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Environmental Health and Sanitation

Community Health Nursing

Safe water supply, water purification, disposal of waste, sewage disposal, food sanitation, housing, ventilation, air pollution, noise pollution, vector control and environmental hygiene.

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CHAPTER 10 / COMMUNITY HEALTH NURSING 10. Environmental Health and Sanitation

1. Definition and importance

Environmental health concerns physical, chemical, biological and social conditions that affect health. Sanitation is safe management of excreta, waste and hygiene conditions. Contaminated water, unsafe food, poor housing, air pollution and vectors contribute to preventable disease.

2. Safe water supply and purification

A safe water supply should be adequate, accessible and free from harmful microbial and chemical contamination. Sources include protected wells, piped supplies, treated surface water and rainwater systems. Protect catchments, prevent cross-connections and test water quality. E. coli should not be detectable in a 100 mL drinking-water sample under WHO guidance. [16]

Purification methods

Method	Principle/limitation
Sedimentation	Settles suspended particles; not reliable disinfection
Filtration	Removes particles and some organisms, depending on filter
Boiling	Rolling boil kills most disease-causing organisms; does not remove dissolved chemicals
Chlorination	Disinfects when appropriate dose, contact time and residual are achieved
Reverse osmosis	Removes selected dissolved contaminants; maintenance required

Chlorine dose depends on product, water quality and demand; use public health instructions rather than improvised dosing. Store treated water in clean covered containers and avoid dipping contaminated hands or cups.

3. Excreta and sewage disposal

Safe toilets, septic tanks with appropriate treatment, sewers and sewage treatment prevent faecal contamination. Sewage treatment typically includes screening, primary settling, biological secondary treatment and further treatment/disinfection when required. Avoid untreated discharge, unsafe manual cleaning and open defecation; arrange safe maintenance by trained services.

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4. Solid and biomedical waste

Segregate organic, recyclable and residual waste according to local rules; compost suitable organic material and use authorized disposal. Healthcare waste must not enter household recycling. Indian biomedical colour categories: yellow for specified anatomical/soiled waste; red for contaminated recyclable plastics; white translucent for sharps; blue for designated contaminated glass and metal implants. Follow current biomedical waste rules and local collection arrangements.

5. Food sanitation

Keep hands, surfaces and utensils clean; separate raw and cooked food; cook thoroughly; maintain safe temperatures; use safe water and ingredients. Protect food from insects and rodents. Suspected foodborne outbreaks need notification, samples and investigation rather than indiscriminate antibiotics.

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6. Housing, ventilation and pollution

Adequate ventilation, daylight, drainage, safe cooking fuel, structural safety and reduced overcrowding improve health. Air pollutants include particulate matter, smoke, carbon monoxide and gases. Reduce exposure through clean fuels, source control and ventilation; monitor air-quality advisories. Noise may cause hearing loss, sleep disruption and stress; reduce at source and use occupational protection when appropriate.

7. Vector and rodent control

Vector	Prevention
Anopheles (malaria)	Insecticide-treated nets, spraying where indicated, larval source management
Aedes (dengue/chikungunya)	Weekly removal of standing water, covered tanks, daytime bite protection
Culex (filariasis/JE in relevant settings)	Environmental management, bite protection and programme measures
Flies	Food protection, waste removal and sanitation

Integrated vector management combines environmental, biological, chemical and personal measures; avoid indiscriminate insecticide use.

8. Nursing importance

Assess water and sanitation, promote handwashing, educate on water storage and food safety, identify vector habitats, report contamination or clusters, coordinate local authorities and evaluate behavior and service improvements.

9. Water, sanitation and hygiene assessment

Assess water source, collection, transport, treatment, storage and household access. A safe source can become contaminated during collection or storage. Store treated water in a clean covered container, preferably with a safe dispensing method. Chlorination must follow an approved dose for the product, water quality and contact time; do not rely on a universal number of drops. Turbid water may need settling or filtration before disinfection.

Environmental problem	Preventive action
Faecal contamination	Safe toilets, sewage management, handwashing and protected water sources.
Food contamination	Clean preparation, separation of raw and cooked food, thorough cooking and safe storage.
Mosquito breeding	Empty, cover and clean water containers; targeted vector control.
Indoor smoke	Clean cooking fuels and effective ventilation where available.
Noise exposure	Control noise at source, limit exposure and use suitable protection.

10. Community sanitation survey

Walk through the locality with permission and residents' participation. Identify open drains, contaminated water points, waste accumulation, stagnant water and housing barriers. Prioritize hazards by probable health impact and feasibility. Coordinate repair or removal with local authorities and reassess the sites. Avoid blaming residents when sanitation infrastructure is inadequate.

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Waste hierarchy

Prevent or reduce waste at source; reuse or recycle safe materials; treat and dispose of residual waste through authorized systems. Infectious healthcare waste must be segregated separately from general household waste.

11. Important Examination Questions

Long Answer Questions

1. 1. Explain water purification, sewage disposal and environmental sanitation.
2. 2. Discuss vector control.
3. 3. Describe safe water handling from source to point of consumption.
4. 4. Explain an environmental sanitation survey and corrective measures.

Short Answer Questions

1. 1. Food hygiene
2. 2. ventilation
3. 3. air/noise pollution
4. 4. biomedical segregation
5. 5. Water storage safety.
6. 6. Waste hierarchy.
7. 7. Food cross-contamination.
8. 8. Integrated vector management.

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Very Short Answer Questions (with answers)

1. 1. Aedes breeding prevention? Remove standing water.
2. 2. E. coli drinking-water target? None detectable in 100 mL.
3. 3. Sharps bin? White translucent.
4. 4. What does WASH stand for? - Water, sanitation and hygiene.
5. 5. Which mosquito commonly breeds in containers? - Aedes.

12. Quick Revision

- Safe water requires safe collection, treatment and storage.
- Sanitation breaks faecal-oral transmission.
- Control vectors at breeding and exposure points.
- Environmental problems require intersectoral action.

Conclusion

Environmental protection interrupts disease transmission and promotes sustainable community health.

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Practice questions

Choose one best answer. The answer key and explanations follow the questions.

1. Which limitation must be explained when recommending boiling for drinking-water treatment?

A. It cannot kill disease-causing organisms
B. It replaces the need for clean storage
C. It removes every dissolved contaminant
D. It does not remove dissolved chemicals

2. Which water-treatment method mainly settles suspended particles and is unreliable for disinfection?

A. Sedimentation
B. Chlorination
C. Boiling
D. Appropriately maintained reverse osmosis

3. Which action helps prevent contamination after water has been treated?

A. Return used drinking cups to the water
B. Store it in a clean covered container
C. Dip unwashed hands into the container
D. Keep the container uncovered near waste

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Answer key and explanations

1. D - It does not remove dissolved chemicals

Boiling kills most disease-causing organisms but does not remove dissolved chemicals.

2. A - Sedimentation

Sedimentation removes settling particles but does not reliably disinfect water.

3. B - Store it in a clean covered container

Safe storage prevents recontamination of treated water.

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