Acute Mercury Poisoning from a Residential Exposure in Iowa, 2014
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Background
- Mercury exists in elemental, inorganic, and organic forms.
- Adverse health effects of mercury exposure are dependent on chemical form, dose, exposure duration and route, and age and health of the person exposed.
- In the United States, mercury poisoning typically occurs from ingestion of contaminated fish or from inhalation or absorption through skin because of an occupational exposure.
- From 2010-2014, 13 cases of elevated mercury exposure have been reported in Iowa.
- Current Iowa code requires reporting of blood mercury results ≥2.8 µg/dl to Iowa Department of Public Health.
- Exposure to elemental mercury through vapor inhalation is the major cause of health concerns.
- Poisoning symptoms from acute exposures include shortness of breath, tremors, nausea, vomiting, and weakness.
- Respiratory symptoms can progress to chemical pneumonitis, pulmonary edema, respiratory failure, and death.

Case Description
- In March 2014, a middle-aged man was admitted to a hospital with a diagnosis of acute respiratory failure secondary to chemical pneumonitis.
- His blood mercury level of 86 µg/L (reference value: <10 µg/L) was reported to Iowa Department of Public Health.
- Patient reported smelting old computer components by heating them with mercury and other chemicals in a frying pan to recover gold and silver.
- He learned the technique from YouTube® and the History® channel and purchased chemicals and mercury through the internet and locally.
- Performed smelting procedure in the kitchen.
- Developed throat irritation, shortness of breath, tremors and weakness.
- He was admitted in the intensive care unit for about two weeks and was ultimately discharged to a long-term-care facility on supplemental oxygen.

Public Health Action
- A month after exposure, an investigation of his house by the local fire department’s hazardous materials team reported the kitchen’s air mercury level at 0.8µg/m³ (Environmental Protection Agency [EPA] reference concentration <0.3µg/m³).
- Remediation was performed by using chemical wipes on kitchen surfaces, and heating and ventilating the kitchen with a negative pressure fan venting outside until air levels of mercury were <0.3µg/m³.
- All contaminated materials and remaining liquid mercury and other chemicals were removed and disposed of by using EPA-recommended guidelines.
- No other person was reportedly exposed.

Information on smelting technique on internet
- More than 12,000 YouTube® videos exist demonstrating techniques to recover gold from computer parts.
- Documentary films have aired on cable television channels presenting the mining processes, which use mercury to recover gold from soil.
- Additionally, a Google® search displayed ~200,000 websites explaining how mercury can be used to extract gold from computer parts.
- Very few videos have mention about the warning signs and safety measures.

Recommendations
- Electronics recycling for gold and silver recovery exposes individuals to dangerous chemicals including mercury and concentrated acids, and when done in a nonindustrial or home setting without appropriate safeguards should be discouraged.
- Healthcare providers should include mercury poisoning in their differential diagnosis for patients presenting with heavy metal exposure symptoms and a history of smelting activities.
- Precautionary guidance should be provided by clinical and public health practitioners whenever they become aware of these practices in their communities.
- Clinicians are also encouraged to report known or suspected exposures to their local or state public health contacts to ensure timely intervention as appropriate.