Bladder cancer risk factor information

This document gives a general overview of risk factors. The document covers:

- About cancer and risk factors
- About bladder cancer
- Types of bladder cancer
- Known risk factors
- Possible risk factors
- Other risk factors that have been investigated
- References / more information

About cancer and risk factors

Cancer is not just one disease.

Cancer is a group of over 100 different diseases. Cancer occurs when abnormal cells grow out of control and crowd out the normal cells. It can start anywhere in the body and can spread ("metastasize") to other parts of the body. Cancer types are named for the original location in the body and the type of cell or tissue. Different types of cancer have different causes and risk factors.

Cancer can take a long time to develop.

The cause of cancer is sometimes related to events that happened many years ago. Most cancer types are thought to take anywhere from 10 to over 50 years to develop. A few types, such as leukemia or lymphoma, are thought to take less than 10 years.

A risk factor is anything that increases your chance of getting cancer.

Some risk factors can be controlled while others cannot. Risk factors can include:

- Hereditary conditions (such as genes passed down from parents)
- Medical conditions or treatments (such as a previous cancer diagnosis)
- Infections (such as human papilloma virus [HPV])
- Lifestyle factors (such as smoking cigarettes)
- Environmental exposures (such as certain air pollutants)

Most risk factors do not directly cause cancer.

A risk factor influences the development of cancer but usually does not directly cause cancer. Instead, a combination of risk factors likely drives cancer development. For example, genetic factors can make individuals more likely to get cancer when they are exposed to a cancer-causing chemical.

Environmental risk factors depend on how, how much, and how long you are exposed.

Your risk from exposure to certain chemicals or radiation depends on the type, extent, and duration of exposure. For example, breathing a certain chemical may increase your risk of getting cancer. However, touching the same chemical may not. In addition, some substances may increase your risk only if you are exposed to high amounts over a long time.

It is difficult to identify the exact causes of cancer.

- Many cancers can develop due to random chance.
- Multiple risk factors can act in combination.
- Risk factors can change over time.
- Cancer might not develop or get diagnosed for a long time after an initiating event (such as exposure or random cell mutation).

Knowing your risk factors can help you make more informed choices.

Discuss your risk factors with your health care provider to make more informed decisions on lifestyle and health care.

About bladder cancer

Bladder cancers start in the bladder and are described based on whether they grow into deeper layers of the bladder wall.

The bladder is a hollow organ in the lower abdomen that stores urine. The wall of the bladder is made up of several layers.

- Non-invasive bladder cancers (also called in situ bladder cancers) only involve the layer of cells in the bladder lining where they start.
- Invasive bladder cancers have grown into deeper layers of the bladder lining, possibly into the muscle wall or beyond.

All data provided in this risk factor summary are for diagnoses of non-invasive (*in situ*) and invasive bladder cancer.

For most cancer types, information on the number of new diagnoses is limited to invasive cancers only, but data on bladder cancer includes *both* non-invasive (*in situ*) and invasive diagnoses. This is because all bladder cancers have a high likelihood of progression and recurrence.

Bladder cancer is more common among men than women.

Bladder cancer is the 4th most common type of cancer diagnosed among men nationally and statewide.[1,6] The American Cancer Society estimates 84,870 people in the United States (65,080 men and 19,790 women) will be diagnosed with bladder cancer in 2025.[1,2] In Massachusetts, about 1,870 new diagnoses of bladder cancer are expected in 2025.[1] During 2016-2020, bladder cancer accounted for 7.3% of all cancer diagnoses among men in Massachusetts and 2.5% of all cancer diagnoses among women.[6]

The risk of bladder cancer is higher among non-Hispanic White individuals.

For reasons that are not well understood, bladder cancer is about twice as likely to develop in White people than Black or Hispanic people.[2] In Massachusetts, non-Hispanic White men had higher incidence rates of bladder cancer compared to other racial/ethnicity groups.[6]

The risk of bladder cancer increases with age.

Nearly 90% of people diagnosed with bladder cancer are older than 55.[2] It is most frequently diagnosed among people aged 65-74 with a median age at diagnosis of 73.[9,10]

Types of bladder cancer

Urothelial carcinoma (also called transitional cell carcinoma) is by far the most common type of bladder cancer.

The inner lining of the bladder is called the urothelium or transitional epithelium. Urothelial cells line the inside of the bladder and are able to stretch when the bladder is full or shrink when it is empty.[2,7] Urothelial carcinoma starts in these cells.[2,10]

Other types of bladder cancer are much less common.

- Squamous cell carcinomas (SCCs) account for about 3 to 5% of all bladder cancers diagnosed in the United States.
- Adenocarcinomas start in gland-forming cells and account for about 1 to 2% of bladder cancers.

- Small cell carcinomas start in nerve-like cells (called neuroendocrine cells) and are rare, accounting for less than 1% of bladder cancers.
- Sarcomas are very rare cancers that can start in the muscle cells of the bladder.[2]

Known risk factors

Medical conditions and treatment

Chronic (long-term, ongoing) bladder irritation:

Urinary infections, kidney and bladder stones, bladder catheters left in place for a long time, and other causes of chronic bladder irritation are associated with bladder cancer, especially squamous cell carcinoma.[2]

Previous cancer diagnosis and treatment:

Individuals with a previous cancer diagnosis in any part of the urinary tract (including the bladders, kidneys, ureters, and urethra) increases the risk of developing another cancer somewhere in the urinary tract.[2] People who have taken the chemotherapy drug cyclophosphamide (Cytoxan) for a long time have a higher risk of bladder cancer.[2,8] People treated with radiation to the pelvis for other types of cancer are also more likely to develop bladder cancer.[2,8]

Birth defects:

Certain bladder birth defects may increase the risk of bladder cancer.

- The urachus is a temporary connection between the belly button and the bladder that exists before birth. After birth, it usually closes. If the connection remains, it could become cancerous – though this is rare, accounting for less than 1% of all bladder cancers.[2]
- Exstrophy (a rare birth defect where the bladder and abdominal wall do not close properly) greatly increases a person's risk of urinary infections and bladder cancer even though it can be surgically repaired soon after birth.[2]

Hereditary conditions

Family history of bladder cancer:

People with a family history of bladder cancer are at an increased risk. Although the reason is unclear, this may be due to shared exposures, such as tobacco smoke, inherited genetic changes, or a combination of factors.[2,8,10]

Inherited gene mutations and conditions:

A small number of people inherit a genetic syndrome that increases the risk of bladder cancer. For example,

- A mutation of the retinoblastoma gene (*RB1*) can increase the risk of bladder cancer and, in infants, can also cause cancer of the eye.
- Cowden disease (caused by changes in the *PTEN* gene) is linked to cancers of the breast and thyroid but also increases the risk of bladder cancer.[2,8]
- Lynch syndrome (also called hereditary non-polyposis colorectal cancer or HNPCC) is mainly linked to colon cancer and endometrial cancer but may also increase the risk for bladder cancer.[2]

Other gene mutations that have been linked to bladder cancer include *HRAS*, *NAT2*, and *GSTM1*.[8]

Infections

Schistosoma haematobium:

Although extremely rare in the United States, infection with *Schistosoma haematobium* (a parasitic worm found mainly in Africa and the Middle East) is a risk factor for bladder cancer.[2,8]

Lifestyle

Tobacco use:

Tobacco use, especially cigarette smoking, is a well-established risk factor for bladder cancer.[2,8,10] Smokers are at least three times as likely to develop bladder cancer compared to nonsmokers.[2,10] When tobacco is used, harmful cancer-causing chemicals are absorbed from the lungs into the blood. The kidneys filter the blood and remove these chemicals, which then collect in the urine. This can damage the cells lining the bladder.[8] About 50% of bladder cancers may be explained by smoking.[10] Quitting smoking may reduce the risk of developing bladder cancer by 30% to 60%.[10] For information about quitting tobacco use, contact the DPH Tobacco Cessation and Prevention Program at 1-800-QUIT-NOW or 1-800-784-8669.[12]

Environmental exposures

Arsenic:

Arsenic occurs naturally in soil and bedrock. Arsenic in drinking water is associated with an increased risk of bladder cancer.[2,3,8,10] The chance of arsenic exposure from drinking water depends on where you live and the source of your drinking water.[2] Groundwater is more likely to have high levels of arsenic than surface water (such as lakes or reservoirs).[3,8] Drinking water is not a major source of arsenic exposure for most people living in the United States.[2] In Massachusetts, it naturally occurs in some groundwater, usually in bedrock aquifers in the

central part of the state and in the Merrimack River Valley. For more information on arsenic in private well water and how to test your well water, visit this FAQ.

Possible risk factors

Medical conditions

Diabetes medicine pioglitazone:

Some studies suggest the use of the diabetes medicine pioglitazone could be associated with an increased risk of bladder cancer. This risk seems to increase with higher doses of the medicine.[2,10] It is not clear if diabetes is an independent risk factor for bladder cancer.[10]

Lifestyle

Not drinking enough fluids:

People who drink a lot of fluids on a regular basis tend to have lower rates of bladder cancer.[2,10] This may be because they empty their bladder more often, which may keep chemicals from lingering.[2] However, findings are inconsistent across studies.[10]

Dietary supplements containing aristolochic acid:

Dietary supplements containing aristolochic acid, which is mainly found in herbs from the *Aristolochia* family, have been associated with an increased risk of bladder cancer.[2,8] These herbal ingredients are often found in traditional Chinese medicines.

Environmental exposures

Workplace exposure:

Certain industrial chemicals may increase the risk of bladder cancer.[2,10] These include aromatic amines, such as benzidine and beta-naphthylamine which are sometimes used in the dye industry.[2] A higher risk of bladder cancer has been observed among manufacturing workers in the rubber, leather, textiles, metal, printing, and paint products industries.[2,8,10] Studies also suggest that hairdressers, machinists, firefighters, and truck drivers may also have a higher risk of bladder cancer.[2,4,5,10]

Other risk factors that have been investigated

Lifestyle

Drinking coffee?

Coffee consumption was once suggested as a risk factor for bladder cancer, but studies have not found a clear association.[10]

Environmental exposures

Disinfection byproducts in drinking water?

Disinfection of drinking water is necessary to kills germs and bacteria that can cause illness.[11] Byproducts can form when chlorine or other disinfectants are added. Some studies found a link between an increased risk of bladder cancer and ingestion of drinking water with high levels of disinfection byproducts while others have not.[8,10,11] Because disinfection byproducts occur in mixtures, it is difficult to identify the specific chemicals that may be causing the increased risk.[11] It is important that disinfection not be compromised in an attempt to decrease byproducts. Levels of disinfection byproducts are monitored by public water systems and alternate methods for disinfection are being researched.[11]

References / more information

This information sheet should not be considered exhaustive. For more information on other possible risk factors and health effects being researched, please see the resources below. Much of the information contained in this summary has been taken directly from these sources. This material is provided for informational purposes only and should not be considered as medical advice. Consult your physician if you have questions regarding a specific medical problem or condition.

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