

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

December 9, 2021

**Drinking Water Petroleum Exposure
Health Care Provider Evaluation and Treatment Guidance**

Dear Health Care Provider:

On November 28, 2021, the Hawaii Department of Health (DOH) and the Hawaii Poison Center began receiving calls from residents about the smell of fuel in their tap water. Since then, DOH has recorded over 500 reports. The contamination is limited to the Navy's Joint Base Pearl Harbor-Hickam (JBPHH) water distribution system and is primarily affecting families living in military housing served by this water system. Residents have reported a variety of health effects. Initial water testing results demonstrate evidence of petroleum contamination. Water testing is ongoing.

On November 29, DOH released a health advisory recommending that anyone served by the JBPHH water distribution system avoid using the water for any consumption purposes including drinking, cooking, or oral hygiene. Residents that can detect a fuel smell in their water are also advised to avoid using the water entirely, including avoiding bathing, showering, washing dishes or laundry. The advisory applies to residents and household pets. This advisory remains in place and will be updated as conditions evolve and DOH obtains evidence the water is safe to use.

Many affected people are seeking medical care and screening via the Military Health Services but many community health care providers are caring for these patients as well. The information below is designed to help providers in the assessment, care and education of patients exposed to petroleum contaminated water.

If you have questions about this contamination incident, this document or a case, please contact DOH Toxicologist Diana Felton MD at diana.felton@doh.hawaii.gov. The Hawaii Poison Center (800-222-1222) is also available 24/7 for advice on clinical cases.

Petroleum Hydrocarbon Exposure:

Exposure to petroleum hydrocarbons in water can occur via the following routes:

- ingestion through drinking, cooking, and oral hygiene
- dermal via bathing and showering
- inhalation via vapors from showers or potentially via drinking and aspiration.

Typical symptoms from exposure to petroleum hydrocarbons include:

- **CNS:** Headaches, dizziness and lightheadedness (ingestion or inhalation plus odors)
- **Respiratory:** cough and shortness of breath, hydrocarbon pneumonitis (inhalation)
- **Gastrointestinal:** Upset stomach, nausea, vomiting, diarrhea and abdominal cramping (ingestion)
- **Skin:** irritation and rashes (dermal)
- **Mucous membranes:** irritation, epistaxis (ingestion)

Hydrocarbon pneumonitis is a severe chemical pneumonitis that mimics pneumonia caused by inhalation or aspiration of hydrocarbons. It is rapid in onset and is often accompanied by fever and significant infiltrates on chest x-ray.

The chemical make-up and viscosity of the hydrocarbon in the water impacts the risk of chemical pneumonitis from ingestion or inhalation. This explains why a person can drink motor-oil with only minor gastrointestinal effects (high viscosity, low aspiration risk), while a child that unintentionally drinks a sip of lamp oil or lighter fluid (low viscosity - easily aspirated) can develop a severe and even fatal hydrocarbon pneumonitis.

Long-term health effects from exposures to petroleum hydrocarbons in drinking water is not well understood. Based on current data, people exposed to contaminated drinking water in this incident are not expected to experience long-term health effects.

Similarly, data on reproductive and developmental health effects from this type of exposure is limited. Petroleum hydrocarbons of the types suspected to be in the water are not known teratogens or carcinogens, but data is limited.

Clinical Approach: Patients presenting with symptoms possibly related to exposure to the water should be evaluated with a thorough history and physical. History should include all pertinent details of symptom onset and evolution, potential exposures including occupational, and additional symptoms. Care should be taken to not focus solely on the potential exposure as an explanation of the patient's symptoms.

Biological Testing: Blood and urine testing for petroleum hydrocarbons is limited and not readily available. Standard urine drug screens do not detect hydrocarbons. Hair testing is not recommended. Testing is unlikely to provide exposure information or impact management. Depending on the patient's presentation, laboratory testing can include: CBC, electrolytes, creatinine, and liver enzymes in severe cases. Diagnostic testing should be driven by the clinical evaluation. For patients presenting with respiratory symptoms after suspected exposure to petroleum hydrocarbons, a chest x-ray should be performed at least 6 hours after initial symptom onset.

Treatment and Disposition: Treatment is symptomatic and supportive. Disposition should be tailored to the clinical evaluation and include telling the patient to stop using the water until declared usable by DOH. Symptoms related to petroleum hydrocarbons in drinking water should

resolve rapidly (within 1-2 days) of cessation of exposure. Symptoms that do not improve may be an indication for further evaluation and work-up for other causes.

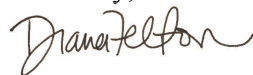
Documentation:

- Please carefully document the patient's symptoms and potential or assumed exposures in their medical record.
- Consider using ICD10 code Z77.111 *Contact with and (suspected) exposure to water pollution* in addition to the primary diagnosis code(s) for future identification and epidemiologic analysis.
- The Military Health Services is standing up an incident report registry that includes all people living in affected housing. Please advise your patients to follow up with the registry including any health surveys.

Resources:

- Updates from DOH: <https://health.hawaii.gov/about/navy-water-system-quality-updates/>
- Updates from the Military: <https://www.cpf.navy.mil/JPBPHH-Water-Updates/>
- Agency for Toxic Substances and Disease Registry Public Health Statement on Kerosene/Fuel Oils: <https://wwwn.cdc.gov/TSP/ToxFAQs/ToxFAQsDetails.aspx?faqid=515&toxid=91>
- Agency for Toxic Substances and Disease Registry Public Health Statement on JP-5, JP-8, and Jet-A Fuels: <https://www.atsdr.cdc.gov/toxfaqs/tfacts121.pdf>
- UChicago Hydrocarbon Poisoning fact sheet: <https://pedclerk.bsd.uchicago.edu/page/hydrocarbon-poisoning>

Sincerely,



Diana Felton, M.D.
State Toxicologist
Department of Health