



## Cotinine

Cotinine is a product formed after the chemical nicotine enters the body. Nicotine is a chemical found in tobacco products, including cigarettes and chewing tobacco. Measuring cotinine in people's blood is the most reliable way to determine exposure to nicotine for both smokers and nonsmokers exposed to environmental tobacco smoke (ETS). Measuring cotinine is preferred to measuring nicotine because cotinine remains in the body longer.

### How People Are Exposed to Cotinine

Nicotine enters people's bodies when they smoke or chew tobacco. When exposed to ETS from nearby smokers, smaller amounts of nicotine enter the body of the nonsmoker. Workers who harvest tobacco and produce tobacco products can also be exposed through their skin.

### How Environmental Tobacco Smoke Affects People's Health

ETS increases the risk for lung cancer and heart disease in adults who do not smoke. Exposure to ETS also increases the risk for sudden infant death syndrome, asthma, bronchitis, and pneumonia in young children.

### Levels of Cotinine in the Nonsmoking U.S. Population

In the *Fourth National Report on Human Exposure to Environmental Chemicals (Fourth Report)*, CDC scientists measured cotinine in the serum (a clear part of blood) of 6,320 nonsmoking participants aged three years and older who took part in CDC's National Health and Nutrition Examination Survey (NHANES) during 2003–2004. Prior survey periods of 1999–2000 and 2001–2002 are also included in the *Fourth Report*. By measuring cotinine in the serum, scientists can estimate the amount of nicotine that has entered people's bodies.

- The *Fourth Report* shows differences in cotinine levels among different racial groups. For example, non-Hispanic blacks had levels twice as high as Mexican Americans and non-Hispanic whites.
- In the past 15 years, blood cotinine levels for nonsmokers in the U.S. population have decreased about 70%, indicating that public health interventions to reduce ETS exposure have been successful.

Biomonitoring studies of serum cotinine will help physicians and public health officials in monitoring population exposure to tobacco smoke and assessing the effectiveness of public health interventions to reduce smoking. Biomonitoring data can also help scientists plan and conduct research about exposure to ETS and health effects.

## **For More Information**

- Centers for Disease Control and Prevention  
**Tobacco Web site**  
[www.cdc.gov/tobacco](http://www.cdc.gov/tobacco)
- Environmental Protection Agency  
**Office of Air and Radiation, Secondhand Smoke/Smoke-Free Homes**  
<http://www.epa.gov/smokefree/>
- National Cancer Institute  
**Cancer Information System Secondhand Smoke: Questions and Answers**  
[http://cis.nci.nih.gov/fact/10\\_18.htm](http://cis.nci.nih.gov/fact/10_18.htm)

November 2009

---

The Centers for Disease Control and Prevention (CDC) protects people's health and safety by preventing and controlling diseases and injuries; enhances health decisions by providing credible information on critical health issues; and promotes healthy living through strong partnerships with local, national, and international organizations.