



**The risk to unborn babies,
pregnant women and children**

**Environmental
Tobacco
Smoke**



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A resource for professionals
and community organizations

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Introduction

Smoking and Environmental Tobacco Smoke (ETS - commonly known as second-hand and third-hand smoke) negatively affects a woman's health before she becomes pregnant. During pregnancy, smoke can be harmful to both the woman and her unborn baby. After birth, the effects of ETS continue to harm the health of children, as well as their mothers.

Despite the known health risks, women continue to smoke. Approximately 16% of Canadian women aged 15 and over smoke daily or occasionally. A recent Health Canada study reported that among female smokers, 29% smoked during their most recent pregnancy. Although these statistics have decreased over the last 10 years, they are still alarmingly high.

When a person smokes, everyone around the smoker is also smoking. Over two-thirds of the smoke from a cigarette is not inhaled by the smoker. This smoke enters the air and carries with it liquids, gases and small particles. This smoke is inhaled involuntarily by non-smokers, including children, and can harm their health.

As well, once the actual smoke clears, chemical residue remains on surfaces within the environment on things like hair, clothing, furniture, and blankets.

Tobacco Smoke

Types of Smoke

- Mainstream Smoke is the smoke inhaled by the smoker.
- Sidestream Smoke is smoke from the burning end of a cigarette, pipe or cigar.
- Exhaled Smoke is smoke exhaled by the smoker.

What's in Tobacco Smoke?

Tobacco smoke contains over 4,000 harmful substances, including carbon monoxide, nicotine, tar, ammonia, arsenic, cyanide, and lead. Nicotine, for example, causes blood vessels to constrict, reducing blood flow.

Carbon monoxide decreases oxygen intake which in return reduces the amount of oxygen delivered to the heart, other body tissues and, for a pregnant woman, to her unborn baby. Of the 4,000 chemicals in tobacco smoke, 50 are associated with causing cancer and promoting tumour growth.

Environmental Tobacco Smoke

Environmental Tobacco Smoke (ETS) includes exhaled and sidestream smoke as well as the chemical residue caused by tobacco smoke. An average cigarette produces 12 minutes of ETS compared to 30 seconds of mainstream or inhaled smoke. Studies have shown that ETS has at least twice the nicotine and tar as the smoke inhaled by the smoker.

On average, 75% of the smoke generated in smoking a cigarette is released into the environment.

Sidestream smoke contains the same harmful substances found in mainstream smoke. Sidestream smoke comes from tobacco burned at a higher temperature than mainstream smoke, and has higher concentrations of the toxic chemicals. In 1992, the U.S. Environmental Protection Agency classified Environmental Tobacco Smoke as a known human carcinogen.

When non-smokers breathe in ETS, they are passively smoking. Brief periods of exposure to ETS may produce headaches, eye, nose and throat irritation, coughing and wheezing, dizziness and nausea, as well as stress to the heart and blood vessels. ETS also aggravates the symptoms of people with allergies, asthma and other respiratory and heart disorders. Long-term exposure has been linked to heart and respiratory diseases, stroke, ulcers, and many forms of cancer.

Sexual and Reproductive Health

Women who smoke, like all smokers, are at risk for smoking-related diseases such as cancer, heart disease and respiratory diseases. Women, 30-39 years of age, who smoke and are using birth control pills, are at increased risk for heart attacks or strokes compared to women who use the pill and do not smoke.

Smoking and exposure to ETS also have effects on women's reproductive health. Women who smoke have increased risk for cancer of the cervix, endometrium and urinary tract. Smoking and exposure to ETS are related to reduced fertility and earlier menopause. Smokers, on average, reach menopause two years earlier than non-smokers.

Men who smoke have been found to have reduced secretion of male hormones and lower sperm count. As well, the ability of sperm to move is altered and the risk of impotence is increased.

These factors reduce the chances of the couple conceiving a child.

Pregnancy Complications

Smoking and/or exposure to ETS increase a woman's risk of complications during pregnancy. These complications also affect the health of the fetus. Pregnancy complications include:

- **Miscarriage**

Pregnant women who smoke 1-10 cigarettes daily have 1.5 times greater risk for miscarriage than non-smokers. This danger increases the more the woman smokes.

- **Ectopic (Tubal) Pregnancy**

A woman who smokes has double the risk for a fertilized egg to be implanted outside of her uterus (usually in one of the uterine tubes). This is a critical situation. An ectopic pregnancy cannot support the life of an unborn baby, can be fatal to the pregnant woman, and can only be treated by ending the pregnancy.

- **Placenta Previa**

Placenta previa occurs when the placenta attaches and develops in the lower part of the uterus, near or covering the opening to the birth canal. It can cause bleeding complications during pregnancy and labour that can be life-threatening to the mother and her unborn baby. Smoking during pregnancy increases the risk for placenta previa by 1.5 times.

- **Abruptio Placenta**

Abruptio placenta occurs when the placenta separates too early from the wall of the uterus. This causes bleeding and can lead to some of the same problems that occur with placenta previa. Pregnant smokers have almost double the risk for this condition compared to pregnant non-smokers.

- **Premature Rupture of the Membranes**

Premature rupture occurs when membranes "break" before 37 weeks gestation. Women who smoke during pregnancy are at greater risk of having premature rupture of the membranes. This increases the risk of infection and premature birth.

- **Pre-eclampsia or Gestational Hypertension (toxemia of late pregnancy)**

Symptoms of pre-eclampsia include high blood pressure, swelling and protein in the urine. The incidence of pre-eclampsia is decreased among women who smoke during pregnancy. However, if a pregnant woman who smokes develops pre-eclampsia, the risk of abruptio placenta is much higher. There is also increased risk of the baby being stillborn or dying before one month of age compared to non-smokers.

A pregnant woman who smokes, like all smokers, is at a higher risk for delayed wound healing following surgery and/or caesarian delivery than one who does not smoke. This is due to the negative effects of smoking on tissue oxygenation, heart rate, airway clearance, immune response, and circulation.

The Newborn

Maternal smoking during pregnancy can profoundly affect the health of the fetus and the outcome of the pregnancy. The fetus can also be affected if the pregnant woman is a non-smoker but is regularly exposed to ETS. Whether a pregnant woman smokes or is exposed to ETS, chemicals cross the placenta into the unborn baby. The placenta does not filter out the chemicals produced by tobacco smoke, permitting them to enter the baby.

Carbon monoxide and nicotine are two chemicals which greatly affect the unborn baby. Carbon monoxide reduces the ability of the blood to carry adequate oxygen to the unborn baby's tissues. Nicotine increases fetal blood pressure and decreases fetal breathing rate. Nicotine can affect the central nervous system, genital, gastrointestinal, and urinary systems of the unborn baby. Babies of mothers who smoke may be born addicted to nicotine and suffer withdrawal symptoms. As well, nicotine can cause placental blood vessels to narrow, diminishing the baby's food supply.

Babies born to smokers are, on average, about 200 grams (1/2 pound) lighter than babies born to non-smokers. There is also evidence that non-smoking mothers who are exposed to ETS give birth to smaller babies than non-exposed mothers.

The baby exposed to tobacco smoke before birth is at higher risk for:

- **Low Birth Weight and Premature Birth**

Exposure to tobacco smoke during pregnancy greatly increases the chance of having a low birth weight baby. Smoking increases the chance the baby will be born too soon (born before 37 weeks) or will have poor growth during pregnancy. Smoking during pregnancy causes 15% of all pre-term births, 20 - 30% of all low birth weight and a 150% increase in overall perinatal mortality.

Prevention of premature births is extremely important as premature babies may experience jaundice, anemia, bleeding in the brain, trouble breathing, cerebral palsy, visual problems, and other serious health problems.

Babies of mothers who smoke have almost double the risk of being born weighing less than 2,500 grams (5.5 pounds). Risk increases the more the mother smokes. Infants weighing 2,500 grams (5.5 pounds) or less are more likely to die than a normal birth weight infant. About two-thirds of all newborn deaths are related to low birth weight. As well, low birth weight babies have a greater chance of developing serious health problems including growth and learning disorders, visual problems and respiratory illness.

- **Damaged Lungs**

Chemicals present in tobacco smoke can damage an unborn baby's lungs. This damage can be made worse if the baby continues to be exposed to ETS as an older child.

- **Death**

Babies of mothers who smoke during pregnancy have a higher risk of dying during the perinatal period (three months before and one month after birth). This is due mainly to the increased rate of abruptions (abruptio placenta, placenta previa and premature rupture of the membranes) and an increased rate of delivering immature infants of low birth weight.

Infants and Children

The effects of smoking and ETS can continue to affect children after birth. For example, the harmful products found in tobacco smoke can also be passed to the infant in breast milk. Infants and children are particularly vulnerable to the effects of ETS because they are still maturing physically and mentally. Children breathe faster than adults. They inhale more air relative to their body weight. Their lungs are still growing and developing. Children have a higher metabolism than adults and can absorb more smoke. It is important to remember that chemical residue is still present on surfaces even after the smoke clears. Normal childhood behaviours, e.g., putting objects in their mouths, can increase the risk of children being in contact with these.

Infants and children who are exposed to ETS are at greater risk for:

- **Sudden Infant Death Syndrome (SIDS)**
SIDS (formerly known as crib death) is the number one cause of death to children from one month to one year of age. Infants whose mothers smoked during pregnancy have an increased risk of dying from SIDS. The risk increases with amount smoked. An infant's exposure to ETS in the household increases the risk of sudden infant death three-fold. The risk increases with number of smokers, amount smoked and hours of exposure.
- **More Illness**
Children exposed to ETS in the home are likely to have colds and respiratory illnesses which cause them to be absent from school, confined to bed or have restricted activity more often than children not exposed. They have more doctor visits and hospital stays than non-exposed children. Smoking during pregnancy may increase the risk of type 2 diabetes in offspring.
- **Ear Infections (otitis media)**
Children who are exposed to tobacco smoke prenatally or from ETS have two to three times the risk of ear infections. They are also more likely to have operations to insert tubes into the ears (tympanostomies) as a result of ear infections.
- **Enlarged Adenoids**
Children exposed to ETS are more likely to have enlarged adenoids. Enlarged adenoids reduce air flow through the throat and nose and increase the accumulation of secretions, which provides a growing place for bacteria. As a result, these children are more likely to have upper respiratory infections.

- **Asthma**
ETS increases the number of cases of wheezing and asthma in children, and also worsens existing cases of asthma.
- **Respiratory Infections**
Children under five years of age who are exposed to ETS have higher rates of bronchitis and pneumonia than non-exposed children.
- **Allergies**
Exposure to parental smoking increases the risk of allergic reactions in children, most notably to foods.
- **Respiratory Symptoms**
Young children have episodes of coughing, wheezing and phlegm if their parents smoke in the home.
- **Developmental and Behavioural Problems**
Children who are exposed to tobacco smoke are more likely to have problems in learning and memory, less developed language, decreased ability to understand visual information, and balance problems. ETS has been associated with Attention Deficit Hyperactivity Disorder and behavioural problems in children.

Every year children die or are injured from smoking-related fires.

Children whose parents smoke are twice as likely to become smokers as children whose parents are non-smokers. If older siblings or other family members smoke, younger siblings are more likely to become smokers.

Clearing the Air

People can be exposed to smoke in the home, workplaces and public indoor and outdoor facilities. In Canada, 5.8% of children under age 12 are regularly exposed to ETS in their homes. For working women, on-the-job exposure to ETS can be four times higher than in the home.

The only way to eliminate Environmental Tobacco Smoke is to remove the source. Prohibit smoking in the workplace and indoor public places. Maintain a smoke-free home.

Air "purifiers" and electronic filters may remove some smoke particles from the air, but they cannot remove those that have settled on food, skin and other surfaces. Increasing ventilation will dilute the smoke but will not remove it completely or make it safe, since there is no known safe level of exposure to carcinogens. Restricting smokers to separate rooms will work only if these rooms have their own ventilation systems. There is only one way to eliminate ETS from indoor and outdoor air and that is to remove the source.

Steps to Take

There are steps that people can take to protect pregnant women and children from ETS.

- If you are a smoker, consider quitting.
- Keep a smoke-free home by restricting smoking to the outdoors.
- Avoid taking children to public places and homes where they would be exposed to ETS. Pregnant women should try to avoid the same places.
- Avoid smoking in the presence of pregnant women and children.
- Never smoke or allow smoking in a vehicle that is carrying children or pregnant women.
- Support non-smoking by-laws in all workplaces and public places, especially where children are likely to be, such as malls, arenas, family restaurants, and child care centres.

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- Encourage people who work with children to set a non-smoking example - not to smoke when children are present, and ensure that smoking materials are kept out of the reach of children.
- Promote non-smoking as the norm.

A pregnant woman who smokes needs to be encouraged to:

- Try to quit or reduce the amount she smokes. Quitting smoking before becoming pregnant or early in pregnancy can increase a woman's chance of having a healthy baby. Quitting at any time throughout the pregnancy can also benefit the baby.
- Keep trying to quit, even if she fails to quit the first time. Most people have to try a few times before they quit for good. Trying to quit means she is smoking less. This will also help the baby.

Protecting children before and after birth from the effects of tobacco smoke and ETS must be everyone's priority. Change is never easy! Every step in the right direction is a move towards keeping our children healthy.

For more information on ETS:

Government of Saskatchewan - Health	www.health.gov.sk.ca/rr_smoking.html
The Saskatchewan Coalition for Tobacco Reduction	www.sctr.sk.ca
The Canadian Council for Tobacco Control	www.cctc.ca
Canadian Paediatric Society	www.cps.ca
The Saskatchewan Lung Association	www.sk.lung.ca/smoking
A Tribe Called Quit - Aboriginal Youth and Tobacco	www.ayn.ca
The Lung Association	www.lung.ca
The Canadian Cancer Society	www.cancer.ca
Living Well with Asthma	www.asthma.ca/adults/lifestyle/smoking/php

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