

Cancer Prevention: An Overview

Cancer prevention is action taken to lower the chance of getting cancer. Some risk factors, like smoking, can be avoided, while others, like inheriting certain genes, cannot. Ways to help prevent cancer include avoiding known causes, healthy lifestyle changes, finding precancerous conditions early, and, for some people, medicines or surgery.

The simple version

Cancer prevention is action taken to lower the chance of getting cancer. Preventing cancer lowers the number of new cases. That can reduce the burden of cancer and lower the number of deaths from it.

Cancer is not a single disease. It is a group of related diseases. Many things in our genes, our lifestyle, and the environment around us may raise or lower our risk of getting cancer.

Scientists study many ways to help prevent cancer. These include:

- Avoiding or controlling things known to cause cancer.
- Changing diet and lifestyle.
- Finding precancerous conditions (cell changes that may turn into cancer) early.
- Using medicines to lower risk (chemoprevention).
- Risk-reducing surgery.

In short: prevention is about lowering your chance of getting cancer.

How cancer forms

Carcinogenesis (car-sin-oh-JEN-uh-sis) is the series of steps that take place as a normal cell becomes a cancer cell. Cells are the smallest units of the body. Each cell contains genes that guide how the body grows, develops, and repairs itself.

Changes in genes, called mutations, can cause the normal controls in cells to break down. When this happens, cells do not die when they should. And new cells form when the body does not need them. The buildup of extra cells may form a tumor. Tumors can be benign (not cancer) or malignant (cancer). Malignant tumor cells invade nearby tissues and spread. Benign tumor cells do not.

Risk factors you can and cannot change

Anything that increases your chance of developing cancer is a risk factor. Anything that decreases it is a protective factor. Some risk factors can be avoided, but many cannot. For example, both smoking and inheriting certain genes are risk factors for some cancers. Only smoking can be avoided. Risk factors a person can control are called modifiable risk factors.

Factors known to increase cancer risk include:

- **Cigarette smoking and tobacco use** — strongly linked to many cancers. Not smoking, or quitting, lowers the risk.
- **Infections** — certain viruses and bacteria, such as HPV, hepatitis B and C, Epstein-Barr virus, and *Helicobacter pylori*.
- **Radiation** — including ultraviolet radiation and ionizing radiation.
- **Immunosuppressive medicines** — taken after an organ transplant, they lower the body's ability to keep cancer from forming.

Other factors may affect cancer risk too. Ask your healthcare team which ones apply to you.

In short: some causes of cancer can be avoided, and some cannot.

Ways that can lower cancer risk

- **Chemoprevention.** For people at high risk, some medicines can lower cancer risk. Medicines such as tamoxifen and raloxifene have been shown to lower the risk of breast cancer in high-risk women. Finasteride has been shown to lower the risk of prostate cancer. These medicines can have side effects, so they are used carefully.
- **Weight loss surgery.** Weight loss surgery lowers the risk of cancers linked to being overweight.
- **Risk-reducing surgery.** Some people have certain gene changes, or a strong personal or family history. They may consider surgery to lower their risk. It is important to have a cancer risk assessment and counseling before making this decision.

Ways that have not been shown to lower risk

- **Aspirin** has not been shown to prevent most cancers. Long-term use may help prevent colorectal cancer in certain people. Aspirin can cause bleeding, so talk with your doctor first.
- **Vitamins and dietary supplements** have not been shown to prevent cancer. In one large trial, vitamin E taken alone increased the risk of prostate cancer.

New ways to prevent cancer are being studied in clinical trials. Your healthcare team is the best source of advice about lowering your own cancer risk.

Source: National Cancer Institute (cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq)

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