



## **Longer Life Expectancies Mean More People Live With — and Manage the Effects of — Chronic Diseases**

*Risks of contracting these diseases can be reduced with a healthy diet and exercise and by avoiding cigarette smoking. With proper treatment, many individuals with the diseases can live otherwise healthy lives — and many pilots can continue flying.*

—  
*FSF Editorial Staff*

Increases in life expectancy and changes in lifestyle are altering the statistical picture of death worldwide.

People in the world's developed nations no longer die in large numbers because of infectious diseases such as measles and tuberculosis, diarrheal diseases and birth defects — all of which still plague developing nations. Instead, the leading causes of death in developed nations are chronic, noninfectious diseases, especially circulatory diseases such as heart attack and stroke, and cancers.<sup>1</sup>

Individuals in developed nations who develop chronic diseases may live with those diseases for years. In many instances, they find ways to manage the illness so that they can continue to live much as they have in the past. For example, some pilots with diabetes mellitus can control the disease with healthy diets and exercise and can continue flying, and other pilots who have had heart attacks or strokes can be issued medical certificates — sometimes with requirements for additional medical tests or physicians' reports at periodic intervals—and can continue their careers.

In other instances, individuals can reduce the risk that they will develop a specific chronic disease — or at least delay its onset.

“The development of chronic diseases is seldom, if ever, due to one single cause,” the United Nations World Health Organization said in *The World Health Report, 1997*:



*Conquering suffering, Enriching humanity.* “In addition to inherited vulnerability, many lifestyle factors are known to increase the risks — factors such as smoking, heavy alcohol consumption, inappropriate diet and inadequate physical activity.

“These factors are at least to some extent within the control of the well-informed individual.”<sup>2</sup>

Lifestyle factors are cited by medical researchers in the development of eight diseases among the top 10 leading causes of death in the developed nations. The 10 leading causes on that list are, in order of

prevalence: ischemic heart disease; cerebrovascular disease; trachea, bronchus and lung cancers; lower respiratory infections; chronic obstructive pulmonary disease; colon and rectum cancers; diabetes mellitus; breast cancers; stomach cancers; and road traffic injuries<sup>3</sup> (Table 1, page 2).

### **Ischemic Heart Disease**

Ischemic heart disease, also known as coronary artery disease or coronary heart disease, is an inadequate supply of blood to the heart muscle, which causes damage to the heart. This category includes heart attacks, angina (chest pain) and related problems caused by narrowed coronary arteries.

A person's lifestyle is a major factor in his or her risk of developing ischemic heart disease: Cigarette smoking,

**Table 1**  
**Leading Causes of Death**  
**In Developed Regions, 1998**

Rank	Disease	Number of Deaths
1.	Ischemic heart disease	1,883,763
2.	Cerebrovascular disease	893,182
3.	Trachea, bronchus and lung cancers	422,347
4.	Lower respiratory infections	306,187
5.	Chronic obstructive pulmonary disease	280,168
6.	Colon and rectum cancers	242,996
7.	Diabetes mellitus	161,069
8.	Breast cancers	160,139
9.	Stomach cancers	143,310
10.	Road traffic injuries	141,656

Source: United Nations *World Health Report, 1999* Database

physical inactivity, obesity, a high-fat diet, high cholesterol levels, excessive alcohol consumption, high blood pressure, and diabetes are among the factors over which an individual has at least some control. Post-menopausal women not on estrogen-replacement therapy also have some increased risk. Other, non-modifiable risk factors are sex (men have a greater risk of dying of heart disease than women, especially between ages 35 and 55), family history and increasing age.

People with ischemic heart disease may have no symptoms, as long as the body's demands for oxygen and blood supply are not too great for the heart to meet. If the coronary arteries continue to narrow, however, and further limit the flow of blood to the heart, symptoms become apparent. The primary symptom of angina is pain or pressure beneath the sternum (breastbone); other symptoms include pain or discomfort in the left shoulder, the left arm, the back, the throat, the jaw or the teeth and occasionally the right arm. In most instances, angina begins during physical activity and continues no longer than several minutes, ending after the physical activity ends. Angina often is worse when physical activity follows a meal, during cold weather or during emotional stress.

Advance symptoms of heart attack typically involve intermittent chest pain, shortness of breath or fatigue several days before the attack. During a heart attack, the most typical symptom is pain (similar to the pain of angina) in the middle of the chest that spreads to the back, the jaw, the left arm or — occasionally — the right arm. In some instances, there is no pain in the chest but rather in the back, the jaw, an arm or the abdomen. Other symptoms may include faintness, pounding of the heart, irregular heartbeat, restlessness or sweating. Some people experience no symptoms and learn that they had a heart attack only during a subsequent electrocardiogram.

Patients with mild forms of angina typically are treated with medication — including anti-platelet drugs such as aspirin to

prevent platelets (fragments of blood cells) from sticking to blood vessel walls, beta-blockers to reduce the heart's resting rate, calcium antagonists to prevent blood vessels from constricting and nitrates such as nitroglycerin to dilate the walls of the blood vessels and relieve the pain of angina — and attempts to reduce their risk factors for ischemic heart disease, such as high-fat diets and high blood pressure. If those changes fail to reduce symptoms, the treatment may include:

- Coronary artery bypass surgery, in which veins or arteries taken from another part of the body are grafted from the aorta (the major artery that carries blood from the heart) to the coronary artery (which carries blood to the heart) to bypass the blocked artery. Bypass surgery is most likely to help individuals with severe angina who have not benefited from drug therapy, who have had no heart attacks, who have no other conditions that would make the surgery hazardous and who have otherwise normally functioning hearts. About 85 percent of bypass patients experience dramatic improvement after surgery;<sup>4</sup> or,
- Coronary angioplasty, in which a catheter (a long, narrow, hollow tube) with a deflated balloon on its tip is guided through the artery whose walls have been narrowed by an accumulation of cholesterol. When the balloon reaches the accumulation, the balloon is inflated, pushing the cholesterol deposits back against the walls of the artery. When angioplasty is successful, as it is in 80 percent to 90 percent of patients, the arterial obstruction is greatly reduced. In about 20 percent to 30 percent of patients, however, the artery becomes obstructed again within six months, and the angioplasty may be repeated. In some instances, a stent made of wire mesh is inserted into the artery; the stent may reduce by half the risk of a recurrence of the obstruction.<sup>5</sup>

Another, less frequently used, treatment is atherectomy, in which a laser catheter is inserted in the same manner that a catheter is inserted for angioplasty and is used to bore through the narrowed portion of the artery.

The main consideration in treatment of a heart attack — in which some of the blood supply to the heart is restricted, causing death of part of the heart muscle — is the speed with which medical treatment is obtained. Most of the damage done by a heart attack occurs during the first two hours,<sup>6</sup> and most heart-attack deaths occur in the first three hours or four hours after the first symptoms appear.<sup>7</sup>

The American Heart Association recommends taking aspirin as soon as warning signs of a heart attack occur.<sup>8</sup> If the coronary artery is blocked by a blood clot, aspirin typically reduces the size of the clot. Initial treatment in a hospital also may involve medication to slow the heart rate so that there is less demand on the heart to pump blood through the body. Supplemental oxygen may be administered to increase oxygen pressure in the blood and provide more oxygen to the heart. If the heartbeat

is abnormal, physicians may try to correct the rhythm by using a defibrillator to deliver a therapeutic electric shock to the heart. If the heart stops beating, physicians will administer chest compressions to attempt to maintain pumping action until the heart begins beating again or death occurs. The more quickly the blood clot can be removed, the less damage will be done to the heart; therefore, medication may be administered to dissolve the clot, or — in some instances — coronary bypass surgery or angioplasty may be performed.

In the first few days after a heart attack, a patient typically rests in bed. A tranquilizer may be administered, along with medication to reduce enlargement of the heart that accompanies a heart attack.

Treatment for angina and heart attack cannot eliminate the underlying causes of ischemic heart disease; instead, changes in lifestyle factors, including healthy diet, appropriate exercise and abstinence from cigarette smoking, are needed to reduce the risk of further episodes of angina or heart attack. Control of those lifestyle factors also constitutes the best means of avoiding the onset of ischemic heart disease.

The International Civil Aviation Organization (ICAO) says in its *Manual of Civil Aviation Medicine* that ischemic heart disease is “a common cardiovascular cause of medical disqualification among personnel engaged in aviation duties ... especially for the aircrew member who is a Caucasian male over 40 residing in an industrialized society.”<sup>9</sup>

ICAO recommends that its member nations adopt regulations to prohibit pilots from being granted medical certification if they have “any abnormality of the heart, congenital or acquired, which is likely to interfere with the safe exercise of the applicant’s license and rating privileges.”<sup>10</sup>

Nevertheless, ICAO also recommends “flexibility in the application of medical standards” in specific circumstances,<sup>11</sup> and national regulatory authorities, including the European Joint Aviation Authorities and the U.S. Federal Aviation Administration (FAA), follow that recommendation.

For example, U.S. Federal Aviation Regulations (FARs) Part 67.111 reiterates ICAO’s recommendation that medical certification should not be granted to a pilot with a history of heart attacks, angina or coronary heart disease that has required treatment or has been “symptomatic or clinically significant.” But a pilot with a history of heart attack or angina can receive a discretionary issuance of a medical certificate if a review of his or her case determines that the condition does not interfere with the safe performance of flight duties.

FARs Part 67.401 provides for the discretionary issuance (either an authorization for special issuance of a medical certificate or a statement of demonstrated disability) for pilots with otherwise disqualifying conditions. In Europe, Joint Aviation Requirements-Flight Crew Licencing (JAR-FCL) 3.125 provides for a “variation and review policy” for pilot applicants who do not fully meet medical requirements.

## Cerebrovascular Disease

Cerebrovascular disease refers to neurological problems that result from disruption of the flow of blood to the brain. In developed nations, strokes are the most common examples of cerebrovascular disease — and hypertension (high blood pressure) and atherosclerosis (hardening of the arteries) are the greatest risk factors. Two broad types of strokes exist: ischemic strokes, in which the flow of blood to the brain is stopped because of atherosclerosis or because a blood clot has blocked a blood vessel, and hemorrhagic strokes, in which a blood vessel bursts and blood leaks into part of the brain and destroys it.

Strokes also can occur if fat from the marrow of a broken bone lodges in an artery; if the blood vessels leading to the brain are narrowed by infection, inflammation or consumption of drugs such as cocaine or amphetamines; or if a person experiences a sudden, severe drop in blood pressure, typically after a major loss of blood or a heart attack or in instances of an abnormal heart rate.

Symptoms of a stroke vary, depending on which part of the brain is affected, but the most common symptoms include paralysis, weakness or loss of sensation in an arm, a leg or one side of the body; partial loss of hearing or vision; double vision; dizziness; slurred speech; loss of balance; fainting; difficulty speaking or remembering words; and loss of bladder control.

If a stroke victim obtains medical care while the stroke is in progress, he or she may be treated with anticoagulant medication to prevent the blood from clotting. Oxygen and intravenous nourishment may be administered, and medication may be administered within a few hours of the start of the stroke to break up blood clots.

After the stroke, medication may be administered to reduce swelling in the brain; the person may require a respirator to aid breathing; and surgery may be performed to remove blockages of a carotid artery (one of two main arteries on either side of the neck that carry blood to the head) to reduce the risk of future strokes. The patient may experience — and require treatment for — related problems, including heart failure, irregular heartbeat, hypertension, lung infections and mood changes.

In the days immediately following a stroke, determining whether the patient’s condition will improve or deteriorate is difficult. Many recover completely; some require rehabilitation to regain the ability to walk to or to speak; others never recover their former health status; and others die. Recovery is likely to be more difficult if the stroke victim is elderly or if the stroke resulted in loss of consciousness, impaired breathing or impaired heart function.

Other ailments included within the category of cerebrovascular disease include:

- Transient ischemic attacks (in which the brain receives an inadequate supply of blood for a short period of time),

which often are seen as early warning signs of a stroke; and,

- Intercranial hemorrhage (in which bleeding occurs in the brain or around the brain), which most often is a result of a head injury but sometimes is caused by an anatomical abnormality in blood vessels in the brain or around the brain.

Recommendations for avoiding cerebrovascular disease include controlling hypertension and high cholesterol (major risk factors not only for stroke but also for heart disease and other ailments) either with medication or with a combination of healthy diet and exercise or with both.

ICAO recommends that pilots with abnormally high blood pressure or abnormal variations in blood pressure “should be assessed as unfit for aviation duties.” If pilots can “demonstrate satisfactory control of their hypertensive disease and have no evidence of secondary effects of hypertension,” however, their hypertension can be considered under control and they can be considered medically fit to perform aviation duties.<sup>12</sup>

Whether a pilot who has recovered from a stroke can receive medical certification depends on a variety of individual factors. In some cases, prompt treatment of a stroke leads to full recovery or to only a minor loss of function that does not preclude medical certification.

## Trachea, Bronchus and Lung Cancers

Cancer can develop from any tissue in the body when the genetic material within the cells changes, causing the cells’ uncontrolled growth. Cancer takes nutrients away from normal cells and can prevent the normal development of blood cells, obstruct body organs, erode tissue and — if the cancer is found in the brain — can cause swelling or seizures.

Cancer exists in about 200 forms, each with its own set of risk factors.

Cancers of the lungs, the trachea (also known as the windpipe, the major airway to the lungs) and the bronchi (two smaller airways that link the trachea and the lungs) are the most deadly. In most cases (90 percent of lung cancers in men and 70 percent in women),<sup>13</sup> cigarette smoking is the primary cause of the disease. Other causes are workplace exposure to radiation and to substances such as asbestos, arsenic, chromates, nickel and chloromethyl ethers. In some instances, exposure to radon gas in homes may be a cause; and in other instances, lung diseases such as tuberculosis and fibrosis may leave victims more susceptible to some lung cancers.

Symptoms of lung cancer vary, depending on the specific type of lung cancer, the location and the way in which it spreads, but the main symptom is a persistent cough. Other symptoms

may include loss of appetite and loss of weight, weakness and shortness of breath.

The lung cancer may grow into other organs; if that occurs, other symptoms develop. For example:

- A lung cancer that grows into specific nerves in the neck can cause an eyelid to droop, the pupil of that eye to shrink, the eye to appear sunken and perspiration to be reduced on that side of the face;
- A lung cancer that grows into the heart can cause abnormal heart rhythms, an enlarged heart or fluid in the pericardial sac, which surrounds the heart; or,
- A specific type of lung cancer, small cell carcinoma, may secrete an anti-diuretic hormone that results in fluid retention and low levels of sodium in the blood or the carcinoma may secrete corticotrophin, a hormone linked to Cushing’s syndrome, in which excess fat develops throughout a person’s torso, the skin becomes thin and easily bruised, and the risk increases of developing kidney stones and diabetes.

If the lung cancer has not spread beyond the lung, surgery sometimes can be performed to excise it. Nevertheless, surgical removal of the cancer does not necessarily mean that the cancer has been cured; of patients who undergo surgical removal of an isolated tumor, only 25 percent to 40 percent survive five years. If the lung cancer has spread, surgery is unlikely to help. In those cases, radiation therapy may slow the growth of the cancer and control pain in the bones. (In radiation therapy, high-dose beams of radiation kill tumor cells.) In cases of small cell carcinoma of the lung, the patient is treated with chemotherapy — sometimes combined with radiation therapy — and in 25 percent of those patients, chemotherapy prolongs survival “substantially.”<sup>14</sup> (In chemotherapy, medications and chemicals destroy tumor cells, but they also harm normal cells, disrupt normal body functions and cause nausea, hair loss and other side effects.)

The most widely recommended means of lowering an individual’s risk of lung cancer and many other cancers is avoiding cigarettes and other tobacco products.

Pilots typically are medically disqualified from flying during the periods in which they undergo surgery, radiation and chemotherapy for lung cancer and virtually all other types of cancer, and during a period following their treatment.

JAR-FCL 3.2.A.ABC.ONCO says, “Every pilot who has been treated for malignant disease will need an individual assessment before returning to flying. Recovery from surgery or [radiation therapy] should be assessed. Current ... chemotherapy is incompatible with certification, and recovery from the effects of these drugs will demand a period of a temporarily unfit assessment after the treatment has finished.”

Following recovery from the primary treatment, if there is no indication of a residual tumor, the regulation says, “then the level of certification will depend on the likelihood of recurrent disease.”

In the United States, in some instances, pilots who have been treated for cancer are granted special-issuance medical certificates, allowing them to fly for a limited time before they must submit updated medical information and undergo another medical exam.

## Lower Respiratory Infections

Lower respiratory infections are various forms of pneumonia, in which the air sacs (alveoli) in the lungs become infected, making it difficult for oxygen to circulate through the bloodstream. Without adequate oxygen, other cells in the body cannot function properly, and death can result.

The various types of pneumonia have various causes. In adults, the most common cause is pneumococcus bacteria. Other causes include viruses, mycoplasmas (which have characteristics of both bacteria and viruses) and some fungi and other substances. Pneumonia is especially likely to occur when the body’s defenses are weakened, either by illness, old age, malnutrition, impaired immune systems or other ailments. Cigarette smoking, alcoholism, diabetes, heart failure and chronic obstructive pulmonary disease also are risk factors for pneumonia.

Symptoms of pneumonia typically include a cough, chest pain, chills, fever and shortness of breath. The severity of the symptoms varies, depending on the cause and the extent of the disease.

Pneumonia typically is treated with oral antibiotics or antiviral drugs, depending on which organism is responsible for the disease. More seriously ill patients may be hospitalized so that antibiotics can be administered intravenously and so that the patient may receive mechanical respiratory support, supplemental oxygen and additional medication.

An otherwise healthy young person may recover from pneumonia within a week, but others may require weeks before recovery is complete.

Some forms of pneumonia can be prevented with annual influenza (flu) shots, because pneumonia often is a complication of influenza, and a vaccine also exists to prevent pneumococcal pneumonia. The vaccine typically is administered only to patients with a high risk of contracting the disease, including those who have a chronic illness such as heart disease, diabetes or another serious lung ailment. Generally good health — including proper diet, rest, exercise and hygiene — also helps increase resistance to pneumonia and other respiratory diseases. Recovery is aided by early detection of the disease, which is best accomplished when patients recognize any symptoms of respiratory trouble that persist for more than a few days.

## Chronic Obstructive Pulmonary Disease

Chronic obstructive pulmonary disease (COPD) refers to two related diseases: emphysema (in which the lungs’ air sacs become stretched) and chronic bronchitis (in which the bronchial glands become enlarged and secrete excess mucus into the airways, resulting in a chronic cough). Both diseases obstruct the airways, causing air to become trapped in the lungs.

The primary risk factor for COPD is cigarette smoking, but one form of emphysema is hereditary. Workplace exposure to chemical fumes and dust also may increase the risk of contracting the disease.

The first symptom is a cough, along with an increasing frequency of head colds that develop into chest illnesses. As the disease progresses, patients develop shortness of breath and may experience weight loss caused by increased difficulty in breathing after eating, swollen legs caused by heart failure (because the heart must work harder to pump blood to the lungs), an abnormal heartbeat, chest pains and palpitations, cyanosis (a blue tinge to the skin, fingernail and lips) and headaches.

COPD cannot be cured, but the severity of symptoms can be lessened. The first step in treatment is quitting smoking, which slows the development of the disease. Other recommendations may include exercise programs; medication to help open airways, strengthen the heartbeat, reduce the accumulation of excess fluid, expel mucus from the airways, stop muscle spasms and fight infection; influenza vaccines and pneumococcal vaccines; avoiding exposure to airborne irritants; respiratory therapy to loosen secretions in the chest; oxygen therapy to lessen heart failure and reduce excess levels of red blood cells that result from low blood oxygen; and lung transplants.

COPD usually is preventable; in nearly all instances, not smoking cigarettes prevents onset of the disease.

ICAO recommends that when emphysema is assessed in pilots, breathing tests should be used to measure the extent of functional impairment of the lungs and to determine whether the pilot should be issued a medical certificate.<sup>15</sup>

## Colon and Rectum Cancers

Colon and rectum cancers are the second-leading cause of cancer deaths in the developed world. The major risk factor appears to be genetics; people are more likely to develop the disease if they have ulcerative colitis (a disease in which the large intestine is inflamed and ulcerated) or Crohn’s disease (a chronic inflammation of the intestinal wall), a family history of colon and rectum cancers or a family history of familial polyposis (a hereditary condition in which a large number of precancerous polyps appear in the colon and rectum). Another major risk factor is reported to be a diet that is low in fiber and high in animal protein, fat and refined carbohydrates, including sugar.

Symptoms of colon and rectum cancers develop slowly and vary, depending on the specific type of cancer, its location and its size. Fatigue and weakness may be the only symptoms of a cancerous tumor in the ascending (right) colon, even after the tumor has grown large enough that it can be felt during a physical examination through the abdominal wall. A tumor in the descending (left) colon, however, can cause abdominal pain, constipation or blood-streaked bowel movements. Bleeding during a bowel movement typically is the first noticeable symptom of rectum cancer, which also can cause painful bowel movements and pain while sitting.

Treatment for colon and rectum cancer typically requires surgery to remove the affected portion of the intestine and associated lymph nodes; after surgery, the remaining ends of the intestine are joined. If rectum cancer has grown deep into the rectal wall, the rectum and anus are removed, and surgeons create a colostomy (an opening between the large intestine and the abdominal wall) through which contents of the large intestine empty into a colostomy bag. Radiation therapy may be required to limit growth of residual tumors, delay a recurrence of the disease and improve survival chances. When colon and rectum cancers have spread too far to be cured by surgery, chemotherapy can help prolong the person's life but is unlikely to cure him or her of the disease.

The risk of developing colon and rectum cancers may be reduced with a diet containing adequate amounts of calcium, vitamin D and green vegetables, including broccoli and cabbage. Regular screening — either through examination of the stool or insertion of a flexible sigmoidoscope into the large intestine to allow visual examination — can help in early detection of the cancers.

## Diabetes Mellitus

Diabetes mellitus is a disorder in which the level of glucose (sugar) in the blood is higher than normal because the body cannot use insulin (a hormone secreted by the pancreas to regulate blood sugar levels) properly. Two types of diabetes mellitus exist: type 1 diabetes, in which injections of insulin are required to manage the disease, and type 2 diabetes, in which the body's insulin deficiency can be controlled without injections.

People with type 1 diabetes, in which the pancreas produces little or no insulin, typically develop the disease before age 30. Type 2 diabetes, in which the pancreas produces insulin but various body tissues become resistant to its effects, can occur any time but is more common after age 50. The most common risk factors for type 2 diabetes include obesity, a sedentary lifestyle and hereditary factors. Blacks and Hispanics also have an increased risk of developing the disease.

Many people with diabetes do not realize that they have the condition until it is discovered during a routine physical examination when a urine test reveals an elevated level of sugar.

Symptoms of diabetes include excessive urination, excessive thirst, weight loss and excessive hunger; blurred vision, drowsiness, nausea and a decrease in endurance during exercise. If the level of sugar in the blood becomes especially high, additional symptoms may include dehydration and confusion.

If the condition is not treated, any of several complications may develop, including some that would result in loss of medical certification: macular degeneration, diabetic retinopathy and cataracts, which cause loss of visual acuity; atherosclerosis; and neurological degeneration, which leads to loss of cognitive ability and coordination. In addition, poor circulation can damage body organs and extremities, can delay healing of injuries and can weaken nerves.

Treatment of diabetes focuses on keeping blood sugar levels as close to normal as possible through weight control, exercise and a healthy diet. If guidelines for weight control, exercise and diet are followed throughout life, the onset of type 2 diabetes can be delayed for many years. Dietary guidelines include eating meals on a regular schedule and limiting sweet food and (because people with diabetes also may have high cholesterol levels) saturated fats. Oral medication also may be required to lower blood sugar levels if diet and exercise are not effective.

If a pilot with diabetes requires insulin injections to control blood sugar levels, he or she will — in many nations — lose medical certification. (An FAA regulation implemented in 1996, however, allows some insulin-dependent pilots to receive third-class medical certificates [required for issuance of a private pilot certificate]. Those pilots are subject to continued monitoring of their condition, and they are prohibited from flying outside the United States.)<sup>16</sup>

In most instances, however, pilots who can control their type 2 diabetes can continue flying. In the United States, for example, the pilot may receive medical certification without a special issuance but first must be able to demonstrate during the initial evaluation of type 2 diabetes that blood sugar levels have been under control for at least three months; that no disqualifying medical complications exist; that there is no history of significant hypoglycemic reaction (low levels of blood sugar, which sometimes result from overtreating diabetes and which, in their most extreme forms, can cause loss of consciousness); and that the body's natural adrenaline response system is intact.

## Breast Cancers

Breast cancers develop along different paths, but about 90 percent begin in the milk glands. Other types of cancer begin in the milk ducts, fatty tissue or connective tissue.

The cause of breast cancer is unknown, but risk factors include a woman's increasing age (60 percent of breast cancers occur in women over age 60);<sup>17</sup> previous instances of breast cancer; family history of breast cancer (if a woman's mother, sister or

daughter has had breast cancer, the woman's risk is increased by two times to three times); and genetics (if a woman has one of the two genes for breast cancer identified by researchers, her chances of developing the disease are considerably higher than normal). Other factors, which often appear to have only minimal importance, include previous noncancerous breast disease; first menstruation before age 12, menopause after age 55 and no pregnancies before age 30; prolonged use of oral contraceptives or estrogen replacement therapy; and obesity after menopause.

Nevertheless, the Breast Cancer Society of Canada says, 70 percent of the individuals diagnosed with breast cancer have no known risk factors.<sup>18</sup> (Men account for about 3 percent of all cases of breast cancer, but the disease typically is not suspected — by the patients or their physicians — as the cause of their symptoms.)

Symptoms of breast cancer can include a lump in the breast that feels different from surrounding breast tissue, persistent swelling, puckered or dimpled skin, scaly skin around the nipple, changes in the breast's shape, changes in the appearance of the nipple, or fluid— especially bloody fluid — leaking from the nipple. In inflammatory breast cancer, the main symptoms are that the breast is warm, red and swollen; often no lump is felt.

Early detection is the most important factor in recovery from breast cancer, and chances of recovery are 90 percent or more with early detection of the disease.<sup>19</sup> Symptoms of breast cancer typically are not apparent in the early stages, so the most effective means of detecting the disease are mammography (which uses low-level x-rays to detect abnormalities in the breast), monthly self-examination and examination by a physician.

If examination reveals a lump that could be cancerous, physicians perform a biopsy by using a needle and a syringe to remove cells from the lump, by making an incision to remove a piece of tissue or by excising the entire lump.

If the lump is cancerous, treatments vary, depending on the type of breast cancer and its typical rate of growth and pattern of growth. If the cancer has not spread beyond the breast, treatment typically involves surgery — either mastectomy, in which the entire breast is removed, or breast-conserving surgery, in which only the tumor and the surrounding tissue are removed. (Several forms of breast-conserving surgery exist, including lumpectomy, in which the tumor and a minimal amount of surrounding tissue are removed; wide excision or partial mastectomy, in which the tumor and more surrounding tissue are removed; and quadrantectomy, in which one-fourth of the breast is removed.) Survival rates appear to be identical for at least 20 years after both breast-conserving surgery with radiation therapy and mastectomy.<sup>20</sup>

Radiation therapy may be accompanied by side effects such as reddening or blistering of the skin, rib fractures and mild inflammation of the lungs. Mastectomy may be followed by plastic surgery to reconstruct the breast using artificial implants or tissue taken from other parts of the woman's body.

Follow-up therapy may involve chemotherapy or medication to block production of the hormones that allow growth of cancer cells. Such treatment delays a recurrence of cancer but, except in rare cases, does not cure the disease.

If the cancer has spread beyond the breast, there is no cure for the disease. In most instances, women live at least two years; chemotherapy or hormone-blocking drugs may be prescribed to prolong their lives and relieve cancer symptoms.

Men with breast cancer have similar treatment options, except that breast-conserving surgery is rare and there have been no studies of the effectiveness of radiation or medication after surgery. If the cancer spreads to other parts of the body, the treatment may involve hormone-blocking medication, surgical removal of the testes to rid the body of hormones that support the growth of cancer, or chemotherapy.

## **Stomach Cancers**

Stomach cancers' causes are difficult to identify, but specialists say that the disease may be related to the same bacteria that have been linked to peptic ulcers and may be more likely to occur in people who have had noncancerous stomach polyps. Heavy consumption of salt, carbohydrates and nitrate preservatives and low consumption of green, leafy vegetables and fruit also may be related to stomach cancer.

The earliest noticeable symptoms of stomach cancer may be weight loss or weakness; anemia caused by slow bleeding; black, tarry stool; and vomiting blood. When the cancer is advanced, the tumor can be felt by a physician through the abdominal wall. When the tumor spreads, it may result in enlargement of the liver, jaundice (a yellowing of the skin and the whites of the eyes because of a high level of bile pigment in the blood), fluid accumulation in the abdomen, cancerous skin nodules and weakened bones.

If the cancer has not spread beyond the stomach, surgery to remove the stomach and nearby lymph nodes may cure the disease. In most instances, if the cancer has spread, chemotherapy or radiation may be administered to relieve symptoms and to prolong life.

The risk of contracting stomach cancer may be reduced if salt intake is restricted and if consumption of fresh fruits and vegetables — especially those containing large amounts of beta-carotene and vitamin C — is increased.

## **Road Traffic Accidents**

Road traffic accidents kill more people in the developed regions of the world than any other type of unintentional injury. Research says that, in most instances, human error is at least partly to blame; in Canada, for example, the Canada Safety Council estimated that 85 percent of accidents are caused by driver error.<sup>21</sup>

As chronic diseases have become more common as causes of death, the belief that individuals can take actions to prevent or to delay their onset has become more prevalent. In most instances, those actions focus on reducing the risk factors by adopting a healthy diet and an appropriate exercise program, limiting alcohol consumption and avoiding cigarette smoking. ♦

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