

Environmental Health Nursing Case Studies

Study #3: Water

Observed Indications of Potential Problems

Drinking water quality has been a hot topic for the local news media lately. Most of the homes on the outskirts of your small city rely on well water. There have been high levels of nitrates found in some of the well water, and people have been advised to drink bottled water. One of your neighbors has read that 10% of all gas stations in the country have leaking underground storage tanks, and she's concerned about the possibility of leaks affecting her well water. One of your clinic patients, who lives in the city and pays for public drinking water, has recently read that there can be problems with the public (non-well) drinking water from the disinfectants that are used to reduce the pathogens in the water. Other clinic patients, including pregnant and nursing mothers, frail elderly people and patients infected with HIV, are concerned about the effect of water contamination on their health.

Concerns Expressed by Community Members

- Where do nitrates come from, and what are the health problems associated with them?
- What are the risks associated with leaking storage tanks? Is it a problem if fuel oil gets into drinking water? How do you know if there is a problem with leaking storage tanks in your community?
- Are there really risks from the disinfectants that keep water germ-free?
- Are there special risks for pregnant and nursing mothers? What about risks associated with baby formula? Do elderly or chronically ill people have special concerns?

Assessment

What information about potential health risks are you able to find from the resources cited below, or other resources? What information is missing? What would be possible approaches to obtaining further information?

(Assume that the primary contaminant from leaking storage tanks in this community is fuel oil. Contaminants associated with fuel oil are MTBE and other oxygenates.)

Planning and Intervention

Based on your research and assessment, write a brief report for the community members. Explain the basic concepts of risk and risk assessment. Give them the information that you have found related to their concerns, citing and describing your sources. Make suggestions to them for next steps. What further information do you think they need, and how can they get it? What steps do they need to take to protect their health? How would they approach these issues? Who in the community might be of assistance?

Internet Resources

Note: Any research should include a literature search of professional journals. You may wish to use PubMed and other resources at www.toxnet.nlm.nih.gov, or perform a search at your school library.

Local sources of pollution:

- Environmental Protection Agency – www.epa.gov (see “Where You Live”)
- Environmental Protection Agency – Toxics Release Inventory): www.epa.gov/tri
- Agency for Toxic Substances and Disease Registry (ATSDR): www.atsdr.cdc.gov (see “Hazardous Waste Sites”)

Specific chemicals:

- Agency for Toxic Substances and Disease Registry (ATSDR): www.atsdr.cdc.gov (see “ToxFAQ’s” and “Toxicological Profiles”)
- National Library of Medicine – TOXNET: www.toxnet.nlm.nih.gov
- National Institute of Environmental Health Sciences (NIEHS): www.niehs.nih.gov → National Toxicology Program → Chemical Health and Safety Information

Risk assessment:

- Environmental Protection Agency (EPA) – Integrated Risk Information System (IRIS): www.epa.gov/IRIS (see “Introduction”)
- National Library of Medicine – Toxicology Tutorial: www.sis.nlm.nih.gov

Drinking water (including disinfectant byproducts [DBP’s], MTBE):

- Environmental Protection Agency (EPA): www.epa.gov/safewater
- NSF International: www.nsf.org
- National Institute of Environmental Health Science (NIEHS): www.niehs.nih.gov (search “drinking water”, also National Toxicology Program factsheets)

Nitrates:

- Centers for Disease Control and Prevention (CDC): www.cdc.gov (search “nitrate”)
- University of Nebraska: www.ianr.unl.edu (search “nitrate and drinking water”)

Underground Storage Tanks:

- Environmental Protection Agency: www.epa.gov/oust

This case is from the Kellogg Faculty Development in Environmental Health Workshop materials. The case study was developed at the Environmental Health Education Center of the University of Maryland School of Nursing. For more information, see envirn.umaryland.edu.