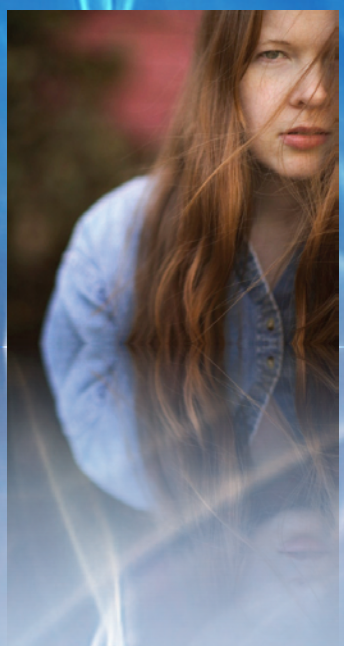
A Report of the Surgeon General

How Tobacco Smoke Causes Disease



...what it means to **you**

DEPARTMENT OF HEALTH & HUMAN SERVICES • USA

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

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Surgeon General

About the 2010 Surgeon General's Report

The 2010 Surgeon General's report contains important new information about how tobacco smoke causes disease. The report makes it clear why we must protect others from tobacco smoke, especially children and pregnant women. It also helps explain why it is so important to quit smoking ... *and why now is the time to quit.*

This *Report of the Surgeon General* on how tobacco smoke causes disease includes the contributions of 64 health experts. The full report is more than 700 pages long. It is written for a scientific audience. This summary has a message for everyone. Please share it with your family, friends, and coworkers.

Smoking cigarettes can kill you. This report is important because it reveals new scientific findings about how deadly cigarettes are and how quickly they can damage your body. This new research also suggests that tobacco companies have altered cigarettes to make them more addictive. Cigarettes are deadly.

The Surgeon General is America's doctor.

The President appoints the Surgeon General as the highest-ranking health leader to protect the health of all Americans. The Surgeon General uses the best scientific information available to promote health, to reduce risk for illness and injury, and to make the nation healthier.

To read the full report and its related materials, go to www.surgeongeneral.gov

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Tobacco smoke is a deadly mix of more than 7,000 chemicals.

New research reveals why the poisons in tobacco smoke are so deadly. Your doctor can help you quit.

Tobacco smoke is a toxic mix of more than 7,000 chemicals. Many are poisons. When these chemicals get deep into your body's tissues, they cause damage. Your body must fight to heal the damage each time you smoke. Over time, the damage can lead to disease.

The chemicals in tobacco smoke reach your lungs quickly when you inhale. What this new report shows is that *these same poisonous chemicals reach every organ in your body*. They go quickly from your lungs into your blood. Then the blood flows through your arteries. It carries the chemicals to tissues in all parts of your body.

Your lungs, blood vessels, and other delicate tissues become inflamed and damaged when you smoke.

Smoking keeps your body under attack. If you spilled drain cleaner on your skin, it would hurt and become inflamed. If you did this many times a day, your skin would not have a chance to heal. It would stay red, irritated, and inflamed. The organs in your body also have a lining of cells similar to skin. Chemicals in tobacco smoke cause inflammation and damage to these cells. When you keep smoking, the damage cannot heal.

Smoking makes your immune system work overtime. Your body makes white blood cells

to respond to injuries, infections, and even cancers. Blood tests show that your white blood cell numbers stay high when you smoke. High numbers mean that your body is constantly fighting against the damage caused by tobacco smoke. This constant stress disrupts how your body works. New research shows that stress can lead to disease in almost any part of your body.

Scientists now know that your disease risk surges even higher after you have smoked for about 20 years. But research shows that if you quit by age 30, your health could become almost as good as a nonsmoker's. At any age, the sooner you quit, the sooner your body can begin to heal.

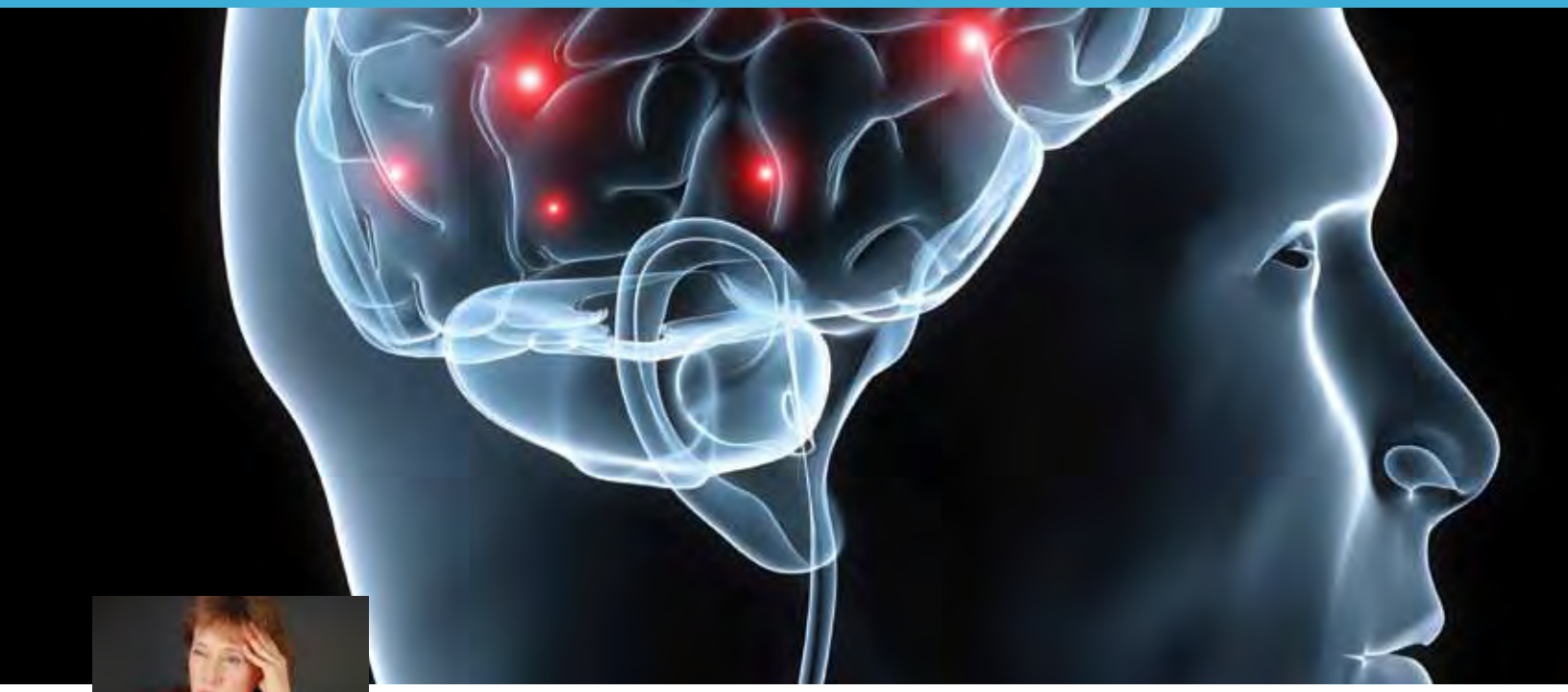
Damage is immediate.
The poisons in smoke pose a danger right away. Sudden blood clots, heart attacks, and strokes can be triggered by tobacco smoke. Poisons in tobacco smoke disrupt the way your body heals itself. Even smoking a cigarette now and then is enough to hurt you. Sitting in a smoky bar raises your odds of a heart attack.

Smoking longer means more damage.
The more years you smoke, the more you hurt your body.

Tobacco smoke contains a deadly mix of **more than 7,000 chemicals**. Hundreds are toxic. About 70 can cause cancer. Here are some of the chemicals.

addiction

Nicotine is powerfully addictive.



Addiction to nicotine changes the chemical balance in your brain.

Nicotine is a highly addictive drug. Addiction keeps people smoking even when they want to quit. Breaking addiction is harder for some people than others. Many people need more than one try in order to quit.

Scientists now know more about why the brain craves nicotine. Like heroin or cocaine, nicotine changes the way your brain works and causes you to crave more and more nicotine. These powerful cravings make it hard for you to think about anything else. Smoking can cause both physical and mental addiction.

Cigarettes are designed for addiction. Cigarette makers have long known that nicotine addiction helps sell their products. Cigarettes today deliver more nicotine and deliver it quicker than ever before. The additives and chemicals that tobacco companies put in cigarettes may have helped make them more addictive. Once inhaled, nicotine races from your lungs to your heart and brain.

You might have thought that "filtered," "low-tar," or "light" cigarettes were less dangerous than others. But research shows that these cigarettes are every bit as addictive and are no safer than other cigarettes. Misleading labels are no longer allowed.

Teens are more sensitive to nicotine.
Each day, about 4,000 teens smoke a cigarette for the first time. That's nearly 1.5 million youth per year. It's as many people as the entire population of a city like Philadelphia.

Many teens who try cigarettes don't know how easy it is to become addicted. Nicotine addiction is so powerful that every day about 1,000 teens become daily smokers. Why is this important? Because most current smokers became addicted as teenagers.

You can beat addiction to tobacco.
Smokers who quit go through withdrawal. The first days are the most uncomfortable. The physical symptoms of nicotine addiction end about 3 weeks after you quit smoking. But you may still have an urge to smoke when you wake up, drink coffee, or are out with friends. It takes longer to break these patterns. But you can beat the mental addiction, too.

Call 1-800-QUIT-NOW for free advice and support. Experienced counselors will help you make a quit plan that works for you. People who get coaching are more likely to succeed than those who try to quit smoking on their own. Many other groups also offer booklets, programs, and advice to help smokers quit. Talk to your doctor about quitting, and see the quit page at the back of this booklet.

If you've already tried other ways, ask your doctor about nicotine replacements or new medicines to help you quit. They help you control the cravings of nicotine withdrawal.

Your most important step to better health is to quit smoking. It's up to you. Now is the time.

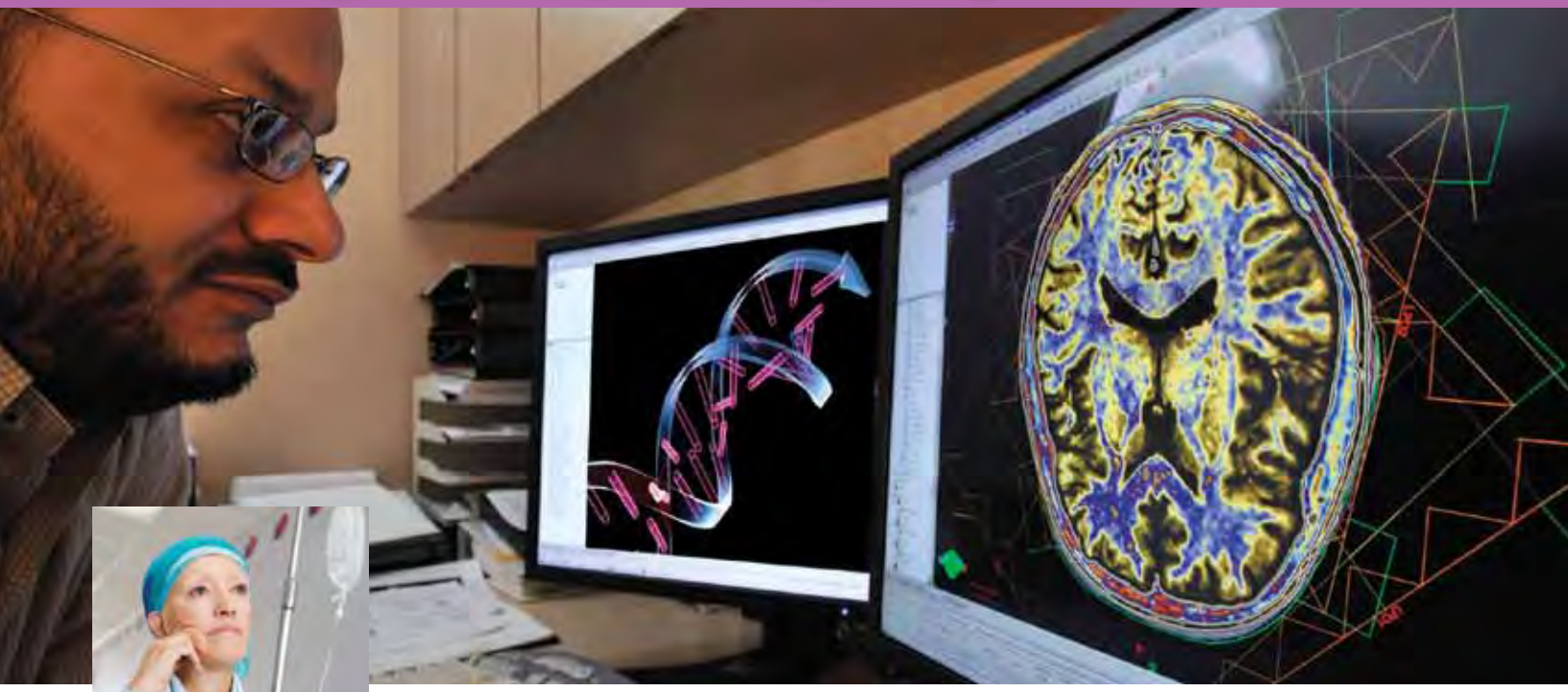
...what it means to YOU

If you quit a pack-a-day habit, you will save about $2,000 per year by not buying cigarettes. That would buy a family vacation or down payment on a car.

You *can* beat addiction to nicotine. More than half of all adults who ever smoked have quit. So can you.

cancer

Smoking can start your body on a path toward cancer.



Every cigarette increases the risk for cancer.

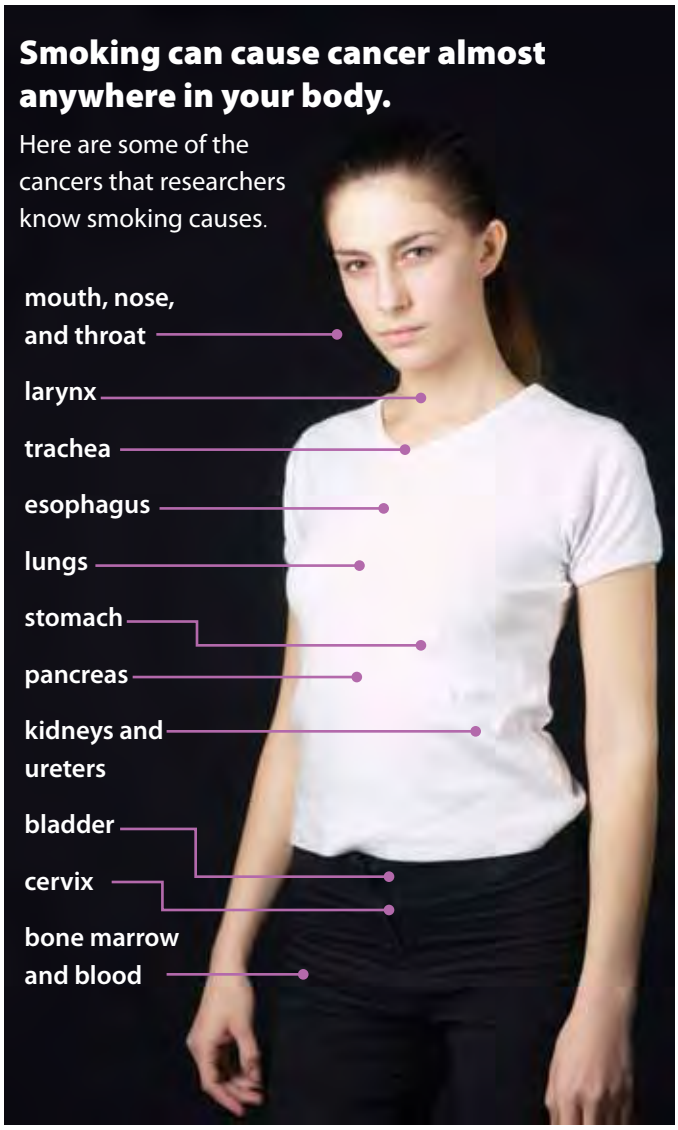
Smoking today can cost you in the future. Once tobacco has damaged cells, they can grow uncontrollably as cancer. Because cells are tiny, years sometimes pass before you find a lump or your doctor sees a tumor on a scan.

DNA damage leads to cancer.

DNA is the cell's "instruction manual." It controls a cell's normal growth and function. When DNA is damaged, a cell can begin growing out of control and create a cancer tumor. This happens because poisons in tobacco smoke can destroy or change the cell's instructions. The next cigarette you smoke might damage your DNA in a way that leads to cancer.

Normally, your immune system helps to protect you from cancer. It sends out tumor fighters to attack and kill cancer cells. However, new research shows that the poisons in cigarette smoke weaken the tumor fighters. When this happens, cells keep growing without being stopped. For this reason, *smoking can cause cancer and then block your body from fighting it.*

Breathing tobacco smoke when you already have cancer is especially dangerous. New research shows that tobacco smoke helps tumors grow. It can undo the benefits of chemotherapy. Being smoke-free will help your body heal.



Doctors have known for years that smoking causes most lung cancers. Nearly 9 out of 10 men who die from lung cancer smoke. About 3,000 nonsmokers die each year from lung cancer caused by secondhand smoke.

Ten years after you quit smoking, your risk for dying from lung cancer drops by half. And there are benefits of quitting at ANY age. Quitting smoking saves lives.

... what it means to YOU

Within 5 years of quitting, your chance of cancer of the mouth, throat, esophagus, and bladder is cut in half. If nobody smoked, 1 of every 3 cancer deaths in the United States would not happen.

Chemicals in tobacco smoke can start cells throughout your body on a path toward cancer. For example, here's how smoking causes dangerous bladder cancer.

Repeated irritation by cancer-causing chemicals stresses cells in your bladder...

...sometimes causing a tumor to begin...

...and to grow out of control as cancer.

circulatory

Smoking causes immediate damage to your arteries.

Smoking can cause

- aneurysms, which are bulging blood vessels that can burst and cause death
- stroke, which is sudden death of brain cells caused by blood clots or bleeding
- heart attack and damage to your arteries

Smoking increases the danger of heart attack and stroke.

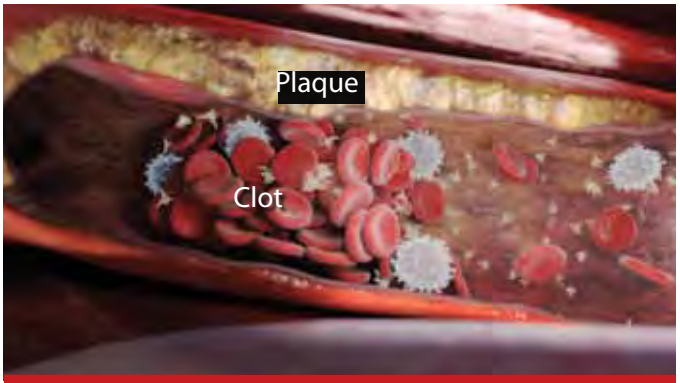
Breathing tobacco smoke can change your blood chemistry. This damages blood vessels. *Almost immediately, cells that line your body's blood vessels react to the poisons in tobacco smoke.* Your heart rate and blood pressure go up. Your blood vessels thicken and grow narrower.

Smoking alters your blood chemistry. When you get a cut, blood cells called platelets stick together to form a clot. This helps stop the cut from bleeding. However, blood clots cause trouble when they form inside your body. Chemical changes caused by smoking make blood too sticky. Deadly clots form that can block blood flow to your heart, brain, or legs.

Breathing tobacco smoke causes other changes in your blood. Your triglyceride level rises, and your "good cholesterol" level falls. The chemicals in tobacco smoke also prevent your body from repairing damaged places in the lining of your arteries. Clots are more likely to form in a damaged artery.

Smoking leads to heart attack and stroke. Smoking is one cause of dangerous plaque buildup inside your arteries. Plaque is made of cholesterol and scar tissue. It clogs and narrows your arteries. This can trigger chest pain, weakness, heart attack, or stroke. Plaque can rupture and cause clots that block arteries. Completely blocked arteries can cause sudden death.

When your arteries are narrowed and blocked from smoking, you may have other problems, too. Blockages reduce blood flow in your legs and skin. Tissue slowly dies. You may develop skin ulcers. Eventually, your toes, feet, or legs can be so damaged that they must be amputated.



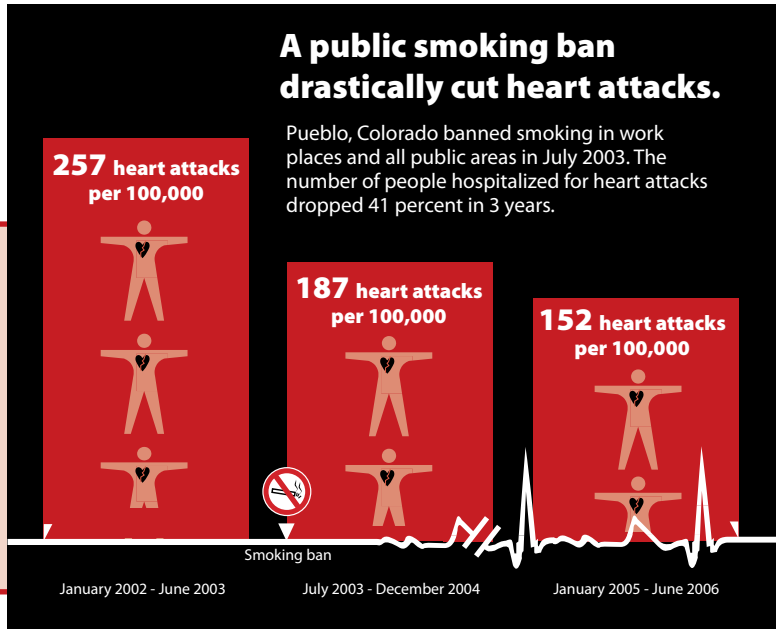
Plaque narrows vessels so less blood can flow through. When a clot forms in one of these narrow places in an artery around the heart, your heart muscle becomes starved for the oxygen it needs.

Secondhand smoke triggers heart attacks. Tobacco smoke hurts anyone who breathes it. When you breathe secondhand smoke, platelets in your blood get sticky and may form clots, just like in a person who smokes. New research shows that even spending time in a smoky room could trigger a heart attack. Smoking is not the only cause of these problems, but it makes them much worse.

Quitting can save your life. If you already have heart or artery disease, you have years of life to gain by quitting smoking. Your risk for a heart attack drops sharply just 1 year after you quit smoking. After 2 to 5 years, your chance of stroke could fall to about the same as a nonsmoker's. You will feel better and can be more active when cigarettes are gone from your life.

... what it means to YOU

Smoking around others increases their risk for heart attack and death. By not smoking, you help protect your family, friends, and coworkers.



respiratory

Smoking damages your lungs.

Even after the age of 65, quitting tobacco can add years to your life. You will breathe better and feel better.

Every cigarette you smoke damages your breathing. *New research shows that poisons in tobacco smoke harm your body from the moment they enter your mouth.* They attack the inner tissue on the way to your lungs.

Your body is telling you not to smoke.
The first time you smoke, your lungs may feel like they are burning. You may cough violently. That's your body telling you it's being poisoned.

Tiny, brush-like cilia line your airways. They sweep out mucus and dirt so your lungs stay clear. Over time, smoking damages and destroys these brushes. You get "smokers' cough" because your body makes more mucus and the cilia can no longer clear your lungs. Other damage is happening, too.

When you quit smoking, you will cough and wheeze less. You will cough up less mucus. After a few smoke-free months, you will breathe easier.

Tobacco smoke scars your lungs.
Your lungs should be elastic like a balloon. They expand when you breathe in and compress when you breathe out. The poisons in tobacco smoke inflame the delicate lining of your lungs. Years of smoking can damage your lungs so much that they no longer stretch and exchange air.

Smoking causes lung disease.
Smoking causes chronic obstructive pulmonary disease, or COPD. There is no cure. People with COPD slowly die from lack of air. COPD includes the diseases emphysema and chronic bronchitis.

- **Emphysema** causes the walls between the air sacs in your lungs to lose their ability to stretch and shrink back. The air sacs become weaker and wider. Air gets trapped in your lungs. You have trouble breathing in oxygen and breathing out carbon dioxide. If you keep smoking, normal breathing may become harder as emphysema develops. With emphysema, lung tissue is destroyed, making it very hard to get enough oxygen.
- **Chronic bronchitis** is the swelling of the lining of your bronchial tubes. When this happens, you have less air flow to and from your lungs. You cough up heavy mucus with chronic bronchitis.

COPD caused by smoking makes you weak from lack of oxygen. Eventually, you may have to live on oxygen from a tank.

Pneumonia and respiratory problems are far more common in smokers. For people with asthma, even breathing someone else's smoke can trigger a severe attack. Your airways become inflamed and tight. It's hard to breathe.

... what it means to YOU

If you quit smoking, you will breathe better. You will cough less than people who continue to smoke. You'll be surprised how much easier it is to be active.

children

Smoking harms reproduction and your children's health.

Pregnant women who smoke are more likely to have babies who die from sudden infant death syndrome, or SIDS. If you are pregnant, smoking is dangerous.

Breathing secondhand smoke is dangerous, too.

Smoking or breathing secondhand smoke can make it harder for you to become a parent. Research shows that tobacco smoke decreases your chances of having a healthy baby.

Smoking hurts people hoping to become parents.

Smoking reduces a woman's chance of getting pregnant. Chemicals in smoke interfere with the functioning of the tubes that your eggs travel through to reach the womb. This might decrease fertility or lead to pregnancy complications.

Researchers have also found that smoking might damage the DNA in men's sperm. This DNA damage might decrease fertility, cause birth defects, or lead to miscarriage.

Smoking hurts unborn babies.
Smoking during pregnancy increases the risk of pregnancy complications, premature delivery, low birth weight infants, stillbirth, and sudden infant death syndrome (SIDS). Premature delivery is when a baby is born too early. Low birth weight is when a baby weighs less than 5 1/2 pounds. Babies born too early or too small are not as healthy. Babies whose mothers smoke are about 3 times more likely to die from SIDS (crib death).

Tobacco smoke damages the tissues of an unborn baby's growing brain and lungs. When a pregnant woman smokes, there could also be problems with the growth of the placenta (the organ that feeds the baby). Problems with the placenta could lead to miscarriage, premature delivery, or low birth weight. Smoking can even make the placenta detach from the womb too early. If this happens, you will miscarry or deliver your baby too early.

Tobacco smoke hurts babies and children.
Mothers know it is important to quit smoking while they are pregnant. But starting to smoke again after your baby is born is also dangerous. Babies who breathe secondhand smoke are more likely to die from SIDS.

Babies and children who breathe secondhand smoke have other health problems. Their lungs don't work as well. Over half of all children in the United States breathe secondhand smoke at home, in cars, or in public places. More than 300,000 children suffer each year from infections caused by tobacco smoke, including bronchitis, pneumonia, and ear infections. They wheeze and cough more often.

For children who have asthma, breathing secondhand smoke can trigger an attack. The attack can be severe enough to send a child to the hospital. Sometimes an asthma attack is so severe that a child dies.

One in every five babies born to mothers who smoke has low birth weight. Low birth weight is a leading cause of infant death.

diabetes

Smoking makes diabetes harder to control.

New science shows that people with diabetes are especially affected by tobacco smoke.

We now know that poisons in tobacco smoke affect your blood sugar. *Smoking even increases your chance of having type 2 diabetes.* People with diabetes who smoke need more insulin than those who don't smoke. They are also more likely to have serious health problems from diabetes.

... what it means to YOU

The health benefits for people with diabetes who stop smoking begin immediately. Diabetics who quit smoking have better control over their blood sugar levels.

Smokers with diabetes have higher risks for serious complications, including

- heart and kidney disease
- amputation
- retinopathy (eye disease causing blindness)
- peripheral neuropathy (nerve damage). Such damage short circuits your body's electrical system. It causes numbness, pain, weakness, and poor coordination. People with diabetes who smoke are three times more likely to have this nerve damage.

Not smoking can make diabetes easier to control. You can even recover from surgery faster.

families

Secondhand smoke causes immediate harm to nonsmokers.

Protect your family from secondhand smoke. Secondhand smoke causes immediate harm to nonsmokers who breathe it. If you are a nonsmoker, you can do some important things to protect yourself and your family.

- *Do not allow anyone to smoke anywhere in or near your home.* Some of the smoke stays in your house even if you only allow smoking near an open window.

Allowing someone to smoke in only one room does not protect nonsmokers. Smoke from halls and stairs gets inside, too.

- Do not allow anyone to smoke in your car, even with the window down. No amount of smoke is safe.
- Make sure your children's day care centers and schools are tobacco-free. A tobacco-free campus policy prohibits any tobacco use or advertising on school property by anyone at any time. This includes off-campus school events.
- If your state still allows smoking in public areas, look for restaurants and other places that do not allow smoking. "No-smoking sections" do not protect you and your family from secondhand smoke.
- Teach your children to stay away from secondhand smoke. Be a good role model by not smoking.

QUIT

Now is the time to quit smoking.

The new research in this report shows the scientific reasons to quit smoking. *But people who quit do it for their own personal reasons.* What are yours?

- I want more years with my family and friends.
- I want to be around to share birthdays with my kids.
- I want fewer sick days and lost wages.
- I want to be at my daughter's wedding.
- I want to know my grandkids.
- I want more energy.
- I want to breathe easier.
- I want to enjoy the smell and taste of food.
- I want to be a better role model.
- My pet needs me.
- I am tired of standing outside in the cold.
- I want to spend my money on something besides cigarettes.
- I want to live to enjoy retirement.

When you are ready, here are some ways to begin.

- Talk to your doctor. Consider nicotine replacement therapy or medication.
- Find a support program. Social support helps when you are trying to quit.
- Focus on eating right and being active.
- Don't get discouraged. Quitting often takes several tries before you succeed.

... what it means to YOU

Now is the time to quit smoking. No one can make you quit, and no one can do it for you. Even if you have smoked for many years, you CAN quit. For more information, go to www.smokefree.gov or call 1-800-QUIT-NOW.

Suggested citation:

U.S. Department of Health and Human Services. *A Report of the Surgeon General: How Tobacco Smoke Causes Disease: What It Means to You.* U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2010.

For more information

You can read the full *Report of the Surgeon General* on how tobacco smoke causes disease at this Web site: **www.surgeongeneral.gov**

For more information on the dangers of tobacco smoke, talk to your doctor, nurse, pharmacist, or other health care professional.

More facts and advice are available from the
Centers for Disease Control and Prevention at **www.cdc.gov/tobacco**
Toll free: **1-800-CDC-INFO** (1-800-232-4636)
In English and en Español, 24 hours/day, 7 days/week
Text telephone for hearing impaired: 1-888-232-6348

Other helpful information is available at **www.smokefree.gov**
To access a telephone quitline serving your area, call
1-800-QUIT-NOW (1-800-784-8669).