

Arsenic

Health Effects and Reducing Exposure

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Learning Objectives

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

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Description

- ◆ Naturally occurring heavy metal found in earth's crust
- ◆ White to light gray powder
- ◆ Found at 1014 National Priority List sites, or "Superfund" sites

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Uses

◆ Medications

- ◆ Fowler's and Pearson's Solutions
- ◆ Treatment of psoriasis and asthma

◆ Wood preservative to prevent rot and insect damage

◆ Pesticides – insecticides, fungicides, herbicides

◆ Ceramic enamels, glass, and fireworks

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How Are We Exposed?

◆ Ingestion

- ◆ Drinking water
- ◆ Food grown in contaminated soil

◆ Inhalation

- ◆ Dust from sanding
- ◆ Smoke from burning arsenic treated wood

◆ Workplace

- ◆ Mining
- ◆ Metal processing by-product
- ◆ Burning fossil fuels



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Health Effects: Cancer

- ◆ Lung cancer
- ◆ Liver cancer
- ◆ Bladder cancer
- ◆ Renal cancer
- ◆ Prostate cancer
- ◆ Skin cancer
- ◆ Childhood leukemia

◆ ATSRD, 2000



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Health Effects: Cardiac



- ◆ Ischemic heart disease
- ◆ High blood pressure
- ◆ Vascular disease (Blackfoot disease)
- ◆ Anemia (low red blood cells and white blood cells)

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Health Effects: Skin

- ◆ Acute contact: redness and swelling
- ◆ Long term exposure: dark discoloration, scaly, and cancer



Health Effects: Other

- ◆ Diabetes
- ◆ Nerve damage – “pins and needles”
- ◆ Sore throat, lung irritation, erosion of nasal septum
- ◆ Nausea and vomiting
- ◆ Possible danger to unborn baby
- ◆ Causes some cancer cells to self – destruct

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Indication of Exposure

- ◆ Urine – most accurate test for exposure within the last few days
- ◆ Blood
- ◆ Hair and nails – identifies high levels of exposure or exposure over 6 –12 months

How to Reduce Risk

- ◆ Avoid products with arsenic
- ◆ Wash vegetables thoroughly that are grown in contaminated soil
- ◆ Have drinking water tested and treat if needed, or use an alternative source
- ◆ Wear protective equipment if sanding pressure treated wood
 - ◆ Wood preservative industry voluntarily agreed to stop making arsenic – based pressure treated wood
- ◆ If exposed at work shower and change clothes before leaving

Policy

- ◆ Safe Drinking Water Act, 1974
www.epa.gov/safewater/sdwa/sdwa.html
- ◆ January 2001, EPA's maximum contaminant level (MCL) for arsenic was lowered from 50 parts per billion (ppb) to 10 ppb, but the rule will not be enforceable until 2006. Also, research is showing that 10 ppb may not be low enough to protect health

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Policy



- ◆ OSHA 8-hour day/40-hour week air level for worker exposure is 10 mcg/m³, measured by air monitoring.

Resources

- ◆ ATSDR ToxFAQs
<http://www.atsdr.cdc.gov/tfacts2.pdf>
- ◆ New Jersey Fact Sheet
www.state.nj.us/health/eoh/rtkweb/0152.pdf
- ◆ EPA IRIS Report www.epa.gov/iris/subst/0278.htm
- ◆ Environmental Defense Fund's Scorecard
www.scorecard.org
- ◆ World Health Organization Fact Sheet
<http://www.who.int/inf-fs/en/fact210.html>

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In Review

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

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