



LIVE LIFE HASSLE-FREE

Centre of Excellence:
Renal Sciences



Kidney, Prostate, Urinary Tract and Urinary Bladder problems can impact lives in many ways. If unattended, they can be life threatening.

With the threat of diabetes, hypertension, HIV, TB etc. looming large in Africa, the need for world-class renal expertise is higher than ever before. We, at Mediheal Group of Hospitals, are at the forefront of addressing this need by providing the most comprehensive and technologically advanced services through our chain of healthcare facilities across Kenya and Rwanda.

Our centres are staffed with the region's most highly-qualified professionals including Urologists, Nephrologists, Surgeons, Lab Technicians and Nursing Staff. Our doctors are trained across the world at leading healthcare institutions and present the most appropriate diagnosis and treatment for finest patient outcomes.





“Complementing
the great African dream
with comprehensive
healthcare support...”

Africa is the youngest continent in the world today developing very fast, hosting about 1 billion people, which is 14% of the world population and very compatible with the modern smart electronic age. Complementing the great African dream with comprehensive healthcare support is Mediheal Group of Hospitals.

We have been leading the healthcare segment with high quality medical services and have participated in inspiring improvements with our patients in mind. Thanks to their incessant trust and support, our spectrum of services today is spread across Kenya, Uganda, Tanzania, Rwanda and Burundi.

We are constantly looking to attract highly qualified medical professionals who live up to the high standards we set for ourselves. We always procure state-of-the-art equipment that is being used across the world, and make sure that our diagnostic labs consistently meet international standards for accuracy and reliability.

As I look back on the years of successful development and aspirations beginning with the establishment of Mediheal Group of Hospitals, I feel both proud and excited about the future. As a progressive healthcare provider, we aim to keep expanding with new facilities and continue the momentum as one of the fastest growing healthcare groups in Africa.

Dr. S. R. Mishra

MS - Obstetrics & Gynaecology (India)
Dip. Gynae Endoscopy (Germany)
Chairman, Mediheal Group



“
I, along with my reverend team, deliver results that are on par with the best in the world.”

Today, Africa is facing a huge burden of kidney and renal diseases. Mainly due to major risk factors such as Hypertension, Glomerulonephritis, HIV, Malaria, TB, Diabetes etc. Renal Replacement Therapies for these conditions include different modalities such as Hemodialysis, Peritoneal Dialysis and Renal Transplantation.

We, at Mediheal Group of Hospitals, are adept at delivering these therapies by adopting international standard treatment practices, driven by technology, in a comfortable patient-focused environment. We operate as a team, ready to work under any circumstance, aiming for results par excellence every single time.

Having trained in Genitourinary Surgery and Renal Transplant from the prestigious PGMER (Chandigarh, India) I acquired expertise in all sub-specialties like Kidney Transplant, Uro-Oncology (Urological Cancers), Laparoscopy, Endourology and Reconstructive Surgery. Having more than 15 years' experience in Urology and Renal Transplant, I have performed over 3000 Kidney Transplants (>1700 performed independently), with Laparoscopic Donor Nephrectomy in almost all the cases. I, along with my reverend team, deliver results that are on par with the best in the world.

According to the research, one in every ten people suffer from kidney disease, and millions suffer from kidney failure worldwide. Millions of young and productive people are falling prey to these dreaded diseases due to lack of awareness, timely treatment and transplant facilities. Also, there is a huge disparity of treatment facilities available in different parts of world compared to Africa and Asia. Also, the cost factor plays a major role in many people losing their lives to these diseases.

We, at Mediheal Group of Hospitals, believe in making advanced Urology and Kidney Care affordable and accessible to underdeveloped and underprivileged areas in Africa. As an effort in that direction, we are establishing Haemodialysis (the foremost treatment for renal disease) units across all major towns in East and Central Africa, and very soon we are going to bring Kidney Transplantation Units in Kenya and other countries of sub-Saharan Africa. We would like to thank NHIF Kenya and Govt. of Rwanda for partnering us in this noble endeavour.

Dr. Sananda Bag

MBBS, MS - Surgery, M.Ch. - Urology (PGIMER)

Fellow Renal Transplant Surgery

Robotic Surgery Training - Roswell Park, Buffalo (USA)



“We are committed to tackling the kidney disease challenge in the region.”

Chronic Kidney Disease (CKD) is highly prevalent in adults living on the African continent, warranting efforts aimed towards prevention, early detection and control of CKD. Rapid urbanization, the HIV epidemic, and increasing rates of non-communicable diseases, make people in Sub-Saharan Africa vulnerable to kidney disease. The problem is compounded in Africa due to limitations to technology and unawareness about kidney diseases and their treatments.

We, at Mediheal Group of Hospitals, are committed to tackling the kidney disease challenge in the region and are constantly investing in quality clinicians and treatment facilities, in addition to making efforts towards raising awareness on the causes and risks of kidney diseases.

Having worked for over 22 years in the field of Nephrology, I have honed my skills in offering a comprehensive range services including OP, IR Daycare, Maintenance Hemodialysis, Peritoneal Dialysis, Diagnostic and Therapeutic Services, Renal Transplantation both Live and Cadaveric. My area of expertise also includes USG guided Dialysis Catheter Insertions both Non-cuffed and Cuffed and USG-guided Kidney Biopsies.

Despite being a substantial health burden in Sub-Saharan Africa, there is not enough data which limits inferences and draws attention to the need for more information and validated measures of kidney function especially in the context of the growing burden of non-communicable diseases in the region. At Mediheal Group of Hospitals, we are dedicated to preventing kidney diseases, improving health and well-being of individuals and families affected by kidney disease. To fulfill this endeavour, we are setting up state-of-the-art treatment facilities across the region. With able support from local governments, we will be able to extend quality healthcare, especially in the Nephrology field, to the people of Africa.

Dr. A. S. Murthy

MD - General Medicine

DM - Nephrology



“ Phenomenal development in super-specialties (Neurosurgeries, Transplant Surgeries, Onco-surgeries etc.), has led to Anaesthesia making rapid strides in the surgical techniques. Eg., today’s Neuro-Anaesthesia is totally a metamorphed basic balanced Anaesthesia . ”

Today’s Anaesthesiologist takes care of the patient during the entire perioperative period, preoperative evaluation (PAC), intraoperative care and post-operative care including the patient’s stay in the ICU. Having said that, through PAC and pre-operative optimisation, the morbidity and mortality of the surgical patient can be reduced almost to 99%.

Intraoperative Monitoring has come a long way with Multi-modal Monitoring - Heart Rate, SPO2, ECG, Core Body Temperature, BP, Invasive BP, CVP, Resp. Rate, ETCO2, End-Tidal N2O, Isoflurane, etc. (through the end tidal gas analyser).

Present-day modern operation theatres can provide comfort zone temperatures (18 - 20o C), during which the patient’s normal body temperature plummets to dangerous levels causing unfavorable outcomes. To counter this, we use thermal blanket & IV fluid warming devices. Hence, patients can recover perfectly even after surgeries that last 12 hours or more.

Phenomenal development in super-specialties (Neurosurgeries, Transplant Surgeries, Onco-surgeries etc.), has led to Anaesthesia making rapid strides in the surgical techniques for eg., today’s Neuro-Anaesthesia is totally a metamorphed basic balanced Anaesthesia .

Mediheal Group of Hospitals has gone a long way in providing the most ultramodern Patient Monitoring Facilities for PAC, Intra-operative Monitoring, Post-Operative areas and ICU Ventilated patients. Committing itself to higher success rates and safety in high-end surgeries.

I have been working as an Anaesthesiologist and Intensivist in various capacities for more than 30 years. I have worked as a Dy. In-charge (HOD) at Dept. of Pediatric Ophthalmology Anaesthesia at L.V. Prasad Eye Institute, Hyderabad (India), HOD & Sr. Consultant Anesthesiologist at the Dept. of Anaesthesiology and Intensive Care at Yashoda Super Specialty Hospital, Hyderabad (India) and Member of the Quality Assurance Committee Board at King Fahad Hospital Al-Hasa, Ministry of Health - KSA. My areas of expertise include Ultrasound-guided Regional Blocks Anaesthesia, Paediatric Ophthalmology Surgery Anaesthesia, Renal Transplants, Awake Craniotomies and Neuromonitored Anaesthesia (i.e., giving Anaesthesia without using N2O, Volatile Anaesthetics and Muscle Relaxants). I also worked as an appraiser for DNB Board, Govt. of India, New Delhi and as a Guide for DNB Post Graduate students.

Dr. B. Vijaykumar
MBBS, MD, DA
Chief Anaesthesiologist



“Our patients remain the centre of all our endeavours as we evolve with changing times. Thousands of smiling Africans bear testimony to our dedication...”

We, at Mediheal Group of Hospitals, have always strived to raise the bar for healthcare in Africa to meet the highest international medical standards. A warm and friendly ambience, high-quality medical services and personalized nursing care have always been the hallmarks of hospitals since inception.

Our patients remain the centre of all our endeavours as we evolve with changing times. Thousands of smiling Africans bear testimony to our dedication, to the quality of care and sensitivity to everyone who walk through our doors. The continuum of care is an added edge that we offer as we aim to elevate the overall health of the society.

With eminent doctors leading each practice, we are committed to delivering world-class healthcare to an increasing number of people who have come to consider Mediheal as their preferred choice of hospital. We recruited doctors with training and experience at top international hospitals and implemented evidence-based protocols that are followed by leading global institutions. They provide treatment, supportive care and preventive measures spanning over 15 specialties and super-specialties of medicine. We receive a large number of international patients every year trusting our expertise and services.

We believe technology plays a vital role in delivering superior healthcare and hence have made effective outlays in procuring the best of equipment to serve our patients. We have introduced several cutting-edge technologies and procedures to the people of Africa that have improved the clinical outcomes significantly.

As we evolve, we try to sustain the highest level of competence through various academic programs and initiatives for our staff. Together, we aim to bring our vision for Africa to life by embarking in a journey to redefine healthcare in Africa.

Mr. Gokul Prem Kumar

Vice President - International Patient Services



WHAT ARE KIDNEYS?

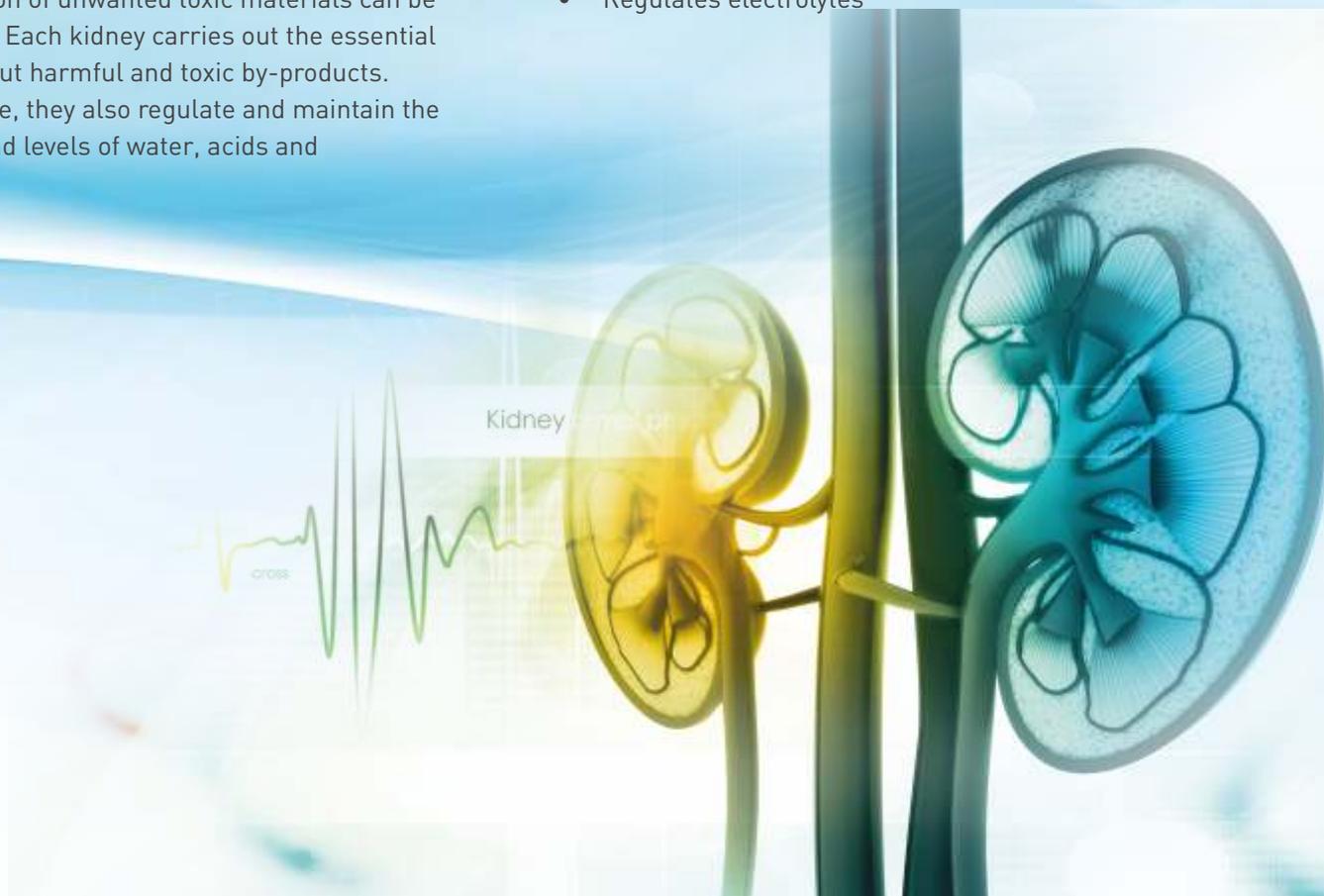
The kidneys are two bean-shaped organs located at the upper and back side of the abdomen, on either side of the spine. They are protected from damage by the lower ribs. They lie deep inside the abdomen so normally one cannot feel them.

We consume different kinds and quantities of food every day. The quantity of water, salts, and acids in our body also varies every day. The continuous process of converting food into energy produces harmful toxic materials. These factors lead to changes in the amount of fluid, electrolytes and acids in the body.

The accumulation of unwanted toxic materials can be life threatening. Each kidney carries out the essential job of flushing out harmful and toxic by-products. At the same time, they also regulate and maintain the right balance and levels of water, acids and electrolyte.

The kidneys are among the most vital organs of the human body. Malfunction of the kidneys can lead to serious illness or even loss of life. Each kidney has a very complex structure and function.

- Removes waste products and excess fluid from your blood as urine, retaining back important nutrients
- Regulates hormones which help to control blood pressure
- Secretes Erythropoietin, which is an important stimulus to produce red blood cells
- Helps in forming healthy bones by converting vitamin D to its active form which assists in calcium absorption
- Regulates electrolytes



KIDNEY DISEASE

Kidney diseases are broadly classified into two types: acute kidney disease and chronic kidney disease.

Acute kidney injury is sudden damage to the kidneys. In many cases, it will be short term but, in some people, it may lead to long-term chronic kidney disease. The main causes of acute kidney diseases are damage to the actual kidney tissue caused by a drug or severe infection, obstruction to urine leaving the kidney. People who have chronic kidney disease are also at increased risk of acute kidney injury.

Chronic kidney disease occurs, as in most cases, as kidneys worsen over several years. Sometimes it can progress to end-stage kidney disease, which requires dialysis or a kidney transplant to keep you alive. The main causes of chronic kidney disease are damaged blood vessels to the kidneys due to

- High blood pressure and diabetes
- Attacks on the kidney tissue by disease or the immune system (glomerulonephritis)
- Growth of cysts on the kidneys (polycystic kidney disease)
- Damage due to backward flow of urine into the kidneys (Reflux Nephropathy)
- Congenital abnormalities of the kidney or urinary tract

Some kidney problems can be early signs of chronic kidney disease. Finding and treating these problems early can help prevent chronic kidney disease from becoming kidney failure. Other kidney problems can lead to chronic kidney disease if they are not treated. Knowing your body and contacting your healthcare provider when you notice something isn't right can help you prevent bigger problems in the future.

Risk factors of kidney disease:

Factors that may increase your risk of chronic kidney disease include:

- Diabetes
- High blood pressure
- Heart and blood vessel (cardiovascular) disease
- Smoking
- Obesity
- Family history of kidney disease
- Abnormal kidney structure





SIGNS AND SYMPTOMS OF KIDNEY DISEASE:

Signs and symptoms of kidney disease are often non-specific, meaning they can also be caused by other illnesses. Because your kidneys are highly adaptable and able to compensate for lost function, signs and symptoms may not appear until irreversible damage has occurred.

Therefore, it is important to consult your doctor when you see one or combination of the below symptoms:

- Changes in how much you urinate
- Decreased mental sharpness
- Muscle twitches and cramps
- Swelling of feet and ankles
- Persistent itching
- Chest pain, if fluid builds up around the lining of the heart
- Shortness of breath, if fluid builds up in the lungs
- High blood pressure (hypertension) that's difficult to control



KIDNEY FAILURE

There are numerous causes of kidney failure, and treatment of the underlying disease may be the first step in correcting the kidney abnormality. Some causes of kidney failure are treatable, and the kidney function may return to normal. Unfortunately, kidney failure may be progressive in other situations and may be irreversible. The diagnosis of kidney failure usually is made by blood tests measuring bun, creatinine, and glomerular filtration rate (GFR).

Treatment of the underlying cause of kidney failure may return kidney function to normal. Lifelong efforts to control blood pressure and diabetes may be the best way to prevent chronic kidney disease and its progression to kidney failure. As we age, kidney function gradually decreases over time. If the kidneys fail completely, the only treatment options available may be dialysis or transplant.

DIALYSIS

Dialysis removes your body's waste and excess fluid from the blood. It replaces some of the functions of the kidney. There are two types of dialysis:

- Peritoneal Dialysis
- Hemodialysis

Peritoneal Dialysis

It uses the peritoneal membrane as the filter for dialysis. The peritoneal membrane lines the wall of the inner abdomen and covers the abdominal organs. The dialysis solution, which is a specially prepared fluid, is drained into the abdominal cavity through a special tube called the peritoneal catheter. Waste products and extra fluid is removed from the blood into the dialysis solution. When the dwell is completed, the 'used' dialysis solution can then be drained out of the abdomen and fresh dialysis solution is instilled. There are two types of Peritoneal Dialysis:

- CAPD (Continuous Ambulatory Peritoneal Dialysis) - Manual procedure
- APD (Automated Peritoneal Dialysis) - Mechanized procedure

Disadvantages of Peritoneal Dialysis:

- Four to five exchanges per day are needed for CAPD
- A catheter leading from the abdominal cavity to the outside is permanently present
- High chances of infection due to indwelling catheter

In view of these disadvantages and high chances of infection, this form of dialysis is no longer practiced routinely.

Hemodialysis

During Hemodialysis, blood is drawn out from the body into the artificial kidney, where waste and excess fluids are removed, and the cleansed blood is then returned to the body.

Advantages of Hemodialysis:

- It is performed 3 times a week for usually 3 to 4 hours each time
- It is performed by nurses and dialysis care technicians in hospitals
- Hemodialysis at a dialysis centre or hospital allows for a social contact
- Chances of infection are minimal as compared to peritoneal dialysis

Disadvantages of Hemodialysis:

- You will be confined to your dialysis chair for 4 hours



MEDIHEAL GROUP OF HOSPITALS: OFFERING UNMATCHED EXPERTISE IN DIALYSIS

- Availability of well-equipped and standardized machines for Hemodialysis
- Sequential dialysis with different modes can be done here. We can remove only excess body fluids without altering the solutes in blood for patients who have fluid overload (pulmonary edema) with normal kidney function parameters
- Dedicated team of doctors and technicians available round-the-clock
- Cleanliness with pleasant ambience and patient-friendly atmosphere
- Availability of doctors readily in case of emergency during Hemodialysis
- State-of-the-art ICU in case of emergency
- Facility for insertion of Hemodialysis catheter
- Special diet designed by a Nutritionist for kidney failure patients free of cost
- Well-equipped Pathology Lab for monitoring patients' kidney function periodically

Advantages of kidney transplant:

- A transplanted kidney works like a normal kidney
- Helps you return to a state of good health
- You do not need dialysis

Disadvantages of kidney transplant:

- If you do not have a living donor, you may have to wait a considerable time for a deceased donor
- It requires a major surgery
- Your body may reject the new kidney, so the treatment may not last a lifetime
- You will need to take anti-rejection medicine to maintain the transplanted kidney
- Frequent infections may occur requiring antibiotic administration.
- Need to be on regular monitoring of the kidney function, BP and Blood Sugar levels and other medical parameters



Renal ICU



Organ Transplant Theatre with HEPA Filters and Laminar Air Flow

KIDNEY TRANSPLANT

A kidney transplant is a surgical procedure to place a healthy kidney from a live or deceased donor into a person whose kidneys no longer function properly. A kidney transplant is often the treatment of choice for kidney failure compared to a lifetime on dialysis. A kidney transplant can treat chronic kidney disease with Glomerular Filtration Rate (GFR, a measure of kidney function) less than or equal to 20 ml/min and end-stage renal disease to help you feel better and live longer.

During a transplant, the surgeon places the new kidney in your lower abdomen and connects the artery and vein of the new kidney to your artery and vein. Often, the new kidney will start making urine as soon as your blood starts flowing through it. But sometimes it takes a few weeks to start working.

Advantages of Kidney Transplantation:

- Best, curative treatment - corrects all problems associated with kidney failure
- Offers better survival (10 years patient and kidney allograft survival 80%. Longest survival recorded 35-40 years)

Who can/should undergo kidney transplant?

- Patients of end stage kidney failure (ESRD) requiring dialysis
- Patients aged 65 (or even up to 70 if otherwise medically fit), fit for operation are advised for kidney transplant
- Patients with severe Azotemia GFR <15 ml and not yet on Dialysis can also undergo transplant directly (pre-emptive transplant) if a suitable donor is available

Patients harboring disseminated (incurable) malignancies, debilitating illness or chronic untreatable infections are deferred from transplant. Those with treatable cancers can undergo kidney transplant after 2 years following curative treatment. In Cadaver Donor Program, transplant waiting list is prepared by point scoring system based on age, expected survival, time on Dialysis, PRA, and other factors.

Types of Kidney Donors:

- Deceased Donor: People who become brain dead, following accidents, trauma and brain hemorrhage, and are maintained on life support but with functioning organs such as kidneys, liver, heart, lungs, eyes etc can be retrieved for transplant
- Live Donors: Relatives, friends of ESRD patients, aged 18 - 65 years, with stable kidney function and no psychiatric abnormality or drug addiction, can donate one of their kidneys to their kin

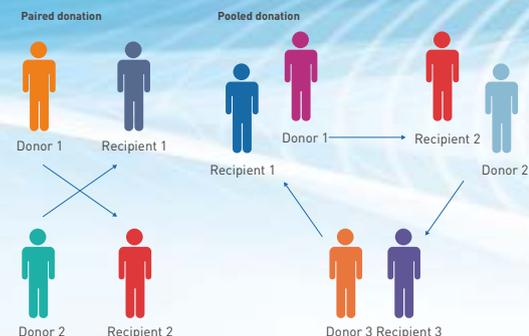


Fig. 1: Paired and pooled living kidney donation. Donor-recipient pairs who are immunologically incompatible and between whom a direct transplant is not viable are registered in the national scheme to achieve a compatible transplant match with other donor-recipient pairs. When two pairs are involved it is termed paired donation; pooled donation comprises more than two pairs. Donor-recipient pairs who have poor compatibility or substantial age-disparity and would like to achieve a better match can also register in this scheme.



Advantages of Live Donor KTP over Deceased (Cadaver) Kidney:

- There are not enough deceased donor organs, one must wait long (many years) to get a cadaver kidney
- Kidneys from living donors are completely healthy, work immediately, better and longer than deceased donor kidneys. Live donor kidney transplant operation can be planned electively as per their comfort
- Kidney donated from family or close relative can have better tissue match - thus less chance of rejection, better long-term survival, and more cost effective

Selection criteria for a living related kidney donor:

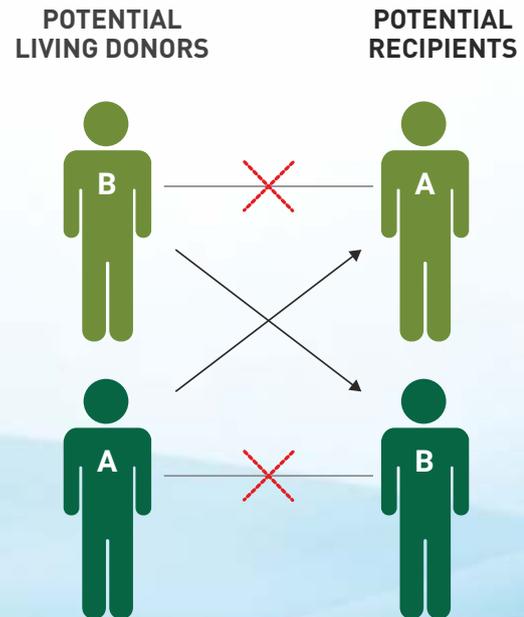
Any healthy person aged 18 - 65 years, preferably from the recipient's family (parents, spouse, siblings, children), other relatives and friends having genuine interest to donate and having compatible blood group with that of recipient, can donate one kidney to their kin. Donors should be in good health - fit for anesthesia and operation.

People with high blood pressure (uncontrolled), diabetes, kidney disease, untreated cancers, heart disease, liver disease, sickle cell disease, HIV etc. are not qualified to donate.

Kidney Donation - is there any risk?

Kidney donation is safe, not serious and does not affect survival or donor's quality of life. However, there could be minimal risk of anesthesia. Otherwise, donors are discharged within 4 - 6 days and can go back to work within 2 weeks and lead a normal life. Only 10% of donors may have hypertension or proteinuria.

Now a days, Donor Nephrectomy is done Laparoscopically, which decreases postoperative pain, hospital stay and scar site sore or long-term morbidity. These overall comforts to donors have encouraged more and more people to donate.



Swap Donation/ Paired Kidney Exchange:

If you have a potential donor who is not a biologic match for you (blood group not compatible), but may match with someone else, kidney paired exchange is the option. The person who wanted to donate to you can donate to a different patient, whose intended donor can donate a kidney to you. Potential live donors' and recipients' information and reports are matched to find successful donor-recipient combinations.



KIDNEY TRANSPLANT PROCEDURE

Kidney transplants are performed with general anesthesia, so you're not aware of the procedure being administered. The surgical team monitors your heart rate, blood pressure and blood oxygen levels throughout the procedure.

During the surgery:

- The surgeon makes an incision and places the new kidney in your lower abdomen. Unless your own kidneys are causing complications such as high blood pressure, kidney stones, pain or infection, they are left in their place
- The blood vessels of the new kidney are attached to the blood vessels in the lower part of your abdomen, just above one of your legs
- The new kidney's ureter - the tube that links the kidney to the bladder - is connected to your bladder





DONOR NEPHRECTOMY: OPEN/LAPAROSCOPIC

Donor operation can be done through open surgery in which a rib and the back muscles are cut to gain access. Kidney is mobilized - ureter and vessels are securely divided keeping adequate length of artery, vein and well-vascularized ureter for anastomosis. With advancement in technology, Laparoscopic Donor Nephrectomy has been a standardized procedure for renal donors.

During the Laparoscopic Surgery, a few very small incisions are made in the abdomen to insert Laparoscopic instruments. The Laparoscope contains a miniature camera that helps guide the surgical team. Kidney is mobilized using a long surgical instrument and visualized through a monitor screen. Once kidney dissection is complete, a 2 - 3 inch incision is made in lower abdomen (non-muscle cutting, covered under clothing) for the removal of the kidney.

Advantages of Laparoscopic Donor Nephrectomy:

- Less pain - early recovery
- Early ambulation, less complication
- Shorter hospitalization (4 - 5 days)
- Early convalescence - join back to work in 2 weeks
- As there is no muscle cut, there will be no scars nor site complications nor muscle weakness or bulge



What to expect after the procedure?

- Spend about a week in the hospital. Doctors and nurses monitor your condition in the hospital's transplant recovery area to watch for signs of complications. Expect soreness or pain around the incision site while you're healing. Most kidney transplant recipients can return to work and other normal activities within three to eight weeks after transplant. No lifting objects weighing more than 10 pounds or exercise other than walking until the wound has healed (usually about six weeks after surgery).
- Have frequent checkups as you continue recovering. After you leave the hospital, close monitoring is necessary for a few weeks. You may need blood tests several times a week and have your medications adjusted in the weeks following your transplant.
- Take medications for the rest of your life. You'll take several medications after your kidney transplant. Drugs called Immunosuppressants (anti-rejection medications) help keep your immune system from attacking and rejecting your new kidney. Additional drugs help reduce the risk of other complications, such as infection, after your transplant.

After a successful kidney transplant, your new kidney will filter your blood, and you will no longer need dialysis. To prevent your body from rejecting your donor kidney, you'll need medications to suppress your immune system. Because these anti-rejection medications make your body more vulnerable to infection, your doctor may also

prescribe antibacterial, antiviral and antifungal medications.

After your kidney transplant, you may need to adjust your diet to keep your new kidney healthy and functioning well. Exercise and physical activity should be a regular part of your life after a kidney transplant to continue improving your overall physical and mental health. After a transplant, regular exercise helps boost energy levels and increase strength. It also helps you maintain a healthy weight, reduce stress and prevent common post-transplant complications such as high blood pressure and cholesterol levels.



ADVANCED TREATMENT FOR URINARY STONES:

Kidney Stones

PCNL /Mini-Perc RIRS ESWL: Nephrolithiasis (kidney stones) is a disease affecting the urinary tract. The management of nephrolithiasis has undergone rapid transformation following the introduction of extracorporeal shock wave lithotripsy (ESWL), and endourological procedures such as percutaneous nephrolithotomy (PCNL) and retrograde intrarenal surgery (RIRS). The latest in the advancement of PCNL is mini-percutaneous nephrolithotomy. The success of these minimally-invasive therapies has made open surgery for urinary stone disease rare. PCNL has established itself as an effective and safe technique that delivers high stone-free rate as well as a shorter overall treatment time. Recent developments in PCNL have been targeted toward creating a reduced tract size in the attempt to reduce complications. This advancement has led to the development of various minimally-invasive percutaneous approaches. RIRS is a popular procedure for small volume nephrolithiasis, especially as the risk of injury to the viscera and bleeding is much lower when compared to PCNL.

Ureter Stones

URS with Laser / RIRS: Ureteroscopy (URS) is a form of minimally invasive surgery using a small telescope that is passed through the urethra and into the ureter to remove a stone. Often the stone requires fragmentation with a laser which then allows the smaller fragments to be removed with a grasping device. Only about 10-15% of urethral stones require surgical intervention. URS is approximately 95% successful in removing stones in the lower ureter and about 85-90% successful in treating and removing stones in the upper ureter and kidney.

The technical developments in laser technology and significant improvement in flexible ureteroscopes have made RIRS for larger ureteric/renal stones possible. The low complication rate gives RIRS for ureteric/renal stones superiority over the invasive percutaneous approach, which is associated with significant morbidity.



Laparoscopic removal for Renal Pelvic / Upper Ureter stone: As in other fields of urology, the use of minimally invasive techniques has helped decrease the morbidity and convalescence associated with the management of urolithiasis (the formation of stony concretions in the bladder or urinary tract). Laparoscopy has also been used as one of the minimally invasive techniques. This has developed particularly with the increasing experience and use of intracorporeal suturing techniques. Patients, who are otherwise candidates for open surgery, benefit from laparoscopic surgery in reducing morbidity and hastening recovery.

Bladder Stones

Endoscopic surgery - CLT with Laser: Cystolithotripsy (CLT) is the removal of bladder stones by the procedure of crushing (or) destruction of the stones. The major advantage of CLT is that it is very safe and effective treatment for the removal of the bladder stones and no incision is made in the body and the patient can be discharged from the hospital in the next morning. Stone that were routinely removed by making an open incision and then broken of the stones into multiple smaller pieces and are removed from a natural body opening (the urethra), by avoiding both the pain and the recovery of an open incision.

Pelviureteric Junction Obstruction (PUJO)

PUJ obstruction/ ureteropelvic junction (UPJ) obstruction, is one of commonest causes of obstructive uropathy. Mostly congenital – due to Stenosis / high insertion of Ureter / Obstruction due to Crossing vessels; but at times can be acquired due to tuberculosis or other infection / retroperitoneal fibrosis.

PUJ obstruction is commonest causes of antenatal hydronephrosis, with estimated incidence of ~1 per 1000 new born. Male predominance (M:F = 2:1); Left side affected more (67% cases); bilateral in ~30%.

Clinical presentation

Mostly asymptomatic – detected incidentally when the renal tract is imaged (USG scan) for other reasons. Symptoms include intermittent pain after drinking large volumes of fluid or fluids with a diuretic effect. They may also include recurrent flank pain, heaviness, urinary tract infections, stone formation and even a palpable flank mass. They are also at high risk of renal injury even by minor trauma.

Renal tract abnormalities at times associated with congenital PUJO – renal duplication; multicystic dysplastic kidneys; horseshoe kidney or cross fused ectopia. Aberrant, accessory, or early-branching lower pole segment vessel is found to compress the ureter, causing mechanical obstruction in 40% cases.

Diagnosis: by Radiographic imaging

The condition is suspected on Ultrasound screening for pain or other indication. Nowadays antenatal hydronephrosis on USG screening during pregnancies are detected – most of such babies post-delivery are diagnosed as PUJO on followed up USG scan / DTPA Renogram - although 30 - 50% resolve with increasing age.

USG will often show a dilated renal pelvis with a collapsed proximal ureter; with higher resistive indices(RI) on Doppler.

IVU: Traditionally intravenous urography (IVU) has been performed for assessing for PUJ obstruction. The administration of furosemide may be add confirming the diagnosis, also exclude a dilated non-obstructed extrarenal pelvis ('baggy pelvis').

CT (plain + Urogram): detects stone, calcification - shows hydronephrosis +/- caliectasis with collapsed ureters; can assess crossing vessels especially useful before surgical intervention is planned.



Cases and figures

Ultrasound & CT IVP : gross Hydronephrosis
– large pelvis with dilated calyces

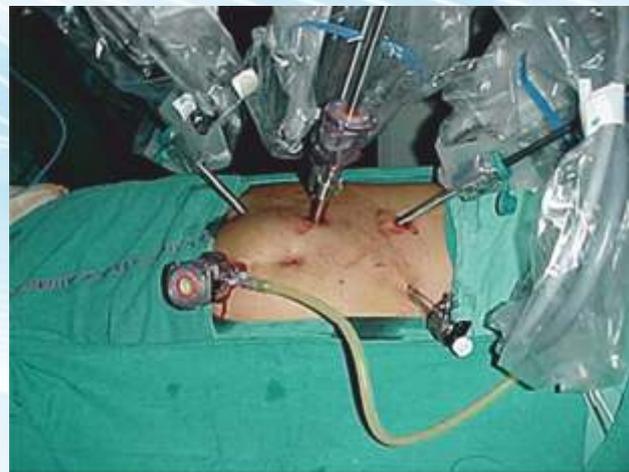
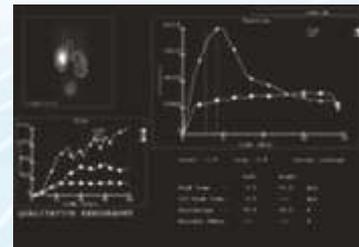
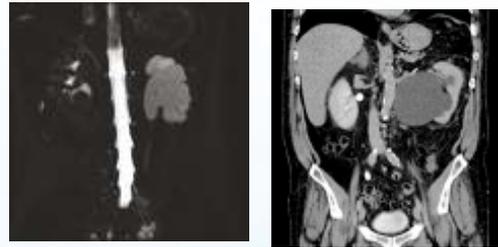
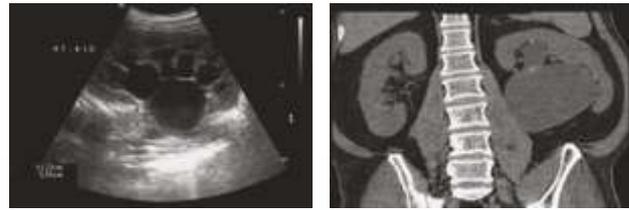
Extrinsic ureter compression by fibrosis
Radionuclide scintigraphy (DTPA)

Treatment and prognosis

Treatment depends on age, underlying cause, symptoms and serial decline in renal function. All symptomatic patients, those with obstructed drainage (IVU / DTPA scan) or serial decline in renal function (GFR) require surgical intervention.

Antenatal Hydronephrosis babies are followed up with serial USG every 6 months – increased HDN or deterioration of RFT requires a nuclear imaging (if available) or functional study (IVU / CT Urogram). About 30-50% cases resolve with age – rest of patients obviously become symptomatic and require surgery.

Traditionally Open Pyeloplasty used to be gold standard – done in all age groups including infants and small children. Nowadays advances in technology and improved surgical skills have made Laparoscopic Pyeloplasty as the standard of care - good cosmesis, less pain and early convalescence.



VUR & Mega-Ureter

Vesicoureteral reflux (VUR) is the retrograde flow of urine from urinary bladder to upper urinary tract. VUR is the most common congenital abnormality of urinary tract (1% of new-borns). 20% of antenatal hydronephrosis (prenatal ultrasound) babies are diagnosed with VUR on follow up during early childhood. 35.7% children of affected parents and 27.4% of siblings are affected – indicating strong genetic predisposition.

With recurrent UTI, children with VUR are at risk for chronic pyelonephritis, renal scarring that ultimately can result in renal insufficiency, chronic kidney disease. Some cases present during adolescent with sepsis, pyonephrosis, severe renal dysfunction, End Stage Renal Disease.

Diagnosis of UTI requires both symptoms and positive urine culture. Typical symptoms include dysuria, urinary frequency, urgency, haematuria. Atypical symptoms may include fever, malaise, Malodorous urine, abdominal or flank pain, diarrhoea, vomiting, weight loss.

Unexplained fever in the child with VUR should prompt workup for urinary source in absence of other apparent cause. Proper urine collection for culture in young children often requires catheterization.

Voiding dysfunction / Bladder Bowel Dysfunction (BBD) is associated in many cases, complicates the course. Urine culture and appropriate antibiotics treatment is sufficient in many cases of UTI. MCU (VCUG) / radionuclide DRCG tests are

needed in recurrent cases to look for grade the degree of reflux.

Mega-Ureters is another disorder of obstructive uropathy present similar to VUR but more aggressive renal dysfunction and early progress to ESRD unless timely intervened.

Low grade VUR (Gr I-II) often resolves spontaneously with time, continuous antibiotic prophylaxis (CAP) has been found to prevent UTI in 50% children while waiting for VUR resolution. Careful follow-up, parental education about pathophysiology and management of VUR and identifying symptoms of UTI, and management of bowel and bladder dysfunction (BBD - that cause recurrent UTI, complicates VUR outcomes) are the foundation of treatment.

Endoscopic injection of bulking agents like Dextranomer-copolymer (Deflox) has been found to resolve Gr II-III VUR, for medium term follow up. Gr IV-V reflux usually require surgical re-implantation of the ureter (Ureteroneocystostomy - UNC). Advances in technology have improved minimally invasive (Laparoscopic / Robotic) approaches for treating VUR.

Surgical management remains a relevant option for select patients who fail conservative measures with breakthrough UTIs or failure to resolve. Minimally invasive surgical options are available with acceptable outcomes though open ureteroneocystostomy still carries the highest success rate.

CUTTING-EDGE TECHNOLOGY

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ICU



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Siemens 64 Slice CT

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