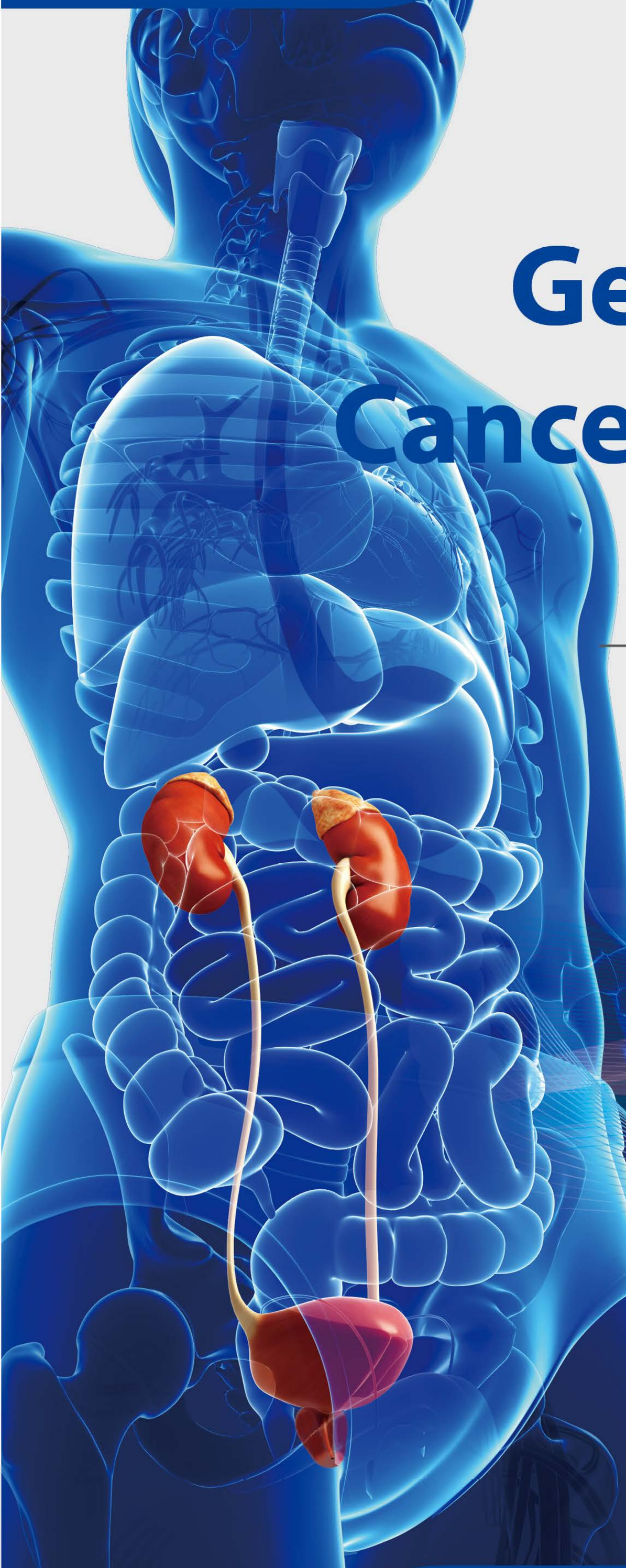
SMC Specialized Treatment Series No. 6
Samsung Comprehensive Cancer Center



Genitourinary Cancer Treatment

Global leader in minimally invasive treatment for urological cancer

With ample experience in world-class surgery and treatment, SMC is at the forefront of patient customized therapy.

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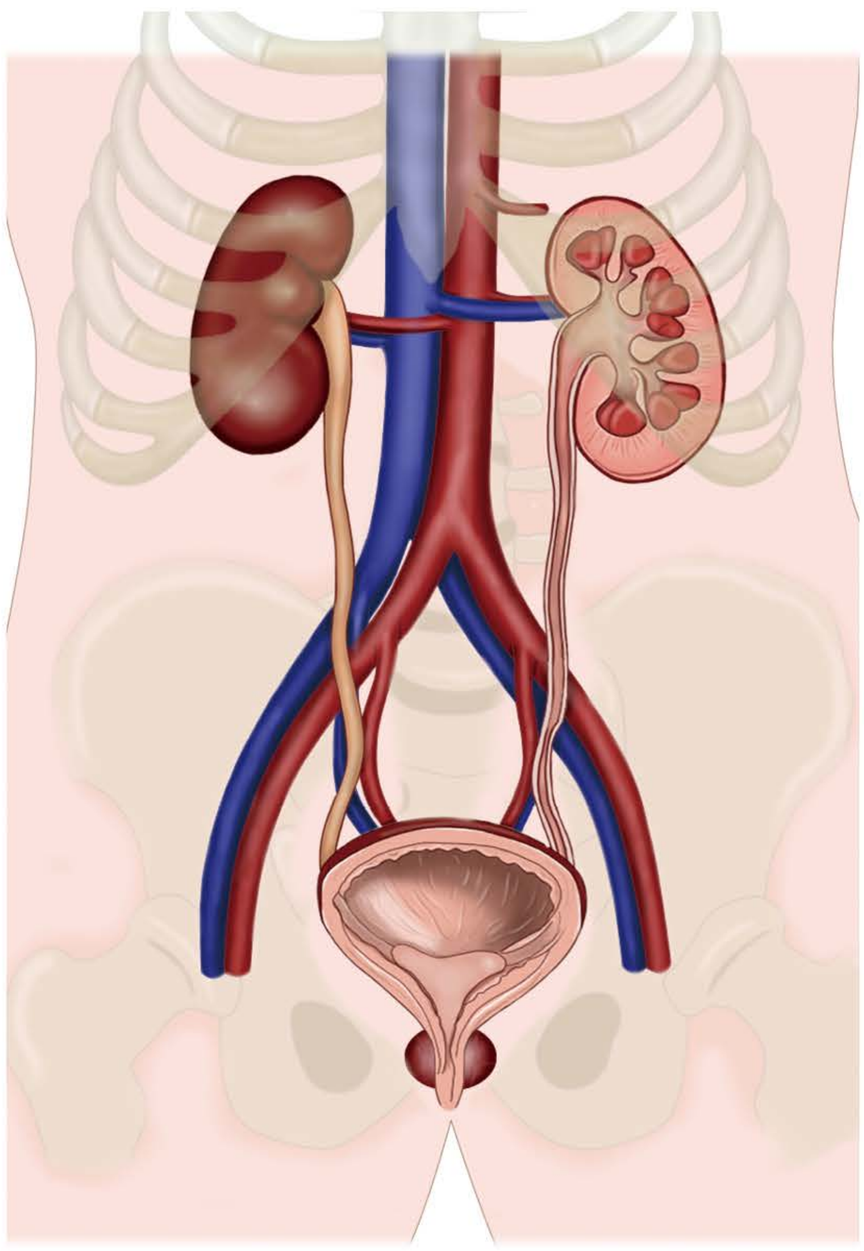
Types and Symptoms of Urological Cancer

Urological cancer refers to all types of cancer arising in the urinary system, which formates and releases urine, and in the male reproductive system. Prostate cancer, kidney cancer (renal cell carcinoma) and bladder cancer are known to be the 3 major types of urological cancer. It is more likely to develop in men than in women according to cancer statistics.



Prostate Cancer

In prostate cancer, the most common among the 3 major types, a normal prostate cell divides abnormally and grows out of control to turn into a malicious tumor in the end. Symptoms rarely occur in early stages, and the cancer is sometimes spotted during a regular medical checkup by luck. Major symptoms include a strong, sudden need to urinate that is difficult to delay (urge incontinence), frequent urination, sense of residual urine, acute urinary retention, bloody urine (hematuria), and painful ejaculation. If the cancer spreads to other parts of the body (metastasis), it accompanies pain in the bone in case of bone metastasis, backpain, muscle weakness or numbness in the legs due to spine metastasis, and pain in the side caused by the swelling of a kidney due to a build-up of urine (hydronephrosis) and kidney failure.

Kidney Cancer

Kidney cancer can be classified into renal pelvis cancer and renal cell carcinoma (RCC), but in general, it refers to RCC that originates in the very small tubules in the kidney that filter blood and make urine. RCC is the most common type of kidney cancer, responsible for approximately 80~90% of cases. Upon the onset, the small tumor rarely causes symptoms, but when the tumor is big enough to push neighboring organs to the side, symptoms such as pain in the side, hematuria, or a lump in the side or upper abdomen may appear.

Bladder Cancer

About 95% of cancer that develops in the bladder is carcinoma, which may be categorized into urothelial and non-urothelial carcinoma (adenocarcinoma, squamous cell carcinoma, and other types of carcinoma), but mostly urothelial. Typical symptoms include painless hematuria, frequency or dysuria and urge incontinence. If the cancer progresses, it usually accompanies weight loss and pain, and in case of bone metastasis, the pain may be felt in the bone or the side relating to hydronephrosis.

How to Diagnose

Prostate Cancer

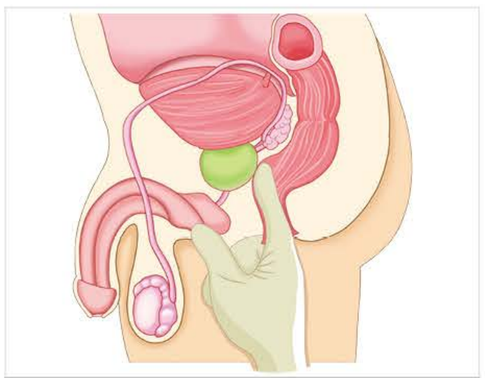
· Digital Rectal Exam (DRE)
· Ultrasound-guided biopsy
· Prostate-Specific Antigen (PSA) test

Kidney Cancer

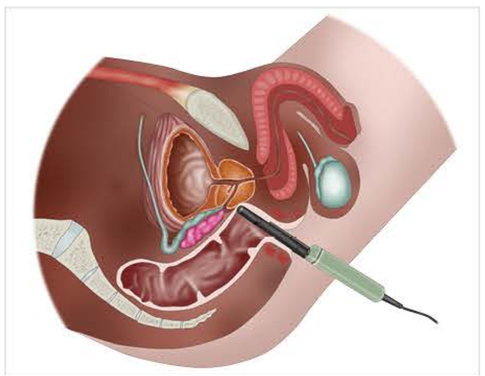
· Ultrasound-guided biopsy
· Urine/Blood test

Bladder Cancer

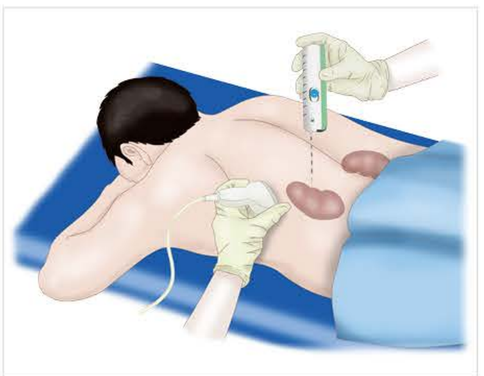
· Cystoscopy
· Urine test/Urine cytology



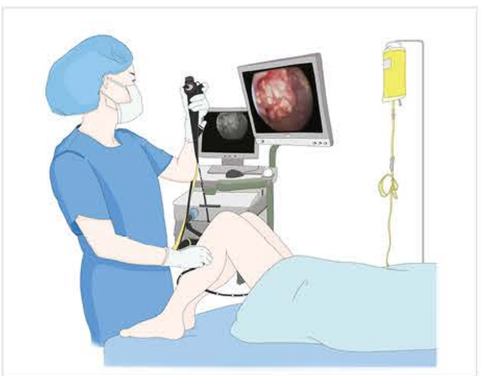
Digital Rectal Exam (DRE)



Ultrasound-guided biopsy



Ultrasound-guided biopsy



Cystoscopy

* In order to determine the stage of cancer, imaging tests such as CT, MRI, Bone scan, PET and Ultrasound may be recommended based on your individual case.

What are Treatment Options for Urological Cancer?

Surgery

* Treatments Available at SMC

Robotic Laparoscopic Surgery

In a robotic laparoscopic surgery, the surgeon uses hand controls to manipulate robotic arms to operate with greater precision and no hand tremors through tiny incisions in the patient's body. The robotic arms have twistable and bendable joints that allow for surgery in narrow or deep-seated spaces. The three-dimensional imagery with 10X~15X magnification provides better vision in removing the targeted cancer with higher accuracy while minimizing the damage of the surrounding nerves or organs. Additionally, with smaller incisions than those of open surgery which render less bleeding and postoperative pain, the recovery time is shorter.

Laparoscopic Surgery/Open Surgery

Depending on the patient's condition, and at the specialists' discretion, laparoscopic surgery or open surgery can be performed.

* For bladder cancer, since there will be no organ to store urine if the bladder is removed, it is critical to help the patient to urinate normally by performing urinary diversion or artificial bladder replacement.

Minimally Invasive Treatment

High Intensity Focused Ultrasound (HIFU) for Prostate Cancer Treatment

High-intensity focused ultrasound (HIFU) is a procedure in which beams of high energy ultrasound are delivered directly into cancerous tissues and burn them away. It is performed for prostate cancer patients to which surgery is not a possible option due to old age or other accompanying conditions. Since ultrasound itself is harmless, and a ultrasound probe is inserted into the anus-rectum passage without skin incision, HIFU inflicts little pain on the patient. Additionally, by precisely targeting the cancerous area, it remarkably lowers the risk of side effects such as urinary incontinence and erectile dysfunction to require only a single treatment.

Percutaneous Radiofrequency Ablation (RFA) / Cryotherapy for Kidney Cancer Treatment

Percutaneous radiofrequency ablation (RFA) and cryotherapy are effective in treating small-sized kidney cancer, and can be performed limitedly for patients who cannot receive surgery. RFA is a treatment that places a needle-like electrode into the tumor to create heat to treat kidney cancer. In cryotherapy, 3~4 probes are inserted into the tumor and freeze the cancer cells to destroy them.

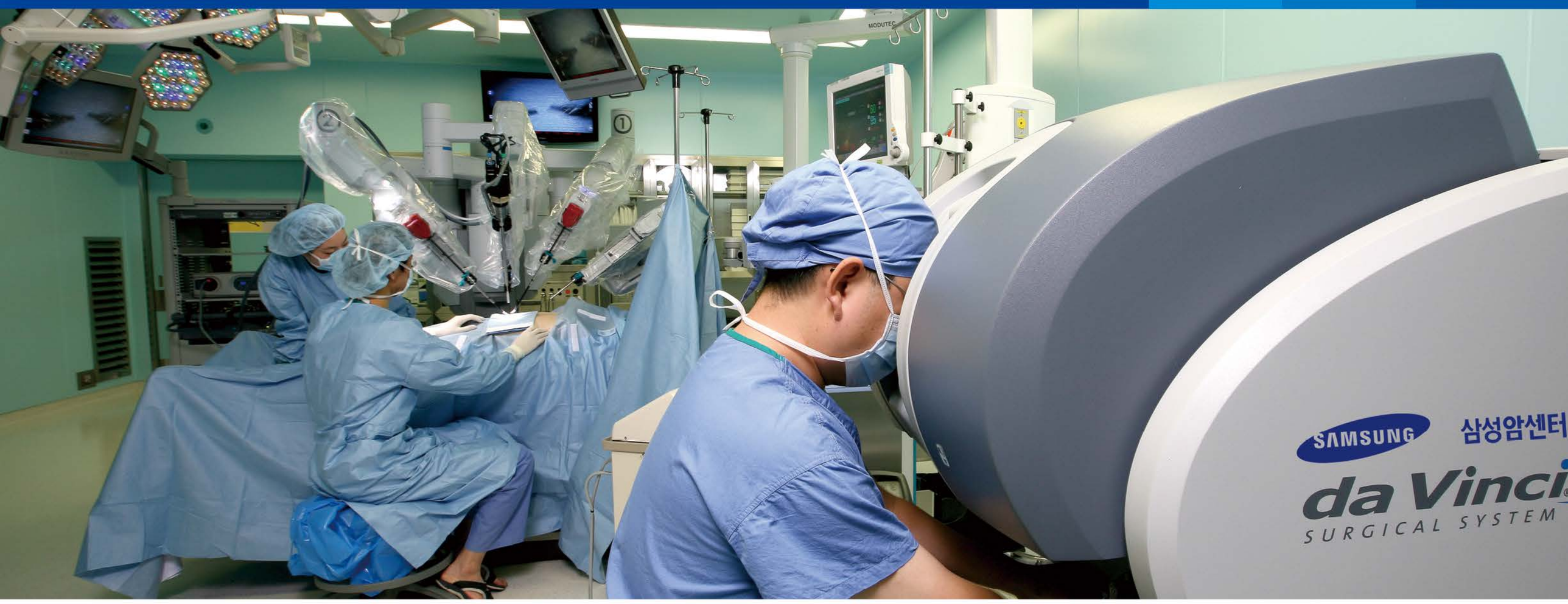
Proton Therapy/ Intensity Modulated Radiation Therapy (IMRT)

If the cancer is inoperable or recurrent, or if complete removal of remaining cancerous cells in the tumor resection area is necessary, radiation therapy (RT) can be performed. Proton therapy is the most advanced type of RT that concentrates a large amount of energy on the cancerous tissues and their surroundings only to destroy them; it significantly reduces the damage to the normal tissues in the neighboring area while achieving the intended therapeutic effect. Intensity-modulated radiation therapy (IMRT) selectively adjusts radiation doses onto the tumor by fine-tuning the intensity of the radiation delivered to it to minimize radiation to the normal tissues around the tumor.

Chemotherapy

- Chemotherapy
- Targeted therapy
- Immunotherapy

For metastatic cancer, surgical or radiation therapy may not achieve satisfying effects; hormone therapy, chemotherapy, transarterial chemoembolization (TACE), targeted therapy, immunotherapy and other various options may be provided concurrently depending on the type of tumor.



What Makes SMC's Genitourinary Cancer Center Stand out?

Highest records in Korea in robotic surgery and survival rates

Since the prostate, the kidneys, and the bladder are closely associated with reproductive and urinary functions, to achieve a complete cure of cancer in them while preserving their functions as much as possible to protect the patient's quality of life, we perform robotic laparoscopic surgery to remove cancerous tissues. The success of the surgery depends on the skills and experience of the doctor, and the Genitourinary Cancer Center in SMC performs 1,000 or more robotic laparoscopic surgeries a year on average, which helps the medical staff to develop world-class surgical expertise.

2016.10
2000 cases of robotic radical prostatectomy

2017.03
3000 cases of independent urologic robotic surgery

2018.11
1000 cases of robotic partial nephrectomy

2020.02
200 cases of robotic radical cystectomy

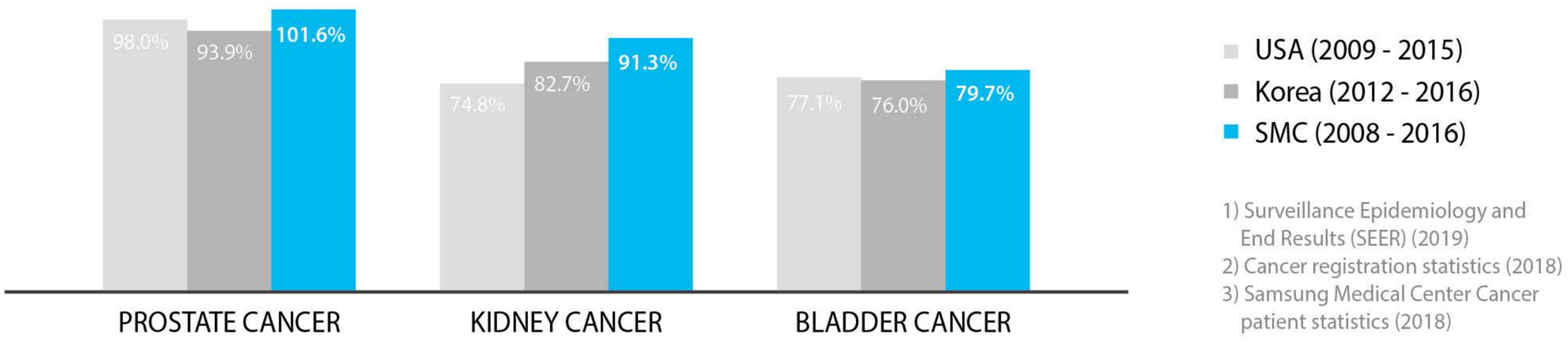
2020.03
6000 cases of independent urologic robotic surgery

2020.04
4000 cases of robotic radical prostatectomy

For small-sized kidney cancer, to remove cancerous lesions only and preserve the other part to retain as much kidney function as possible, we perform robotic partial nephrectomy based on our cumulative 1000 or more cases (as of November 2018) to rank as the unrivaled leader in Korea in terms of case counts and success rates.

The five-year relative survival rates of the urologic cancer patients after receiving cutting-edge treatments from our medical staff trained by numerous cases are higher than those of other Korean hospitals and other countries, and with our specialized treatment and careful follow-up for prostate cancer, the relative survival rate is higher than even that of ordinary cancer-free people.

5-year Relative Survival Rate



1) Surveillance Epidemiology and End Results (SEER) (2019)
2) Cancer registration statistics (2018)
3) Samsung Medical Center Cancer patient statistics (2018)

Accurate and painless diagnosis through state-of-the-art technology

In many prostate cancer cases, cancer masses are scattered at multiple locations to make it critical to examine exact cancerous tissues for accurate diagnosis. At the Genitourinary Cancer Center of SMC, we perform MRI-targeted biopsies, the most accurate biopsy technique currently available in which lesions suspected of cancer are defined by MRI for targeted biopsies.

Along with this, we have been performing transperineal biopsies as the only Korean institution that offers such an option since 2017. A transperineal biopsy involves a tissue examination for 24 ~36 locations in the prostate depending on its size by passing the biopsy needle through the perineal skin and into the prostate. With a 30% higher detection rate for cancer which may not be found through conventional biopsies, it is not only a diagnostic tool for prostate cancer, but also a useful screening technique for patients who require active observation and localized treatment.

Patient-customized, non-operative treatments

Other than surgical therapy, the Genitourinary Cancer Center of SMC provides HIFU, proton therapy, RFA, cryotherapy and other latest non-operative therapies to treat cancer while minimizing side effects. We introduced HIFU equipment in 2004 as the first Korean medical institution to adopt such non-operative techniques and have accumulated a great deal of experience in treating prostate cancer as a result. Recently, we have introduced the second generation HIFU system and are applying it to precise locations and treatment of cancer with its real-time, MRI-combined imagery.

SMC has also introduced second generation of proton equipment, known to be “the holy grail of the cancer therapy tool,” and increased accuracy of cancer targeting and minimized damage to neighboring tissues. For kidney cancer, RFA, cryotherapy and other non-operative therapies help optimize treatments for individual patients.

Fast track from diagnosis to treatment

In a weekly meeting between faculties from Urology, Hematology-oncology, Radiation Oncology and Radiology and coordinating nurses from the Genitourinary Cancer Center, we examine treatment directions and prognosis from diverse angles to reach an inter-specialty consensus faster in treating clinically-challenging patients and produce the most desirable outcomes for each of them.

For prostate cancer which requires many tests including prostate-specific antigen (PSA) tests, digital rectal examination(DRG), transrectal ultrasonography, biopsy, diagnostic imaging and bone tests, we perform as many tests as possible on the first day to lessen the patient’s burden of frequent visits and shorten the time from diagnosis to surgery.

Process to Treat Prostate Cancer

Diagnosis	Doctor-patient consultation	Hospitalization	Surgery
- PSA test - Transrectal ultrasonography (Biopsy)	- Determine surgery date - Metastasis / Preoperative tests	- Final preoperative examinations	- Surgery - Radiation therapy if necessary

Best professors in Urological Cancer

Seong Soo Jeon M.D., Ph.D

Urologist

Chair, Department of Urology
Director, Genitourinary Cancer Center

Areas of Expertise :

Robotic surgery
Prostate cancer

Hyun Moo Lee M.D., Ph.D.

Urologist

Areas of Expertise :

Robotic surgery, HIFU
Prostate cancer

Seong Il Seo M.D., Ph.D.

Urologist

Areas of Expertise :

Robotic surgery
Laparoscopic surgery
Urological cancer (Kidney, Prostate)

Byong Chang Jeong M.D., Ph.D.

Urologist

Areas of Expertise :

Robotic surgery
Urological cancer(Bladder, Prostate)
Adrenal gland tumor
Renal pelvis cancer

Hwang Gyun Jeon M.D., Ph.D.

Urologist

Areas of Expertise :

Robotic surgery, HIFU
Urological cancer
(Prostate, Bladder, Kidney)

Hyun Hwan Sung M.D., Ph.D.

Urologist

Areas of Expertise :

Robotic/Laparoscopic surgery
Urological cancer
(Bladder, Kidney, Renal pelvis, Ureter)
Urethral stricture

Wan Song M.D., Ph.D.

Urologist

Areas of Expertise :

Robotic/Laparoscopic surgery
Urological cancer
(Prostate, Bladder, Ureter, Kidney)

Min Yong Kang M.D., Ph.D.

Urologist

Areas of Expertise :

Robotic/Laparoscopic surgery
Urological cancer
(Kidney, Prostate and Bladder)

Jae Hoon Chung M.D., Ph.D.

Urologist

Areas of Expertise :

Robotic/Laparoscopic surgery
Urological cancer

Se Hoon Park M.D., Ph.D.

Oncologist

Areas of Expertise :

Chemotherapy
Genitourinary cancer

Won Park M.D., Ph.D.

Radiation Oncologist

Areas of Expertise :

Radiation/Proton therapy
Genitourinary cancer
Colorectal/Breast cancer

Hong Ryul Pyo M.D., Ph.D.

Radiation Oncologist

Areas of Expertise :

Radiation/Proton therapy
Genitourinary cancer
Lung cancer

Byung Kwan Park M.D., Ph.D.

Radiologist

Areas of Expertise :

Genitourinary disease
Prostate cancer

Chan Kyo Kim M.D., Ph.D.

Radiologist

Areas of Expertise :

Imaging-guided tumor ablation
Genitourinary disease

Sung Yoon Park M.D., Ph.D.

Radiologist

Areas of Expertise :

Genitourinary disease

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