



Cadmium

Health Effects and Reducing Exposure

Learning Objectives

- ◆ Describe characteristics and identify sources of Cadmium
- ◆ Discuss Health Effects of Cadmium
- ◆ Determine actions for reducing exposures to Cadmium

Uses and Sources

- ◆ Naturally occurring element
- ◆ Blue – white solid or gray – black powder
- ◆ Found at 776 National Priority List sites
- ◆ Found in soil, rocks, coal and mineral fertilizers
- ◆ Used in batteries, silver solder, pigments, metal coatings, plastics, and electroplating

How Are We Exposed?

- ◆ Inhaling air emissions from industrial processes or incineration (ex. during production of zinc, lead, and copper)
- ◆ Eating contaminated food (such as shellfish, liver, kidney, vegetables, cereal)
- ◆ Ingestion of contaminated soil
- ◆ Ingestion of contaminated water

Health Effects: Inhalation



- ◆ Acute: flu-like symptoms with headache, chill, aching, and fever, “Metal-fume fever”
- ◆ Loss of smell
- ◆ Injure lungs, coughing, shortness of breath
- ◆ Fluid in the lungs
- ◆ Death

Health Effects: Ingestion

- ◆ Stomach irritation
- ◆ Nausea/vomiting
- ◆ Diarrhea



Health Effects: Kidney

- ◆ Cadmium is stored in the body for a very long time, mostly in the kidneys
- ◆ Damages kidney tubules
- ◆ Kidney stones
- ◆ End Stage Renal Disease



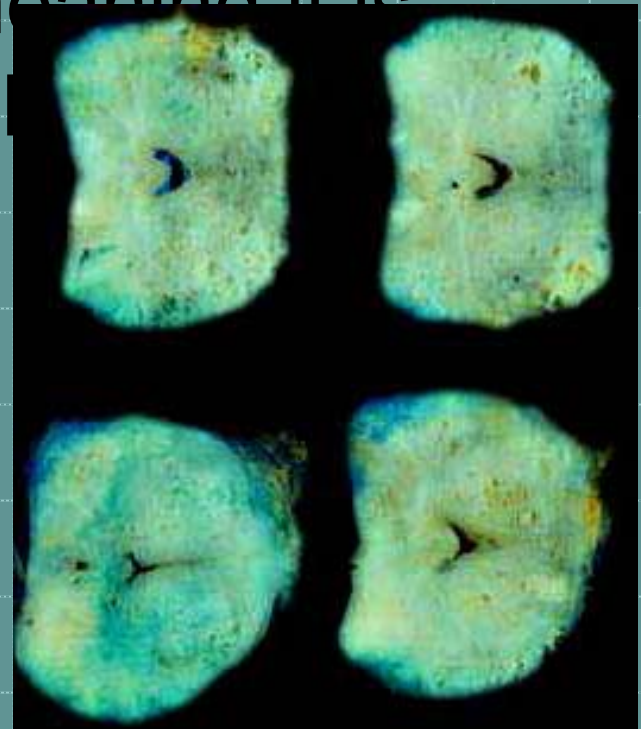
Health Effects: Bone Changes



- ◆ Osteoporosis due to depletion of calcium
- ◆ Fractures
- ◆ Effects of Cadmium are increased if person is iron-deficient

Health Effects: Cancer

- ◆ “Probable carcinogen” meaning it is likely to cause cancer in humans
 - ◆ Prostate
 - ◆ Kidney
 - ◆ Testes
 - ◆ Lung



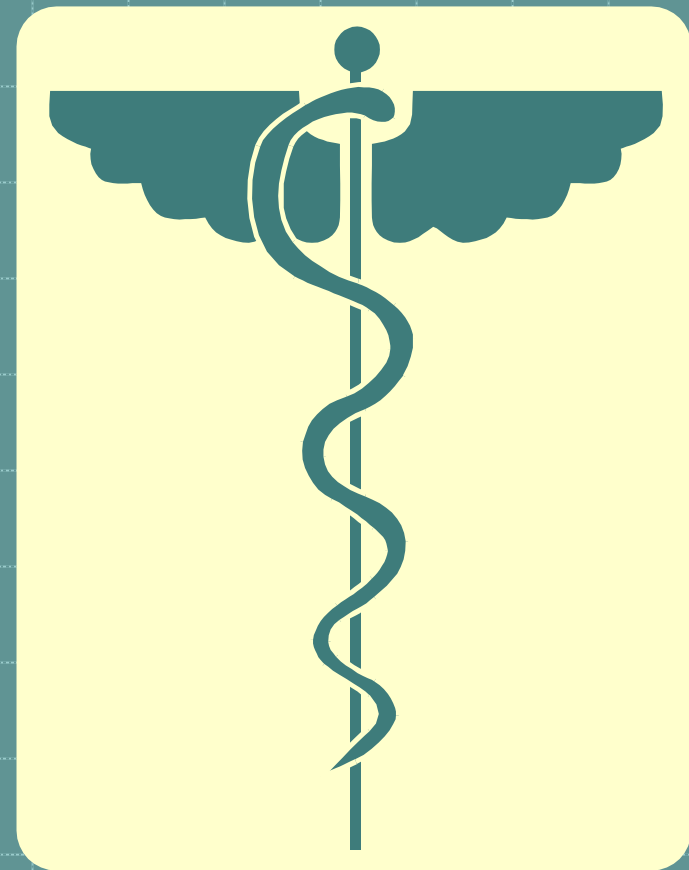
Health Effects: Reproductive

- ◆ Harms developing baby
- ◆ Damage testes
- ◆ Interrupt female cycle



Indication of Exposure

- ◆ Blood – indicates recent exposures
- ◆ Urine – can identify both recent and past exposures
- ◆ Hair and nails – unknown value of test results
- ◆ Monitor kidney function to evaluate recovery



What to Do?

- ◆ Eat a balanced diet to minimize intake of any one source that may be contaminated
- ◆ Wash vegetables thoroughly and limit intake of food grown in contaminated soil
- ◆ If exposed at work
 - ◆ Wash hands immediately and before going home
 - ◆ Change clothes at work, launder separately
 - ◆ Handle products safely - use proper protective equipment and adequate ventilation

Policy

- ◆ EPA Maximum Contaminant Level for water is 5 parts per billion (ppb)
- ◆ FDA limit for food colors is 15 parts per million (ppm)
- ◆ OSHA limit for air concentration is 5 mcg/cubic meter
 - ◆ Workers must be monitored for exposure and if elevations are found, actions must be taken to remove them from source of exposure

Resources

- ◆ ATSDR fact sheet www.atsdr.cdc.gov/tfacts5.pdf
- ◆ EPA fact sheet on Drinking Water
www.epa.gov/OGWDW/dwh/t-ioc/cadmium.html
- ◆ NJ fact sheet
www.state.nj.us/health/eoh/rtkweb/0305.pdf

In Review

- ◆ What is cadmium and how are we exposed to it
- ◆ How does cadmium effect our health
- ◆ How can we reduce our exposure to cadmium