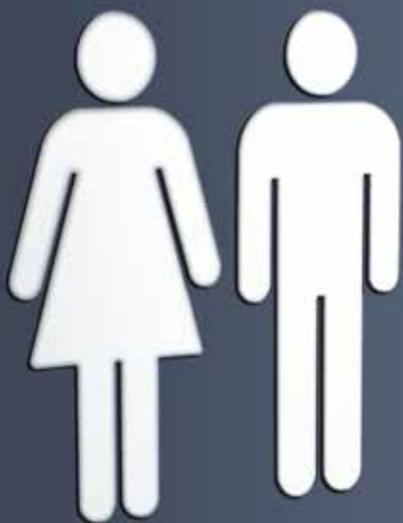


The facts on common
Urology Conditions

STRAIGHT TALK



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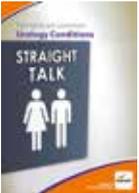
Eye Check:

A look at common eye conditions



Up Close:

Get the answers to common Ear, Nose and Throat conditions



Straight Talk:

The facts on common urology conditions



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Get the answers to common sleep conditions

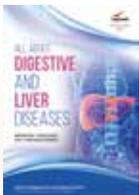


Let's Conquer Cancer



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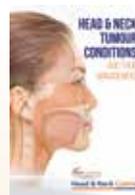
Take the bite out of 20 common health conditions



All About Digestive and Liver Diseases:
Important conditions and their management



All Woman:
All about common gynaecological conditions



Head and Neck Tumour Conditions
and their management



Brush Up
On what you need to know about common dental conditions

Foreword

Urology is a specialty that deals with problems related to the genitourinary system. Contrary to popular beliefs, urological disease spans across a wide age group and is present in both genders. We see problems from urinary stones, urinary tract infection, urinary incontinence, to the commonly known prostate problems and oncological problems such as kidney, bladder and prostate cancers. There are also other lesser known urological problems such as congenital urological problems, functional lower urinary symptoms, and kidney transplantation.

In this brochure, we hope to introduce to you some common urological diseases, the symptoms and signs, and what you can do to help yourself. Written in simple layman terms, we aim to empower you to understand the problem you are

suffering from and the various treatment options available, so that you can make the most appropriate choice for yourself.

Singapore General Hospital, KK Women's and Children's Hospital and National Cancer Centre Singapore offer a comprehensive suite of services to treat a range of urology conditions in adults and children.

Our dedicated and internationally-qualified doctors, utilising a full range of technology and facilities, strive to achieve the best outcomes for our patients.

Dr Ng Lay Guat
Head and Senior Consultant
Department of Urology
Singapore General Hospital

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This is a patient education brochure. Some illustrations may not be suitable for the young.

Disclaimer: All information provided within this publication is intended for general information and is provided on the understanding that no surgical and medical advice or recommendation is being rendered. Please do not disregard the professional advice of your physician.

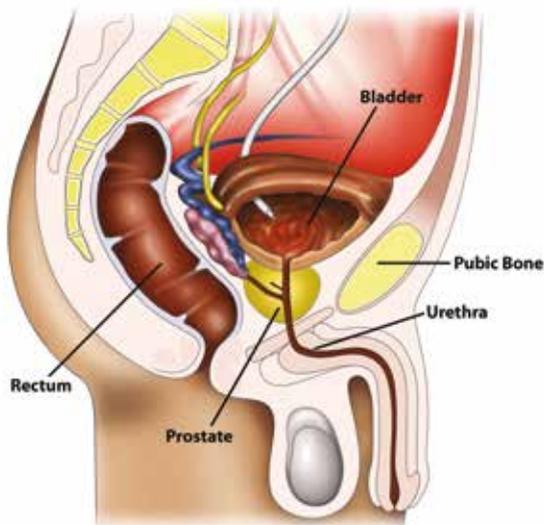
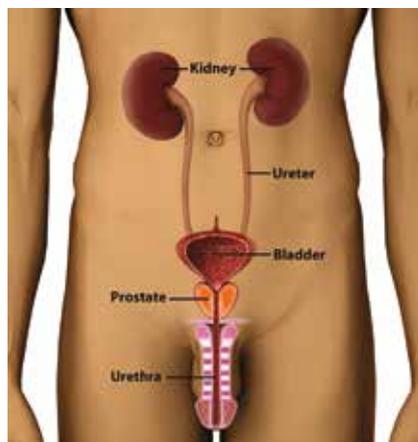
Benign prostatic enlargement

The prostate is a plum-sized gland located in front of the rectum and just below your bladder, where urine is stored. The prostate gland surrounds the urethra, which is the passage through which urine passes out of your body. The prostate also secretes fluid that forms part of semen.

The prostate gland often enlarges with age. This condition is known as benign prostatic enlargement (BPE), benign prostatic hyperplasia (BPH) or benign prostatic hypertrophy.

As the prostate enlarges, its capsule (layer of tissue surrounding it) stops it from expanding outwards. This causes the prostate gland to press inwards against the urethra like a clamp on a garden hose, resulting in poor urinary flow.

As a result, the bladder wall thickens and the bladder contracts even with small amounts of urine, causing more frequent urination. Eventually, the bladder weakens and loses the ability to empty itself, resulting in residual urine left in the bladder.



The male genitourinary tract.

Causes

BPE occurs because of a complex interaction between the male hormone dihydroxytestosterone (DHT – active component of testosterone), small amounts of oestrogen (female hormone), and other growth factors. This results in an imbalance of cell growth and cell death, and subsequent prostate growth and enlargement.

Risk Factors

Increasing age is a risk factor for BPE. There is no convincing evidence that your diet or lifestyle are risk factors for the condition.

Symptoms

If you have BPE, you may experience symptoms that include:

- A hesitant, interrupted, weak urine stream
- Urgency and leaking or dribbling of urine
- More frequent urination, especially at night

Some men with greatly enlarged glands have little obstruction and few symptoms. Others, whose glands are less enlarged, may have more blockage and greater problems.

Sometimes you may not know you have any obstruction until you suddenly find yourself unable to urinate at all. This condition, called acute urinary retention, may be triggered by taking certain cold medications that prevent the bladder opening from relaxing and allowing urine to empty.

Severe BPE can, over time, cause serious problems such as urinary tract infections, bladder or kidney damage, bladder stones, and incontinence. If your bladder is permanently damaged, treatment for BPE may be ineffective. If BPE is found in its earlier stages, your risk of developing such complications is lower.

Diagnosis

Some of the common tests to diagnose BPE include:

- **Digital rectal examination (DRE).** Your doctor inserts a gloved finger into the rectum and feels the prostate next to the rectum. This gives him a general idea of the size and condition of the gland.
- **Urine flow study.** A special device you urinate into measures how quickly the urine is flowing. A reduced flow often suggests BPE.

- **Cystoscopy.** A small tube, a cystoscope, is passed through the opening of the urethra in the penis. It contains a lens and light system that helps your doctor see the inside of the urethra, prostate and the bladder to identify the location and degree of the obstruction.

Treatment

Treatment may not be needed in mild cases. In moderate to severe cases, the following treatment options are available:

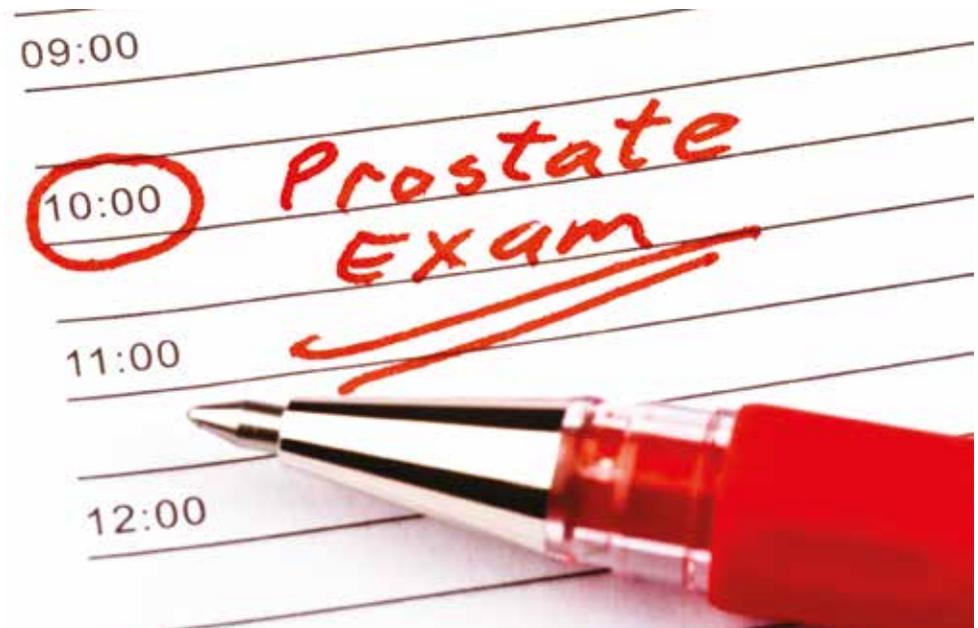
Drug Treatment

Drugs that relax the smooth muscle of the prostate and bladder neck are used to improve urine flow and reduce bladder outlet obstruction.

Drugs that inhibit production of the male hormone DHT, which is involved with prostate enlargement, are used to prevent progression of growth of the prostate or actually shrink the prostate in some men.

Surgical Treatment

Most urologists recommend removal of the enlarged part of the prostate as the best long-term solution for someone



The risk of developing complications is lower if BPE is found in its earlier stages.

with BPE. With surgery for BPE, only the enlarged tissue that is pressing against the urethra is removed; the rest of the inside tissue and the outside capsule are left intact.

Surgery may be performed by the following methods:

- **Transurethral resection of the prostate (TURP).** This is the most common technique used in 90 percent of all prostate surgeries for BPE. Under anaesthesia, a resectoscope is inserted through the penis. The surgeon uses the resectoscope with a special wire loop or laser fibre to remove the obstructing tissue one piece at a time. The pieces of tissue are carried by the fluid into the bladder and then flushed out at the end of the operation.
- **Open surgery.** In some cases when a transurethral procedure cannot be used or if the gland is extremely large, open surgery may be needed. Under anaesthesia, the surgeon makes an incision in order to reach the prostate capsule to scoop out the enlarged tissue from inside the gland.
- **Laser vapourisation.** A laser fibre is passed through the urethra into the prostate using a cystoscope and bursts of laser energy are delivered

to destroy the prostate tissue. As with TURP, laser surgery requires anaesthesia and a hospital stay. This technique is often used for selected people with smaller glands.

At the end of surgery, a urinary catheter is inserted through the opening of the penis to drain urine from the bladder into a collection bag for a few days.

Sexual Function After Surgery

Most men are able to continue to have erections after surgery. After prostate surgery, the neck of the bladder is widened, so the semen takes the path of least resistance and enters the wider opening to the bladder rather than be expelled through the penis. Later, it is harmlessly flushed out with the urine.

The main impact of prostate surgery is that you will not be able to father children in the normal way as you have a dry ejaculate. However, most men find little or no difference in the sensation of orgasm or sexual climax after surgery.

Specialist services available at the following institution:
• Singapore General Hospital Tel: 6321 4377

Kidney stones

The kidneys are two bean-shaped organs located below your chest, one on each side of the spine. The kidneys remove extra water and wastes from the blood, producing urine. They also produce hormones and keep a stable balance of salts in the blood. Narrow tubes called ureters carry urine from the kidneys to the bladder, an oval-shaped reservoir for urine in the abdomen.

A kidney stone is composed of crystals formed by chemicals that separate from the urine that builds up in the kidney.

The most common type of stone contains calcium oxalate or calcium phosphate. A less common type of stone, caused by infection in the urinary tract, is called a struvite stone. Other rarer stones include uric acid stones and cystine stones.

Causes

Stones form as a result of urine with a high concentration of certain chemicals (such as calcium, oxalate, phosphate,

uric acid and others) and a low concentration of substances that stop stone formation (urinary inhibitors such as citrate and magnesium).

Urinary tract infections, kidney disorders such as cystic kidney diseases, and certain metabolic disorders are linked to stone formation.

Calcium oxalate stones may also form in people with chronic inflammation of the bowel or have had an intestinal bypass operation, or ostomy surgery.

Risk Factors

Stones occur more frequently in men, and most commonly between 40 and 70 years old. Once you get more than one stone, other stones are likely to develop.

Symptoms

Many people may not feel any symptoms. The first symptom of a kidney stone is severe pain, which begins suddenly when a stone moves in the urinary tract and blocks the flow of urine.



Severe pain is often the first symptom of kidney stones.

Typically, you will feel a sharp, cramping pain in your back and side, and around the area of the kidney. The pain may shift to the lower abdomen later on. Sometimes, you may also experience nausea and vomiting.

As the stone moves and the body tries to push it out, blood may appear in your urine making the urine pink. As the stone moves down the ureter closer to the bladder, you may feel the need to urinate more often or a burning sensation during urination. If fever and chills accompany any of these symptoms, an infection may be present.

Diagnosis

This requires imaging of the urinary tract, which includes:

- **X-ray or ultrasound of the kidneys and bladder, or**
- **Intravenous urogram (IVU) or computerised tomography (CT) scan**

Additional urine and blood tests may be needed to exclude infection and impairment of kidney function.

You may be asked to collect urine for 24 hours to measure urine volume and the levels of chemicals in the urine. Your doctor will also ask about your medical history, occupation, and eating habits.

Prevention

You are likely to form another if you have had more than one kidney stone. Therefore, prevention is important.

Adequate water intake. If you tend to form stones, try to drink enough liquid throughout the day to produce at least 2 litres of clear urine.

Calcium intake. In the past, people who form calcium stones were told to avoid dairy products and other foods with high calcium content. Recent studies have shown that foods high in

calcium, including dairy products, may help prevent calcium stones. Older women taking calcium supplements to prevent bone loss should continue to do so.

Oxalate intake. If you are prone to forming calcium oxalate stones, you may be asked by your doctor to limit or avoid certain foods if your urine contains an excess of oxalate. Foods that have medium amounts of oxalate may be eaten in limited amounts.

HIGH-OXALATE FOODS	MEDIUM-OXALATE FOODS
<ul style="list-style-type: none">• Spinach, rhubarb, beets• Peanuts• Soybean crackers• Chocolate• Black tea• Sweet potatoes	<ul style="list-style-type: none">• Grapes• Celery, green pepper• Raspberries, strawberries• Marmalade• Liver

Vitamin D intake. You may be told to avoid food with added vitamin D and certain types of antacids that have a calcium base.

Meat intake. If you have highly acidic urine you may need to eat less meat, fish, and poultry as these foods increase the amount of acid in the urine.

Treatment

Most small kidney stones can pass through the urinary system with plenty of water – 6 to 8 glasses a day – to help move the stone along. For larger stones, the following treatment options are available:

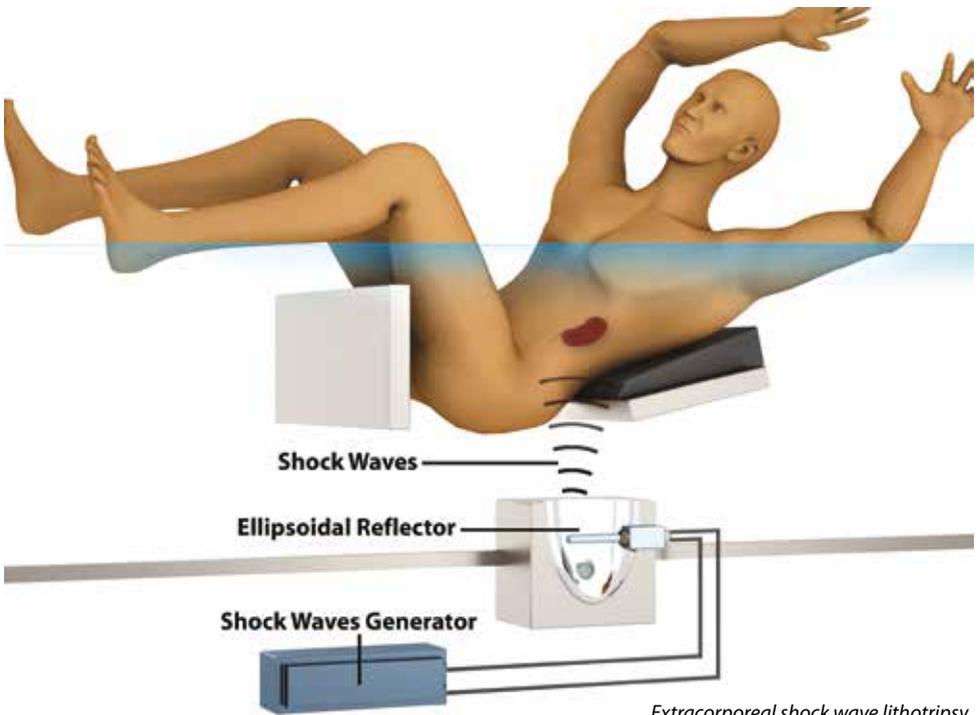
Medical Therapy

Certain medications may help prevent calcium and uric acid stones by controlling the amount of acid or alkali in the urine which are key factors in crystal formation. The medicine allopurinol may also be useful in some cases of hyperuricosuria where the chemical uric acid is secreted in large amounts in the urine.

Surgical Treatment

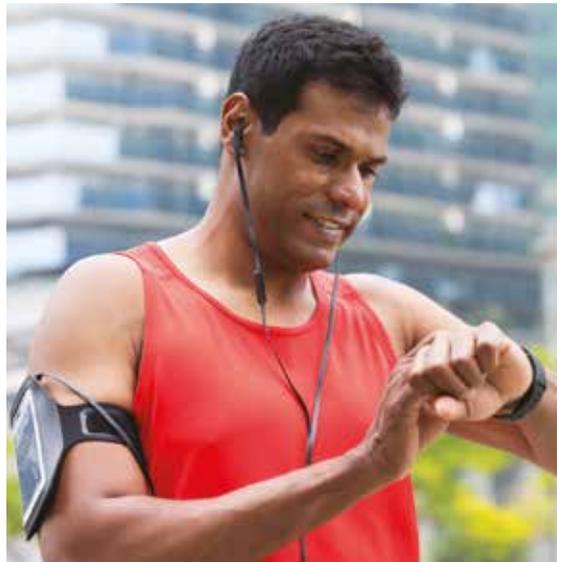
There are three ways to treat stones using surgery. This includes:

- **Extracorporeal shock wave lithotripsy (ESWL).** You lie on a special machine that produces shock waves. The shock waves are created outside the body and travel through the skin and body tissues until they hit the denser stones. The stones break down into small particles that pass easily through the urinary tract in the urine. ESWL is usually done on an outpatient basis. Recovery time is relatively short, and most people can resume normal activities in a few days. Many people have blood in their urine for a few days after treatment.

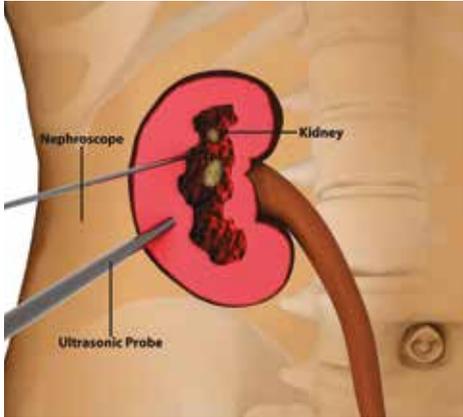


Extracorporeal shock wave lithotripsy.

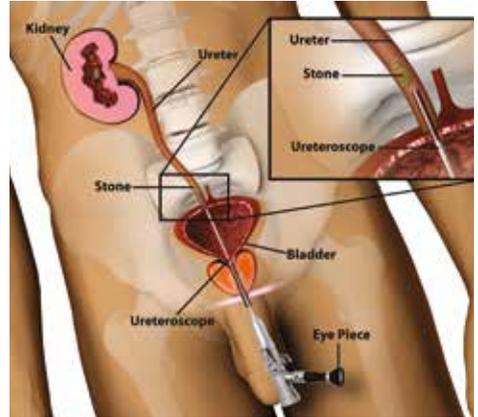
Complications may occur with ESWL. Bruising and minor discomfort in the back or abdomen from the shock waves can occur. To reduce the risk of complications, patients are normally told to avoid aspirin and other medicines that affect blood clotting for several weeks before treatment. Sometimes, the shattered stone particles cause a minor blockage of the urinary tract which requires the placement of a stent into the ureter to help the fragments pass. If the stone is not completely shattered with one treatment, additional treatments may be needed.



Most people can resume normal activities in a few days after ESWL.



Percutaneous nephrolithotomy.



Ureteroscopic stone removal.

- **Percutaneous nephrolithotomy (PCNL).** PCNL is often used when the stone is quite large or in a location that does not allow for the effective use of ESWL.

In this procedure, the surgeon makes a tiny incision in the back and creates a tunnel directly into the kidney. The surgeon uses a nephroscope to locate and remove the stone. A small tube called a nephrostomy tube is left in the kidney for a few days.

The advantage of percutaneous nephrolithotomy is that some of the stone fragments can be removed directly instead of relying solely on their natural passage from the kidney.

- **Ureteroscopic stone removal.** Ureteroscopy may be needed for mid- and lower-ureter stones. The surgeon passes a ureteroscope, a small fiberoptic instrument, through the urethra and bladder into the ureter to locate and fragment the stone with laser energy and remove it with a cage-like basket. A small stent may be left in the ureter for a few weeks to help urine flow.

Specialist services available at the following institutions:

- Singapore General Hospital Tel: 6321 4377
- KK Women's and Children's Hospital Tel: 6294 4050 (Services for children only)

Urinary incontinence

Urinary incontinence is a condition where you are unable to control urination, such that urine is lost at the wrong time and place. During urination, the muscles in the wall of the bladder contract, forcing urine out of the bladder and into the urethra. At the same time, sphincter muscles surrounding the urethra relax, letting urine pass out of the body. Incontinence occurs if your bladder muscles contract suddenly or the sphincter muscles are not strong enough to hold back urine.

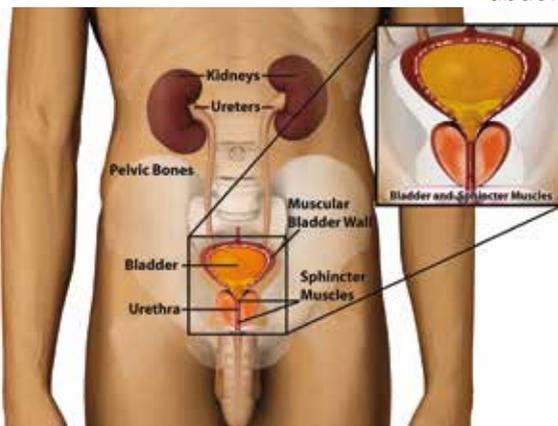
Causes

There are many types of urinary incontinence.

Urge incontinence is caused mainly by the presence of elements that irritate the bladder, such as the presence of urinary tract infection, bladder stones or even bladder tumours.

Overactive bladder syndrome (OAB) is a diagnosis of exclusion where there are no identifiable causes irritating the bladder, yet there is a severe urge to empty the bladder.

Stress urinary incontinence (SUI) is usually related to a weak pelvic outlet from previous trauma, multiple pregnancies, or undue repeated high abdominal pressure such as recurrent persistent cough, obesity or constipation.



Front view of bladder and sphincter muscles in a man.

Overflow incontinence occurs when the bladder is very full but unable to empty, and is related to weak bladder contraction in diabetics or patients affected by stroke.

Risk Factors

Women who have had vaginal deliveries or are post-menopausal are at higher risk. You are also at risk if you are obese. Intake of irritants such as coffee or tea may worsen the problem.

Prevention

Pelvic floor exercises taught and practised early, before menopause, will help women reduce the risk of severe SUI in older age. Reducing intake of coffee and tea may reduce the symptoms of urge incontinence.

Diagnosis

The diagnosis is often obtained from a well-taken history and complete physical assessment. The latter gives the doctor an idea of your pelvic floor muscle tone and helps to exclude other diagnoses with similar symptoms.

Tests to exclude urinary tract infection, stones and bladder tumours may be needed. In some people, urodynamic studies, a complex assessment of changes in bladder activity during filling and emptying,

may be needed to confirm the diagnosis.

Treatment

Treatment strategies differ depending on the cause of the incontinence:

1. Stress urinary incontinence

Non-surgical options may include:

- **Bladder retraining and pelvic floor exercises.** These include Kegel exercises to strengthen the pelvic floor muscles that help hold in urine. If done correctly and diligently, it is able to improve the quality of life of at least 40 to 50 percent of women with SUI. The best results occur in the pre-menopausal age group, but older women can also benefit from this.
- **Vaginal devices for stress incontinence.** Such as a ring pessary that presses against the wall of the vagina and the nearby urethra. The pressure helps reposition the urethra, leading to less stress leakage.

Surgical options may include:

- **Collagen injections.** Bulking agents, such as collagen, are injected near the urinary sphincter. As the body may over time slowly eliminate certain bulking agents, repeat injections may be needed.

• **Surgery for SUI.** These are broadly classified into two categories:

a. Retropubic suspension such as Burch colposuspension, where surgical threads called sutures are used to support the bladder neck.

b. Sling procedures where slings of natural tissue or man-made mesh are used to support the bladder neck and urethra. The most common type in use today is tension-free vaginal tape (TVT).

2. Urge incontinence and overactive bladder

Treatment options include:

- **Removal of the irritant.** This includes reducing the amount of coffee and tea intake.
- **Medication.** The first line of treatment are drugs called anticholinergics that block the nerve signals causing frequent urination and urgency, and bladder spasms. The main dose-limiting problem is the side effect of mouth and throat dryness. If you have glaucoma, ask your doctor if these drugs are safe for you.



A urodynamic study can confirm the cause of urinary incontinence.

• **Injections for overactive bladder.**

Those who are unable to tolerate anticholinergics may be offered injection of botulinum toxin A into the bladder wall. Botulinum toxin relaxes the bladder muscles, reducing its overactivity.

- **Neuromodulation.** The stimulation of the nerves to the bladder leaving the spine (neuromodulation) can be effective in some for whom urge incontinence does not respond to behavioural treatments or drugs. However, the therapy is expensive, involving surgery with possible surgical revisions and replacement.

Specialist services available at the following institutions:

- Singapore General Hospital Tel: 6321 4377
- KK Women's and Children's Hospital Tel: 6294 4050 (Services for women and children)

Erectile dysfunction

Erectile dysfunction (ED) is the inability to get or keep a firm erection sufficient for sexual intercourse.

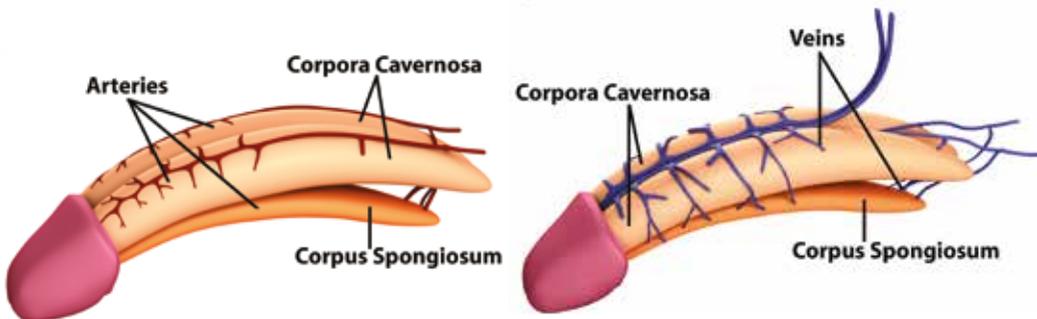
In an erection, impulses from the brain and local nerves cause the muscles of the corpora cavernosa, two chambers in the penis, to relax and allow blood to flow in through the arteries and fill the spaces. The engorged chambers expand the penis and the tunica albuginea, a membrane covering the two chambers, helps to sustain the erection.

The erection ends when muscles in the penis contract to stop the inflow of blood and open the veins for blood outflow.

Causes

These may be classified into several categories:

- **Psychological factors** such as stress, anxiety, guilt, depression, low self-esteem, and fear of sexual failure.
- **Chronic illnesses** such as diabetes, high blood pressure, nerve disease or damage, multiple sclerosis, atherosclerosis and heart disease can damage the nerves and arteries to the penis, resulting in ED.
- **Poor lifestyle** such as smoking, excessive alcohol intake, being overweight, and lack of exercise.
- **Pelvic surgery** which can injure nerves and arteries near the penis.



Anatomy of the penis.



Stress can cause erectile dysfunction.

- **Medications** such as blood pressure drugs, antihistamines, antidepressants, tranquilisers, appetite suppressants, and cimetidine, an ulcer drug.
- **Hormonal abnormalities** such as low levels of testosterone.

Diagnosis

Patient history. A person's medical and sexual histories will help define the degree and nature of ED. The medical history can disclose diseases leading to ED, and a simple recounting of sexual activity may identify problems with sexual desire, erection, ejaculation or orgasm.

Use of certain drugs can suggest a chemical cause as drug effects are a frequent cause of ED.

Physical examination. A physical examination can give clues to systemic problems. For example, if the penis is not sensitive to physical touch, a problem in the nervous system may be the cause. Abnormal secondary sex characteristics, such as unusual hair pattern or breast enlargement, can point to hormonal problems, which would mean the endocrine system is involved.

The doctor may discover a circulatory problem by observing a decreased pulse rate in the wrist or ankles. Unusual characteristics of the penis itself could suggest the source of the problem — for example, a penis that bends or curves when erect could be the result of Peyronie's disease.

Laboratory tests. Tests for systemic diseases include blood counts, urinalysis, lipid profile, and measurements of creatinine and liver enzymes. Measuring the amount of available testosterone in the blood can yield information on problems with the endocrine system and may explain why someone has decreased sexual desire.

Psychosocial examination. A psychosocial examination, using an interview and a questionnaire, can reveal psychological factors. A man's sexual partner may also be interviewed to determine expectations and perceptions during sexual intercourse.

Treatment

Treatment options may include:

- **Lifestyle changes** such as quitting smoking, reducing alcohol consumption, losing excess weight, and increasing physical activity may help some men regain sexual function.
- **Cutting back on or replacing medicines** that could be causing ED.
- **Psychotherapy.** Techniques that decrease anxiety associated with intercourse can be taught together with the help of the partner.

• Oral or locally injected drugs

- a. Oral drugs called phosphodiesterase (PDE) inhibitors enhance the effects of nitric oxide, a chemical that relaxes smooth muscles in the penis during sexual stimulation and allows increased blood flow in the penis.

Men who take nitrate-based drugs such as nitroglycerin pills for heart problems should not use any of these drugs because the combination can cause a sudden drop in blood pressure.

- b. Drugs such as prostaglandin E1, papaverine hydrochloride, and phentolamine, are injected into the shaft of the penis to relax the smooth muscles of the corpora cavernosa, causing it to become engorged with blood. Patients using such medications should be warned about persistent erection, known as priapism, which requires emergency treatment.

• Vacuum erection devices

Mechanical vacuum devices cause an erection by creating a partial vacuum, which draws blood into the corpora cavernosa, engorging and expanding the penis. An elastic ring is moved from the end of the cylinder to the base of the penis as the cylinder is removed to maintain the erection.

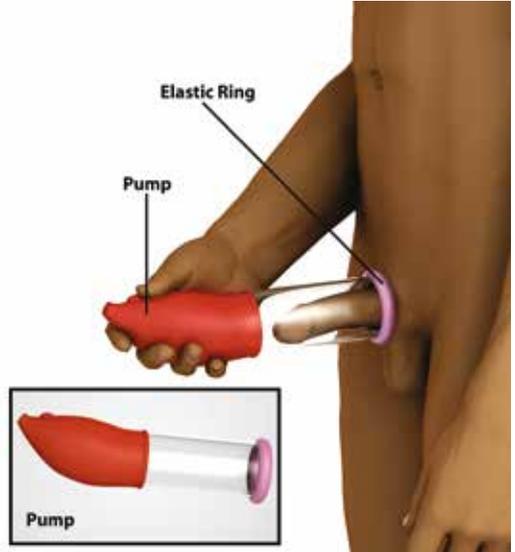
- **Extracorporeal shockwave therapy (EWST)**

Low-intensity shockwaves can be directly delivered to the penis, which can modify the blood flow to the penis. Improvement has been seen in about 70 percent of the patients.

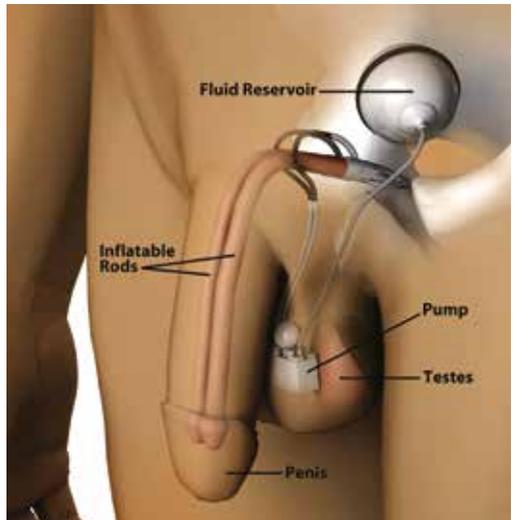
- **Surgery**

- **Penile implant.** Implanted devices, known as prostheses, can restore erection in many men with ED. The implants may be malleable implants or inflatable implants. Once a man has either a malleable or inflatable implant, he must use the device to have an erection.

Possible problems with implants include mechanical breakdown and infection, although the incidents of mechanical problems have decreased in recent years because of technological advances.



Vacuum device.



Penile implant.

Specialist services available at the following institution:

- Singapore General Hospital Tel: 6321 4377

Prostate cancer

Prostate cancer is a disease where malignant (cancer) cells form in the prostate tissue. It is the third most common cancer in Singaporean men and the most common cancer in American men.

Risk Factors

Prostate cancer is found mainly in older men above 50 years old. Those with a family history of prostate cancer are at slightly higher risk.

Symptoms

Early prostate cancer is usually asymptomatic. Symptoms of prostate cancer usually show up at later stages of the disease as the tumour grows and narrows the urethra (urine passage) and when it spreads to other organs.

The following symptoms are non-specific and may also be caused by benign (non-cancerous) conditions such as benign prostatic hyperplasia and prostatitis. They include:

- Weak or interrupted flow of urine
- Frequent urination
- Difficulty urinating

- Pain or burning during urination
- Blood in the urine or semen
- Nagging pain in the back, hips, or pelvis
- Painful ejaculation



Prostate cancer mainly affects men over 50.

Diagnosis

Several abnormal parameters, including clinical findings and laboratory tests, can help to diagnose prostate cancer:

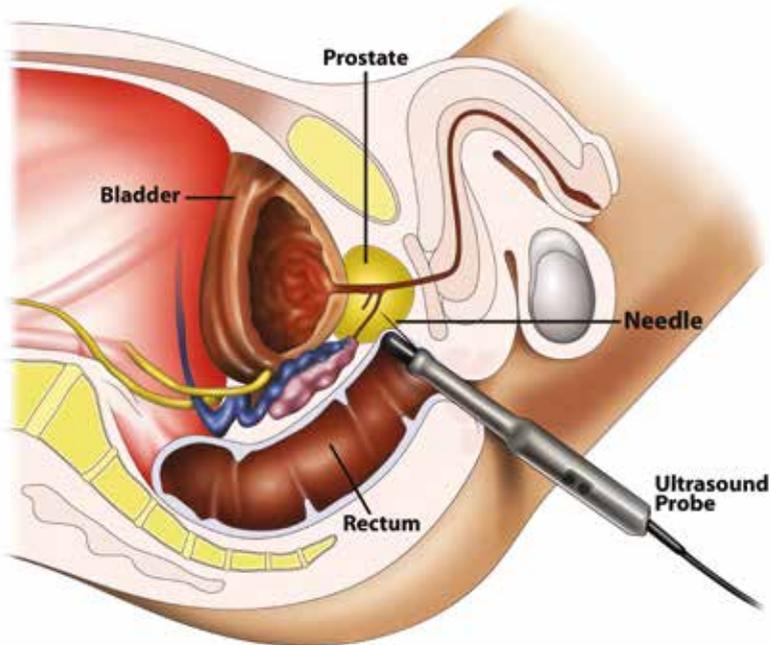
- **Abnormal digital rectal examination (DRE).** The doctor or nurse examines the prostate by inserting a lubricated, gloved finger into the rectum and feeling the prostate through the rectal wall for lumps or abnormal areas.

- **Elevated prostate specific antigen (PSA) level in the blood.** PSA, a substance made by the prostate may be found in increased amounts in the blood of men who have prostate cancer. PSA levels may also be high in men who have an infection, inflammation or an enlarged non-cancerous gland.

- **Transrectal ultrasound guided biopsy** of the prostate showing presence of cancer cells. This is a procedure in which an ultrasound probe about the size of a finger is

inserted into the rectum to assess the prostate. The probe utilises sound waves (ultrasound) to image the prostate. This allows the prostate tissues to be targeted for a biopsy, which is the removal of prostate tissue by a thin needle under local anaesthetic. Later these samples will be sent to the pathologist who views the tissues under a microscope.

- **CT scan or MRI of the pelvis.** This is a detailed scan of the pelvis that helps to identify the extent of cancer involvement after biopsy confirmation of cancer.



Transrectal ultrasound guided needle biopsy of the prostate.

Treatment

The decision on the choice of treatment depends on the prostate cancer profile. This profile depends on several factors, including:

- Age and expected actuarial survival
- Medical condition and risk factors
- Presence of significant illnesses, such as myocardial infarction, stroke, diabetes, etc
- PSA level
- Gleason Score (derived from the pathologist's assessment of the prostate biopsy)
- Presence of metastasis (extensive spread of disease)
- Status of DRE (digital rectal examination)



The choice of treatment depends on the prostate cancer profile.

There are different types of treatment for people diagnosed with prostate cancer.

Active surveillance

Selected persons may be closely monitored by blood tests and repeat biopsies and treatment is initiated when there is evidence of cancer progression. This is usually used in older men or men with early-stage small volume cancer who are willing to comply with the follow-up protocol.

Surgery

Those in good health are usually offered surgery as treatment for prostate cancer. Known as radical prostatectomy, this is a surgical procedure to remove the prostate, surrounding tissue, and seminal vesicles. Depending on their cancer profile, the pelvic lymph nodes around the prostate gland may also be removed in selected cases.

This procedure allows the removal of the entire prostate gland, enabling a complete examination by pathologists. This histological assessment will tell us how advanced the cancer is, the risk of cancer recurrence and if additional treatment will be needed.

As the prostate gland is removed, the PSA level will drop to undetectable levels. This helps doctors to monitor for recurrence. Radiation can be given after surgery, if necessary.



Surgery is usually offered to those in good health.

The surgery is performed in two ways:

a. Open radical retropubic prostatectomy. The prostate gland with the attached seminal vesicles and vas deferens are removed via a 15 cm incision below the navel in the midline of the abdomen.

b. Da Vinci robot-assisted laparoscopic radical prostatectomy. The same operation is performed via special laparoscopic

instruments through 5 to 6 keyhole-sized incisions in the abdomen. These instruments are manipulated by the robotic arms of the Da Vinci surgical robotics system that are controlled by surgeons.

This technique allows a magnified, 3-dimensional view of the operating field and allows the exact surgery to be performed with smaller incisions with less bleeding, allowing for faster recovery and less post-operative pain.

Complications of prostatectomy

Some men may experience mild to moderate amounts of urinary leakage especially immediately after surgery. Most patients show significant improvement within 3 months after surgery. Some may experience difficulties with erection and require alternative treatment.

Radiation therapy

Radiation therapy is a cancer treatment that uses high-energy x-rays to kill cancer cells or keep them from growing. There are two types of radiation therapy:

- a. External beam radiation therapy** uses a machine outside the body to send radiation towards the cancer in the prostate. The treatment usually lasts about 7 weeks, and may require additional hormonal therapy in addition to the radiation.
- b. Brachytherapy or internal radiation therapy** involves small radioactive seeds implanted directly into the prostate. It is performed

under anaesthesia and involves the mapping and evaluation of the prostate to estimate the number of radioactive seeds needed for a given brachytherapy procedure. Radioactive iodine and palladium are used to deliver the energy into the prostate.

Complications of radiation therapy

Radiation cystitis (inflammation of the bladder) and radiation proctitis (inflammation of the rectum) can occur after treatment as the radiation often has to travel through the bladder and the rectum. Most symptoms improve after the radiation treatment is completed.

The radiation oncologist will sometimes suspend radiation if the side effects are significant and will resume once the symptoms have subsided. There is a small risk of bladder cancer and/or rectal cancer in men treated with radiation therapy. Erectile dysfunction and urinary problems may occur in men treated with radiation therapy.

Hormonal Therapy

In prostate cancer, male sex hormones can cause prostate cancer to grow.

Hormonal therapy works by removing the source of male hormones or opposing its action on the tumour cells with drugs or surgery.

Drug treatment may be in the form of subcutaneous or intramuscular injections (luteinising hormone releasing hormone agonists or antagonists) or oral medications (antiandrogens, ketoconazole or oestrogens).

Surgery involves removal of both testes (orchiectomy), which is the main source of male hormones.

Hot flashes, impaired sexual function, and loss of desire for sex may occur in men treated with hormone therapy.

Chemotherapy

Chemotherapy is a cancer treatment that uses drugs to stop the growth of cancer cells, either by killing the cells or stopping them from dividing.

Chemotherapy is usually given to patients in an advanced stage of prostate cancer when they are no longer responsive to hormonal treatment.

Patients may experience nausea, hair loss (alopecia), inflammation of the cheeks, gums, tongue, lips, and roof or floor of the mouth (stomatitis) and abnormal blood profile that increases the risk of infection.

Treatments under clinical trials

High-intensity focused ultrasound

This is a treatment that uses ultrasound (high-energy sound waves) to destroy cancer cells. To treat prostate cancer, a probe is placed in the rectum to make the sound waves.

Specialist services available at the following institutions:

- Singapore General Hospital Tel: 6321 4377
- National Cancer Centre Singapore Tel: 6436 8088

Kidney cancer

Kidney or renal cell cancer is a disease in which malignant (cancer) cells form in the tubules of the kidney. In Singapore, it accounts for 1-2% of all cancers or approximately 2.4 and 1.3 of every 100,000 men and women respectively. The prevalence of this disease has been rising in recent years at an annual rate of approximately 2-3% and this has been attributed to the use of ultrasonography and computed tomography (CT) scan for other complaints.



Smoking doubles your risk of kidney cancer.

Causes

As is the case for other human cancers, kidney cancer is a disease commonly affecting the elderly with nearly 2 out of 3 people diagnosed over 65 years old. Kidney cancer is rare in people under 50.

In most cases, there is no identifiable cause for the disease, although there are some associated risk factors:

- **Smoking.** Smokers have approximately double the risk of non-smokers.
- **Obesity.**
- **End-stage kidney diseases** that require dialysis.
- **Hereditary kidney cancer.** Most of those affected have a sporadic or a non-hereditary form of kidney cancer. A hereditary form of the disease occurs in a small subset of patients (less than 5 percent of total) due to the presence of faulty genes.

These inherited conditions that predispose one to kidney cancer include von Hippel-Lindau (VHL) syndrome, tuberous sclerosis, Birt-Hogg-Dube syndrome, and hereditary papillary renal cell cancer.

Symptoms

The majority of those with kidney cancers are diagnosed when they are investigated for other complaints, even though they have no specific symptoms related to the disease. Kidney cancer diagnosed this way is usually small and at an early stage. On the other hand, about a third of all those with the disease will present late with the disease at an advanced stage. Possible signs of symptomatic renal cell cancer include:

- Blood in the urine
- A mass in the abdomen
- A pain in the side that does not go away
- Loss of appetite or weight loss for no known reason
- Anaemia (low blood count)

Diagnosis

Further tests to confirm the presence and extent of kidney cancer may include:

- **Ultrasound or Computed Tomography (CT) scan.** Detailed images are taken of the kidney to show the size, characteristics and extent of spread of the kidney tumour.
- **Kidney biopsy.** Samples of kidney tumour tissue are removed and examined under the microscope to confirm presence of cancer.

- **Cystoscopy.** A small tube, a cystoscope, is passed through the opening of the urethra in the penis. It contains a lens and light system that helps the doctor see the inside of the urethra, prostate and the bladder to identify any additional tumours in those who have blood in the urine and a kidney tumour.

Treatment

1. Early kidney cancer

The treatment options for early cancer may include:

Surgery

Surgery is the standard treatment option for those with kidney tumours who are fit for surgery. The extent of surgery may be categorised into two types:

- Partial nephrectomy** where the tumour is removed with a margin of normal tissue, preserving the rest of the unaffected kidney.
- Radical nephrectomy** where the whole kidney including the tumour is removed.

Partial nephrectomy is performed when the tumour is small or if the person has a single kidney or has impaired kidney function. Radical nephrectomy is performed when the tumour is large and very close to the blood vessels or ureter.

Kidney surgery may be performed using the conventional, open laparoscopic or robot-assisted techniques, depending on the kidney tumour characteristics and patient suitability.

Radiofrequency ablation or Cryoablation

This is a minimally invasive ablative procedure that uses either radiofrequency waves to raise the temperature within the tumour tissue or argon/helium gas to cool the tumour. This causes destruction of the tumour tissue.

Active surveillance

Selected patients with a very small kidney tumour may be monitored closely with kidney scans to assess the growth rate or changes in the tumour appearance.

Minimally invasive ablation and active surveillance are more suited for elderly patients with multiple medical problems and are not fit for surgery.

As only one good kidney is needed to lead a normal life, most people with one kidney removed do not end up with kidney failure which requires dialysis. Your treating doctor will

counsel you on the risks of impaired kidney function after surgery which depends on the presence of factors such as diabetes, high blood pressure and advanced age.

2. Advanced kidney cancer

For selected patients who present late with kidney cancer that has spread to other parts of the body, surgery to remove the kidney in combination with systemic therapy has shown to be effective treatment even in advanced kidney cancer.

Systemic treatment in this group of patient may include:

- **Targeted therapy.** Uses drugs that target specific tumour growth pathways in the cancer cell.
- **Immunotherapy.** Uses drugs that incite the body's immune response towards the cancer.

If you are not fit for surgery, immunotherapy or targeted therapy may be given to control the disease with or without surgery later, depending on your response to treatment. It is reassuring to note that there are still very effective treatments for patients presenting late with advanced stage of kidney cancer.

Specialist services available at the following institutions:

- Singapore General Hospital Tel: 6321 4377
- KK Women's and Children's Hospital Tel: 6294 4050 (Services for children only)
- National Cancer Centre Singapore Tel: 6436 8088

Bladder cancer

Bladder cancer is a disease of the urinary bladder where malignant (cancer) cells form in the tissues of the bladder. Bladder cancer is the 9th most common cancer in Singapore men. It is more common in men than women and occurs in older people.

The bladder is a balloon-shaped organ in the lower part of the abdomen. It has a muscular wall that can distend with urine until it is emptied.

Causes

Bladder cancer is closely associated with the following risk factors:

- **Contact with certain chemicals** that predispose to cancer formation.

This may occur through:

- Occupational contact with aniline dyes in rubber, textile, paint, leather, metal and hair dye
- Chemotherapy with cyclophosphamide
- Chronic intake of certain Chinese herbs and painkillers especially phenacetin

- **Smoking.**

- **Pelvic radiation** for other cancers.

- **Chronic bladder inflammation** from untreated bladder stones, long-term indwelling catheter or infection by a specific bladder parasite.

There are three subtypes of bladder cancer:

1. **Transitional cell or urothelial carcinoma.**

Cancer that derives from transitional cells in the innermost tissue layer of the bladder. This is the most common cell type.

- ### 2. **Squamous cell carcinoma.**
- Cancer that develops from squamous cells, which are thin, flat cells that may form in the bladder after long-term infection or irritation.

- ### 3. **Adenocarcinoma.**
- Cancer that arises from glandular (secretory) cells that may form in the bladder.



Bladder cancer is more common in men and older people.

Symptoms

Bladder cancer may present in a variety of ways, including:

- Blood in the urine (slightly rusty to bright red in colour)
- Frequent urination or urgency
- Pain during urination
- Lower back pain

Diagnosis

Bladder cancer can be diagnosed through the following clinical findings, laboratory and radiological tests:

- **Physical exam.** The doctor feels the abdomen and pelvis for tumours and it may include a rectal or vaginal exam.
- **Urine tests.** The laboratory checks the urine for blood, cancer cells and other signs of disease.
- **Ultrasound scan.** This is a safe and painless test that uses sound waves to create images of organs and structures inside your body. It may be used to diagnose a bladder cancer.

- **CT urogram or intravenous urogram (IVU).** For patients with blood in the urine to visualise the whole urinary tract from the kidney to the bladder. A series of x-ray or CT scan images are taken after dye is injected and secreted by the urinary tract.
- **Cystoscopy.** A small tube, called a cystoscope, is passed through the opening of the urethra in the penis. It contains a lens and a light system that helps the doctor see the inside of the bladder lining to identify any tumours causing the bleeding.

Tissue samples can be obtained from the bladder and sent to test for cancer cells.

Bladder cancer may be divided into:

- 1. Non-muscle invasive bladder cancer (NMIBC),** where the tumours are confined to the lining of the bladder, and
- 2. Muscle invasive bladder cancer,** where the tumours have invaded into or beyond the muscular wall of the bladder.

The long-term outcome of bladder cancer depends on:

- **Stage of the cancer,** whether it is muscle-invasive or not
- **Aggressiveness of the cancer** under the microscope (grade)
- **Bladder cancer cell type**
- **Patient's age and general health**

Treatment

1. Non-muscle invasive bladder cancer

These cancers rarely spread and can usually be cured. Left untreated they may, in some cases, develop into muscle-invasive tumours.

These are usually treated in the following ways:

- **Transurethral resection of bladder tumour (TURBT)**
Under anaesthesia, an instrument called a resectoscope is inserted through the penis. The surgeon uses the resectoscope to remove the tumour tissue one piece at a time using a special wire loop. The pieces of tissue are flushed out at the end of the operation.

- **Intravesical therapy**

After resection, chemotherapy agents such as mitomycin or immunotherapy such as BCG (Bacille Calmette Guerin) therapy may be given through a catheter into the bladder to reduce the risk of recurrence and disease progression.

Immunotherapy uses substances made by the body or in a laboratory to boost, direct, or restore the body's natural defenses against cancer.

2. Muscle-invasive bladder cancer

Muscle-invasive tumours have a high chance of spreading to other parts of the body and treatment is usually more aggressive.

Treatment options may include:

- **Surgery**

Surgery involves removal of the entire bladder (radical cystectomy). Under general anaesthesia, the surgeon removes the entire urinary bladder and the surrounding lymph nodes in the

pelvis. The prostate is removed in the male and the uterus, ovaries, fallopian tubes and part of the vagina are removed in the female.

- **Radiation therapy**

Radiation therapy is a cancer treatment that uses high-energy x-rays to kill cancer cells or keep them from growing.

- **Chemotherapy**

Chemotherapy is the treatment of cancer by using anti-cancer drugs that kill cancer cells, or stops them from multiplying. It may be given before or after surgery.

Patients may experience nausea, hair loss (alopecia), inflamed cheeks, gums, tongue, lips, and roof or floor of the mouth (stomatitis), and abnormal blood profile that increases the risk of infection.

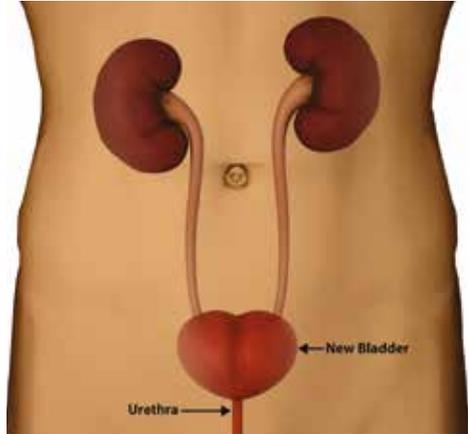
Sometimes a combination of treatment with chemotherapy with surgery or radiation is needed to improve the chances of cure in selected patients.

What happens during surgery?

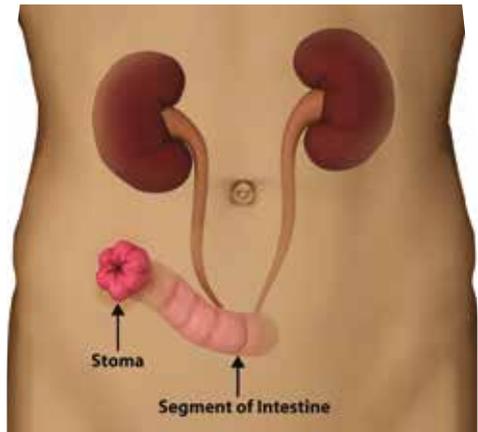
At the time of surgery, the entire bladder is removed. The ureters are disconnected from the bladder and joined to a loop of small intestine specially fashioned to contain urine.

Depending on the pre-operative medical condition, stage of disease, and ability to perform clean intermittent self-catheterisation, the loop of small intestine may be:

- 1. Connected directly to the abdominal wall** and urine flows out through a urinary stoma (ileal conduit).
- 2. Fashioned into a sphere** (ileal neobladder) and reattached to the urethra. Urine passes out through the normal passage. Some patients may need to catheterise their urine passage regularly everyday to empty the bladder, as the neobladder does not have the sensory and contractile properties of the native bladder.



Ileal conduit creation, where a segment of the intestine directs urine through a stoma into an external collecting bag.



Ileal neobladder creation, where a loop of intestine is fashioned into an urine reservoir and connected to the urethra.

Specialist services available at the following institutions:

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- KK Women's and Children's Hospital Tel: 6294 4050 (Services for children only)
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Common urology conditions in children

KIDNEY SWELLING – HYDRONEPHROSIS

Hydro = Water
Nephros = Kidney

Hydronephrosis is the distention or swelling of the kidney as urine builds up in the kidney. This is due to slow drainage of urine from the kidney into the ureter and/or the bladder.

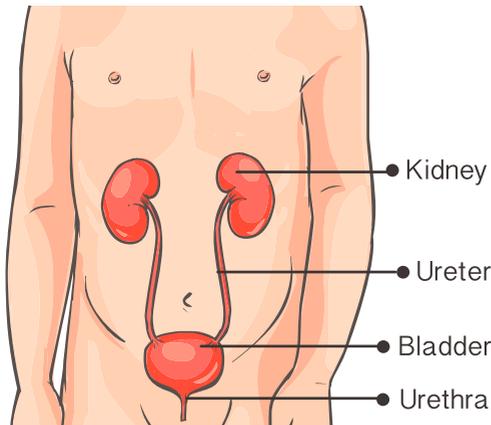


Illustration of normal urinary excretory system.

Hydronephrosis is a common urinary tract abnormality in babies and children. Hydronephrosis in one or both kidneys is usually present at birth, but occasionally only develops later in childhood.

Causes

Hydronephrosis is an inborn condition that is not known to be inherited or related to food intake or behaviour during pregnancy.

There are many causes of hydronephrosis, which occurs when there is slow drainage of urine from the kidney into the ureter and/or the bladder.

In some babies, it is part of normal developmental change and resolves with growth. Often it is caused by partial or complete blockage at the junction between the kidney and the ureter (PUJO – pelviureteral junction obstruction).

Less common causes include the backflow of urine from the bladder into the kidneys (VUR – Vesicoureteric reflux) or a blockage of the lower end

of the ureter (VUJO – Vesicoureteric junction obstruction) or blockage at the urethra (PUV – posterior urethral valves).

Signs and Symptoms

This condition usually does not cause any symptoms. Rarely, small children may have a visible bulge in the abdomen due to a huge swollen kidney, or long-standing blockage causing urine infections, urinary stones or pain. Severe chronic blockage of the urine flow will reduce the kidney function of that side, while the other kidney often compensates to perform more of the body's total excretory needs.

Hydronephrosis is often diagnosed in unborn babies during routine antenatal ultrasound scans of the expecting mother. It does not usually affect the pregnancy and the delivery should proceed as planned. The condition will then be confirmed by an ultrasound of the baby's kidneys on the second or third day of life.

Hydronephrosis that develops later in childhood may be diagnosed incidentally on an ultrasound scan of the abdomen requested to investigate other conditions.

Diagnosis

When hydronephrosis is diagnosed on ultrasound scan, other tests are required to establish the cause. The

ultrasound looks at the size and shape of the kidneys and bladder.

A radioisotope scan (e.g. MAG3) is requested to assess the relative kidney function (the ability of the kidneys to excrete urine) and the flow of urine down the ureters to the bladder. If VUR is suspected, then an MCU (micturating cysto-urethrogram) test is needed.



Treatment for hydronephrosis depends on its cause and severity.

Treatment

Treatment will depend on the underlying cause. Generally, a few investigations will be needed over time before it can be known if any operation is required.

For many babies, they only require regular observation with repeat scans until the hydronephrosis resolves. The kidney continues to grow and develop during the first 5 years of life, so monitoring is important in order to prevent silent kidney damage.

For those who have physical blockage of the urinary tract (PUJO/VUJO/PUV), the timing and the type of surgery needed depends on the level and severity of the blockage.

The most common surgical cause of hydronephrosis, PUJO, is treated by an operation called **pyeloplasty**. This is a major operation under general anaesthesia, with a very high cure rate and low chance of complications. Both open and keyhole surgical options are available.

UNDESCENDED TESTIS

***Testis** (singular) / **Testes** (plural) – testicle, or male reproductive organ where sperm and testosterone are produced.*

A baby boy's testicles are usually present in the scrotum at birth. As part of normal development during pregnancy, the testicles are initially situated in the baby's abdomen, then move into the scrotum in the last 3 months of pregnancy.

Undescended testis is the condition when one of the testicles is not found in the scrotum. Usually only one testicle is affected but in some cases, both testicles may be undescended.

This condition is more common in premature boys. It is not related to the mother's diet or activity during pregnancy.

Diagnosis

The baby's doctor will usually check for undescended testis at birth and at routine baby reviews that are typically scheduled with vaccinations.

Older boys will be checked during the School Health Service screening programme at kindergarten and primary school. If the boy's testicles are not in the expected position, he will need a referral to a paediatric surgeon.

This condition is usually confirmed by physical examination alone and typically scans are not required for diagnosis.

If the undescended testis cannot be felt in the groin area, then additional tests or diagnostic laparoscopy (keyhole viewing of the abdomen) may be required as part of the treatment.

Treatment

From birth until 3 months of age, there is still a chance that the undescended testis may continue to descend without intervention. If it has not descended by then, early referral to a paediatric surgeon is recommended.

Even though the condition itself is painless, the undescended testis is at higher risk of injury and torsion (twisting). Early treatment will also reduce the boy's risk of developing infertility and testicular cancer later in life.

The majority of cases where the undescended testis is located in the groin can be treated by an operation called **orchidopexy**. It is a routine day surgery procedure under general anaesthesia, typically with few complications.

Currently recommendations for age for surgery is before 1 year old. Most boys with one undescended testis and another normal testis will have normal hormone and sperm production.

Risks

Leaving a testicle in an abnormal position will affect the growth and development of the testicle, with subsequent higher risk of infertility and testicular cancer in the future.

An undescended testicle is also more prone to injury, twisting, and is associated with hernia development.

HYPOSPADIAS

– PENIS ABNORMALITY

In hypospadias, the urethra (urine tube emptying the bladder) in a boy does not open at the tip of the penis. Instead, the opening is further down the penis, or at the root of the penis in the scrotum between the testicles.

It is often associated with a forward bend of the penis (chordee), and extra foreskin on the back of the penis (dorsal hood) and lack of foreskin on the under-surface of the penis. It is categorised as mild, moderate and severe hypospadias, depending on where the urethra opening is found and the presence of chordee.

Diagnosis

Hypospadias is usually obvious at birth and diagnosed by physical examination. Some of the mild cases may be missed and are only recognised when the boy is brought for a circumcision.

Left untreated, hypospadias can lead to difficulty during toilet-training as the boy may have abnormal spraying of urine, or need to sit down to pee to avoid wetting his legs.

As he grows older, chordee will interfere with erections and affect

sexual intercourse as an adult.

In Singapore, a baby with hypospadias needs to be referred to a paediatric surgeon. In different parts of the world, hypospadias is managed by paediatric surgeons, urologists and plastic surgeons, depending on country norms.

Causes

The exact cause is unknown but research suggests that the development of hypospadias may be related to environmental changes and/or a genetic predisposition. However, for most cases it is not possible to pinpoint a specific cause.

Treatment

Babies with hypospadias should not be circumcised as the foreskin is needed for use in hypospadias repair. Hypospadias repair involves repair of the urethra together with straightening of the penis and rearrangement of the foreskin.

The timing of the surgery depends on the severity of the condition:

Mild to moderate hypospadias are usually operated between 1 and 2 years of age. An early operation is easier for psychological development and facilitates toilet-training as the boy learns to stand up and pass urine in a normal way.

However the operation for **severe hypospadias** cannot be done early because it takes time for the penis to grow enough tissue for use in the repair.

The operation

Hypospadias repair is a complicated and meticulous operation. The missing part of the urethra is created by using the patient's own penis tissues to form a tube that reaches the tip of the penis. The penis is straightened out by releasing fibrous attachments causing chordee.

Usually, since some of the foreskin is needed for the repair, the remaining skin cover is rearranged to give a circumcised penis appearance.

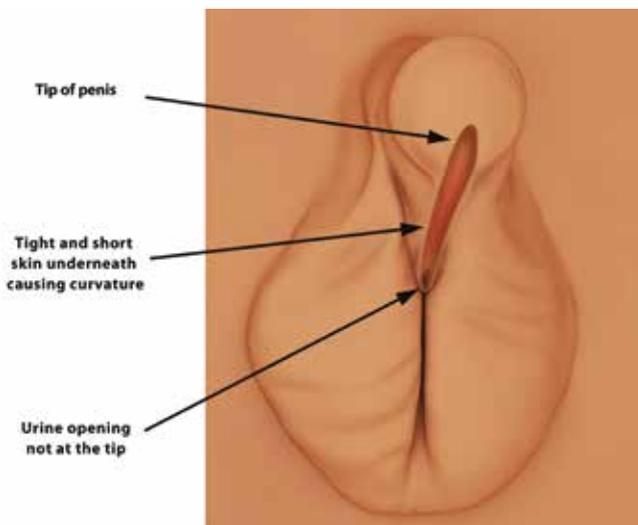


Illustration of hypospadias.

A urinary catheter (a soft drainage tube passed into the urinary bladder through the repaired urethra) is needed to drain the urine for a period of time while healing occurs.

After the operation

The operation results depend on the type of hypospadias and healing process. Complications include fistulas (small leakage) and strictures (narrowing) which will require second or re-do operations. For some severe cases, the hypospadias repair may be done in stages.

After surgery, most boys will have a normal-looking circumcised penis, are able to pass urine standing up and will have normal erections.

Parents are often concerned that their child may become unhappy with penis size or function later in life, particularly if he was born with severe hypospadias with relative lack of penile tissue. Psychological care during follow-up is important as adolescents need to learn that there is a wide variability of normal penis size and function, even among males without hypospadias.

CIRCUMCISION

Circumcision is the world's oldest operation. It remains one of the most commonly performed operations. It involves the surgical removal of the foreskin that covers the end (head) of the male penis to leave it exposed.

Some religions have a requirement for circumcision either as newborns or later in childhood. Certain cultures consider circumcision as a rite of passage into adult life. In other communities, it is not a requirement but a widespread societal expectation.

Medical indications for circumcision include phimosis (very tight foreskin opening) that is associated with repeat episodes of foreskin infection and to reduce the risk of recurrent urinary tract infection in boys born with abnormal urinary tract.

In most developed countries, the risk of complications from circumcision outweigh the risk of developing urinary tract infections or sexually transmitted diseases, hence circumcision is not recommended in normal boys without medical conditions.

Care of the Foreskin

In newborns, the normal foreskin is stuck to the head of the penis and cannot be retracted (pulled back). With time, the foreskin gradually separates off the head of the penis, and can then be retracted to fully expose the head of the penis.

Before complete separation, it is important not to use too much force to pull open the foreskin during baths to avoid causing a tear in the foreskin that will scar and cause phimosis.

Simple hygiene measures like daily gentle retraction without pain to allow washing during baths and flicking away excess urine trapped in the foreskin after passing urine are recommended to avoid foreskin infections.

The Operation

When a circumcision is necessary, it is usually done with local or general anaesthesia, the skin is cut, bleeding is stopped and the stitches are put in.

Most of the stitches used will drop off on their own. Sometimes a clamp device is used for circumcision and this device is removed after a few days. The post-operative care depends on the type of procedure done and the

patient needs to follow the surgeon's specific instructions.

Boys who undergo circumcision before puberty typically heal faster than adolescents and require about 1-2 weeks for recovery.

The main complications of circumcision are bleeding and infection during the healing period. Babies who still need diapers have an additional risk of developing scarring of the urethra opening, which will block the passing of urine (meatal stenosis). Hence for non-medical indications, it is preferable to delay circumcision until the child is toilet-trained.



Boys who undergo circumcision before puberty heal faster than adolescents.

URINARY TRACT INFECTION

Urinary tract infection (UTI) is an infection that occurs when bacteria gain access into the urinary system, i.e. the bladder and the kidneys. UTI is one of the most common bacterial infections in children and requires prompt recognition, treatment and investigations.

Causes

UTI is usually caused by bacteria commonly found in the stools, which can stay on the skin around the buttock areas. The bacteria can gain access into the urethra which is the passage leading to the bladder from outside the body and along which urine passes.

Why UTI occurs in a child is not fully understood but it is not entirely due to poor cleaning or inadequate changing of diapers. In some children, an underlying abnormality of the urinary tract can predispose them to UTI.

Signs and Symptoms

Symptoms of UTI are usually non-specific in a baby or young child. Unexplained fever or fever without an obvious source is the only consistent symptom among young children with UTI.

In some infants: There may be poor feeding, increased irritability, vomiting or cloudy and smelly urine.

In older children: The symptoms are more specific to the urinary tract. They may have pain or a burning sensation when passing urine, increased frequency of urination, an urge to urinate even after emptying their bladders, lower abdominal pain and uncontrolled wetting.

Pain over the loin and fever suggests a more serious infection in older children.



UTI requires prompt recognition and treatment.

Diagnosis

UTI is diagnosed by testing the urine for the presence of pus cells and bacteria. A fresh urine sample should be collected, avoiding contamination as far as possible. Collecting the mid-

stream of the urine as the child urinates after cleaning his/her private area well does this.

If this cannot be done especially in young infants, it may be necessary to collect urine by passing a fine tube into the bladder through the urethra or to collect the urine through a small needle that is inserted into the bladder through the abdomen.

These procedures are safe in the hands of experienced doctors.

Using adhesive bags to collect urine specimens are not reliable as they are often contaminated. Urine specimens once collected are usually tested with a dipstick to look for pus cells and when present, it may indicate the presence of UTI.

A definitive diagnosis of UTI can only be made by sending the urine to the laboratory to see whether there is any significant growth of bacteria in the urine. This process is termed urine culture and it takes 48 to 72 hours to be ready.

Treatment

Antibiotics to kill the bacteria are used in the treatment of UTI. Oral antibiotics are used for older children who are otherwise fairly well. Children, especially young babies, who are unwell are often admitted to hospital for more aggressive

and effective antibiotic treatment by injecting the antibiotics directly into the blood stream through a drip or what is termed intravenous antibiotic treatment.

Intravenous antibiotic is converted to oral antibiotic when the fever has settled for 24 hours and when the child's condition has improved. The choice of antibiotics is based on the urine culture result, which will show the most appropriate antibiotic to be used.

The whole course of treatment for UTI usually lasts 14 days. After which a low nightly dose of antibiotics (prophylactic or preventive antibiotics) may be continued in young babies, till further review by doctors.

What happens after an episode of UTI

Children with UTI will require regular reviews with the doctor after discharge. Imaging studies of the urinary tract are also necessary to assess if there are any underlying abnormalities. Such studies include ultrasound of the kidneys and the urinary tract, a kidney scan called DMSA scan, and a special radiological study called Micturating Cysto-urethrogram (MCU).

Care at Home

Parents need to remember that their child must complete the full course of antibiotics after discharge. Some children may need to continue treatment with a small nightly dose of antibiotic to prevent recurrent UTI while waiting to have further tests done. This small dose of antibiotic is safe and will have no long-term adverse effect on the child's health.

There is a possibility that the child might get another UTI even if the child is on a small dose of preventive antibiotic. If the child develops any symptoms suggestive of a UTI as mentioned earlier or is unwell with a fever with no other obvious cause, please bring the child to the doctor for a urine test as soon as possible.

Good hygiene practices, avoiding constipation, going to the toilet regularly to empty the bladder and adequate fluid intake are some measures that may help deter UTI.

Most children make very good recovery after UTI and have no further problems. In a small group of patients, scars may form in the kidneys, which can give rise to high blood pressure, and require long-term monitoring and follow-up.

NOCTURNAL ENURESIS (BEDWETTING) IN CHILDREN

Nocturnal enuresis, commonly known as bedwetting, is wetting that occurs during sleep in a child beyond the age of 5 years.

Bedwetting is a common and troublesome problem in children. Traditionally it is seen as part of growing up, but when bedwetting persists beyond early childhood, it becomes unacceptable and can often be stressful and distressing to the affected children and their families.

Most children seeking treatment for bedwetting in Singapore are:

- 5 years or older, most frequently between 7 and 12 years of age.
- Suffering from a bedwetting frequency of at least two times a week, with a majority being almost every night.

Causes

The exact cause of bedwetting is not known, but some known contributing factors are:



Seek help if bedwetting persists beyond early childhood.

- **Heredity** – Bedwetting often runs in a family.
- **Deep sleep** – Inability to wake up in the night to pass urine, as some children are very 'deep sleepers'.
- **Delayed development** – Some children are developmentally slower to attain dryness at night but eventually will outgrow the problem.

- **Problem of hormone regulation**

– Children who wet the bed may have a lower level of a hormone called the antidiuretic hormone, which suppresses urine production during sleep. This means that they may produce more than the normal amount of urine during sleep and that predisposes them to bedwetting.

Is bedwetting a problem that needs therapy?

Yes, especially when the child is of school-going age and the wetting is frequent. Studies have shown that constant bedwetting can adversely affect the psychosocial development of the child, causing low self-esteem and poor social adjustment.

It can also cause much resentment in parents and other family members towards the bedwetting child, and is a constant source of embarrassment that deters the sufferer from healthy outdoor activities like overnight camping and travelling.

Treatment

With treatment, the majority of children with bedwetting can improve significantly and even overcome it.

There are two main treatments for enuresis:

- 1. Medication** (prescribed by a doctor)
- 2. Enuresis alarm** (prescribed by occupational therapists upon a doctor's referral)

1. Medication (Desmopressin)
Bedwetting children typically produce large amounts of urine during sleep. To reduce this excessive urine production, the doctor may prescribe a medication called Desmopressin whose action is similar to antidiuretic hormone (ADH) that can reduce the production of urine. Up to 70 percent of children with bedwetting show a good response to this medication.

It is necessary to try out this medication over 2 weeks to assess the child's response first as only about 70 percent of children will respond to the medication. If the response is satisfactory, then treatment is continued for at least 3 months, after which the treatment

will need to be reviewed. Some children may need treatment for a longer period of time.

This medication is generally considered safe. However, as it reduces water excretion from the body, it can potentially cause water retention if the child drinks excessively after taking the medication. The excessive water in the body can cause fits which is a major unwanted side effect.

Fortunately, bedwetting children are 'deep sleepers' and do not wake up to drink water and the effect of the medication usually lasts for 8 to 9 hours or overnight.

By the time the child gets up in the morning, the effect of the medication would have worn off and the child can then resume normal drinking. This side effect has, therefore, very rarely occurred in the treatment of bedwetting.

Precautions such as not drinking water 1 to 2 hours before bedtime and not drinking till the child wakes up in the morning are important with the use of this medication.

It is also important to remember to discontinue the medication if more water intake is necessary e.g. if the child is febrile or having diarrhoea and vomiting.

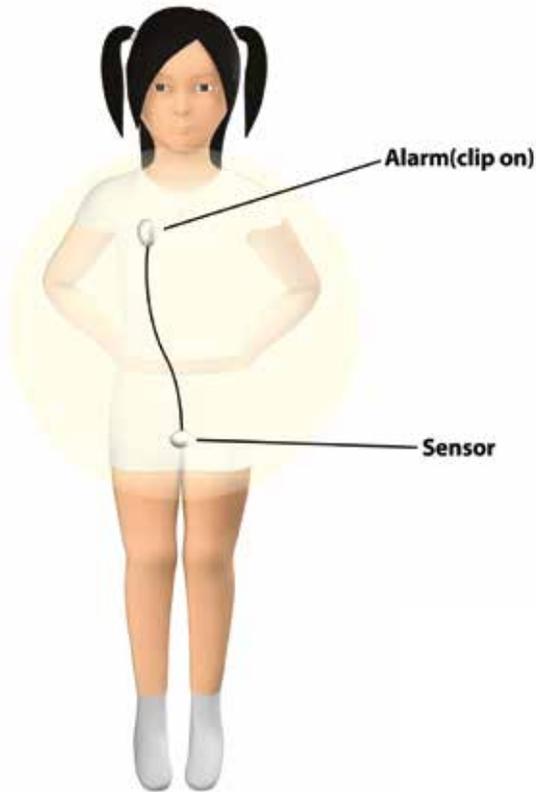
There may be an occasional occurrence of other minor side effects, which include headaches, loss of appetite and abdominal cramps.

2. Enuresis alarm

As bedwetting children are 'deep sleepers' and do not wake up when the bladder is full, enuresis alarm training is targeted at this problem by training the child to wake up when the bladder is full.

The alarm system works like this: When the child starts to wet the bed, a moisture sensor worn by the child sends a signal to trigger the alarm to sound, the alarm wakes the child, who then knows it is time to get up and go to the toilet. Following nights of training, the child will eventually be able to recognise a full bladder and the need to wake up to pass urine.

You can usually see some results after 1 to 2 weeks of training. The reported success rate in using the alarm is 60 to 80 percent after 2 to 3 months of training.



An enuresis alarm on a child.

How does the occupational therapist help?

Upon referral from a doctor, the occupational therapist (OT) assesses a child's suitability for therapy. The OT then teaches the child and family how to use the alarm and set up a therapy program at home.

As compliance and motivation are essential for success, the OT will follow-up with the child until he/she has attained dryness. During these

follow-up sessions, the OT will work with the child and family to review progress and solve any issues or problems.

Consistent follow-up is critical in attaining dryness. Children who do not have follow-up may lose motivation, resulting in lower compliance and treatment failure.

Once dryness is attained, the child will be reviewed by the doctor and discharged from the clinic.

Specialist services available at the following institution:
• KK Women's and Children's Hospital Tel: 6294 4050

Services Available at SingHealth Institutions

Singapore General Hospital



Department of Urology

The SGH Urology Centre provides a whole range of comprehensive and efficient services for the management of urological problems.

With our complete range of facilities, the centre performs minimally invasive procedures such as extracorporeal shock wave lithotripsy for treatment of urinary stones, transrectal ultrasound and biopsy of the prostate and urodynamics study of the urinary tract.

The Urology Centre is staffed by Urologists with a broad range of experience in the fields of shock wave lithotripsy, endourology, laser

surgery, uro-oncology, female urology, andrology, reconstructive urology and renal transplantation.

Specialty clinics are organised into:

- Female urology and incontinence
- Prostate disease
- Urinary stone disease
- Uro-oncology
- Male infertility and andrology
- Renal transplantation and dialysis access
- Reconstructive urology

The centre adopts a team management approach whereby any individual patient will be managed by more than one urologist. This ensures that our patients get the most comprehensive and appropriate care available.

Clinical Services

Uro-oncology

In addition to prostate cancer, the centre also provides screening, staging and treatment for other urologic malignancies such as renal, ureteric, bladder, testicular and penile malignancies.

Following major, curative, extirpative surgeries, body image enhancing reconstructive options are available to minimise the emotional impact on the patients.

Prostate Disease

The centre offers a one-stop evaluation and treatment facility for benign and cancerous prostate diseases. These services include prostate scans, ultrasound guided prostate biopsies, prostate specific antigen tests, urodynamic studies and flexible cystoscopy.

Non-surgical and surgical treatment options for benign and malignant prostate conditions are individually tailored for the patients.

Female Urology and Incontinence

We have a trained Continence Nurse Advisor who provides counselling and education on the practical management of urinary incontinence. Every patient is carefully assessed and the treatment plan is then tailored to meet the needs of the patients and their caregivers.

The centre is equipped with urodynamic testing facilities to assess incontinence problems in women. Our treatment modalities

include medical therapy, bladder rehabilitation and various surgical options such as tension-free vaginal tape, colposuspension, collagen injection, slings and artificial urinary sphincters.

Urinary Stones

The centre is equipped with the complete range of stone treatment modalities. These include sophisticated non-invasive and minimally invasive techniques such as shock wave, laser, lithoclast and percutaneous nephro-lithotripsy.

Transplantation and Dialysis Access

Our Urologists work closely with the nephrologists to provide a renal transplantation service for patients with end-stage renal failure. We perform most of the renal transplants in Singapore.

Infertility and Andrology

The centre provides a thorough evaluation of male infertility problems. Treatment may involve microsurgical techniques to correct congenital defects and to reverse prior vasectomies. Harvesting of sperms for in-vitro fertilisation is also performed.

Erectile Dysfunction

We work with patients to search for solutions to their complex problems. Treatment options include oral medications, injection therapy, vacuum devices and surgical implants.

Urinary Tract Infection

We provide a complete urological evaluation for male and female patients with complicated or recurrent urinary tract infections. Specific treatment is then tailored for the individual patient.

Reconstructive Urology

We provide reconstructive surgery for various congenital and acquired urological malformations. These complex, reconstructive procedures include neo-bladder formation, ileal conduit creation and urethroplasty.

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KK Women's and Children's Hospital



Kidney Diseases (Nephrology)

Our Nephrology Service is a key referral centre in Singapore, managing a large number of wide-ranging kidney diseases among children. These include:

- Nephrotic Syndrome and various glomerulonephritis
- Acute pyelonephritis and urinary tract infection
- Vesicoureteric reflux and reflux nephropathy
- Glomerular diseases including asymptomatic microhaematuria and proteinuria
- Voiding problems like frequency/ enuresis/incontinence
- Fluid/electrolyte problems/ tubulopathies
- Acute renal failure with provision for peritoneal dialysis and continuous renal replacement therapy (CRRT)

We also offer outpatient consultations for general nephrology problems, voiding problems, lupus nephritis and spina bifida.

We are fully equipped with supportive facilities for the optimal management of patients. These include real-time ultrasound guided renal biopsies with full histopathological reports; detailed imaging and functional studies of the kidneys and the renal tract e.g. DMSA, MAG3, uroflowmetry and urodynamic studies.

Range of Services:

- Clinical nephrology
- Neonatal nephrology
- Uro-nephrology – voiding problems
- Renal biopsy

Outpatient Clinics:

- General Nephrology Clinic (Monday - Friday)
- Voiding Problem Clinic (Wednesday)
- Other referral clinics (by appointment)

Senior Consultants

Dr Ng Yong Hong (Head)
Adj Assoc Prof Chao Sing Ming

Consultants

Dr Indra Ganesan
Dr Chong Siew Le

Paediatric Surgery Department and the Children's Surgery Centre

We are the largest centre for paediatric surgery in Singapore. We treat paediatric general surgery and paediatric urology problems in babies, children and adolescents. Our patients range from extreme low-weight premature babies to teenagers.

We provide acute inpatient care and outpatient specialist consultation service and accept new referrals of children up to 16 years of age.

We offer a wide range of emergency and elective surgeries, including complex minimally invasive procedures (keyhole or thoracoscopic/laparoscopic surgery). The department performs more than 3,000 surgeries a year.

Range of Services:

- General paediatric surgery
- Paediatric urology
- Neonatal surgery
- Corrective surgery for congenital deformities
- Paediatric surgical oncology
- Paediatric hepatobiliary surgery
- Minimally invasive surgery
- Day surgery

Clinics at Children's Surgery Centre:

- General Paediatric Surgery
- Paediatric Urology
- Paediatric Urodynamics and Urotherapy

- Wound Management
- Bowel Management

Multidisciplinary Clinics (Paediatric surgeons together with other medical specialists):

- Vascular Malformation
- Spina Bifida
- Liver Clinic
- Preadmission Clinic for Same Day Admission for Elective surgery
- Urology-Nephrology

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Listing of doctors at KKH current as at March 2017. Please refer to the website www.kkh.com.sg for the latest information.

National Cancer Centre Singapore



At National Cancer Centre Singapore (NCCS), we believe in providing the most effective outcome to patients through our multidisciplinary approach, where any treatment there is for cancer is available.

These include Medical Oncology, Oncologic Imaging, Palliative Medicine, Surgical Oncology and Radiation Oncology.

To provide integrated care to patients, these disciplines are grouped into different cancer types. Our oncologists sub-specialising in these cancer types operate from our Specialist Oncology Clinics to give patients the convenience of one-stop care.

NCCS specialists treating Genitourinary cancers (including prostate, kidney, bladder and urethral cancers):

Senior Consultants

Dr Ng Quan Sing
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Dr Thng Choon Hua (Head, Oncologic Imaging)
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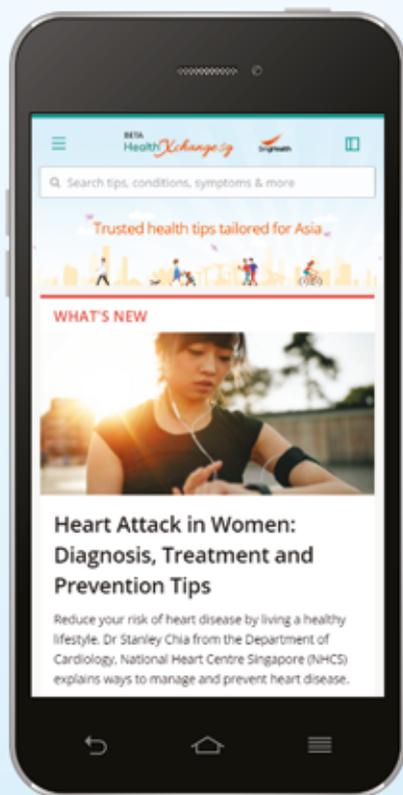
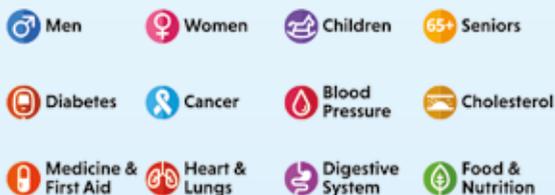
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Notes

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National Specialty Centres



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National Heart Centre Singapore

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Bright Vision Hospital

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