Benzene

Health Effects and Reducing Exposure
Learning Objectives

- Describe characteristics and identify sources of benzene
- Discuss health effects of benzene
- Determine actions for reducing exposures to benzene
Uses and Sources

- Colorless liquid, sweet odor, evaporates quickly, highly flammable
- Found at 813 National Priority List Sites
- Produced during the burning of gasoline, cigarettes, volcanoes, and forest fires
- Used in plastics, resins, nylon, and synthetic fibers, some rubbers, lubricants, dyes, detergents, drugs, pesticides
How Are We Exposed?

- Inhalation
  - Gasoline vapors
  - Cigarette smoke (first and second hand)
  - Vapors from contaminated steam during showering or cooking

- Ingestion
  - Contaminated groundwater

- Skin contact
Health Effects: Acute Inhalation

- Drowsiness
- Dizziness
- Fast heart rate
- Headache
- Tremors
- Confusion
- Unconsciousness
- Death
Health Effects: Ingestion – High Level

- Food or water
  - Nausea/vomiting
  - Stomach irritation
  - Dizziness
  - Sleepiness
  - Convulsions
  - Fast heart rate
  - Death
Health Effects: Skin Contact

- Redness
- Sores
- Eye irritation
Health Effects: Chronic

- Decreased blood production
- Inability to fight infection
- Cancer: Acute myeloid leukemia
- Low birth weight
- Delayed fetal bone formation
- Injury to reproductive organs leading to infertility and difficulty getting pregnant
Indication of Exposure

- Breath test – only useful shortly after exposure, cannot detect low levels
- Blood and bone marrow – only indicates recent exposures
- Urine for benzene breakdown products, such as phenol – may not be specific for benzene exposure
How to Reduce Risk

- Avoid breathing or ingesting vapors
- Wear protective respiratory equipment and gloves
- Ensure adequate ventilation where fumes are present
- If exposed at work
  - Wash immediately and before going home
  - Change clothes at work, launder separately
Policy

- EPA Maximum Contaminant Level
  - Water: 5 parts per billion (ppb)
  - Air: 0.4 ppb
  - Goal for both air and water: 0 ppb
Policy

- OSHA 8 hour day/40 hour week limit for air exposure is 1 part per million (ppm) with a short-term air exposure limit of 5 ppm
- NIOSH recommends use of special respiratory equipment when handling benzene
Resources

- ATSDR fact sheet
- NJ fact sheet
  www.state.nj.us/health/eho/rtkweb/1929.pdf
In Review

- What is benzene and how are we exposed to it
- How does benzene affect our health
- How can we reduce our exposure to benzene
References

