

**THE COLLEGE OF SURGEONS OF HONG KONG  
THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH**

**Urology Training Curriculum**

**Overview and objectives of the Urology Curriculum**

Trainees who have completed basic surgical training, passed the Membership Examination and selected by the Central Selection Exercise for higher surgical training in urology will undergo at least four years of higher urology training in centres accredited jointly by the College of Surgeons of Hong Kong and the Royal College of Surgeons of Edinburgh. The purpose of the curriculum is to train urologists who will be able to work independently to the standard of a Specialist in Urology. Most of the skills to be acquired relate to the management of common general elective and emergency urology and this forms the basis of the main part of the curriculum, with the competences, both non-operative and operative being completed by the final year of training.

Topics

**[1]Basic science**

**Anatomy**

**Knowledge**

Gross and microscopic anatomy of the urinary tract

Vascular anatomy of the urinary tract

Neurological supply of the urinary tract, pathways of pain.

Embryological development in relation to disorders affecting the urinary tract

**Physiology**

**Knowledge**

Endocrine homeostasis

Control of blood pressure

Mechanism of urine production

Mechanism of peristalsis

Mechanism of neuromuscular transmission

Antireflux mechanism

Neurophysiological control of filling and voiding cycles.

Physiological properties of bladder muscle and mucosa.  
Neurophysiology of sphincter mechanism in male and female.  
Physiology and molecular biology of prostate cell  
Physiology of prostate secretion  
Prostate specific antigen and related markers  
Physiology of erection and ejaculation  
Urological endocrinology  
Mechanism of spermatogenesis and mechanism of spermatic transport  
Function of accessory genital organs.  
Effect of disease and drugs on normal genital function  
Physiology of pain.  
Pathways of pain

## **Pharmacology**

### **Knowledge**

Mechanism of action of commonly used drugs in urology  
Nephro-pharmacology  
Cholinergic and Adrenergic mechanisms  
Non-adrenergic, non-cholinergic (NANC) mechanisms  
Pharmacology of coagulation  
Pharmacology of inflammation  
Pharmacology of neoplastic disease.

## **Pathology**

### **Knowledge**

Basic genetics of uropathological conditions  
Common congenital disorders affecting the urinary tract  
Changes related to congenital abnormalities  
Basic principles of microbiology, resistance, cross infection relevant to the GU tract  
Infection control and sterilization  
Antibiotics including mechanism of action  
Acute and chronic inflammatory response  
Chronic inflammatory mechanisms and diseases  
Role of genetics and environmental factors in urological cancer  
Mechanism of tumour initiation and growth  
TNM classification of common urological tumours  
Oncogenes, growth factors and angiogenesis  
Mechanism of chemotherapy, immunotherapy and radiotherapy

Familial prostate cancer and renal oncology  
Abnormalities resulting from trauma  
Primary and secondary wound healing by anatomical site.

## **[2] Clinical pharmacology**

### **Knowledge**

Clinical pharmacology of commonly used drugs including side effects and contraindications of drugs for the following conditions:

Acute and chronic infection

Lower urinary tract dysfunction

Erectile dysfunction

Urinary incontinence

Systemic chemotherapy for urological malignancy

Intravesical chemotherapy for urological malignancy

Anticoagulants

Analgesics and postoperative pain relief

Immunosuppressants

DVT prophylaxis in urological surgery

Side effect upon genitourinary tract of drugs used to treat common conditions.

### **Clinical skills**

Appropriate use of commonly used drugs recognizing common side effects, interaction and contraindications

## **[3] Stone disease**

### **Knowledge**

principles of management of stones in the urinary tract

mechanism of stone formation

natural history and pathophysiology of stones

symptom complexes according to site

complications of stone

metabolic management of stone disease

mechanism of ureteric colic

renal adaptation to ureteric obstruction

microbiology of sepsis of urinary tract

acute and chronic inflammatory response related to stones.

role of IVU/US and CT in diagnosis

principles of isotope and isotope imaging.

pharmacology of drugs for ureteric colic  
pharmacology of drugs for metabolic stone disease  
pharmacology of drugs for sepsis of urinary tract  
pharmacology of pain prevention and relief  
Local anaesthetics  
Mechanism of extracorporeal lithotripsy  
Mechanism of intracorporeal lithotripsy  
Complication of treatment for stones  
Results of stone treatment in different locations  
Percutaneous access  
Range and choice of ureteroscopes  
Open operation for renal stone.  
Role of stents  
Post treatment care

### **Clinical skills**

management of renal stone  
management of ureteric stone  
management of bladder stone  
requirement for emergency therapy  
appropriate multidisciplinary assessment and management  
investigation and management of patients with recurrent stone disease.  
Assessment of obstruction/ sepsis  
Selection of appropriate isotope investigations and interpretation of renogram  
Assessment of the anuric patient, patient in renal failure  
Medical management of stones.

### **Procedures**

Methods of drainage: JJ stent and PCN insertion  
ESWL  
Rigid ureteroscopy  
PCNL  
Flexible URS with intracorporeal lithotripsy  
Cystoscopic lithotripsy  
Open cystolithotomy.

### **[4] Urinary tract obstruction**

Include topics on benign upper tract disease, including pelviureteric junction

obstruction, ureteric stricture

### **Knowledge**

Mechanism of peristalsis initiation in urinary tract

Mechanism of neuromuscular transmission

Anatomy, etiology and pathophysiology of upper urinary tract obstruction

Etiology, pathophysiology and management of ureteric stricture

Operative approaches, indications and complications of surgical treatment of ureteric stricture including ureteroscopic, laparoscopic and open

Principles of Isotopes and isotope imaging

Pharmacology of pain prevention and relief

Endoscopic management of upper tract obstruction

Etiology, pathophysiology and clinical features of pelviureteric junction obstruction

Investigation and management of pelviureteric junction obstruction

Operative approaches, indications and complications of surgical treatment of pelviureteric junction obstruction including percutaneous, ureteroscopic, laparoscopic and open

Anatomy, pathophysiology, epidemiology of lower urinary tract obstruction in men and women.

Investigation and treatment options for lower urinary tract symptoms

Causes and pathophysiology of urinary retention in men and women.

Mechanism of acute/ chronic retention of urine.

Etiology, pathophysiology and management of urethral stricture

Etiology, pathophysiology and management of bladder neck stenosis

Epidemiology of BPH

Natural history and complications of BPH

Urodynamic basis for symptoms of BPH

Non-urological causes of LUTS

Utility of PSA

Detail medical and surgical therapy for BPH

### **Clinical skills**

Assessment of unilateral and bilateral renal obstruction

Recognition and early management of sepsis

Management of upper urinary tract obstruction

Selection of imaging investigations for upper tract disorder

Selection of appropriate isotope investigation

Interpretation of IVU and diuresis renography

Management of postobstructive diuresis  
Assessment of renal function and fluid balance.  
Management of patient with Pelviureteric junction obstruction  
Selection of treatment options and surgical approaches for pelviureteric junction obstruction.  
Counsel and obtain informed consent for operation on pelviureteric junction obstruction  
Management of patient with ureteric stricture.  
Selection of treatment options and surgical approaches for ureteric stricture  
Counsel and obtain informed consent for operation on ureteric stricture  
Interpretation of urinary flow rates  
Clinical assessment and differential diagnosis of men and women with LUTS  
Therapeutic plan for men and women with LUTS  
Management of urethral stricture  
Management of bladder neck stenosis  
Interpretation of fluid, frequency voiding charts  
Interpretation of biochemistry and PSA in LUTS  
Interpretation of flow rate, residual urine and urodynamic investigations in male LUTS  
Medical therapy of BPH/ LUTS in men.

### **Procedures**

Cystoscopy and retrograde pyelogram, insertion of JJ stent, PCN  
Urodynamic test  
TURP  
Bladder neck incision  
Suprapubic catheter insertion  
Urethrography  
Optical urethrotomy.  
Urethral stents.  
Percutaneous access to kidney  
Retroperitoneal access  
Assistance in open, laparoscopic pyeloplasty, and percutaneous and URS treatment of PUJ obstruction  
Ureteroscopic treatment of ureteric stricture.  
Extra-anatomical stent insertion  
Open surgical procedures for correction of ureteric stricture.  
Lap/ open simple nephrectomy

## **[5] Urinary tract infection**

### **Knowledge**

Biological mechanisms of upper and lower urinary tract infection – virulence

Host defence

Antibiotics and mechanisms of action

Microbiological tests

Predisposing causes of pyelonephritis

Clinical presentation and management of pyelonephritis.

Pathogenesis and predisposing causes of renal and peri-renal abscess

Clinical presentation and management of renal and peri-renal abscess

Pathogenesis, natural history and complication of genitourinary tuberculosis

Clinical presentation and management of genitourinary tuberculosis

Classification, pathogenesis, natural history and complications of prostatitis

Diagnosis and management of prostatitis

Role of segmented culture in prostatitis

Pathogenesis, natural history and complication of epididymitis

Clinical presentation and differential diagnosis of epididymitis

Treatment of epididymitis

Classification of scrotal abscess

Pathogenesis, natural history and complications of scrotal abscess

Diagnosis and management of scrotal abscess

Pathophysiology and clinical features of Fournier's gangrene

Pathogenesis, natural history and complications of sexually transmitted diseases

Clinical presentation, differential diagnosis and management of sexually transmitted diseases

Pathogenesis, natural history and complications of retroperitoneal fibrosis

Clinical presentation and management of retroperitoneal fibrosis.

Pathogenesis, natural history and complications of interstitial cystitis

NIH criteria for diagnosis of interstitial cystitis

Clinical presentation and management of interstitial cystitis

Role of urodynamics, imaging, endoscopy and other investigations for interstitial cystitis

Conservative treatment for interstitial cystitis.

Indications, results and complications of surgical treatment for interstitial cystitis.

### **Clinical skills**

Identification and management of significant infection and asymptomatic bacteriuria.

Selection of appropriate antibiotics  
Management of infection in specific patient groups: children, adult female, pregnancy  
Collection of specimens and interpretation of results.  
Assessment , diagnostic and microbiological workup for pyelonephritis  
Indications for nephrostomy/ drainage of kidney  
Assessment , diagnostic and microbiological workup for renal and peri-renal abscess  
Treatment for renal and peri-renal abscess  
Assessment , diagnostic and microbiological workup for genitourinary tuberculosis  
Assessment , diagnostic and microbiological workup for prostatitis  
Medical management of prostatitis  
Assessment , diagnostic and microbiological workup for epididymitis  
Medical management of epididymitis.  
Assessment , diagnostic and microbiological workup for scrotal abscess  
Management of Fournier’s gangrene, multidisciplinary approach  
Assessment , diagnostic and microbiological workup for sexually transmitted disease  
Assessment and diagnostic workup for retroperitoneal fibrosis  
Medical management of retroperitoneal fibrosis.  
Assessment and diagnostic workup for interstitial cystitis  
Medical management of interstitial cystitis, MDT approach  
Further management of patient with resistant painful bladder syndrome

### **Procedures**

Cystoscopy and retrograde ureterogram, JJ stent insertion, PCN  
Surgical treatment of scrotal abscess  
Cystoscopic assessment of the painful bladder  
Augmentation and substitution cystoplasty  
Simple cystectomy and ileal conduit diversion.  
Continent urine diversion

### **[6] urinary incontinence**

#### **Knowledge**

Etiology, epidemiology, pathophysiology and classification of incontinence in men and women  
Clinical presentation and differential diagnosis of urinary incontinence  
Management of urinary incontinence  
Etiology, epidemiology, pathophysiology and classification of neuropathic bladder  
Management of neuropathic incontinence  
Incontinence in elderly



Investigation, diagnosis and management of urgency and urge incontinence.  
Role of urodynamics, imaging, endoscopic and other investigations for urgency and urge incontinence.  
Conservative management techniques for urgency and urge incontinence  
Indications, results and complications of surgical treatment for urgency and urge incontinence  
Investigation, diagnosis and management of stress incontinence.  
Role of urodynamics, imaging, endoscopic and other investigations for stress incontinence.  
Conservative management techniques for stress incontinence  
Indications, results and complications of surgical treatment for stress incontinence

### **Clinical skills**

Clinical assessment of urinary incontinence  
Interpretation of frequency volume chart  
Multidisciplinary approach to incontinence  
Medical treatment of incontinence  
Clinical assessment of neuropathic bladder  
Investigation of neuropathic bladder  
Multidisciplinary approach to neuropathic bladder  
Medical treatment for neuropathic bladder.  
Clinical assessment and management of incontinence in the elderly  
Clinical assessment of urgency and urge incontinence according to ICS standard  
Counsel patient on therapeutic options for treatment of urgency and urge incontinence.  
Further management of patient with resistant overactive bladder  
Clinical assessment of stress and mixed incontinence according to ICS standard  
Conservative treatment for stress incontinence  
Selection of appropriate surgical treatment for stress incontinence  
Counsel patient on therapeutic options for treatment of stress incontinence.

### **Procedures**

Urodynamic studies  
Cystoscopic injection of botulinum toxin  
Cystoscopic injection of urethral bulking agent  
Surgical insertion of mid urethral tape  
Detrusor myomectomy

Augmentation and substitution cystoplasty  
Sacral neuromodulation

**[6a] Female urology:** topics (female incontinence), (painful bladder syndrome), female urinary retention, prolapse, urinary fistula, urethral diverticulum, trauma

**Knowledge**

Abdominal and pelvic anatomy, with emphasis on bony pelvis, pelvic viscera, pelvic floor and side walls and the endopelvic fascial

Embryology of the genitourinary tract

Neuroanatomy in relation to bladder, urethral and pelvic floor function

Physiology and neurophysiology of the micturition and continence

Physiology of bladder function

Physiology of female reproduction and female hormonal function

Physiology of female sexuality

Pharmacology of cholinergic, adrenergic and other neurotransmitter system

Pharmacology of drugs used in management of lower urinary tract dysfunction.

Pharmacology of drugs for other systems that would affect urinary tract

Hormonal replacement in postmenopausal women.

Pharmacology of drugs for treatment of anorectal dysfunction and constipation.

Pathophysiology of urinary incontinence in women

Pathophysiology of pelvic organ prolapse in women

Indications, techniques, complications and results of non-surgical and surgical therapy for pelvic organ prolapse.

Pathology of ageing effects on pelvic organs and urinary tract

Pathophysiology of interstitial cystitis and other painful bladder syndrome

Pathophysiology of UTI in women.

Underlying causes and mechanism of urinary retention in women.

Causes, pathophysiology, presentation and complication of urinary fistulae

Diagnosis and management of urinary fistula

Indications, results and complications of surgical treatment of urinary fistula.

Causes, pathophysiology, presentation and complications of urethral diverticulum

Diagnosis and management of urethral diverticulum

Indications, complications and results of surgical treatment of urethral diverticulum

Pathophysiology of traumatic and radiation damage to the genitourinary tract

Diagnosis and management of traumatic and radiation damage to the genitourinary tract

Graft, flaps and bowel in reconstruction for traumatic and irradiation damage to the

genitourinary tract

Pelvic floor electromyography, nerve conduction studies.

### **Clinical skills**

Assessment of lower urinary tract dysfunction in women integrated with bowel, sexual and reproductive issues.

Appropriate use of commonly used drugs with knowledge of side effects, interactions and contraindications.

Investigation and management of women with urinary retention.

Assessment of pelvic organ prolapse

Selection of conservative treatment , pessary or surgical treatment for prolapse, with MDT

Assessment of patient with urinary fistula

Selection and timing of surgical treatment for urinary fistula

Assessment of urethral diverticulum

Advice on surgical treatment for urethral diverticulum

Assessment of women with traumatic and radiation damage to the urinary tract

Advice on surgical treatment for traumatic and radiation damage to the urinary tract.

Assessment of bowel dysfunction in women with lower urinary tract dysfunction

Advice on dietary regimes, bowel medications and enema.

### **Procedures**

Urodynamics study

Pad test

Pessary fitting

Anterior repair

Paravaginal repair, vaginal obturator shelf repair

Sacrocolpopexy

Vaginal hysterectomy

Vesicovaginal fistula repair

Martius flap

Urethrovaginal fistula repair

Ureterovaginal fistula repair

Simple cystectomy and ileal conduit

Continent urinary diversion

Surgical excision of urethral diverticulum

Vaginal reconstruction

## **[6b] Reconstruction in urinary tract**

### **Knowledge**

Abdomino-pelvic anatomy

Neuroanatomy relating to bladder , urethral and pelvic floor functions

Anatomy and vascular supply of the gastrointestinal tract

Physiology of gastrointestinal function

Causes and Pathophysiology of conditions that might require reconstruction of the bladder and ureter, including: congenital and acquired neurogenic conditions, congenital abnormalities of the urinary tract, genitourinary tumours, iatrogenic damage or trauma, inflammatory disorders.

Techniques for assessment of patients for reconstruction including urodynamics, radiological and nuclear imaging

Metabolic effects of urinary tract reconstruction and interposition of intestine within the urinary tract

Complications of urinary tract reconstruction and interposition of intestine within the urinary tract

Endourological techniques relevant to urinary reconstruction

Surgical techniques in reconstruction of the bladder and ureter

Anatomy of the male genitalia and urethra

Embryology of urethral , hypospadias and epispadias

Physiology of erection and ejaculation

Causes and pathophysiology of urethral strictures

Pathophysiology of traumatic urethral injury

Techniques and complications of urethral reconstruction

Endourological techniques of urethral reconstruction

Surgical techniques of urethral reconstruction

### **Clinical skills**

Assessment of patients with upper and lower urinary tract dysfunction who require urinary tract reconstruction

Advice on non-surgical and surgical options for conditions requiring reconstruction

Indication and selection of surgical management for patient

Appropriate choice of reconstructive technique

Management of postoperative consequence of urinary tract reconstruction and interposition of intestine within the urinary tract.

Appropriate follow up of patients with urinary tract reconstruction and interposition of intestine within the urinary tract

Assessment of men with urethral strictures

Assessment of patient requiring urethral reconstruction  
Management of postoperative consequences of urethral reconstruction  
Appropriate follow up of patients with urethral reconstruction  
Appropriate choice of surgical options for urethral stricture.

### **Procedures**

Urodynamics studies  
Intestinal anastomosis and mobilization of omentum  
Ureteric anastomosis  
Ureteric reimplantation  
Psoas hitch and Boari flap  
Transuretero-ureterectomy  
Augmentation cystoplasty  
Substitution cystoplasty  
Simple cystectomy and ileal conduit diversion  
Continent urinary diversion  
Orthotopic bladder reconstruction  
Artificial sphincter insertion  
Vaginal reconstruction  
Optical urethrotomy  
Harvesting of buccal mucosal graft  
Bulbar anastomotic urethroplasty  
Single stage substitution urethroplasty with flaps and grafts  
Two stage buccal graft urethroplasty  
Urethral reconstruction for pelvic fracture.

### **[6c] Neurourology**

#### **Knowledge**

Neuroanatomy of the peripheral and central nervous system related to normal and abnormal bladder and genital function  
Physiology and neurophysiology of micturition and continence  
Physiology of bladder mucosa and musculature.  
Physiology and neurophysiology of sexual and reproductive function in men and women.  
Pharmacology of the genitourinary organs including cholinergic, adrenergic and other neurotransmitter systems.  
Pharmacology of drugs used in the management of lower urinary tract dysfunction  
Pharmacology of drugs used in the management of disease of central nervous system

(eg Parkinson's disease, neuropathic pain)

Pharmacology of agents used for treatment of constipation and alteration of bowel activities.

Pathophysiology of neurogenic bladder dysfunction in congenital and acquired diseases of the central and peripheral nervous system

Effects of neurogenic bladder dysfunction upon renal function

Pathophysiology of sexual dysfunction in congenital and acquired diseases of the central and peripheral nervous system

Pathophysiology of traumatic spinal cord injury, including effects upon function of the genitourinary tract

Effects of neurological disease upon mobility, manual dexterity, vision and other bodily functions relevant to the management of bladder dysfunction.

Pathophysiology of autonomic dysreflexia

Investigations and management of patients with neurogenic bladder or sexual dysfunction

Complications of neurogenic bladder dysfunction including renal impairment, urosepsis, and calculus formation.

Role of urodynamics, imaging, endoscopic and other investigations for neurogenic bladder

Conservative management techniques for neurogenic bladder

Surgical treatment for neurogenic bladder dysfunction

Indications, complications and results of surgical techniques for neurogenic bladder

### **Clinical skills**

Assessment of patients with neurological disease and bladder or sexual dysfunction

Indication, common side effects, interactions and contraindications to commonly used drugs for lower urinary tract dysfunction

Clinical assessment of neurogenic bladder according to ICS standards

Plan investigation and treatment for neurogenic bladder dysfunction with MDT

Plan conservative management for bladder dysfunction and sexual dysfunction.

Selection of management of neurogenic bladder dysfunction

Counsel patient and obtain informed consent for various therapeutic options for neurogenic bladder dysfunction.

### **Procedures**

Urodynamics study and video urodynamics study

Cystoscopic injection of botulinum toxin

Suprapubic catheter insertion

Exteranal sphincterotomy  
Augmentation cystoplasty  
Substitution cystoplasty  
Continent diversion  
Insertion of artificial sphincter  
Insertion of spinal simulator  
Neuromodulation

## **[7] Urological oncology, General**

### **Knowledge**

Epidemiology of common urological cancer  
Genetic and environmental factors in oncogenesis  
Molecular biology of urological cancer  
Oncogenes, growth factors and angiogenetic factors in relation to cancer  
TNM classification of common urological cancers  
Neoadjuvant versus adjuvant therapy  
Principles and application of radiotherapy

### **Clinical skills**

Terminal care  
Principles of screening  
PSA as screening tool and controversy  
Urine cytology screening and controversy  
Multidisciplinary care

### **Procedure**

TURBT  
Ureteroscopy

## **[7a] Prostate cancer**

### **Knowledge**

Embryology and anatomy of the prostate, bladder and sphincters  
Lymphatic drainage of the pelvic organs  
Physiology of the prostate  
Physiology of erection  
Physiology of micturition  
Pharmacology of endocrine drugs used in prostate cancer  
Pharmacology of cytotoxic drugs used in prostate cancer

Pharmacology of other agents used in prostate cancer  
Genetics of prostate cancer  
Environmental factors for prostate cancer  
Current theories of tumour initiation and growth.  
Role of oncogene and growth factor in pathogenesis of prostate cancer  
Theory and technique of radiological and nuclear imaging for prostate cancer  
Theory and technique of radiotherapy for prostate cancer  
Rationale, indications, complications of radical surgery for prostate cancer  
Rationale, indications, complications of radical external beam radiotherapy for prostate cancer  
Rationale, indications, complications of brachytherapy for prostate cancer  
Rationale and indications of active surveillance  
Rationale, indications, complications of adjuvant and neoadjuvant hormonal therapy  
Role and limitation of new technologies in prostate cancer (cryotherapy, HIFU)  
Rationale, indications, complications of hormone therapy for metastatic prostate cancer  
Rationale, indications, complications of chemotherapy for metastatic prostate cancer  
Rationale, indications, complications of radiotherapy for metastatic prostate cancer  
Rationale, indications, complications of novel therapy for metastatic prostate cancer  
Definition and prognosis of hormone refractory prostate cancer  
Biology of bone metastasis and drug management.  
Pharmacology of drugs for bone metastasis

### **Clinical skills**

Assessment of patients with locally confined prostate cancer  
Assessment of patient with locally advanced prostate cancer  
Assessment of patient with metastatic prostate cancer  
Assessment of patient with hormone refractory prostate cancer  
Interpretation of stage, grade and molecular markers  
Selection of relevant pathological and radiological investigations  
Formulation of management plan with a MDT  
Counsel and obtaining informed consent for treatment procedures.  
Palliative management of metastatic prostate cancer patients.  
Indications of likely response, duration of response and survival in patients with metastatic disease  
Formulation of follow up plan

### **Procedures**



Assist in radical prostatectomy (open, laparoscopic conventional/ robot assisted)  
Brachytherapy

### **[7b] Bladder cancer**

#### **Knowledge**

Embryology and anatomy of the bladder

Lymphatic drainage of the pelvic organs.

Physiology of micturition

Pharmacology of intravesical chemotherapy

Pharmacology of intravesical immunotherapy

Pharmacology of cytotoxic drugs for urothelial cancer

Pathology of different types of bladder cancer

Role of genetics, oncogenes and growth factor in bladder cancer

Role of environmental factors in bladder cancer

Current theories of bladder cancer initiation and growth.

Evolution of system of staging and grading of bladder cancer

Theory and technique of nuclear imaging in bladder cancer

Theory and technique of radiotherapy for bladder cancer.

Rationale, indication, complications and results of TURBT

Rationale, indication, complications and results of intravesical chemotherapy

Rationale, indication, complications and results of intravesical BCG

Rationale, indication, complications and results of radical cystectomy

Rationale, indication, complications and results of radical radiotherapy

Rationale, indication, complications and results of palliative radiotherapy

Rationale, indication, complications and results of systemic chemotherapy

Rationale, indication, complications and results of reconstructive surgery following cystectomy

Role and limitation of new technology in diagnosis and therapy of bladder cancer

Relevance of co-morbidities in the choice of therapy for bladder cancer

#### **Clinical skills**

Assessment of patients with superficial bladder cancer

Assessment of patients with muscle invasive bladder cancer

Assessment of patients with metastatic bladder cancer

Indication of relevant radiological and pathological investigations

Formulation of management plan with MDT

Indication of likely response, duration of response and survival in patients after treatment.

Palliative care of patient with metastatic bladder cancer.  
Counsel and obtaining informed consent for treatment procedures  
Counsel and obtaining informed consent for diversion after cystectomy  
Formulation of a relevant follow up plan

### **Procedures**

Cystoscopy biopsy  
TURBT  
Radical cystectoprostatectomy, cystourethrectomy  
Urethrectomy  
Ileal conduit diversion  
Orthotopic bladder reconstruction  
Continent urinary diversion

### **[7c] Renal cancer**

Knowledge  
Embryology and anatomy of the upper urinary tract  
Pharmacology of agents used for systemic therapy in renal cancer  
Pharmacology of immunological agents for renal cancer  
Pathology of different types of renal cancer and other renal tumours  
Role of genetics in renal cancer and upper tract TCC  
Role of oncogenes and growth factors in renal cancer and upper tract TCC  
Role of environmental factors in renal cancer and upper tract TCC  
Current theories of tumour initiation and growth for renal cancer and upper tract TCC  
Current and previous staging and grading systems for renal cancer and upper tract TCC  
Immune response and its relevance to therapy of renal cancer and upper tract TCC  
Theory and technique of radiological and nuclear imaging for renal cancer and upper tract TCC  
Rationale, indications, complications and results of radical nephrectomy for renal cancer  
Rationale, indications, complications and results of nephron sparing surgery  
Rationale, indications, complications and results of minimally invasive therapies  
Rationale, indications, complications and results of new technology in the diagnosis and therapy of renal cancer  
Role and limitations of surgery, biological agents, immunotherapy, hormone therapy and novel therapy for metastatic renal cancer  
Rationale, indications, complications and results of radical surgery and endoscopic

surgery for upper tract TCC

Rationale, indications, complications and results of new technologies in the diagnosis and therapy of upper tract TCC

Relevance of co-morbidities in the choice of therapy

### **Clinical skills**

Assessment of patient with renal cancer and upper tract TCC with appropriate use of stage, grade, molecular markers and imaging

Indication of relevant radiological and pathological investigations

Appropriate use of drugs, immunological agents and biological agents in renal cancer

Formulation of management plan with MDT

Selection of appropriate therapeutic approach for treatment of renal cancer and upper tract TCC

Counsel and obtaining informed consent for treatment procedures

Formulation of follow up plan

### **Procedures**

Radical nephrectomy

Partial nephrectomy

Laparoscopic nephrectomy

Laparoscopic partial nephrectomy

Radical nephroureterectomy

Segmental ureterectomy and reconstruction

Laparoscopic nephroureterectomy

Ureteroscopic therapy of TCC

### **[7d] Penile cancer**

#### **Knowledge**

Embryology and anatomy of the male genitalia including lymphatic drainage

Anatomy of the femoral triangle and upper thigh

Pharmacology of agents used for chemotherapy in penile cancer

Pathology of the differing types of penile cancer and premalignant conditions

Role of genetics, oncogene and growth factors in penile cancer

Role of environmental factors in penile cancer

Current previous staging and grading system for penile cancer

Theory and technique of radiological and nuclear imaging for penile cancer

Theory and technique of radiotherapy for penile cancer

Rationale, indications, complications and results of surgery and radiotherapy for

penile cancer

Rationale, indications, complications and results of surgery, radiotherapy and chemotherapy for lymphatic involvement in penile cancer.

Role and limitations of new technologies in diagnosis and therapy of penile cancer.

Understanding the relevance of co-morbidity in the choice of therapy.

Rationale, indications, complications and results of different therapies for metastatic penile cancer.

### **Clinical skills**

Selection of imaging for penile cancer

Assessment of penile cancer with stage, grade and molecular markers

Assessment of patient with possible lymphatic involvement including radiological assessment.

Assessment and treatment of patient with metastatic penile cancer

Selection of pharmacological, immunological and biological agents in penile cancer

Indications, contraindications and complications of treatment of penile cancer

Formulation of management plan with MDT

Selection of therapeutic approach for the treatment of penile cancer

Counsel and obtaining informed consent for treatment procedures.

Formulation of follow up plan

### **Procedures**

Circumcision and penile biopsy

Partial penectomy

Glansectomy and skin grafting

Total penectomy

Inguinal LN dissection

External iliac LN dissection

Laparoscopic pelvic lymph node dissection

### **[7e] testicular cancer**

#### **Knowledge**

Embryology and anatomy of male genitalia including lymphatic drainage

Anatomy of retroperitoneum

Reproductive physiology

Pharmacology of cytotoxic agents used for testicular cancer.

Pathology of different kinds of testicular cancer and premalignant conditions.

Role of genetics, oncogenes and growth factors in testicular cancer  
Role of environmental factors in testicular cancer  
Past and current system for the staging and grading of testicular cancer  
Theory and technique of radiological and nuclear imaging for testicular cancer  
Theory and technique of radiotherapy for testicular cancer  
Rationale, indications complications and result of surgery in treatment of testicular cancer.  
Rationale, indications complications and result of surgery, chemotherapy and radiotherapy for testicular cancer.  
Relevance of co-morbidities in the choice of therapy

### **Clinical skills**

Assessment of patient with testicular cancer through appropriate use of staging, grading and tumour markers  
Selection of imaging for testicular cancer  
Formulation of management plan with MDT  
Appropriate use of chemotherapeutic agents in testicular cancer.  
Selection of pharmacological agents in patients with testicular cancer.  
Counsel and attention to future fertility prospects.  
Formulation of relevant follow up plan

### **Procedure**

Radical orchidectomy  
Insertion of testicular prosthesis  
Retroperitoneal dissection

### **[8] Andrology**

#### **Knowledge**

Anatomy, embryology and physiology of male reproductive system  
Causes, assessment and management of male factor infertility  
Methods of assisted fertilization  
Anatomy, physiology and pharmacology of erection  
Pathophysiology of erectile dysfunction  
Risk factors and etiology for erectile dysfunction  
Sexual function and aging  
Assessment and investigation of erectile dysfunction.  
Uses and limitation of Doppler US, cavernosography, cavernosometry and nocturnal penile tumescence test in erectile dysfunction

Cardiovascular function and disease relevant to sexual dysfunction  
Endocrinology of sexual dysfunction  
Hypogonadism  
Therapeutic options for erectile dysfunction  
Surgical management of man with erectile dysfunction.  
Physiology of ejaculation  
Physiology of female sexual function  
Ejaculatory disorder- anatomy, physiology and management  
Premature ejaculation  
Retrograde ejaculation  
Delayed ejaculation  
Neuropharmacology and receptor pharmacology  
Endothelial derived modulators of corporal smooth muscle  
Oral pharmacotherapy for erectile dysfunction  
Pharmacokinetics, adverse events and interaction of drug for erectile dysfunction  
Intracavernosal, topical and intraurethral agents for erectile dysfunction  
Pharmacology of drugs for priapism  
Pharmacology of drugs for ejaculatory disorder  
Causes and pathophysiology of ejaculatory disorders  
Range of therapies for ejaculatory disorders  
Testosterone replacement therapy  
Anatomy, physiology and management of penile deformity  
Causes and pathophysiology of penile deformity  
Range of therapy for penile deformity  
Surgical treatment for penile deformity  
Causes and classification of penile dysmorphism  
Range of therapy for penile dysmorphism  
Surgical treatment for penile dysmorphism  
Causes, pathophysiology and management of prolonged erection  
Range of therapy for prolonged erection  
Surgical treatment for prolonged erection  
Mechanism of injury in penile fracture  
Range of therapy for penile fracture  
Assessment and management of penile fracture  
Methods, results and complications of vasectomy  
Varicocele – anatomy, physiology and management.

### **Clinical skills**

Assessment and formulation of management plan for male infertility  
Multidisciplinary approach in male infertility  
Assessment and formulation of management plan for erectile dysfunction  
Assessment of organic elements of erectile dysfunction  
Medical management of erectile dysfunction  
Indications, side effect, interactions and contraindications of drugs for erectile dysfunction, priapism, ejaculatory dysfunction.  
Determination of appropriate surgical treatment for erectile dysfunction  
Assessment and formulation of management plan for penile deformity, prolonged erection, ejaculatory disorder, varicocele, penile fracture.  
Determination of surgical approach for penile deformity  
Determination of surgical approach for prolonged erection  
Determination of surgical approach for penile dysmorphism  
Assessment and management of man with premature ejaculation  
Counsel and manage patient for vasectomy

### **Procedure**

Nesbit procedure  
Lue procedure  
Vasectomy  
Varicocelectomy  
Surgical management of prolonged erection: shunting procedures  
Surgical management of penile fracture.  
Nocturnal penile tumescence test  
Cavernosometry  
Insertion of penile prosthesis  
Penile revascularization  
Venous ligation  
Division of suspensory ligament  
Repair of suspensory ligament  
Surgical repair of penile fracture

### **[8a] Male factor infertility**

#### **Knowledge**

Anatomy and embryology of the genitalia and reproductive system and congenital abnormalities  
Vascular, lymphatics and nerve supply of the genitalia and reproductive system and pelvic organs.

Genetics and male sexual and reproductive function, sexual differentiation, intersex, genetic abnormalities and infertility.

Male reproductive axis: hypothalamus, pituitary function, testis, endocrinology of testis, testosterone metabolism and effects of aging on male endocrinology

Spermatogenesis: genetic basis, hormonal regulation, Sertoli cell function

Physiology of male reproduction: epididymal function, physiology of vas deferens, seminal vesicles. Ejaculation . Role of prostate in sexual function.

Physiology of female sexual function

Physiology of female reproduction

Drugs/ gonadotoxins and their effect on male reproduction and sexual function.

Pharmacology of drugs for treatment of male factor infertility

Etiology and pathogenesis of male infertility

Antisperm antibodies and fertility

Varicocele and male fertility

Causes and Pathophysiology of testicular obstruction

Causes of male factor infertility

Causes of female factor infertility

Varicocele and male fertility

Endocrine disease and fertility, metabolic syndrome

Role of assisted conception in treatment of infertile couple

Surgical treatment of male factor infertility

Indication, methods, results and complications of sperm retrieval

Indication, methods, results and complications of assisted conception

Microsurgical treatment of male factor infertility

### **Clinical skills**

Assessment and treatment of man or couple with male factor infertility

Indications, common side effects, interactions and contraindications of commonly used drugs for male infertility

Plan management of male factor infertility with MDT

Determination of appropriate surgical plan for infertility

### **Procedures**

Varicocele operation

Testicular exploration and vasography

Transurethral resection of ejaculatory duct

Electroejaculation

Vaso-vasostomy



Testicular exploration and sperm extraction (TESE)

Percutaneous epididymal sperm aspiration (PESA)

Microscopic epididymal sperm aspiration (MESA)

Epididymovasostomy

## **[9]Pediatric urology**

### **Knowledge**

Anatomy and embryology of the pelvis, male genitalia, urethra, including embryology of hypospadias and epispadias.

Neuroanatomy of bladder, urethra and pelvic floor function

Physiology and neurophysiology of micturition and continence

Embryology and anatomy of common congenital abnormalities

Embryology, anatomy and natural history of intersex, spina bifida and posterior urethral valves

Bacteriology of UTI in childhood

Biological mechanism of upper and lower urinary tract infection, virulence and host defence

Pathophysiology and natural history of vesicoureteric reflux

Antibiotics for children and mechanisms of action

Pathogenesis, natural history and complication of torsion of testis

Differential diagnosis and management of acute scrotum

Etiology, pathophysiology and clinical features of upper urinary tract obstruction in childhood

Investigations for upper urinary tract obstruction in childhood

Techniques, indications and complications of different approaches to treatment of pelviureteric junction obstruction including percutaneous approach, laparoscopic approach and open surgical approaches.

Staging and classification of Wilms' tumour and neuroblastoma

Pathology of the different types of benign and malignant tumours affecting the kidney

Current standards of treatment for common urological cancers in children

Theory and techniques of radiological and nuclear imaging for urological conditions in children

Natural history and normal patterns of continence

Clinical presentation and differential diagnosis of urinary incontinence

Anatomy, physiology and pharmacology of bladder and sphincter mechanisms

Etiology, epidemiology, pathology and classification of incontinence in childhood

Natural history of enuresis

Causes of neuropathic bladder and types of presentation

Techniques of reconstruction of bladder and ureter  
Basic genetics of uropathological conditions  
Pathophysiology of hypospadias and epispadias  
Causes, pathophysiology and complications of urethral stricture.  
Techniques of assessment for bladder and urethral reconstruction including urodynamics, radiological and nuclear imaging.  
Indications, techniques and complications of urethral reconstruction

### **Clinical skills**

Assessment, prognosis and management plans for common congenital urological disorders including undescended testis, duplex systems, reflux and hydronephrosis  
Assessment, prognosis and management plans for spina bifida, intersex and posterior urethral valves.  
Assessment of hypospadias and epispadias  
Indications, side effects, interactions and contraindications of drugs used in children with urinary symptoms.  
Diagnosis and management of inguinal scrotal abnormalities including undescended testis, hydrocele, testicular torsion and phimosis  
Investigation and management plan of UTI in children  
Identification of significant infection and symptomatic bacteriuria  
Selection of antibiotics for childhood UTI  
Selection of surgical approach for vesicoureteric reflux  
Assessment of patient with acute scrotal pain  
Interpretation of investigations in acute scrotal pain  
Management of acute scrotal pain in children  
Assessment of unilateral or bilateral renal obstruction  
Management of urosepsis  
Management plan for patient with PUJ obstruction  
Interpretation of investigations for PUJ obstruction  
Selection of treatment options for PUJ obstruction  
Counsel and obtain informed consent for procedures for PUJ obstruction  
Assessment of child with Wilms' tumour or neuroblastoma with use of stage , grade and molecular markers.  
Selection of imaging for pediatric renal tumour  
Formulation of management plan for common urological cancers with MDT  
Management plan for enuresis  
Assessment with history, examination and frequency volume chart of urinary incontinence and neuropathic bladder

Formulation of management plan for urinary incontinence and neuropathic bladder with MDT  
Medical management of urinary incontinence in children  
Selection of surgical procedure for child requiring reconstruction of bladder or ureter  
Assessment of patients requiring reconstruction of urethra  
Selection of surgical options for urethral construction  
Management of postoperative consequences of urethral reconstruction  
Selection of procedures for hypospadias.  
Counsel and obtain informed consent for procedures for hypospadias.

**Procedures**

Urodynamics studies  
Circumcision  
High ligation for hydrocele  
Orchidopexy  
Surgical management of acute scrotum  
Surgical exploration of torsion of testis with fixation  
Surgery for ureteric reflux  
Endoscopic treatment of reflux  
Open ureteric reimplantation  
Radical nephrectomy and laparoscopic nephrectomy in children  
Ureteric anastomosis  
Ureteric reimplantation  
Augmentation/ substitution cystoplasty  
Continent urinary diversion  
Vaginal reconstruction  
MAGPI repair  
Harvesting buccal mucosal graft  
Snodgrass repair  
Two stage buccal graft urethroplasty  
Surgery for epispadias

**[10] Renal function and nephrology**

**Knowledge**

Physiology of renal function  
GFR estimation techniques  
Tubular function and dysfunction  
Basic pathology of acute and chronic renal failure

Principles of dialysis, renal preservation  
Etiology, diagnosis and early management of acute tubular necrosis and pre-renal failure  
Mechanism of obstructive uropathy  
Causes and pathophysiology of bilateral and unilateral obstruction  
Principles of hemodialysis and peritoneal dialysis  
Indwelling cannulae for hemodialysis  
Temporary dialysis technique  
Continuous ambulatory peritoneal dialysis  
Recipient selection and indications for transplantation  
Tissue typing and cross matching for transplantation  
Relative indication for hemodialysis  
Immunosuppression for transplantation  
Complications of renal transplantation

### **Clinical skills**

Practical GFR assessment  
Assessment and management of anuria, obstructive uropathy, tubular disorders and renal failure.  
Assessment and management of fluid/ acid base balance  
Management of postobstructive diuresis  
Ambulatory dialysis technique  
Evaluation of potential recipients for renal transplantation  
Urinary tract workup of potential recipients prior to transplantation.  
Choice of renal replacement therapy  
Management of complications related to dialysis access

### **Procedures**

Tenckhoff catheter insertion  
Tenckhoff catheter removal  
A-V fistula formation  
Assisted in open/ lap living donor nephrectomy, cadaveric kidney harvest and renal transplantation.

### **[10a] Renal transplantation**

#### **Knowledge**

Anatomy of retroperitoneum and great vessels  
Embryology of development of kidney and common variation in blood supply

Pharmacology of drugs for immunosuppression  
Pharmacology of perfusion fluids and use of diuretics  
Pharmacology of inotropes and blood pressure control and effects of drugs on renal blood flow.  
HLA matching  
Cytotoxic cross match  
Rejection  
Immunosuppression  
Causes and classification of renal failure  
Pathophysiology and clinical features of renal failure  
Treatment options for renal failure  
Indications and contraindications for renal transplantation.  
Indications and types of dialysis  
Access for dialysis  
Complication of dialysis  
Criteria for brainstem death  
Pathophysiology of brainstem death  
Principles of donor management and organ preservation  
Selection criteria for patients from the waiting list

### **Clinical skills**

Assessment and management of organ donors (live or cadaveric)  
Assessment of patients referred for vascular access  
Identify appropriate access site  
Management of complications of vascular access  
Assessment of patients referred for peritoneal dialysis access  
Management of patients with peritoneal dialysis catheter  
Management of complications of peritoneal dialysis catheter including peritonitis  
Assessment of patients requiring renal transplantation or renal replacement therapy  
Counsel and obtaining informed consent from living donor  
Management of recipient peri-operatively  
Management of complications of renal transplantation  
Follow up of patients with renal transplants

### **Procedures**

Peritoneal dialysis catheter insertion  
Peritoneal dialysis catheter removal  
Central venous line insertion

A-V fistula formation at wrist and elbow  
Ligation of AV fistula  
Cadaveric donor nephrectomy for transplantation  
Open / laparoscopic donor nephrectomy for transplantation  
Preparation of kidney for transplant  
Kidney transplant  
Transplant nephrectomy  
Lymphocelelectomy

## **[11] Emergency Urology**

### **Knowledge**

Pathophysiology and renal adaptation to ureteric obstruction  
Presentation and clinical course of urinary tract stone  
Role of IVU, USG and CT in diagnosis of renal colic  
Management options for ureteric colic  
Complications of urinary tract stone including urosepsis  
Pharmacology of pain relief for renal colic  
Endoscopic management of ureteric stones  
Causes and pathophysiology of urinary tract infection  
Clinical presentation and renal function changes in urinary tract infection  
Antibiotics and relevant pharmacology  
Indications for further investigation of urinary tract infection  
Causes, epidemiology and pathophysiology of acute and chronic urinary retention  
Treatment options for acute and chronic urinary retention  
Causes and pathophysiology of hematuria  
Causes and pathophysiology of coagulation disorders  
Pathophysiology of testicular torsion  
Pathophysiology of epididymitis  
Clinical features and differential diagnosis of testicular pain  
Causes, pathophysiology, clinical features and management of Fournier's gangrene  
Causes, pathophysiology, clinical features and management of paraphimosis  
Causes, pathophysiology, clinical features and management of priapism  
Causes, pathophysiology, clinical features and management of penile fracture

### **Clinical skills**

Emergency assessment and treatment of ureteric colic  
Emergency assessment and management of obstruction and sepsis  
Detection of complication of obstruction, renal failure and renal/ peri-renal abscess

Diagnosis and management of urinary tract infection  
Assessment, investigation and formulation of a management plan for acute and chronic urinary retention.  
Assessment of fluid balance and renal function.  
Management of post-obstructive diuresis  
Assessment , investigation and management of patient with hematuria  
Assessment , investigation and management of acute scrotal pain  
Assessment , investigation and management of epididymitis  
Assessment , investigation and management of scrotal abscess  
Assessment , investigation and management of Fournier's gangrene with multidisciplinary team engagement  
Assessment , investigation and management of paraphimosis  
Assessment , investigation and management of priapism  
Assessment , investigation and management of penile fracture

### **Procedures**

Cystoscopy & JJ stent insertion, PCN  
Percutaneous suprapubic catheter insertion  
Cystoscopy and bladder washout  
Surgical exploration for torsion of testis with fixation  
Surgical management of scrotal abscess  
Surgical management of Fournier's gangrene  
Reduction of paraphimosis and dorsal slit  
circumcision  
Operative management of priapism  
Operative management of penile fracture.

### **[12] Trauma to Urinary Tract**

#### **Knowledge**

Causes, pathophysiology , classification and management of renal trauma  
Causes, pathophysiology , classification and management of ureteric trauma  
Causes, pathophysiology , classification and management of bladder trauma  
Causes, pathophysiology , classification and management of urethral trauma  
Causes, pathophysiology , classification and management of genital and testicular trauma

#### **Clinical skills**

Resuscitation, live support and liaison with other specialties in multiple trauma

Assessment and management of renal trauma  
Assessment and management of ureteric trauma  
Assessment and management of urethral trauma  
Assessment and management of genital and testicular trauma

### **Procedure**

Testicular repair  
Orchidectomy  
Percutaneous suprapubic catheter insertion

### **[13] Urological radiology**

#### **Knowledge**

Principles of ionizing radiation  
Patient and physician protection against radiation  
Investigation related radiation dose  
Common radiological investigations in urology  
Principles of isotope and isotope imaging  
Application of isotopes to functional assessment  
Techniques of interventional radiology  
Indications, limitations and complications of interventional radiology  
IVU: basic theory, practical techniques, contrast agents, indications, interpretation and limitations, safety and contraindications.  
Ultrasound: basic theory, practical techniques, contrast agents, indications, interpretation and limitations  
CT scan: basic theory, practical techniques, contrast agents, indications, interpretation and limitations, safety and contraindications.  
MR scan: basic theory, practical techniques, contrast agents, indications, interpretation and limitations, safety and contraindications  
PET scan: basic theory, practical techniques, contrast agents, indications, interpretation and limitations, safety and contraindications  
Renography: basic theory, practical techniques, contrast agents, indications, interpretation and limitations, safety and contraindications.

#### **Clinical skills**

Indications for use of ionizing radiation in urological investigations  
Indications for use of ultrasound in urological investigations.  
Resuscitation of complications with contrast imaging  
Selection of appropriate isotope investigations.



Interpretation of renograms

IVU: therapeutic application, interpretation and limitations

Ultrasound: therapeutic application, interpretation and limitations

CT scan: therapeutic application, interpretation and limitations

MR scan: therapeutic application, interpretation and limitations

PET scan: therapeutic application, interpretation and limitations

Renography: therapeutic application, interpretation and limitations

### **Procedures**

IVU

Cystogram

Urethrogram

Retrograde pyelogram

Renal ultrasound

Bladder ultrasound

Scrotal ultrasound

Transrectal ultrasound with biopsy