OMFS Survival Guide – MRCS

Urology

* Kidneys
	+ Retroperitoneal
	+ 11 x 6 x 4cm
	+ R lower than L
	+ Relations
		- Posteriorly – diaphragm, quadratus lumborum, psoas, transversus abdominis, 12th rib, 3 nerves (SUBCOSTAL, ILIOHYPOGASTRIC, ILIO-INGUINAL)
		- Anteriorly
			* R – to liver, 2nd part of duodenum (easily damaged), ascending colon
			* L – stomach, pancreas, spleen, descending colon
	+ Medial kidney = hilum
		- Renal vein – L is longer
		- Renal artery
		- Renal pelvis
			* Can lie outside kidney/buried in hilum
			* Receives 3 major calyces (which themselves receive minor calyces) and form collecting ducts transporting urine to urinary tracts
		- VAP (front to back – vein 🡪 artery 🡪 pelvis)
	+ Lies in perinephric fat within renal fascia
		- Fascia blends with diaphragm, leaving separate suprarenal compartment; and fascia of aorta and IVC, and laterally to transversalis fascia
		- Remains open inferiorly
	+ Has 3 capsules
		- Fascia
		- Fat (perinephric fat)
		- True (fibrous capsule – attaches strongly to organ when inflamed)
	+ Blood supply – highly vascular 🡪 bleeding in rupture contained in renal capsule
		- Renal artery (off aorta)
			* Right renal artery passes behind IVC
		- Renal vein (to IVC)
			* Left renal vein passes in front of aorta just below origin of SMA
	+ Lymph
		- To para-aortic lymph nodes
* Ureter – adheres to overlying peritoneum and lies over tips of transverse processes, crossing infront of sacro-iliac joints
	+ 25cm
	+ 3 parts
		- Abdominal – lies on psoas major then crosses into pelvis at bifurcation of common iliac arteries
			* Right ureter covered part 2nd part of duodenum at its origin then runs lateral to IVC
				+ Crossed by gonadal, right colic, ileocolic vessels
			* Left ureter crossed by gonadal and left colic vessels then runs behind sigmoid colon to cross common iliac artery above its bifurcation
		- Pelvic – lateral wall of pelvis in front of internal iliac artery then turns forwards and medially to enter bladder
			* Males – lies above seminal vesicle and crossed by vas
			* Females – passes above fornix of vagina and lies below broad ligament and uterine vessels
		- Intravesical – passes through wall of bladder (base)
	+ Blood supply
		- Aorta
		- Renal arteries
		- Gonadal arteries
		- Internal iliac arteries
		- Inferior vesical arteries
	+ Narrowings – where stones lodge
		- Junction of renal pelvis and ureter
		- Pelvic brim
		- Ureteric orifice (most narrow)
* Bladder
	+ Average capacity 300mls
	+ Relations
		- Anterior – pubic symphysis
		- Superior – small intestine and sigmoid colon, uterus in women
		- Posterior – rectum, seminal vesicles, vagina
		- Lateral – levator ani and obturator internus
	+ Bladder neck fuses with prostate in males
	+ Has muscle coat (trabecular)– becomes hypertrophic in chronic obstruction
		- Circular component forms internal urethral sphincter (is destroyed in prostatectomy but continence preserved due to presence of external sphincter)
			* External sphincter made up of striated muscle
	+ Cystoscopy
		- Inspects interior bladder and 3 orifices (2 ureters and internal meatus)
		- Trigone = triangle bounded by ureteric orificies and internal meatus
	+ Blood supply
		- Superior and inferior vesical branches of internal iliac artery
		- Vesical veins form plexus which drains to internal iliac vein
	+ Lymph drainage
		- Iliac and para-aortic nodes
	+ Nerve supply
		- Parasympathetic fibres S2-4 🡪 motor fibres to muscles and inhibitory fibres to internal sphincter
		- Normal filling and emptying of bladder controlled by parasympathetics
		- Pudendal nerve supplies external sphincter
* The urethra
	+ Male
		- 20cm long
		- Parts
			* Prostatic
				+ Prostatic sinus allows drainage of prostatic ducts
				+ Ejaculatory duct (union of seminal vesicle and vas deferens)
			* Membranous
				+ Pierces external sphincter
			* Spongy
				+ In corpus spongiosum of penis
			* External orifice is narrowest part of urethra
	+ Female
		- 4cm long
		- Lies in front of vagina
		- Internal sphincter more important in vesical control
	+ Mucosa
		- Kidney/ureter/bladder/urethra all lined by transitional epithelium until ejaculatory ducts enter prostatic urethra
		- After this point, it is columnar then squamous
* Male Genital Organs
	+ Prostate
		- Fibromuscular and glandular, surrounding prostatic urethra
		- Relations
			* Superior – continuous with neck of bladder
			* Inferior – apex of prostate lies on external sphincter
			* Anterior – pubic symphysis (separated by retropubic space)
				+ Prostatic plexus of veins lie near here
			* Posterior – rectum (separated by fascia of Denonvilliers)
			* Lateral – levator ani
		- Ejaculatory ducts enter upper posterior partand open into urethra at colliculus seminalis
		- Capsules
			* Two (three pathologically)
				+ True – thin fibrous sheath surrounding gland
				+ False – extraperitoneal fascia continuous with fascia Denonvilliers

Venous plexus lies within here

* + - * + Pathological

Benign hypertrophy takes place here

* + - Blood supply
			* Inferior vesical artery (branch of internal iliac)
			* Veins forms prostatic plexus (receives dorsal vein of penis) and drains to internal iliac vein
				+ Blood also drains to valveless vessels of Batson which lies on vertebrae (could explain quick spread of cancer to vertebrae)
		- Prostatectomy
			* Stays above colliculus seminalis to avoid urethral sphincter damage
			* Requires open surgery if prostate very large
		- BPH affects lateral lobes
	+ Scrotum
		- Pouch containing testes and their coverings (not developed in cryptorchidism)
		- Sebaceous cysts can occur here
		- Subcutaneous tissue contains dartos muscle and is continuous with abdominal fascia
			* Urine/blood can spread between planes to scrotum (always bilateral as septum doesn’t completely close off both sides of scrotum)
	+ Testis and epididymis
		- Left testis lies lower down than right
		- Arise at level of mesonephros (L2/3) and drags its vessels from this level
		- Testis
			* Covered by tunica albuginea then tunica vaginalis
		- Epididymis covers posterior surface of testes
			* Posterior margin is extaperitoneal (not covered by tunica vaginalis)
		- Both contain an appendix – CAN TORSION
			* Appendix testes is remnant of upper paramesonephric (Mullerian) duct
			* Appendix epididymis is remnant of mesonephros
		- Blood supply
			* Testicular artery (directly from aorta)
				+ Anastomoses with artery to vas (from inferior vesical artery) supplying vas deferens and epididymis
			* Pampiniform plexus of veins becomes testicular vein
				+ Drains into IVC on right and renal vein in left
				+ Becomes VARIOCELE when dilated
				+ Left sided renal tumours cause variocele as stop venous drainage
		- Lymph drainage
			* Accompanies venous drainage – to para-aortic nodes at level of renal vessels
				+ Palpate abdomen for any nodes
		- Nerve supply
			* T10 – T11 sympathetic fibres via renal and aortic plexus 🡪 afferent pain fibres 🡪 referred pain from testes to loin/groin
		- Structure
			* 200 lobules each containing seminiferous tubules
			* Tubules anastomose into plexus called rete testis
		- Development
			* Testis arise from GERMINAL RIDGE OF MESODERM and linked to epididymis and vas which arise from MESONEPHRIC DUCT
			* Testis undergoes caudal migration during fetal development
				+ 3rd month – iliac fossa
				+ 7th month – inguinal canal
				+ 8th month – external ring
				+ 9th month – descends into scrotum
			* Mesenchymal strand (gubernaculum) extends from testis and blends into scrotal fascia
		- Conditions
			* Indirect inguinal hernia – persistence of processus vaginalis
			* Hydrocele – fluid in tunica vaginalis
	+ Vas deferens
		- 45cm long
		- From tail of epididymis to scrotum and inguinal canal 🡪 lateral abdominal wall 🡪 joins seminal vesicles to form ejaculatory duct which opens into prostatic urethra
	+ Seminal vesicles
		- 5cm long
		- Extraperitoneal at bladder base
		- Drains via vas to ejactulatory duct
* Female Genital Organs
	+ Terms
		- Vulva = female external genitalia
		- Labia majora = hair bearing folds
		- Labia minora = enclose clitoris, forming anterior prepuce and posterior frenulum
		- Vestibule = contains urethral orifice and vaginal orifice
			* Hymen can be imperforated
		- Bartholins glands = mucus secreting glands deep to labia majora and can become infected
	+ Vagina
		- Surrounds cervix and opens into vestibule
		- Cervix has anterior/posterior/lateral fornices
		- Relations
			* Anterior – base of bladder and urethra
			* Posterior – anal canal, rectum, pouch of Douglas
			* Lateral – levator ani, ureters
		- Blood supply
			* Internal iliac artery (vaginal, uterine, internal pudendal and middle rectal branches)
			* Venous plexus drains via vaginal vein into internal iliac vein
		- Lymph drainage
			* Upper third to EXTERNAL/INTERNAL ILIAC NODES
			* Middle third to INTERNAL ILIAC NODES
			* Lower third to SUPERFICIAL INGUINAL NODES
		- Structure
			* Stratified squamous epithelium lines vagina and cervix
	+ Uterus
		- Structure
			* Fundus, body, cervix
			* Fallopian tubes enter in supero-lateral angle
			* Body narrows to form isthmus which continues into cervix
				+ Isthmus and uterine body joint forms internal os
				+ Cervix opens into vagina via external os
		- Position
			* Anteflexed and anteverted
			* Lies in roughly horizontal plane
		- Relations
			* Anterior – uterovesical pouch
			* Posterior – pouch of Douglas
			* Lateral – broad ligament
			* Ureter lies close to uterine vessels
		- Blood supply
			* Uterine artery (from internal iliac)
				+ Anastomoses with ovarian artery
			* Veins follow arteries
		- Lymph drainage
			* Fundus (+ovary and fallopian tube) 🡪 aortic nodes
			* Body 🡪 external iliac nodes
			* Cervix 🡪 external iliac nodes + internal iliac nodes + sacral nodes
		- Structure
			* Peritoneum loosely adhered to cervix to allow distension
			* Mucosa of body = endometrium (cuboidal ciliated cells)
			* Cervical canal epithelium made of tall columnar cells which secrete mucus forming cervical plug
			* Vaginal aspect of cervix lined in stratified squamous epithelium
		- Menstrual cycle
			* Proliferative phase
				+ Day 1-4: desquamation, bleeding
				+ Day 5-7: reconstitution of raw mucosal service by growth of epithelial cells
				+ Day 14: endometrium reformed
			* Secretory phase
				+ Day 14-28: endometrium thickens, glands distend

Layers:

Compact superficial zone

Spongy middle zone

Basal zone of inactive tubules

* + - * + When corpus luteum degenerates, endometrium shrinks, vessels become ischaemic and desquamation occurs
	+ Fallopian Tubes
		- Lie in free edge of broad ligament
		- Parts
			* Infundibulum – has fimbriae which overlies ovary
			* Ampulla – most common site for ectopics
			* Isthmus
			* Interstitial part – pierces uterine wall
		- Structure
			* Covered by peritoneum
			* Muscular outer longitudinal and inner circular fibres
			* Columnar mucosa
	+ Ovary
		- Attaches to broad ligament by mesovarium, suspensory ligament of ovary (holding ovarian vessels, sympathetic nerves and lymphatics) and the ovarian ligament
		- Relations
			* Lies opposite ovarian fossa (contains obturator nerve)
		- Develops from genital ridge and descends into pelvis (like testes, drags its blood supply and lymph drainage downwards from posterior abdominal wall)
		- Blood supply
			* Ovarian artery (from aorta)
			* Ovarian vein (to IVC on right, and left renal vein on left)
		- Lymph drainage
			* Aortic nodes
		- Nerve supply
			* Aortic plexus (T10/11) – ovarian pain refers to loin/groin
		- Structure
			* Consists of connective tissue stoma containing Graafian follicles at varying developmental stages, corpus lutea and corpora albicantia
	+ Pelvic ligaments
		- Pelvic fascia = connective tissue floor covering levator ani and obturator internus
		- Endopelvic fascia = extraperitoneal tissue of uterus, vagina, bladder, rectum
			* Forms slings which support cervix
				+ Transverse cervical ligaments
				+ Uterosacral ligaments
				+ Pubocervical fascia
		- Other ligaments
			* Broad ligament – connects uterus and pelvic wall
				+ Contains:

Fallopian tube

Ovary (and mesovarium)

Round ligament

Ovarian ligament

Uterine vessels and branches of ovarian vessels

Lymph and nerve fibres

* + - * Round ligament
* Embryology (kidney and ureter)
	+ Mesodermal origin
	+ Pronephros receives parts of mesonephros and becomes mesonephric (Wolffian) duct
	+ Diverticulum appears in mesonephric duct, which develops into metanephric duct
	+ The top part of the metanephric duct becomes kidney glomeruli (metanephros)
		- Kidney develops in pelvis then migrates up
	+ Rest of metanephric duct develops into ureter, calyces and collecting tubules
	+ Now in females, mesonephric duct disappears however in males, it goes on to form epididymis and vas deferens
	+ Development abnormalities
		- Aberrant arteries (extra branches)
		- Persistent pelvic kidney due to failure to migrate
		- Two metanephric masses fuse to form horseshoe kidney
		- Mesonephric duct can give off double metanephric duct forming 2 ureters on each side
* Embryology (fallopian tubes, uterus and vagina)
	+ Paramesonephric (MULLERIAN) and mesonephric (WOLFFIAN) ducts develop on posterior abdominal wall 🡪 mesodermal
		- Males: paramesonephric ducts disappear and mesonephric ducts remain (M keeps M)
		- Females: mesonephric ducts disappear (persist as small remnants) and paramesonephric ducts remain
			* Form fallopian tubes, broad ligament, uterus, cervix, vagina
				+ Musculature develops for mesoderm



Urinary Key Revision Points

* Indinavir = antiretroviral agent used in HIV
	+ Can cause radiolucent stones (can’t be seen on imaging)
* Prostaglandins increase renal blood flow and GFR
* ADH increases water absorption in collecting ducts
* Hypotonic = more water than electrolytes
* Kidney physiology
	+ Fluid in dital end of ascending loop of hnele is hypotonic regardless of fluid status of patient because it actively reabsorbs Nacl here and not water so water remains in tubule
	+ Glucose passes into ultrafiltrate then is absorbed back in normal individuals
	+ Filtration kept constant by afferent/efferent constriction (not blood pressure as it is kept constant over wide range of blood pressures)
* Renin produced in juxtaglomerular cells of kidney
* Testicular cancer
	+ Teratoma = twenties 🡪 raised AFP and b-HCG
* Renal cancer
	+ Staging
		- 3a = extend into renal vein
	+ 30% have mets at presentation
	+ Squamous cell is solid and invasive and linked to chornic irritation of bladder
* Lymph
	+ Lower anal canal, external genitalia = superficial inguinal nodes
	+ Internal iliac receive lymph from gluteals, inferior pelvic viscera, deep perineum
	+ Para-aortic drain adrenals, kidneys and gonads
	+ Penis to superficial inguinal nodes
* PSA
	+ Falsely elevated by prostatitis and acute urinary retention
	+ Some cancers might not express PSA
* Paraphimosis = retracted foreskin
* Kidney stones
	+ Most commonly calcium oxalate
	+ Get XR then CTKUB
* Uterus
	+ 3 layers – endometrium, myometrium, perimetrium
	+ Lymph drainage – fundus to para-aortic; body and cervix to internal/external iliac and superficial inguinal nodes
	+ Pelvic floor muscles support uterus
* Urinary symptoms
	+ Irritative – frequency, nocturia, urgency, suprapubic pain
	+ Obstructive – hesitancy, poor flow, incomplete emptying, dribbling, overflow incontinence
* Transverse perineal muscles lie between urethra and anus
* Ilioinguinal nerve not in spermatic cord
* Ureter crosses anterior to bifurcation of common iliac artery at level of pelvic brim
* Dialysis
	+ Can be done via abdomen – peritoneal dialysis
	+ May require AV fistula
	+ Can be used in refractory fluid overload or hyperkalaemia
* Ischioanal fossa
	+ 
	+ Levator ani is superior and medial to fossa
* BPH
	+ Tx = alfuzosin (alpha blocker)
* Prostate cancer
	+ Tx = goserelin (LHRH)
* Proteinuria
	+ Suggests renal disease/myeloma
	+ Requires thorough investigations – BP, albumin:creatinine ratio, blood glucose, protein electrophoresis
* Undescended testes
	+ Can be retractile, ectopic or incompletely descended
		- Ectopic most commonly palpated in superficial inguinal pouch
		- Incompletely descended most commonly found intra-abdominally
* Spermatocele = painless fluid filled cyst in upper pole of testes and transilluminates
	+ Ix = USS
* Cryptorchidism
	+ Absence of one/both testes from scrotum
	+ Due to problem with **gubernaculum**
	+ Migration of testes happens in 2 phases
		- 1 = from abdomen to internal inguinal ring
		- 2 = through inguinal canal into scrotum
* Wilms tumour
	+ Most commonly presents with mass
	+ Requires nephrectomy and adjuvant chemotherapy
	+ Mets spread via blood (most common site of spread is lung)
* Amiodarone can cause epididymitis as accumulates in high concentrations in epididymis
* Epididymitis
	+ Requreis 14 day abx
	+ Most commonly bacterial
	+ Complications:
		- Abscess
		- Testes infarction
		- Chronic pain
		- Infertility
* Rneal cancer
	+ Mets spread via blood
* Bladder cancer
	+ Tx
		- if superficial; TURBT and BCG vaccine/mitomycin
		- If muscle invasive; radical cystectomy
* Traumatic catherterisation can cause urethral rupture
	+ Rupture of spongy penile part causes urine to leak into Colles fascia
* Ejactulatory ducts empty into prostatic urethra
* Priapism (unwanted erection lasting >4hours)
	+ Low flow – urgent decompression via aspiration of blood
	+ High flow – conservative treatment
	+ Recurrent – linked to sickle cell disease
* Gout suffers can get uric acid renal stones
* Kidney stones
	+ Made up of calcium/uric acid/oxalic acid
* White cell casts found in urine in infection/inflammation (glomerulonephritis/interstitial nephritis)
* Prostate cancer
	+ Peripheral zone
	+ Rare in men castrated before puberty
	+ Staging = TNM
	+ Most are multifocal
	+ Afro-carribean at greater risk
	+ Gleason score (out of 10)
	+ Tx = watcha and wait/radical prostatectomy/radiotherapy
		- Those having radiotherapy require TURP as risk of rentention
* TURP
	+ Risk of retrograde ejaculation and TURP syndrome (hyponatreamia)
* If recent surgery on urinary tract then UTI, caused by staph aureus
* Scrotum layers
	+ Skin
	+ Dartos fascia (continuation of colles)
	+ External spermatic
	+ Cremaster
	+ Internal spermatic
	+ Tunica vaginalis
		- Parietal layer
		- Visceral layer
	+ Tunica albuginea
* In men, bulbourethral glands lie adjacent to membranous urethra
* Anal canal
	+ Superior part drains via superior rectal veins to inferior mesenteric vein
	+ Dentate line splits anal canal into upper and lower parts and have different neurovascular supplies
		- Superior rectal artery (from IMA)
		- Inferior rectal artery (from internal pudendal)
	+ Has only circular muscle
* GFR
	+ Measured via inulin clearance
	+ In clinical practice, creatinine clearance used to estimate eGFR
* Seminoma most common testicular cancer
* Horseshoe kidney
	+ Kidneys fuse at inferior pole before ascending
	+ More prone to infection, stone formation and trauma
* Femoral triangle
	+ Roof = fascia lata
	+ Floor = pectineus, iliopsoas, adductor longus
	+ Borders SAIL
		- Superior = inguinal ligament
		- Medial = medial border of adductor longus
		- Lateral = Sartorius
	+ Contents of triangle
		- Femoral canal
		- Femoral artery
		- Femoral vein
		- Femoral nerve
			* Femoral artery and vein and canal are in femoral sheath but NERVE IS NOT
* Male urethra develops from cloaca
	+ Cloaca divides into urogenital sinus (forms bladder, urethra and genital tubercle) and anal canal
* Teratoma
	+ Measure tumour markers to assess disease response post-treatment (orchidectomy)
* Hydrocele
	+ Painless, can’t feel testes, chronic, slowly increases in size
* Epididymal cyst are felt separate from testes
* Testes innervated by T10
* OBSTRUCTED INFECTED URINARY TRACT REQUIRES NEPHROSTOMY
* Testes drained by para-aortic nodes
* Mesonephric duct forms tubular sysmte (vas, epididymis, ureter, seminal vesicle, ejaculatory duct) – not prostate and testes
* Struvite stones form staghorn
* Seminal vesicles lie behind bladder
* Post-op acute renal tubular dysfunction managed with osmotic diuretics
* Risk factor for SCC of bladder is long term catheter
	+ Due to chronic inflammation
	+ Caused by schistosomiasis
* TCC’s are multicenteric
* Distal convoluted tube = aldosterone-regulated reabsorption of sodium
* Glucose reabsorbed with sodium via active transport in renal tubular cells
* Nephrolithotomy
	+ CI = clotting abnormalities
	+ Used for large volume stones
* In diabetes insipidus, water intake adjust to maintain blood volume when everything is peeed out
	+ In DI, kidney can’t concentrate urine due to lack of ADH (cranial) or kidney doesn’t respond to ADH (nephrogenic)
* Benzidine is risk factor for bladder cancer – an industrial carcinogen
* Posterior urethral valves is a form of congenital obstruction
	+ Bilateral hydronephrosis, thick walled bladder
	+ Most common cause of BOO in male newborns
	+ Tx = catheter then valve ablation
* Pelvic floor
	+ Levator ani = puborectalis, iliococcygeus and pubococcygeus
		- Innervated by pudendal nerve
	+ Components = levator ani, coccygeus muscle, fascia coverings
* PTH inhibits phosphate reabsorption in renal proximal tubule
	+ Occurs via cotransport with sodium
* Calcitonin lowers calcium by suppressing osteoclasts
* Renal blood flow estimated by PAH clearance
* Kidneys receive 25% cardiac output
* Acute renal failure causes metabolic acidosis (low bicarb, low ph, low paco2 as more co2 is blown off to correct acidosis)
* 5% seminomas secrete bHCG – causes gynaecomastia
	+ Is radiosenstive and radiotherapy offered instead of surgery in some cases
	+ Tx = surgical (radical inguinal orchidectomy)
* Rectum lymph drainage to internal iliac and IMA nodes
* Cysteine and urate stones form acidic urine
* Increased urine osmolality = more solutes in urine
* Renal exrecretio of drugs reduced due to extensive binding of drug to plasma proteins
* Bladder cancer – chromosome 9 deletion
* Hypercalcaemia linked to paraneoplastic syndromes
* Wilms tumour – WT1 tumour suppressor gene on chromosome 11p
* Testicular tumour staging
	+ 1 – confined to testes
	+ 2 – abdo node mets
	+ 3 – suprdiaphragmatic nodal mets
	+ 4 – extralymphatic mets
* Sciatic nerve
	+ L4-s3
	+ Bifurcates in popliteal fossa apex
	+ Entrapped in piriformis syndrome
* Uterine artery lies anterior and superior to ureter at lateral portion of fornix
* Hydroceles have red glow with pen torch
* After testicular torsion, increased risk of cancer in same side and opposite side testes
* Hypospadias linked to undescended testes, inguinal hernia, DSD, hydroceles
	+ Repair performed 6-18 months
* Seminomas linked to previous undescended testes
* Operate on undescended testes (cryptorchidism) aged 6-12 months
* GFR can decrease up to 50% before creatinine is affected
* Rate of urine production determined by tubular function
* COCP cause endocervical hyperplasia (polyp)
* Haematocolpos = accumulation of blood in vagina
* Flexible cystoscopy is one of the first line investigations for haematuria
* Tortion of appendix of testes = blue dot sign
* Renal tumour
	+ Left sided – causes left variocele
	+ Do abdominal USS
	+ Adenocarcinoma of renal cortex
* BPH
	+ Tx = alpha adrenergic antagonists – block action of noradrenaline
	+ 5 alpha reductase inhibitor – inhibits conversion of testosterone to DHT
	+ TURP
* Prostate lumps
	+ Biopsy before treatment
	+ Radiotherapy/radical prostatectomy/hormonal (LHRH)
		- Radica rpsotatectomy done in young patient with local disease
* Renal lumps
	+ Manage surgically
		- Radical nephrectomy for T2 or more
		- Partial nephrectomy if T1
	+ Not usually radiosensitive
* VUR investigations
	+ DMSA scan looks for renal scarring
	+ MAG 3 scan used for imaging kidneys in renal impairment
	+ MCUG scan can calculate degree of reflux
	+ IVU looks for structural problems ie stones
* Radiodense stones
	+ Most radiodense = calcium phosphate
	+ Uric acid stones are most radiolucent
* Testicular trauma
	+ Haematoceles occur immediately after event
	+ Hydroceles can occur up to weks afterwards
* Torsion
	+ Tx = exploration and testicular fixation via sutures or placement in dartos pouch
* Pelvic trauma and peritonitis - ?bladder rupture
* Renal adenocarcinoma causes hypertension
* Vesicovaginal fistula = continuous dribbling after prolonged labour
* LHRH can initially make mets from prostate cancer worse
* Cresmasteric reflex preserved in tortion of appendix of testes but absent if tortion of testes
* Suspected testicular cancer doesn’t need biopsy to confirm
* Discharge people with stones <5mm
* Hydrocele – can’t palpate testes
* Epididymal cyst – painless, can feel testes separately

