Lao People's Democratic Republic

Peace Independence Democracy Unity and Prosperity

Guideline for “Hygiene and Disinfection to Prevent and Control the new Coronavirus disease (COVID-19)”

As of May 2021

Department of Hygiene and Health Promotion, Ministry of Health

Principles of hygiene and disinfection

1. Techniques for hygiene and disinfection

Hygiene starts from the little dirty areas to the dirtiest ones, from the lowest spots to the highest ones in order to let the trash fall down to the floor and clean up for a final round systematically. Using clean clothes every time to clean up the areas where are considered to be at risks of contamination by COVID-19.

Hygiene equipment for areas at risks and areas where get infected by COVID-19 must be separated, kept and stored very well. Detergents or disinfectants that are contaminated and used must be abandoned, then replace the new ones. After cleaning, equipment must be washed by detergents and rinsed by clean water, dried and then it is reused.

2. Products for hygiene and disinfection

2.1. Products for hygiene:

1. Detergents (fab)
2. Soaps/liquid detergents
3. Clean water

2.2. Products for disinfection:

2.2.1. Hypochlorite comprises of 2 types:

- Sodium Hypochlorite (liquid), example: Haiter, Detton …..
- Calcium Hypochlorite (powder), example: Chlorine powder 65-70%

Chlorine powder

Products that have mixed with Chlorine is Sodium Hypochlorite and powder which is mixed with water like Calcium Hypochlorite. These types of stuff must be melted in the water according to the calculating formulation in order to reach an effective level to be able to resist general germs such as: resistance of viruses with the density of disinfection is at 0.05% (500pm) and there must use the density of disinfection at 0.5% (5.000 ppm) for some germs.

For the prevention of COVID-19 outbreak, it is recommended that using concentrated disinfection at 0.1% (1000 ppm) which is able to resist other germs as well. In case there is drops or leakage of body fluids, it is necessary to use concentrated disinfection at 0.5% (5.000 ppm).

Mixture of disinfectants

Formula 1 liquid form: Sodium Hypochlorite concentrations:

Percentage (%) of Chlorine in Sodium Hypochlorite is divided by percentage (%) of concentrated Chlorine needed - 1 = proportion of water per 1 proportion of Sodium Hypochlorite.

Example: 65% in Sodium Hypochlorite

0.5% of Chlorine needed -1 = 9 proportions of water per 1 proportion of Sodium Hypochlorite

Formula 2 powder form: **Calcium Hypochlorite Concentrations**

Percentage (%) of Calcium Chlorine in powder form is divided by percentage (%) of Chlorine needed -1= proportion of water.

Example: 70% Calcium Chlorine powder form

0,1% Chlorine needed - 1= 699 proportions of water

Chlorine 1 proportion (1 spoon)=15 ml/water 699 proportions

1/699 Chlorine 70% 1 table spoon (15ml) x 699 = 10,485 ml

Table of disinfectant mixture

Types of products	Volume	Volume of clean water	Concentration
Chlorine powder 70%	1 table spoon (15 ml)	1 liter	1%
Chlorine powder 70%	1 table spoon (15 ml)	2 liters	0,5%
Chlorine powder 70%	1 table spoon (15 ml)	10 liters	0,1%
Whitening detergent (Haiter) 5 - 6%	1 portion	water 4 portions	1%
Whitening detergent (Haiter) 5 - 6%	1 portion	9 portions of water	0,5%
Whitening detergent (Haiter) 5 - 6%	1 portion	49 portions of water	0,1%
Detton 5 - 6%	1 portion	4 portions of water	1%
Detton 5 - 6%	1 portion	9 portions of water	0,5%
Detton 5 - 6%	1 portion	49 portions of water	0,1%

1. **The health effects of Chlorine are as following**:
   - The effects to digestion system: if the Chlorine is swallowed, it can cause a stomach pain, a diarrhoea, dizziness and vomiting;
   - The effects to the eyes: it can cause eye burns, redness and eye pains;
   - The effects to the skin: it can cause itchy rashes on the skin.

2. **Storage**
   - The Chlorine must be stored in a safety container covering with the tight lid and the container must be inaccessible to the light. The container must be stored far away from the flammable materials and the reach of children;
   - For the mixed disinfectants, they last for two hours. Therefore, the volume of mixed disinfectants is calculated based on the areas where will be sanitized. After mixing, the Chlorine must be stored in a safety container covering with the tight lid and the container must be inaccessible to the light. The container must be stored far away from the flammable materials and the reach of children. If it is over two hours, it must be discarded.

3. **Warnings**
   - Do not drink; if it is unconsciously drunk, must drink a lot of water and see the doctor to seek medical advice.
   - Prevent not to contact with skin, eyes (if eyes or skin are contacted, must rinse eyes and skin immediately with plenty of clean water and see the doctor to seek medical advice)

2.2.2. 70% alcohol has two types as following:

Alcohol used to kill germs has two types such as Ethyl alcohol and Isopropyl alcohol. Both types are liquid, colourless, easy to evaporate in a room temperature, used to sanitize, disinfect materials, metal, rubber, wood, leather and stainless steel which are residue free and safe. Both types of alcohol are effective in killing microorganisms, tuberculosis, fungi and microbes, but they do not destroy spores (spores of microorganisms).

The 70% alcohol is certified as hygiene product and disinfect for all areas. Moreover, it is used for hand wash directly and can be mixed with gel for hand which is commonly sold in the market.

The 90% - 95% alcohol contains a high alcohol content that will accelerate the evaporation without being absorbed through the cell membrane of the pathogen. Besides, it can cause the skin dry and itchy, and that is why it is recommended that not to use the 90% - 95% alcohol to disinfect.

Precautions for the use of disinfectants, it is recommended to take into account the frequency of use as it can dry the skin. The storage of this disinfectant should be avoided from the sunlight and the heat due to the alcohol can be electrically conductive and is a product for external use.

2.2.3. UV/ UV light tubes

- UVGI Disinfection Chamber is an oven-like feature which is used to disinfect equipment and it can be laundered and cleaned;
- They are UV light tubes that can be moved around and suitable for disinfections where there is a risk of the COVID-19 pandemic such as the room with minus pressure. When the UV light is on, it is not allowed anyone to stay in the room;

  Radiation emitted from the light tube between 200nm-313nm (according to the international standards of CIE, DIN, IESNA) is the most effective. If the wavelength is around 265nm, it can kill germs such as microorganisms, fungi, yeast and it can also destroy microbes (virus). The radiation will destroy the chains of DNA-RNA such as the COVID-19 virus and can inhibit the growth of microorganisms and viruses.

- The use of UV light should be taken into account for a suitable purpose that the disinfection is needed such as the UVGI Disinfection Chamber is an oven-like feature which is used for disinfection of equipment and it can be laundered and cleaned.

- The Moveable UVGI Air and Surface is the UV light that can be moved around and suitable for disinfections where there is a risk of the COVID-19 pandemic such as the room with minus pressure. When the UV light is on, it is not allowed anyone to stay in the room;

- The Handheld UVGI Surface Disinfection Equipment is a kind that is used to disinfect equipment which is used among many people such as computer keyboards, bathroom knobs.

Effects from UV radiation to human organs are as following:

- Eyes can be harmful to the cornea and lens;
- Skin can be burnt, redness, burning and may cause cancer;
- Respiratory system: with the radiation emitted, if the wavelength is more than 240nm, it can produce ozone gas that is toxic to the respiratory.

2.2.4 Disinfection by heat: (Pasteurization)

Disinfection by heat and temperature of hot water at 100 degrees Celsius for more than 30 minutes can be disinfected. This method is a highly effective disinfection.

3. Principles for hygiene and disinfection

1.1. Step 1 before the hygiene and disinfection

1.1.1. Hygiene and disinfection personnel must clean and disinfect hands

Proper hand hygiene can reduce germs while working on such activities such as blood, mucus, saliva, urine, feces or touching equipment, surrounding with patients. Hygiene and disinfection personnel must clean and disinfect hands before and after working.

Washing hands is done by using clean water, soap, rinsing by clean water, washing hands for 40-60 seconds, drying by a clean towel and use it one time or a paper towel. Washing hands can only wash out some germs and germs can outspread or grow in humanity and wet areas well. Therefore, after washing hands it is a must to use alcohol or gel to hygiene hands which contains alcohol of 70% to disinfect hands. Steps for washing hands by soap or gel to disinfect which contains alcohol are as following:

- Step 1: Rub your hands palm to palm, then with your fingers linked through the other hand
- Step 2: Rub the right palm with the left palm and link your fingers through the other hand and then swap
- Step 3: With your fingers interlocked, rub the backs of them against the palms
- Step 4: Rub the left hand around the right thumb and then swap
- Step 5: Rub your fingers over your palms by swapping left and right

1.1.2. Wearing equipment to protect oneself:

Hygiene and disinfection personnel must wear personal protective equipment during working on cleaning and disinfecting to prevent germs contacting hands, eyes, clothes and shoes and to prevent outspreading germs to other people as follows:

1. Thin gloves;
2. Long thick waterproof gloves;
3. Protective glasses;
4. Mask that can prevent chemicals;
5. Waterproof apron;
6. Gown (disposable surgical gown);
7. Waterproof boots;
8. Hat or hair cap.

A principle of self-protection is to reduce the risk of infection and to prevent chemicals from contacting the body, but that cannot be fully protected. To wear an effective self-protection equipment correctly, the steps must be as following:

1. Hygiene and disinfect hands
2. Wear a mask (prevent chemicals and germs)
3. Wear a gown (Disposable surgical gown)
4. Wear protective glasses
5. Wear a hair cap
6. Wear a waterproof apron
7. Wear waterproof boots
8. Wear thin waterproof gloves
9. Wear thick long-sleeved waterproof gloves
10. Must have an assistant to look after readiness

- Avoid contacting self-protective equipment which is used and mixed with body fluid;
- Do not double wear self-protective equipment because they cannot prevent germs more than that, but it will be wasteful and uncomfortable to work;
- Do not wear self-protective equipment with others.

Therefore, it is necessary to have sufficient self-protective equipment at all time and the hygiene and disinfection personnel receive trainings on how to use self-protective equipment thoroughly and up to date with the situation. Hygiene and disinfection personnel must know techniques and principles of wearing self-protective equipment correctly.

Cautions

- Avoid contacting with the surface of the contaminated equipment while disposal;
- Protective glasses, waterproof boots and other reusable items must be immediately removed and soaked in the disinfectant; Disposal items must be left in a bag and discarded in a yellow trash bin which is for medical disposal.

- Removing protective equipment every time, hands must be disinfected by 70% alcohol. When removing all equipment, must wash hands with soap, rinse with clean water and then hygiene;
- For reusable items, they must be disinfected by Chlorine content of 0,5%;
- Mixture of disinfectants must be in a well-ventilated area;
- Be careful and avoid direct contact with the disinfectant;
- Mixture of disinfectants must be strictly followed with proper proportions in this guideline.

1.2. Step 2 hygiene and disinfection:

- Doors and windows must be open for ventilation;
- No one is allowed in the room for hygiene and disinfection;
- Hygiene and disinfect all areas where are at risk of infection by using a towel soaked in the solution prepared or spraying all the areas where to be cleaned and disinfected. Then using a towel mops from the least dirty areas to the most ones, from the highest areas to the lowest ones, from the inside to the outside such as ventilation spaces, air conditioning, devices in the room, door knobs, stairs, push bottons of the lift, restrooms, trash storage, waste and others…

1.3. Step 3 After hygiene and disinfection

After a completion of hygiene and disinfection, the hygiene personnel must remove self-protective equipment carefully as following:

1. Wash hands by soap, rinse by clean water and disinfect hands by 70% alcohol or gel;
2. Remove long-sleeved gloves, wash hands by soap and clean water, disinfect hands by 70% alcohol or disinfectant gel;
3. Remove an apron and wash hands by 70% alcohol or disinfectant gel;
4. Remove the cap to the back and wash hands by 70% alcohol or disinfectant gel;
5. Remove the gown by rolling it off and wash hands by 70% alcohol or disinfectant gel;
6. Remove waterproof boots and wash hands by 70% alcohol or disinfectant gel;
7. Remove thin waterproof gloves and wash hands by 70% alcohol or disinfectant gel;
8. Remove protective glasses and wash hands by 70% alcohol or disinfectant gel;
9. Remove the mask and wash hands by 70% alcohol or disinfectant gel;
10. Wash hands by soap, rinse by clean water, dry hands by a clean towel or hygiene paper;
11. Hygiene hands by disinfectant gel that contains 70% alcohol;
12. Take a shower to clean the body and then change to clean clothes.

After a completion of hygiene-disinfection, it is a must to clean the body by soap, clean water. All equipment and clothes must be soaked by disinfectants that contain Chlorine 0.1% (1.000mg/l). If areas are at risks and infected, they must be soaked by disinfectants that contain 0,5-1% and rest them for 30 minutes, wash and dry them well.

Hygiene personnel should observe themselves and if they feel sick and are risky such as coughing, sneezing, having a running nose, having a fever or feeling difficult to breathe, they must contact hotlines 165 – 166 to seek an advice.

Attentions

Disinfection at each site should be under the direction of the local health department which is carried out by the relevant authorities in a timely manner. Hygiene and disinfection at all health facilities should be the responsibility of the medical staff and hygiene unit, with the need for technical training to the team from the local hygiene and disinfection unit, and the storage of disinfectants must be kept in accordance with the above principles.