

# Intravesical Pharmacotherapy for Non-Muscle-Invasive Bladder Cancer

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## Editorial

Bladder cancer is any of several types of cancer arising from the tissues of the urinary bladder. Symptoms include blood in the urine, pain with urination, and low back pain. Risk factors for bladder cancer include smoking, family history, prior radiation therapy, frequent bladder infections, and exposure to certain chemicals. The most common type is transitional cell carcinoma. Other types include squamous cell carcinoma and adenocarcinomas. Diagnosis is typically by cystoscopy with tissue biopsies. Staging of the cancer is determined by transurethral resection and medical imaging.

Treatment depends on the stage of the cancer. It may include some combination of surgery, radiation therapy, chemotherapy, or immunotherapy. Surgical options may include transurethral resection, partial or complete removal of the bladder, or urinary diversion. The typical five-year survival rates in the United States are 77%, Canada is 75%, and Europe is 68%.

Bladder cancer, as of 2018, affected about 1.6 million people globally with 549,000 new cases and 200,000 deaths. Age of onset is most often between 65 and 84 years of age. Males are more often affected than females. In 2018, the highest rate of bladder cancer occurred in Southern and Western Europe followed by North America with rates of 15, 13, and 12 cases per 100,000 people. The highest rates of bladder cancer deaths were seen in Northern Africa and Western Asia followed by Southern Europe.

Bladder cancer characteristically causes blood in the urine, which may be visible or detectable only by microscope. Blood in the urine is the most common symptom in bladder cancer, and is painless. Visible blood in the urine may be of only short duration, and a urine test may be required to confirm non-visible blood. Between 80 and 90% of people with bladder cancer initially presented with visible blood. Blood in the urine may also be caused by other conditions, such as bladder or ureteric stones, infection, kidney disease, kidney cancers or vascular malformations, though these conditions (except kidney cancers) would typically be painful.

Tobacco smoking is the main known contributor to urinary bladder cancer; in most populations, smoking is associated with over half of bladder cancer cases in men and one-third of cases among women, however these proportions have reduced over recent years since there are fewer smokers in Europe and North America. There is an almost linear relationship between smoking duration (in years), pack years and bladder cancer risk. A risk plateau at smoking about 15 cigarettes a day can be observed (meaning that those who smoke 15 cigarettes a day are approximately at the same risk as those smoking 30 cigarettes a day). Smoking (cigar, pipe, Egyptian water pipe and smokeless tobacco) in any form increases the risk for bladder cancer. Quitting smoking reduces the risk. Risk of bladder cancer decreases by 30% within 1–4 years and continues to decrease by 60% at 25 years after smoking cessation. However, former smokers will most likely always be at a higher risk of bladder cancer compared to people who have never smoked. Passive smoking also appears to be a risk.

Opium consumption increases the risk of bladder cancer by 3-fold and concurrent use of opium and smoking increases the risk of bladder cancer by 5 times compared to the general population. Currently, the best diagnosis of the state of the bladder is by way of cystoscopy, which is a procedure in which a flexible or rigid tube (called a cystoscope) bearing a camera and various instruments is introduced into the bladder through the urethra. The flexible procedure allows for a visual inspection of the bladder, for minor remedial work to be undertaken and for samples of suspicious lesions to be taken for a biopsy. A rigid cystoscope is used under general anesthesia in the operating room and can support remedial work and biopsies as well as more extensive tumor removal. Unlike papillary lesion, which grows into the bladder cavity and is readily visible, carcinoma *in situ* lesion is flat and obscure. Detection of carcinoma *in situ* lesions requires multiple biopsies from different areas of interior bladder wall. Photodynamic detection (blue light cystoscopy) can aid in the detection of carcinoma *in situ*. In photodynamic detection, a dye is instilled into the bladder with the help of a catheter. Cancer cells take up this dye and are visible under blue light, providing visual clues on areas to biopsied or resected.

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