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## Harmful Chemicals in Tobacco Products

- [Tobacco smoke](#)
- [Smokeless tobacco products](#)
- [E-cigarettes and similar devices](#)

All types of tobacco products contain chemicals that can be harmful to your health.

### Tobacco smoke

Cigarettes, cigars, and pipe tobacco are made from dried tobacco leaves. Other substances are often added for flavor and to make smoking more pleasant. The smoke from these products is a complex mixture of chemicals produced by burning tobacco and its additives.

Tobacco smoke is made up of thousands of chemicals, including at least 70 known to cause cancer. These cancer-causing chemicals are referred to as *carcinogens*. Some of the chemicals found in tobacco smoke include:

- Nicotine (the addictive drug that produces the effects in the brain that people are looking for)
- Hydrogen cyanide
- [Formaldehyde](#)<sup>1</sup>
- Lead
- [Arsenic](#)<sup>2</sup>
- Ammonia
- Radioactive elements, such as polonium-210 (see below)

- [Benzene](#)<sup>3</sup>
- Carbon monoxide
- Tobacco-specific nitrosamines (TSNAs)
- Polycyclic aromatic hydrocarbons (PAHs)

Many of these substances cause cancer. Some can cause heart disease, lung disease, or other serious health problems, too. Most of the substances come from the burning tobacco leaves themselves, not from additives included in cigarettes (or other tobacco products).

### Radioactive materials in tobacco smoke

Radioactive materials are in the tobacco leaves used to make cigarettes and cigars. These materials come from the fertilizer and soil used to grow the tobacco leaves, so the amount in tobacco depends on the soil the plants were grown in and the type of fertilizers used. These radioactive materials are given off in the smoke when tobacco is burned, which people who smoke take into their lungs as they inhale. This may be another key factor in people who smoke getting lung cancer.

### Is cigar smoke different?

Cigar smoke has many of the same toxic and carcinogenic compounds as cigarette smoke, but some of them are present at different levels.

Because of the aging process used to make cigars, cigar tobacco has high concentrations of some nitrogen compounds (nitrates and nitrites). When cigar tobacco is smoked, these compounds give off several tobacco-specific nitrosamines (TSNAs), some of the most potent cancer-causing substances known.

Also, because the cigar wrapper is less porous than a cigarette wrapper, the tobacco doesn't burn as completely. This results in higher concentrations of nitrogen oxides, ammonia, carbon monoxide, and tar – all very harmful substances.

To learn more, see [Health Risks of Smoking Tobacco](#)<sup>4</sup>.

### Smokeless tobacco products

The main smokeless tobacco products in the United States are **snuff** and **chewing tobacco**, which are put into the mouth or nose but are not burned like cigarettes or cigars.

Smokeless tobacco products contain a variety of potentially harmful chemicals, including high levels of TSNAs. There are also other cancer-causing agents in smokeless tobacco, such as polonium-210 (a radioactive element) and other polycyclic aromatic hydrocarbons (PAHs). These carcinogens are absorbed through the mouth and may be why [several types of cancer](#)<sup>5</sup> are linked to the use of smokeless tobacco.

**Snus** (pronounced 'snoose') is a type of moist snuff that does not require spitting. It was first used in Sweden and Norway, but it is now available in the United States as well. Snus generally has lower levels of nicotine and TSNAs than traditional moist snuff brands, but it can still be addictive and has been linked to some types of cancer.

**Dissolvable products** are forms of smokeless tobacco that come in different shapes and sizes, such as lozenges, orbs, pellets, thin strips, and sticks. Depending on the type, they are held in the mouth, chewed, or sucked until they dissolve. Like other tobacco products, dissolvable tobacco products contain nicotine and other harmful and potentially harmful chemicals.

**Heated tobacco products** (sometimes called "heat-not-burn" products) typically use an electronic heating element, which heats specially designed sticks, plugs, or capsules containing tobacco. The heat releases nicotine (and other chemicals) that can then be inhaled into the lungs, but the tobacco doesn't get hot enough to burn. These devices are not the same as e-cigarettes (see below). Like other tobacco products, heated tobacco products give off nicotine and other harmful and potentially harmful chemicals. Although the levels of these chemicals are generally lower than in the smoke from regular cigarettes, this doesn't mean these products are completely safe.

On average, smokeless tobacco products kill fewer people than cigarettes. But while they're often promoted as a less harmful alternative to smoking, some types have still been linked with cancer. Some products may expose users to lower levels of harmful chemicals than regular cigarettes, but this doesn't mean they are safe.

**No smokeless tobacco product has been proven to help people who smoke quit.**

To learn more, see [Health Risks of Smokeless Tobacco](#)<sup>6</sup>.

## E-cigarettes and similar devices

E-cigarettes and other electronic nicotine delivery systems (ENDS) have become very popular in recent years, especially among younger people. They are sometimes used as substitutes for cigarettes or other tobacco products, but for many people, they are the first tobacco product used.

Makers of e-cigarettes and other ENDS often claim the ingredients are safe. But the aerosols (mixtures of very small particles) that these products produce can contain addictive nicotine, flavorings, and a variety of other chemicals, some known to be toxic or to cause cancer. The levels of many of these substances appear to be lower than in traditional cigarettes, but the amounts of nicotine and other substances in these products can vary widely because they are not standardized. The long-term health effects of these devices aren't yet known.

To learn more, see [What Do We Know About E-cigarettes?](#)<sup>7</sup>

## Hyperlinks

1. [www.cancer.org/cancer/risk-prevention/chemicals/formaldehyde.html](http://www.cancer.org/cancer/risk-prevention/chemicals/formaldehyde.html)
2. [www.cancer.org/cancer/risk-prevention/chemicals/arsenic.html](http://www.cancer.org/cancer/risk-prevention/chemicals/arsenic.html)
3. [www.cancer.org/cancer/risk-prevention/chemicals/benzene.html](http://www.cancer.org/cancer/risk-prevention/chemicals/benzene.html)
4. [www.cancer.org/cancer/risk-prevention/tobacco/health-risks-of-tobacco/health-risks-of-smoking-tobacco.html](http://www.cancer.org/cancer/risk-prevention/tobacco/health-risks-of-tobacco/health-risks-of-smoking-tobacco.html)
5. [www.cancer.org/cancer/risk-prevention/tobacco/health-risks-of-tobacco/smokeless-tobacco.html](http://www.cancer.org/cancer/risk-prevention/tobacco/health-risks-of-tobacco/smokeless-tobacco.html)
6. [www.cancer.org/cancer/risk-prevention/tobacco/health-risks-of-tobacco/smokeless-tobacco.html](http://www.cancer.org/cancer/risk-prevention/tobacco/health-risks-of-tobacco/smokeless-tobacco.html)
7. [www.cancer.org/cancer/risk-prevention/tobacco/e-cigarettes-vaping/what-do-we-know-about-e-cigarettes.html](http://www.cancer.org/cancer/risk-prevention/tobacco/e-cigarettes-vaping/what-do-we-know-about-e-cigarettes.html)

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