pennsylvania
DEPARTMENT OF HEALTH

BARIUM

Barium is a silvery-white metal in the Earth's crust. It is only found naturally as a combination with other chemicals, such as sulfate, carbonate, and hydroxide. Barium compounds are used in manufactured materials, including tiles, automobile clutch and brake linings, rubber, brick, paint, and glass. Barium sulfate is used in medical settings for X-ray studies of the gastrointestinal tract (referred to as barium swallow or barium enema). Barium compounds are also used by the oil and gas industries to make drilling mud. Drilling mud makes it easier to drill through rock by keeping the drill bit lubricated. Barium is generally present in air as a result of industrial emissions, particularly the burning of coal and diesel.

HOW DOES BARIUM GET INTO MY BODY?

You ingest it by eating foods that contain barium, such as potatoes, onions, lettuce, beans, nuts, fish, and cereal grains. You may drink surface or groundwater containing barium. You breathe in barium from contaminated air or dust, including cigarette smoke. Some barium compounds can enter your body through your skin, but this typically happens during industrial accidents at factories that make or use barium compounds.

WHAT CAN BARIUM DO TO ME?

Barium causes stomach and intestinal problems (e.g., vomiting and diarrhea) and numbness around the face, muscle weakness, increased or decreased blood pressure, and difficulty breathing when people are exposed to it above background levels for a short time. Exposure to high levels of barium can cause changes in heart rhythm, paralysis, kidney damage, and possibly death. The health effects of different barium compounds depend on how well the compound dissolves in water or in stomach contents. Barium compounds that do not dissolve well, such as barium sulfate, are generally not harmful.

WHAT ARE THE ENVIRONMENTAL REGULATIONS FOR BARUIM?

The Environmental Protection Agency (EPA) limits barium in public drinking water to 2.0 parts per million. Private well owners should test their water to ensure their systems are within EPA regulations. Additionally, the Occupational Safety and Health Agency (OSHA) limits soluble barium compounds in workplace air to 0.5 milligrams per cubic meter (mg/m^3) during an 8-hour day and 40-hour week. OSHA limits for barium sulfate dust are 15 mg/m^3 and 5 mg/m^3 for a respirable fraction of the airborne particulate.

WHAT CAN I DO?

- Do not smoke or work to quit smoking.
- You can limit exposure to foods and water known to contain barium. However, the amount of barium in foods and drinking water is usually too low to cause health concerns.
- Wear dust masks, gloves, and protective clothing when producing or using barium at work.
- Use raised bed gardens and store-bought soil.
- Regularly test private water wells for barium.
- If your water is high in barium, consider installing a water treatment system or change water sources.
- If you work at a job that may expose you to barium, shower and change clothes before going home.
- Concerned about barium in your body? Visit a health care provider for testing and follow-up.

If you have questions or concerns about barium, please contact the
Division of Environmental Health Epidemiology at dehe@pa.gov or 717-787-3350.

Resources

1. https://www.atsdr.cdc.gov/toxprofiles/tp24.pdf
2. https://www.atsdr.cdc.gov/toxprofiles/tp24-c4.pdf

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