

Safe Water System & Hand Washing Guide for Health Care Workers



Photo by Amy A. Parker

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Acknowledgments

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~Overview of Safe Water System and Hand Washing with Soap~

The Safe Water System (SWS) is a household-based water quality intervention that has been developed in response to the need for inexpensive, alternative means of water treatment and storage in the short to medium term for populations lacking access to safe water.



Photo by: Amy A. Parker

The intervention has three components:

1. Water treatment in the home with a dilute, locally-produced sodium hypochlorite (bleach) solution (i.e. WaterGuard)
2. Safe water storage containers with a narrow mouth and a lid. (i.e. modified clay pots and jerrycans)
3. Behavior change techniques regarding water treatment, storage, and hygiene.

Goals of the Safe Water System (SWS):

1. To improve the microbial quality of water in homes by means of a sustainable technology
2. To decrease death and diarrhea from contaminated drinking water
3. To improve hygienic behaviors related to water use.

Why use SWS?

- ✚ The SWS is simple to use, inexpensive, and effective.
- ✚ It gives households a way to make their water safe until they gain access to a piped, treated water system.
- ✚ WaterGuard solution provides a residual effect against recontamination (Whereas boiling is expensive, time consuming, hard on the environment, and does not protect against residual recontamination.)
- ✚ The SWS containers keep dirty hands or cups out of the water because of the narrow mouth and tight-fitting lid.
- ✚ The SWS reduces diarrhea morbidity by about half in children under five years old.

Why wash hands with soap?

- ✚ Hand washing is the number one prevention against the spread of person-to-person infection.
- ✚ Hand washing is the cornerstone of infection-control practice.

What is the Link between the SWS and Hand Washing with Soap?

Together, the SWS and proper hand washing with soap dramatically reduce the risk of diarrheal diseases.

Reasons Why It Is Important for Nurses and Public Health Technicians to Promote the SWS and Hand Washing with Soap

Health benefits to individuals and the community:

1. Treating household drinking water protects the family from diarrhea.
2. Hand washing reduces the spread of germs that cause diarrhea, respiratory illness, and skin infections.

Professional obligation to promote cleaner water and better hygiene practices.

~Components of the SWS~

I. The Bottle of WaterGuard



Photo by: PSI

What is WaterGuard?

- WaterGuard is a 1% sodium hypochlorite solution (dilute bleach) which is used to disinfect water and make it safe for drinking.

When should you use WaterGuard?

- Every time you refill your water container, you should treat the water with WaterGuard. Water should be treated YEAR ROUND. You should even treat your water if you have piped water and store it because the water can become contaminated during storage.
- WaterGuard is a household water treatment intervention and should not be used in boreholes or community wells.

How much WaterGuard should be added to a 20 litre container (or 25 litre container in Nigeria)?

- 1 capful is sufficient for clear water
- 2 capfuls for dirty water
- For containers larger than 20 litres, the dose of WaterGuard should be increased proportionately (e.g., 2 capfuls should be used to treat clear water in a 40 litre container). In Nigeria, a 50 litre container of clear water would require 2 capfuls.

How long does the bottle last before it expires?

- The product's shelf life is 12 months if UNOPENED.
- After the bottle is opened in the home, the solution should be used up within two to three months because the introduction of air causes it to lose its potency.

When is the water safe to drink after treating it?

- ✚ Treat the water and shake or stir the container. Then wait ½ hour before drinking.

Where should the bottle of WaterGuard be stored?

- ✚ Out of sunlight, out of the reach of children, in a cool, dry place.

Who sells the product?

- ✚ Hospital canteens/ kiosks
- ✚ Supermarkets
- ✚ Some pharmacies
- ✚ Other shops
- ✚ Some community-based organizations



Photo by Amy A. Parker

Cost: KSh 20 per bottle. In Nigeria, one bottle costs about 30 Naira.

What are other purposes of WaterGuard besides using it for drinking water?

- ✚ Treated water should also be used for hand washing, washing fruits and vegetables, and cleaning kitchen utensils.

Is WaterGuard a prevention or a treatment for diarrhea?

- ✚ WaterGuard is a PREVENTION for diarrhea, whereas Oral Rehydration Solution (ORS) is a treatment.

What does WaterGuard taste like?

- ✚ WaterGuard has a chlorine or metallic taste to it. It is important to tell your patients that a slight odor of chlorine means that their water is safe to drink.

Limitations of WaterGuard

- ✚ Relatively ineffective against some parasites
- ✚ Reduced efficiency and disagreeable taste or odor that may result when WaterGuard is used to treat water with excessive amounts of organic material, for example in turbid water.

Safety Issues and Health Impact: WaterGuard is Dilute and Safe

- ✚ If WaterGuard is accidentally ingested in large quantities by children, there are only minor, transient effects on health.
- ✚ There may be a very low risk of cancer from using WaterGuard which only would be a concern after many decades of regular use in turbid water. The risk of poor growth and development (and even death) from diarrhea is quite high for infants and small children, so the benefits of WaterGuard far outweigh any small risks. This position has been taken by WHO and the world's leading water experts.
- ✚ Chlorinated water is the norm in most developed countries. Chlorine is used widely in city water systems.

II. The Recommended Containers: Modified Clay Pots and JerryCans

EXAMPLES of MODIFIED CLAY POTS



Photos by Amy A. Parker

Advantages:

- Spigot, narrow mouth, and lid reduce risk of recontamination
- The water is kept cool

Disadvantages:

- Break easily
- Heavy to carry
- Vary in volume (making dosing instructions difficult)
- More expensive than traditional clay pot
- Spigot may leak

EXAMPLES of JERRYCANS



Photo by: <http://www.stowers.co.nz>

Advantages:

- A narrow mouth for filling
- Appropriate shape and dimensions so that it is not too difficult to carry
- Standard volume simplifies WaterGuard dosing

Disadvantages:

- Does not keep water cool
- Over time the exposure to sunlight may damage the vessel causing it to crack
- Narrow mouth makes cleaning more difficult
- Some are expensive

Containers that are NOT RECOMMENDED:

Traditional Clay Pots and Buckets (Or other vessels with a wide mouth and no lid)

Traditional Clay Pot



Bucket



Photos by: Amy A. Parker

Although these cost less and are readily available, these options **DO NOT KEEP YOUR WATER SAFE FROM RECONTAMINATION!**

If you do not have a modified clay pot or a jerrycan, it is recommended that you use a lid on the container you do have, and that you either pour out the water or retrieve the water with a clean ladle or cup (making sure not to touch your hands in the water).

****Although the use of the recommended safe storage containers is encouraged, patients should be taught to use WaterGuard in whatever storage vessel they can afford for now. The chlorine residual left in the water by WaterGuard protects the quality of stored water.*

Cleaning Instructions for the Container:

- ✚ Clay pots should be cleaned out with a sisal twine EACH TIME water is added, preferably with detergent.
- ✚ Jerry cans should be cleaned at least once a week to remove bio-film build-up as follows:
 1. Pour 1-2 litres of water into the container.
 2. Add double the usual dose of WaterGuard (e.g., two capfuls instead of one)
 3. Add hard grains of rice or gravel
 4. Agitate vigorously. (This step is key!)
 5. Pour out solution.

III. Behavior Change Techniques

*****Behavior change is required for the positive impacts of the SWS and hand washing to take effect!**

Aspects to consider when dealing with behavior change:

- Cultural issues / acceptability
- Awareness of a problem
- Patient preferences

Use motivational interviewing techniques to promote the Safe Water System and Hand Washing with Soap. Motivational Interviewing involves the following elements described in the acronym ‘FRAMES**’:**

Feedback
Responsibility
Advice
Menu (of options)
Empathy
Self Efficacy



Photo by: Amy A. Parker

1. **Providing Feedback** involves non-judgmental sharing of local data on diarrhea rates and water quality within the patients' community. This also includes education on the causes of diarrhea.
2. **Responsibility** for change within each patient is emphasized.
3. **Advice** is given (but in a professional, non-threatening manner). The patient is free to decide how the suggestions fit his or her own personal lifestyle and to accept or reject the advice.
4. **Menu** of options is given for dealing with the problem.
5. **Empathic** listening style is important to build the trust of the patients.
6. **Self Efficacy**, or self confidence in achieving change, is supported. It is important to support any thought, desire, or attempt at behavior change by expressing beliefs that change is achievable for that person.



Photo by Amy A. Parker

The components of motivational interviewing also involve using the following:

- **Open-ended questions** (These are questions such as, “How do you feel about trying a different water treatment method?”) These are NOT yes/no questions!
- **Affirmations** (Positive statements, such as: “Yes, that is very good.”)
- **Reflective listening** (Repeating what your patient has just said, such as “What I hear you telling me is that you think WaterGuard is too expensive.”)
- **Summarizing** (Listening to what your patient says and then sum it up concisely.)

Your role as a health care provider in encouraging behavior change from your patients:

- Serve as positive role models for your patients. Incorporate the changes into your own lifestyle, so that when patients see you out in the community using the SWS and proper hand washing techniques, they'll want to try it too.



Photo by Amy A. Parker

- Do NOT TELL your patients what to do. Instead, it is more effective to encourage them by reinforcing the benefits of using the SWS and proper hand hygiene.
- Do NOT use scare tactics. Positive reinforcement and knowing your facts goes a long way in encouraging change.
- Listen to the concerns of your patients and constructively address their questions or comments. AVOID argumentation.
- Be open-minded and patient. Do not expect change to happen overnight. Patients will change their behavior when they are ready to do so. Be supportive in the meantime and continue teaching the message...you never know when the message will finally hit home with a patient and motivate him or her to change!

- Encourage patients to share the SWS message with their family, neighbors, and friends.

Motivating Patients for Behavior Change



Photo by: Amy A. Parker

- ✚ Identify obstacles that need to be overcome before behavior change can happen.
- ✚ Your role as the nurse/public health technician in facilitating behavior change:
 - 1) Increase knowledge of your patients.
 - 2) Motivate your patients to adopt hand washing practices.
 - 3) Be role models in the community on proper hand washing and SWS use.

Addressing Barriers to Change (Barriers to Purchase or Use the SWS)



Photo by Amy A. Parker

- ✚ If your patients claim that WaterGuard is too expensive:
 - 1) Explain that it is cheaper than taking your child to the clinic for treatment or cheaper than boiling all drinking water.
 - 2) It can save your life by preventing cholera.
 - 3) It will save you time that you have to take off from work by taking your child to the clinic.
 - 4) It costs about the same as one glass of beer and lasts for one to two months.
- ✚ If your patients state that their water “looks safe” because it is clear and comes from the tap:
 - 1) Even tap water can be contaminated.
 - 2) The germs are too small to see, so even if the water looks clear, it can be unsafe.
 - 3) Flow may be intermittent allowing contamination through leaks where pipes are connected. In addition, if it is a community tap, the water must be transported and stored which would allow for the possibility of recontamination.
- ✚ If your patients state they have never before treated their water, why should they start now?
 - 1) If your child has ever had diarrhea, it may have been caused by contaminated drinking water.
 - 2) Your water can have germs at any time. You should always treat your water.
- ✚ If your patients think that they only need to treat their water during the dry season:
 - 1) Reinforce that water needs to be treated year-round, because even if their water looks clean, it can have germs that cause diarrhea at any time of the year.

Frequently Asked Questions:

What do I do if the water is cloudy?



A woman filtering her water.
Photo by: Amy A. Parker

Filter water with a cloth. (To make a filter, fold the cloth over a number of times, enough to remove dirt but still allow water to flow through easily.)

OR

Use a settling technique (Let water settle overnight or for a few hours and then carefully pour the cleared water into a new container, leaving the sediment behind.)

Why does my water taste like chlorine and what can I do about it?



Photo by: Amy A. Parker

Teach your patients that the smell of chlorine means that the water is safe to drink.

OR

Teach them that if they treat their water in the evening for the following day, the chlorine taste will be less strong.

Can I just use commercially-prepared bleach instead?

No, because the concentration varies so it is difficult to ensure correct application. Commercial bleach may contain chemical additives that may not be intended for human consumption.

WaterGuard is formulated specifically for drinking water and is cheaper than commercial bleach.

~Components of Proper Hand Washing~

Benefits of integrating proper hand washing into daily hygiene routine:

1. **Hand washing with soap is the number one prevention against spread of infection from person to person.**
2. Hand washing with soap is the cornerstone of infection-control practice.

Key elements to remember when teaching your patients about hand washing:

1. Use soap every time you wash your hands.
2. How you wash your hands is just as important as when you wash them. (Just rinsing them is not enough!)
3. Unwashed (or poorly washed) hands can transfer harmful microorganisms to other people.
4. Discourage multi-use of wash basins from eldest generations to youngest generations. Instead, change water between each person.
5. Encourage patients to share the hand washing message with their family, neighbors, and friends.

When should you tell your patients to wash their hands?



Photo by: Amy A. Parker

1. After going to the latrine
2. After cleaning up a child or a child's stools
3. Before preparing or eating food
4. Before and after tending to someone who is sick
5. After handling uncooked foods, particularly raw meat, poultry, or fish
6. After blowing your nose, coughing, or sneezing
7. After handling an animal or animal waste
8. After handling garbage
9. Before and after treating a cut or wound
10. Before and after feeding an infant/ child.

Hand Washing Training

1. Hand washing is best learned through watching and doing.
2. Demonstrate proper hand washing with each patient (step-by-step) then ask patients to do it while you coach them.
3. Give feedback

Proper Hand Washing Steps:



1. Wet hands



2. Use Soap



3. Briskly rub hands and between fingers for 10-15 seconds.



4. Rub under fingernails



5. Rinse



6. Dry hands with a clean towel.



7. If no clean towel is available, air dry hands

Steps in Proper Hand Washing Techniques:

1. Place your hands together under water (warm water if possible)
2. Use soap
3. Rub your hands together for at least 10-15 seconds. Wash all surfaces thoroughly, including wrists, palms, backs of hands, fingers, and under the fingernails.
4. Clean the dirt from under your fingernails.
5. Rinse hands.
6. Dry your hands completely with a clean towel if possible (this helps remove the germs). Pat your skin rather than rubbing to avoid chapping and cracking.
7. If no clean towel is available, air dry hands.

An Important Review of What Your Patients Should Know about the SWS and Hand Washing with Soap

Patient Education Messages:

- ✚ Always drink water treated with WaterGuard.
- ✚ WaterGuard will help prevent diarrhea in your family.
- ✚ WaterGuard will kill bacteria and viruses (germs) in your water that cause diarrhea--including cholera.
- ✚ WaterGuard should be dosed according to the instructions.
- ✚ Store your water in a closed container with a lid to avoid recontamination.
- ✚ Even tap water or water that looks clean can have germs. All drinking water must be treated.
- ✚ WaterGuard is a household-based water treatment intervention. It is not suitable for treatment of water in boreholes or wells.
- ✚ When traveling, bring treated water with you.
- ✚ Treat your water year round, not just during the rainy season.
- ✚ Use treated water for washing fruits, vegetables, and other foods consumed raw which potentially reduces the incidence of food-borne infections. Also, use treated water for washing kitchen utensils.
- ✚ WaterGuard is a PREVENTION for diarrhea, NOT a treatment for diarrhea. An important part of treatment of diarrhea is with the use of oral rehydration solution (ORS). Oral rehydration therapy encompasses two phases of treatment:
 1. A rehydration phase, in which water and electrolytes are administered as oral rehydration solution (ORS) to replace existing losses.
 2. A maintenance phase, which includes both replacement of ongoing fluid and electrolyte losses and adequate dietary intake.
- ✚ Hand washing with soap is the most important means of preventing the person-to-person spread of disease and infection.
- ✚ Encourage hand washing with soap after using the latrine, cleaning up after a child, and before preparing or eating food.



Photo by Amy A. Parker

Summary

- ✚ People (especially children) in developing countries continue to be at risk for illness and death due to diarrheal diseases, but the Safe Water System has been shown to reduce diarrheal disease risk by about half in field trials.
- ✚ The Safe Water System is inexpensive, simple to use, adaptable to different conditions, and can be implemented in a relatively short period of time.
- ✚ As health care providers, your patients trust you and listen to what you have to say. By introducing the Safe Water System and hand washing with soap into your patient education sessions, you are helping to improve the health and quality of life of your patients.
- ✚ It is important to repeat the message daily so that each person who enters the clinic has the opportunity to learn about the Safe Water System and hand washing with soap. Also, some people need to hear the message more than once before they actually change their behaviors.
- ✚ By being leaders and role models in implementing the Safe Water System and hand washing with soap, you are directly contributing to the development and productivity of your patients and the community.



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