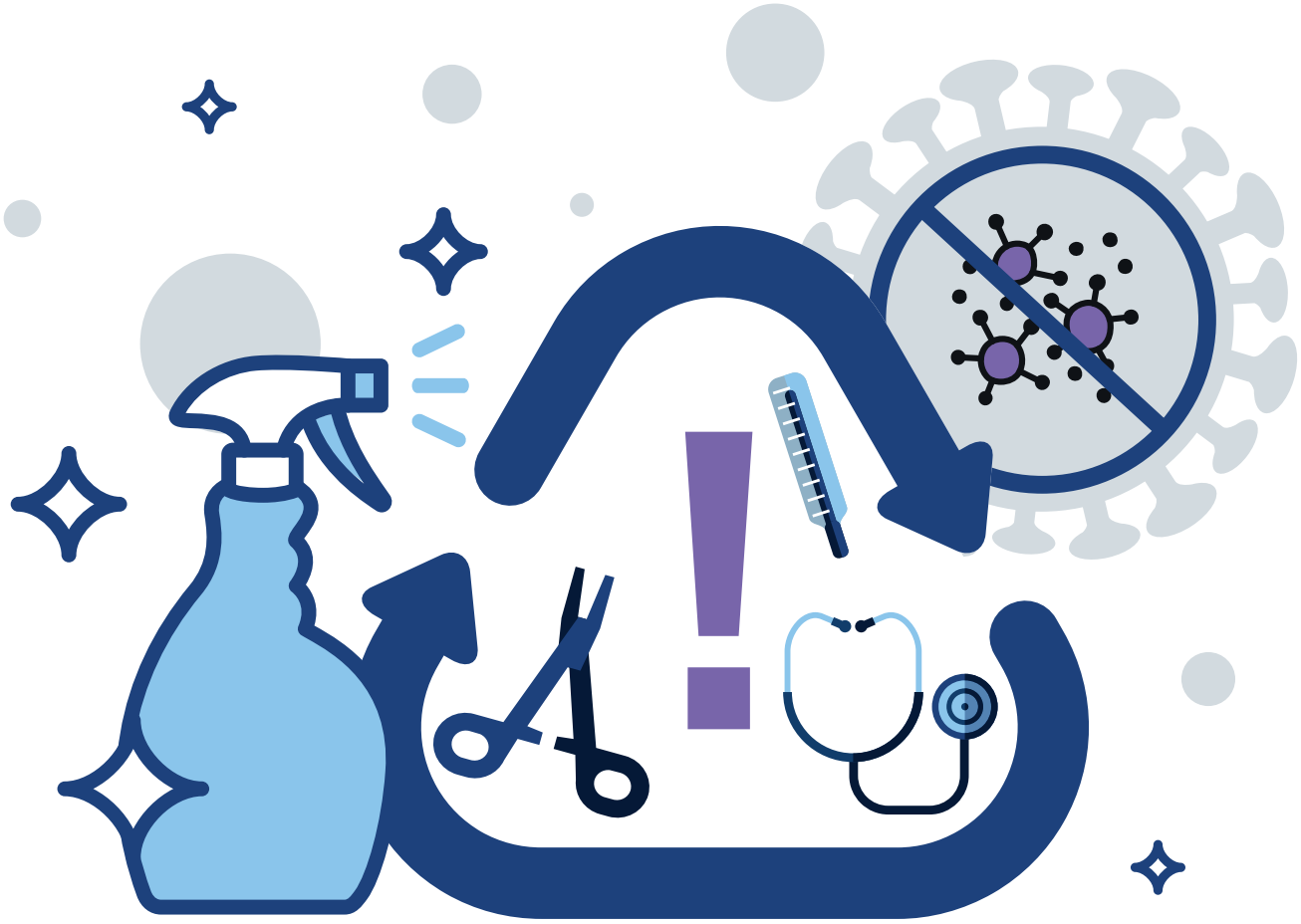
CLEANING AND DISINFECTION OF THE ENVIRONMENT & REUSABLE MEDICAL DEVICES

STANDARD PRECAUTIONS



INFECTION PREVENTION AND CONTROL

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CONTENTS

ACRONYMES

IPC ..... Infection Prevention and Control
HAI ..... Health care Associated Infection
HCW ..... Health Care Worker
HVF ..... Haemorrhagic Viral Fever
MDRO ..... Multi-Drug Resistant Organism (ESBL, MRSA, VRE, pAmpC, CRE, etc.)
PPE ..... Personal protective equipment

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This manual is a collective effort by health and education professionals acting as a reference in their area of expertise and having all field experience. Despite all efforts, it's possible that certain errors may have been overlooked in this manual. Please inform the authors of any errors detected at the following email address:

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The authors would be grateful for any comments or criticism to ensure that this manual continues to evolve and remains adapted to the field reality.

A. WHAT IS ENVIRONMENTAL DECONTAMINATION AND WHY IS IT IMPORTANT?

ENVIRONMENTAL DECONTAMINATION IS ONE OF THE MOST IMPORTANT IPC MEASURES TO PREVENT HAIs.

RESEARCH SHOWS THAT THE COMPLIANCE FOR CORRECT AND ADEQUATE ENVIRONMENTAL DECONTAMINATION PRACTICES IS LOW.

NOT PRACTICING ADEQUATE ENVIRONMENTAL DECONTAMINATION PUTS PATIENTS AND HEALTHCARE WORKERS *(HCWs)* AT RISK TO BECOME COLONIZED AND POTENTIALLY INFECTED WITH MDROS AND OTHER COMMUNICABLE DISEASES.

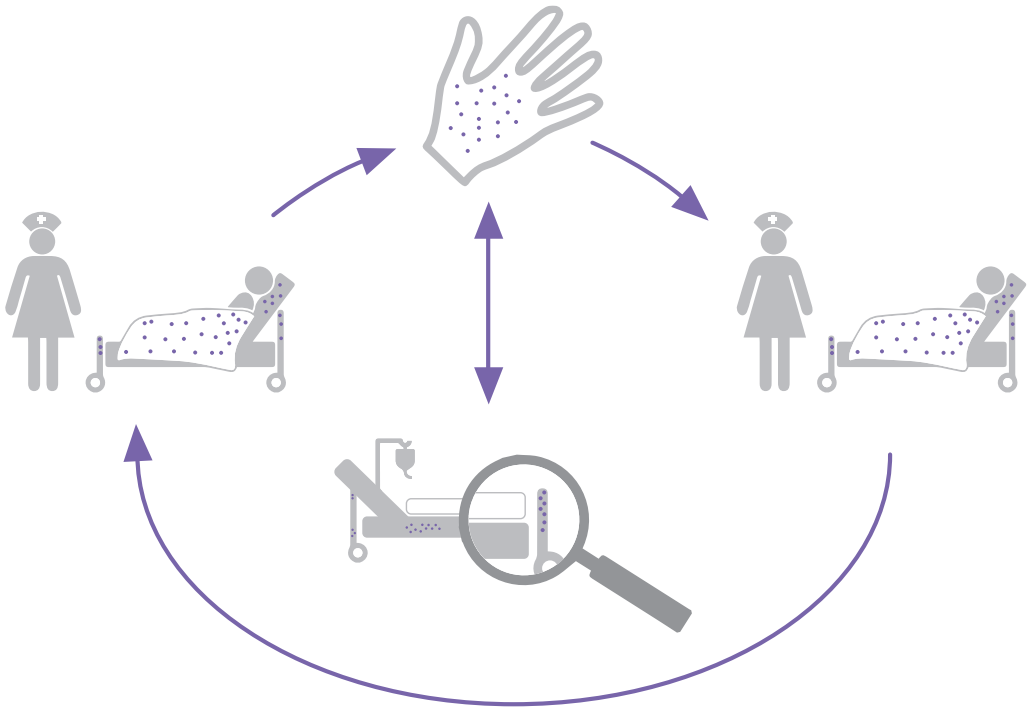


Figure 1: Reminder of cross transmission via contact with contaminated environment

Environmental decontamination programs entail cleaning, disinfection *(and sterilization)* to prevent the presence, replication and transmission of microorganisms in healthcare facilities and therefore to protect patients, HCWs and visitors.

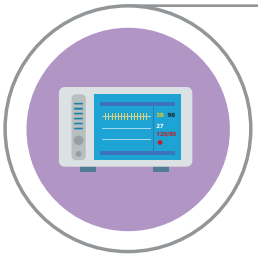
The decontamination is the mechanical removal of blood and organic material or bio burden of soil and disease-causing microorganisms from objects, so they are safe to handle *(before further re-processing for re-use or safe discard).*

The environment covers:

- **Environmental surfaces:**

  → <u>Surfaces in non-clinical areas</u> such as *offices, technical locations, logistics, pharmacy, etc....* where not in contact with patient.

  → <u>Surfaces in clinical areas</u> including high-touch surfaces that are in the patient zone and that are touched frequently by the patient himself or the HCW *(e.g.: beds (bedrail, mattresses), bedside tables, infusion poles, door handles, surfaces in the nurse station (depending on location)).*



- **The medical devices:**

  → **Instruments** intended for **use in the diagnosis of disease or other conditions**, or in the examination, mitigation, treatment, or prevention of disease *(e.g.: bedpan, ultrasound machine, infusion pump, blood pressure cuff, biomedical equipment).*

N.B.

The biomedical equipment covers all medical devices requiring calibration, maintenance, repair, user training and decommissioning.

Biomedical equipment excludes implantable, disposable or single-use medical devices.

B. CLEANING & DISINFECTION OF ENVIRONMENTAL SURFACES IN PATIENT ZONE

The **patient zone** contains the **patient** and their **immediate surroundings**, including inanimate surfaces that are touched by or in direct physical contact with the patient *(i.e. bed, bedside table, bed linen, infusion tubing, bedpans, urinals)* and **surfaces frequently touched by HCWs** during patient care, *such as monitors, knobs and buttons and other high touch surfaces*.

The patient zone is the zone with most risk.

It is recommended to **clean AND disinfect** all environmental surfaces in patient zone :

- **On daily basis:** A daily cleaning/disinfection schedule should be available and include schedules for cleaning of **all clinical and non-clinical areas**. Prioritize high-touch surfaces.

- **On terminal cleaning/disinfection:** after discharge of the patient before admitting a new patient, the patient zone must be thoroughly cleaned/disinfected.

The **cleaning** is the removal of gross, or visible soil/dirt/fluids from objects and surfaces using water with detergents/ soap or enzymatic products. It is always done **BEFORE** disinfecting.

e.g.: liquid soap bought locally, ...

The **disinfection** describes a process that eliminates many or all disease-causing microorganisms *(except bacterial spores)* on inanimate objects. It is done **AFTER** a proper cleaning with water and detergent.

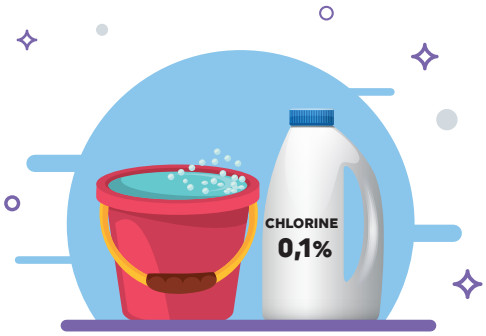
e.g.: chlorine solution, ...

- **DETERGENT: Soap**

Figure 2 : example of detergent in MSF settings (ITC catalogue) used for cleaning purpose only.

- **DISINFECTANT: Chlorine 0.1%,**

are used only for special indications *(As disinfectant, the chlorine would be deactivated by dirt if the surface is not cleaned beforehand and due to its toxic effects for patients, HCWs and material with "risk of corrosion")*
Chlorine is a disinfectant to disinfect surfaces after a proper cleaning with some water and any detergent + rinsing, **two-steps procedure** *(= step 1: cleaning + rinsing with soap/water and step 2: disinfection with chlorine).*
Chlorine is used in absence of Surfanios *(see Pillar 2 guideline).*
For outbreaks, refer to appropriate guidelines *(e.g.: HVF and cholera outbreak).*



- **DETERGENT/DISINFECTANT combination : Surfanios,**

is a combined detergent with a disinfectant that is used in **one-step procedure** *(Step 1: cleaning and disinfection)* although it must be used on a non-visibly soiled surface to be effective and needs 15 min of contact to kill microorganisms *(do not rinse but leave it dry).*

Figure 3 : combined detergent/disinfectant used in MSF settings

C. CLEANING & DISINFECTION OF REUSABLE MEDICAL DEVICES

Most of **MEDICAL DEVICES** come in **DIRECT CONTACT WITH THE PATIENT and /or WITH BODILY FLUIDS**. They can therefore spread microorganisms that can cause an infection if they are not treated properly. Medical staff is responsible for the proper treatment of medical devices, which has a considerable impact on HAIs prevention.

THE TREATMENT OR CLEANING/DISINFECTION OF MEDICAL DEVICES IS A BIG PRIORITY TO AVOID HAIs

Medical devices are divided in TWO MAIN CATEGORIES :

- **Single use :** ***ONE USE ON ONE PATIENT***, must be discarded immediately after one use on one patient in the appropriate waste container. They must never be reused or treated to be reused twice on the same patient or on any other patient. *(these items tend to have a 2 with a diagonal line across it on the outer packaging as an indication it is single use)*

› *e.g.: venous catheter, needle, syringes, urinary catheter, ...*

N.B. Single use: MULTIPLE USES FOR ONE PATIENT

*A few medical devices are said to be single **patient** use. They should be cleaned with water and soap, preferably after each use. When the treatment has ended or if they are damaged, they must be discarded (e.g.: oxygen mask, ...). Then must never be reused or treated to be reused on another patient.*

- **Reusable : must all be *TREATED* after use *BETWEEN EACH PATIENT*** according their level of risk to avoid the transmission of microorganisms during the next utilization on another patient.

› *e.g.: surgical instruments, oropharyngeal airway, resuscitator, vaginal speculum, blood pressure cuff, oxygen concentrator, pulse oximeter, ...*

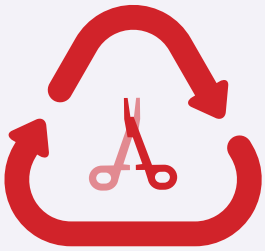
Cleaning and disinfection of reusable medical devices should occur between patients *(or after the device has been used for a patient)* and **after patient discharge** *(all medical devices in the patient zone are cleaned/disinfected)*.

Reusable medical devices are divided in 3 GROUPS according to the **level of risk for transmission of microorganisms**:

1

- **Critical** ***(high-risk)***: touches sterile site. They must always be treated in a full process of sterilization that is meant to fully eliminate pathogenic microorganisms, including spores.

  › *e.g.: surgical instruments, instruments from delivery set, ...*



2

- **Semi-critical** ***(moderate-risk)***: touches mucous membrane or non-intact skin. They also must be sterilized after being used.

  › *e.g.: vaginal speculum, oropharyngeal airway, resuscitator, ...*

3

- **Non-critical** ***(low-risk)***: touches in-tact skin. They must be systematically cleaned AND disinfected between each patient use *(Surfanios is the product of choice in MSF settings).*

  › *e.g.: stethoscopes, blood pressure cuff, thermometer, tourniquet, dressing tray, nursing trolley, ...*

  *(⚠ **exception :** bedpan and urinals: need to be cleaned and disinfected using soap/water and chlorine solution)*

D. CLEANING & DISINFECTION OF BIOMEDICAL EQUIPMENT

The biomedical equipment is part of the medical devices and therefore their cleaning and disinfection is part of the IPC program, as it is an important **measure to reduce the transmission of microorganisms that cause infection**, but it also impacts the maintenance of the equipment itself allowing to keep a **good effectiveness** and increasing the **life expectancy**.

Each HCW must be aware that it plays a crucial role in the environmental decontamination maintenance ➜ **SAFETY**.

Therefore, the obstacles/difficulties identified to ensure this should be discussed with the team in order to find possible solutions.

Many challenges in the cleaning and disinfection of the biomedical equipment has been observed as for example:

- Policy about biomedical equipment not defined or not clearly mentioned
- Involvement of several departments *(medical and non-medical)* which often makes the roles and responsibility of each other unclear
- Lack of knowledge in biomedical equipment *(numerous different models with different recommendations from manufacturers)*
- HCWs don't have time and don't want to be burdened with more responsibility
- The recommendations for cleaning and disinfection differ from one component to the other within the same biomedical equipment, which can bring misunderstanding and mistake

e.g.: about the oxygen concentrator

- *The **external part** is a low-critical medical device ➜ and should be cleaned and disinfected between each patient with Surfanios.*
- *The **humidifier** is a semi-critical medical device ➜ and should be sent to sterilization between patient.*
- *The **oxygen mask** and **tubes** are single patient use ➜ and should be discarded once the patient is discharged.*

- The shortage of some spare parts often leads to alternative method for cleaning and disinfection that does not respect the protocols
- The poor infrastructure doesn't allow to respect the protocols about cleaning and disinfection *(e.g.: no sterilization available)*
- ...

CLEANING AND DISINFECTION OF BIOMEDICAL EQUIPMENT MUST BE INCLUDED IN THE ENVIRONMENTAL DECONTAMINATION LOCAL POLICY.

E. PRINCIPLES TO RESPECT WHEN CLEANING AND DISINFECTING ENVIRONMENTAL SURFACES AND REUSABLE NON-CRITICAL MEDICAL DEVICES

All HCWs *(including doctors, nurses, midwives, and cleaners,...)* have **roles** and **responsibilities** **for** **cleaning and disinfection.**

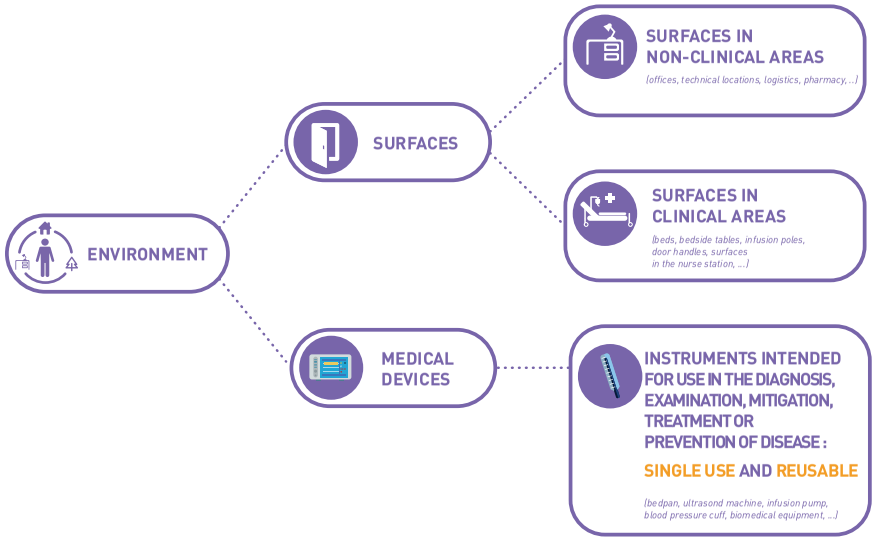
These responsibilities should be clearly defined in the local policy

- Medical staff **must oversee** that cleaning/disinfection of medical areas is properly done *(by cleaners).*
- Medical staff **are responsible** of cleaning/disinfection of reusable medical devices.
- Wear the **appropriate work attire** and **PPE**.
- Material used for cleaning/disinfection of medical devices must be different than the one used for environmental surfaces.
- **Always clean before disinfecting**.
- Best practice is to use **one cloth for one patient area**, changing cloth in between *(and send cloth to laundry).*
- Move from **clean to dirty** areas and from **high to low** surfaces.
- **Perform HH after removing gloves** used during the procedure of after touching and/or after touching the patient surroundings.
- **Damaged materials** *(surfaces and medical device*s) that cannot be cleaned and disinfected properly **should be replaced or repaired** systematically.

SUMMARY

Environmental decontamination is one of the most important IPC measures to prevent HAIs.

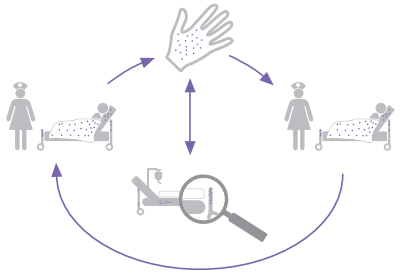
Not practicing adequate environmental decontamination puts patients and healthcare workers (HCWs) at risk to become colonised and potentially infected with MDROs and other communicable diseases



Cleaning = removal of gross, or visible soil/dirt/fluids from objects and surfaces using water with **detergents/soap** ➜ always **BEFORE** disinfecting.

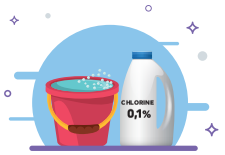
Disinfection = process that eliminates many or all disease-causing micro-organisms (except bacterial spores) on inanimate objects ➜ always **AFTER** a proper cleaning.

It is recommended to **clean AND disinfect** all environmental surfaces in **patient zone**



Products available in MSF settings.

- **DETERGENT : Soap**



- **DISINFECTANT: Chlorine 0.1%**

➜ **Only for special indications**
➜ **Two-steps procedure**

(= step 1: cleaning + rinsing with soap/water and step 2: disinfection with chlorine)

- **DETERGENT/DISINFECTANT combination: Surfanios**

➜ **Most used in MSF settings for BOTH cleaning and disinfection**
- Environmental surfaces
- Low-critical reusable medical devices

➜ **15 minutes** of contact to kill micro-organisms
➜ **One-step procedure**

(=Step 1: cleaning and disinfection)