

Community Hygiene, and Sanitation Unit 1

Reviewer — Importance and Role of Water in Health and Disease + Hydrologic Cycle (CH 57)

1. Water and Health: The Basic Connection

Water is essential for drinking, food preparation, personal hygiene, and sanitation. When water becomes contaminated, it can become a pathway for disease transmission.

Possible Contaminants

- **Bacteria, Viruses, Parasites,** and **Harmful Chemicals.**

Diseases Associated with Unsafe Water

- **Cholera, Typhoid Fever,** and **Acute Diarrheal Diseases.**

How Disease Can Spread

- Contaminated Water → Exposure to Pathogens → Possible Infection → Diarrhea/Vomiting/Fever → Fluid Loss → Dehydration.

2. Water: An Essential Nutrient

Water is an essential substance that our body needs to survive and function properly. It makes up a large portion of the human body and is involved in almost every body process.

- **Temperature Regulation:** helps maintain normal body temperature (e.g., sweating cools the body).
- **Transportation:** helps transport nutrients and other substances (e.g., blood carries nutrients).
- **Waste Removal:** helps eliminate waste products (e.g., urine removes waste).
- **Digestion:** supports digestion and movement of food.
- **Lubrication & Protection:** helps reduce friction and protect tissues (e.g., helps joints move smoothly).
- **Metabolism:** supports many chemical reactions during metabolic processes.

3. Properties of Water (H₂O)

Water is a clear, odorless, and tasteless liquid compound made of two hydrogen atoms and one oxygen atom (H₂O).

- **Universal Solvent:** dissolves more substances than any other liquid.
- **Unique States:** exists naturally as solid (ice), liquid, and gas.
- **Global Presence:** covers 71% of the Earth's surface.
- **Human Body:** comprises 60% to 75% of total body weight.

4. Maintaining Water Balance

The body constantly takes in and loses water. Health depends on keeping these processes reasonably balanced.

Water Intake

- Drinking water and other beverages (primary source), fruits and vegetables, and foods containing water.

Water Output

- Urination (kidneys remove excess water), sweating (cooling the body), breathing (water vapor lost in air), and feces (small amount of water lost).

5. Hydration vs. Dehydration

- **Hydration:** *having enough fluid in the body to support normal body functions.*
- **Dehydration:** *occurs when the body loses more water than it takes in.*

Common Causes of Dehydration

- Not drinking enough fluids, excessive sweating, vomiting, diarrhea, fever, prolonged physical activity, hot weather.

Signs of Dehydration

- Mild/Moderate: **thirst**, dry mouth, dark yellow urine, reduced urination, fatigue, dizziness, headache.
- Severe: **very little/no urine**, extreme weakness, confusion, fainting, rapid heartbeat.

6. The Hydrologic (Water) Cycle

Water moves continuously through the environment in a repeating cycle made up of several stages:

- **Evaporation:** water from the ocean/sea rises into the air as vapor due to heat from the sun.
- **Condensation:** water vapor cools and forms clouds.
- **Precipitation:** water falls back to earth as rain (carried by wind).
- **Infiltration:** water seeps into the ground through mountains and soil.
- **Surface Runoff:** water flows over land back into rivers and eventually the ocean/sea, completing the cycle.

7. Water Quality Assessment

Water examination may involve three main areas: **physical examination**, **chemical analysis**, and **microbiological analysis**.

1. Physical Quality — Questions to Ask

- Is it clear? Does it have an unusual color? Does it have an unusual odor? Is it aesthetically acceptable?

2. Chemical Quality — Questions to Ask

- Are harmful chemicals present? Is the mineral content acceptable? Is the water chemically suitable for its intended use?

3. Microbiological Quality — Questions to Ask

- Are disease-causing organisms present? Is there evidence of fecal contamination?

Important: physical acceptability does not guarantee microbiological safety — clear, odorless water can still carry disease-causing organisms.

8. Basic Principles of Water Sampling

Students should understand that the quality of the sample affects the reliability of the test result.

- Use an appropriate sterile container for microbiological testing.
- Avoid contaminating the inside of the container or cap.
- Collect the sample according to the testing protocol.
- Properly label the sample.
- Record relevant information, such as: source, location, date, time, and collector.
- Transport the sample appropriately and promptly to the laboratory.

9. Water Treatment

Water treatment aims to make water suitable for its intended use and, for drinking water, reduce health risks from contaminants.

Treatment Depends On

- Source, type of contamination, intended use, available resources, and local conditions.

10. Case Study: The Contaminated Shallow Well

A rural community gets drinking water from a shallow well. After several days of heavy rain, the water becomes cloudy. Some families continue drinking it without treatment. A few days later, several children develop diarrhea, vomiting, and abdominal discomfort.

- Problem: **possible contamination** of the shallow well after heavy rainfall.
- Possible Causes: surface runoff entering the well, poorly protected well, nearby sources of contamination, lack of water treatment, unsafe water storage/handling.
- Possible Health Effects: **diarrhea**, **vomiting**, abdominal discomfort, **dehydration**, and possible outbreaks of water-related disease.

11. What Should the Community Do?

- Stop using the suspected contaminated water for drinking.
- Use a safe alternative water source.
- Treat drinking water appropriately according to local public-health guidance.
- Store treated water safely in clean, covered containers.
- Seek medical attention for severe or persistent symptoms.

12. How to Prevent Water-Related Diseases (At Home)

- **Use safe water**: use a reliable and protected water source.
- **Treat water when necessary**: use an appropriate water-treatment method based on health-authority guidance.
- **Store water safely**: keep water in clean, covered containers.
- **Practice hand hygiene**: wash hands at important times, especially after using the toilet and before preparing or eating food.
- **Practice food safety**: use safe water for drinking and food preparation.

13. The Midwife's Role in Community Water Safety

The midwife helps the community prevent disease before it becomes a bigger health problem.

- **Health Education**: teach safe water, hygiene, sanitation, and dehydration prevention.
- **Counseling**: guide families on hydration, safe water practices, and danger signs.
- **Environmental Assessment**: identify unsafe water sources, drainage, toilets, and waste-disposal risks.
- **Disease Prevention**: reduce exposure to contaminated water and promote early action.
- **Community Participation**: encourage families to join sanitation and water-safety activities.
- **Coordination**: work with BHWs, RHU, LGU, and other health workers/agencies.
- **Referral**: refer clients with serious symptoms or danger signs for appropriate care.

14. Key Takeaways

- Water is essential for life and normal body functions — it makes up a large portion of our body and is involved in almost every body process.
- Dehydration happens when the body loses more water than it takes in. It can cause thirst, dry mouth, dark yellow urine, fatigue, dizziness, and headache. Severe dehydration may cause confusion, fainting, and rapid heartbeat.

- Unsafe water can become a pathway for disease transmission — contaminated water may contain bacteria, viruses, parasites, or harmful chemicals and can be associated with diseases such as cholera, typhoid fever, and acute diarrheal diseases.
- Safe water practices help prevent water-related diseases — using safe water, treating water when necessary, storing it properly, practicing hand hygiene, and following food safety practices are important.
- Water moves continuously through the **hydrologic cycle** — the major stages are evaporation, condensation, precipitation, surface runoff, and infiltration.

Legend: **Blue Bold** = category headings **Red Bold** = key term *Italic + Underline* = definition