

# Here's What Happens When You Quit Smoking

Analysis by [Dr. Joseph Mercola](#)

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## STORY AT-A-GLANCE

- › About 50 years ago, nearly 42% of U.S. adults smoked; in 2015 that number had dropped to 15%, and experts would like it to drop to 12% by 2020
- › Research has found it's never too late to quit as people between 50 and 74 demonstrate improved health benefits each year after quitting
- › When you quit smoking your body repairs the damage done by the toxic chemicals in the cigarettes, reducing your risk of heart disease, stroke and cancers each year you remain smoke free

***Editor's Note: This article is a reprint. It was originally published July 1, 2017.***

About 50 years ago, nearly 42% of the population smoked cigarettes.<sup>1</sup> Between 2005 and 2014, those numbers dropped from 20% to 17% and then again to 15% by 2015.<sup>2</sup> Public health officials are hoping that that number will drop below 12% by 2020. By 2021, that has been achieved – the latest figure is currently at 11.5%.<sup>3</sup>

However, while the number of people smoking traditional cigarettes is steadily dropping, the number of teens using smokeless **electronic cigarettes**, also known as vaping, is steadily rising.<sup>4</sup> Since 2011, teens have been smoking less and vaping more, and research demonstrates that teens who vape may also smoke.

If you smoke, quitting is an essential strategy to return to good health. However, I strongly recommend that you first get your diet under control, as the implications of a

poor diet may outweigh those from smoking, and those who are in the process of quitting may turn to food to help alleviate their cravings.

Smoking is linked to a number of chronic diseases, such as [cancer](#), [heart disease](#) and stroke. However, your bones, brain, teeth, eyes and even fertility may all be damaged by smoking. Fortunately, your body has an amazing ability to heal.

Once you stop smoking, your body will undergo changes over the following days, weeks and years, all of which move toward clearing your body of the damage done by nicotine, smoke and the hundreds of chemicals included in tobacco during the manufacture of cigarettes.<sup>5</sup>

## Smoking Rots You From the Inside Out

Ongoing exposure from toxins in the cigarettes you may be smoking begins to damage and breakdown tissue in your body. These changes happen on a microscopic level, so it may be years before you notice the changes in your body, outlined in a report from Public Health England (PHE).<sup>6</sup> While you may be aware that smoking damages your heart and lungs, the PHE report identified other damage to your body that happens slowly through the years you're smoking:

Smoking causes progressive harm to your musculoskeletal system and bone mineral density

Men who smoke have a 25% increased risk of any fracture and a 40% increased risk of hip fracture

Smoking leads to slower healing after injury

Smoking increases your risk of tooth loss and decay

Smokers are 59% more likely to develop [Alzheimer's disease](#)

Smokers are 53% more likely to develop cognitive impairment than nonsmokers

Smoking leads to a 79% increase in chronic back pain and a 114% increase in

Smoking increases your risk of age-related macular degeneration by 78% to

disabling lower back pain

358%, and increases your risk of age-related cataracts

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Much of the damage to your body happens when you undergo some of the same biological processes that contribute to the development of cardiovascular disease and stroke from smoking cigarettes. The following pathological processes trigger changes to your arterial system and the development of disease:<sup>7</sup>

- Increased total plasma homocysteine that is a known risk factor for stroke, Alzheimer's disease, other dementias and cognitive impairment
- Accelerated development of atherosclerosis in your heart and brain, depriving your brain of oxygen and nutrients. Stiffness from atherosclerosis is also associated with the buildup of beta-amyloid plaque, a hallmark of Alzheimer's disease
- Brain changes in people with Alzheimer's disease may also be related to increased oxidative stress, excitotoxicity, neural death and inflammation triggered by tobacco

## **The Risks of Secondhand Smoke**

The smoker is not the only person who may be harmed by tobacco smoke. Those in the immediate vicinity, many times partners and children, are unintended casualties. Even when you're careful, it's difficult to protect those around you from the effects of smoking, as much of the smoke is released into the atmosphere and even the smoke you exhale contains toxins.

The U.S. Centers for Disease Control and Prevention (CDC) estimates 41,300 people die each year in the U.S. after exposure to secondhand smoke triggers heart disease and/or lung cancer.<sup>8</sup> There is no risk-free exposure to secondhand smoke, and even short-term exposure may increase your risk of a heart attack.<sup>9</sup> Secondhand smoke contains hundreds of different toxic chemicals, including formaldehyde, benzene, arsenic and cyanide.<sup>10</sup>

Although secondhand smoke increases your risk of lung cancer, there is also some evidence that it may increase your risk of brain, bladder, breast and stomach cancers.<sup>11</sup>

Children may also experience increased risks of middle ear infections and sudden infant death syndrome,<sup>12</sup> as well as an increased risk of leukemia, liver cancer and lymphoma.<sup>13</sup> Those exposed to secondhand smoke also experience an improvement in health risks when their exposure is eliminated. This is among the reasons smoking is banned in many public places and work environments.

## **Nicotine Addiction**

Nicotine is not the only ingredient in cigarettes with an addictive property.<sup>14</sup> Using neuroimaging technology, scientists observed a marked decrease in monoamine oxidase (MAO) in the brain, an enzyme that breaks down dopamine. The increased amount of dopamine in the brain may contribute to the unique addictive qualities of cigarettes, as in order to sustain the levels of dopamine in the brain, you must smoke another cigarette.

Researchers from New Zealand published a study that showed how rats were more willing to get a dose of smoke from a non-nicotinic tobacco than from a dose of factory-made cigarettes with nicotine.<sup>15</sup> This indicates there is another chemical additive in the cigarettes that makes the product more difficult to give up.

Penelope Truman, Ph.D., formerly from the Institute of Environmental Science and Research, presented the study at the SmokeFree Oceania conference in New Zealand, saying:<sup>16</sup>

*"This extra chemical is an additional thing that makes smoking harder to give up. This is a formal proof that some tobacco substances are more addictive than nicotine is."*

However, what that particular substance is has not yet been determined and may be different from the chemical causing a marked increase in MAO in the brain.

## **It's Never Too Late to Quit Smoking**

If you have had a history of smoking but don't currently smoke, the risks of heart disease, stroke and cancer are less predictable, suggesting that if you stop smoking later in life, you'll continue to enjoy the benefits of reduced health risks and lower your overall mortality.

In one study, researchers analyzed 9,000 German people between ages 50 and 74 years for 10 years.<sup>17</sup> They found that even those well into their 70s could reverse some of the damage of a lifetime of smoking after quitting. The researchers found the individuals slashed their risk of heart attack and stroke by nearly 40% five years after quitting.<sup>18</sup>

Researchers found the greater the number of cigarettes you smoke each day and the number of years you smoke, the higher your risk potential for all diseases associated with smoking. The researchers recommended that based on their results demonstrating the elderly also benefit from smoking cessation, programs that are often designed specifically for younger people should also be addressing the needs of seniors.

Researchers from the German Cancer Research Center reviewed previous studies and found similar results.<sup>19</sup> Their analysis of the previous research determined that smokers over age 60 who quit would enjoy a 28% reduction in risk of premature death. The study included participants from Japan, England, China, Australia and Spain, some of whom were tracked for over 50 years.

Former smokers aged 50 and older report that one of their major reasons for quitting was to improve their health or after their doctor advised them to stop.<sup>20</sup> Another reason people over 50 stated they quit was so cigarettes would no longer control their lives. These same people said support from loved ones was helpful in increasing the potential of their success.

## **DNA Damage May Continue for Decades**

While it is never too late to experience the benefits of eliminating toxic chemicals from your body, some damage may linger for decades. Scientists once believed the genes you were born with were the ones you were stuck with for the remainder of your life. However, research has demonstrated a process called methylation can affect how your genes are expressed.

Although scientists are still working to understand the complexities of how DNA methylation and genetic expression are connected, they have identified this connection in the development of cancer (although, as explained in previous articles, genetic changes that contribute to cancer are typically downstream effects of metabolic dysfunction, not the original cause).<sup>21</sup>

Research has demonstrated that smoking alters your DNA methylation, and another study shows these changes may last longer and be more widespread than originally anticipated.<sup>22</sup> Lead researcher Dr. Stephanie London, deputy chief of the Epidemiology Branch at the National Institute of Environmental Health Sciences in Research Triangle Park, North Carolina, told Reuters:<sup>23</sup>

*"We don't really know whether it means 'damage' to the DNA. That requires more study, using data outside what we have here. What we're saying is that it's a change to your DNA that can have a downstream effect on what genes are expressed at what levels."*

However, you may consider anytime a toxic substance changes your DNA, it is damaging. The amount of damage and the consequences from the change will be the focus of further study. In this study, the researchers combined data from participants in 16 studies and used samples from over 15,000 people. Comparing the samples from current to former smokers and those who said they had never smoked, researchers found over 2,500 genetic changes in those currently smoking.

After quitting they also found that much of the DNA changes would revert to their original state, but some remained damaged, even decades later. The researchers found 185 genetic locations that were significantly different between people who formerly smoked and those who had never smoked.

# What Happens in the First Weeks You Stop Smoking

Your body has an amazing ability to heal and repair damage when supported with good nutrition, adequate-quality sleep and consistent movement. Healing from the damage done from smoking cigarettes is not different. Here is what happens to your body in the first weeks you stop smoking.<sup>24,25</sup>

**After 20 minutes** — In just 20 minutes after you've smoked your last cigarette, your heart rate, blood pressure and the temperature of your hands and feet begin to return to normal.

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**After eight hours** — The nicotine in your bloodstream falls by over 93%.

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**After 12 hours** — Cigarettes contain carbon monoxide gas that prevents oxygen from entering your lungs and blood. After just 12 hours, your body gets rid of the excess carbon monoxide gas and your oxygen levels return to normal.

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**After one day** — In the first 24 hours, the anxiety you'll experience quitting smoking will peak and your risk of heart attack begins to decline. Your blood pressure begins to normalize, your oxygen levels are higher and physical activity becomes easier. Smoking anxiety will reduce to pre-quitting levels after two weeks.

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**After two days** — The nerves responsible for smelling and tasting begin to heal and you may notice more vivid smells and tastes. At this time, your quitting-related anger and irritability will peak.

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**After three days** — The nicotine level in your body is depleted after three days, which may increase your withdrawal symptoms. You may experience moodiness, irritability and severe headaches as your body begins to detoxify and adjust to a healthier environment. The bronchial tubes in your lungs are relaxing and it's easier for you to breathe.

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**After one week** — In the first five to eight days, you'll experience three cue-induced cravings per day. If you normally lit up after a meal, it's likely that will be the time you

experience these cravings. You can fight these cravings by substituting something else, such as going for a walk, chewing gum or doing jumping jacks as these cravings typically don't last more than three minutes.

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**After two weeks** – Within two weeks the blood circulating in your gums and teeth will return to that of a nonsmoker. This helps heal periodontitis and improve your breath.

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**After four weeks** – Between two and four weeks the anxiety, depression, [insomnia](#) and anger you may have experienced while quitting will have disappeared. Your lung function is improving and your risk of heart attack is decreasing. You might notice less coughing and shortness of breath and renewed ability for greater activity.

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**After nine months** – Your sinus congestion, fatigue and shortness of breath are significantly decreased. The cilia in your lungs that help to clear debris and dust have regrown and you experience an increase in energy. You may notice a reduction in the number of colds you experience as the cilia in your lungs are better able to do their job.

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## One Year and Beyond Your Body Continues to Recover

As much damage as your body has repaired in the 12 months after you quit smoking, there is still more to do. This short video demonstrates many of those changes.

**After one year** – In the 12 months after you quit smoking, your risk of coronary artery disease, [heart attack](#) and stroke drops by 50% and continues to drop each year you don't smoke.

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**After five years** – After five years without a cigarette your arteries and blood vessels begin to widen, reducing your risk of clot formation, reducing your risk of stroke. This also reduces your blood pressure even further. Your risk of stroke will continue to decline for the next 10 years. Within 15 years, your risk of a stroke is the same as a nonsmoker.

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**After 10 years** – Your risk of lung cancer is 30% to 50% of a smokers risk and your risk of death from **lung cancer** has been reduced by half. Your risk of mouth, throat, esophagus and pancreatic cancer has also reduced significantly.

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**After 13 years** – At 13 years after quitting, your risk of tooth loss is the same as that of a nonsmoker.

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**After 15 years** – In this time period your risk of pancreatic cancer has reduced to that of a nonsmoker, as well as your risk of coronary artery disease.

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**After 20 years** – Your risk of dying from a smoking-related cause will drop to the same risk as that of a nonsmoker 20 years after you quit smoking.

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