Occupational Safety and Health Manual

Prevention, Health Surveillance and Radiation Protection

Faculty of Veterinary Medicine · Universidade Lusófona

Code FVM-OSH-MAN · Version 1.0

Faculty of Veterinary Medicine, Universidade Lusófona (FVM-ULusófona)



FACULDADE DE MEDICINA VETERINÁRIA
UNIVERSIDADE LUSÓFONA

UNIVERSIDADE LUSÓFONA

Approval of the Occupational Safety and Health Manual

This version of the Occupational Safety and Health Manual was prepared by the Health, Safety and Biosecurity Committee (HSBC), with the occupational safety officer, the occupational physician and the radiation protection officer, and is approved by the Dean of the Faculty of Veterinary Medicine, Universidade Lusófona (FVM-ULusófona). It comes into force on the date of approval and is reviewed at least once a year.

Document identification

Item	Details
Document	Occupational Safety and Health Manual
Code	FVM-OSH-MAN
Version	1.0
Year	2026
Scope	All FVM-ULusófona facilities and activities (Chapters 1–10)
Next ordinary review	Before the start of the academic year

Index

Chapter 1: Purpose, Scope and Policy 7

Chapter 2: Legal Framework 8

Chapter 3: Organisation and Responsibilities 9

Chapter 4: Risk Assessment 10

Chapter 5: Radiation Protection: X-ray and CT 16

Chapter 6: Health Surveillance and Medical Examinations 20

Chapter 7: Other Risks 24

Chapter 8: Groups Requiring Special Protection 28

Chapter 9: Training, Emergencies, Accidents and Records 30

Chapter 10: Conclusion 32

List of Abbreviations

Abbreviation	Meaning
ACT	Authority for Working Conditions (Autoridade para as Condições do Trabalho)
ALT	Alanine aminotransferase
APA	Portuguese Environment Agency (Agência Portuguesa do Ambiente)
Art./Arts.	Article/Articles
AST	Aspartate aminotransferase
CSTD	Closed-system drug-transfer device
CT	Computed tomography
DGS	Directorate-General of Health (Direção-Geral da Saúde)
DL	Decree-Law (Decreto-Lei)
ECG	Electrocardiogram
FFP2	Filtering facepiece, class 2 (respirator)
FVM	Faculty of Veterinary Medicine
FVM-BIO-MAN	Document code of the FVM-ULusófona Biosecurity Manual
FVM-OSH-MAN	Document code of this Manual
FVM-ULusófona	Faculty of Veterinary Medicine, Universidade Lusófona
GDPR	General Data Protection Regulation
GGT	Gamma-glutamyl transferase
HSBC	Health, Safety and Biosecurity Committee
LoW	European List of Waste
NIOSH	National Institute for Occupational Safety and Health (United States)
OSH	Occupational Safety and Health
PPE	Personal protective equipment
T4	Thyroxine
TSH	Thyroid-stimulating hormone
VTH-CA	Companion Animal Teaching Hospital

Background

This Manual sets out how the Faculty of Veterinary Medicine (FVM) prevents occupational accidents and work-related diseases, conducts occupational health surveillance and controls exposure to physical, chemical and biological agents across its activities. Universidade Lusófona has an Occupational Safety and Health (OSH) policy tailored to the specific characteristics of veterinary medicine, as its teaching hospitals and ambulatory services involve the continuous interaction of multiple occupational hazards. This policy aims to protect staff and students, support the quality of veterinary care and promote safe and healthy working practices among future veterinary professionals.

This Manual applies to all staff, teaching and research personnel, veterinarians, veterinary nurses, radiographers, assistants and administrative staff, as well as to trainees, interns, research fellows, students involved in practical activities and external workers providing maintenance, cleaning, security or technical support services within the Faculty's facilities.

Veterinary medicine involves a combination of occupational hazards rarely encountered together in other working environments. The National Institute for Occupational Safety and Health (NIOSH) identifies, among others, injuries resulting from animal handling, zoonotic diseases, exposure to radiation and chemical agents, sharps injuries, allergens, noise and work-related stress.

Occupational risk prevention is also an expression of the One Health approach, recognising the close links between human and animal health and the quality and safety of the working environment.

The Faculty of Veterinary Medicine has offered the Integrated master's degree in veterinary medicine since 2004, and its Veterinary Teaching Hospital operates 24 hours a day, seven days a week. Its continuous emergency services, diagnostic imaging facilities (including X-ray and computed tomography (CT)), anaesthesia procedures and contact with sick animals require ongoing risk management and preventive measures rather than occasional interventions. The Faculty's activities have also expanded. Universidade Lusófona now includes the University Veterinary Outpatient Clinic in Lisbon, with radiology and oncology facilities, and the Catapereiro Farm Animal Teaching Hospital, dedicated to medium and large animals, which includes a necropsy room and laboratories. Each facility and activity involves specific occupational hazards that must be identified and addressed from the outset.

An effective OSH policy is therefore essential to pursuing the goal of preventing occupational accidents and work-related diseases. Employers are legally required to ensure safe and healthy working conditions in all aspects of work. However, an OSH policy goes beyond legal compliance: it brings together the University's commitments, responsibilities and preventive measures within a coherent framework.

This OSH Manual translates the University's OSH policy into a practical framework of principles, responsibilities and procedures for the prevention and management of occupational risks. It aims to protect workers' health, support the quality of veterinary care and ensure compliance with applicable legal requirements.

This Manual is complementary to the FVM-ULusófona Biosecurity Manual (document code: FVM-BIO-MAN). Both manuals are developed, implemented and periodically reviewed by the same Health, Safety and Biosecurity Committee (HSBC). This integrated approach promotes coordination between occupational safety and health and biosecurity measures and supports the continuous improvement of both manuals.

Chapter 1: Purpose, Scope and Policy

The purpose of OSH Manual is to establish a framework for the prevention and management of occupational risks across the activities and facilities of the Faculty of Veterinary Medicine (FVM) at Universidade Lusófona.

1.1. Scope

- Teaching staff, researchers, veterinarians, veterinary nurses, radiographers, assistants and administrative staff.
- Trainees, interns, research fellows and students in practical activities.
- **External workers:** maintenance, cleaning, security and technical support for equipment.
- **Areas:** hospital, diagnostic imaging, operating theatre, hospitalisation, laboratories, farm, classrooms and services.

1.2. Commitments of the Management

- Comply with the applicable legislation and provide the service with sufficient resources.
- Eliminate risks and assess those that cannot be avoided.
- Give preference, whenever possible, to substitution of potentially harmful agents, engineering measures and work organisation.
- Give priority to collective over individual protection.
- Justify and optimise every use of ionising radiation.
- Ensure health examinations, dosimetry, training and information for workers.
- Consult the workers' OSH representatives.
- Protect health data and ensure medical confidentiality.

Chapter 2: Legal Framework

Two regimes are central: Law No. 102/2009 of 10 September, which sets the legal framework for OSH, and Decree-Law (DL) No. 108/2018 of 3 December, on radiation protection. Veterinary radiology is neither medical exposure nor non-medical imaging under Article 4(2) of this Decree-Law, so the regulatory authority is the Portuguese Environment Agency (APA).

Table 2.1: Main legislation and guidance

Instrument	Subject
Law No. 102/2009 of 10 September, as amended	General OSH framework
Decree-Law No. 108/2018 of 3 December, as amended	Radiation protection, doses, dosimetry and surveillance
APA Guidance DAN 010	Monitoring and health surveillance
Directorate-General of Health (DGS) Technical Guide No. 1	Health surveillance of workers exposed to ionising radiation and fitness criteria
Decree-Law No. 84/97 of 16 April, as amended	Exposure to biological agents at work
Decree-Law No. 301/2000 of 18 November, as amended	Exposure to carcinogens, mutagens and reproductive toxicants
Decree-Law No. 24/2012 of 6 February, as amended	Exposure to chemical agents at work
Decree-Law No. 348/93 of 1 October and Ordinance No. 988/93 of 6 October, as amended	Personal protective equipment
Decree-Law No. 220/2008 and Ordinance No. 1532/2008, as amended	Fire safety in buildings
Decree-Law No. 102-D/2020 of 10 December, as amended	General waste management regime (solid and liquid waste)
Order (Despacho) No 242/96 of 13 August	Classification and management of healthcare waste (Groups I–IV)
Commission Decision 2000/532/EC, as amended by Commission Decision 2014/955/EU	European List of Waste (LoW codes for solid and liquid waste)
Regulation (EC) No 1069/2009 and Commission Regulation (EU) No 142/2011, as amended	Animal by-products, including cadavers

Chapter 3: Organisation and Responsibilities

Table 3.1: OSH roles and responsibilities

Role	Main responsibilities
University Management	Ensures OSH conditions and the technical and human resources for risk assessment
Faculty Management (Dean)	Ensures that legal procedures, practice records and the Radiation Protection Programme are checked
Health, Safety and Biosecurity Committee (HSBC)	Includes the occupational safety officer, the occupational physician and the radiation protection officer; coordinates this Manual and the Biosecurity Manual, reviews them yearly and analyses accidents, incidents and indicators
Occupational safety officer	Assesses risks with a specific methodology, plans prevention, sets preventive and, when needed, protective measures, and investigates accidents
Occupational physician	Technically responsible for health surveillance; performs examinations, analyses potential harmful effects and issues the fitness certificate
Occupational health nurse	Supports consultations and performs complementary tests (such as electrocardiogram [ECG], blood sampling, audiogram)
Radiation protection officer	Supervises protection and ensures that work with radiation complies with the procedures
Radiographers and veterinarians	Follow protocols, wear a dosimeter and personal protective equipment (PPE), and report anomalies
Teaching staff	Ensure information, supervision and compliance with the rules in practical classes
Workers and students	Follow instructions, attend examinations and report risk factors
Workers' OSH representatives	If elected by the workers, are consulted and propose measures

Chapter 4: Risk Assessment

Every workstation has a written assessment, with preventive measures and a person responsible for implementing them.

4.1. Assessment Matrix

The assessment and the preventive measures are recorded in a matrix with five components, by work area:

Table 4.1: Components of the risk assessment matrix

Component	What it records
Task	What is done, including preparation, maintenance and emergencies
Equipment and materials	Machines, instruments, substances, animals and environment involved
Risk factors	Agent or condition with the potential to cause harm
Risks	Harm that may occur to health or safety
Preventive/control measures	Measures in order: eliminate, substitute, engineering controls, organise, collective protection and PPE

4.2. Risk Charts by Area

4.2.1. Radiology

Table 4.2: Risk chart – Radiology

Task	Equipment and materials	Risk factors	Risks	Preventive measures
Take radiographs	X-ray tube, detector, table, animal	Direct and scattered ionising radiation	Stochastic effects; lens and skin injury	Shielding; distance; non-essential people out of the room; dosimetry; signed zones
Restrain and position the animal	Positioners, lead apron and gloves	Radiation near the beam; animal movements; weight	Dose to hands and lens; bites; musculoskeletal injury	Sedation and positioners; manual restraint only as a last resort, in rotation; lead PPE; hands out of the beam
Perform CT	CT scanner, console, door and signage	High-intensity radiation in the room; unauthorised access	Accidental exposure; high dose	Shielded console; empty room; check of signals and doors; access control; maintenance

Task	Equipment and materials	Risk factors	Risks	Preventive measures
Monitor anaesthesia during imaging	Monitor, ventilator, gases, cables	Anaesthetic gases; radiation if present; tripping	Effects of gases; exposure; falls	Remote monitoring; gas scavenging; cable management; PPE and dosimeter if presence is justified
Give contrast media	Injector, syringes, contrast	Syringes; blood; animal reaction	Needlestick; infection; bites	Safety devices; sharps container; adequate restraint; gloves
Move the animal onto the table	Stretcher, table	Heavy load; posture	Back injury	Lifting table or stretcher; help from another person; manual handling training

4.2.2. Consultations and Hospitalisation

Table 4.3: Risk chart – Consultations and hospitalisation

Task	Equipment and materials	Risk factors	Risks	Preventive measures
Examine and restrain animals	Table, muzzle, gloves	Aggressive behaviour; teeth and claws	Bites, scratches, infection, falls	Assess the animal; flag aggressiveness; muzzle and sedation; restraint training
Treat animals with a possible zoonosis	Fluids, isolation material	Biological agents	Rabies, leptospirosis, dermatophytosis and other zoonoses	Triage and isolation; vaccination; hand hygiene; PPE; cleaning circuit
Take blood and inject	Needles, syringes, medicines	Sharps; injectable products	Needlestick; infection; accidental injection	No recapping; safety devices; rigid container; safe restraint
Care for hospitalised animals	Cages, kennels, cattery, faeces and urine	Biological agents; noise; physical load	Infection; hearing loss; musculoskeletal injury	Scheduled cleaning; noise measurement; cages at a suitable height; breaks
Perform euthanasia	Drugs	Emotional strain; conflict with owners; euthanasia drug	Stress, burnout, aggression, accidental injection	Psychological support; incident reporting channel; secure storage and handling of the drug
Emergencies and shifts	Permanent service	Night work, long hours, lone working	Fatigue, error, accidents	Rotas with rest; alternating hazardous tasks; alarm system

4.2.3. Operating Theatre

Table 4.4: Risk chart – Operating theatre

Task	Equipment and materials	Risk factors	Risks	Preventive measures
Induce and maintain anaesthesia	Anaesthetic machine, isoflurane, sevoflurane, nitrous oxide	Anaesthetic gases	Headaches, effects on the liver and reproduction	Scavenging; leak checks; ventilation; avoid mask induction when possible
Fill vaporisers	Bottles, vaporiser	Spills; vapours	Inhalation; skin contact	Closed filling system; ventilated area; spill kit
Perform surgery	Scalpels, needles, blood, tissues	Sharps; biological agents	Cuts; needlestick; infection	Safe technique; gloves, mask and eye protection; container at the point of use
Electrosurgery or laser	Electrosurgical unit, laser	Surgical smoke; non-ionising radiation; electricity	Inhalation; eye injury; burns; fire	Smoke evacuation; eye protection; maintenance; ignition control
Stand through long surgeries	Table, surgical light	Static posture; pace	Musculoskeletal injury; fatigue	Adjustable table; breaks; rotation
Sterilise instruments	Autoclave, instruments	Heat; steam; pressure; disinfectants	Burns; irritation	Maintenance and checks; heat-resistant gloves; ventilation

4.2.4. Large Animals and Farm

Table 4.5: Risk chart – Large animals and farm

Task	Equipment and materials	Risk factors	Risks	Preventive measures
Restrain and examine	Horses, cattle, sheep, crush	Kicks; crushing; sudden movements	Severe trauma; fractures; death	Crush; escape routes; sedation; never working alone; safety footwear
Assist births and rectal palpation	Long gloves	Biological agents; exertion	Brucellosis, Q fever, shoulder injury	Gloves and face protection; vaccination and herd health; rotation and breaks
Treat animals in the barn	Straw, hay, dust	Organic dust; allergens	Asthma; allergic alveolitis	Ventilation; dampen or limit dust; respiratory protection if indicated
Portable field radiography	Portable generator, plate	Radiation; no physical zone	Exposure of the operator and others	Keep people away; plate holders; distance; dosimeter; PPE
Travel and outdoor work	Vehicles, trailers, uneven ground	Driving; falls; weather	Road accidents; falls; heat stress	Equipment maintenance; proper planning; suitable clothing; breaks

4.2.5. Laboratories

Table 4.6: Risk chart – Laboratories

Task	Equipment and materials	Risk factors	Risks	Preventive measures
Handle biological samples	Tubes, plates, centrifuge, biological safety cabinet	Biological agents; aerosols	Infection	Classify the risk group; certified biological safety cabinet; sealed rotors; disinfection; lab coat and gloves
Use reagents	Solvents, acids, bases, xylene	Chemical agents; vapours; flammable products	Poisoning, burns, fire	Substitute with less hazardous products; fume hood; safety data sheets available; storage in a dedicated cabinet; eye protection
Cold storage	Liquid nitrogen, freezers	Extreme cold; oxygen deficiency	Burns; asphyxia	Ventilation; oxygen sensor if needed; gloves and face shield
Use glass and sharps	Glass, blades, needles	Cuts; contamination	Wounds; infection	Replace glass with plastic; rigid container; accident procedure
Microscope and bench work	Microscope, pipettes, chair	Posture; repetitive movements	Neck and wrist injuries	Adjustable furniture; ergonomic pipettes; breaks

4.2.6. Necropsy and Anatomy

Table 4.7: Risk chart – Necropsy and anatomy

Task	Equipment and materials	Risk factors	Risks	Preventive measures
Perform necropsies	Cadavers, knives, saws, table	Biological agents; aerosols; sharps	Zoonoses; cuts; infection	Triage of suspect cases; ventilated table; cut-resistant gloves; face and respiratory protection if indicated
Preserve specimens	Formaldehyde, containers, tanks	Carcinogen; vapours	Cancer; irritation; sensitisation	Substitute whenever possible; closed containers; extraction; air monitoring; medical surveillance
Anatomy classes	Specimens, instruments, students	Formaldehyde; sharps	Irritation; cuts; exposure of pregnant women	Ventilation; small groups; prior training; tasks adapted for pregnant women
Move cadavers	Hoist, trolleys, cold room	Load; wet floor; cold	Back injury; falls	Mechanical aids; non-slip floor; suitable clothing
Manage animal by-products	Containers, cold room	Biological agents; odour	Infection	Dedicated circuit; leak-proof containers; collection by an authorised operator

4.2.7. Pharmacy

Table 4.8: Risk chart – Pharmacy

Task	Equipment and materials	Risk factors	Risks	Preventive measures
Prepare cytotoxic drugs	Suitable containment cabinet, closed systems, vials	Carcinogens, mutagens and reproductive toxicants	Cancer; reproductive effects; irritation	Centralised preparation; closed-system drug-transfer device (CSTD); PPE; training; medical surveillance; exclusion of workers who are pregnant, breastfeeding or in fertility treatment
Administer cytotoxic drugs	Lines, syringes, gown, gloves	Spills; contact; animal reaction	Exposure; needlestick; bites	Sedation if indicated; CSTD; PPE; spill kit at hand
Manage excreta and waste	Faeces, urine, waste, cage	Cytotoxic residues	Skin exposure	Written instructions for staff and owners; gloves; dedicated containers (Group IV)
Store and dispense medicines	Shelves, refrigerator, controlled drugs	Loads; errors; substances of abuse	Injury; poisoning	Safe storage; restricted access; records

4.2.8. Cleaning, Laundry and Waste

Table 4.9: Risk chart – Cleaning, laundry and waste

Task	Equipment and materials	Risk factors	Risks	Preventive measures
Clean and disinfect	Biocides, buckets, machines	Chemical agents; wet floors	Dermatitis; asthma; falls	Choose less hazardous products; dispensers; gloves; wet-floor signs; never mix products
Clean radiology rooms	X-ray and CT rooms	Entry during exposures	Accidental exposure	Cleaning outside examination hours; authorisation and training; classification assessed
Handle contaminated laundry	Washing machines, textiles	Biological agents; forgotten sharps; heat	Infection; needlestick; burns	In-house laundry only for textiles of the Companion Animal Teaching Hospital (VTH-CA) (all others go to an outsourced laundry); closed, labelled bags; no hand sorting and no hands inside bags (empty onto the bench without shaking; sharps removed with forceps); gloves; machine maintenance

Task	Equipment and materials	Risk factors	Risks	Preventive measures
Collect waste	Containers, trolleys	Biological agents; sharps; chemicals; loads	Infection; needlestick; injury	Sorting at source; closed containers; transport trolleys; vaccination; defined circuit

4.2.9. Administrative Services and Teaching

Table 4.10: Risk chart – Administrative services and teaching

Task	Equipment and materials	Risk factors	Risks	Preventive measures
Work with display screen equipment	Screen, keyboard, chair, imaging console	Posture; repetitive movements; glare	Musculoskeletal injury; eye strain	Assess workstations; adjustable furniture; lighting; breaks
Deal with the public	Reception desk, waiting room	Conflicts; loose animals	Aggression; stress; bites	Circulation rules; training; incident reporting channel; animals restrained
Teach and supervise students	Classrooms, voice, travel	Vocal strain; workload	Voice disorders; stress	Amplification when needed; work organisation; psychosocial assessment
Move around and stay in buildings	Floors, stairs, facilities	Fire; slipping	Burns; falls	Self-protection measures; maintenance; drills

Chapter 5: Radiation Protection: X-ray and CT

No member of the radiology team may start work with potential exposure without an occupational health examination, classification, training, a dosimeter and PPE. The Faculty is the licence holder for the practice and is responsible for radiation protection and safety.

5.1. Requirements for the Installation

- **APA registration:** the operation of radiation generators for veterinary medicine requires registration. Registration is valid for 5 years and renewal is requested at least 60 days before it expires.
- **Radiation protection officer:** appointed and suitably trained (Article 159 of Decree-Law No. 108/2018 of 3 December).
- **Radiation Protection Programme:** a document available to workers, structured as in Article 26 and the applicable ordinance template.
- **Internal emergency plan:** suited to the practice, as in Article 27. Confirm the level of requirement with the APA.
- **Equipment:** periodic maintenance and checks (Article 24), with information in Portuguese (Article 25).

5.2. Dose Limits

Table 5.1: Dose limits

Group	Effective dose	Lens of the eye	Skin and extremities	Basis
Exposed workers	20 mSv/year	20 mSv/year, or 100 mSv in 5 years with a maximum of 50 mSv/year	500 mSv/year	Art. 67
Students aged 18 or over who use radiation sources	20 mSv/year	Idem	500 mSv/year	Art. 68
Other students and members of the public	1 mSv/year	15 mSv/year	Skin: 50 mSv/year	Arts. 65 and 68
Unborn child	1 mSv for the rest of the pregnancy	—	—	Art. 69

5.3. Classification of Workers

Classification is made before starting work and reviewed periodically (Article 73). Category A applies to anyone who may receive more than 6 mSv/year, more than 15 mSv/year to the lens or more than 150 mSv/year to the skin and extremities. All other exposed workers are Category B.

The table gives a working hypothesis, to be confirmed by the safety assessment and the dosimetry results.

Table 5.2: Initial classification of workers (working hypothesis)

Role	Exposure to consider	Initial hypothesis
Radiographer	X-ray and CT; presence in the room only if justified	Exposed; category according to assessment
Diagnostic imaging veterinarian	Examinations, fluoroscopy if available, restraint	Exposed; A if present near the beam
Anaesthetist or veterinary nurse	Monitoring and support in the room	Exposed, if entering during exposures
Teacher in classes with radiation	Supervision in the zone	Exposed, depending on frequency
Student aged 18 or over	Training with sources	Classify; dosimeter if exposed
Cleaning and administrative staff	Access outside exposures	Member of the public, if shown by the assessment
External maintenance	Work on the equipment	External worker; see section 8.4

5.4. Zones

Table 5.3: Classified zones

Zone	Annual criterion	Rules
Controlled	Workers could receive more than 6 mSv/year effective dose, or more than three tenths of an Article 67 limit (6 mSv/year to the lens; 150 mSv/year to skin and extremities)	Delimited, controlled access, authorised persons, instructions, specific training and PPE
Supervised	Not a controlled zone, but workers are likely to receive more than 1 mSv/year effective dose, 15 mSv/year to the lens or 50 mSv/year to skin and extremities	Signs showing the type of zone, source and risks; work instructions

All values are annual: effective dose for the whole body; equivalent dose for the lens, skin and extremities. A zone meeting both sets of criteria is classified as controlled. The radiation protection expert confirms the classification of each room in the Radiation Protection Programme.

The classification is reviewed annually (Article 78(5)). Visitors and non-exposed staff have only occasional access, with protection equivalent to that of the public and a record of their stay (Article 78(6)).

5.5. Good Safety Practice

The following rules are good practices to be included in the Radiation Protection Programme once validated by the radiation protection expert.

5.5.1. X-ray

- Justify every examination and choose the lowest-dose technique with diagnostic quality.
- Prefer sedation or anaesthesia and positioners to manual restraint.

- If manual restraint is essential, the veterinarian responsible for the examination authorises it and records the reason; it is done by as few classified exposed workers as possible, in rotation, with a dosimeter, lead apron, thyroid shield, lead gloves and lead glasses.
- Never place hands in the primary beam, even with gloves.
- Exclude pregnant and breastfeeding women and people under 18 from restraint.
- Collimate the field, keep as far away as possible and reduce the time.
- Before exposing, check that everyone not essential to the examination has left the room and the door is closed.

5.5.2. CT

- Operate from the shielded console, with a view of the animal through a window or camera.
- Monitor anaesthesia remotely whenever possible.
- Keep the room empty during acquisition; any exception is justified, recorded and done with PPE and a dosimeter.
- Check warning lights, doors and emergency buttons daily.

5.5.3. Owners and Lead PPE

- **Owners and companions:** veterinary practice applies, with adaptations, the information provided for carers and comforters (Article 4(2) and Article 101(2)). The proposed rule is that they do not stay in the room; exceptions are rare, informed and authorised by the veterinarian.
- **Lead PPE:** inventory, identification, storage on racks and periodic integrity checks, with withdrawal when defective or deteriorated.

5.6. Individual Dosimetry

Exposed workers are individually monitored by a dosimetry service recognised by the APA. The monitoring period is monthly for Category A and quarterly for Category B, matching calendar quarters (Article 74 and Guidance DAN 010).

Table 5.4: Individual dosimetry: stages, responsibilities and actions

Stage	Responsible	Action
Allocation (after classification)	Radiation protection officer	Allocate a personal dosimeter to every exposed worker, read monthly for Category A and at least quarterly for Category B (Article 74(1)). Workplace monitoring or other estimates are used only when individual measurement is impossible or inappropriate, as decided by the expert (Article 74(3))
Use	Worker	Always wear in a classified zone. With one dosimeter, wear it on the trunk under the apron. With two, wear one on the trunk under the apron and the other at collar level over the apron
Additional dosimeters	Expert	Assess the need for a ring dosimeter (manual restraint) and a lens or over-apron dosimeter
Storage	Worker	Dedicated board, outside the room and away from sources; never shared
Exchange	Radiation protection officer	Collection and dispatch on time; delays recorded

Stage	Responsible	Action
Results	Radiation protection officer	Communicate to the worker and the Occupational Health Service (Article 75(4))
Central register	Dosimetry service	Report to the Central Dose Register (Article 75(2))
Abnormal value	Radiation protection officer and expert	Report immediately; estimate the dose by a documented method (Article 74(3))
Loss or damage	Worker and radiation protection officer	Report immediately; estimate the dose by a documented method (Article 74(3))
Accidental or emergency exposure	Worker, radiation protection officer and expert	Report immediately, assess the dose specifically and inform the Occupational Health Service

Results are kept until the worker reaches 75 years of age and never less than 40 years after the end of the exposed activity (Article 75(5)).

5.7. Accidental Exposure

- Stop the exposure, make the room safe and keep the technical parameters.
- Inform the radiation protection officer and the occupational physician.
- Send the dosimeter for urgent reading.
- Assess the dose and report it immediately to the person and to the competent authority (Article 82).
- Notify significant events and record the analysis and corrective measures (Article 83).
- If a limit is exceeded, carry out specific health surveillance and submit future exposure conditions for approval (Article 89).

Chapter 6: Health Surveillance and Medical Examinations

All workers have health examinations paid for by the University, and those exposed to radiation have specific examinations. Category A workers are examined at least once a year (Article 85(5)). The occupational physician is technically responsible.

6.1. Timing of Examinations

Table 6.1: Timing of health examinations

Examination	Who	When	Basis
Pre-employment	Everyone	Before starting; if urgency justifies it, within the following 15 days	Law No. 102/2009, Art. 108
Specific pre-employment	Workers exposed to radiation	Before classification and first exposure	DL 108/2018, Art. 85(4)
Periodic, Category A	Category A workers	At least yearly	DL 108/2018, Art. 85(5)
Periodic, Category B	Category B workers	Set by the occupational physician	DL 108/2018, Art. 85(5)
General periodic	All others	Every 2 years; yearly for minors and people over 50	Law 102/2009, Art. 108
Occasional	Everyone	Substantial changes at work, or return after more than 30 days of sick leave or after a work accident	Law 102/2009, Art. 108
Specific	Accidental exposure or limit exceeded	Immediately, as decided by the physician	DL 108/2018, Art. 89
Post-exposure	When needed	Continued after the end of the activity	DL 108/2018, Art. 85(6)

6.2. Content of the Medical Examination for Workers Exposed to Radiation

The final protocol is decided by the occupational physician, in light of DGS Technical Guide No. 1, which sets the fitness criteria and restrictions.

Table 6.2: Content of the medical examination for workers exposed to radiation

Component	Pre-employment	Periodic	Notes
Clinical and occupational history, previous doses	Yes	Update	Previous doses shared under Article 77
Physical examination, including skin and hands	Yes	Yes	Special attention to those who perform manual restraint
Full blood count with differential	Yes	As decided by the physician	Individual baseline value

Component	Pre-employment	Periodic	Notes
Ophthalmological assessment of the lens	Proposed if eye exposure is relevant	According to dose	Decide on the basis of dosimetry
Physical fitness to wear an apron and restrain animals	Yes	Yes	Spine and upper limbs
Psychological assessment	Yes	Yes	Physical and mental fitness (Article 108)
Review of dosimetry results and workstation	Yes	Yes	Article 85(3)
Reproductive health and counselling	Yes	Yes	Includes declaration of pregnancy and breastfeeding

6.2.1. Protocol for Workers Exposed to Ionising Radiation

- **Laboratory tests:** full blood count with differential leucocyte and platelet counts, erythrocyte sedimentation rate or C-reactive protein, aspartate aminotransferase (AST), alanine aminotransferase (ALT), gamma-glutamyl transferase (GGT), thyroid-stimulating hormone (TSH) and, if needed, free thyroxine (free T4), creatinine, glucose and urinalysis.
- Electrocardiogram (ECG).

6.3. Surveillance According to Other Risks

The frequency and complementary tests are set by the occupational physician according to the risk assessment.

Table 6.3: Health surveillance according to other risks

Exposure	Proposed content
Biological agents and zoonoses	Vaccination status, serology if indicated, allergies, immunosuppression and counselling
Rabies	Assess pre-exposure prophylaxis and serology, according to risk and public health guidance
Animal allergens and latex	Respiratory and skin questionnaire; spirometry if indicated
Anaesthetic gases	Clinical and reproductive history; liver function and monitoring if indicated
Formaldehyde and other chemicals	Airways, skin, eyes; specific surveillance for carcinogens
Cytotoxic drugs	Reproductive history, blood count if indicated and exposure record
Loads and postures	Musculoskeletal assessment
Noise	Audiometry according to measured levels
Night or emergency work	Assessment suited to the working-time arrangement
Psychosocial factors	Signs of burnout and compassion fatigue, with confidential referral

6.4. Pathway

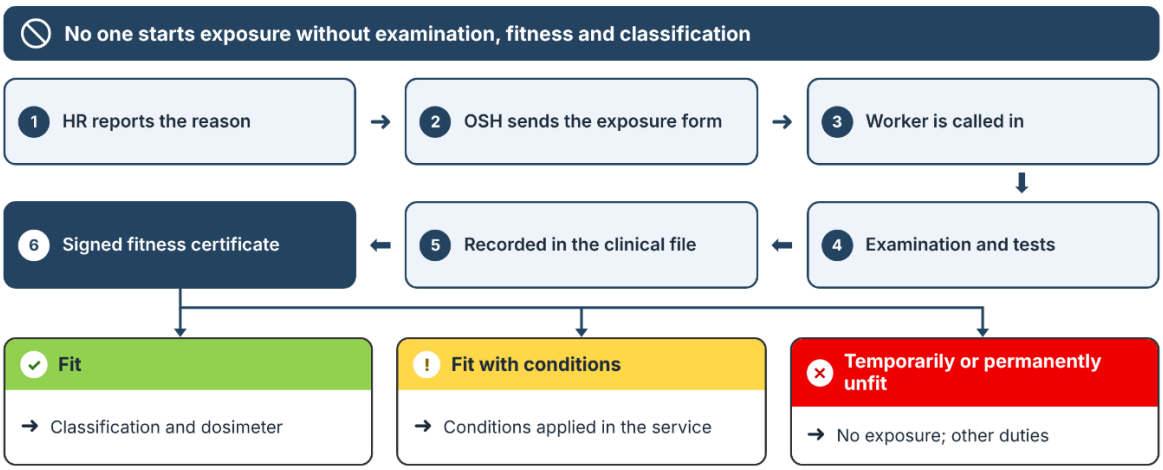


Figure 6.1: Health surveillance pathway, from notification to decision

Appeals against the classification and periodic reassessment apply in every branch.

Who does what:

- Human Resources notify the OSH service of new hires, changes of role and absences of more than 30 days.
- The radiation protection officer and the occupational safety officer send the exposure form: workstation, risks, category and doses.
- The Occupational Health Service calls the worker in, performs the examination and records it in the clinical file.
- The occupational physician completes the fitness certificate right after the examination and sends a copy to Human Resources.
- The worker acknowledges, signs and dates the certificate.
- The head of the area applies any restrictions resulting from the examination.

6.5. Fitness Outcome

Exposed workers are classified as fit, fit with conditions, temporarily unfit or permanently unfit.

Table 6.4: Fitness outcome and consequences

Outcome	Consequence
Fit	Continues or starts work
Fit with conditions	Works with the stated restrictions, without disclosure of clinical data
Temporarily unfit	No exposure until reassessment
Permanently unfit	Cannot be hired or classified for Category A work; the physician indicates other possible duties

The classification may be appealed to the Authority for Working Conditions (ACT) within 15 days of notification and is assessed by a medical board (Article 86).

6.6. Confidentiality

- The clinical file is subject to professional secrecy and is the physician's responsibility (Article 109).
- The fitness certificate contains no clinical data (Article 110(3)).
- The clinical file does not record race, nationality or ethnic origin, nor personal habits unrelated to specific conditions or other health data (Article 109(3)).
- Anyone leaving the service receives a copy of their clinical file (Article 109(4)).
- The medical record of exposed workers includes risk assessment, exposure, results, accidents, responsible physician and doses (DL 108/2018, Article 88).

Chapter 7: Other Risks

Biological and chemical agents and animals are everyday risks and have their own minimum rules.

7.1. Biological Agents and Zoonoses

Agents are classified by risk group, with an assessment by service. Activities with group 3 or 4 agents are high risk (Law 102/2009, Article 79), requiring a detailed assessment by service and strict biosecurity measures.

- **Agents to consider:** rabies, brucellosis, tuberculosis, leptospirosis, Q fever, psittacosis, scabies, bartonellosis and zoonotic influenza (avian influenza subtype H5).
- **Vaccination:** the plan is set by the occupational physician and is free of charge when effective vaccines exist for the risk. Assess tetanus, hepatitis B, rabies and influenza; for students, tetanus vaccination is compulsory before practical classes and rabies pre-exposure vaccination is recommended for those working with animals (section 8.3).
- **Hygiene:** wash hands between animals; no eating, drinking or smoking in work areas; dedicated work clothing that does not leave the workplace.
- **Personal protection:** gloves; protective goggles and a filtering facepiece class 2 (FFP2) mask whenever there is a risk of splashes or aerosols, or a suspected zoonosis transmitted by the respiratory route (e.g., psittacosis, Q fever, tuberculosis or zoonotic influenza).
- **Isolation:** a suspect animal follows its own circuit, PPE and cleaning, and the responsible veterinarian is informed.
- **Notifiable diseases:** the responsible veterinarian makes the applicable animal health notifications.

Biosecurity procedures (patient risk classes, isolation, circuits, cleaning and disinfection, waste and crisis scenarios) are set out in the FVM-ULusófona Biosecurity Manual (code FVM-BIO-MAN), which refers to this Manual for workers' health and safety. Where the two overlap, the stricter rule applies.

7.2. Sharps

- Sharps injury prevention follows Directive 2010/32/EU on the prevention of sharp injuries in the hospital and healthcare sector (Decree-Law 121/2013).
- Never recap, bend, break or remove needles by hand; discard the needle and syringe together.
- Use safety-engineered devices when available.
- Dispose of sharps immediately in a rigid, puncture-proof container at the point of use; do not fill above the fill line and close the container when full (Group IV waste, section 7.3).
- **Broken glass is never picked up by hand:** use forceps or a dustpan and brush.

- Remove scalpel blades with a blade remover or forceps, never with the fingers; in surgery, pass sharp instruments through a neutral zone rather than hand to hand.
- **Treat every needlestick as an accident:** wash, report and consult the health service. Accidentally injected medicines, such as euthanasia solutions or oil-adjuvanted vaccines, require urgent medical contact. Tilmicosin can be fatal to people and needs emergency care at once; prostaglandins and hormones are a risk for pregnant women. Take the product leaflet to the doctor.

7.3. Solid and Liquid Waste

Waste is sorted where it is produced, in the containers defined in the Biosecurity Manual (Chapter 1, section 1.3.8, Table 1.7 and Appendix 2), and collected by a licensed operator. Waste from isolation units is always treated as biological-risk waste.

7.3.1. Solid Waste

Table 7.1: Healthcare waste groups

Group	Type	Packaging	Examples
I	Comparable to urban waste	Black bag	Paper, packaging, food waste from rest areas
II	Non-hazardous hospital waste	Black bag	Empty packaging of clinical material, plaster, non-contaminated disposables
III	Biological-risk hospital waste	White bag in a green container	Material contaminated with blood or body fluids, dressings, PPE from Class 3–4 areas, non-identifiable tissues
IV	Specific hospital waste (incineration)	Red bag; puncture-proof container for sharps	Sharps, cytotoxic drugs, unused medicines, infectious material

- Bags are filled to 2/3 and containers and sharps boxes to 3/4 (fill line); they are closed before transport and never compressed by hand, emptied or reopened.
- Cytotoxic waste and the material used to handle it go to Group IV; carcasses and identifiable anatomical parts follow the Category 1 animal by-product circuit (Regulation (EC) No 1069/2009 and Regulation (EU) No 142/2011; Biosecurity Manual, Chapter 7).

7.3.2. Liquid Waste

- Chemical liquid waste (solvents, formaldehyde, dyes, acids, bases and reagents) is collected in dedicated jerricans, labelled before use with the waste name and European List of Waste (LoW) code (Biosecurity Manual, Tables 2.9 and 9.12), filled only to the mark and closed. It is never poured down the drain.
- Decanting is done in the fume hood, with gloves, lab coat and eye and face protection; acids and bases, or other incompatible products, never go into the same container.
- Biological liquids (blood, urine, cultures and fluids from analysers, surgery or restraint) are collected in leak-proof, labelled containers; cultures are autoclaved before disposal.
- Chemical spills follow the safety data sheet; biological spills follow the spill procedure of the Biosecurity Manual (Table 9.9).

7.3.3. Transport, Protection and Accidents

- Waste is transported in closed containers and dedicated trolleys, along a defined route, to the storage area, which is locked and kept apart from clean supplies and medicines.
- People collecting waste wear heavy-duty gloves, closed footwear and the PPE indicated; vaccination (tetanus and hepatitis B) is assessed by the occupational physician.
- Any needlestick or cut during sorting or collection is a work accident and follows section 9.3.

7.4. Bites, Kicks and Restraint

- Know the animal before intervening and flag aggressive animals in the record.
- Use muzzles, gloves and suitable restraint; sedate when indicated.
- With large animals, use a crush and keep an escape route; never work alone.
- Wash any wound thoroughly, report it and seek medical attention the same day; assess the risk of rabies and tetanus.
- For serious injuries, call 112 (section 9.2); if the animal is suspected of rabies, go to an emergency department the same day (Biosecurity Manual, section 14.4).
- Infections after cat or dog bites need early attention.

7.5. Chemical Agents

Each service keeps an inventory and accessible safety data sheets.

Table 7.2: Chemical agents: use and minimum measures

Agent	Use	Minimum measures
Isoflurane, sevoflurane, nitrous oxide	Anaesthesia	Scavenging system, leak checks, safe filling and ventilation
Formaldehyde	Anatomy, pathology, preservation	Substitute when possible; closed system and ventilation or local exhaust; air quality monitoring; respiratory protection
Glutaraldehyde and biocides	Disinfection	Less hazardous alternatives, controlled dilution, gloves and eye protection
Cytotoxic drugs	Oncology	Centralised preparation in a dedicated containment cabinet; CSTD; PPE; management of excreta, spills and waste; specific regime applies
Ethylene oxide, if used	Sterilisation	Assess substitution, closed equipment and monitoring
Solvents and xylene	Laboratory	Fume hood, storage in a dedicated cabinet and separate waste
Liquid nitrogen	Preservation	Ventilation, oxygen sensor if needed, gloves and face shield

7.6. Physical Agents, Ergonomics and Psychosocial Factors

- **Loads:** use lifting tables, stretchers and help from another person; set the weight above which help is compulsory.
- **Noise:** measure in kennels, catteries and plant rooms and act on the results.
- **Lasers and non-ionising radiation:** assess the class, display signs and use eye protection.
- **Electricity and machines:** check, maintain and lock out before intervening.
- **Display screens:** assess reporting and imaging console workstations.
- **Working hours:** plan shifts, emergencies and rest, especially in the permanent service.
- **Psychosocial factors:** assess workload, euthanasia, conflict with owners, harassment and violence; provide a confidential channel and psychological support.

Chapter 8: Groups Requiring Special Protection

Pregnant and breastfeeding women and minors have prohibited or restricted activities, and students and external workers are not left outside the protection system.

8.1. Pregnancy, Postpartum and Breastfeeding

Workers are encouraged to report pregnancy as early as possible; those exposed to radiation must declare it immediately to the licence holder (DL 108/2018, Article 69).

Table 8.1: Pregnancy, postpartum and breastfeeding: rules

Factor	Rule	Basis
Ionising radiation, pregnant	Activity prohibited if she is or may be exposed	Law No. 102/2009, Art. 51
Ionising radiation, breastfeeding	Activity prohibited	Art. 54
Toxoplasma and rubella, pregnant	Prohibited unless antibodies or immunity are proven and protection is sufficient	Art. 52
Biological agents of groups 2, 3 and 4	Restricted for pregnant, postpartum and breastfeeding women	Art. 58
Reproductive toxicants, mutagens and specific target organ toxicity	Prohibited or restricted according to classification	Arts. 53, 54 and 59
Carcinogens, cytotoxic drugs and mercury	Restricted	Art. 59
Loads above 10 kg, impacts and postures	Restricted for pregnant women	Art. 57

Procedure:

- The worker informs the occupational physician or her manager; the process is confidential.
- The physician and the occupational safety officer reassess the workstation the same day or the next working day.
- The dosimeter is reassessed and duties are adjusted without loss of rights.
- The situation is reviewed on return to work and until the end of breastfeeding.

Radiography with manual restraint and presence in the CT room are excluded.

8.2. Minors

Activities involving ionising radiation (Article 62 of Law 102/2009) and group 3 and 4 biological agents (Article 63) are prohibited for minors. Internal rule: people under 18 do not enter classified zones or take part in processes involving exposure.

8.3. Students, Trainees and Researchers

- Occupational exposure includes students and trainees; they are treated as workers solely for the purposes of Law 102/2009 (Article 4).
- Students aged 18 or over who work with sources are classified and receive operational protection, including health surveillance and training (DL 108/2018, Articles 63 and 73).
- Students who do not work with sources have the public dose limits (Article 68(4)); in principle, therefore, they stay outside the room during exposures.
- **Before practical classes:** training, compulsory tetanus vaccination (other vaccines recommended), rules and a signed acknowledgement.
- Students working with animals receive information on zoonotic risks before practical classes; rabies pre-exposure vaccination is recommended to them, as assessed by the occupational physician (DGS Norm 01/2025).
- All students are covered by school accident insurance during curricular and practical activities, including external practical training (EPT); accidents follow section 9.3.
- **External placements:** a written agreement on who provides dosimetry, PPE and surveillance.
- Agree with the occupational physician how health surveillance is provided for exposed students, who have no employment contract.

8.4. External Workers

External workers have protection equivalent to that of Faculty workers (Article 90). Before they enter a classified zone, the licence holder checks:

- Classification appropriate to the foreseeable doses.
- Medical fitness, if Category A in a controlled zone.
- Basic training and instructions specific to the site and task.
- Suitable dosimeter and PPE.
- Record of the activity and the dose after the intervention.

Employers working on the same Faculty premises cooperate to ensure the safety and health of their workers. The University must ensure the safety and health of service providers and temporary workers working on its premises (Law 102/2009, Article 16).

8.5. Other Situations

Immunosuppression, allergies, chronic disease or return from sick leave are assessed by the occupational physician, who indicates adaptations without disclosing the diagnosis.

Chapter 9: Training, Emergencies, Accidents and Records

Training is given at no cost to the worker, and the records of exposed workers must be kept.

9.1. Training and Information

Information is compulsory on hiring, on change of role, with new equipment or technology and when several companies work on the Faculty premises (Article 19).

Table 9.1: Training and information

Audience	Content	Proposed frequency
Everyone	Workstation risks, rules, PPE, emergencies and accident reporting	On hiring and regular refreshers
Workers exposed to radiation	Risks, procedures by workstation, emergencies, medical requirements, pregnancy and breastfeeding (Article 64 of DL No. 108/2018)	Before exposure and yearly
Radiation protection officer	At least 12 hours in the relevant area; continuing education (Article 159)	Initial and continuing
Biological and chemical exposure	Zoonoses, sharps, spills, anaesthetic gases and cytotoxic drugs	On hiring and every two years
Emergency teams	First aid, fire and evacuation (Article 20(3))	Regular, with drills
Students	Laboratory, hospital and radiation rules	At the start of each practical unit

9.2. Emergency Organisation

The University maintains an internal first-aid, evacuation and fire-fighting structure, with named people (Articles 15 and 75 of Law No. 102/2009), which provides:

- **Emergency number:** 112.
- **Emergency plan:** floor plans, assembly points, teams, annual drill and contacts.
- **Animal evacuation:** people come first; a specific plan for large animals.
- **Specific situations:** chemical or cytotoxic spills, gas leaks, radiological exposure, escaped animals, aggression and power failure in the operating theatre.

9.3. Accidents, Incidents and Diseases

- Give first aid and make the area safe.
- Report to the line manager and the OSH service.
- Record on the internal form, even without injury.
- If fatal or with serious physical injury, report to the ACT within 24 hours (Article 111) and preserve the scene.

- Notify the insurer or follow the regime that applies to the employment relationship. For students, activate the school accident insurance.
- Investigate causes, define measures and review the risk assessment.
- Suspected occupational diseases are reported by the physician, as required by law.

9.4. Records and Retention

Table 9.2: Records and retention periods

Document	Responsible	Minimum period	Basis
OSH service activities	OSH service	Keep documentation on OSH service activities available for inspection for 5 years	Law 102/2009, Art. 73-B
Consultation of workers	OSH service	Yearly consultation	Art. 18
Records of risks to genetic material	OSH service and physician	40 years after the end of exposure	Art. 46
Results held by the dosimetry service	Dosimetry service	5 years	DL 108/2018, Art. 74
Individual dose records	Licence holder	Until age 75 and never less than 40 years after the end of the activity	Art. 75
Medical record of exposed workers	Health service	Until age 75 and never less than 40 years after the end of the activity	Art. 88
Fitness certificate	Physician and Human Resources	Kept while the worker remains in the organisation	Law 102/2009, Art. 110
Radiological events	Radiation protection officer	Set in the Radiation Protection Programme	DL 108/2018, Arts. 83 and 24

Data processing follows the General Data Protection Regulation (GDPR), with restricted access and involvement of the data protection officer. Clinical data are kept separate from administrative records.

9.5. Monitoring

The OSH service prepares its annual activity report by completing Annex D of the Single Report (Relatório Único) and monitors the following indicators:

Table 9.3: Monitoring indicators

Indicator	Proposed target
Health examinations on time	100 %
Exposed workers with a valid dosimeter	100 %
Dosimeters returned on time	At least 95 %
Doses above the investigation level with completed analysis	100 %
Compulsory training completed	100 %
Accidents and needlesticks	Downward trend, with every case investigated

Chapter 10: Conclusion

The effectiveness of this Manual depends on the commitment and active involvement of all those covered by its scope: University Management, which provides the necessary resources and organisational arrangements; the professionals responsible for occupational safety and health, including the occupational safety officer, the occupational physician and the radiation protection officer, who assess and monitor risks, oversee preventive measures and recommend improvements; and all staff, students, trainees and external workers, who are responsible for following the established procedures, participating in relevant training and reporting hazards, accidents, incidents or non-conformities.

This Manual shall be subject to annual review and shall be revised whenever changes in working conditions, equipment, activities, applicable legislation or risk assessment findings make such revision necessary. It is complementary to the FVM-ULusófona Biosecurity Manual (FVM-BIO-MAN), with both documents contributing to the institution's integrated approach to prevention and risk management. The implementation and effectiveness of this Manual are supported by risk assessment, occupational health surveillance, training, incident reporting and the monitoring of performance indicators.

Through the shared commitment of University Management and all those covered by its scope, this Manual contributes to fostering a strong and sustainable institutional culture of health, safety and biosecurity across all FVM-ULusófona facilities and activities.