, and measures taken.

7.14. Approved detergents and disinfectants for use in the PAU

7.14.1. Tables and floors

- Mida Foam 193 Christeyns: cleaning and disinfection.

7.14.2. Hands and materials

- Lifo-Scrub: hand soap. Sterilium: hydroalcoholic hand disinfectant.

7.14.3. Waterproof vinyl gowns

- Oxivir Excel CE: Concentrated Detergent Disinfectant or Mistolin ACTIVRAPID DVR-80 - Virucidal Detergent Disinfectant.

7.15. Guidelines for reception and disposal of cadavers

- Animals arriving alive at the PAU are euthanized in a designated room by a veterinarian.
- All cadavers enter the PAU through the door of room G0.18, which is immediately closed.
- Cadavers are stored in the refrigerator or freezer depending on how soon they will be used for class.
- Cold rooms and freezers are regularly cleaned and disinfected.
- Cadavers not used for preservation are discarded at the end of each class and placed in bioboxes for collection by the contracted company (ITS|etsa).

7.16. Measures to Interrupt Transmission Cycles

7.16.1. Visitors

Visitors may only enter through the Lobby door, accompanied by technical staff or teaching staff, and must follow the same entry and exit routes as staff.

7.16.2. Children

The same rules apply to children visiting the PAU.

7.16.3. Animals

It is strictly forbidden for any animal not used for diagnostic or teaching purposes to enter the PAU. Staff, teachers, and students are not authorized to bring companion animals into the PAU.

7.17. Emergency exits

Emergency exits are the doors providing access to the street from the Lobby and from rooms G0.17 and G0.18.

8. LABORATORIES, ANIMAL FACILITY AND CLINICAL SKILLS TRAINING CENTRE

Poster 11 summarizes the instructions that students must follow whenever they have practical classes in teaching, research OR service-provision laboratories, and in the animal facility. Copies of this poster are displayed on the entrance door of the laboratories.

Poster 11

Instructions for students on the Standard Operating Procedures for Biosecurity in force during practical classes in the Laboratories and in the Animal Facility

LABORATORIES AND ANIMAL FACILITY

INSTRUCTIONS FOR STUDENTS

1 - Place your personal belongings (e.g., coat and backpack) on a shelf in the cabinet located in the corridor opposite the Laboratory.
2 - The use of shorts or skirts without leggings or tights is not permitted.
3 - Always wear closed-toe shoes.
4 - Put on your white cotton lab coat.
5 - Tie back long hair.
6 - Bring only 1 notebook and 1 pen, or a tablet.
7 - If you bring a water bottle, place it on the bench located outside next to the Laboratory entrance door.
8 - Disinfect your hands and enter the Laboratory, respecting the entry route.
9 - Wait for instructions from the teaching staff regarding the need to put on additional PPE.
10 - Respect the Laboratory entry and exit routes.
11 - When the class ends, disinfect your hands and leave the Laboratory, respecting the exit route.
12 - Take your water bottle with you.
13 - Remove your personal belongings from the cabinet located opposite the Laboratory.
14 - Leave the cabinet open.
15 - If you have doubts, read the QR Code on the poster to consult more detailed information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

A. White cotton lab coat, personal and clean.
B. The remaining PPE, e.g., gloves, is provided by FMV.
C. In practical classes in Microbiology, due to the biological risk, cotton lab coats are provided by FMV.
D. In practical classes in Parasitology and Infectious Diseases, whenever there is biological risk, disposable gowns will be provided by FMV.

Poster 12 summarizes the instructions that students must follow whenever they have practical classes or carry out autonomous training sessions at the Clinical Skills Training Centre. This poster is displayed next to the Centre door.

Poster 12

Instructions for students on the Standard Operating Procedures for Biosecurity in force at the Clinical Skills Training Centre

CLINICAL SKILLS TRAINING CENTRE

INSTRUCTIONS FOR STUDENTS

1 - Place your personal belongings (e.g., coat and backpack) in a locker in the General Changing Room.
2 - Put on your white cotton lab coat.
3 - Lock the locker with your padlock.
4 - The use of shorts or skirts without leggings or tights is not permitted.
5 - Wear closed-toe shoes.
6 - Tie back long hair.
7 - Bring only 1 notebook and 1 pen, or a tablet.
8 - Follow the Centre entry and exit routes.
9 - Step on the footbath mat placed at the entrance to the Centre.
10 - Disinfect your hands when entering and leaving the Centre.
11 - If you have doubts, read the QR Code on the poster to consult more detailed information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

A - White cotton lab coat, personal, clean.
B - The remaining PPE, e.g., gloves, is provided by FMV.

CLINICAL PATHOLOGY LABORATORY

8.1. Introduction

- The Clinical Pathology Laboratory, named Professor Manuel Braço Forte Clinical Analysis Laboratory (LACPMBF), performs clinical analyses for the Teaching Hospital (HE) and for external Veterinary Medical Care Centres (CAMV), namely complete blood counts, clinical biochemistry, including ionograms, urinalysis, analysis of effusion fluids, transtracheal and

bronchoalveolar lavage fluids, cerebrospinal and synovial fluids, as well as various cytologies and myelograms.

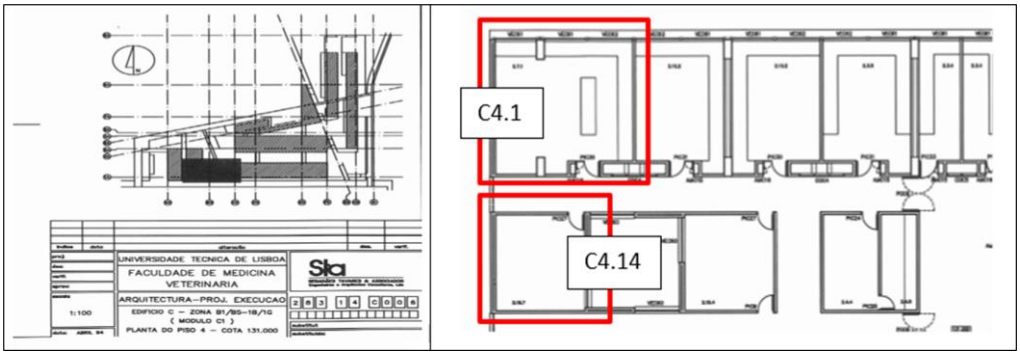
- The species from which samples originate include not only standard veterinary species but also exotic companion animals (birds, small mammals, and reptiles) and wildlife and zoo species.
- Biological fluids and solid materials handled in the LACPMBF may constitute sources of contamination. The facilities are classified as Biosafety Level 2, associated with the relative hazards of infectious microorganisms handled there belonging to Risk Group 2 (moderate individual risk, low community risk).
- The Laboratory operates from Monday to Friday from 9:00 a.m. to 9:00 p.m.

8.2. Summary description of spaces and their location

- The LACPMBF is located on the 4th floor of Building C of FMV. It comprises two spaces: the analysis laboratory C4.1 and the laboratory support office C4.14 (Figure 9). This office houses the archive, computers and printers for issuing reports and general administrative work (test requests, documentation), and the lockers of the technical staff.

Figure 9

Clinical Analysis Laboratory



8.3. Identification of biological risks

- In general, the prevention of risks specific to each area of the LACPMBF follows the general rules of Good Laboratory Practice.
- Biological materials received and handled in this laboratory include biological samples from the different animal species mentioned above (blood, urine, other body fluids, and cytology smears).

8.4. Equipment requiring prior training

- The use of all equipment allocated to the laboratory requires prior training of potential users, provided by the technicians working in the laboratory.
- In more specific cases requiring advanced and autonomous training, this is ensured by the equipment representatives.
- The use of the different clinical pathology instruments is exclusively reserved for technical staff properly trained for this purpose.

8.5. Protective equipment

8.5.1. Collective protective equipment

• In room C4.1:

- Emergency shower

- Eyewash station.

• In room C4.14:

- First aid kit.

8.5.2. Equipamentos de proteção individual

• Personal protective equipment:

- Lab coats

- Disposable gloves

- Disposable masks

- Protective goggles.

8.6. Access rules to the LACPMBF

• Access to laboratory room C4.1 is permitted only to assigned personnel, including faculty members, veterinarians, and auxiliary staff of the HE. Access by unauthorized persons is not permitted.

• Access to the laboratory support office C4.14 is open to clients, students, and staff during operating hours and in the presence of laboratory personnel.

• Each technician has a set of keys providing access to both areas. Opening and closing are performed by the technician on duty during their respective shift

8.7. Safety officer

• The person responsible for the LACPMBF laboratory, for the purpose of ensuring compliance with Safety, Hygiene and Health procedures, is Professor José Duarte Correia (zeca@fmv.ulisboa.pt).

LABORATORY OF ANTIBIOTIC AND BIOCIDE RESISTANCE

8.8. Introduction

• The facilities associated with this Laboratory include a laboratory and a storage room, used for research activities, diagnostic services, service provision, and practical classes of the elective

course “Antibiotherapy Strategies in Veterinary Medicine” of the Integrated Master’s Degree in Veterinary Medicine (MIMV).

• The diagnostic and service activities include:

- performing antibiotic susceptibility testing using minimum inhibitory concentration determination and disk diffusion methods requested by the HE and by external entities;

- performing biocide susceptibility testing requested by the HE and by external entities;

- detection and identification of bacterial agents and resistance genes using molecular biology techniques.

• The laboratory conducts research activities in bacteriology — antibiotic and biocide resistance — using culture methods and molecular biology methods

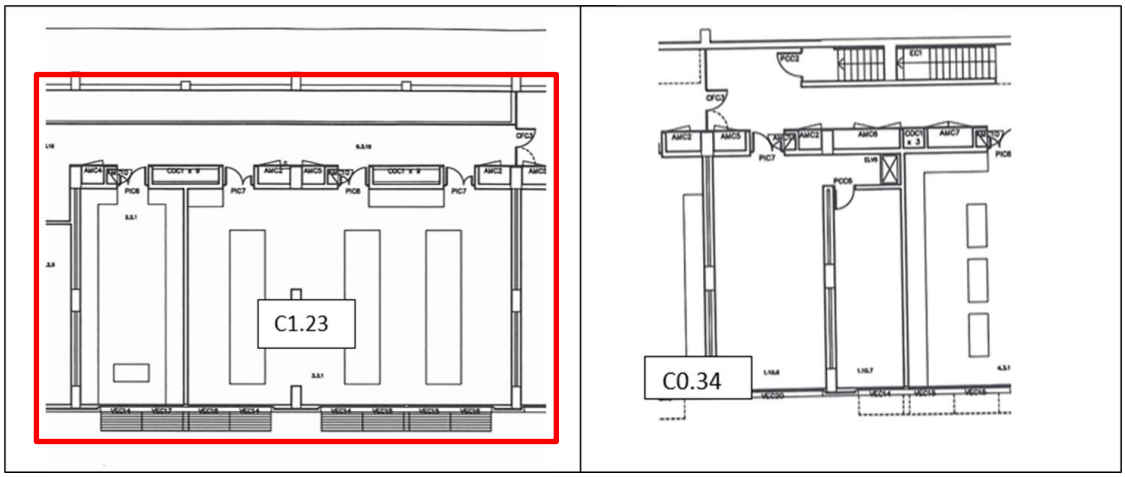
8.9. Summary description of spaces and their location

• The Laboratory of Antibiotic and Biocide Resistance operates in the following areas on Floor 1 of Building C (Figure 10):

- C1-23 - Practical class laboratory with benches and microscopes. Routine techniques laboratory and research laboratory;

- C0.34 - Storage room for plastic consumables, powdered culture media, refrigerated culture media, and bacterial isolates stored in preservation medium at −20ºC.

Figure 10
Laboratory of Antibiotic and Biocide Resistance



8.10. Identification of biological risks

• Compliance with all basic Safety and Hygiene rules implemented at FMV is mandatory.

• Safety precautions must be part of routine laboratory work, just like aseptic techniques and safe microbiological practices.

• Together with good practices and procedures, the use of safety equipment will help reduce risks when facing hazards inherent to biological safety.

• Prevention of these risks requires proper use of collective protective equipment in each laboratory (forced ventilation and fume hoods, showers, and eyewash stations), including compliance with rules regarding waste management in accordance with the FMV Integrated Waste Management System. Protection also includes mandatory use of personal protective equipment according to task specifications and biological risk class.

• The biological risk of the Laboratory of Antibiotic and Biocide Resistance is Class 3 (infectious diseases caused by bacteria multiresistant to antimicrobials or moderately transmissible and/or potentially zoonotic infectious diseases). These cause diseases for which effective treatment and preventive measures exist.

• The following rules are established for the Antibiotherapy Strategies classes:

- The person responsible for the class is tasked with selecting the bacterial agents to be handled;

- While classes are in progress, students are required to use personal protective equipment and may not wear sandals in the laboratory;

- When working with a Bunsen burner, users with long hair must tie it back;

- At the end of classes, students are required to wash and disinfect their hands;

- At the end of class, the entire laboratory must be properly tidied and cleaned.

8.11. Prior Training

8.11.1. Training in biological protection

• Training in laboratory biological protection and laboratory biological safety is provided to all personnel. This training is delivered by the Laboratory Supervisor.

• Personnel training always includes information on safe methods for high-risk situations that laboratory staff frequently face, namely:

- Inhalation risks (during aerosol generation, for example) when using inoculating loops, performing inoculations, pipetting, making smears, opening culture bottles, collecting blood/serum samples, and centrifuging;

- Risks of accidental ingestion when handling samples, smears, and cultures;

- Risks of skin puncture when using syringes and needles;

- Biological risks in handling blood and other potentially contaminated materials;

Biological and chemical risks in the decontamination and disposal of infectious material.

8.11.1. Equipment training

• All equipment used in the laboratories has User Manuals available in Laboratory C1.23 in a dedicated folder.

• The use of the following equipment may also require specific training:

- Microscopes (training provided by the Laboratory Supervisor);

- Pipettes and pipetting techniques (training provided by the Laboratory Supervisor);

- Bunsen burners (training provided by the Laboratory Supervisor);

- Autoclave (training provided by the Laboratory Supervisor);
- Microwave oven (training provided by the Laboratory Supervisor);
- Hot plate and magnetic stirrer (training provided by the Laboratory Supervisor);
- PCR equipment (training provided by the Laboratory Supervisor);
- Biological Safety Cabinets (training provided by the Laboratory Supervisor);
- Water bath (training provided by the Laboratory Supervisor);
- Centrifuges (training provided by the Laboratory Supervisor);
- Refrigerators and freezers (training provided by the Laboratory Supervisor).

8.5. Protective Equipment

8.5.1. Collective protective equipment

- Fume hood with HEPA filter
- Forced ventilation
- Biological safety cabinets
- Air conditioning
- Emergency shower
- Eyewash station

8.5.2. Personal protective equipment

- All users are required to wear a lab coat.
- All users must wear appropriate gloves for all work involving direct or accidental contact with blood, body fluids, or potentially infectious materials. After use, gloves must be discarded in the appropriate container, and hands must be thoroughly washed and disinfected.
- Staff must wash and disinfect their hands after handling infectious material and before leaving laboratory work areas.
- All users must wear safety goggles, face shields, or other protective devices whenever it is necessary to protect the eyes and face from splashes, impacts from objects, or ultraviolet radiation.
- All users are prohibited from wearing protective clothing outside the laboratory.
- Storing or consuming food and beverages in laboratory work areas is prohibited.
- Written documents that may leave the laboratory must be protected from contamination inside the laboratory.
- All technical procedures must be performed in a way that minimizes the formation of aerosols and droplets.
- All procedures where aerosols and droplets may be generated must be carried out using disposable materials (pipettes and loops).
- Work surfaces must be decontaminated after any spill of potentially hazardous material and at the end of each working day.

- The laboratory must be kept tidy, clean, and free of materials not relevant to its activities.

8.5.3. Essential biological safety equipment

- Pipetting devices – pipettes and manual pipettors and automatic single-channel and multi-channel micropipettes.
- Biological safety cabinets, to be used whenever infectious material is handled. This material may be centrifuged in the laboratory if sealed safety centrifuge cups are used and if they are loaded and unloaded inside a biological safety cabinet, when there is an increased risk of airborne infection or when procedures with high aerosol-generation potential are used.
- Disposable plastic inoculating loops.
- Tubes and bottles with screw caps.
- Disposable plastic Pasteur pipettes, whenever available, to avoid glass.
- Biological safety cabinets are validated using appropriate methods at periodic intervals, according to the manufacturer's instructions.

8.6. Laboratory access rules

- The international biohazard symbol and sign are displayed on the laboratory entrance door.
- Only authorized personnel may enter laboratory work areas.
- Laboratory doors remain locked when unattended.
- Children are not allowed in laboratory work areas.
- No animals may enter the laboratory.
- Access to the laboratory is exclusively controlled by the Laboratory Supervisor and Researchers, through keys issued to them. Access to storage room C0.34 is via keys kept on a key holder in laboratory C1.23.
- The last user of each day is responsible for ensuring that all doors are locked

8.7. Safety officer

- The person responsible for the Laboratory of Antibiotic and Biocide Resistance, for ensuring compliance with Safety, Hygiene and Health procedures, is Professor Constança Pomba (cpomba@fmv.ulisboa.pt).

ENDOCRINOLOGY LABORATORY

8.8. Introduction

- The Endocrinology Laboratory provides services in the field of endocrine diagnostics, including:

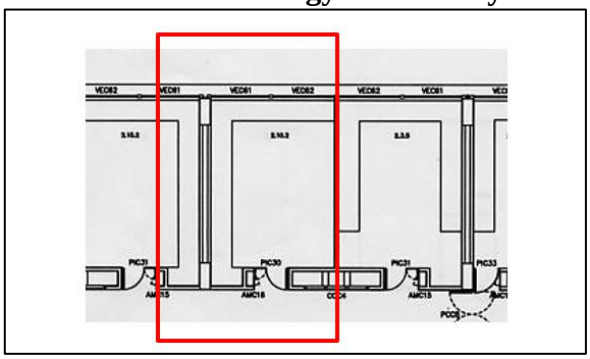
- Performing endocrine analyses requested by the HE and by external entities;

- Performing endocrine analyses associated with research projects

8.9. Summary description of spaces and location

• The Endocrinology Laboratory operates on the 4th floor of Building C, room C4.3 (Figure 11).

Figure 11
Endocrinology Laboratory



8.10. Identification of biological risks

• Considering the activities carried out, the existence of specific biological risks is anticipated, associated with the handling of animal serum.

• Prevention of these risks requires the use of gloves when handling serum samples. After analysis, the sample must be discarded in accordance with the FMV Integrated Waste Management System (Chapter 11 “Waste management and disposal”)

8.11. Prior training

• All equipment used in the laboratory has User Manuals available in Laboratory C4.3 in a dedicated folder.

• Training in the use of equipment is provided by the faculty member responsible for the Laboratory

8.12. Protective equipment

8.12.1. Collective protective equipment

- Emergency shower

- Eyewash station

8.12.2. Personal protective equipment

• All laboratory users are required to wear a clean, personal white cotton lab coat.

• All users must wear gloves when handling biological samples and kit components

8.13. Laboratory access rules

• The room is always kept locked and is only opened by the faculty member and authorized senior technicians.

8.14. Safety officer

• The person responsible for ensuring compliance with General Safety, Hygiene and Health Procedures in the Workplace is Professor Teresa Villa Brito (tbrito@fmv.ulisboa.pt).

PHARMACOLOGY AND TOXICOLOGY LABORATORIES

8.15. Introduction

• The facilities associated with the Pharmacology and Toxicology Laboratory (LFT) include a laboratory (with five contiguous and interconnected rooms) and two storage rooms. These facilities are used for research activities, diagnostic services, service provision, and practical classes of the courses "Pharmacology, Pharmacy and Pharmacotherapy" and "Toxicology and Veterinary Forensic Medicine."

• The diagnostic and service activities include:

- Toxicological diagnosis requested by the HE and external entities;

- Pharmacological diagnosis requested by the HE and external entities;

- Preparation of materials for allergological diagnostic testing at the HE;

- Preparation of specific immunotherapies requested by the HE.

• The laboratory develops research activities in the fields of Pharmacology and Toxicology

8.16. Summary description of spaces and location

• The LFT operates on the 3rd floor of Building C in the following areas (Figure 12).

- C3-5 - Research and service laboratory.

- C3-6 - Research and service laboratory.

- C3-7 - Research and service laboratory.

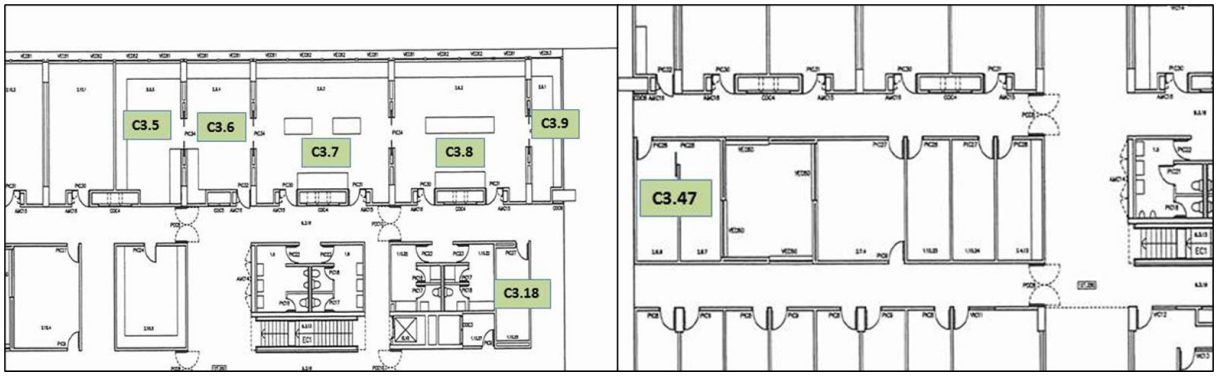
- C3-8 - Research, service, and teaching laboratory.

- C3-9 – Washing room.

- C3-47- Storage room for various consumables and chemical reagents.

- C3-18- Storage room for various consumables and chemical reagents.

Figure 12
Pharmacology and Toxicology Laboratory



8.17. Identification of biological risks

- The risks expected to be present in the areas used by the LFT include biological risks.
- Compliance with all basic Safety and Hygiene rules implemented at FMV is mandatory.
- Safety precautions must be part of routine laboratory work, just like aseptic techniques and safe microbiological practices.
- Together with good practices and procedures, the use of safety equipment will help reduce risks when dealing with hazards inherent to biological safety.
- Prevention of these risks requires proper use of each laboratory's collective protective equipment (forced ventilation and fume hoods, emergency showers and eyewash stations), including compliance with rules related to waste management.
- Protection also includes the mandatory use of personal protective equipment according to the specific tasks and the biological risk class.
- The biological risk level of the Pharmacology and Toxicology Laboratory is Class 1 and 2.
- The following rules apply to practical classes in Pharmacology and Therapeutics and Toxicology:

- While classes are in progress, students must use personal protective equipment. Sandals are not allowed in the laboratory.

- At the end of classes, students must wash their hands.

- At the end of class, the entire laboratory must be properly tidied and cleaned

8.18. Prior training

- Training in biological and/or chemical protection in the laboratory, and training in biological and/or chemical safety in the laboratory, must be provided to all personnel.
- Personnel training must always include information on safe methods for high-risk situations, namely:

- Inhalation risks (e.g., during aerosol production) when handling chemicals, manipulating blood/serum samples or organs and/or tissues for diagnosis, and centrifuging;

- Risk of ingestion when handling various samples;

- Risks of skin puncture when using syringes and needles;

- Handling blood and other potentially hazardous pathological materials;

- Decontamination and disposal of infectious and/or toxic material.

• This training is provided by the Laboratory Supervisor.

• Equipment used in the laboratories has User Manuals available in Laboratory C3.8 in a dedicated folder or located next to the equipment itself.

• Equipment that may require training includes:

- Balances – Training provided by the Laboratory Supervisor and Supervisor;

- Hot plate and magnetic stirrer – Training provided by the Laboratory Supervisor and senior technicians;

- Plate shaker – Training provided by the Laboratory Supervisor and Supervisor;

- Water bath – Training provided by the Laboratory Supervisor and Supervisor;

- Centrifuges – Training provided by the Laboratory Supervisor and Supervisor;

- Incubators – Training provided by the Laboratory Supervisor and Supervisor;

- Muffle furnaces – Training provided by the Laboratory Supervisor and Supervisor;

- Ultrasonic bath – Training provided by the Laboratory Supervisor and Supervisor;

- Rotary evaporator – Training provided by the Laboratory Supervisor and Supervisor;

- Vacuum pump – Training provided by the Laboratory Supervisor and Supervisor;

- Maintenance and use of refrigerators and freezers – Training provided by the Laboratory Supervisor and Supervisor;

- Gas chromatography equipment – Training provided by the Laboratory Supervisor and Supervisor;

- HPLC equipment – Training provided by the Laboratory Supervisor and Supervisor;

- UV-VIS spectrophotometer – Training provided by the Laboratory Supervisor and Supervisor;

- Atomic absorption spectrophotometer – Training provided by the Laboratory Supervisor and Supervisor;

- Inverted optical microscope – Training provided by the Laboratory Supervisor and Supervisor;

- Magnifying lenses – Training provided by the Laboratory Supervisor and Supervisor;

- UV reader – Training provided by the Laboratory Supervisor and Supervisor;

- Protein purifier – Training provided by the Laboratory Supervisor and Supervisor;

- Biological Safety Cabinet – Training provided by the Laboratory Supervisor and Supervisor;

- Fume hood – Training provided by the Laboratory Supervisor and Supervisor

8.19. Protective equipment

8.19.1. Collective protective equipment

• The laboratory is equipped with:

- Fume hood with HEPA filter (C3.8)
- Forced ventilation
- Class IIB Biological Safety Cabinet (C3.5)
- Emergency shower (C3.8)
- Eyewash stations (C3.5 to C3.8)
- Bucket of sand for fires or hazardous chemical spills
- Cabinets for chemical substances
- Fire blanket
- Spill response kit

8.19.2. Personal protective equipment

• All users must wear a clean, personal white cotton lab coat.

• All users must wear appropriate gloves for all tasks involving direct or accidental contact with blood, body fluids, organs and/or tissues, or potentially toxic materials. After use, gloves must be removed and hands thoroughly washed.

• The use of a disposable apron is recommended depending on the type of task performed.

• Handwashing is mandatory after handling contaminated material and before leaving laboratory work areas.

• All users must wear safety goggles, face shields, or other protective devices whenever necessary to protect the eyes and face from splashes, impacts, ultraviolet radiation, or contact with highly toxic substances.

• Users are prohibited from wearing laboratory protective clothing outside the laboratory.

• Storing food and beverages in laboratory work areas is prohibited.

• All technical procedures must be performed in a way that minimizes the formation of aerosols and droplets.

• Work surfaces must be decontaminated after any spill of potentially hazardous material and at the end of each working day.

• The laboratory must be kept tidy, clean, and free of materials not relevant to its activities.

8.20. Laboratory access rules

• Safety signage, in accordance with European harmonization standards, is displayed on the entrance door of Laboratory C3.8.

• Only authorized personnel may enter laboratory work areas.

- Only properly equipped personnel may enter laboratory work areas.
- Laboratory doors must remain closed when unattended.
- Children are not allowed in laboratory work areas.
- No animals may enter the laboratory.
- Access to the laboratory is exclusively controlled by the Laboratory Supervisor, Researchers, and other laboratory users through keys issued to them. Access to storage rooms C3.47 and C3.18 is via keys kept on a key holder in laboratory C3.09.
- The last user of each day is responsible for ensuring that all doors are closed.

8.21. Safety officer

- The person responsible for the LFT, for ensuring compliance with Safety, Hygiene and Health procedures, is Professor Berta Braz (bsaobraz@fmv.ulisboa.pt).

MICROBIOLOGY AND IMMUNOLOGY LABORATORIES

8.22. Introduction

- Facilities associated with Microbiology and Immunology activities (Bacteriology, Mycology, and Virology/Immunology) include laboratories allocated to the FMV Diagnostic Service, research laboratories and storage rooms, as well as a practical teaching laboratory.
- The laboratories within the Diagnostic Service provide services to the community in the field of microbiological diagnosis for all colleagues who request them. The current range of analyses offered covers the diagnosis of most infectious processes in the areas of bacteriology (aerobic and strict anaerobic), mycology, and virology. Antibacterial and antifungal susceptibility testing is also performed. The current range of analyses also includes molecular diagnosis of the most significant viral agents in companion animals, serological diagnosis of feline retroviruses, and assessment of the immune response of dogs and cats to specific viral agents.
- The Microbiology and Immunology laboratories also support teaching and research.
- In the teaching laboratories (C0.23, C0.23A), practical classes are held for the compulsory courses in Microbiology and Immunology of the Integrated Master's in Veterinary Medicine, and for the compulsory course in Food Microbiology of the Master's in Microbiology.

8.23. Summary description of spaces and location

- At FMV there are two laboratories dedicated to Bacteriology and Mycology activities allocated to the Diagnostic Service:

- C3.46 - Mycology Laboratory, 3rd floor, Building C (Figure 13.1).

- C4.51 - Bacteriology Laboratory, 4th floor, Building C (Figure 13.2).

- There are also three laboratories associated with research activities:

- C3.44 - Food Bacteriology Laboratory, 3rd floor, Building C (Figure 13.3).

- C3.52 - Aseptic Room, 3rd floor, Building C (Figure 13.4).

- C3.75 - Cell Culture Laboratory, 3rd floor, Building C (Figure 13.5).

• Associated with these laboratories there are two storage rooms for reagents and materials:

- C3.50 - Reagents Storage Room, 3rd floor, Building C (Figure 13.6).

- C4.63 - Storage Room, 4th floor, Building C (Figure 13.7).

• There is also one laboratory where practical classes take place:

- C0.23/23A - Practical Teaching Laboratory, 1st floor, Building C (Figure 13.8).

• Virology and Immunology activities are carried out in the following areas (Figure 14):

- C4.50 - Virology Laboratory, 4th floor, Building C.

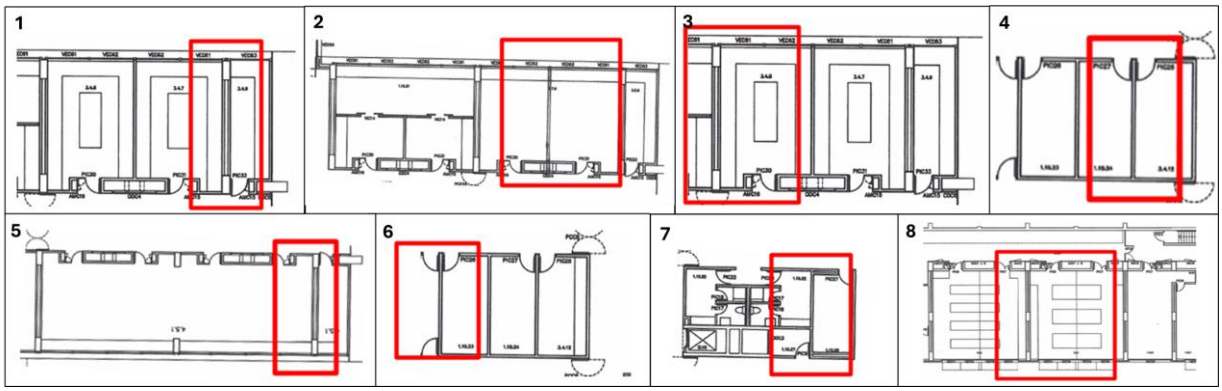
- C4.85 - Molecular Biology Laboratory, 4th floor, Building C.

• Laboratory C4.85 is multidisciplinary and associated with the Interdisciplinary Research Centre in Animal Health (CIISA) of FMV. It is used by researchers from various areas for sharing equipment and resources. It operates under the coordination of a faculty member designated by the CIISA Coordinator.

• Associated with these laboratories there is a room for equipment (balances):

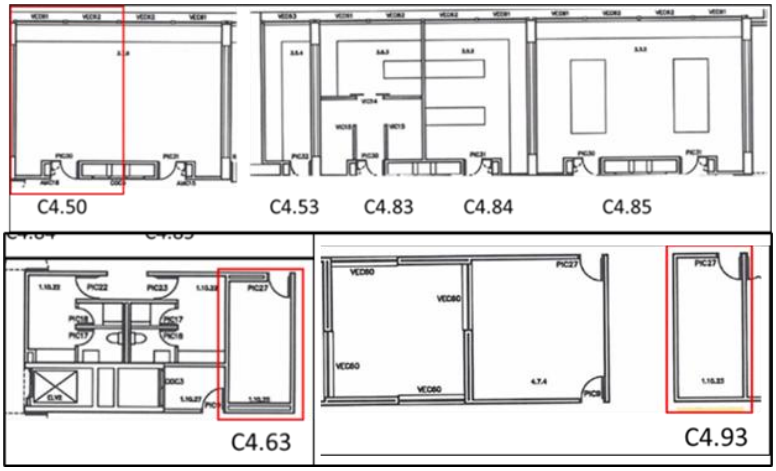
- C4.93 – Balances Room, 4th floor, Building C.

Figure 13
Microbiology Laboratory



1 - Mycology Laboratory C3.46, 3rd floor of Building C.; 2 – Bacteriology Laboratory C4.51, 4th floor of Building C.; 3 – Food Bacteriology Laboratory C3.44, 3rd floor of Building C.; 4 – Aseptic Room C3.52, 3rd floor of Building C.; 5 – Cell Culture Laboratory C3.75, 3rd floor of Building C.; 6 – Reagents Storage Room C3.50, 3rd floor of Building C.; 7 – Storage Room C4.63, 4th floor of Building C.; 8 – Practical Classes Laboratory C0.23/23A, floor 0 of Building C.

Figure 14
Virology and Immunology Laboratory



Virology Laboratory C4.50, Molecular Biology Laboratory C4.85, Reagents Storage Room C4.63, and Balances Room C4.93

8.24. Identification of biological risks

- The risks inherent to the facilities where Bacteriology, Mycology and Virology activities take place include biological risks.

- The laboratory facilities associated with Bacteriology and Mycology activities are Biosafety Level 1 and 2 laboratories. In the laboratories allocated to the Diagnostic Service (C3.46, C4.51), as well as those associated with research activities in Bacteriology and Mycology (C3.44, C3.52, C3.75) or teaching activities (C0.23/23A), only biological agents from Risk Groups 1 and 2 are handled (Decree-Law no. 84/97 of 16 April).

- The laboratory facilities associated with Virology activities are Biosafety Level 1 and 2 laboratories. In the laboratories allocated to the Diagnostic Service (C4.50, C4.85), as well as those associated with research activities (C4.85) or teaching activities (C0.23/23A), only biological agents from Risk Groups 1 and 2 are handled (Decree-Law no. 84/97 of 16 April).

- In these laboratories, biological agents from Risk Groups 3 and 4 are not handled, in accordance with the list of classification of biological agents (Ministerial Order no. 1036/98 of 15 December).

- In Storage Room C4.63 and in the Balances Room (C4.93), given the activities carried out there, specific biological risks are not anticipated.

- Prevention of these risks requires proper use of each laboratory's collective protective equipment and the mandatory use of personal protective equipment according to the specific tasks and the biological risk class.

- In the event of an accident, the emergency procedures set out in the Internal Emergency Plan (IEP) must be activated (https://www.fmv.ulisboa.pt/uploads/2024/09/66f53535061d1.pdf).

8.25. Prior training

- In the laboratories allocated to the Bacteriology, Mycology and Virology Laboratory, there is diverse specific equipment whose use requires prior training.
- Those responsible for providing this training are the Professors responsible for each laboratory or the most senior Laboratory Technician associated with it.
- In specific cases, training may be provided by the companies supplying the equipment.
- In Storage Rooms C3.50 and C4.63, there is no equipment that requires prior training.
- The equipment used in the laboratories has User Manuals available in the respective laboratory in a dedicated binder or in digital format (stored in a specific folder on the PC located in Laboratories C4.50 and C4.51).

8.26. Protective equipment

8.26.1. Collective protective equipment

- In all facilities, the following is ensured:

- Restricted access to FMV staff, professors, postgraduate students, and the clinical staff of the Teaching Hospital. Public access is not permitted. MIMV students and Master's in Microbiology students only have access to laboratory C0.23/23A, which is not open to the public.

- Unobstructed passageways and emergency exits. Fire extinguishers are easily accessible and appropriately signposted.

- Windows sealed to the outside of the building and access doors opening to the corridor.

- Walls, ceilings and floors made of smooth, impermeable materials resistant to the chemicals and disinfectants normally used in laboratories. The floor is made of non-slip material.

- Benches and furniture that are impermeable and resistant to disinfectants, acids, alcohols, organic solvents and moderate heat. The space under benches and equipment is accessible for cleaning.

- General gas shut-off valve.

- Containers for the disposal of sharp and piercing materials.

- Waste bins for disposal of Group I waste.

- Impermeable containers for placing non-disposable material containing Group II waste, for subsequent washing in the Floor Preparation Room.

- Waste bins for placing non-reusable disposable material containing Group II waste.

- Impermeable containers with plastic bags suitable for autoclaving, for placing contaminated or potentially pathogenic Group III material. This material will subsequently be decontaminated in the autoclave in the Floor Preparation Room.

- Containers for placing non-reusable disposable material containing Group IV waste. This material is disposed of in accordance with the FMV Waste Management and Disposal Plan (https://www.fmv.ulisboa.pt/uploads/2024/09/66f53535061d1.pdf. Chapter 11 "Waste management and disposal").

- Containers for placing hazardous liquid waste, separated according to category, for disposal in accordance with the FMV Waste Management and Disposal Plan

(https://www.fmv.ulisboa.pt/uploads/2024/09/66f53535061d1.pdf. Chapter 11 "Waste management and disposal").

- Regarding storage areas, each laboratory has sufficient space to store routinely used material. In the Bacteriology Laboratory (C4.51) there is a refrigerator for storage of culture media and a refrigerator for storage of contaminated samples. In the Mycology Laboratory (C3.46) there is a refrigerator for storage of culture media and a chest freezer for storage of biological samples. In the Food Bacteriology Laboratory (C3.44) there is a refrigerator for storage of culture media. In the Practical Classes Laboratory (C0.23/23A) there is a refrigerator for storage of culture media and reagents used in practical classes. There are also two storage rooms located outside the laboratory area (C3.50, C4.63) with cabinets for storage of general materials and reagents and flammable reagents.

- Staff and other laboratory users have offices and changing rooms with lockers available to store clothing and personal belongings.

8.26.2. Specific collective protective equipment

- Mycology Laboratory, C3.46:

- 1 autoclave for decontamination located in the dirty area of the preparation room C3.41/2 and another intended for preparation and sterilization of clean material located in the clean area.

- Bacteriology Laboratory, C4.51:

- Biosafety cabinet (Biological Safety Cabinet) level 2.

- Eyewash station and emergency shower.

- 1 autoclave for decontamination located in the dirty area of the preparation room C4.47/8 and another intended for preparation and sterilization of clean material located in the clean area.

- Food Bacteriology Laboratory, C3.44:

- Biosafety cabinet level 2.

- Eyewash station and shower.

- 1 autoclave for decontamination located in the dirty area of the preparation room C3.41/2 and another intended for preparation and sterilization of clean material located in the clean area.

- Aseptic Room, C3.52:

- Emergency shower and eyewash station nearby and easily accessible (C3.44).

- 1 autoclave for decontamination located in the dirty area of the preparation room C3.41/2 and another intended for preparation and sterilization of clean material located in the clean area.

- Cell Culture Laboratory, C3.75:

- Emergency shower and eyewash station nearby and easily accessible (C3.44).

- 1 autoclave for decontamination located in the dirty area of the preparation room C3.41/2 and another intended for preparation and sterilization of clean material located in the clean area.

- Practical Classes Laboratory, C0.23/0.23A:

- 2 biosafety cabinets level 2.

- Emergency shower and eyewash station.

• In the facilities associated with the Virology Laboratory, the following is ensured:

- Exhaust hoods (fume hoods).

- Laminar flow cabinets.

- Emergency shower.

- Eyewash station.

- Various types of waste containers for waste disposal, including sharps.

• The laboratories allocated to the Diagnostic Service (Virology Laboratory C4.50) and to research activities (Molecular Biology Laboratory C4.85) have an eyewash station and emergency shower and have access to an autoclave for decontamination of material, located in the dirty area of the floor preparation room C4.46, and another intended for preparation and sterilization of clean material located in the clean area (C4.47/8).

• The research laboratory C4.50 (Virology Laboratory) has a Class II Type A/B3 biological safety cabinet.

• Staff and other laboratory users have offices and changing rooms with lockers available to store clothing and personal belongings.

8.26.3. Personal protective equipment

• In the laboratories allocated to the FMV Diagnostic Service (Mycology Laboratory C3.46, Bacteriology Laboratory C4.51, Virology Laboratory C4.50, Molecular Biology Laboratory C4.85), in the research laboratories (Food Bacteriology Laboratory C3.44, Aseptic Room C3.52, Cell Culture Laboratory C3.75), and in the Practical Classes Laboratory (C0.23/23A), biological risks are reduced through appropriate personal protective equipment.

• Wearing a white lab coat, to be used exclusively in these locations, is mandatory.

• When necessary, the use of gloves and masks is also предусмотр/foreseen.

8.27. Access rules for Diagnostic and Research Laboratories

• Mycology Laboratory, C3.46: this laboratory may be accessed by the staff allocated to it as well as the laboratory head. Access is allowed to the Teaching Hospital clinical staff and to postgraduate students conducting research work in this area. Public access is not permitted. The access key is kept in Storage Room C4.63.

• Bacteriology Laboratory, C4.51: this laboratory may be accessed by the staff allocated to it as well as the laboratory head. Access is allowed to the Teaching Hospital clinical staff and to professors and postgraduate students conducting research work in this area. Public access is not permitted. The access key is kept in Storage Room C4.63.

• Virology Laboratory C4.50: this laboratory may be accessed by the staff allocated to it as well as the laboratory head. Access is allowed to the Teaching Hospital clinical staff and to postgraduate students conducting research work in this area. Public access is not permitted. The access key is kept in Storage Room C4.63.

• Molecular Biology Laboratory C4.85: this laboratory may be accessed by the staff allocated to it as well as the laboratory head. Access is allowed to professors and postgraduate students conducting research work in this area. Public access is not permitted.

• Food Bacteriology Laboratory, C3.44: this laboratory may be accessed by the staff allocated to it as well as the laboratory head. Access is allowed to professors and postgraduate students conducting research work in this area. Public access is not permitted.

• Aseptic Room, C3.52: this laboratory may be accessed by professors and postgraduate students conducting research work in this area. Public access is not permitted. The access key is kept in Storage Room C4.63.

• Cell Culture Laboratory, C3.75: this laboratory may be accessed by professors and postgraduate students conducting research work in this area. Public access is not permitted. Public access is not permitted. The access key is kept in Storage Room C4.63.

• Balances Room C4.93: this room may be accessed by professors and postgraduate students conducting research work in this area. Public access is not permitted.

• Storage Room C4.63 remains permanently locked, and copies of the keys are placed on a key holder located in the clean area of the floor preparation room C4.47/8. These areas are only accessible to staff allocated to diagnostic and research laboratories, as well as professors and postgraduate students conducting research work in this area.

8.28. Access rules for the Practical Classes Laboratory

• The Practical Classes Laboratory (C0.23/23A) may be accessed by professors, MIMV students and Master's in Microbiology students attending the curricular units "Microbiology" and "Immunology" (MIMV) and "Food Microbiology" (Master's in Microbiology), and by staff allocated to it. Public access is not permitted. The access key is kept in Storage Room C4.63.

• Entry procedures for the Microbiology practical classes laboratory:

- Upon arrival, students must go to the locker located at the entrance of the laboratory.

- They must store in the locker all personal belongings, including mobile phones, backpacks, coats and other non-essential items.

- Next, they must put on a properly disinfected white cotton lab coat provided by FMV.

- The use of shorts, skirts without tights, sandals or open footwear, rings, bracelets or other adornments on hands and wrists is strictly prohibited. Students with long hair must tie it back securely.

- They must disinfect their hands with a 70% alcohol solution provided at the laboratory entrance. When there are wounds or cuts on the hands, the use of disposable gloves as additional personal protective equipment is mandatory.

- Entry into the laboratory must be exclusively through the door indicated for that purpose. Students may only take with them the material strictly necessary for note-taking (e.g., notebook, pen).

- Before the start of practical activities, each student must carefully disinfect their bench with a 70% alcohol solution.

• Exit procedures for the Microbiology practical classes laboratory:

- At the end of the class, each student must again disinfect their bench with a 70% alcohol solution.

- Next, they must carefully wash their hands at the sink using water and soap.

- After washing, they must disinfect their hands with a 70% alcohol solution.

- Exit from the laboratory must be exclusively through the door indicated for that purpose.

- Lab coats must be removed and placed back in the respective cabinet, unless they are visibly dirty. In the event of visible contamination, the lab coat must be placed in a specific collection container.

- Lab coats are collected by a staff member and transported to the FMV laundry twice per week, and extraordinary collections may occur whenever necessary.

8.29. Safety officer

• The person responsible for the Bacteriology and Mycology laboratories, for ensuring compliance with Safety, Hygiene and Health procedures, is Professor Luís Tavares (ltavares@fmv.ulisboa.pt).

INFECTIOUS DISEASES LABORATORIES

8.30. Introduction

• The facilities associated with Infectious Diseases activities include research laboratories and storage rooms, as well as two practical classes laboratories (Figure 13).

• In the teaching laboratories (C0.22 and C0.22A) the practical classes of the Infectious Diseases curricular unit take place

8.31. Summary description of the spaces and their location

• Infectious Diseases activities are carried out in the following spaces (Figure 15):

- C4.53- Cell Culture Laboratory, on the 4th floor of Building C.

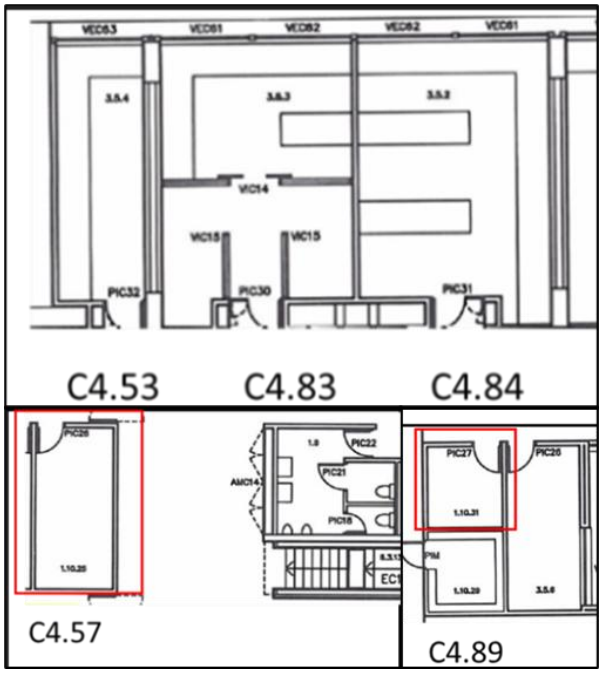
- C4.84 – General Laboratory, on the 4th floor of Building C.

• Associated with these laboratories there is a storage room for reagents and materials and a clean room:

- C4.57 - Storage room for various laboratory materials, on the 4th floor of Building C.

- C4.89 - Clean room, on the 4th floor of Building C.

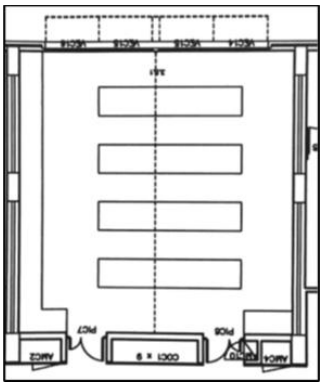
Figure 15
Infectious Diseases Research Laboratories



- There is also a laboratory where practical classes take place (Figure 16):

- C0.22/22A – Infectious Diseases Practical Classes Laboratory, on floor 0 of Building C.

Figure 16
Infectious Diseases Practical Classes Laboratory



8.32. Identification of biological risks

- The risks inherent to the facilities where Infectious Diseases activities take place include biological risks.

- The laboratory facilities associated with Infectious Diseases activities are Biosafety Level 1 and 2 laboratories. In these laboratories, only biological agents from Risk Groups 1 and 2 are handled (Decree-Law no. 84/97 of 16 April).

- The C4.83 laboratory, due to its use as a laboratory for handling virus-infected cells, is equipped with an autoclave and with a forced air exhaust system through HEPA filters. All material handled in the laboratory is sterilised before leaving the laboratory.
- In these laboratories, biological agents from Risk Groups 3 and 4 are not handled, in accordance with the list of classification of biological agents (Ministerial Order no. 1036/98 of 15 December).
- In Storage Room C4.57 and in the clean room (C4.89), given the activities carried out there, specific biological risks are not anticipated.
- Prevention of these risks requires proper use of each laboratory's collective protective equipment and the mandatory use of personal protective equipment according to the specific tasks and the biological risk class.
- In the event of an accident, the emergency procedures set out in the IEP must be activated (https://www.fmv.ulisboa.pt/uploads/2024/09/66f53535061d1.pdf).

8.33. Prior training

- In the laboratories allocated to Infectious Diseases activities there is specific equipment whose use requires prior training.
- Those responsible for providing this training are the Professors responsible for each laboratory or the most senior Laboratory Technician associated with it.
- In Storage Room C4.57 there is no equipment that requires prior training.
- The equipment used in the laboratories has User Manuals available in the respective laboratory in a dedicated binder or in digital format.

8.34. Protective equipment

8.34.1. Collective protective equipment

- In all facilities, the following is ensured:

- Exhaust hoods (fume hoods).

- Laminar flow cabinets.

- Emergency shower.

- Eyewash station.

- Various types of waste containers for waste disposal, including sharps

- The laboratories allocated to Infectious Diseases activities (Cell Culture Laboratory C4.53, General Laboratory C4.84) have an eyewash station and emergency shower and have access to an autoclave for decontamination of material, located in the dirty area of the floor preparation room C4.46, and another intended for preparation and sterilisation of clean material located in the clean area (C4.47/8).
- The Cell Culture Laboratory C4.53 has Class II Type A/B3 biological safety cabinets.
- Staff and other laboratory users have offices and changing rooms with lockers available to store clothing and personal belongings

8.34.2 Personal protective equipment

- In the Cell Culture Laboratory C4.53 and in the General Laboratory C4.84, the use of appropriate personal protective equipment is mandatory, such as a white lab coat to be used exclusively in these locations.
- The use of gloves and a mask is also mandatory, namely when using liquid nitrogen containers and whenever justified.
- In the Cell Culture laboratories (C4.53), the use of disposable lab coats, for exclusive use in those spaces, is mandatory.
- In laboratories C0.22/C0.22A reserved for teaching activities, wearing a lab coat is mandatory.

8.35. Access rules for the Laboratory

- Cell Culture Laboratory, C4.53: these laboratories may be accessed by the staff allocated to them as well as the laboratory heads. Access is allowed to professors and postgraduate students conducting research work in this area, with authorisation from the person responsible. Public access is not permitted. Copies of the access keys are kept on a key holder in room C4.101.
- Clean Room C4.89: this laboratory may be accessed by professors and postgraduate students conducting research work in this area and with authorisation from the person responsible. Public access is not permitted. Copies of the access keys are kept on a key holder in room C4.101.
- The Reagents Storage Room C4.57 remains permanently locked, and copies of the keys are placed on a key holder in room C4.101. This space is only accessible to staff allocated to diagnostic and research laboratories, as well as professors and postgraduate students conducting research work in this area.
- Practical Classes Laboratory (C0.22 / 22A): this laboratory may be accessed by professors, MIMV students attending the Infectious Diseases curricular unit, and staff allocated to it. Public access is not permitted. This laboratory remains permanently locked, and copies of the access keys are kept in office C4.101.

8.36. Safety officer

- The person responsible for the Infectious Diseases laboratories, for ensuring compliance with Safety, Hygiene and Health procedures, is Professor Fernando Boinas (fboinas@fmv.ulisboa.pt).

PARASITOLOGY AND PARASITIC DISEASES LABORATORIES

8.37. Introduction

- The facilities associated with Parasitology and Parasitic Diseases include practical class laboratories in these subject areas, which are also used for practical classes in Infectious Diseases and in the MIMV optional curricular units “Forensic Sciences in Veterinary Medicine” (Forensic

Entomology), "Tropical Infectious and Parasitic Diseases", "Apiculture Health". They are also used by the Master's in Environmental and Human Biology (FCUL), the Master's in Animal Science Engineering, the Master's in Microbiology, parasitological diagnostic service laboratories, a fluorescence microscopy room, research laboratories, the tick collection (carraçoteca) and a storage room.

- The parasitological diagnostic services include:

- Analyses for the detection and identification of protozoa, helminths and arthropods requested by the Teaching Hospital (HE) and by external entities, using serological, haematological, coprological, molecular techniques and morphological identification.

- Analyses requested by various entities, including entomological diagnosis in support of forensic necropsies requested by the Public Prosecutor's Office.

- The service laboratories associated with Parasitology and Parasitic Diseases also support research activities.

8.38. Summary description of the spaces and their location

- The Parasitology and Parasitic Diseases teaching laboratories operate in the following spaces in Building C (Figure 17):

- Floor 0:

C0.18/19 - Practical classes laboratory with benches and microscopes.

- Floor 4:

C4.11 – Tropical Animal Health and Production Laboratory.

C4.12 – Diagnostic laboratory.

C4.13 – Tick collection (Carraçoteca).

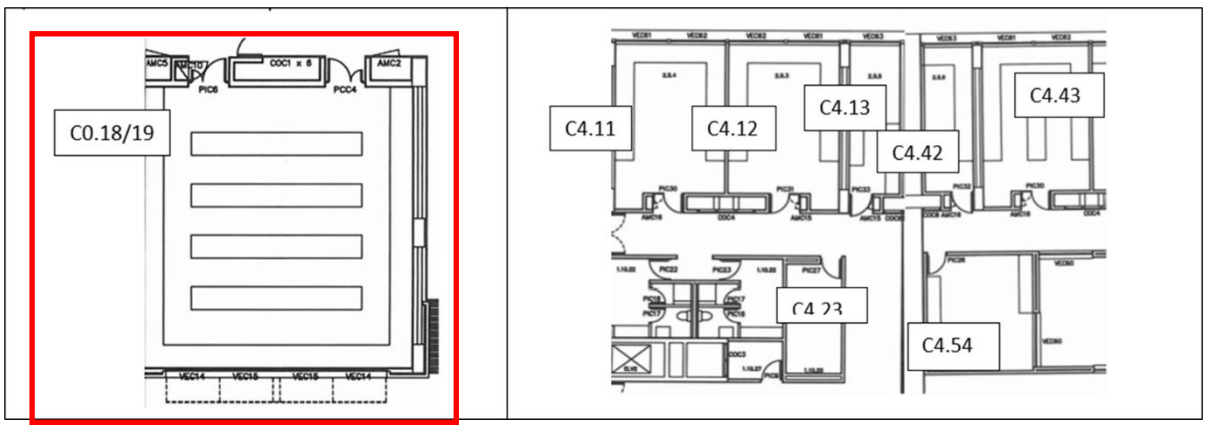
C4.42 – Fluorescence microscopy and molecular biology room.

C4.43 – Research laboratory.

C4.54 – Research laboratory.

C4.23 – Storage room for frequently used materials.

Figure 17
Parasitology and Parasitic Diseases Practical Classes Laboratories



8.39. Identification of biological risks

- The risks anticipated to be present in the spaces used by Parasitology and Parasitic Diseases include biological risks.
- Compliance with all basic Safety and Hygiene rules implemented at FMV is mandatory.
- The specific risks for each space are:

- C0.18/19 – Practical classes laboratory with benches and microscopes – handling parasites preserved in 70% alcohol, handling reagents in demonstration classes of various parasitological techniques (in blood samples, faeces and endo/ectoparasites) and also the occasional use of parasites and anatomical specimens preserved in fixative fluids.

- C4.11 – Animal Health and Production Laboratory – risks associated with processing samples within the scope of research.

- C4.12 – Service laboratory (routine techniques for preparing samples for parasitological analysis) – risks associated with processing samples received for parasite detection and identification.

- C4.13 – Tick collection (Carraçoteca) – risks associated with sample handling.

- C4.42 – Fluorescence microscopy and molecular biology room – risks associated with sample handling.

- C4.43 – Research laboratory – risks associated with processing samples within the scope of research.

- C4.54 – Research laboratory – risks associated with processing samples within the scope of research.

- Prevention of biological risks requires proper use of each laboratory's collective protective equipment (forced ventilation, Class II laminar flow cabinets and fume hoods, emergency showers and eyewash stations), including compliance with the rules regarding management of the waste produced.
- Protection also includes the mandatory use of personal protective equipment according to the specific tasks and the biological risk class.
- The biological risk level of the Parasitology and Parasitic Diseases laboratories is Class 1 and 2, mitigated by the fact that parasites preserved in 70% and 96% alcohol are frequently handled.

8.40. Prior training

- All equipment in use in the laboratories has User Manuals available in the respective laboratories in a dedicated binder.
- The following equipment may require specific training:

- C4.11 – Tropical Animal Health and Production Laboratory:

Telstar laminar flow cabinet (Class II) – training provided by the direct supervisors (PhD holders) of the ongoing research.

Microflow laminar flow cabinet (Class II) – training provided by the direct supervisors (PhD holders) of the ongoing research.

Heal Force HF151UV CO2 incubator – training provided by the direct supervisors (PhD holders) of the ongoing research.

Eppendorf 5810R centrifuge – training provided by the direct supervisors (PhD holders) of the ongoing research.

Eppendorf 5415R microcentrifuge – training provided by the direct supervisors (PhD holders) of the ongoing research.

VWR MicroStar 17R microcentrifuge – training provided by the direct supervisors (PhD holders) of the ongoing research.

Olympus CH30 microscope – training provided by the direct supervisors (PhD holders) of the ongoing research.

Olympus CKX41 inverted microscope – training provided by the direct supervisors (PhD holders) of the ongoing research.

ELISA plate washer Labsystems WellWash 4 MK2 – training provided by the direct supervisors (PhD holders) of the ongoing research.

- C4.12 – Routine techniques laboratory for preparation of samples for parasitological analysis:

Memmert incubators – training provided by the Parasitology and Parasitic Diseases technician.

Hettich EBA 85 and P Selecta Centronic centrifuges – training provided by the Parasitology and Parasitic Diseases technician.

Microscopes: Olympus CX31, Olympus BX40, Olympus CH30 and Micros, as well as a CETI stereomicroscope – training is provided by the teaching staff and the senior technician of Parasitology and Parasitic Diseases.

Fume hood – training provided by the Parasitology and Parasitic Diseases technician.

- C4.13 – Tick collection (Carraçoteca):

Reptile max 60, used for maintenance of ixodid colonies.

Euromex stereomicroscope – training is provided by the teaching staff, researchers and the senior technician of Parasitology and Parasitic Diseases.

- C4.42 – Fluorescence microscopy and molecular biology room:

Olympus BX50 immunofluorescence microscope with digital microphotography system – training is provided by the teaching staff and the senior technician of Parasitology and Parasitic Diseases. A summary of the most important points is available next to the microscope on which the system is mounted. There is a logbook for recording users.

Molecular biology equipment – Eppendorf thermocycler - Mastercycler Gradient, Hoefer MacroVue UV-25 transilluminator and high-speed agitation homogeniser (TissueLyser II). Training provided by the teaching staff and researchers with experience in molecular biology.

- C4.43 – Research laboratory:

2 ISCO FDT 250 vertical incubators and 1 WTC Binder bench incubator. Training provided by the teaching staff, laboratory technician and researchers.

Sigma 3K10 centrifuge. Training provided by the teaching staff, laboratory technician and researchers.

Vacuum pump Vacum Pump GE Motors. Training provided by the teaching staff, laboratory technician and researchers.

Sonorex Super RK 106 sonicator. Training provided by the teaching staff, laboratory technician and researchers.

3 electrophoresis power supplies: Bio-Rad, Pharmacia Biotech EP45 3500, Consort E431. Training provided by the direct supervisors (PhD holders) of the ongoing research.

3 electrophoresis tanks. Training provided by the direct supervisors (PhD holders) of the ongoing research.

Julabo F25 water bath. Training provided by the teaching staff, laboratory technician and researchers.

- C4.54 – Research laboratory:

Olympus microscope, model CH30RF200. Training provided by the teaching staff, laboratory technician and researchers with experience in microscopy.

Olympus SZ51 stereomicroscope. Training provided by the teaching staff, laboratory technician and researchers with experience in microscopy

8.41. Protective equipment

8.41.1. Collective protective equipment

- The spaces listed below are equipped with:

- C0.18/19 – Practical classes laboratory:

Ventilation through windows to the outside.

Emergency shower.

Eyewash station.

- C4.11 – Tropical Animal Health and Production Laboratory:

Fume hood with forced ventilation.

- C4.12 – Laboratory for preparation of samples for parasitological analysis:

Fume hood with forced ventilation.

Emergency shower.

Eyewash station.

- C4.43 – Research laboratory:

Forced ventilation.

Emergency shower.

Eyewash station.

8.41.2. Personal protective equipment

- All laboratory users are required to wear a lab coat.

- The use of a personal, clean, white cotton lab coat is mandatory in practical classes in laboratories C0.18/19.
- In classes involving handling of biological samples for parasitological analysis and preserved parasites, the use of disposable gloves is mandatory.
- The use of an apron, generally disposable, is optional.

8.42. Laboratory access rules

- Access to all laboratories and the microscopy room is made using keys kept on a key holder/in a drawer in laboratory C4.12 and in storage room C4.23.
- The last user each day is responsible for ensuring that all doors are closed and that the respective keys are on the key holder.
- Access to the classrooms is exclusively by the teaching staff and the technician who assists with setting up the classes, using keys kept in the lecturers' offices and on the key holder of Laboratory C4.12.

8.43. Safety officer

- The person responsible for the Parasitology and Parasitic Diseases laboratories, for ensuring compliance with Safety, Hygiene and Health procedures, is Professor Isabel Fonseca (ifonseca@fmv.ulisboa.pt).

HISTOLOGY AND EMBRYOLOGY, GENERAL PATHOLOGY AND ANATOMICAL PATHOLOGY LABORATORIES

8.43. Introduction

- The facilities associated with Histology and Embryology, General Pathology and Anatomical Pathology activities include practical class laboratories in these subject areas.
- They also include anatomical pathology diagnostic service laboratories, a microscopy room, a necropsy room, archives and storage rooms.
- Due to its specific characteristics, the Necropsy Room is addressed in a separate chapter (Chapter 7 – Anatomy and Anatomical Pathology).
- The Anatomical Pathology diagnostic services include:

- The performance of necropsies requested by various entities, including forensic necropsies requested by the Public Prosecutor's Office.

- Cytological and histopathological analyses requested by the Teaching Hospital and by external entities.

- The performance of immunohistochemistry techniques.

• The service laboratories associated with Anatomical Pathology also support research activities.

8.45. Summary description of the spaces and their location

• The Histology and Embryology, General Pathology and Anatomical Pathology teaching laboratories operate in Building C, in the following spaces (Figure 18):

- Floor 1:

C1-17 - Practical classes laboratory with benches and microscopes.

C1.18 - Practical classes laboratory with benches and microscopes.

C1.19 - Storage room for specimens fixed in formalin or for use in practical classes.

- Floor 3

C3.12 Microscopy observation room, microphotography room and slide archive.

- Floor 4

C4.4 – Routine techniques laboratory for preparing samples for histopathological and cytological analysis.

C4.5 – Room housing the automatic tissue processor, storage of specimens under processing and preparation of fresh samples for fixation.

C4.6 – Room for analysis registration, archive of requests and reports and secretarial support.

C4.7 – Immunohistochemistry laboratory.

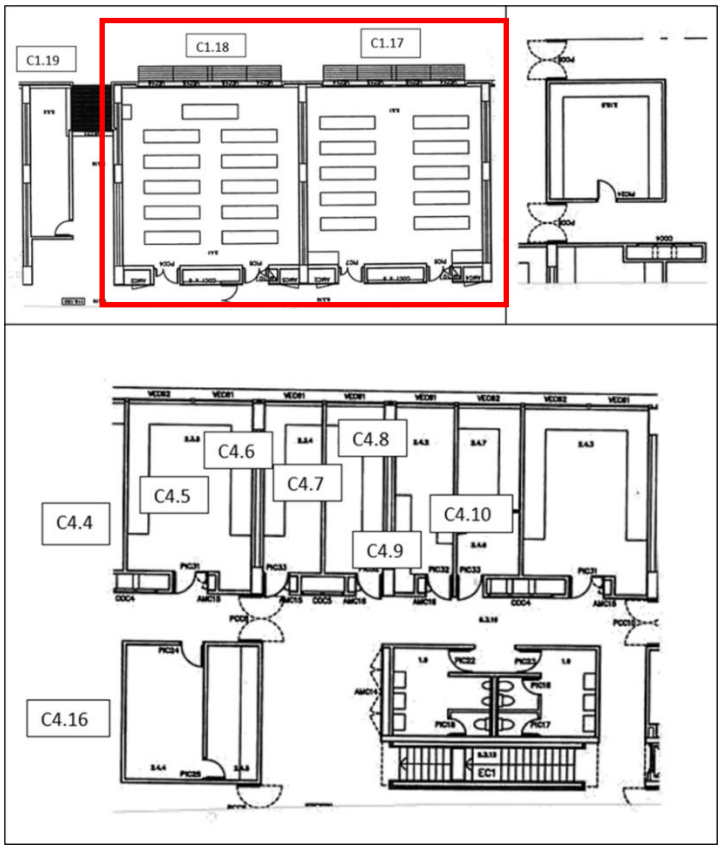
C4.8 – Multi-purpose room and special stains storage.

C4.9 – Ultramicrotome room.

C4.10 - Routine techniques laboratory for preparing samples for histopathological analysis.

C4.16 – Slide and block archive.

Figure 18
Histology and Embryology, General Pathology and Anatomical Pathology Practical Classes Laboratories



8.46. Identification of biological risks

• The spaces used by Histology and Embryology, General Pathology and Anatomical Pathology may be associated with biological risks.

• Adequate training in the use of the facilities and compliance with all basic Safety and Hygiene rules implemented at FMV is mandatory.

• Specifically:

- C1.18 – Practical classes laboratory with benches and microscopes – embryology classes using fresh animal-origin material (eggs).

- C4.4 – Routine techniques laboratory for preparation of samples for histopathological and cytological analysis – processing organ and tissue samples for histological analysis.

- C4.5 – Room with the automatic tissue processor, storage of specimens under processing and preparation of fresh samples for fixation – processing organ and tissue samples for histological analysis.

- C4.10 – Routine techniques laboratories for preparing samples for histopathological analysis – processing organ and tissue samples for histological analysis.

• Prevention of biological risks requires proper use of collective protective equipment in each laboratory (forced ventilation and fume hoods, emergency showers and eyewash stations), including compliance with waste management rules.

• Protection also includes the mandatory use of personal protective equipment according to the specific tasks and the biological risk class.

• The biological risk level of the Histology, General Pathology and Anatomical Pathology laboratories is Class 1 and 2, mitigated by the fact that tissues handled are fixed in 10% formalin.

8.47. Prior training

• All equipment in use in the laboratories has User Manuals available in the rooms where they are used.

• Equipment that may require training includes:

- C3.12

Microscopy observation room, microphotography room, slide archive. Olympus digital microphotography system, model DP21 – training is provided by the Anatomical Pathology teaching staff and senior technicians. A summary of the most important points is available next to the microscope on which the system is mounted. A logbook is available to record users. A digital version of the complete instruction manual is installed on the room computer.

White light optical microscopes (Olympus and Leica) – training provided by the Anatomical Pathology teaching staff and senior technicians.

Sliding microtome, Leica – training provided by the Anatomical Pathology technician.

Water bath – training provided by the Anatomical Pathology technician.

Memmert incubators – training provided by the Anatomical Pathology technician.

Kunz Instruments embedding station (CPL4, WD4 and TM1) – training provided by the Anatomical Pathology technician.

Removable filter fume hood – training provided by the Anatomical Pathology technician.

Automatic tissue processor, Leica, model TP1020 – training provided by the Anatomical Pathology technicians.

Gas exhaust system vented outdoors connected to specimen storage cabinets and flammable liquids cabinet – training provided by the Anatomical Pathology technicians.

Pressure cooker – training provided by the Anatomical Pathology technician.

Microwave – training provided by the Anatomical Pathology technician.

pH meter – training provided by the Anatomical Pathology technician.

Hot plate and magnetic stirrer – training provided by the Anatomical Pathology technician.

Sonicator – training provided by the Anatomical Pathology technician.

Manual Sequenza system for immunohistochemistry – training provided by the Anatomical Pathology technician.

Leica ultramicrotome, Reichert Ultracut S model – training provided by the Anatomical Pathology teaching staff.

Leica/Reichert knifemaker – training provided by the Anatomical Pathology teaching staff.

Leica Minot microtomes – training provided by the Anatomical Pathology technician.

Memmert incubators – training provided by the Anatomical Pathology technician.

8.48. Protective equipment

8.48.1. Collective protective equipment

- Laboratories C4.4 and C4.10 are equipped with:

- Fume hood
- Forced ventilation
- Emergency shower
- Eyewash station

- Laboratory C4.5 is equipped with:

- Forced ventilation system with exhaust chimney over the processor
- Eyewash station
- Removable filter fume hood
- Laboratories C4.7, C4.8, C4.9 are equipped with eyewash stations.
- Laboratories C1.17 and C1.18 are equipped with:
- Forced ventilation
- Emergency shower
- Eyewash station
- Fume hood

- Room C1.19 has forced ventilation.

8.48.2. Personal protective equipment

- All laboratory users are required to wear a lab coat.
- Wearing a lab coat is mandatory in practical classes in laboratories C1.17 and C1.18.
- In classes involving handling of specimens preserved in formalin, the use of disposable gloves and masks is mandatory.
- The use of an apron, generally disposable, is optional.

8.49. Laboratory access rules

- Access to all laboratories, storage rooms and the microscopy room is made using keys kept on a key holder in laboratory C4.4.
- The last user each day must ensure that all doors are closed and that the respective keys are on the key holder.
- Access to the classrooms and room C1.19 is exclusively by teaching staff and technicians who assist in preparing the classes, using keys kept on the key holder of Laboratory C4.4.

8.50. Safety officers

• The persons responsible for the Histology and Embryology, General Pathology and Anatomical Pathology laboratories, for ensuring compliance with Safety, Hygiene and Health procedures, are Professor Mário Pinho (Histology and Embryology – mpinho@fmv.ulisboa.pt) and Professor Jorge Correia (Anatomical Pathology – jcorreia@fmv.ulisboa.pt).

BIOCHEMISTRY LABORATORY

8.51. Introduction

• The facilities associated with Biochemistry include the "Biochemistry, Cellular and Molecular Biology" laboratory of the Integrated Master's in Veterinary Medicine (C1.21) and the animal-origin product quality research laboratory, where research activities and laboratory services to the community are carried out (C4.45), as well as an archive (C4.56).

8.52. Summary description of the spaces and their location

• The Biochemistry teaching, research and service laboratories operate in the following areas of Building C (Figure 19):

- Floor 1:

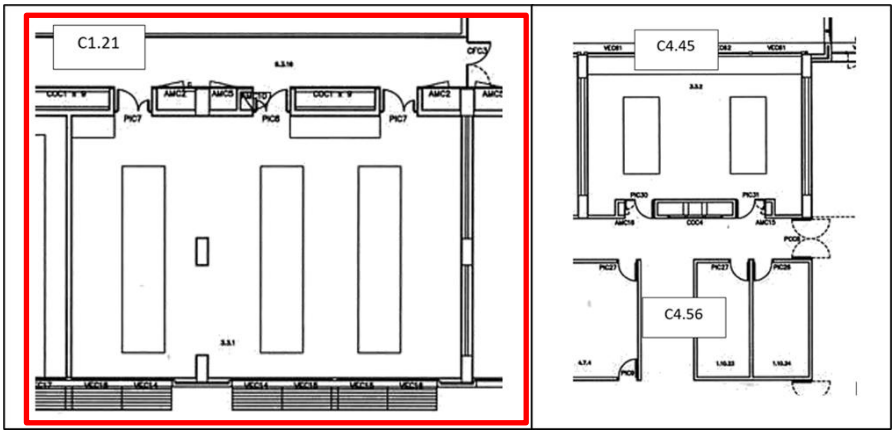
C1-21 - Practical classes laboratory with benches.

- Floor 4:

C4.45 – Research and service laboratory in the area of biochemistry and food chemistry.

C4.56 – Archive of various materials.

Figure 19
Biochemistry Laboratory



8.53. Identification of biological risks

- The risks that may be present in spaces used for Biochemistry, Cellular and Molecular Biology include biological risks.
- Compliance with all basic Safety and Hygiene rules implemented at FMV is mandatory.
- During experiments or work involving cultures and microorganisms (C1.21), access to the laboratory must be restricted to authorized personnel only, in accordance with procedures implemented by the laboratory supervisor.
- A lab coat must always be worn.
- Hands must be washed with soap/disinfectant and water before and after handling biological materials, whenever gloves are removed, and before leaving the laboratory.
- Sharp and piercing materials must be used according to their respective protocols.
- Work must be carried out in a way that minimizes or avoids aerosol formation.
- Work surfaces must be decontaminated at a minimum before starting work and whenever finishing, using an appropriate disinfectant, and whenever a small spill of biological material occurs (70% alcohol).
- At the end of each class, benches must be left properly organized and clean.
- Prevention of these risks requires proper use of collective protective equipment in each laboratory (forced ventilation and fume hoods, emergency showers and eyewash stations), including compliance with waste management rules.
- Protection also includes the mandatory use of personal protective equipment according to the specific tasks and biological risk class.

8.54. Prior training

- All equipment in use in the laboratories has User Manuals available in Laboratories C1.21 and C4.45 in dedicated folders.
- Specific equipment that may require training:

- C1.21 – Practical classes laboratory:

Thermo Spectronic spectrophotometer – training provided by teaching staff, researchers and the Biochemistry senior technician.

Gallenkamp Junior educational gas chromatograph coupled to a nitrogen cylinder – training provided by teaching staff, researchers and the Biochemistry senior technician.

Heittich Rotofix II centrifuge – training provided by teaching staff, researchers and the Biochemistry senior technician.

Analytical balance and single-pan balance (Mettler Toledo) – training provided by the Biochemistry technician.

Sotel incubator – training provided by the Biochemistry technician.

Memmert and Grant water baths – training provided by the Biochemistry technician.

Whirlpool microwave – training provided by the Biochemistry technician.

Orion potentiometer – training provided by teaching staff, researchers and the Biochemistry senior technician.

Ika hot plates and stirrers – training provided by teaching staff, researchers and the Biochemistry senior technician.

- C4.45 – Research and service laboratory (biochemistry and food chemistry):

Gas exhaust system vented outdoors connected to specimen storage cabinets and flammable liquids cabinet – training provided by teaching staff, researchers and the Biochemistry senior technician.

Gas installation certified by Air Liquide – training provided by teaching staff and the Biochemistry senior technician.

HP6890A gas chromatograph (GC) – training provided by teaching staff and the Biochemistry senior technician.

Agilent 1100 High Performance Liquid Chromatograph (HPLC) – training provided by teaching staff, researchers and the Biochemistry senior technician.

Agilent 1200 HPLC – training provided by teaching staff, researchers and the Biochemistry senior technician.

Fast Protein Liquid Chromatography system (FPLC) – training provided by teaching staff, researchers and the Biochemistry senior technician.

Kjeltec digestion and distillation system – training provided by teaching staff, researchers and the Biochemistry senior technician.

Pharmacia spectrophotometer – training provided by teaching staff, researchers and the Biochemistry senior technician.

Kontron Instruments densitometer – training provided by teaching staff, researchers and the Biochemistry senior technician.

Heraeus Labofuge 400 and Biofuge 28RS centrifuges – training provided by teaching staff, researchers and the Biochemistry senior technician.

GFL 1083 water bath – training provided by teaching staff, researchers and the Biochemistry senior technician.

Melag incubators – training provided by teaching staff, researchers and the Biochemistry senior technician.

Radiometer PHM 92 potentiometer – training provided by teaching staff, researchers and the Biochemistry senior technician.

Grant MXB14 ultrasonic bath – training provided by teaching staff, researchers and the Biochemistry senior technician.

Heidolph heating plate and stirrers – training provided by teaching staff, researchers and the Biochemistry senior technician.

Gibertini E42 analytical balance – training provided by teaching staff, researchers and the Biochemistry senior technician.

Stuart concentrator – training provided by teaching staff, researchers and the Biochemistry senior technician.

IKA rotary evaporator – training provided by teaching staff, researchers and the Biochemistry senior technician.

- The analytical methodologies performed using this equipment are included in a file entitled "Analytical Techniques" on the Biochemistry intranet.

8.55. Protective equipment

8.55.1. Collective protective equipment

- Laboratory C1.21 is equipped with:

- 2 fume hoods

- Forced ventilation

- Emergency shower

- Eyewash station

- Laboratory C4.45 is equipped with:

- Fume hood

- Forced ventilation

- Emergency shower

- Eyewash station

8.55.2. Personal protective equipment

- All users of laboratories C1.21 and C4.45 are required to wear a lab coat.
- Gloves, filter masks and protective goggles are also available.

8.56. Laboratory access rules

- Access to all laboratories and the storage room is made using keys kept on the key holder in laboratory C4.45.
- The last user each day must ensure that all doors are closed and that the respective keys are on the key holder.

8.57. Safety officer

- The person responsible for the Biochemistry, Cellular and Molecular Biology laboratory, for ensuring compliance with Safety, Hygiene and Health procedures, is Professor José Prates (japrates@fmv.ulisboa.pt).

SECTION OF ANIMAL PRODUCTS TECHNOLOGY

8.58. Introduction

• The Section of Animal Products Technology (STPA) has a Safety Manual whose purpose is to define and plan preventive measures known as Good Laboratory Practices, which must be implemented and followed by the entire laboratory team, including academic and non-academic staff, researchers, students, trainees and visitors.

• A copy of the Safety Manual is available at STPA for consultation. This manual must be read by all staff members as well as by students carrying out temporary work in the laboratories. Confirmation that it has been read and that its rules have been accepted and understood must be documented by signing the Internship Registration Form

8.59. Descrição sumária dos espaços e sua localização

• STPA laboratory facilities are located in Building C and include (Figure 20):

- Molecular Biology and Research Laboratory (C3.45).

- Food Microbiology Laboratory (C2.3 and C2.3A).

- Food Chemistry Laboratory (C2.18, C2.18A and C2.18B).

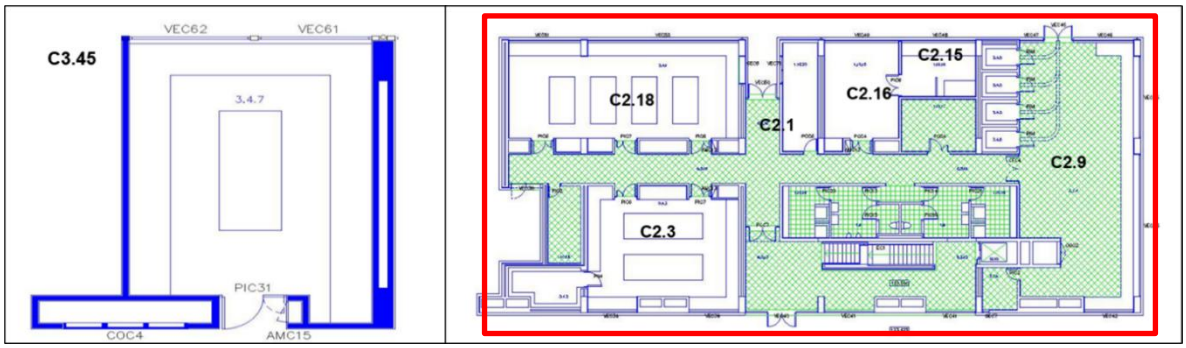
- Technological Workshop (C2.9).

- Preparation Rooms (C2.15, C2.16).

- Technical Support Office (C2. 17).

• All these laboratories operate under Biosafety Levels 1 and 2.

Figure 20
Laboratories of the Section of Animal Products Technology



8.60. Identification of biological risks

• STPA activities are associated with biological risks.

• Biological risks specific to each area:

- Microbiology Laboratory (C2.03) – Research/handling/storage of Group 1 and 2 microorganisms.

- Molecular Biology Laboratory (C3.45) – Research/handling/storage of Group 1 and 2 microorganisms.

- Preparation Rooms (C2.15, C2.16 and C2.17) – Decontamination of potentially contaminated materials coming from the Microbiology Laboratory.

• Risk prevention requires compliance with all basic Safety and Hygiene rules implemented at FMV.

• As a specific rule in the Technological Workshop, the use of jewelry and adornments is prohibited, including watches, earrings, piercings and artificial nails. Painted nails are not allowed; in such cases, the use of gloves is recommended. The use of makeup is not recommended.

• In order to minimize risk, STPA has implemented a cleaning, disinfection and sterilization plan in accordance with the table below.

Table 8

Cleaning, disinfection and sterilization plan in STPA

Location	Washing	Remarks	Disinfection	Sterilization (UV)
Microbiology Laboratory (C2.03)	Walls, ceilings, light fixtures, hard-to-reach areas	Annual	Not applicable	Every 2 months and whenever justified
	All benches and incubators	Twice a year	Not applicable	
	Work benches	Before and after use	Before and after use with Trisan / 70% alcohol	
Molecular Biology Laboratory (C3.45)	Walls, ceilings, light fixtures, hard-to-reach areas	Annual	Not applicable	Not applicable
	All benches and incubators	Twice a year	Not applicable	
	Work benches	Before and after use	Before and after use with Trisan / 70% alcohol	
Chemistry Laboratory (C2.18)	Walls, ceilings, light fixtures, hard-to-reach areas	Annual	Not applicable	Not applicable
	All benches and incubators	Twice a year		
	Work benches	Before and after use		
Preparation Rooms (C2.15, C2.16 and C2.17)	Walls, ceilings, light fixtures, hard-to-reach areas	Annual	After use with bleach	Not applicable
	Sinks, tables and benches	Before and after use		
Technology Workshop (C2.09)	Walls, ceilings, light fixtures, hard-to-reach areas	Annual	Before and after use according to the ECOLAB hygiene plan	Not applicable
	All benches and machines	Twice a year		
	Work benches and machines	Before and after use		
Cold Rooms	Walls, ceilings, shelves, door and floor	Twice a year	Cleaning vinegar	Not applicable
	Shelves, floor	Whenever justified		
Laminar Flow Cabinet	Interior	Before and after use	Before and after use with Trisan / 70% alcohol	Before and after use

8.61. Prior Training

- All STPA equipment is recorded in folders labeled "Equipment", which are available for consultation on the shelf in the technical office C2.17.
- Files E001 – E019 include an initial list called "Equipment List (E)", containing all equipment in this section's laboratories in alphabetical order, with the following information: Reference – corresponding to the equipment's entry number (Exxx); Equipment name; Brand; Model; Acquisition date; Location within the section.
- Each individual equipment file contains an "Intervention Record Sheet" and an Instruction Manual.
- The Intervention Record Sheet is used to record breakdowns, repairs, and calibrations/verifications carried out.
- All equipment assigned to this section requires training, as these are laboratory instruments. Training is provided by the section's technical staff and teaching staff.
- Whenever equipment is used frequently and by different operators, an Operating Procedure (OP Exxx) is made available next to the equipment. This document includes basic rules for use, checks and/or calibrations, and a usage log, in accordance with Table 9.

Table 9
Operating Procedure of the Section of Animal Product Technology

Equipment	Operating Procedure	Rules for Use	Calibration Rules	Usage Log
pH Meter 9025	PO E035	×	×	×
pH Meter 99163	PO E036	×	×	×
Laminar Flow Cabinet	PO E029	×		×
Hygrometer	PO E040	×	×	×
Smart	PO E050	×		
Colorimeter	PO E031	×	×	
Hettich Centrifuge	PO E043	×		
Eppendorf Centrifuge	PO E018	×		
Texture Analyzer	PO E077	×	×	×

8.62. Protective Equipment

8.62.1. Common Structural Protection Features

- Laboratories and the workshop have no direct connection with common access areas. Restricted-access entry points are through doors equipped with security and fire-resistant systems opening into the common corridor.
- Doors providing access to laboratories and the workshop open toward the corridor.
- Laboratories and the workshop are spacious areas, allowing activities to be carried out safely, as well as facilitating cleaning and maintenance.
- Walls, ceilings, and floors are smooth, easy to clean, impermeable, and resistant to the chemicals and disinfectants normally used in laboratories.
- Floors are non-slip.

- Lighting is adequate for all activities carried out.
- Windows face the outside of the building and are sealed.
- Furniture is sturdy, and the space between and beneath benches and equipment is accessible for cleaning.
- Benches are impermeable and resistant to disinfectants, acids, alcohols, organic solvents, and moderate heat.
- Storage space is appropriate for keeping routinely used materials.
- There is a cold room for storage of culture media.
- There is a long-term storage area located outside the laboratory work area, designated as the reagent room, with cabinets for storage of general reagents, flammable reagents, and another for volatile reagents equipped with an extraction system.
- Facilities are available outside laboratory work areas for storing clothing and personal belongings (offices and changing rooms with lockers).
- Passageways and emergency exits are unobstructed, and fire extinguishers are properly signposted.

8.62.2. Collective Protective Equipment

- Includes:

- Class II biological safety cabinet — Food Microbiology Laboratory (C2.3 and C2.3A).

- Fume hood — 3 in the Food Chemistry Laboratory (C2.18, C2.18A and C2.18B); 1 in the Molecular Biology Laboratory (C3.45).

- Eyewash station — 1 in the Food Microbiology Laboratory (C2.3 and C2.3A); 1 in the Food Chemistry Laboratory (C2.18, C2.18A and C2.18B); 1 in the Molecular Biology Laboratory (C3.45).

- Emergency shower — 1 in the Food Microbiology Laboratory (C2.3 and C2.3A); 1 in the Food Chemistry Laboratory (C2.18, C2.18A and C2.18B); 1 in the Molecular Biology Laboratory (C3.45).

- Autoclave — Preparation rooms (C2.15 and C2.16).

- First aid kit — Preparation room (C2.17).

8.62.3. Personal Protective Equipment (PPE)

- Includes:

- Na entrada da Oficina Tecnológica (C2.9) são colocadas toucas e luvas.

- O uso de bata branca e touca é obrigatório neste espaço.

- Class II biological safety cabinet — Food Microbiology Laboratory (C2.3 and C2.3A).

- Lab coat — Available in the user's personal locker. Disposable lab coats are available for visitors.

- Gloves, caps, safety goggles, masks — Drawer labeled “PPE” in the Food Chemistry Laboratory (C2.18, C2.18A and C2.18B), Food Microbiology Laboratory (C2.3 and C2.3A), and Molecular Biology Laboratory (C3.45).

- At the entrance to the Technological Workshop (C2.9), caps and gloves are provided.
- Wearing a white lab coat and cap is mandatory in this area

8.63. Laboratory Access Rules

- The Animal Products Technology Section is used by teaching and non-teaching staff, students, trainees, and visitors when accompanied by staff assigned to the section.
- All staff assigned to the STPA have a key to the main entrance door (C2.000) and a key ring containing all remaining keys providing access to laboratories, storage rooms, preparation rooms, and the workshop. Opening and closing of these doors are the responsibility of the first and last user, respectively.
- Except for scheduled and duly authorized activities, children are not allowed to enter laboratories or the workshop.
- Entry of animals into the section is prohibited

8.63. Safety Officer

- The person responsible for ensuring compliance with Safety, Hygiene, and Health procedures in the Animal Products Technology laboratories is Professor Maria João Fraqueza. mjoaofraqueza@fmv.ulisboa.pt).

ANIMAL PRODUCTION AND NUTRITION LABORATORY

8.64. Introduction

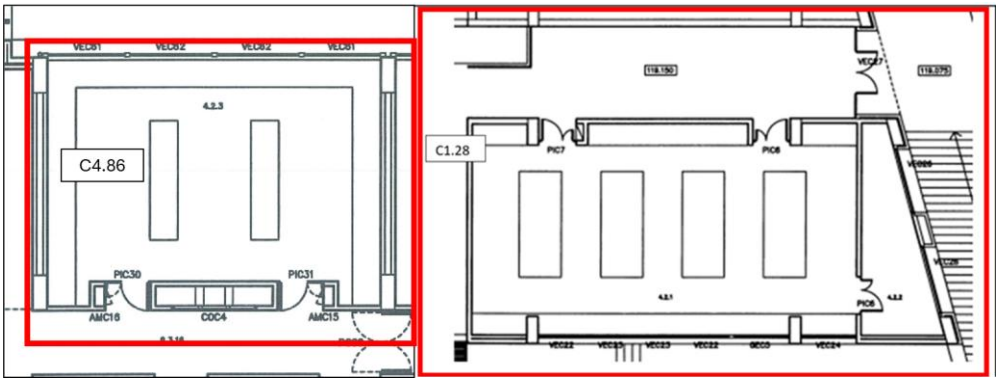
- • Facilities associated with Animal Production and Nutrition activities include a laboratory for research activities, sample preparation and routine analyses, and practical classes for optional courses of the Master’s Degree in Food Safety.
- • They also include the practical class laboratory C1.28, which is used for teaching two courses in the Integrated Master’s in Veterinary Medicine, “Animal Husbandry, Agriculture and Environment” and “Nutrition and Feeding,” and is also used for service provision and research support activities.

8.65. Summary Description of Spaces and Location

- The Animal Production and Nutrition Laboratory operates on Floor 4 of Building C as a research, sample preparation, and routine analysis laboratory (C4.86) (Figure 21).

• The practical class laboratory for "Animal Husbandry, Agriculture and Environment" and "Nutrition and Feeding" is located in room C1.28 of Building C, Floor 1 (Figure 21).

Figure 21
Laboratories of Animal Production, Agriculture and Environment, and of Nutrition and Feeding



Research laboratory for sample preparation and routine analyses (C4.86). Practical class laboratory for "Animal Husbandry, Agriculture and Environment" and "Nutrition and Feeding" (C1.28, Building C, Floor 1)

8.66. Identification of Biological Risks

• The risks expected to be associated with the activities of the Animal Production and Nutrition Laboratories C1.28 and C4.86 include biological risks.

• Compliance with all basic Safety and Hygiene rules implemented at FMV is mandatory.

• In the Animal Production and Nutrition Laboratory, safety procedures, laboratory techniques implemented in the laboratory, as well as hazard symbols and safety data sheets for the chemicals available in the laboratory, are accessible for consultation.

• Biological risks associated with the activities of the Animal Production and Nutrition Laboratory include handling biological samples of animal origin (digestive contents, plasma, feces). They also result from the use of reagents in various analytical procedures, equipment use, and the performance of assays in biological material.

• Prevention of biological risks requires the correct use of collective protective equipment in each laboratory (forced ventilation and fume hoods, emergency showers and eyewash stations), including compliance with the rules for management of produced waste according to FMV's Integrated Waste Management System (Chapter 11 "Waste management and disposal").

• Protection also includes the mandatory use of personal protective equipment according to the specific tasks and biological risk class.

• The biological risk classification of the Animal Production and Nutrition Laboratories C1.28 and C4.86 is Class 1.

8.67. Prior Training

• All equipment located in laboratories C1.28 and C3.76 that presents risks associated with its use has User Manuals available in the respective laboratories in dedicated folders.

- For designated equipment, users must record their usage.
- Equipment requiring specific training includes:

- Gas chromatograph with flame ionization detector — Advanced training provided by the responsible Professors or Researchers.

- Gas chromatograph coupled to a mass spectrometer — Advanced training provided by the responsible Professors or Researchers.

- Gerber centrifuge — Basic training provided by the responsible Professors or Researchers.

- SPE vacuum manifold — Basic training provided by the responsible Professors or Researchers.

- Nitrogen stream evaporator — Basic training provided by the responsible Professors or Researchers.

- Monza analyzer — Advanced training provided by the responsible Researchers.

- Ultrasonic bath — Basic training provided by the responsible Professors or Researchers.

- Bomb calorimeter — Training provided by lecturers and senior technicians of the Nutrition sector. A summary of the most important points is available near the equipment. A user logbook is provided. A complete version of the instruction manual is available next to the device.

- Soxhlet apparatus — Training provided by lecturers and senior technicians of the Nutrition sector.

- Muffle furnace — Training provided by lecturers and senior technicians of the Nutrition sector. It is located in one of the fume hoods in this laboratory.

- Kjeldahl apparatus — Training provided by lecturers and senior technicians of the Nutrition sector. It is located in one of the fume hoods in this laboratory.

8.68. Protective Equipment

8.68.1. Collective Protective Equipment

- Facilities associated with Animal Production and Nutrition activities are equipped with:

- Fume hood

- Forced ventilation

- Emergency shower

- Eyewash station

8.68.2. Personal Protective Equipment (PPE)

- All laboratory users must wear a clean, personal white cotton lab coat.
- All handlers of chemical reagents are required to use:

- Lab coat

- Disposable gloves

- Wearing a lab coat is mandatory during practical classes in Laboratory C1.28.

- The use of safety glasses and masks depends on the risk associated with the biological substance being handled.

8.69. Laboratory Access Rules

- Access to Laboratories C1.28 and C4.86 is by keys provided to users duly authorized by the laboratory supervisor, or available from the faculty member responsible for the laboratory.
- The last user each day must ensure that all doors are closed and keys returned to the key holders.

8.70. Safety Officer

- The person responsible for ensuring compliance with Safety, Hygiene, and Health procedures in the Animal Production and Nutrition Laboratory is Professor Rui Bessa (rjbbessa@fmv.ulisboa.pt).

GLYCOBIOLOGY AND STRUCTURAL ENZYMOLOGY LABORATORY

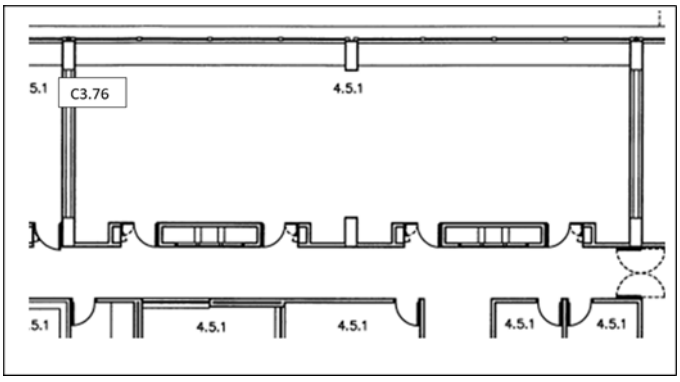
8.71. Introductiono

Facilities associated with the activity of the Glycobiology and Structural Enzymology Laboratory include research laboratory C3.76, which is restricted to research activities and project development.

8.72. Summary Description of Spaces and Location

The Glycobiology and Structural Enzymology research laboratory operates in room C3.76 of Building C, Floor 3 (Figure 22).

Figure 22
Glycobiology and Structural Enzymology Laboratory



8.73. Identification of Biological Risks

- The risks expected to be present in Laboratory C3.76 include biological risks.
- Compliance with all basic Safety and Hygiene rules implemented at FMV is mandatory.
- Risks arise from the use of reagents in various analytical procedures, equipment operation, and the performance of assays on biological material.
- Prevention of biological risks requires the correct use of collective protective equipment in each laboratory (forced ventilation and fume hoods, emergency showers and eyewash stations), including compliance with the rules regarding waste management in accordance with FMV's Integrated Waste Management System.
- Protection also includes the mandatory use of personal protective equipment according to the specific tasks and biological risk class.
- The biological risk classification of the Glycobiology and Structural Enzymology Laboratory is Class 1.

8.74. Prior Training

- All equipment located in Laboratory C3.76 that presents risks associated with its use has User Manuals available in the laboratory in a dedicated folder.
- Equipment requiring prior training includes:

- Isothermal titration calorimeter — Training provided by faculty members and senior technicians working in this laboratory. A summary of key points is available next to the equipment. A user logbook is provided. A full instruction manual is available beside the device.

- FPLC chromatography system — Training provided by faculty members and senior technicians working in this laboratory. A summary of key points is available next to the equipment. A user logbook is provided. A full instruction manual is available beside the device.

- Nucleic acid and protein electrophoresis systems — Training provided by faculty members and senior technicians working in this laboratory.

- Microwave oven — Training provided by the laboratory technician.

- pH meter — Training provided by the laboratory technician.

- Sonicator — Training provided by the laboratory technician.

- Spectrophotometer — Training provided by the laboratory technician.

- Orbital incubators — Training provided by the laboratory technician.

- Centrifuges — Training provided by the laboratory technician.

8.75. Protective Equipment

8.75.1. Collective Protective Equipment

- Laboratory C3.76 is equipped with:

- Fume hood

- Forced ventilation

- Emergency shower

- Eyewash station

8.75.2. Personal Protective Equipment (PPE)

• All laboratory users must wear a clean, personal white cotton lab coat.

• All handlers of nucleic acids, proteins, and other chemical reagents must use:

- Lab coat

- Disposable gloves

• The use of safety glasses and masks depends on the risk associated with the biological substance being handled.

8.76. Laboratory Access Rules

• Access to Laboratory C3.76 is restricted exclusively to faculty members, researchers, and technicians of the Glycobiology and Structural Enzymology Laboratory, using personal keys.

• The last user each day must ensure that all doors are closed and keys returned to the key holders.

8.77. Safety Officer

• The person responsible for ensuring compliance with Safety, Hygiene, and Health procedures in the Glycobiology and Structural Enzymology Laboratory is Professor Pedro Bule Gomes (pedrobule@fmv.ulisboa.pt).

PHYSIOLOGY LABORATORY

8.78. Introduction

• Facilities associated with Physiology include practical class laboratories and two adjoining research laboratories where microscopes are also used to provide anatomopathological diagnostic services for mare endometrium, as well as a storage room.

8.79. Summary Description of Spaces and Location

• Physiology teaching laboratories operate in the following spaces in Building C (Figure 23):

- C0.26-27, Floor 0 - Practical class laboratory with benches, microscopes, and water bath.

- C4.87-88, Floor 4 – Research laboratories.

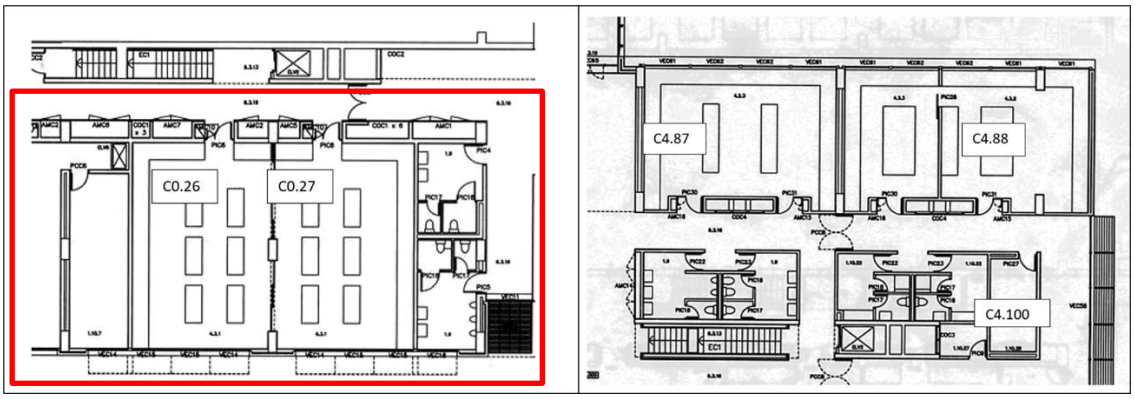
- C4.87, Floor 4 – Laboratory for processing genital tracts collected at slaughterhouses from mares considered by veterinary inspection to be in perfect health for human consumption. Samples are

used for explant culture, cell isolation, fixation in buffered formalin for subsequent histopathological analysis (Histology Laboratory), and various determinations using molecular biology techniques (qPCR, Western Blot, zymography, immunohistochemistry). Plasma/serum separation by centrifugation for endocrinological analyses. Archive of slides and paraffin blocks. Storage of biological samples in an ultra-freezer (-80ºC).

- C4.88, Floor 4 – Cell and tissue culture laboratory, immunohistochemistry, and molecular biology techniques. Cryostat room (Leica CM3050S). Special immunohistochemistry stains and disposable materials.

- C4.100, Piso 4 – Storage room for reagents kept at room temperature and disposable materials.

Figure 23
Physiology Laboratory



8.80. Identification of Biological Risks

- The risks expected to be present in the areas used by Physiology include biological risks.
- Compliance with all basic Safety and Hygiene rules implemented at FMV is mandatory.
- The risks are associated with the processing of organ and tissue samples.
- Prevention of these risks requires the proper use of collective protective equipment in each laboratory (forced ventilation and fume hoods, emergency showers and eyewash stations), including compliance with the rules regarding the management of generated waste.
- Protection also includes the mandatory use of personal protective equipment according to the specific tasks and biological risk class.
- The biological risk classification of the Physiology laboratories is Class 2, due to the handling of tissues collected from slaughterhouses.

8.81. Prior Training

- All equipment used in the laboratories has User Manuals available in Laboratory C4.87 in a dedicated folder.
- Equipment that may require training includes:

- Memmert incubators

- Ultra-freezer (–80 °C) used for storage of biological samples

- Western Blot equipment
- Refrigerated centrifuge
- pH meter
- Laminar flow cabinet and respective O_2 cylinders
- Inverted microscope
- Light microscope
- Two CO_2 incubators
- Spectrophotometer
- Shaker plates
- Hot plate and magnetic stirrer
- Leica ultramicrotome, Reichert Ultracut S model

• With the exception of the ultramicrotome (training provided by Physiology faculty), training for proper equipment use is provided by the Head of the Physiology Laboratory

8.82. Protective Equipment

8.82.1. Collective Protective Equipment

• The laboratories are equipped with:

- Fume hood
- Forced ventilation
- Emergency shower
- Eyewash station

8.82.2. Personal Protective Equipment (PPE)

• All laboratory users must wear a clean, personal white cotton lab coat.

• During practical classes involving handling of preserved specimens, the use of disposable gloves is mandatory.

• The use of an apron, generally disposable, is optional

8.83. Laboratory Access Rules

• Access to all laboratories, storage rooms, and the microscopy room is controlled by keys held by their direct users.

• The last user each day is responsible for ensuring that all doors are closed and the respective keys are returned to the key holders. A key to Laboratory C4.87 is kept in a location known only to authorized users.

8.91. Safety Officer

- The person responsible for ensuring compliance with Safety, Hygiene, and Health procedures in the laboratories is Professor Graça Ferreira Dias (gmlfdias@fmv.ulisboa.pt).

9. LAUNDRY

9.1. Introduction

The laundry is a very important department within Biosafety, as soiled and contaminated items from all FMV departments enter it daily.

9.2. General Information

• All soiled laundry coming from the Teaching Hospital and the Diagnostic Service must be considered contaminated, and standard precautions must always be applied when handling it.

• The use of disposable items should be encouraged whenever possible in areas where biological risk is higher, for example, items originating from areas with biosafety level 3 and 4.

• The use of reusable PPE is in place in various FMV facilities, and the Laundry follows a specific procedure for materials washed on its premises:

- Laboratories:

○ White coats

○ Hand towels

○ Cleaning cloths

○ Fabric coveralls

- Companion Animal, Equine and Production Animal Hospitals:

○ Surgical scrubs (blue, green, and burgundy)

○ White coats

○ Blankets

○ Surgical drapes

○ Surgical gowns

○ Towels for Exotic Species

○ Reception staff uniforms

○ Heating pads

- Maintenance, Waste, Stables and Cleaning:

○ Uniforms

- Dormitories:

○ Bed sheets

○ Towels

○ Duvets

○ Kitchen cloths

• The Laundry has completely separate circuits for dirty and clean materials.

• Dirty and clean materials are transported in containers of different colors (red for contaminated and green for clean laundry).

• Dirty and clean materials are stored in separate areas.

• Order of procedures: clean materials must be handled before dirty ones.

• In the laundry room:

- Movement must follow a one-way flow.

- Walls and floors must be easy to clean.

- The room must be climate-controlled at a constant temperature.

- The room must be kept clean (regular cleaning, especially in the dirty area).

- Industrial equipment (washing machines, dryers, ironing machines) is used for **effective elimination of microorganisms and compliance with biosafety standards** through high-temperature cycles. This ensures **operational efficiency** with **long-term cost reduction** due to fabric durability and water/energy savings, and **improves staff comfort and safety** by providing clean and disinfected laundry, mitigating the risk of nosocomial infections.

- A sink is available in the dirty area for hand hygiene.

- Dirty and clean areas are physically separated and clearly marked.

• Procedures implemented in the Laundry are standardized in written documents available in a file kept in the Laundry.

• • In occasional situations requiring washing/drying volumes exceeding installed capacity or in case of machine breakdown, the use of an external private laundry service is предусмотр.

• • Anyone involved in the collection, transport, sorting, or washing of soiled materials must be properly trained.

9.3. Procedures

9.3.1. Collection of Potentially Contaminated Laundry

9.3.1.1. In the Laundry

• During the collection of dirty materials, the risk of contamination for the technician performing collection, for the environment, and for clean laundry must be minimized.

• Precautions to be taken:

- Contaminated laundry must not be shaken, to avoid aerosolization of pathogens.

- Carefully remove any organic matter residues before starting the washing process (e.g., blankets from the Teaching Hospital – Companion Animals).

- In each sector, specific surgical scrubs / uniforms / PPE are used to avoid cross-contamination. Specific procedures for Class 3 and Class 4 patients are detailed in the respective chapters.

- Wear gloves when handling potentially contaminated laundry.

- Any skin lesion or wound on Laundry staff must be properly covered.

• Procedure to follow:

- Remove all items that do not belong to the Laundry from the dirty laundry. Do not leave sharp objects in pockets, as they may injure staff and damage equipment.

- Place dirty laundry in the appropriate container, biobox, or white bag (contaminated), or in the designated dirty-laundry bag if an external service is contracted. Containers/bags must not be overloaded.

- Remove gloves, wash and disinfect hands immediately after handling dirty laundry.

• For external laundry services, bags must be clearly labeled and identified.

• The subsequent procedure is validated for materials/laundry washed and processed at FMV. External companies follow their own validated procedures.

9.3.1.2. Internal Transport of Dirty Materials to the Laundry

• Containers must be transported on department trolleys and remain closed during transport to prevent spills and loss.

• Trolleys used for transporting dirty materials must be easy to clean and must never be used to transport clean materials unless they have been previously cleaned and disinfected.

• Trolleys used for dirty materials must be cleaned and disinfected regularly.

• Precautions must be taken to minimize the risk of contamination during the transport of dirty items:

• Minimize handling of dirty materials.

• Sorting/classification must not be carried out in patient care areas.

• Dirty items must never be transported through the clean area.

• When dirty laundry arrives at the Laundry, it must enter through the dirty area, whose entrance is clearly identified.

• During the sorting procedure, carried out in each Department, measures must be taken to minimize microbial contamination of the environment and staff handling dirty materials.

• Materials may be classified according to the following categories:

- Normal – standard processing;

- Infectious – risk to workers, environment, and animals;

- Delicate (e.g., blankets from the Teaching Hospital – Companion Animals) – may be damaged by the normal washing process.

9.3.2. Washing and Disinfection Process

• The following precautions must be taken:

- Do not overload the washing machine, as detergent distribution and spinning efficiency will be compromised;

- After loading the machine, discard used gloves in the designated container, wash and disinfect hands.

• The washing process has the following effects:

- Mechanical: agitation of fabrics;

- Thermal;

- Chemical: disinfectants and some detergents have antimicrobial properties;

• Each program has specific characteristics:

- Program duration: pre-wash, wash, rinse;

- Temperature: washing, disinfection, rinsing;

- Chemical products: detergents and disinfectants, with different types and concentrations at each stage of the process. These products are listed in the Laundry Procedures Manual.

• The use of high temperatures during washing ensures a disinfecting effect. The following formula estimates the process duration according to washing temperature:

N minutes × Temperature (X°- 55°) > 250

where X = selected wash cycle temperature.

For example, hot water (71°C) for a minimum of 25 minutes is considered effective in eliminating microorganisms.

• If this procedure cannot achieve such results, or if high temperatures are not recommended, **chemical disinfection** must be used. The following disinfectants may be applied:

- Sodium hypochlorite (bleach): should be used for white cotton fabrics due to its bleaching effect, low cost, and broad antimicrobial spectrum.

- Various detergents and disinfectants suitable for industrial machines:

○ Detergent – Dual 100 OB

○ Bleach and disinfectant – Lunosept Hypo

○ Disinfectant – Peracid Asepsis

○ Fabric softener – Soft Power

○ Alkaline additive – Power Perfect

○ Enzymatic booster – Smart Enzym

• Manufacturer recommendations for all products used in the machines must be followed. Products must not damage fabrics or cause skin irritation.

9.3.3. Drying

• After washing, handling of materials must be minimized.

• The time between washing and drying must be as short as possible.

• Do not leave damp laundry in machines overnight.

• Preferably use a tumble dryer, as it enhances the antimicrobial effect, and select high-temperature programs whenever the fabric allows.

9.3.4. Ironing and Folding Laundry

- Ironing at high temperature helps eliminate microorganisms.
- Folding laundry immediately after ironing helps maintain cleanliness.
- If laundry becomes soiled during the process, it must be rewashed

9.3.5. Storage of Clean Laundry

- Clean laundry must be stored in a separate room or in the clean area of the laundry. Avoiding recontamination during storage is crucial.
- If stored in another room, the door must always remain closed.
- Clean laundry must be transported in dedicated containers, preferably using a trolley reserved for clean materials. If the trolley is also used for dirty materials, or whenever it appears dirty, it must be thoroughly cleaned and disinfected before transporting clean items.
- The storage area must be clean, avoiding cross-contamination, especially if bed linen is stored on open shelves or trolleys.
- The storage room/area must be accessible only to authorized personnel.
- Clean materials must be handled as little as possible and only after handwashing.
- If laundry is processed by an external service, upon return it must remain packaged until use and should not be stored in a potentially contaminated area.

9.4. Specific Considerations

9.4.1. Materials from Rooms with Class 3 and 4 Patients

- The use of reusable textiles in rooms with Class 3 and 4 patients should be avoided as much as possible, with preference given to disposable items. However, if handling laundry from Class 3 or 4 patients is necessary (e.g., burgundy isolation unit scrubs), additional precautions must be taken, including the use of extra PPE: disposable gown, face mask, gloves, and eye protection.
- The patient's risk class must be clearly visible on a label placed on the transport container (contaminated items enter the Laundry in white bags).
- After washing contaminated items, run an empty wash cycle to ensure the machine is not left contaminated.
- Some microorganisms, e.g., *Cryptosporidium* spp., may adhere to bedding during machine washing. Therefore, fabrics must not be sorted but placed directly into the washing machine.
- Parvoviruses can withstand temperatures of 80 °C for at least one hour.

9.4.2. Surgical Laundry

- All textile items used in surgical rooms must undergo additional inspection: any tear, (micro)hole, etc., must be detected before washing, since a hole ≥ 1 µm allows bacterial penetration. This procedure is carried out by technicians from each Department.

• The number of cycles (from washing to sterilization) each item withstands must be recorded to anticipate loss of the "protective barrier" property and the need for replacement.

9.4.3. Blankets and Towels from the Companion Animal Teaching Hospital

• Laundry items, blankets, and towels must be used for only 1–2 patients that do not have wounds. One blanket is used per animal.

• Patients housed in Class 3 and 4 rooms, as well as those with any wound (surgical or otherwise), must have disposable pads in their cages.

10. PEST CONTROL

10.1. Introduction

Portugal is located in Southwestern Europe, in a region conducive to the presence of animal species that act as mechanical or biological vectors for the transmission of pathogenic agents. Diseases transmitted by these vectors are a concern, and in this context, measures must be implemented to reduce the risk of transmission.

10.2. Arthropods

- Mosquitoes:

- *Culex* spp.: vectors of agents associated with canine dirofilariasis, West Nile Fever, among others;

- *Aedes* spp.: vectors of agents associated with canine dirofilariasis, Chikungunya, dengue, and equine encephalitis;

- Mosquitoes (Family Culicidae): involved in the transmission of Bluetongue, Schmallenberg disease, Akabane disease, African Horse Sickness, etc.

- Flies:

- Horse flies (Family Tabanidae): involved in the transmission of viral diseases such as Equine Infectious Anemia, Classical Swine Fever, and Vesicular Stomatitis; parasitic diseases such as Trypanosomiasis and Besnoitiosis; and bacterial diseases such as Anthrax, Bovine Anaplasmosis, Lyme disease, etc.;

- Common house flies: mechanical vectors for more than 100 pathogenic agents causing disease in animals and/or humans, for example *Bacillus anthracis*, *Escherichia coli*, *Vibrio cholerae*, etc.;

- Face fly (*Musca autumnalis*): vectors of *Moraxella bovis*, associated with bovine conjunctivitis and keratitis; *Corynebacterium pyogenes*, which causes abscesses with pus in domestic animals; and intermediate hosts of *Thelazia* spp. and *Parafilaria* spp., associated with parasitic ocular infection and subcutaneous lesions, respectively;

- Horn fly (*Haematobia irritans*): not described as vectors of disease but affect animal welfare;

Sand fly (*Phlebotomus* spp.): vector of canine leishmaniasis.

- Ticks:

- The three most common tick species in Portugal are *Ixodes ricinus*, *Dermacentor reticulatus*, and *Rhipicephalus sanguineus*, which may transmit Lyme disease, Babesiosis, and Ehrlichiosis.

- Fleas:

- Vectors of bacterial species such as *Bartonella henselae* and *Mycoplasma haemofelis*, which cause Cat Scratch Disease in humans and Feline Infectious Anemia, respectively.

- Lice:

- Host-specific. Vectors involved in the transmission of pathogens such as Swine Pox virus, *Anaplasma* spp., and *Trichophyton verrucosum* in cattle.

- Mites

- Feed on skin debris and may cause various diseases such as sarcoptic mange, otitis, and lesions in different parts of the animal's body.

10.2.1. Control and Monitoring of Arthropods

• Preventing flying insects from entering animal facilities is crucial, especially isolation units housing patients with infectious and contagious diseases, and contact with potential hosts should be minimized.

• Non-flying arthropods are spread via infested hosts, accidental transport by humans, and sharing of materials/equipment between animals.

• The best approach for arthropod/vector control consists of combining several methods through an Integrated Vector Management Program (IVMP).

10.2.1.1. Capture of Adult Flying Insects

• Capturing adult flying insects contributes to:

- Reduction of insect populations

- Validation of control measures

- Detection of new species

- Identification of breeding sites

• Traps adapted to target species must be used.

10.2.1.2. Physical Measures to be Implemented for Arthropod Control

• Facility doors must always remain closed.

• Sticky insect traps should be placed in strategic locations, namely in the Equine Isolation Unit and in Bars/Cafeterias.

• Screens (galvanized mesh) with mesh sizes appropriate to target insects should be installed in strategic locations.

• In the Equine Isolation Unit (biosafety level 4), several levels of physical control exist to reduce the entry/exit of flying insects:

- Closed windows

- Double doors

- Animal anterooms delimited by two gates

- Installation of two screen layers between the exhaust pathway (HEPA filters) and the ventilation pathway

- HEPA filters

10.2.2. Environmental Control of Habitats and Breeding Sites

• Main breeding sites of flying insects:

- Mosquitoes: *Culex* spp.: stagnant water; *Aedes* spp.: tree holes, buckets, or other water storage containers

- Mosquitoes (Family Culicidae): moist organic matter such as decomposing leaves and any animal excrement

- Flies: wet organic matter; larvae feed on a wide variety of materials (blood, meat, carcasses, excrement, decomposing plant matter)

- House flies and face flies: fecal matter (e.g., manure storage containers)

- Sand flies: flower beds, green waste, and epiphytes

- Mosquito control: egg-laying sites within a 1.5–2 km radius of facilities should be controlled. Mosquitoes require stagnant water for more than 96 hours to lay eggs, so mapping risk areas (e.g., resident cattle park) is essential

- Black flies (Genus *Simulium*): lay eggs in oxygen-rich running river water

- Ticks: control grazing areas (two paddocks: horses and dog park)

• Green area maintenance must be managed sustainably to limit negative impacts on biodiversity.

10.2.3. Integrated Vector Management Program (IVMP)

• Involves ecosystem-based strategic cooperation, focusing on long-term vector population control through combining different techniques:

- Species surveillance in a given location

- Physical control

- Training: raising awareness about breeding habitats and how these can be reduced/eliminated

• Applicable measures for different FMV facilities are detailed below

10.2.3.1. Production Animal Facilities (Equines and Ruminants)

• Specific prevention and control measures for these facilities are listed in the tables below.

• Physical control of flying insects with electric insect killers, screens, and window traps is essential. Doors must be kept closed, especially in facilities housing animals.

• Regarding ectoparasites, infected and non-infected animals must be separated. Limiting animal movement between facilities helps reduce ectoparasite transfer.

• Chemical control of adult flies is recommended if populations reach harmful levels. Residual insecticides such as pyrethroids may be sprayed in fly resting sites (walls and structures). However, this should be avoided whenever possible to prevent resistance development.

• Management of Culicidae breeding sites is often difficult. Insecticides or repellents applied directly to animals provide some protection but are not highly effective in reducing Bluetongue virus transmission during epidemics.

- Keeping animals indoors reduces bites from resistant mosquitoes.

10.2.3.2. Isolation of Facilities

- Installation of screens/filters reduces insect presence.
- Screens/filters must be inspected regularly for damage and cleaned monthly.
- Smaller mesh sizes in dusty environments may clog pores, reducing ventilation.
- Various methods may be used to control ectoparasites and ticks in the environment and herds.
- In general, whenever an animal enters the facility, it must undergo quarantine, inspection, and insecticide treatment before contacting other animals.
- Sheep-specific measures:

- Shearing ewes before lambing prevents the spread of Melophagus ovinus, an external parasite that attaches to wool and feeds on blood. It also prevents fly strike (larval infestation of wounds).

- Shearing wool soiled with urine and/or feces prevents fly attack.

- Scheduling lambing before spring is recommended since flies are less abundant at that time.

10.2.3.3. Small Animal Facilities

Specific prevention and control measures for the Companion Animal Hospital are detailed in the following tables.

Table 10

Arthropod control measures in production animal facilities

	Mosquitoes	Culicoides	Horseflies (Tabanids)	Flies*	Black flies
Physical measures					
Keep doors closed at all times	×	×	×	×	×
Window screens/mesh – mesh size (≥ 1.5 mm)** (regular maintenance)	×		×	×	
Window screens/mesh – mesh size < 1 mm** (regular maintenance)		×			×
Capture using electric fly-killing devices				×	
Pasture trapping (shelter to reduce light exposure)					×
Chemical measures					
Organophosphate compounds	×				
Carbamates	×				
Pyrethroids	×	×	×	×	×
Diethyltoluamide (DEET)			×		
Insecticide application on adult animals	×	×	×	×	×
Environmental insecticide application (e.g., sprays)	×			×	×
Environmental measures					
Avoid standing water and water accumulation	×				
Control humidity		×	×	×	
Reduce/remove unwanted emergent vegetation	×				
Limit feed access: store feed in closed rooms				×	
Protect hay				×	
Strict hygiene (remove waste such as feces)		×		×	
Avoid accumulation of organic debris		×		×	
Remove debris daily (e.g., spilled feed, dry vegetation, leaves)				×	
Remove debris near water sources					×
Waste containers					
Dispose of and clean twice per week	×			×	
Keep waste containers covered with lids	×			×	
Drainage system	×				
Rain gutters – periodic inspection and cleaning (leaves/debris)	×				
Repair to ensure proper drainage	×				
Keep ditch drainage free of vegetation and debris	×				
Drains with fine mesh kept free of water and debris	×				
Manure/feces					
Manure storage areas must be kept dry				×	
Daily removal				×	
Avoid fecal accumulation on walls/bars and floors				×	
Turn manure once per week to prevent hatching				×	

* Flies: common houseflies (*Musca domestica*), stable flies (*Stomoxys calcitrans*), face flies (*Musca autumnalis*), and horn flies (*Haematobia irritans*)

Table 11
Arthropod control measures in companion animal facilities

Measures	Mosquitoes	Houseflies	Sand flies
PHYSICAL MEASURES			
Keep doors closed at all times	×	×	×
Window screens/nets – mesh size ≥ 1.5 mm* (regular maintenance)	×	×	×
Window screens/nets – mesh size < 1 mm* (regular maintenance)			×
Capture using electric fly-killing devices		×	
CHEMICAL CONTROL			
Organophosphate compounds	×		
Carbamates	×		
Pyrethroids	×	×	×
Application of insecticides to adult animals			×
Application of insecticides in the environment (e.g., sprays)	×	×	×
ENVIRONMENTAL CONTROL			
Avoid presence and accumulation of standing water	×		
Control humidity		×	
Reduce/eliminate vegetation	×		×
Waste containers			
Dispose of and clean weekly	×	×	×
Keep waste in closed bins/containers	×	×	×
Drainage system			
Rain gutters – periodic inspection and cleaning (leaves/debris)	×		
Rain gutters – repair and ensure proper drainage	×		
Grates – keep drainage ditches free of excessive vegetation and debris	×		
Grates – small-mesh drains must be kept free of water and debris	×		
Avoid accumulation of organic debris (regular inspection and removal)		×	×
Remove organic waste weekly (e.g., spilled food, dry vegetation, leaves)		×	
Remove pet feces daily		×	
Promptly place small animal carcasses in yellow containers (collected and refrigerated until final disposal)		×	
Seal cracks and crevices in walls, ceilings, floors			×
Clean outdoor flooring areas			×
Destroy rodent habitats (hosts of insects)			×
Keep dogs indoors at dawn and dusk to minimize the risk of leishmaniosis			×

Table 12
Tick and permanent ectoparasite control measures (companion and production animals)

Measures	Ticks	Lice	Mites	Fleas
PHYSICAL CONTROL				
Separate / limit contact between healthy and infested animals		×	×	×
Hospitalization		×	×	
Avoid sharing cages	×	×	×	×
Companion animals: avoid marking territory during dog walks outside the clinic	×			
Limit animal movement between facilities (to reduce transfer of ticks and ectoparasites)	×	×	×	×
Regularly check patients – daily marking for inspection and removal if necessary	×			
Perform daily cleaning of rooms and bedding				×
Clipping/shearing if necessary (severe infestation)		×	×	×
CHEMICAL CONTROL				
Application of chemical agents for treatment in animals (internal deworming)	×	×	×	×
Application of ivermectin or similar parasiticides	×	×	×	
Companion animals: treatment with insecticides	×	×	×	×
ENVIRONMENTAL CONTROL				
Environmental management				
Reduce tick presence around buildings	×			
Annually trim trees and shrubs around buildings	×			
Regularly mow grass and remove vegetation around buildings	×			
Remove leaf litter	×			
Install fencing in facilities	×			
Manage rodent-friendly habitats (control vegetation around outdoor storage, stone walls, and small openings)	×			
Control rodents to minimize contact with vectors	×			×

10.3. Rodents

- The following may be found on FMV premises:

- House mouse (*Mus musculus*) – Nests inside and around buildings, omnivorous, prefers stored food.

- Black rat (*Rattus rattus*) – Prefers grains and fruit and is an agile climber.

- Brown rat (*Rattus norvegicus*) – Omnivorous, nests below surfaces, and is a strong swimmer.

- Wood mouse (*Apodemus sylvaticus*) – Lives in wooded areas, around houses, ruins, rocky areas, and parks. Avoids open pasture and is omnivorous.

- Common vole (*Microtus arvalis*) – Lives in open areas and dry pastures with low vegetation, cultivated fields, and gardens.

- Bank vole (*Myodes glareolus*) – Lives in deciduous forests, hedgerows, woodlands, and vegetated ditches. Omnivorous.

- Rodents require water daily and are attracted to animal feed, bedding, and animal waste.

10.3.1. Diseases Associated with Rodents

• Rodents can transmit and spread pathogenic agents. They may carry various pathogens and are a potential source of infection for humans and animals:

- Bacteria: *Campylobacter* spp., *Salmonella* spp., *Yersinia pestis*, *Pasteurella* spp., *Leptospira* spp., *Brachyspira hyodysenteriae*, *Rickettsia* spp., *Escherichia coli*, *Listeria* spp., *Mycobacterium* spp., *Brucella* spp.

- Viruses: Hepatitis E virus, encephalomyocarditis virus, porcine circovirus type 2, rabies virus, hantaviruses.

- Parasites: *Trichinella* spp., *Toxoplasma* spp., *Cryptosporidium parvum*.

• Rodents may contaminate food with feces and urine.

• They can damage feed, equipment, and materials, and may destroy insulation materials, electrical wiring, and pipes.

• Rodents can also be a source of stress for animals due to their nocturnal activity.

10.3.3. Signs of Rodent Infestation

• Characteristic sounds: gnawing noises, squeaks, and climbing sounds.

• Presence of droppings: along walls, behind objects, or near feeders. Rat droppings are dark, bean-shaped (about 10–12 mm long and up to 5 mm in diameter). Mouse droppings are dark, about 4 mm long and much thinner (≈1 mm in diameter).

• Direct observation of rodents moving, often associated with dust-free areas along walls.

• Mouse or rat burrows.

• Gnaw marks: chewed wood, torn grain sacks.

• Grease marks: a greasy film on pipes and frequently used surfaces (typical of infestations lasting more than two years).

• Strong, characteristic odor, especially with large populations.

10.3.4. Prevention of Rodent Infestation

• Preventive measures must limit rodent entry and access to animal facilities while avoiding conditions that favor nesting, feeding, and reproduction.

• Avoid outdoor hiding places:

- Keep building surroundings clean and uncluttered;

- Avoid accumulation of materials, weeds, or waste near floors and against walls.

• Limit rodent entry:

- Keep doors permanently closed; they should fit tightly to the floor (gap ≤ 0.6 cm).

- Seal openings > 0.6 cm with rodent-resistant materials (do not use wood, rubber, or plastic), paying special attention to gaps around pipes, cables, and other openings.

- Protect vulnerable corners with metal plates or mesh.

- Create a gravel barrier at least 1 meter wide around buildings.

- Carry out an annual building inspection, focusing on door gaps, broken windows, water connections, and holes near feeding areas.

• Eliminate potential food sources:

- Store feed in tightly sealed, rodent-proof bags or metal containers with lids.

- Store only the minimum necessary quantity of feed and hay.

- Clean feed storage areas weekly.

- Store hay and straw on pallets, off the ground.
- Clean up any feed spills immediately.
- Remove accessible water sources for rodents.

• Waste storage and disposal:

- Immediately remove food waste, droppings, and other materials that may attract rodents.
- Animal carcasses must be disposed of according to regulatory procedures in appropriate locations.
- Take measures to reduce potential nesting and hiding sites.
- Equipment (refrigerators, washing machines) should be movable to allow cleaning underneath and behind.
- Feed bags should be stored on pallets, leaving free space around and underneath.

10.3.5. Rodent Control

• Combined control strategies should be adopted, including physical control (such as traps) and chemical control (such as properly authorized rodenticides applied by qualified professionals).

• Dead rodents must be collected using protective gloves to ensure safety and prevent contamination.

• The use of traps is recommended not only as a control method but also as a monitoring tool to assess rodent presence and activity in the facilities.

10.3.5.1. Physical Control

• Traps should be placed in strategic locations such as:

- Areas frequently used by rodents (along walls, behind objects, in dark corners).
- Feed storage areas (keeping a safe distance from the feed).

• Sensitive areas such as surgery rooms or wards with hospitalized patients must be avoided.

• To increase effectiveness, two traps should be placed in line to prevent rodents from jumping over them.

• Plastic traps should be used, as they are easier to clean and prevent odor buildup that may deter rodents.

• Mechanical snap traps should be avoided, as they may alarm animals and make rodents more cautious.

• The use of ultrasonic devices is strictly prohibited in animal facilities, as these devices may cause stress to patients.

10.3.5.2. Chemical Control

• The most commonly used rodenticides are anticoagulants, available as paraffin blocks, foam, gel, and other formulations. These are divided into:

- First-generation anticoagulants – require repeated ingestion over several days;
- Second-generation anticoagulants – effective after a single ingestion.

• Baits should be placed along rodent travel routes:

- 1–2 meters between bait points for mice.
- 7–10 meters for rats.

• Never place baits in areas accessible to patients.

- Rodents usually die 3–4 days after ingestion, away from the bait points, which reduces bait shyness (neophobia) and unpleasant odors.
- Always strictly follow the instructions on the product label.
- Baits must be fresh and palatable to ensure attractiveness.
- Unconsumed baits must be collected (using gloves) and discarded.
- Baits must be placed in appropriate bait stations, in locations inaccessible to people and non-target animals. Bait must be secured inside locked stations.
- For mice, install bait stations 5–7 days in advance to allow acceptance.
- Regular inspections must be carried out to check bait availability, remove rodent carcasses, and record bait disappearance or consumption.
- The best time for infestation control is when facilities are empty and free of food or feed residues, reducing alternative food sources.

10.4. Birds

- Bird species that pose a biosafety risk at FMV facilities, by entering or nesting in large-animal buildings, mainly include pigeons and swallows (*Hirundo rustica*, *Delichon urbicum*).
- Crows may also be problematic, particularly regarding the integrity of large-animal facilities.
- Swallows (family Hirundinidae) are a protected species; destroying them or removing nests is illegal, even outside the nesting season. Swallows build nests with mud and feed mainly on insects.
- Pigeons (*Columba livia* and *Columba palumbus*) feed on grains, seeds, urban waste, insects, bread, and other human-provided foods. They nest on eaves, beams, and building structures. Breeding may occur year-round, with peaks in spring and autumn. *Columba palumbus* is legally protected and may not be culled.
- The common blackbird (*Turdus merula*) may occasionally be observed near the facilities.

10.4.1. Problems Associated with Birds in Production Animal Facilities

- A presença de aves nas instalações destinadas a grandes animais pode originar vários tipos de Birds may consume feed and water intended for animals.
- Wild birds can carry and spread pathogens, contaminating feed, water, and surfaces.
- Pathogens associated with bird transmission include:

- *Salmonella* spp.
- *Escherichia coli*.
- *Campylobacter* spp.
- *Listeria monocytogenes*.
- *Brachyspira hyodysenteriae*.
- West Nile virus

.- Intestinal parasites such as roundworms (Ascaris) and tapeworms (*Taenia* spp.).

- Bird droppings are corrosive and may damage equipment, metal surfaces, and vehicles, affecting infrastructure.
- Nests may obstruct drainage systems and gutters, leading to leaks and structural deterioration.
- Birds may damage thermal or acoustic insulation materials, compromising comfort and energy efficiency.

10.4.2. Measures to Prevent Birds in Production Animal Facilities

- Preventing bird entry and presence requires a combination of measures, including:

- Physical Barriers and Access Restriction

- Keep doors and windows closed or protected with suitable nets/mesh.
- Use durable plastic strip curtains in areas where doors cannot remain closed.
- Cover openings larger than 1.3 cm with metal mesh or materials that cannot be pecked (when applicable).
- Protect windows and openings with well-fitted metal mesh; promptly repair broken or poorly sealed windows.

- Control of Food and Water Sources

- Store feed in sealed metal containers in closed rooms.
- Immediately clean any spilled feed from containers and surrounding floors.
- Clean feeding areas daily.
- Eliminate access to water sources whenever possible.
- Avoid insect proliferation, as insects serve as food for some species (e.g., swallows).

- Reduction of Nesting and Roosting Sites

- Avoid structures that promote nesting, such as sheltered ledges, exposed beams, or areas difficult to clean.
- Install spikes or other deterrent systems to prevent perching, especially by pigeons.
- Consider controlled nest removal for pigeons, in accordance with legislation on protected species:
- Eggs may be removed so birds abandon the site.
- Nest destruction should occur at intervals of at least two weeks.

- Management of Protected Species

- Swallows (Hirundinidae) are legally protected; nest destruction or bird removal is prohibited.
- If necessary, artificial nests may be installed in non-sensitive areas before spring (migration return period – March to April). Installation must strictly follow the manufacturer's guidelines.

11. ANTIMICROBIAL RESISTANCE

11.1. Introduction

- Antimicrobial resistance (AMR) represents a growing threat to veterinary medicine at both national and global levels, affecting companion animals, production animals, and equines. Reducing the use of antimicrobials is essential and should be based on disease prevention measures, particularly through the implementation of biosecurity protocols and good clinical practices.

- At FMV, students receive training focused on raising awareness about antibiotic resistance and the ethical, clinical, and public health responsibilities associated with prescribing and using antibiotics in veterinary medicine, within the courses Microbiology, Pharmacology, Pharmacy and Pharmacotherapy, Epidemiology, Infectious Diseases and Preventive Medicine, Medicine, Exotic Species, Conservation and Laboratory Animal Medicine, Veterinary Public Health, Livestock Clinical Practice and Population Medicine, Equine Clinical Practice, and Companion Animal Clinical Practice.

- This training is delivered based on the principles of responsible antibiotic use and the One Health concept.

11.2. Use of Antibiotics in the Teaching Hospital

- It is the responsibility of the Teaching Hospital (HE) to prevent the introduction of multidrug-resistant bacteria into its facilities, limit their spread, and avoid environmental contamination.

- In Portugal, the use of veterinary medicinal products, including antibiotics, is regulated by Regulation (EU) 2019/6 of 11 December 2018, complemented by national legislation (Decree-Law no. 148/2008). This regulation establishes rules for the authorization, prescription, distribution, use, and pharmacovigilance of veterinary medicinal products.

- At the national level, implementation of the regulation is ensured by DGAV and by the National Plan for the Control of the Use of Medicines and Veterinary Medicines (PNCUM). This plan establishes guidelines for the prescription, recording, and prudent use of antibiotics and veterinary medicines.

- The class, nature, and category of antibiotics to be used must comply with the categorization defined by the Antimicrobial Advice Ad Hoc Expert Group (AMEG) of the European Medicines Agency (EMA).

- The use of antibiotics in the three hospitals associated with the HE must follow the national and European regulations mentioned above. When applicable, specific therapeutic protocols established by professional associations and leading scientific societies may be considered.

- HE clinicians are required to issue veterinary medical prescriptions, preferably through the Electronic Veterinary Prescription System (PEMV), and to keep rigorous records of antibiotics used.

- Antimicrobial therapy should only be initiated after a clinical diagnosis, ideally supported by complementary testing (bacteriology, rapid tests, cytology, antibiogram).

- Whenever possible, an antibiogram should be performed in order to confirm that the antimicrobial therapy prescribed is appropriate for the etiological agent responsible for the condition and its resistance profile.

- Broad-spectrum antibiotics must be used with extreme caution. Antimicrobials classified as “critical” or “last resort” must be reserved exclusively for situations where no adequate and justified therapeutic alternatives exist.

- The use of critical antibiotics in production animals must be based on an antibiogram and their prophylactic use is prohibited.

11.3. Surveillance of Multidrug-Resistant Strains in the Teaching Hospital

- A periodic environmental surveillance program for multidrug-resistant bacteria must be implemented in the HE.

- This program should include: regular environmental monitoring (surfaces, hospitalization areas, surgical areas, animal housing facilities, etc.); culture and typing of bacteria with resistance potential, including priority microorganisms (e.g., multidrug-resistant Enterobacterales); recording of clinical cases where antibiotics were used, indicating the drug, dose, duration, clinical outcome, and antibiogram.

11.4. Education, Training, and Awareness

- Continuous training for students, clinicians, nurses, assistants, and HE interns should include topics related to antimicrobial resistance, responsible antibiotic use, biosecurity, hygiene, disinfection, sterilization, and isolation procedures.

- Animal owners and livestock producers should be made aware of the importance of responsible prescription, the need for complementary testing before therapy, and the risks of self-medication or indiscriminate antibiotic use.

11.5. Review and Updating of Protocols

- HE internal standards regarding antimicrobial resistance must be reviewed at least annually, or whenever:

  - relevant changes occur in national or European legislation;
  - failures, outbreaks, or increases in resistance are detected;
  - changes occur in clinical, hospitalization, or biosecurity practices.

12. CRISIS SCENARIOS

12.1 Introduction

• Whenever there is suspicion of an epidemic and/or notifiable disease affecting domestic animals, the Teaching Hospital (TH) and the FMV Laboratories must adhere to the procedures described in the following scenarios.

• These procedures remain in force until the official health authorities, e.g., DGAV and DGS, assume crisis management.

• The criteria for including diseases on this list are as follows:

- **Severe Zoonotic Risk (Occupational Health)**: Diseases that may cause death, severe chronic illness, or abortion in students and staff (e.g., Leptospirosis, Tuberculosis, Brucellosis, Q Fever).

- **Economic/Legal Impact (Notifiable Diseases)**: Diseases which, if detected, require facility closure, restriction of animal movements at national or international level, or immediate intervention by DGAV (e.g., African Swine Fever, Foot-and-Mouth Disease).

- **High Nosocomial Risk**: Highly contagious diseases that may spread rapidly within the Teaching Hospitals, requiring ward closures or quarantine of multiple patients (e.g., Virulent Systemic Feline Calicivirus, Equine Herpesvirus).

- **Critical Procedural Error (Necropsy Risk)**: Diseases for which performing a necropsy may disseminate spores or aerosols, contaminating facilities (e.g., Anthrax).

• This document details the six contagious diseases (African Swine Fever, Virulent Systemic Feline Calicivirus, Rabies, Highly Pathogenic Avian Influenza, Leptospirosis, and Equine Rhinopneumonitis) of greatest concern within the scope of teaching, research, and service activities carried out at FMV, by animal species, epidemic and/or zoonotic in nature:

- Pigs:

o Economic/Legal Impact: African Swine Fever (ASF).

- Companion animals:

o High Nosocomial Risk: Virulent Systemic Feline Calicivirus (VS-FCV).

o Severe Zoonotic Risk: Rabies and Highly Pathogenic Avian Influenza (HPAI).

- Ruminants and Equines:

o Severe Zoonotic Risk: Leptospirosis.

o High Nosocomial Risk: Equine Rhinopneumonitis.

• This list is dynamic and will be expanded whenever epidemiological scenarios justify it; for example, crisis management measures applicable to Foot-and-Mouth Disease and Equine Influenza are currently being drafted.

12.2 AFRICAN SWINE FEVER / FMV OPERATIONAL SCENARIO

12.2.1. The Virus and the Disease

- **Context:** Notifiable disease in Portugal and to the WOAH. As of the present date (Dec 2025), Portugal is officially free from African Swine Fever (ASF), with the last case recorded on November 15, 1999. For more information on the current situation, consult the ASF-dedicated website of the DGAV[6].
- **Host range:** Domestic pigs and wild boar.
- **Infectious material:** Blood (+++), tissues, urine, feces, secretions/excretions from infected animals (live patients and carcasses).
- **Transmission:** Highly contagious (+++).
- **Clinical Signs and Lesions:**

- Acute form (most common): Subcutaneous hemorrhages (cyanosis and reddening of the skin, especially on ears and extremities); enlarged and hemorrhagic lymph nodes (particularly gastrohepatic and renal lymph nodes); splenomegaly; renal petechiae; hydrothorax / hydropericardium.

- **Environmental persistence:** The virus is highly resistant, especially in carcasses, blood, and contaminated soil (weeks to months, depending on ambient temperature).
- **African Swine Fever contingency plan (DGAV):**
- Available at https://www.dgav.pt/animais/conteudo/animais-de-producao/suinos/saude-animal/doencas-dos-suinos/peste-suina-africana/plano-de-contingencia/

12.2.2. Potential routes of introduction into FMV and associated risks

- Given FMV's characteristics (absence of resident pigs for teaching purposes and absence of an experimental pig unit), the associated risks are as follows:

- Introduction via a companion pig (e.g., Vietnamese pot-bellied pig / minipig) presented at the Companion Animal Teaching Hospital:

- **Scenario:** A client brings a Vietnamese pot-bellied pig with high fever and cutaneous hemorrhages to the Companion Animal Teaching Hospital.
- **Risk:** Low, but not zero. These animals are privately owned. The risk increases if the animal has outdoor access in areas where wild boar may be present, or if the owner has had contact with infected pigs.

- Introduction via fomites (people/materials):

- **Scenario:** Students or staff participating in hunting activities or visiting infected pig farms enter FMV without complying with biosecurity measures, e.g., clothing hygiene/change.
- **Fomites:** The virus may be carried on boots, clothing, and vehicle tires.

- Introduction into the Necropsy Room:

- **Wild boar risk:** Risk is managed at the source. RESTRICTIVE PROCEDURE: Wild boar necropsies are not accepted or performed at FMV facilities. All wild boar carcasses must be referred to INIAV.
- **Domestic pigs (pet pigs) risk:** Low risk, unless there is a compatible clinical history. If there is clinical suspicion *ante mortem*, the animal must not enter the necropsy room and, after authorization from DGAV, must be referred to INIAV.

[6] https://www.dgav.pt/animais/conteudo/animais-de-producao/suinos/saude-animal/doencas-dos-suinos/peste-suina-africana/

12.2.3. Immediate management and case definition

- **Suspect Case**: Animal with compatible clinical signs (high fever, anorexia, cutaneous hemorrhages, sudden death) or suggestive lesions at necropsy.
- **Confirmed Case**: Official laboratory confirmation (INIAV).

12.2.4. Immediate action plan (clinical suspicion in the Teaching Hospital)

- If a veterinarian, veterinary nurse, or student observes suspicious signs in a companion pig:
- **Immediate Notification:**

- Inform the Clinical Director of the Companion Animal Teaching Hospital (aferreira@fmv.ulisboa.pt).
- Notify the Biosecurity and Hygiene Committee (biosseguranca@fmv.ulisboa.pt).
- Mandatory notification to DGAV (Lisbon and Tagus Valley Regional Directorate for Food and Veterinary Services) through the Animal Disease Control and Prevention System (SPC) (https://spc.dgav.pt/).

- Isolation and Restriction:

- The animal must not circulate within the hospital. If still inside the vehicle, it must remain there until DGAV instructions are received.
- **If already in the consultation room**: Immediate closure of the room. No one enters or leaves without appropriate disinfection.
- Isolation *in situ* at the Companion Animal Teaching Hospital until DGAV inspectors arrive.

- Hygiene Measures:

- Install a footbath with 1% Virkon™ S solution at the room entrance.
- Use PPE, e.g., disposable coveralls, gloves, footwear protection.
- No material leaves the room without disinfection.

12.2.5. Procedure for carcasses (necropsies)

- **WILD BOAR:** Total prohibition. If a wild boar carcass is inadvertently brought to FMV, it must not be removed from the vehicle or enter the facilities. The transporter must be instructed to proceed to INIAV.
- **DOMESTIC PIGS:** If suspicious lesions are detected during a routine necropsy of a companion pig:

- Immediately stop the procedure.
- Close the necropsy room. No one leaves without full disinfection of clothing, footwear, and equipment.
- Notify DGAV and await instructions for official sample collection.
- The carcass remains stored in a dedicated cold chamber until official orders are received.

Figure 24
Decision-support flowchart – African Swine Fever
African Swine Fever Operations Manual (DGAV, 2016)

INITIAL TRIAGE Pig (domestic / pet pig)?
CLINICAL / EPIDEMIOLOGICAL ASSESSMENT High fever, haemorrhages, sudden death OR risk factors (wild boar, hunting, fomites)
SUSPECT CASE OF ASF **IMMEDIATE MEASURES** Stop movements Isolate on site Do not transfer to the UICB-AC **MANDATORY NOTIFICATION** Clinical Director + Biosecurity Committee DGAV (SPC) **BIOSECURITY** Full PPE Footbath Virkon™ S 1% Access control
AWAIT OFFICIAL DECISION DGAV / INIAV
NECROPSY Wild boar: PROHIBITED Domestic pig: only if not suspected

12.3 VIRULENT SYSTEMIC FELINE CALICIVIRUS (VS-FCV) / FMV OPERATIONAL SCENARIO

12.3.1. The virus (VS-FCV)

- **Agent:** Hypervirulent variant of Feline Calicivirus (FCV).
- **Transmisson:** Highly contagious (+++). Direct or indirect contact (e.g., environment, equipment, hands, clothing).
- **Environmental resistance:** The virus survives up to 1 month on dry surfaces. It is resistant to many common disinfectants, e.g., chlorhexidine and quaternary ammonium compounds.
- **Inactivation:** Bleach (5% sodium hypochlorite) or Virkon™ S / Virocid / Oxivir. Laundry at 60 °C.
- **Clinical Signs**

- High fever, edema (swelling) of the head and limbs
- Ulcerative lesions on the skin, limbs, muzzle, ears
- Jaundice, respiratory distress, haemorrhages
- High mortality rate (up to 67%)
- Frequently affects vaccinated adult cats (feline calicivirus vaccines do not fully protect against the virulent systemic form).

12.3.2. Potential routes of introduction into FMV and associated risks

The introduction scenario considered consists of the presentation of an infected cat for consultation at the HE-AC.

12.3.3. Crisis management at FMV

- Management is divided into three phases: Surveillance, Pre-alert (Suspicion), and Alert (Confirmation).
- **Suspicion (Pre-alert):** If a cat presents compatible clinical signs, e.g., fever + edema of the face/limbs + cutaneous ulcers, or has a suggestive epidemiological context:
- **Immediate Action:** The clinician/nurse/student informs the Duty Supervisor.
- **Admission:** The cat must be directed straight to the UICB-AC via the designated external route, avoiding entry into the reception and cat waiting room. The owner must not bring other animals.
- **Sampling:** Blood sample in EDTA tube and oropharyngeal swabs for PCR.
- **Isolation in UICB-AC:**

- Isolate the patient in a room with no other animals
- Use PPE exclusive to the UICB-AC
- Footbath mat at room entrance/exit

- **Decontamination:**

- Isolate and discard single-use materials as biohazard waste (Group III/IV)
- Decontamination of potentially contaminated clothing:
  - Machine wash at 60 °C for at least 1 hour.
  - Use bleach for fabrics that cannot tolerate 60 °C.
- Disinfect the cat carrier with Virkon™ S / Virocid / Oxivir or discard for incineration if made of fabric.

- **Confirmation (Alert)**

- If PCR is positive **and** clinical signs are compatible or if an outbreak is confirmed by sequencing:

- **Communication:**

- Inform the owner
-Inform the HE-AC team (aferreira@fmv.ulisboa.pt) and the CHB (biosseguranca@fmv.ulisboa.pt)

- **Contact Tracing:**

- Request from HE-AC Reception the list of movements for that day
- Identify all cats that were in the HE-AC or hospitalised in the same area since the arrival of "patient zero"
- Contact the owners of exposed cats, instructing them to monitor for clinical signs and keep the animal in home isolation for 12 days

- **Measures at HE-AC:**

- Consider suspending non-urgent feline consultations if there is evidence of nosocomial transmission, unless the patient was admitted directly to the UICB-AC
- Reinforce disinfection procedures with mandatory record-keeping
- Exposed hospitalised cats must be kept isolated in the UICB-AC for 12 days

- **End of Crisis**

- The crisis is considered over when:
  - No infected animals remain in the HE-AC
  - Final disinfection, including aerial hydrogen peroxide disinfection, has been completed
  - The maximum incubation period (12–15 days) has elapsed since the last confirmed case.

12.4 RABIES VIRUS INFECTION / FMV OPERATIONAL SCENARIO

12.4.1. The virus and the disease

- **Context:** Fatal zoonosis requiring immediate mandatory notification. Portugal is officially disease-free, but surveillance is mandatory due to the risk of imported cases or wildlife introduction.
- **Agent:** *Lyssavirus*, family *Rhabdoviridae*.
- **Susceptible species:** All mammals. In clinical activity, focus is on dogs, cats, and ferrets.
- **Transmission:**

- Direct contact with infected saliva (bite, scratch)
- Contact of saliva with mucous membranes or open wounds
- Important note: The virus does not cross intact skin

- **Incubation period:** Variable (2 weeks to several months). Dogs may excrete virus in saliva up to 10 days before clinical signs appear.
- **Epidemiological context:** In Portugal, systematic anti-rabies vaccination is mandatory in dogs to protect animals and, consequently, people. It began in 1925 and continues to this day. Rabies has been a notifiable disease in Portugal since 1953 and was officially eradicated in 1961. The last imported rabies case occurred in August 1984 in a puppy under two months of age from Mozambique that entered Portugal illegally. After the animal's death, rabies was laboratory confirmed. Although Portugal maintains officially free status, circulation of other *Lyssaviruses* in bats cannot be excluded.
- **Rabies Contingency Plan (DGAV):** Available at https://www.dgav.pt/wp-content/uploads/2024/08/Plano-de-contingencia-Raiva_2024.pdf
- **DGS guideline on pre- and post-exposure rabies prophylaxis:** Available at https://www.dgs.pt/normas-orientacoes-e-informacoes/normas-e-circulares-normativas/norma-n-0012025.aspx

12.4.2. Case definition (according to DGAV)

Clinical Suspicion: Animal presenting behavioural changes (sudden aggression or excessive shyness), progressive paralysis (jaw, hind limbs), vocalisation changes, excessive salivation, hydrophobia, or sudden death without apparent cause[7].

- **Suspicion due to aggression:** Any rabies-susceptible animal (dog, cat, ferret) meeting all the following criteria: 1 - Has attacked people or other animals; 2 - Does not have valid anti-rabies vaccination; 3 - Shows clinical signs compatible with rabies; 4 - Has a lifestyle (e.g., hunting dog) or has stayed in the last 3 months in a country where rabies is endemic. Animals attacked by such animals are also considered suspects[8].
- **Confirmed Case:** Positive diagnosis by the National Reference Laboratory for Animal Rabies (INIAV).

[7] Artigo 17º da Portaria 264/2013 de 16 de agosto
[8] Artigo 16º da Portaria 264/2013 de 16 de agosto

12.4.3. Immediate management of a suspected case at FMV

A. If an aggression (bite/scratch) to people occurs:

- Human health is the absolute priority:

- A.1.1 - Immediate First Aid (on site):

- Thorough washing of the wound with running water and soap/detergent for at least 15 minutes
- Followed by application of a virucidal disinfectant (e.g., povidone-iodine or 70% alcohol)

- A.1.2 - Communication to FMV Occupational Health and Safety Unit (NSST)

- Report via email to pmorgado@fmv.ulisboa.pt.

- A.2 - Medical referral

Considering clinical context:

- Behavioral changes or clinical signs compatible with rabies;
- Verified vaccination status;

Or the epidemiological context:

- Travel history within the last three months to countries where rabies is endemic;
- History of contact with animals of susceptible species that have traveled to rabies-endemic countries in the last three months;
- Contact with bats within the last three months.
- The injured person must go to a hospital emergency department, and notification must be made to the Public Health Unit (USP) of the Local Health Unit. The Clinical Director of the Companion Animal Teaching Hospital (HE-AC) must contact the USP in the victim's area of residence or in the FMV area to assess the need for Post-Exposure Prophylaxis (PEP) (rabies vaccine and/or rabies immunoglobulin).

B. Management of the Suspected Animal (Alive)

- If an animal presented for consultation or admitted to general hospitalization shows clinical signs compatible with rabies, the following measures must be taken:

– Confinement in a cage and isolation;
– The animal must NOT leave the HE-AC facilities;
– If it is a dog or cat, it must be transferred to the Companion Animal Biological Isolation Unit (UICB-AC) in a secure individual cage labeled **"Biological Risk – Suspected Rabies"**;
– Transport must be in a rigid carrier, sealed with adhesive tape after closing, and handled only by staff wearing full PPE;
– Access to the UICB-AC room where the patient is housed must be restricted to strictly essential personnel (the responsible veterinarian), with mandatory use of full PPE, including eye protection and resistant gloves;
– The animal must remain in the UICB-AC until it is collected by an Official Collection Center with quarantine and monitoring facilities approved by DGAV, where mandatory confinement will be carried out.

- **Mandatory Notification:**

– Inform the Clinical Director of HE-AC (aferreira@fmv.ulisboa.pt) and the Biosafety Committee (biosseguranca@fmv.ulisboa.pt);
– Immediately contact DGAV (Directorate of Food and Veterinary Services of the Lisbon and Tagus Valley Region) and the Municipal Veterinarian of Lisbon (casa.dos.animais@cm-lisboa.pt).

- **Sanitary Confinement (Quarantine):**

– The animal must be kept under confinement for at least 15 days.

• **PROHIBITION OF EUTHANASIA:** The animal must NOT be euthanized during this period without explicit authorization from DGAV, as premature death may make laboratory diagnosis impossible (antigen detection in a brain sample).
• If the animal survives the 15 days without clinical signs, it is considered that it was not transmitting rabies at the time of the incident.

C. Carcass Management (if the animal dies or is euthanized by order of DGAV)

• **Preservation**
– The carcass, or the head in the case of livestock species, must be kept refrigerated between 2°C and 8°C.
– Freezing should be avoided if delivery to the laboratory is rapid (<24–48h), but if there is a delay, freezing may be carried out according to the DGAV Rabies Contingency Plan.
• **Necropsy**
– If there is a strong suspicion of rabies, a full necropsy must **not** be performed in the FMV Necropsy Room to avoid aerosol generation.
– The collection of biological samples (brain/head) must be performed by an experienced pathologist wearing a respiratory protection mask (FFP3), eye protection, and cut-resistant gloves. The use of electric saws is prohibited; a manual saw must be used.
• **Sample Submission**
– Preferably, contact INIAV before sending the material in order to arrange delivery details. Only veterinarians, or technicians properly trained by them, may collect biological samples from an animal suspected of rabies for submission to INIAV and, whenever possible, they should be vaccinated.
– The material must be sent urgently to INIAV, accompanied by the official submission form and clear identification of the biological risk[9]..

12.4.4. Additional biosecurity measures

PPE: When handling a suspected animal: waterproof suit, double nitrile gloves, leather/cut-resistant gloves worn over them if animal restraint is required, FFP2/FFP3 mask, and face shield or protective goggles (to protect the conjunctiva from saliva splashes).
• **Disinfection:** The virus is inactivated by:
– Sodium hypochlorite (bleach);
– 70% ethanol;
– Virkon™ S / Virocid / Oxivir.

12.4.5. Communication and tracing

• **Communication chain:**
- HE-AC Clinical Director → DGAV / Municipal Veterinary
- HE-AC Clinical Director → Public Health Unit.
• **Contact tracing:**

[9] https://www.iniav.pt/images/Servicos-Laboratoriais/saude-animal/Mod_GIC_015_FRA_Canideos_e_Felideos.pdf

- FMV must provide the health authorities with the complete list of all individuals (students, staff, owners) who had direct contact (bite, lick on broken skin or mucous membranes) with the suspected animal.

12.4.6. Rapid Action Flowchart (Summary)

- Suspect/Aggression → Isolate animal in UICB-AC (Do NOT euthanise)
- Injured person → Wash 15 min + Disinfect → Hospital → Public Health
- Notify → DGAV + Municipal Veterinary
- Await → Official instructions for quarantine (15 days) or sampling (INIAV).

12.45 HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI) / FMV OPERATIONAL SCENARIO

12.5.1. The virus and the disease

- **Context:** Disease subject to immediate mandatory notification. Zoonosis with pandemic potential.
- Agent: Influenza A virus, H5 and H7 subtypes (e.g., H5N1, H5N8).
- **Transmission**

- Direct: Contact with respiratory secretions, faeces and feathers of infected birds.
- Indirect: Fomites (clothing, footwear, vehicles, equipment).
- Zoonotic: Risk of transmission to humans, especially in situations of close contact without protection (necropsies, clinical handling).

- **Resistance**: The virus survives for a long time in faeces and water at low temperatures. It is inactivated by common disinfectants (Sodium hypochlorite, Virkon™ S) and by heat (60 °C for min).
- **Avian Influenza Contingency Plan (DGAV):** Available at https://www.dgav.pt/animais/conteudo/animais-de-producao/aves-de-capoeira/saude-animal/doencas-das-aves/gripe-aviaria/
- **DGS Standard DGS-0004/2025, regarding vaccination against zoonotic influenza:** https://www.dgs.pt/normas-orientacoes-e-informacoes/normas-e-circulares-normativas/norma-n-0042025-de-07032025-atualizada-a-21082025-vacinacao-contra-a-gripe-zoonotica--acesso-a-reserva-estrategica-nacional-de-vacina-contra-a-gripe-zoonotica.aspx

12.5.2. Routes of introduction into FMV and specific risks

- Although FMV has no resident birds and no experimental poultry unit, there are three critical biological risk routes:

- Teaching Hospital (HE)

- **Wild and Exotic Birds**: Admission of birds collected by private individuals or authorities (e.g., gulls, raptors, anseriformes) or pet birds (pet chickens) with acute clinical signs.
- **Domestic Mammals (Cats):** Admission of outdoor-access cats that may have preyed upon or been in contact with infected birds or dairy ruminant farms (see case definition below).

- Necropsy Room (Pathological Anatomy): Reception of bird carcasses (domestic or wild) and cats with a clinical history of sudden/acute death for *post-mortem* diagnosis.
- Field Classes (Population Medicine / Veterinary Public Health): Study visits to commercial poultry farms or egg grading/classification centres. Risk that students/teachers act as mechanical vectors of the virus out of or into the Faculty.

12.5.3. Definition of a suspect case (birds)

• Suspicion should be raised in the presence of clinical presentations compatible with HPAI associated with an epidemiological context.
• **Birds (Domestic or Wild):**
Any bird presenting:
o Sudden death (especially if in large numbers or in waterfowl).
o Severe depression and anorexia.
o Respiratory signs (dyspnoea, sneezing, nasal/ocular discharge).
o Head/neck oedema or cyanosis (combs/wattles).
o History of contact with wild birds or originating from Restriction Zones established by DGAV).
• **Cats**
- Given feline susceptibility to the H5N1 strain (clade 2.3.4.4b), any cat meeting the following Clinical **and** Epidemiological criteria should be considered a "Suspect Case":
- Clinical Criteria (Acute/Severe Signs)
o Neurological: Seizures, ataxia, tremors, circling, sudden blindness.
o Respiratory: Severe respiratory distress, dyspnoea, pneumonia.
o General: High fever, severe lethargy, jaundice (less frequent).
o Sudden Death: Cats found dead or that die shortly after admission with the clinical signs described above.
- Epidemiological Criteria (Risk Factors)
o Cat with outdoor access.
o Known or suspected history of predation/ingestion of sick/dead wild or domestic birds in the last 2 weeks.
o Originating from a geographical area with active HPAI outbreaks confirmed by DGAV (in wild birds or farms).
o IMPORTANT NOTE: An indoor-only cat (no outdoor access and not fed raw poultry meat) presents a negligible risk and should not be considered suspected HPAI; other causes should be investigated.

12.5.4. Immediate management of a suspicion at FMV

At the Small Animal Teaching Hospital (HE-AC
If a bird presents compatible clinical signs at triage or consultation:
- The bird or cat must **NOT** remain in the waiting room. Immediately refer to **Isolation**: **If bird**: designated exotic animal isolation room. **If cat**: UICB-AC.
- Only strictly necessary clinical staff may enter these isolation rooms.
- **Mandatory PPE (Zoonotic Level)**: The clinician must use an FFP2/FFP3 mask, eye protection, nitrile gloves, and an impermeable gown/disposable coverall. Respiratory and eye protection are critical.
• **Notification**: Inform the HE-AC Clinical Director (aferreira@fmv.ulisboa.pt) and the CHB (biosseguranca@fmv.ulisboa.pt). Contact DGAV (DSAVRLVT) to report the suspicion.
• **Movement prohibition:** The bird does not leave FMV. The owner must be informed that the bird will be retained under sanitary order.

In the Necropsy Room (Carcasses)
• If carcasses arrive from birds with a history of sudden flock mortality or aquatic wild birds (ducks, geese, gulls) or cats meeting the clinical and epidemiological criteria:

- **DO NOT OPEN THE CARCASS**: If suspicion is strong (based on anamnesis), do not perform the necropsy in general facilities.
- **Safe handling**: Keep the carcass in double bagging, sealed and refrigerated.
- **Referral**: Contact DGAV. As a rule, these samples must be sent to INIAV to exclude HPAI, under biosecurity level 3 conditions, which FMV's necropsy room may not be able to guarantee for high viral-load aerosols.
- **Disinfection**: Immediately disinfect the reception area where the carcass was placed

12.5.5. Procedures for extramural practical classes (Farm Animal Clinical Practice and Population Medicine / Veterinary Public Health)

- Given the risk of mechanical transport of the virus via footwear and clothing (fomites) during visits to poultry farms or egg grading/classification centres:

- Pre-visit verification: On the day before the visit, the responsible teacher must verify whether the destination site is in a Protection Zone or Active Surveillance Zone (consult DGAV notices[10]). If so, the visit must be cancelled or rescheduled.

- "Clean-in, Clean-out" policy:

- Mandatory use of PPE provided by the farm or disposable PPE, e.g., coverall, cap, boot covers.
- Prohibition of bringing personal items that cannot be disinfected into the poultry houses.

- Sanitary Void (**Personal quarantine**): Students and teachers who visit poultry farms are prohibited from contact with other birds (including in the HE-AC, Necropsy Room, or pet birds) for a minimum period of 48 to 72 hours after the visit.

12.5.6. Human health and vaccination

- Avian influenza is a zoonosis. Protection of students, teachers, and staff is a priority.
- **Accidental exposure:**

- Any person who had contact without appropriate PPE with a bird strongly suspected of HPAI or with confirmed disease must contact **SNS 24 (808 24 24 24)** and the local Public Health Unit.
- Active symptom monitoring (fever, cough) for 7 to 10 days and/or antiviral prophylaxis may be required.

- **Vaccination against Zoonotic Influenza (National Strategic Reserve):**

- According to DGS Standard 004/2025[11], workers at increased risk are eligible for pre-exposure vaccination. At FMV, this group may include:
  - Pathologists and necropsy technicians who handle wild/suspect birds.
  - Exotic/wildlife clinicians with frequent contact with wildlife.
- **Procedure:** The CHB, in coordination with FMV's NSST (pmorgado@fmv.ulisboa.pt), must identify eligible professionals and request access to the vaccine from the Local Health Authority, if justified by the volume of risk cases.
- **Seasonal vaccination**: Annual vaccination against seasonal human influenza is strongly recommended to the entire FMV community in contact with animals, to mitigate the risk of co-infection and viral genetic reassortment.

[10] https://www.dgav.pt/animais/conteudo/animais-de-producao/aves-de-capoeira/saude-animal/doencas-das-aves/gripe-aviaria/

[11] https://www.dgs.pt/normas-orientacoes-e-informacoes/orientacoes-e-circulares-informativas/orientacao-n-0042025-de-09092025-vacinacao-sazonal-contra-a-gripe-e-a-covid-19-procedimentos-especificos-pdf.aspx

12.5.7. Crisis communication

- **FMV point of contact:** HE-AC Clinical Director (aferreira@fmv.ulisboa.pt) or Pathology Lead (jcorreia@fmv.ulisboa.pt).
- **External notification:** Mandatory to DGAV and to DGS if there is exposure.
- **Cleaning:** If an outbreak focus is confirmed (positive bird on the premises), the affected area must be closed and subjected to rigorous disinfection with an approved virucide, respecting contact times.

12.6 LEPTOSPIROSIS / FMV OPERATIONAL SCENARIO

12.6.1. The agent and the disease

- **Context**: Severe zoonosis caused by spirochetes of the genus Leptospira. Although not subject to mandatory notification to DGAV, it is a disease of mandatory notification to DGS when confirmed in humans.
- **Transmission**

- Direct contact with urine from infected animals (main route of transmission).
- Contact with tissues, blood or fluids during necropsies or parturition.
- Indirect contact via contaminated water, soil, or bedding.
- Entry routes: injured skin (cuts, abrasions), mucous membranes (eyes, nose, mouth), and inhalation of aerosols (contaminated urine/water).

- **Resistance**: The bacterium survives well in humid and warm environments, but is sensitive to desiccation, freezing, and most common disinfectants.

12.6.2. Risk management by scenario

- Management at FMV is divided into four critical scenarios with distinct procedures.

Scenario 1: Field necropsy (practical classes in Farm Animal Clinical Practice and Population Medicine)

- High risk due to uncontrolled environmental conditions.
- **Prior assessment**: If there is ante-mortem clinical suspicion of leptospirosis (e.g., severe jaundice, haemoglobinuria in calves), a field necropsy with students must not be performed.
- **Accidental discovery**: If, during a field necropsy, lesions suggestive of leptospirosis are observed, e.g., pale/mottled kidneys, generalized jaundice, friable liver:

- Stop the procedure immediately.
- Move students to a safe distance (minimum 2 metres).
- The teacher/veterinarian evaluates whether to close the carcass or proceed only for collection of essential samples.

- **Biosecurity**

- Mandatory use of latex/nitrile gloves, preferably double.
- Use of eye protection (goggles/face shield) to prevent splashes of fluids.
- Rigorous disinfection of boots and equipment before entering the FMV vehicle.

Scenario 2: Necropsy room (Companion animals, Production animals or Exotics)

- Controlled environment, but risk of aerosols during washing.
- **Signage**: Place a warning on the door and on the table: "BIOLOGICAL RISK – SUSPECT LEPTOSPIROSIS".
- **Enhanced PPE**

- FFP2 / FFP3 mask mandatory (protection against aerosols during cavity opening or bone sawing).
- Face shield or full eye protection goggles.
- Cut-resistant gloves + nitrile gloves.
- Waterproof suit and rubber boots.

- **Procedures**

- Avoid electric saws (generation of bone/blood aerosols). Use manual saws whenever possible.
- Use of high-pressure hoses to wash the carcass or table while tissues are exposed is PROHIBITED. Water must run at low pressure to avoid aerosolization of contaminated fluids.
- Limit the number of students present to the essential minimum.

Scenario 3: Clinical case at the Small Animal Teaching Hospital

- Focus on urine management and staff protection.
- **Admission:**

- Animal com sinais de insuficiência renal aguda e/ou hepática, febre e história de vacinação
- Animal with signs of acute renal and/or hepatic failure, fever, and incomplete vaccination history or contact with water/rodents;
- Refer to the UICB-AC

- **Housing in the UICB-AC:**

- Place a notice on the cage: "CAUTION: INFECTIOUS URINE – LEPTOSPIROSIS";
- The cage must have disposable absorbent lining. Avoid grates where urine splashes onto the common floor.

- **Urine management (critical point):**

- Catheterize the animal in a closed system to avoid environmental contamination.
- If the animal urinates on the floor/cage: DO NOT use a pressure hose. Cover urine with absorbent paper, soak with disinfectant, collect as biohazard waste (Group III) and only then wash the surface.

- **Walks**:

- Suspected dogs must not be walked in common outdoor areas of FMV. They must eliminate in UICB-AC cages (pads) or via a closed collection system.

Scenario 4: Clinical case at the Equine Teaching Hospital

- Urine volume and bedding are the main challenge.
- **Isolation:** The horse must be housed in a stall in the Equine Biological Isolation and Containment Unit (UICB-EQ).
- **Footbath:** Mandatory at stall entry and exit, before the sanitary filter for that stall, with disinfectant solution renewed daily.
- **PPE:** Disposable coverall, rubber boots, gloves, and eye protection for anyone entering the stall. The coverall and gloves must be discarded.
- **Bedding and urine management:**

- Urine-contaminated bedding is highly infectious.
- Bedding removal must be carried out carefully to avoid raising dust (inhalation risk).

- Removed material must be considered infectious waste and must not be placed in the common manure heap if there is no guarantee of effective thermal composting. Ideally, bag and send for incineration or specific treatment;
• **Warnings**: Clear signage on the sanitary filter door that gives access to the stall and on the stall itself: “Restricted Access – Biosecurity Level 2".

12.6.3. Disinfection and environmental control

• **Recommended disinfectants:**
- Sodium hypochlorite (bleach) diluted 1:10;
- Virkon™ S at 1%.
- Iodine-based solutions or quaternary ammonium-based products.
• **Protocol**: Removal of organic matter (without water pressure) -> Application of disinfectant -> Contact time (minimum 10 minutes) -> Rinsing.
• **Rodents**: Reinforce the pest control plan in areas where the animal was housed, because urine may attract or infect local rodents, perpetuating the cycle at FMV.

12.6.4. Human health and contact traceability

• As leptospirosis is not a notifiable disease to DGAV, protection responsibility lies with the CHB and the Clinical Direction of HE-AC and HE-EQ.
• **Record of exposed persons**:
- For each confirmed or strongly suspected case, a “Close Contacts List” must be created.
• **Who to include?**
- Students who attended the necropsy/consultation, nurses, veterinarians, assistants and handlers who handled the animal or cleaned cages/stalls.
• **Risk communication:**
- All persons on the list must be informed, by email or in person, about the exposure.
- The information sheet must be provided: “Exposure Alert to a Zoonotic Agent – Leptospirosis ".
• **Health surveillance:**
- Instruct exposed persons to monitor flu-like symptoms (fever, myalgia, headaches) in the two weeks following exposure.
- If symptoms occur, they must seek medical care and explicitly state: “I am a veterinary student/professional and I was exposed to an animal with Leptospirosis ".
• **Occupational medicine:**
- Exposed staff (academic and non-academic) must be flagged to the NSST (pmorgado@fmv.ulisboa.pt).

12.6.5. Laboratory diagnosis at FMV

• Confirmation must be rapid in order to adjust biosecurity measures.
• **Samples:** Urine and blood (EDTA and serum).
- These samples are initially processed at FMV and forwarded to INIAV.
- Appropriate biosecurity measures are used when handling the samples (use of gloves).

12.6.6. Action summary (simple flowchart)

- Suspect? -> Put on enhanced PPE (Gloves + Mask + Goggles).
- Isolation -> UICB-AC (Companion animals) or UICB-EQ (Equines).
- Signage -> Place “Biological Risk” warnings.
- Urine -> Treat as biosecurity level 2 biological risk material. Do not use water jets.
- Record -> List all people who had contact with the animal/carcass.
- Confirmation -> Inform exposed community for symptom monitoring.

12.7 EQUINE HERPESVIRUS (EHV) / FMV OPERATIONAL SCENARIO

12.7.1. The virus and the disease

- **Context**: Contagious disease with high economic and sanitary impact. Although it is not a zoonosis, an outbreak of EHV-1 (neurological or abortive form) may require confinement (lockdown) of the HE-EQ.
- **Agent**: *Equine alphaherpesvirus 1* (EHV-1) and 4 (EHV-4). EHV-1 is the main agent responsible for severe forms: myeloencephalopathy (neurological), abortion, and respiratory disease.
- **Transmission**:

- Aerosols: Inhalation of respiratory droplets (coughing, sneezing) from infected horses.
- Direct contact: Nasal secretions, aborted foetuses, placental fluids.
- Fomites (Critical): Hands, clothing, halters, ropes, buckets, thermometers and shared equipment. The virus survives for weeks in the environment.

- **Latency**: The virus remains latent in asymptomatic carrier horses and can reactivate under stress (transport, hospitalization, surgery), leading to viral shedding.

12.7.2. Case definition and alert level

- **Suspect case:**

- Horse with fever (rectal > 38.5 °C) associated with respiratory or neurological signs (ataxia, paresis, urinary incontinence, tail flaccidity).
- Abortion in mares in the last third of gestation.
- Horse exposed to a confirmed case.

- **Confirmed case:** Identification of viral DNA by PCR (nasal swab, blood) or viral isolation.

12.7.3. Introduction scenarios and immediate management

Scenario A: Admission of a suspect patient (External triage)

- The animal arrives at FMV with a history of fever and ataxia or coming from a stud farm with an active EHV-1 outbreak.
- **Do not unload**: The animal must be assessed in the truck or in the external unloading area, away from resident horse stalls.
- **Direct referral**: If admission is essential, the animal goes directly to the Isolation Unit (HEPA stall in the UICB-EQ) via the shortest external route (“Dirty Route”).
- **Prohibition**: It is strictly prohibited to take this animal through the regular hospitalization area.

Scenario B: "Internal" case

- A horse hospitalized for another reason, e.g., colic, surgery, that develops fever > 38.5 °C and neurological signs.
- Immediate "**CODE RED**".
- **Stop movements**: NO horse enters or leaves the hospitalization area.
- **Isolate the patient**: Immediately move the horse to the HEPA stall in the UICB-EQ.
- **Isolate the original stall**: The stall where the animal was must be sealed (no one enters until disinfection is carried out).
- **Quarantine of contacts**: All horses in the same barn are considered "contacts" and cannot be discharged.

12.7.4. UICB-EQ protocol (HEPA stall)

- FMV has a critical infrastructure: a stall with negative pressure and HEPA filtration. Its use is a priority for suspect respiratory/neurological cases.
- **System activation:**

- Verify that the ventilation/negative pressure system is switched on and functional before bringing the horse in.
- The stall door must remain closed at all times to ensure the pressure gradient and the effectiveness of air filtration, preventing viral aerosol escape into the corridor.

- **Sanitary filter (Transition Zone)**: This is the only area where staff don/doff PPE. It must contain:

- Footbath with Virkon™ S (renewed daily), stock of disposable PPE, Group III waste container.

- **Mandatory PPE:**

- Full disposable coverall (with hood).
- Dedicated rubber boots (kept in the antechamber) or impermeable boot covers.
- Nitrile gloves (double).
- Note: Although Equine Herpesvirus is not zoonotic, a mask (FFP2) and cap are recommended to prevent the virus from settling on the operator's mucous membranes/hair and being mechanically carried to other horses.

- **Dedicated materials:**

- Everything that enters the HEPA stall stays in the HEPA stall (thermometer, stethoscope, buckets, hay, cleaning material). Nothing leaves without chemical disinfection or in a sealed waste bag.

12.7.5. HE-EQ confinement measures (Lockdown)

- **If there is a confirmed case or strong suspicion of EHV-1 (Neurological):**
- **Closure of the HE-EQ:** The HE-EQ Clinical Director orders the suspension of admissions and discharges.
- **Zoning (Traffic-light system):**

🔴 Red Zone (HEPA isolation): Access restricted to the Senior Veterinarian and 1 dedicated nurse. Students are prohibited.

🟡 Yellow Zone (Contacts/General hospitalization): Exposed horses. Use of PPE (gown/gloves) and footbaths between stalls. Temperature monitoring 2×/day.

🟢 Green Zone (Clean): Administrative areas and zones where horses have not circulated.

- **Segregation of students and staff:** Anyone working in the Red Zone must **NOT** enter the other zones on the same day.

• **Students**: Must be prevented from accessing the Red and Yellow Zones. The risk of transporting virus on clothing to external stud farms is high.

12.7.6. Diagnosis and sampling

• **Collection**: Must be carried out at the onset of fever.
• **Nasopharyngeal swab: (For PCR)**: Must be deep.
• **Blood (EDTA):** (For PCR – detection of viraemia).
• **Submission**: INIAV Virology Laboratory. Label the sample as "SUSPECT HERPESVIRUS – HIGH CONTAGION RISK."

12.7.7. Cleaning and disinfection

• Herpesvirus is sensitive to disinfectants, but viral load may be massive.
• **Disinfectants**: Virkon™ S at 1%, Bleach (Hypochlorite) 1:10, or quaternary ammonium compounds.
• **HEPA stall (Post-discharge):**
- Store bedding in black bioboxes for incineration;
- Wash with detergent to remove organic matter;
- Disinfect by spraying all surfaces (walls, ceiling, feeders).
• **Filters**: Check the need for maintenance/replacement of HEPA filters after a positive case, according to the ventilation system manufacturer's instructions.

12.7.8. Communication and notification

• **Internal**: Inform all clinicians, nurses and students about confinement (lockdown) and zone restrictions.
• **External**: Equine rhinopneumonitis is a disease subject to mandatory notification to DGAV. The HE-EQ Clinical Director must notify DGAV-LVT immediately to coordinate official movement restrictions (seizure/quarantine).
• **Clients**: Inform owners of hospitalized horses (contacts) about the situation, the risk, and the impossibility of immediate discharge.

12.7.9. Action summary (Flowchart)

• Fever + Neurological signs -> DO NOT MOVE (if in stall) or HEPA STALL (if admission).
• Lockdown -> No one enters/leaves the barn. Footbaths at the doors.
• Sampling -> Nasal swab + EDTA blood.
• Isolation -> Transfer to HEPA stall with maximum PPE.
• Notify -> Directorate + DGAV.
• Tracing -> Measure temperature of all horses 2×/day.

12.8 EQUINE SALMONELLOSIS / FMV OPERATIONAL SCENARIO

12.8.1. The agent and the disease

- **Context**: Salmonellosis is one of the main causes of contagious diarrhoea and nosocomial outbreaks in veterinary hospitals. It is an important zoonosis (risk to students and staff) and the agent is highly resistant in the environment.
- **Agent**: Several serotypes of Salmonella enterica, e.g., Typhimurium, Newport, Anatum.
- **Transmission**: Faecal–oral.
- **Direct**: Ingestion of faeces, nose-to-nose contact.
- **Indirect** (Critical): Fomites (boots, buckets, nasogastric tubes, thermometers, hands, contaminated floors).
- **Risk factors**: Stress (transport, surgery), antibiotic therapy (dysbiosis), colic, prolonged hospitalization.
- **Clinical signs**: Fever, leukopenia/neutropenia, acute diarrhoea (foul-smelling, profuse), colitis, endotoxaemia (congested mucous membranes, toxic line).
- Asymptomatic carriers exist that may shed bacteria under stress (shedders).

12.8.2. Triage and risk definition

- Triage must be performed at admission or as soon as clinical signs arise during hospitalization.
- **Risk classification (Traffic-light system):**

🔴 High Risk (Red) – Immediate Isolation:
- Acute diarrhoea + Fever (>38.5 °C) and/or Leukopenia (<4000/µL).
- Acute diarrhoea in a horse with recent history of prolonged transport or antibiotic use.
- Foals with diarrhoea/sepsis.

🟡 Moderate Risk (Yellow) – Barrier Precautions:
- Fever of unknown origin (no diarrhoea).
- Soft faeces without fever or leukocyte changes.

🟢 Low Risk (Green):
- No gastrointestinal or systemic signs.

12.8.3. Immediate management of a suspect/confirmed case

A. Admission (External case)

- **Do not unload:** Assess the animal in the truck if there is a history of liquid diarrhoea.
- **Transport:** If admission is necessary, use the “Dirty Route” directly to the UICB-EQ. If the horse defecates along the way, the area must be isolated, collected and immediately disinfected with bleach.

B. Internal case (Hospitalized patient that develops diarrhoea)

- If a horse hospitalized in the general area develops explosive diarrhoea:

- "**CODE BROWN**" (Biological Alert):
- **Block movements**: No one enters or leaves the stall without authorization.

• ***In situ* isolation (Barrier)**: If it is not possible to move the animal immediately, set up an isolation barrier at the stall door (warning tape, footbath, PPE).
• **Transfer**: Move the animal to the UICB-EQ via the shortest and least trafficked route.
• **Closure of original stall**: The contaminated stall remains closed with a sign "BIOLOGICAL RISK – DO NOT ENTER" until disinfection.

C. Measures in the UICB-EQ

• **Housing:** Dedicated stall in the UICB-EQ.
• **Mandatory PPE (Zoonosis level):**
- Nitrile gloves (changed between dirty/clean procedures),
- Waterproof coverall or disposable isolation gown;
- Dedicated rubber boots (kept in the footbath) or high-boot covers (heavy-duty plastic),
- Cap and mask (to avoid splashes to the face/mouth during diarrhoea handling or washing).
• **Dedicated equipment:**
- Everything that enters does not leave (thermometers, stethoscopes, buckets, halters and ropes).
- Nasogastric tubes must be exclusive or autoclaved after use.
- Footbath: Disinfectant solution (Virkon™ S at 1% or bleach 1:10) renewed every 24h or whenever there is visible organic matter.

12.8.4. Laboratory diagnosis

• Due to intermittent shedding, a single negative test does not exclude the possibility of disease.
• **Sampling protocol:**
- Collect at least 5 consecutive faecal samples (12h to 24h interval) for bacteriology or one sample for PCR (IDEXX, Spain);
- **Volume**: Minimum 10 g of faeces (not just a swab);
- **Submission**: FMV Bacteriology Laboratory. Clearly state on the request form: "SUSPECT *SALMONELLA*".

12.8.5. Cleaning and disinfection (Critical point)

• *Salmonella* forms biofilms and persists for months in the environment. Mechanical cleaning is 90% of success.
• **During hospitalization:**
- Frequent faeces removal;
- Do not use high-pressure hoses (risk of aerosolizing bacteria to neighbouring stalls or to the operator's face). Use scrapers and plastic shovels that can be disinfected
• **Terminal disinfection (Post-discharge):**
- Remove all bedding (incineration or controlled composting away from watercourses);
- Wash with enzymatic/degreasing detergent to remove biofilm and organic matter. Scrub walls and floor. Rinse and allow to dry;
- Apply disinfectant: Virkon™ S at 1% or Sodium hypochlorite (bleach) at 10%. Leave for 10–30 minutes;
- Environmental bacteriological culture: The stall is only released for a new patient after negative environmental swabs (floor, feeder, drinker, walls).

12.8.6. Human health and tracing

- Transmission to people is a real risk.
- **Risk groups**: Students, handlers and clinicians who handled the horse or bedding. Immunocompromised persons and pregnant women must not enter the stall.
- **Monitoring**: Inform all contacts to monitor gastrointestinal symptoms (diarrhoea, fever, abdominal cramps) for 7 days.
- **Hygiene**: Vigorous handwashing with water and soap after leaving the UICB-EQ, followed by disinfection. Eating/drinking in clinical areas is prohibited.

12.8.7. Criteria for discharge or lifting isolation

- The animal can only leave the UICB-EQ (home or general stabling) if:

- Resolution of clinical signs (normal faeces, no fever).

and

- 3 to 5 consecutive negative faecal cultures (collected at 24h intervals) or 1 negative PCR result.
- NOTE: If the animal goes home while still shedding the agent, the owner must sign a Responsibility Term and receive the leaflet "Home Care for a Salmonella-positive Horse" (Table 12).

Table 13
Home Care for a *Salmonella*-positive Horse

Title: HOME CARE FOR A HORSE RECOVERING FROM SALMONELLOSIS

Key message: Your horse is clinically better, but may still shed the bacterium in the faeces, posing a risk to other horses and people.

Home measures (for 30 days):

- Isolation: Keep the horse in a paddock or stall separated from other animals.
- Personal hygiene: Use dedicated boots and gloves to care for this horse. Always wash hands after handling. Do not allow children to touch the animal.
- Faeces: Do not spread this horse's manure on pastures. Compost in an isolated location away from watercourses.
- Cleaning: Disinfect buckets, feeders and cleaning equipment with diluted bleach after the isolation period.

12.8.9. Final provisions and communication

- **Point of contact**: In a crisis, communication must be centralized in the Clinical Directors of the Teaching Hospitals (Companion Animals, Equines and Farm Animal Species) and in the Coordinator of the Hygiene and Biosecurity Committee.
- **Students**: Must be immediately informed of access restrictions to isolated areas (UICB-AC, UICB-EQ or closed areas).
- **Dissemination procedure**: This SOP must be available at the hospitals' reception areas, in the UICB-AC, in the UICB-EQ, and in the necropsy room

13. QUALITY ASSURANCE AT THE FACULTY OF VETERINARY MEDICINE

13.1 Introduction

1. The creation of integrated quality assurance systems in Higher Education Institutions results from international recommendations, namely:

i. Standards and Guidelines for Quality Assurance in the European Higher Education Area, contained in the 2015 report prepared by the European Association for Quality Assurance in Higher Education (ENQA) at the request of the Ministers who signed the Bologna Declaration.

ii. Report prepared by ENQA, at the request of the Portuguese Government, on quality assurance in higher education in Portugal (2006), which evaluated practices carried out in this domain under the National Council for the Evaluation of Higher Education (CNAVES) and made recommendations to the Government on the organization, methods, and processes of a new accreditation system in accordance with the European Standards and Guidelines.

iii. Evaluation report of the Portuguese Higher Education system (2006), prepared by the Organisation for Economic Co-operation and Development (OECD) at the request of the Portuguese Government.

iv. Principles and Process of Evaluation and Standard Operating Procedures of the European Association of Establishments for Veterinary Education (EAEVE) and the Federation of Veterinarians of Europe (FVE), revised in May 2016 in Uppsala, which regulate the evaluation of European Veterinary Education Establishments through ECOVE.

2. 1. The first three documents formed the basis for the approval of the Legal Framework for Quality Assessment in Higher Education (Law no. 38/2007 of 16 August) and for the creation of the Agência de Avaliação e Acreditação do Ensino Superior (A3ES), established by Decree-Law no. 369/2007 of 5 November. The last document underpins the European veterinary education evaluation system aimed at its approval, based on compliance with Directive 2005/36, and its accreditation by ECOVE when adequate academic and training quality standards are met.

The higher education quality assurance and evaluation system is based on the existence, within higher education institutions and their organic units, of internal quality assurance systems. To this end, institutions must::

i. Adopt, in line with their mission, a quality assurance policy for their study cycles, as well as appropriate procedures for its implementation.

ii. Develop concrete measures to promote a culture of quality assurance in all areas of activity.

iii. Implement a strategy for continuous quality improvement.

3. Within this context, under Article 7 of the Regulations of the Integrated Quality Management System of Universidade de Lisboa (SIGQ-ULisboa), published by Order no. 15622/2015 in the Official Gazette (2nd Series, no. 253 of 29 December 2015), the School Council of the Faculty of Veterinary Medicine (FMV) approves the Regulations of the Integrated Quality Assurance System of the Faculty of Veterinary Medicine, upon proposal by the President of FMV and following favorable opinions from the Management Council, the Scientific Council, and the Pedagogical Council.

13.2 General Dispositions

Purpose and Scope

1. These Regulations establish the organizational foundations of the Integrated Quality Assurance System of the Faculty of Veterinary Medicine, hereinafter referred to as SIGQ-FMV, defining its organization and main instruments, in accordance with Article 7 of the SIGQ-ULisboa Regulations.

2. SIGQ-FMV shall ensure the continuous improvement of FMV's quality by assessing the degree of fulfillment of its mission through performance criteria and indicators related to its activities and outcomes.

3. SIGQ-FMV shall also integrate the procedures for evaluating research and teaching activities stipulated in Articles 3, 23, 27, and 43 of the FMV Statutes

Coordenation

Coordination and management of SIGQ-FMV are the responsibility of the FMV Quality Assurance Council.

Instruments

The fundamental instruments of SIGQ-FMV are:

a) FMV Strategic Plan;

b) FMV Quality Manual;

c) FMV Quality Plan.

Functions

The Quality Assurance Council of the Faculty of Veterinary Medicine (CGQ-FMV) is responsible for promoting quality evaluation and coordinating and managing SIGQ-FMV.

Composition

1. CGQ-FMV includes:

a) The President of FMV or the member of the Management Council delegated for this purpose

b) The President of the Scientific Council or a delegated member

c) The President of the Pedagogical Council or a delegated academic staff member

d) The President of the Clinical Department Council or a delegated academic staff member

e) One to three FMV professors or researchers appointed by the President of FMV

f) The Executive Director of FMV

g) The President of the FMV Students' Association (AEFMV) or a delegated student representative

2. CGQ-FMV is chaired by the President of FMV or the delegated member of the Management Council.

3. External members may be invited to CGQ-FMV meetings whenever justified by the matters under discussion.

4. Members of CGQ-FMV are appointed by order of the President of FMV.

Responsibilities

1. Within the national accreditation and evaluation framework, and in accordance with the law and guidelines issued by FMV governing bodies, CGQ-FMV is responsible for proposing quality evaluation procedures to be implemented at FMV, namely:

a) Promoting the quality of teaching, research, outreach, and management activities

b) Promoting the development of an integrated institutional quality assurance culture

c) Coordinating quality management and evaluation processes at the service level

d) Monitoring the evaluation of research and teaching activities, in accordance with the FMV Statutes and internal/external evaluation processes

e) Providing information to FMV governing bodies, especially the School Council, regarding SIGQ-FMV activities

f) Analyzing the functioning of SIGQ-FMV, preparing assessment reports, and issuing opinions on corrective measures deemed appropriate

g) Preparing the FMV Quality Manual and Quality Plan and proposing their approval

h) Proposing the creation of institutional support structures for quality assurance implementation

i) Issuing recommendations related to quality assurance

j) Publishing SIGQ-FMV actions and documents

k) Proposing revisions to these Regulations

l) Approving its internal rules;

2. Within its scope of responsibility, CGQ-FMV may request opinions or collaboration from other institutional bodies.

Operation

1. CGQ-FMV meets upon convocation by its chair.

2. In the event of a tie vote, the chair has a casting vote.

3. CGQ-FMV is provided with the human and material resources allocated by the FMV Management Council.

4. CGQ-FMV may create specialized committees, defining their composition and responsibilities, and may include external members.

13.3 Final and Transitional Provisions

Interpretation, Doubts, and Omissions

CGQ-FMV is responsible for interpreting doubts and omissions arising from the application of these Regulations.

Revision and Amendment

The President of FMV may propose amendments to these Regulations to the School Council, after consulting CGQ-FMV and obtaining favorable opinions from the Scientific and Pedagogical Councils.

Entry into Force and Publication

1. The SIGQ-FMV Regulations enter into force the day after their approval by the FMV School Council.

2. SIGQ-FMV documents shall be made publicly available in an appropriate location, and the Quality Manual and Quality Plan must be published on the FMV institutional website.

14. REFERENCES

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15. POSTERS