

# Secondhand smoke and your health

Over the past 50 years, a growing body of scientific evidence has concluded that secondhand smoke can harm the health of people who don't smoke.<sup>1</sup> Recognition of the health impacts of secondhand smoke has been a driver for smoking bans in enclosed workplaces, pubs and clubs and other public spaces.



## What is secondhand smoke (SHS)?

Secondhand smoke is made up of the tobacco smoke breathed out by a person smoking and the smoke which drifts from the burning end of a cigarette.

Secondhand smoke is also called environmental tobacco smoke (ETS). Breathing in secondhand smoke is also referred to as passive smoking.<sup>2</sup>

Secondhand smoke affects the health of both people who do and don't smoke. There are at least **250 chemicals** in secondhand smoke that are known to be **toxic**, including more than **50** that are known to **cause cancer**.<sup>2</sup>

Per cigarette, smoke from the burning end of a cigarette (sidestream smoke) contains higher amounts of some toxic chemicals than the smoke breathed in by the person smoking (mainstream smoke).<sup>2-4</sup> However, since sidestream smoke is diluted by the air, people breathing in secondhand smoke are exposed to lower levels of toxic chemicals than people actively smoking, who draw the tobacco smoke directly into their lungs.<sup>2</sup> Active smoking is more dangerous to health than breathing in secondhand smoke.

## What is thirdhand smoke (THS)?

Thirdhand smoke refers to exposure to chemicals from secondhand smoke on indoor surfaces and dust.

When a cigarette is smoked indoors, chemicals and particles from secondhand smoke settle onto and coat walls, furniture, carpet, clothes, toys, dust and other objects. There, they can react with other chemicals to form new ones, and they can be released back into the air hours or months after they were first deposited.<sup>5-7</sup>

Thirdhand smoke builds up over time in the homes and cars of people who smoke, and can persist for months, even years, even if tobacco is no longer smoked.<sup>5,8</sup> Infants and very young children are likely to be among those most at risk from exposure to thirdhand smoke and its potential health effects.<sup>5-7</sup>



## Diseases related to secondhand smoke

Secondhand smoke causes early death and disease in children and in adults who do not smoke.<sup>2</sup> The more secondhand smoke you are exposed to, the higher your risk of disease.<sup>2,4</sup> There is no level of exposure to secondhand smoke that is free of risk.<sup>2</sup>

Reviews of the research conclude that secondhand smoke **causes** the following diseases and conditions:<sup>2,9</sup>

### In adults

- Heart disease
- Stroke<sup>10</sup>
- Lung cancer
- Irritation of the eyes and nose<sup>4,11</sup>

### In children and infants

- Sudden Unexplained Death in Infancy (SUDI or cot death)
- Lower birthweight (where the pregnant mother was exposed to SHS)
- Bronchitis, pneumonia and other lung/airways infections
- Wheeze illnesses in early childhood

- Middle ear disease (otitis media or 'glue ear', middle ear effusion)
- Respiratory symptoms including cough, phlegm, wheeze and breathlessness
- Higher rates and worsening of asthma
- Weaker lungs: lower level of lung function during childhood (i.e. they cannot breathe in as deeply or breathe out as hard as they would otherwise)

Research also **links** exposure to secondhand smoke to other diseases and conditions. They include:<sup>2,9,10,12,13</sup>

### In adults

- Cancers of the breast, mouth, throat, larynx (voice-box), nasal sinus (nose) and cervix
- Diabetes<sup>14</sup>
- Atherosclerosis (disease of the blood vessels)
- Acute (short term) respiratory symptoms including cough, wheeze, chest tightness and difficulty breathing among both healthy persons and persons with asthma
- Chronic (long term) respiratory symptoms
- Acute (short term) decline in lung function in persons with asthma
- Small loss of lung function
- Development of asthma and worsening of asthma control
- Chronic obstructive pulmonary disease (COPD)

### In children and infants

- Development of asthma
- Preterm delivery (where the pregnant mother was exposed to SHS)
- Childhood cancers: liver cancer, leukemias, and lymphomas (where both the pregnant mother and the child after birth were exposed to SHS)
- Tooth decay
- Breathing complications during and after surgery<sup>15</sup>
- Worsening of cystic fibrosis<sup>11</sup>
- Meningococcal disease

## Heart disease and stroke

Secondhand smoke causes heart disease and stroke in people who don't smoke. It is estimated that long term exposure to secondhand smoke increases the risk of heart attack in a non-smoker by 25% to 30%.<sup>16</sup> The increased risk for stroke is between 20% to 30%.<sup>10</sup>

The majority of deaths from secondhand smoke are from heart disease.<sup>16</sup> People with other risk factors for heart disease such as diabetes, high blood pressure, and vascular disease are at even greater risk from secondhand smoke exposure.<sup>11</sup>

Secondhand smoke interferes with the normal workings of the heart, blood and blood vessels, causing both short and long term damage.<sup>1</sup> Some effects occur within as little as 30 minutes, and appear to be nearly as large as those seen in someone actively smoking.<sup>2,17</sup> For example, secondhand smoke affects the lining of your blood vessel walls and interferes with the way they regulate blood flow. It makes your blood thicker, stickier and more likely to clot.<sup>2,17</sup>

Carbon monoxide from secondhand smoke replaces some of the oxygen in your blood, reducing the delivery of oxygen to your heart and muscles. With less oxygen, short-term or permanent damage to your heart and tissues is more likely. Over many years, the damaging effects of secondhand smoke help to build up fatty deposits on blood vessel walls, narrowing and stiffening them, and causing inflammation. Eventually this may lead to heart attack and stroke.<sup>2,10,11,17</sup>

## Cancer

Secondhand smoke causes cancer in humans, including lung cancer.<sup>2,3,18,19</sup>

Non-smokers with long term exposure to tobacco smoke have a higher risk of developing lung cancer than non-exposed non-smokers by 20% to 30%.<sup>2</sup>

Exposure to secondhand smoke increases the risk for cancers of the mouth, throat, larynx (voice-box), nasal sinus (nose) and cervix.<sup>2,9,11-13,20</sup> It may also be a cause of breast cancer in younger women (before menopause), but more research is needed before these findings can be confirmed.<sup>10,12</sup> Breast cancer is the most commonly diagnosed cancer in Australian women,<sup>21</sup> and the United States government recommends that women avoid exposure to SHS because of high incidence of breast cancer.<sup>2</sup>



## Effects on the unborn child

When a pregnant woman breathes in secondhand smoke, chemicals from the smoke can pass through her lungs into the bloodstream. Nicotine, carbon monoxide and other chemicals can cross the placenta affecting her unborn child.<sup>2</sup>

Women exposed to secondhand smoke are more likely to have a baby with a **low birth weight** of less than 2,500g.<sup>2</sup> Overall, babies who are born to mothers exposed to secondhand smoke have a slightly lower birth weight than they would otherwise. This would not necessarily adversely affect a healthy baby, but could further compromise a baby with other health problems.<sup>2</sup>

The baby of a mother exposed to secondhand smoke may also be more likely to have **preterm birth**, meaning they are carried for less than 37 weeks.<sup>2</sup>

Some evidence suggests that when a pregnant mother and a child is exposed to secondhand smoke before and after birth, her child may have an increased risk of certain **childhood cancers**, such as liver cancer, leukemias, and lymphomas.<sup>2,12,16</sup> However, it's also possible they occur due to damage to the father's sperm from his smoking.<sup>2,12,22</sup>

## Health effects on infants and children

Children are especially vulnerable to secondhand smoke. In households where at least one parent smokes, the best way to **protect children** from secondhand smoke is by parents ensuring their **home and car are totally smokefree**.<sup>23</sup>

Infants exposed to secondhand smoke have about twice the risk for **SUDI (Sudden Unexplained Death in Infancy** or cot death) compared with infants living in a smokefree environment.<sup>2,16</sup> *Red Nose* recommends avoiding exposing babies to tobacco smoke before birth and after, and to put the baby to sleep in a safe bassinette or cot.<sup>24</sup>

The children of parents who smoke have higher rates of **lung or airways infections** such as bronchitis, bronchiolitis and pneumonia during their first two years of life compared to children of non-smokers.<sup>16</sup> They are also more likely to develop **wheeze** illnesses.<sup>2</sup>

Children in this age group exposed to secondhand smoke have higher rates of admission to **hospital**.<sup>25,26</sup>

Children of people who smoke have a **small lowering in lung function**, meaning that on average, they cannot breathe in as deeply or breathe out as hard compared to children of non-smokers.<sup>2</sup> Children of all ages are affected, including adolescents, and some evidence suggests that reduced lung function may even persist into adulthood.<sup>2,11</sup>

**School-aged children** of people who smoke are more likely to have symptoms such as **cough, phlegm, wheeze, and breathlessness**.<sup>2</sup> **Asthma** is more common among children of people who smoke. Children with asthma exposed to secondhand smoke have a greater risk of developing symptoms earlier in life, and having more symptoms and asthma attacks.<sup>2,11</sup> They are more likely to use asthma medications more often and for a longer period.<sup>11</sup> Respiratory symptoms, such as chronic dry cough and phlegm production, can persist into adulthood, even without ongoing exposure to secondhand smoke.<sup>27</sup>

Children of people who smoke are more likely to contract '**glue ear**' (otitis media), which is an infection and swelling of the ear common in young children.<sup>2</sup> They are also more likely to have 'glue ear' multiple times and to have long-term middle ear effusion (leaking of fluid).<sup>2</sup> Middle ear disease is a common cause of **hearing loss** in children, which can delay speech development.<sup>11,28</sup>

Secondhand smoke appears to impair the immune system in both children and adults who don't smoke, which increases their **risk of infection**.<sup>2</sup> Children exposed to secondhand smoke have double the risk of **breathing complications** during and after **surgery** involving a general anaesthetic.<sup>15</sup> Children of people who smoke have over twice the risk of **meningococcal disease**, which is serious illness that can sometimes cause death, mental disability, hearing loss, or loss of a limb.<sup>13,29</sup> People who smoke are more likely to be carriers of the bacteria that causes this disease.<sup>30</sup>

Effects of secondhand smoke that can lead to **heart disease** may begin in **childhood** and **adolescence**.<sup>2</sup> Even though some symptoms from secondhand smoke become less common with age, it is still important to protect children of all ages from secondhand smoke.<sup>2</sup>



## Smokefree homes and children

Adults are more likely to have a smokefree home if they have children, live with non-smoking adults and support public smoking bans.<sup>31</sup>

In 2022–23, among Australian households with children aged under 15 years, 2% reported that someone smokes inside the home. This is down from 31% in 1995.<sup>32</sup>

## Importance of smokefree areas

There is now firm evidence that enacting smokefree laws reduces heart attacks among young and middle-aged people.<sup>10</sup> Other research suggests that it is likely that they also reduce stroke, symptoms of heart disease, preterm births, and hospital admissions for asthma and lung infections in children.<sup>10,33,34</sup>

As well as protecting people from secondhand smoke<sup>35</sup>, smokefree areas serve to:

- de-normalise smoking<sup>35-37</sup>
- decrease daily cigarette consumption<sup>38-40</sup>
- and remove smoking cues that may create cravings for people who used to smoke and those attempting to quit.<sup>41</sup>

Smokefree public places are also linked to the adoption of smokefree homes, which in turn are associated with people make more attempts to quit and having more success at quitting.<sup>31</sup>

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