

Bladder Cancer

Patient Fact Sheet

Introduction

The urinary bladder is a muscular organ that stores urine made by the kidney. Urine flows from the kidney through tubes called ureters to the bladder. As the bladder fills, the muscular wall of the bladder stretches. Sensors in the muscle wall sense fullness and send a signal through your nervous system to the brain making you aware of the need to void (urinate). The bladder usually feels full when it is holding about 2 cups of urine. You will empty your bladder of urine through a tube, called the urethra, when it is socially acceptable. The muscle wall of the bladder is made up of three layers. The inner layer lining inside the kidney, ureters, bladder and urethra is made up of transitional cells. A support or basement membrane separates the inner lining from the middle layer. The middle layer is made up of connective tissue, and the outer layer is muscle tissue. 90% of bladder cancer in the United States is found in the inner lining (transitional cell lining) of the bladder.

Bladder cancer is the fourth most common cancer among men and the eleventh most common cause of cancer among women. More than 70,000 new cases will be diagnosed each year with an estimated 15,000 deaths. Bladder cancer occurs 2-3 times more often in men than women, is more common in Caucasians than African Americans or Hispanics, and has an average age at diagnosis of 65 years.

Risk Factors associated with increased chance for developing bladder cancer

- Smoking or second hand smoke exposure is the #1 risk factor for the development of bladder cancer
- Increasing age
- Family history or genetic defects
- Occupational exposure, especially in those who work with dyes (aromatic amines), rubber, leather, textiles, certain paint products, and printing
- Chronic inflammation, chronic urinary tract infections caused by parasites (common outside the US) or chronic kidney stones
- Chronic inflammation associated with chronic indwelling urinary catheter
- History of previous bladder cancer
- Previous pelvic radiation
- Previous chemotherapy

What are the signs and symptoms of bladder cancer?

- Often people have NO symptoms of bladder cancer. The most common sign of bladder cancer is visible blood in the urine, or blood that is only visible on microscopic examination of the urine (microscopic hematuria). There is often no pain associated with the blood in the urine. Some symptoms that may be present include urinary urgency (strong sensation of the need to urinate), frequency, and waking frequently at night to urinate. There may be pain when urinating, flank pain, back or abdominal pain, and loss of appetite or weight loss. Many of these symptoms can also be due to bladder stones or infection.

How is bladder cancer detected?

- If your health care provider thinks your symptoms might be due to bladder cancer, then he/she will get a medical history including smoking history or second hand smoke exposure along with a physical examination. The health care provider will also order laboratory tests such as cytology to look for cancer cells under the microscope.
- For some cancers, the health care provider can screen (look for) the cancer before you have symptoms. Screening is usually done by looking for substances or chemicals found in your blood or urine that are released by the cancer cells or as a response by the body to the cancer cells. These substances are called tumor markers.
- A cystoscopy is a minor procedure performed under local anesthetic, often in the urology office, which involves the use of a cystoscope placed along the urethra into the bladder in order to visualize the bladder wall.
- Imaging studies are also done to examine your kidneys, ureters, bladder and urethra. A CT urogram is likely to be ordered by your health care provider. To look for spread of cancer, your health care provider might also order a chest x-ray and bone scan.

Diagnosis of Bladder Cancer

In order to diagnose bladder cancer, the physician will need to do a procedure called a transurethral resection of bladder tumor (TURBT) or bladder biopsy. A TURBT or bladder biopsy is typically done in the operating room (OR) where a cystoscope is inserted along the urethra into the bladder to visualize the bladder

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wall lining. The abnormal appearing tissue is removed to examine under a microscope. This removal of tissue is the only way to know if bladder cancer cells are present. In order to grade the cell growth, a pathologist will look at the cancer cells for how fast the cells are growing. The more aggressively the cancer cells are growing, the higher the grade of cancer. The more slowly they are growing, the lower the grade.

Low Grade: (superficial tumors). At this grade, cancer can recur but rarely spreads to the muscle

High Grade: (invasive tumors) look very little like normal tissue and are more likely to grow fast and invade bladder muscle wall

Carcinoma in situ (CIS) describes high grade, flat tumors that sit on top of the lining of the bladder. The tumor cells are flat and sometimes appear as inflammatory or reddened areas within the lining of the bladder.

Another type of bladder tumor commonly seen is a papillary tumor, which is a raised tumor that lies on a stalk, with a shape similar to cauliflower. A papillary tumor can be a low grade or high grade tumor.

Once bladder cancer is diagnosed, the physician needs to find out the extent of disease and whether or not it has spread to other areas of the body. This is done through staging.

T0: - No tumor present

Tis (CIS): Carcinoma in situ

Ta: Papillary tumor without invasion into the bladder wall

T1: Tumor invades the connective tissue under the surface of the bladder lining (lamina propria)

T2: The cancer has spread into the muscle layer of the bladder

T3: The cancer has spread to perivesical fat, which is a lining of fatty tissue that surrounds the bladder

T4: The cancer has spread into the organs near the bladder; for men this is usually the prostate, and for women, this is often the uterus and vagina. In men or women, it can also spread to the pelvic area, lymph nodes and beyond

Most bladder tumors (70%) are non-invasive

Treatment of Bladder Cancer

Decisions about what treatment is best will be made by you and your health care provider based on the stage and grade of tumor. It will also be important to consider your age, general health, and benefits and side effects of the treatment options. No matter what kind of bladder cancer is found it may require life-long monitoring.

Generally for superficial bladder cancers (Tis, Ta, or T1) the following treatment options are suggested alone or in combination with one another:

- Surgery is the most common treatment for bladder cancer. Transurethral resection (TUR) is done to remove all the superficial cancer cells. Using a cystoscope inserted along the urethra, the physician will insert a tool with a small wire loop at the end to remove the cancer and to burn (fulgurate) the base of the tumor, or he/she might use a high-energy laser to destroy any remaining cells.
- Intravesical chemotherapy involves placing a drug into the bladder. It can be a single dose instilled right after the tumor is removed to kill any remaining cancer cells. It can also be given at weekly intervals for up to 6 weeks. These 6 weekly treatments are not started until 2-4 weeks after the surgery and are used to prevent the cancer from recurring. Intravesical chemotherapy agents include Mitomycin C, Gemcitabine and Valrubicin.

- Intravesical immunotherapy with Bacillus Calmett-Guerin (BCG), is a live but weakened tuberculosis vaccine that uses the body's own immune system to attack the cancer cells. Interferon-alpha is sometimes used in combination with BCG.

For muscle-invasive bladder cancer (T2- T4) the physician might recommend the following options:

- Resection of large or deeply invasive tumors is avoided if cystectomy is considered.
- Bladder saving surgery, also called a segmental or partial cystectomy, removes only the part of the bladder affected by cancer, along with nearby lymph nodes. (This is rarely performed)
- If removal of the cancer alone is not an option then the physician might suggest bladder removal (radical cystectomy) with removal of nearby lymph nodes, as well as any organs in the area where the cancer may have spread. For men this might require removal of the prostate gland and seminal vesicles. For women this may include removal of the cervix, ovaries, uterus, urethra, fallopian tubes, and a portion of the vagina.
- When removing the bladder, the physician will need to create a new way to store and/or drain urine. This is called a urinary diversion. There are three types of urinary diversions; continent, incontinent or neobladder. For the continent diversion, the physician might use part of your small intestine to create an internal pouch with a valve that allows drainage of urine several times a day using a catheter. An incontinent diversion or ileal conduit or urostomy, uses a section of small bowel to create a passageway for urine to flow from the ureter to the outside through an opening (stoma) in your skin. The urine drains through the stoma into a bag or pouch worn on the outside of the body. A neobladder is created using a portion of your intestines and placing it in the same place as your original bladder. The neobladder will be connected to your urethra allowing you to urinate more normally by tightening the abdominal muscles and relaxing the pelvic floor muscles to push urine through the urethra.
- External beam radiation therapy is usually offered to you when you cannot have surgery because you are too ill or the tumor cells cannot be removed without harm to you. Side effects from radiation include bladder infection, infection of the prostate, diarrhea, and local skin irritation
- Chemotherapy can either be given before surgery (neoadjuvant) or after surgery (adjuvant). Many clinical trials are evaluating the benefit of both these treatment options.
- In some situations a combination of TURBT, chemotherapy and radiation can be used to preserve the bladder.

Prevention/Detection of Bladder Cancer

- Stop smoking and avoid tobacco smoke in your environment. There are multiple programs and medications available to help with quitting smoking.
- Drinking lots of water, at least 8 glasses a day and eating a diet high in fruits and vegetables may help prevent bladder cancer.
- Adding antioxidants to your diet may play a role in cancer prevention. Sources of antioxidants include: broccoli, kale, berries, nuts, beans, coffee, russet potatoes, and artichokes, to name a few.

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