

# Biomonitoring

## Biological Monitoring of Exposure to Environmental Chemicals



### WHAT ARE ENVIRONMENTAL CHEMICALS?

Environmental chemicals are chemicals present in air, water, food, soil, dust or other items such as consumer products.

### HOW DOES EXPOSURE TO ENVIRONMENTAL CHEMICALS OCCUR?

Exposure to environmental chemicals occurs during normal activities – eating, drinking and breathing. Exposures may also occur while a person is at work or involved in a hobby.

### WHAT IS BIOMONITORING?

Biomonitoring is a technique used to measure environmental chemicals, or their breakdown products, in the human body. Biological specimens such as blood and urine are tested to see if certain chemicals are present and at what levels. An example of biomonitoring is the widespread testing of children's blood to ensure they do not have high levels of lead.

### WHY IS BIOMONITORING PERFORMED?

Biomonitoring results are used to monitor trends in exposure to chemicals and evaluate the effectiveness of efforts and regulatory programs to reduce exposure to them.

### WHAT DO BIOMONITORING RESULTS TELL US?

Individual results determine if a person has been exposed to a certain chemical at a level above what is considered a normal level. Biomonitoring provides an estimate of actual exposure to environmental chemicals, to help determine if lifestyle changes are needed to reduce exposure.

### IF CHEMICALS ARE DETECTED IS THAT UNUSUAL?

No, it is usual that individuals will have measurable levels of chemicals in their bodies. The presence of an environmental chemical in blood or urine does not necessarily mean that the chemical exposure will result in an adverse health impact. The potential health impacts of chemical exposure are dependent on a person's susceptibility, the amount of chemical, and length of time over which the exposure occurred.



## WHO IS MOST SUSCEPTIBLE TO ENVIRONMENTAL CHEMICAL EXPOSURES?

People with pre-existing medical conditions, the elderly, pregnant women, women who may become pregnant, and children may be more susceptible. This may be due to chemical exposure during a sensitive stage of development, or the decreased ability to eliminate chemicals.

## WHEN IS BIOMONITORING CONDUCTED?

In Massachusetts, young children are routinely screened for lead exposure using a blood lead test. Biomonitoring may be offered as a public service to residents unintentionally exposed to an environmental chemical such as mercury following an accidental spill. Biomonitoring can also be used to evaluate suspected exposure to chemicals from living near a contaminated waste site, or from consuming contaminants in drinking water.



## WHAT CHEMICALS CAN BE MEASURED?

Samples collected for biomonitoring may be analyzed for metals such as lead and mercury, or for other environmental chemicals such as polychlorinated biphenyls (PCBs).

## HOW ARE BIOMONITORING SAMPLES EVALUATED?

Blood and urine samples are analyzed at the MDPH State Public Health Laboratory and results are communicated to the MDPH Environmental Toxicology Program for analysis and interpretation.



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## For More Information

For more information about Biomonitoring efforts in Massachusetts please contact:

**Environmental Toxicology Program**  
**Bureau of Environmental Health, MDPH**  
250 Washington Street, 7th Floor, Boston, MA 02108  
Phone: 617-624-5757 | Fax: 617-624-5777 | TTY: 617-624-5286  
Email: [DPHbiomonitoring@state.ma.us](mailto:DPHbiomonitoring@state.ma.us)

<http://www.mass.gov/eohhs/gov/departments/dph/programs/environmental-health/>



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