

FACT SHEET

CANCER RISK FACTORS

Cancer is a group of more than 100 different diseases, each with their own set of risk factors.^{1,2} The risk of developing cancer increases as we age, so age, along with gender, race and personal and family medical history, are risk factors for cancer. Other risk factors are largely related to lifestyle choices, while certain infections, occupational exposures and some environmental factors can also be related to developing cancer. On the basis of strength of evidence in the scientific literature, we distinguish below between known and possible risk factors by site.

ORAL CAVITY AND PHARYNX	
Mouth	Tobacco and alcohol usage accounts for most mouth cancers. Another risk factor is a diet low in fruits and vegetables and possible risk factors are poor tooth development and oral hygiene, trauma due to ill-fitting dentures or jagged teeth, use of mouthwashes with high alcohol content, and iron-deficiency anemia. Human papillomavirus (HPV) infection is also associated with some cancers of the mouth and is believed to be transmitted by sexual contact.
DIGESTIVE SYSTEM	
Colorectal	Risk factors are personal or family history of colorectal polyps or inflammatory bowel disease, certain rare hereditary conditions, type 2 diabetes, and a diet high in red or processed meat and fat and/or low in fiber, fruits and vegetables. Possible risk factors are physical inactivity, alcohol consumption, obesity, and smoking. Risk may be reduced by estrogen replacement therapy, non-steroidal anti-inflammatory drugs (e.g., aspirin, ibuprofen), dietary calcium and vitamin D.
Pancreas	Risk factors are cigarette smoking and possibly alcohol, coffee, or tea consumption, diabetes, chronic pancreatitis, cirrhosis, allergies, obesity, diet high in meat or butter fat, as well as having a family history of pancreatic cancer.
Stomach	Risk factors are dietary nitrites (in pickled, salted, and smoked foods), pernicious anemia, and diet low in fruits and vegetables. Possible risk factors are infection with <i>Helicobacter pylori</i> , high doses of ionizing radiation, cigarette smoking, and genetic factors.
Liver	Risk factors are chronic infection with hepatitis B or C virus, cirrhosis of the liver (chronic liver injury, usually due to alcohol abuse), parasitic infections (schistosomiasis and liver flukes), aflatoxin ingestion (produced by a common mold that invades poorly stored peanuts and other foods), and occupational exposure to thorium dioxide or vinyl chloride. Possible risk factors are use of steroids, smoking, and some inherited metabolic diseases (e.g., hemochromatosis).

DIGESTIVE SYSTEM (continued)	
Esophagus	The most important risk factors are tobacco use (cigarettes, cigars, pipes), and excessive alcohol use along with the syndrome, Barrett's esophagus. Possible risk factors are obesity, inadequate diet, poor nutrition, decreased levels of certain nutrients (carotene, ascorbic acid, riboflavin, niacin, thiamin, zinc, magnesium, and selenium), and insufficient consumption of fruits and vegetables.
Gallbladder	The most important risk factor is gallstones; factors related to stone formation are increasing age, being female, being pregnant, certain ethnicity, obesity, use of estrogen-containing drugs and high fat and caloric intake.
RESPIRATORY SYSTEM	
Lung	Tobacco smoking is responsible for nearly 90% of all lung cancers. Other contributing risk factors are smoking cigars or pipes and environmental tobacco smoke (second-hand smoke). High doses of ionizing radiation, residential radon exposure and occupational exposure to mustard gas, chloromethyl ethers, inorganic arsenic, chromium, nickel, vinyl chloride, radon, asbestos or byproducts of fossil fuel are also thought to increase risk. Possible risk factors are air pollution and insufficient consumption of fruits and vegetables.
Larynx	Most cases are caused by cigarette smoking. Other risk factors are alcohol and occupational exposure to asbestos or mustard gas.
SKIN	
Melanoma	Risk factors are excessive exposure to ultraviolet radiation (sunlight), fair skin, history of severe sunburns, personal or family history of melanoma, multiple moles or atypical moles (colored skin spots), giant congenital moles, xeroderma pigmentosum (a rare hereditary disease), personal history of melanoma, and reduced immune function due to organ transplants or HIV infection. Melanoma occurs most often among white males and females.
Non-melanoma	Risk factors are ultraviolet radiation (sunlight), fair skin, high doses of ionizing radiation, occupational exposure to arsenic, polycyclic hydrocarbons (coal tars, pitches, asphalt, creosote, soot, lubricating and cutting oils) and rare hereditary diseases such as multiple basal cell carcinoma syndrome, xeroderma pigmentosum, and albinism. Possible risk factors are burn scars, chronic infections, and photosensitizers in tanning aids, cosmetics, and medicines.
BREAST	
Breast	For women, risk factors are family history (especially mother or sister) of breast cancer, personal history of breast, ovarian, or endometrial cancer, susceptibility genes (BRCA-1, BRCA-2), some forms of benign breast disease (atypical hyperplasia), higher education and socioeconomic status, menstruation at an early age, late menopause, never bearing children, first child born after age 30, high doses of ionizing radiation, long term use of post-menopause estrogens and progestins, obesity after menopause, and excessive alcohol consumption. Possible risk factors are dietary fat and physical inactivity. For men, risk factors include increasing age, family history, radiation exposure, and having high levels of estrogen due to inherited gene mutations or treatments. Possible risk factors include gynecomastia and obesity.

REPRODUCTIVE ORGANS	
Prostate	Risk factors are some types of prostatic hyperplasia and a family history, especially a father or brother. Possible risk factors are a diet high in animal fat, obesity, hormonal factors, a sexually transmitted agent, smoking, alcohol, and physical inactivity. Black males have much higher prostate cancer rates than white males.
Endometrium	High cumulative exposure to estrogens including never bearing children or bearing few children, menstruation beginning at an early age, failure to menstruate, late menopause, estrogen replacement therapy are major risk factors. Also, use of tamoxifen, infertility, obesity, diabetes, hypertension, gallbladder disease, and Stein-Leventhal syndrome are known risk factors. Possible risk factors are dietary fat and hereditary non-polyposis colon cancer.
Ovary	Risk factors are personal history of breast cancer, family history of breast or ovarian cancer, susceptibility genes (BRCA-1, BRCA-2), never bearing children, and hereditary non-polyposis colon cancer. A possible risk factor is dietary fat. Risk may be reduced by tubal ligation and hysterectomy.
Cervix	Risk factors are infection with human papilloma viruses (HPV), early age at first sexual intercourse, many sexual partners or partners who have had many sexual partners, multiple births, long-term oral contraceptive use, and cigarette smoking. Possible risk factors are certain vitamin deficiencies and hormonal factors.
URINARY SYSTEM	
Bladder	The most important risk factor is cigarette smoking; other risk factors are occupational exposure to benzidine and 2-naphthylamine and occupations in the dye, leather or rubber industry. Possible risk factors are heavy coffee consumption, bladder infection with <i>Schistosoma haematobium</i> (a parasitic flatworm), treatment with chlornaphazine or cyclophosphamide (anti-cancer drugs), long-term use of pain killers containing phenacetin, urinary tract infections or low urine flow, dietary factors, tobacco use other than cigarettes, and genetic factors.
Kidney	Cigarette smoking is the most important risk factor; others are obesity, abuse of analgesics (especially phenacetin-containing pain relievers), and occupational exposure to arsenic. Possible risk factors are regular use of prescription diuretics and increased meat consumption.
LYMPHOMA / LEUKEMIA / MULTIPLE MYELOMA	
Non-Hodgkin Lymphoma	Risk factors are reduced immune function due to organ transplants or infection with HIV, Epstein-Barr or human T-cell leukemia/lymphoma virus. Possible risk factors are occupational exposure to pesticides, herbicides, or organic solvents.
Hodgkin Lymphoma	Risk factors are infectious mononucleosis and Epstein-Barr virus infection. Possible risk factors are family history of Hodgkin lymphoma especially among siblings and genetic factors.

LYMPHOMA / LEUKEMIA / MULTIPLE MYELOMA (continued)	
Leukemia	Risk factors are family history, high doses of ionizing radiation, alkylating drugs used to treat cancer and other diseases, human T-cell leukemia/ lymphoma virus I infection, Down's syndrome or other genetic abnormalities, and occupational exposure to benzene. Possible risk factors are exposure to electromagnetic fields, pesticides, smoking, and several immune-related diseases.
Multiple Myeloma	High doses of ionizing radiation are a risk factor. Possible risk factors are repeated infections, allergic conditions, autoimmune disease, genetic factors, cigarette smoking, farming, and occupational exposure to benzene.
OTHER	
Brain	Risk factors are genetic factors, certain rare inherited syndromes such as neurofibromatosis, being a parent or sibling of a child with brain cancer, high doses of ionizing radiation, and occupational exposure to certain aromatic hydrocarbon compounds, bis-chloromethyl ether, vinyl chloride, and acrylonitrile. Possible risk factors are exposure to electromagnetic fields, exposure to farm animals and pets, severe head trauma, loud noise, and N-nitroso compounds in the diet, cigarettes, and alcohol.
Thyroid	Risk factors are high doses of ionizing radiation and goiter.

¹American Cancer Society. Cancer Facts & Figures, 2012.

²Harras A, editor. Cancer Rates and Risks, USDHHS, NIH 1996.