Resource Guide for Trainers

Riruta United Women Empowerment Programme (RUWEPO)

Disclaimer

Several segments of information in this resource guide can be found online on different websites. The information has been brought together to provide greater background education on the material the trainers will present at the WASH Training for Community Health Workers in Arid Regions trainings.

The links to the online sources used are included below. They are also hyperlinked throughout the Resource Guide.

***Open Line Create (Routes for Disease Transmission): https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=80399&section=4#back_thumbnailfigure_idm45621727663568**

A Laymen's Guide to Clean Water: http://www.clean-water-for-laymen.com/ways-to-clean-water.html

CDC's Global Water, Sanitation, and Hygiene (Solar Disinfection): https://www.cdc.gov/healthywater/global/household-water-treatment/solardisinfection.html

CDC's Water, Sanitation, & Hygiene (WASH)-related Emergencies & Outbreaks (Creating and Storing Emergency Water Supply) : https://www.cdc.gov/healthywater/emergency/creating-storing-emergency-water-supply.html

Tippy Tap: https://www.tippytap.org/tippy-taps

CDC's Handwashing in Communities: Clean Hands Save Lives Page: https://www.cdc.gov/handwashing/when-how-handwashing.html

World Health Organization (How to Handwash): https://cdn.who.int/media/docs/default-source/integrated-health-services-(ihs)/infection-prevention-and-control/how-to-handwash-poster.pdf?sfvrsn=8ab212f0_5

Background for Arid Regions

Access to clean and safe water is a basic and essential need for all people (Sridhar, Okareh, & Mustapha, 2020). Without access to safe water preventable diseases become widespread (Ssemugabo et al., 2019). Lack of access to water and sanitation and hygiene challenges have caused a great number of deaths for children under the age of five around the world (Sridhar et al., 2020). Water-washed diseases are diseases that result from a lack of water available for washing for personal hygiene (Moe & Rheingans, 2006). Common diseases that result from these water issues are diarrhea, cholera, trachoma, shigellosis, typhoid, and malaria and they cause hundreds of thousands of deaths every year (Mourad, Habumugisha, & Sule, 2019).

Many different factors can contribute to the lack of clean and safe such as poor infrastructure, poor water quality, water scarcity in arid regions or the increasing population's demand for freshwater (Moe & Rheingans, 2006). In arid regions the people begin to use unsafe or unreliable water sources such as surface water, unprotected dug wells, or water vendors (Sridhar et al., 2020).

Need for WASH

Providing communities in the ASAL with adequate access to safe water is important to reduce poor health outcomes and incidence of water-related disease (Sridhar et al., 2020). Diseases can also be reduced through improving sanitation and hygiene practices so that communities are drinking fecal contaminated water Hunter). They should also be provided with the proper knowledge, attitudes, and practices that allow for them to practice sufficient personal hygiene (Hunter, MacDonald, & Carter, 2010).

KAP of community members is one of the most important factors in transmitting infectious diseases where there is a lack of adequate water and sanitary conditions (Berhe et al., 2020). When there is a lack of WASH knowledge certain practices become common in communities such as a lack of purification of household water and poor water storage, which leads to contamination of drinking water (Sridhar et al., 2020).

Your Role

To fill in the gaps in KAP regarding WASH there is evidence to show that community health workers (CHWs) can be effective. CHWs have been able to assist in filling gaps where there are limited doctors and nurses available in low and middle-income countries. CHWs are able to provide health care services that are centered around the underserved population they are serving and encouraging the community to be involved and participate in health interventions. Collaborating with communities also improves critical health behaviors, improves knowledge, and practices which lead to a reduction in poor health outcomes in areas with low resources (Farnsworth et al., 2014)

CHWs serve both the community members and the implementers of health programs. They are the bridge to the community and can improve interventions through feedback that sometimes research can't find. They are familiar faces and can better understand the nuances of smaller communities that are unknown in literature.

F-Diagram Explanations

The F-Diagram refers to a diagram that shows the movement of disease-causing pathogens from feces to mouth. It shows both direct and indirect paths that they travel through. It is called the F diagram because all the main pathways begin with "f". The main paths mentioned are food, fluids, flies, fields, and fingers. When communities are faced with poor hygiene and sanitation knowledge and practices and unsafe and limited water sources this can contribute to the spread of diseases that could be prevented. The diagram below shows the change common routes that pathogens from feces can travel to a new host.

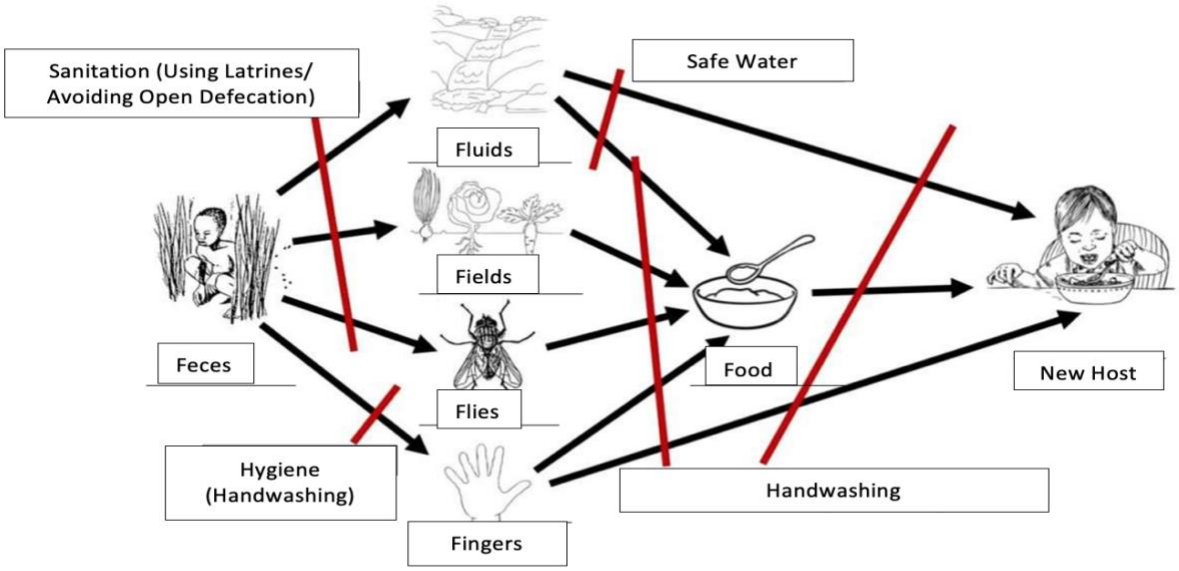
*****Infection from *fluids* usually involves drinking or cooking with water contaminated with faecal organisms.

In the *fingers* pathway, a person ingests the organisms (usually during eating) if they have come into contact with faeces and have not washed their hands properly afterwards. This contact can occur from defecation, from cleaning a child's bottom, from touching dirty surfaces or eating food prepared in an unhygienic manner.

Flies and cockroaches often thrive on excreta. If they land on food they can transfer faecal matter that can be subsequently ingested by a person.

Field (or soil) infection can occur by the ingestion of unwashed raw vegetables and fruit grown in soil contaminated with faeces. Contaminated soil may be transported by feet or shoes for long distances. Infections can also be transmitted through dirty *floors*, perhaps if food is dropped on the floor and then picked up and eaten.

***Information is pulled from online resource: Open Line Create (Routes for Disease Transmission):**
https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=80399&section=4#back_thumbnailfigure_idm45621727663568



Disclaimer

The information that has been presented from pages 3-4 is original information from a literature review on the importance of trained WASH community health members in arid regions. The references for this portion can be found on page 16.

All information from pages 6 to 15 has been pulled from online resources and links to the full online resources can be found on page 2.

Household Treatment Process

The household treatment process is a five-step process. Three of the five activities will be reviewed with the trainees. The five steps that are in the diagram are source protection, sedimentation, filtration, disinfection, and safe storage. The information for this section comes from the source A Laymen's Guide to Clean Water. Click on the hyperlink to explore the website and read more. The following information below is from the website.

Step 1 - Water Source Protection

There are many pollution problems which may threaten drinking water quality at the source or point of collection. These risks include the following:

* poor site selection

* poor protection of the water supply against pollution

* poor construction

* deterioration or damage to structures

* lack of hygiene and sanitation knowledge in the community

Protecting the water source reduces or eliminates these risks and can lead to improved water quality and health. Actions that are good ways to clean water and that can be taken at the community level can include some of the following:

* regularly cleaning the area around the water source

* moving latrines away from and downstream of water sources

* building fences to prevent animals from getting into open water sources

* lining wells to prevent surface water from contaminating the ground water

* building proper drainage for wastewater around taps and welts

Step 2 – Sedimentation

Sedimentation is a physical treatment process used to reduce the turbidity of the water. Remember that turbid water looks cloudy, dirty, or muddy and is caused by sand, silt, and clay that are floating in the water.

Turbid water usually has more pathogens so drinking it increases your chances of becoming sick.

There are ways to clean water and reduce turbidity by simply letting the water settle for some time.

This can be done in a small container such as a bucket or pail.

The sedimentation process can be quickened by adding special chemicals or native plants, also known as coagulants, to the water.

Coagulants help the sand, silt and clay join together and form larger clumps, making it easier for them to settle to the bottom of the container.

Three common chemicals used as ways to clean water and aid in sedimentation are aluminum sulphate, polyaluminum chloride (also known as or liquid alum) and ferric sulphate.

Native plants are traditionally used in some countries in Africa and Latin America to help with sedimentation. For example, prickly pear cactus, moringa seeds and fava beans have all been used to help sediment water.

Step 3 – Filtration

Filtration methods are ways to clean water and are commonly used after sedimentation to further reduce turbidity and remove pathogens. Filtration is a physical process which involves passing water through filter media.

Sand and ceramic are the most common filter media, although cloth and membranes can also be used. There are various types of filters that are used by households around the world.

* Cloth filter

* Biosand filter

* Kanchan arsenic filter

* Ceramic pot filter

* Ceramic candle filter

* Sawyer Filters

Best Water Purification Reviews is your #1 online source for information an all types of water purification systems such as water filters, water softeners, water purifiers, water treatment and bottled water.

Step 4 – Disinfection

The next step in household water treatment is to remove or kill any remaining pathogens through disinfection, The most common methods used by households around the world to disinfect their drinking water are:

* Chlorine disinfection

* Solar disinfection (SODIS)

* Boiling

Turbid water helps pathogens to "hide" from chemical, SODIS and UV disinfection.

Reducing turbidity by sedimentation (see Step 2) and filtration (see Step 3) is necessary to improve the effectiveness of these disinfection methods.

Clarity Water Products are Water Treatment Professionals - Dedicated to finding ways to clean water without using Harsh, Toxic Chemicals.

Chemical free is all they do, and their years of experience in this specialized field of water treatment allow them to bring you the best products for healthier, cleaner, more comfortable water.

Step 5 - Safe Water Storage

Households do a lot of work to collect, transport and treat their drinking water. Now that the water is safe to drink, it should be handled and stored properly to keep it safe.

If it's not stored safely, the treated water quality could become worse than the source water and may cause people to get sick.

Safe storage means keeping your treated water away from sources of contamination and using a clean and covered container. It also means drinking water from the container in a way so that people don't make each other sick.

The container should prevent hands, cups and dippers from touching the water, so that the water doesn't get recontaminated.

Solar Disinfection

The information for this section comes from the CDC's Global Water, Sanitation, and Hygiene. "Solar disinfection was developed in 1980s to inexpensively disinfect water. Users of SODIS fill 0.3-2.0-liter plastic soda bottles with low-turbidity water, shake them to oxygenate, and place the bottles on a roof or rack for 6 hours (if sunny) or 2 days (if cloudy). The combined effects of ultra-violet light (Krishna)-induced DNA damage, thermal inactivation, and photo-oxidative destruction inactivate disease-causing organisms. There are benefits and drawbacks to this method. The benefits include proven reduction of viruses, bacteria, and protozoa in water, proven reduction of diarrheal disease incidence, simplicity of use and acceptability, no cost if using recycled plastic bottles, minimal change in taste of the water, and recontamination is low because water is served and stored in the small narrow necked bottles. The drawbacks include need to pretreat water of higher turbidity with flocculation and/or filtration, limited volume of

water that can be treated all at once, length of time required to treat water, and large supply of intact, clean, suitable plastic bottles required."

Click the hyperlink to read more information on the topic.

Water Storage

The information for this section comes from the CDC's Water, Sanitation, & Hygiene (WASH)-related Emergencies & Outbreaks page. "When storing safe water (water that has been treated to make it safe to use), it is best to use food-grade water storage containers, which do not transfer toxic substances into the water they are holding. Be sure that the containers you choose have a top that can be closed tightly and is made of durable, unbreakable materials (i.e., not glass). If it's possible, use a container with a narrow neck or opening so water can be poured out. DO NOT USE containers that previously have been used to hold liquid or solid toxic chemicals (bleach, pesticides, etc.)."

It is also important to properly clean the containers prior to use. Before filling with safe water, use these steps to clean and sanitize water storage containers:

1. Wash the storage container and rinse completely with water.
2. Sanitize the container with a solution made by mixing 1 teaspoon of unscented liquid household chlorine bleach in 1 quart of water. Use bleach that contains 5%–9% sodium hypochlorite.
3. Cover the container tightly and shake it well. Make sure the sanitizing bleach solution touches all inside surfaces of the container.
4. Wait at least 30 seconds and then pour the sanitizing solution out of the container.
5. Let the empty sanitized container air-dry before use OR rinse the empty container with safe water (water that has been treated).
6. Pour clean water into the sanitized container and cover with a tight lid.

There are also important steps to take to remove and steps to take to ensure safe water in containers.

Tips for removing safe water out of the container:

If using a scoop or other device, use a clean one each time you remove safe water from the storage container to help avoid contaminating the water.
Before scooping out the safe water, try not to touch the water or insides of the container with your hands.
Never scoop safe water with your hands.

Tips for storing safe water in a container after cleaning and sanitizing:

Label container as "drinking water" and include storage date.
Replace stored water every six months.
Keep stored water in a place with a cool temperature (50–70°F).
Do not store water containers in direct sunlight.

Do not store water containers in areas where toxic substances, such as gasoline or pesticides, are present

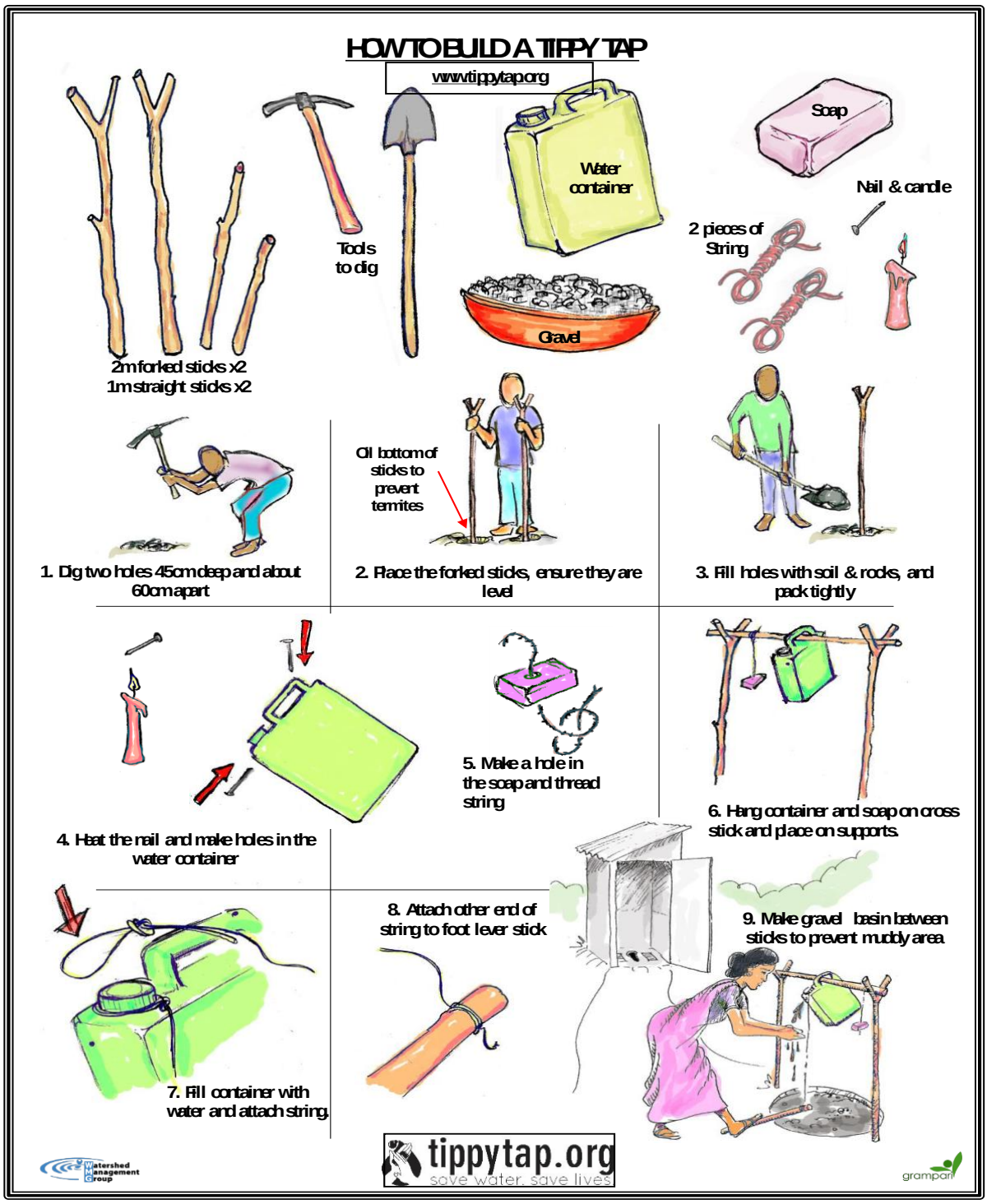
Tippy Tap

The Tippy Tap is technology that offers many benefits for handwashing in places are low resource and lack proper handwashing stations. The information for this section is from TippyTap.org. Click the hyperlink to read more about the Tippy Tap. The Tippy Tap is hygienic, it saves water, it is low cost, there is no waste, it's simple, and it promotes handwashing.

During the training you will lead a demonstration on building the Tippy Tap. You will need to have built the Tippy Tap at least once before to ensure that you are familiar with the process. There are nine steps in the process. They are

1. Dig two holes 45 cm deep and about 60 cm apart
2. Place the forked sticks, ensure they are level
3. Fill holes with soil and rocks, and pack tightly
4. Heat the nail and make holes in the water container
5. Make a hole in the soap and thread string
6. Hang container and soap on cross stick and place on supports
7. Fill container with water and attach string
8. Attach other end of string to foot lever stick
9. Make gravel basin between sticks to prevent muddy area

Below are the one-page fact sheet and step-by-step instructions that will be given out to the trainees. A copy of the sheets can be found in the training manual in English and Swahili as well.



The Tippy Tap

- Every year 1.2 million children under five years old die from acute respiratory infections & diarrhea worldwide. Hand washing with soap can save almost half a million of these children.

- The tippy tap is a simple device to promote hand washing.

- **Hands free –** your main water store stays germ free and keeps you healthy
- **Saves water –** uses 40ml of water while a mug uses 550ml
- **Easy –** even children can make it
- **Economical** - uses local and inexpensive materials
- **Adaptable –** can use wood, bamboo or even a tree to hang the container
- **Convenient –** much easier than using a mug and bucket
- **Efficient –** "waste" water from the tap can water plants or recharge ground water
- **Useful** - place outside latrine/toilet, kitchen and in schools and health clincs
- Wash hands after toilet use and before eating and cooking.

Remember – hand washing with soap saves lives!

tippytap.org
save water. save lives.

Handwashing

The following information is from the CDC's Handwashing in Communities: Clean Hands Save Lives Page.

Washing hands can keep you healthy and prevent the spread of respiratory and diarrheal infections. Germs can spread from person to person or from surfaces to people when you:

Touch your eyes, nose, and mouth with unwashed hands
Prepare or eat food and drinks with unwashed hands
Touch surfaces or objects that have germs on them
Blow your nose, cough, or sneeze into hands and then touch other people's hands or common objects

You can help yourself and your loved ones stay healthy by washing your hands often, especially during these key times when you are likely to get and spread germs:

Before, during, and after preparing food
Before and after eating food
Before and after caring for someone at home who is sick with vomiting or diarrhea
Before and after treating a cut or wound
After using the toilet
After changing diapers or cleaning up a child who has used the toilet
After blowing your nose, coughing, or sneezing
After touching an animal, animal feed, or animal waste
After handling pet food or pet treats
After touching garbage

Proper handwashing steps below are from the World Health Organization:

The duration of the entire procedure should be 40-60 seconds.

0. Wet hands with water.

1. Apply enough soap to cover all hand surfaces.

2. Rub hands palm to palm.

3. Right palm over left dorsum with interlaced fingers and vice versa.

4. Palm to palm with fingers interlaced.

5. Backs of fingers to opposing palms with fingers interlocked.

6. Rotational rubbing of left thumb clasped in right palm and vice versa.

7. Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa.

8. Rinse hands with water.

9. Dry hands thoroughly with a single use towel.

10. Use towel to turn off faucet.

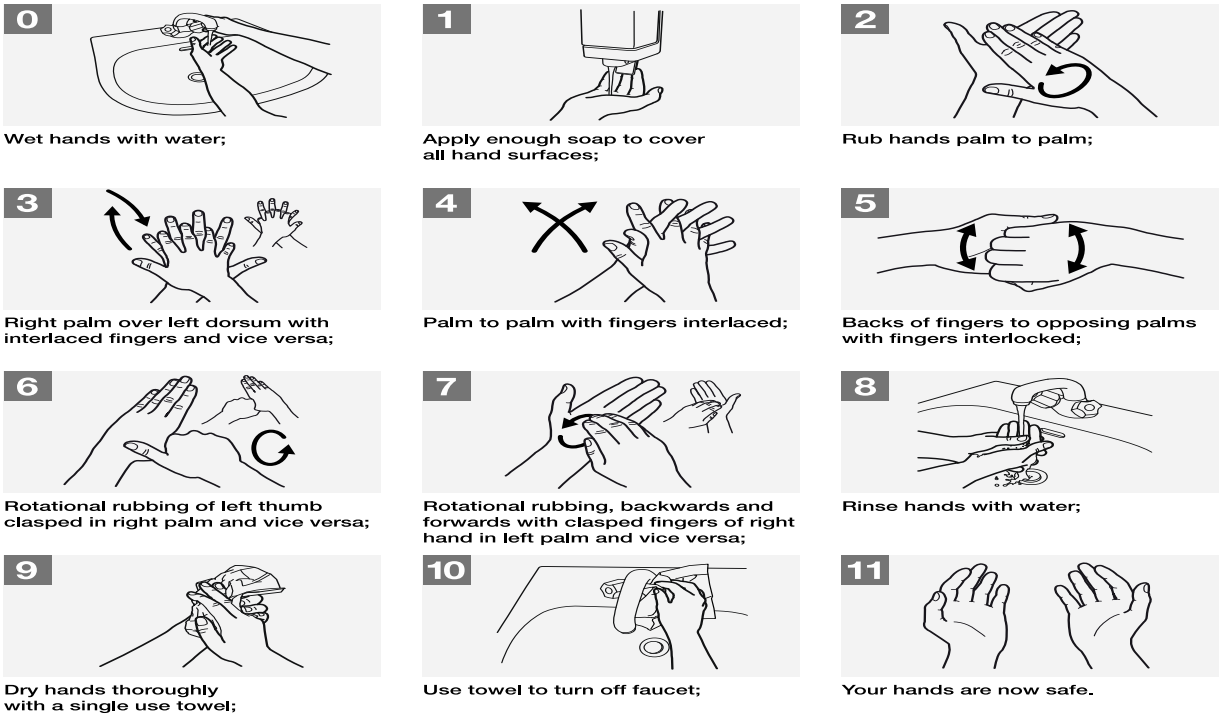
11. Your hands are now safe.

The step-by-step handout below if also included in the training manual.

How to Handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

Duration of the entire procedure: 40-60 seconds



World Health Organization | Patient Safety — A World Alliance for Safer Health Care | SAVE LIVES Clean Your Hands

WHO acknowledges the Hôpitaux Universitaires de Genève (HUG), in particular the members of the Infection Control Programme, for their active participation in developing this material.

May 2009

Activity Instructions

It is important that the trainers are familiar with not only the background information, but also the activities. Do all demonstrations before doing the training session. It is also important to read all the Activity Instructions before the day of the training. The training instructions for all the activities can be found below and in the manual for the day of the training.

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