Environmental Health: Preventing Exposure to Hazardous Substances

Presenter’s Name
Presenter’s Title

Title of Event
Date of Event

Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
What is environmental health?

- Environmental health focuses on the relationship between the environment and human health.
- The Agency for Toxic Substances and Disease Registry (ATSDR) protects human health from the effects of contaminants and hazardous substances found in the environment.
Why is this important to you?

- Having knowledge about environmental health will allow you to
  - Protect you and your family from hazards in your environment
  - Better understand the results of ATSDR’s investigations
  - Know what questions to ask the U.S. EPA, ATSDR, and other public health officials
What is a contaminant

- A substance that may be harmful to human health or the environment

- Other terms:
  - Hazardous substances
  - Pollution
  - Toxic substances

- We will also be discussing exposure to chemicals. Many chemicals can be hazardous substances.
What is exposure?

- An exposure occurs when a contaminant enters your body through
  - Breathing
  - Touching
  - Eating or drinking

- Remember, before a contaminant can harm you, it has to enter your body.
Not all exposures cause harmful effects

- Your general health plays a big role in how much you can be affected by being exposed to a contaminant.
- Other factors include:
  - the type of chemical you were exposed to,
  - the amount of a chemical you were exposed to,
  - how long the contact lasted,
  - how often you came into contact with a chemical, and
  - how the chemical entered your body.
1) Source of contamination

2) Contamination travels via air, food, water, or soil

3) Person comes into contact with contamination

4) Contamination enters the body by touching, eating, drinking, or breathing it in
Air, Water, Soil, and Food

WHERE IS CONTAMINATION IN THE ENVIRONMENT?
Where is Contamination in the Environment?
Most air pollutants come from man-made sources.

Some air pollutants also come from natural sources, such as forest fires and volcanoes.

Air pollution may cause breathing problems.

Air pollution can also bother your eyes and skin.
Water

- Harmful substances enter the water when rain or water washes them into rivers, lakes, streams, or the ground
  - Harmful substances can also be “dumped” into rivers, lakes, or streams

- When contaminants enter sources of groundwater and surface water, they can affect:
  - Drinking water
  - Part of the food chain
  - Human and aquatic life
Soil

- Chemicals such as pesticides can pollute the soil
- Polluted soil can affect the food you grow and eat and the water you drink
- Polluted soil can also spread through the air as dust particles.
 Humans may become exposed to contaminants if

- They eat food or drink beverages that have been exposed to chemicals or other contaminants.
- Plants and animals become exposed in their natural habitat and humans eat them.
Touching, Breathing, Eating, Drinking

PATHWAYS
Exposure Pathways

PATHWAY

- Touching
- Breathing
- Eating/Drinking
Touching

Contact with skin (dermal)

- Chemicals can enter your bloodstream through the pores, small cracks, or cuts in your skin
- Chemicals may irritate or burn your skin, exposing it to infection

Contact with eyes

- Some chemicals may burn or irritate your eyes
- Some chemicals may enter your body through the eye
Breathing (Inhalation)

Contaminants that enter the lungs
- can either have a direct effect on the cells of the lung
- or can be absorbed into the bloodstream

Contaminants that enter the body by breathing include
- gases, vapors, aerosols, particles, and fibers (such as asbestos)
Eating and Drinking (Ingestion)

- Food or drinks may have chemicals on or in them, and the chemicals can enter your body. These chemicals are absorbed, or taken in, by the digestive system.

- Hazardous substances can be ingested:
  - They are on hands, clothing, or hair.
  - They are on food or in beverages.
  - Children eat or drink chemicals or soil (pica).
  - Children’s hands pick up hazardous dusts.
  - You play or walk in a contaminated area.
THE EFFECT OF CONTAMINATION ON SENSITIVE POPULATIONS

Children, Pregnant Women, and Older Adults
Do toxic substances affect everyone the same?

- Some populations are at a higher risk of the effects of toxic substances than others. These populations include:
  - Young children
  - Older adults
  - Pregnant women
Children

- Children:
  - Are closer to the ground
  - Are more likely to put their hands in their mouths
  - May eat dirt
  - Have a limited diet

- Chemicals may be passed in breast milk

- Developing tissues of children are vulnerable
How to protect children from exposure

- Wash hands!
- Wash toys, bottles, and pacifiers often
- Keep poisons locked up
- Keep children away from pesticides, cleaning products, and other chemicals
- Watch where they play
Pregnant and Nursing Women

- Levels of immunity among pregnant and nursing women are lower than normal
- Anything the mother eats, drinks, or touches may be passed to her unborn child
- Contaminants are passed through breast milk
How to Protect Pregnant Women from Exposure

- Be careful what you eat
  - Eat fish that’s low in mercury
    - Shrimp, trout, tilapia, catfish, crab, calamari (squid), & wild Alaska salmon
  - Wash fruits and vegetables

- Wear gloves and a face-mask when gardening
- Have someone else do the painting
- Use no-VOC paint
- Avoid using pesticides
Older adults

- May have weak immune systems
- Tend to have more sensitive lungs
- May be less aware of environmental emergencies
- May have more trouble moving to a safer place
- May have poor nutrition
How to protect older adults from exposure

- Use clear, large print labels on all chemical products
- Do not store chemicals in food containers
- Do not store food in chemical containers
- Be aware of local concerns
At Home, At Work, & At Play

PREVENTING EXPOSURES
At Home

- **Home built before 1980?**
  - Asbestos
    - Insulation
    - Wiring
    - Shingles
  - Mercury
    - Thermostats
    - Thermometers
  - Lead
    - Paint
    - Plumbing

- **Avoid tobacco use and smoke**
Cleaning Products

- Open window or turn on fan when you clean
- Store safely away from children
- Keep in original containers
- Do not mix different products
- Read labels and follow directions

Alternatives to chemical cleaners
- Vinegar (mix with water for an all-purpose cleaner)
- Lemon juice (removes stains, serves as glass cleaner, deodorizer)
- Baking soda (mix with water for an all-purpose cleaner)
- Olive oil (furniture polish)
Heating your Home

- **Wood-burning fireplaces**
  - Have your chimney checked and cleaned
  - Do NOT burn treated wood

- **Kerosene Heaters**
  - Ventilate, follow instructions, and keep 16” away from anything flammable

- Don’t use gas ovens or burners to heat your home

- Never use gas or charcoal-fueled barbecues or grills in the house, carport, or garage

- Install carbon monoxide detectors
In the Garage

- Find a source for throwing out old oil
- Use paint thinners, kerosene, and gas with care
- Keep products in well marked (preferably original) containers
- Store all hazards out of reach of children
- Use masks, gloves, goggles, and appropriate clothing
- Never idle your car in a closed garage
In the Garden and Yard

- Take off your shoes at the door to avoid tracking soil into the home
- Wash your hands after working
- Contaminated soil?
  - Use raised-bed gardening, dampen soil to reduce dust
- Using herbicides, pesticides, and fertilizers
  - Use natural products if available
  - Follow directions, calculate correct amount, and don’t apply before/after heavy rain
- Always wash fruits and vegetables
- Wash pets frequently
At Work

Possible work exposures include dust, fibers, chemicals (liquids or fumes), radiation, or biologic agents

- Contamination can be carried with you on
  - Your hair and body
  - Your car
  - Your clothes

- Wear personal protective equipment
- Shower or change clothes before you go home
- Wash your work clothes separately
Hobbies

- Be aware of the chemicals you are using
- Read the instructions
- Store correctly & away from children
- Wear gloves, masks, and other protective clothing
- Keep work area ventilated
- Wash your hands!

Alternatives:
- Investigate less toxic alternatives for wood strippers, paints, adhesives, etc.
Summary

- Contaminants can be found in air, water, soil, and food
- Contaminants can enter your body by breathing, touching, eating, or drinking them
- Contamination must enter your body before it can make you sick
- Not all chemical exposures make you sick
- Some populations are more sensitive than others (pregnant and nursing women, children, and older adults)
- You can reduce your exposure
Reduce Your Exposure

- Be aware of chemicals in everyday products
- Be aware of any contamination or pollution around your home or work
- Wash your hands
- Wash fruits and vegetables before eating them
- Read labels that warn you about chemical exposure
Reduce Your Exposure

- Don’t burn treated wood
- Follow proper disposal guidelines for electronics, batteries, paint, and other chemical-containing products
- Avoid cigarette smoke
- Eat fish low in mercury
- Follow local fish advisories
Questions?

For more information please contact Agency for Toxic Substances and Disease Registry
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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.