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RECOMMENDATIONS ON PUBLIC ENVIRONMENTAL HEALTH IN HEALTH CARE FACILITIES

Addressing the minimum environmental public health standards in health facilities is a key component for the safety of the patient, health personnel, companions, and visitors.¹

GENERAL RECOMMENDATIONS

- Ensuring the water, sanitation, and hygiene of the health care facility is the responsibility of everyone: health personnel, facilities managers, service providers, patients, companions, and visitors.
- Implement inspection and surveillance measures on water, sanitation, and hygiene conditions in health care facilities.
- Ensure that all facility personnel are aware of the water, sanitation, and hygiene measures to be implemented, for example, actions to store water safely and how to guarantee its quality, health care waste management, etc.
- Ensure that the health care facility has the basic water, sanitation, and hygiene facilities to operate, complying with national standards.
- Adapt spaces or buildings for health care that ensure optimal conditions for the prevention of legionella outbreaks,² in coordination with water operators and institutions responsible for environmental public health.

Areas	Key Actions
Safe Water	<ul style="list-style-type: none">• Supply safe water that meets national standards.• Ensure that the water has a free chlorine residual concentration greater than or equal to 0.5 mg/L throughout the system.• Strengthen water quality monitoring actions and ensure that the facility has at least a record of the free chlorine residual concentration.• Ensure that there are no risks of water contamination within the health facility.• Ensure that all critical places in the health care facility (such as operating rooms, rooms, doctor's offices, sterilization areas, laboratories, kitchen, laundry, showers, toilets, waste storage, and mortuary) have a supply of safe water and soap, as well as a piped drainage system.

¹ Basic environmental hygiene standards in health care Directed by John Adams, Jamie Bartram and Yves Chartier (WHO, 2008).

² See [document about Legionella Control](#) (PAHO 2020).

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	<ul style="list-style-type: none"> Promote strict compliance with the rules for waters of specific use in patient care, focused on microbiological and chemical contamination (for example, for haemodialysis).³ Secure 1 shower for every 40 users, separated for staff and patients, as well as for both sexes.
Sanitation	<ul style="list-style-type: none"> Ensure at least 4 designated toilets (1 for staff and 3 for patients: 1 for women, 1 for men and 1 for children)⁴ and an additional 1 toilet for every 10 beds or every 20 outpatients in long-term health facilities, and 1 toilet for every 20 beds or every 50 outpatients for short-term health facilities. Clean toilets with water and soap at least twice a day and when there are spills of body fluids. Keep track of cleaning. Conduct maintenance of sanitary facilities so that they are always in operation. Adapt patient toilets so that they are accessible to people with disabilities, women with an advanced pregnancy, the elderly, and children. Ensure that the sewage drainage system is designed and operating in a way that avoids contamination within the health facility, as well as in its vicinity. If possible, connection to a sewer system with a design suitable for the volume of the facility's wastewater and connected to a treatment plant is recommended.
Solid Waste	<ul style="list-style-type: none"> Provide all operational personnel with the appropriate personal protective equipment (PPE) according to their tasks (masks, overalls/gown, cap, gloves, and boots). Train all operational and administrative personnel on personal protection measures and risks. Train on disinfection, sterilization, and handling of infectious waste. Request the staff working in waste management to use PPE in the collection, transportation, and final disposal. Separate waste from health care facilities from the moment when they are generated, into the following six categories: <ul style="list-style-type: none"> sharps residues (needles, scalpels, etc.) infectious waste (dressings, syringes without needles, used disposable gloves, body fluids) pathological/anatomical residues

³ BS EN ISO 23500-1:2019, BS EN ISO 23500-2:2019, BS EN ISO 23500-3:2019, BS EN ISO 23500-4:2019, and BS EN ISO 23500-5:2019.

⁴ The Sphere Handbook 2018.

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- chemical and pharmaceutical residues (expired medicines, laboratory reagents, insecticides, etc.)
 - radioactive waste
 - common waste (paper, packaging, etc.).
 - Train all personnel in waste separation according to the categories mentioned above.
 - Place color-coded containers and bags in each room where waste is generated, according to national regulations. For example:
 - Use the color red for infectious waste. The containers must have a capacity of 15 to 40 L and have a lid.
 - Use the color black for common waste. These must have a capacity of 20 to 60 L.
 - Use the yellow sharps containers (special or conditioned) exclusively for sharps waste. Seal the containers in the nursing station with adhesive tape when they reach 80% of their capacity. In the conditioned containers, the needle and syringe must be placed together.
 - Use the color red for chemical and pharmaceutical waste, and label it hazardous.
 - Locate the containers for solid waste collection at a maximum distance of 5 m from the place where they are generated.
 - Locate one set of containers for each 20-bed service or each room, whichever smaller.
 - Take carts with waste every 2-6 hours to the central storage.
 - Wash all containers (except those that are used for sharps waste) and cart with soap and water daily. Then, disinfect with a sodium hypochlorite solution at 0.1% concentration, according to indications below, allowing the disinfection solution at least 1 minute to act.
 - Place the waste in tightly closed bags to be transported. The bag should not have any perforations; however, if they do, they should be placed in a second bag.
 - Ensure the storage of waste in covered containers to avoid the proliferation of vectors and rodents.
- Treatment and final disposal in the health care facility
- Carry out the corresponding waste treatment within 12 hours after being received at the treatment plant.

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	<ul style="list-style-type: none"> • Carry out the treatment and final disposal of the waste by authorized, trained personnel who have PPE. • Keep the equipment running according to established procedures: <ul style="list-style-type: none"> ○ Autoclave: the waste must pass through a shredder before being injected with steam. If there is no integrated shredder, the air must be evacuated with a vacuum pump. The autoclave must be humid, from 103 to 200 kPa, and at a temperature of 121 °C to 134 °C during a period of 20 to 40 minutes. The evacuated air must be filtered using high efficiency particulate filters (HEPA or equivalent). Ensure that the waste has been decontaminated by verifying the temperature indicator bands. Then, it must be disposed of in landfill as common waste. ○ Incinerator: This must be a double-chamber version that reaches temperatures of 850 °C and 1100 °C, respectively, with a gas burning time in the secondary chamber of 2 seconds. Common waste should not be incinerated as it may contain aerosol containers which could explode. Incinerators must meet national pollutant emission reduction standards, including for dioxins and furans. • If the health care facility does not conduct treatment onsite, it must contract an authorized and specialized service to carry out the treatment offsite. Designated vehicles must be used to transport the waste to a special cell.⁵ <p><u>Transport of waste to be treated outside the health care facility.</u></p> <ul style="list-style-type: none"> • Coordinate the removal of waste from the health care facility in a closed vehicle without a compactor, using trained personnel in their corresponding PPE.
<p>Handwashing</p>	<ul style="list-style-type: none"> • Ensure a minimum of 2 sinks in rooms containing more than 20 beds. • Locate free, accessible, and functional handwashing facilities with soap and safe water for staff and patients, as a minimum at: <ul style="list-style-type: none"> ○ the entrance/exit of the facility ○ waiting rooms ○ treatment rooms ○ 5 m maximum from toilets ○ cleaning rooms ○ laundries. • Dry hands with paper towels, which must be discarded after use in a container located next to the sink.

⁵ Technical Note [Recommendations for the Management of Solid Waste](#) (OPS 2020)

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	<ul style="list-style-type: none"> • Post visual and audio messages that indicate the correct method of hand washing.
<p>Ventilation</p>	<p>SARS-CoV-2 can be transmitted from person to person through droplets expelled by the respiratory system into the air (cough, sneeze, etc.). Adequate ventilation and filtration can reduce the concentrations of respiratory droplets in the air and reduce the risk of transmission.</p> <p><u>Prevention approach:</u></p> <ul style="list-style-type: none"> • Verify with the service provider that routine maintenance and cleaning of ventilation, heating and air conditioning systems are carried out in accordance with an established schedule and with a maintenance record. • Ensure that the air flow in the facility is directed from areas of clean air to areas with less clean air. • Make the necessary adjustments to the air filtration, ventilation, air conditioning and heating systems. Verify with the service provider the current status of the system and opportunities for improvement. <p><u>Ventilation in patient care spaces:</u></p> <ul style="list-style-type: none"> • Provide adequate thermal conditions for patients using heating, ventilation, and air conditioning (HVAC) systems. It is not recommended to turn these systems off at any time. • Avoid air conditioning systems with variable air volume. • Ensure a minimum of 2 air exchanges per hour. • Maintain humidity conditions between 40% and 60% and temperature between 21 and 24 °C (70-75 °F). • Consider the use of negative pressure isolation rooms for the development of aerosol-generating procedures (i.e., intubations, mists, bronchoscopy, etc.). The use of HEPA filtration systems which are not switched off is recommended. • Prevent air flow from areas with confirmed cases to the rest of the health care facility, always keep the doors closed, and, if possible, maintain negative pressure in areas with patients. • Ensure a distance of at least 10 m between discharges and intakes of air systems. <p><u>Reduction of respiratory irritation by polluting sources</u></p> <ul style="list-style-type: none"> • Avoid using solid fuels and kerosene for cooking and heating. Health facilities that use these fuels should increase ventilation to the outside in kitchen areas and notify authorities to find cleaner energy alternatives.

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Cleaning and disinfection

- Wash dishes and cutlery immediately with water and soap after use and let them air dry. It is not recommended to use drying cloths, which could transmit infections.
- Clean all surfaces with safe water and soap at least once a day throughout the health facility. Then disinfect them with a sodium hypochlorite solution at 0.1% concentration, leaving to act for at least 1 minute.
- Clean the bed frames with soap and water after each hospitalization. Then disinfect them with a sodium hypochlorite solution at 0.1% concentration, leaving to act for at least 1 minute.
- Use disinfecting solutions made from products that achieve a reduction of 99.9% of the original concentration of SARS-COV-2, and that demonstrate efficiency against enveloped coronaviruses and other pathogens associated with hospital acquired infections in the national context, such as hepatitis, tuberculosis and Staphylococcus. Disinfection solutions that meet these criteria include:
 - sodium hypochlorite solutions at 0.1% concentration leaving to act for at least 1 minute
 - ethanol 70-90% leaving to act for at least 1 minute
 - improved hydrogen peroxide solution to 0.5% leaving to act for at least 1 minute.
- Keep a daily record of cleaning and disinfection activities carried out in the health facility.
- Contaminated or spilled clothing should be placed in waterproof bags and sealed for transportation to the laundry.
- Wash bedding and other washable materials in hot water and soap; let it soak for 30 minutes in a 0.05%⁶ sodium hypochlorite solution according to the instructions in the table below; rinse with clean water and dry.

⁶ If you do not have soap and water, 70% alcohol gel or hydrogen peroxide, a sodium hypochlorite disinfectant solution at 0.05% concentration could be used to wash your hands. However, this is the least recommended option, since frequent use can lead to allergies, dermatitis, depigmentation, and even asthma.

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BASIC MINIMUM PUBLIC ENVIRONMENTAL HEALTH KIT FOR HEALTH CARE FACILITIES

- Equipment to measure the concentration of residual chlorine in the water (chlorine comparators and their reagents)
- Color-coded waste containers and bags: 15 to 40 L and 20 to 60 L
- Containers for sodium hypochlorite solutions
- Carts for the transfer of waste
- Personal protective equipment for cleaning equipment
- Cleaning utensils
- Sodium hypochlorite without softeners, dyes, or scents
- Soap
- Paper towel to dry your hands
- Elements that allow the labels of the prepared dilutions to be labeled (concentration, date of preparation)

HOW TO PREPARE DISINFECTION SOLUTIONS

- Use the concentration of sodium hypochlorite available nationally, which is indicated on the label of the container, to mix the concentration of disinfection solution according to the intended use, following the indications in the table below.
- Use protective equipment such as gloves, mask, eye protection, and apron to mix the solutions.
- Prepare solutions daily, adjusting the amounts shown in the table below for 1 liter according to daily needs.
- Use a designated container for the prepared solutions and label the container clearly with the concentration.
- Do not reuse packaging of edible products to prepare the disinfection solution in order to avoid accidental poisoning.
- Add the appropriate amount of sodium hypochlorite to the quantity of water as indicated in the table below.
- Do not mix sodium hypochlorite with soaps or cleaners.
- Store sodium hypochlorite out of the reach and sight of children, in a safe place that is not exposed to light and heat.
- Use sodium hypochlorite products without added fabric softeners, colors, or perfumes.

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Sodium hypochlorite concentration	Disinfection solution concentration					
	0.05% ⁶		0.1%		0.5%	
	For hand washing and laundry		For disinfecting surfaces, floors, cleaning utensils and mortuary		For spills of body fluids (blood, vomiting, etc.)	
	Amount of sodium hypochlorite	Quantity of water	Amount of sodium hypochlorite	Quantity of water	Amount of sodium hypochlorite	Quantity of water
1%	50 ml	1 L	100 ml	1 L	500 ml	1 L
3%	15 ml	1 L	30 ml	1 L	154 ml	846 ml
4%	13 ml	1 L	25 ml	1 L	125 ml	875 ml
5%	10 ml	1 L	20 ml	1 L	100 ml	1 L
10%	5 ml	1 L	10 ml	1 L	50 ml	1 L

Climate Change and Environmental Determinants of Health Unit
 Communicable Diseases and Environmental Determinants of Health Department

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