Disinfection (hygiene)

Disinfection and **sterilization** in healthcare facilities are performed by trained healthcare professionals. The procedures and means used are subject to the approval of the chief hygienist of the Czech Republic and are regulated by the relevant hygiene legislation. According to the degree of removal of microorganisms from the object or environment, the following procedures are distinguished:

- mechanical cleaning;
- disinfection;
- higher degree of disinfection;
- sterilization.

Disinfection of the stretcher used to transport the patient

Mechanical cleaning - sanitation

A set of procedures that mechanically remove impurities and reduce the number of microorganisms . Depending on the type of workplace, ordinary detergents or detergents with a disinfectant are used (according to the hygienic-epidemiological regime of the specific workplace). In addition, cleaning agents or cleaning agents with a disinfecting effect are used. These are applied either manually or using washing and cleaning machines, pressure guns, ultrasonic devices , etc.

All tools and equipment are kept clean. Cleaning aids are disinfected and dried after use. Cleaning machines and other equipment are used according to the manufacturer's instructions. Cleaning is done daily with a damp cloth.

SODIS (Solar Water Disinfection) – a water disinfection method using PET bottles and sunlight used in some developing countries

Disinfection

It serves to **destroy pathogenic microorganisms** in the given environment. A set of measures to destroy microorganisms using **physical** (temperature above 90 °C), **chemical** (use of chemicals) or c**ombined procedures** (temperature above 60 °C + use of chemicals). These are supposed to interrupt the path of infection from the source to the susceptible individual .

- **Prophylactic, preventive**: it is carried out even when infectious diseases do not occur, it is part of complex hygiene measures (e.g. water chlorination, milk pasteurization , waste water treatment).
- Oppressive, focal: in the focus of infection; it is continuous or final, it is aimed at the destruction of disease-causing germs in the focus with the aim of interrupting the further spread of the infection.

The choice of disinfection is important, it is necessary to take into account the individual types of microorganisms:

1. sensitivity of individual microorganisms;
2. effect;
3. effect of temperature and pH;
4. the agent must act on the entire surface and must not cause allergies ;
5. it must be economically advantageous.

Physical disinfection

- boil at atmospheric pressure for at least 30 minutes;
- boil in pressure vessels for at least 20 minutes;
- disinfection in washing machines, washing machines and steam machines at a temperature higher than 90 °C;
- UV radiation with a wavelength of 253.7–264 nm;
- filtration , annealing , combustion .

Chemical disinfection

By way of use

- disinfection of surfaces;
- instrument disinfection;
- hand disinfection;
- special disinfection.

According to active substances

More detailed information can be found on the page Disinfection and antiseptics .

- Chlorine compounds (e.g. sodium hypochlorite – SAVO®),
- iodine compounds (e.g. JODISOL®),
- aldehydes ,
- quaternary ammonium compounds (KAS),
- phenol derivatives, alcohols ,
- peroxide compounds (they are both oxidizing and reducing in nature),
- amines,
- surfactants – chemical surface-active compounds (the most important are ammonium quaternary compounds),
- hydroxides (e.g. sodium hydroxide),
- organic acids.

According to the efficiency spectrum

- Bactericidal,
- virucidal,
- fungicidal,
- tuberculocidal,
- sporucidal.

By place of use

- Healthcare,
- food industries, etc.

Physical chemical disinfection

- Vapor formaldehyde chamber (disinfection of textiles, plastic products, wool, leather and furs at a temperature of 45 to 75 °C).
- Washing, washing and cleaning machines (disinfection takes place at a temperature of up to 60 °C with the addition of chemical disinfectants).

Principles of chemical disinfection

- Disinfectants and procedures that do not damage the disinfected material and are non-toxic.
- Prevention of selection, possibly resistance of microbes to the product – disinfectant products with different active ingredients are alternated.
- When preparing disinfectant solutions, it is assumed that their names are so-called "word marks" and the preparations are considered 100% .
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- Disinfectant solutions are prepared by dissolving a measured/weighed disinfectant in water.
- The frequency of changing disinfectant solutions is determined by the manufacturer's recommendation (most often it is done every shift, depending on the degree of load with biological material and more often).

Physical chemical disinfection

- The effectiveness of some disinfectant solutions can be improved by increasing the temperature (phenol preparations and quaternary ammonium compounds to 50 to 60 °C, iodine preparations to 35 °C).
- Aldehyde, chlorine preparations and peroxy compounds are diluted with cold water.
- Disinfection is carried out by washing, wiping, immersion, spraying, foam or aerosol.
- It is important to observe the concentration and duration of action of the disinfectant prescribed in the instructions.
- Objects and surfaces contaminated with biological material are disinfected with a preparation with a virucidal effect.
- When using disinfectants with washing and cleaning properties, the stage of cleaning and disinfection can be combined. (*Procedure:* disinfection – mechanical cleaning; disinfection.)
- Objects that come into contact with food must be thoroughly rinsed with potable water after disinfection.
- Compliance with the principles of health and safety at work and the use of personal protective equipment, workers are instructed in the principles of first aid.
- We use microbiological methods (smear and fingerprints) to verify the effectiveness of disinfection.

Higher degree of disinfection

- It guarantees the killing of all microorganisms, but not protozoan cysts, helminth eggs, etc.
- Two-stage disinfection:
- ***procedures that guarantee the killing of bacteria, viruses, microscopic fungi and some bacterial spores*** , but do not guarantee the killing of other microorganisms (highly resistant spores) and developmental stages of health-important protozoa , helminths and their eggs.
- Disinfectant solutions for a higher degree of disinfection must be stored in closed containers.
- The frequency of changing disinfectant solutions is indicated in the instructions for use of individual products.

- Tools subjected to a higher level of disinfection are intended for immediate use or are stored for a short time covered by a sterile mask in closed cassettes and cabinets (freely stored - in cassettes for 24 hours, protected - in cassettes and closed cabinets for 48 hours).
- After use, the items are cleaned (machine or hand) and dried.
- In case of contamination with biological material - disinfection with a preparation with a virucidal effect, then dry objects are immersed in solutions intended for a higher level of disinfection so that all hollow parts are filled without air bubbles.
- After a higher degree of disinfection, it is necessary to rinse the objects with sterile water to remove disinfectant residues, sterile drying, and it is also necessary to dispose of objects such as sterile instruments.

Links

Related Articles

- Sterilizace (hygiena)
- Dezinficiencia a antiseptika
- Antisepse
- Asepse
- Cultivation certificate of hand disinfection

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