Cancer 101

Cancer Prevention

Cancer develops when normal cells grow out of control. This usually happens because of genetic changes, especially mutations involving genes that play a role in cell multiplication and repair. These mutations can have a wide range of causes, including radiation, chemical exposure and random changes that accumulate with age.

Some cancer risk factors cannot be controlled, including age, sex, race or ethnicity, family history and inherited genetic characteristics. However, only around 5% to 10% of cancers are caused by inherited gene mutations, with the rest attributable to changes that occur during a person's lifetime.

Other risks related to environmental exposure, such as smoking or eating ultra-processed food, are simple to avoid—but simple doesn't necessarily mean easy! Some risk factors, like overweight, are influenced by a combination of genetics, environment and behavior. Certain cancers are linked to socioeconomic status, which can affect everything from the type of work a person does to their stress level and access to health care.

Smoking and Tobacco Use

Smoking is a major risk factor for cancer, accounting for around 30% of all cancer deaths in the United States, according to the American Cancer Society. Not only do smokers have a higher risk for cancer but so do nonsmokers who are exposed to second-hand smoke. Smokeless tobacco products can also raise cancer risk.

In addition to lung cancer, tobacco use can also contribute to a dozen other malignancies, including cancers of the mouth and throat, stomach, bladder, cervix, colon, kidney, liver and pancreas. Some studies have seen an increased risk of breast cancer in women who smoke. There is less research on cannabis smoking, but any inhaled combustible material can be harmful.

Nicotine is addictive, and quitting smoking can be a challenge. Some people find nicotine replacement using gum or patches helpful. Vaping, or inhaling nicotine vapor using an e-cigarette or other device, is less detrimental than smoking, but the inhaled aerosols also contain harmful chemicals. The prescription medications Chantix (varenicline) and Zyban (bupropion) can reduce the urge to smoke. Smoking cessation hotlines, text message services and support groups may also be helpful. Many people find that it takes several tries before they quit smoking for good.

The health benefits of smoking cessation begin soon after quitting, and lung cancer risk is cut in

half after 10 years. The risk remains elevated compared with never smokers, however, so screening is recommended for long-time heavy smokers. The sooner you stop smoking, the better, but quitting is beneficial at any age.

Alcohol

Alcohol contributes to around 4% of cancer deaths in the United States, according to the American Cancer Society. Alcohol consumption has been linked to cancers of the mouth and throat, esophagus, breast, colon, pancreas and stomach. Heavy drinking can cause cirrhosis of the liver, a major risk factor for liver cancer. But even moderate or light drinking may raise the risk for some cancers.

The American Cancer Society recommends that people who drink should limit their alcohol consumption to no more than two drinks per day for men or one drink per day for women. A beer, a glass of wine and a cocktail contain about the same amount of alcohol.

Diet and Exercise

A healthy diet and regular physical activity can reduce the risk of cancer. People with overweight or obesity are at higher risk for at least 13 different types of cancer, according to the Centers for Disease Control and Prevention (CDC). These include cancers of the breast, colon, kidney, liver, ovaries, pancreas and thyroid. Body size is influenced by genetics and can't be fully controlled, but a healthy diet and exercise are beneficial at any weight.

The American Cancer Society recommends a well-balanced diet with plenty of vegetables, fruits and whole grains. Limit red meat and processed or smoked meats, which have been linked to colon cancer. High doses of vitamins, minerals and nutritional supplements have not been shown to prevent cancer; in some cases, they may even be harmful.

The benefits of exercise go well beyond weight loss. People who get more physical activity have a lower risk for several types of cancer, while being sedentary—especially sitting for long periods—raises the risk. Guidelines recommend that adults should get at least 150 minutes of moderate intensity activity or 75 minutes of vigorous activity each week, along with muscle strengthening activity, but studies show that even brief exercise is beneficial.

Sun Exposure

Exposure to ultraviolet (UV) radiation from the sun or tanning beds is the major risk factor for skin cancer, including melanoma. People with pale skin are at greatest risk, but darker-skinned people of all ethnicities can also get skin cancer.

Reducing exposure is by staying out of the sun during midday, when the rays are most intense. When outdoors, cover up with long sleeves and pants, a hat with a brim and sunglasses that block UV rays.

Apply sunscreen to exposed skin, including easily overlooked areas, like the ears and back of the neck. Sunscreen with a higher sun protection factor, or SPF, offers more protection. An SPF of 15 means it will take 15 times longer for skin to burn. Look for products that block both UV-A and UV-B rays. But remember—even the best sunscreen doesn't completely block harmful radiation.

Infections and Vaccines

Some types of cancer are caused by viruses or bacteria, so preventing or treating the infection can reduce cancer risk.

Human papillomavirus (HPV) is the main cause of cervical cancer, anal cancer, vaginal and penile cancers and some oral cancers. There are more than 100 types of HPV, about a dozen of which are considered high risk, or cancer-causing. HPV is commonly sexually transmitted, but it can also spread via nonsexual skin-to-skin contact.

Cervical cancer deaths have fallen dramatically since the advent of routine screening with Pap smears and HPV tests. Screening for anal or oral cancer is not routinely offered. The Gardasil 9 vaccine protects against nine types of HPV, including seven that cause cancer and two that cause genital warts. The CDC recommends that adolescent girls and boys should be vaccinated at age 11 or 12, with eligibility continuing through age 27. The vaccine is approved for people up to age 45, and some older individuals may still benefit.

Hepatitis B and C, two blood-borne infections, are among the major causes of liver cancer. To prevent infection, don't share needles to inject drugs, use condoms and take steps to protect yourself from exposure to blood.

Hepatitis B can be prevented with a vaccine. Babies are routinely vaccinated in the United States, and the CDC now recommends the vaccine for all adults regardless of risk. Hepatitis B can be treated with antiviral medications, but it usually can't be cured. There is no vaccine for hepatitis C, but it can be treated with antivirals that cure most people in two or three months. Successful treatment lowers the risk of developing cirrhosis and liver cancer.

Heliobacter pylori are bacteria that cause stomach ulcers and raise the risk of stomach cancer. Antibiotics can kill the bacteria, and some research suggests this may lower the risk of cancer. Epstein-Barr virus also causes certain cancers, and HIV raises the risk.

Environmental Risk Factors

Exposure to carcinogenic chemicals in the environment—for example, industrial chemicals in the workplace and vehicle exhaust in air pollution—can increase cancer risk.

Substances with a known link to cancer include asbestos, arsenic (present in drinking water in some areas), benzene (present in gasoline fumes and cigarette smoke) and formaldehyde. Radon, an invisible and odorless radioactive gas, is the second leading cause of lung cancer after

smoking.

Despite widespread myths, there is no convincing evidence that artificial sweeteners, deodorants or antiperspirants, power lines or radiation from cell phones are associated with increased cancer risk.

Cancer Screening

Regular screening can detect cancer early, when it is easier to remove or treat, which can prevent disease progression and death. Experts recommend routine screening for breast cancer, cervical cancer and colon cancer as well as regular visual exams for skin cancer. Lung cancer and liver screening are recommended for people at high risk. PSA prostate cancer screening is offered for older men based on individual risk factors and preferences. See Cancer Screening for more information.

The following resources offer more information about cancer prevention:

American Cancer Society: Eat Healthy and Get Active

American Cancer Society: Stay Away From Tobacco

American Cancer Society: Be Safe in the Sun

National Cancer Institute: Causes and Prevention

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