



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:

$$N \text{ minutes} \times \text{Temperature (X}^\circ - 55^\circ) > 250$$

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 $\geq 1 \mu\text{m}$ 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.