# The renal system diseases:

- Renal/ ureteric pain is felt in the distribution of dermatomes of T10-12/L1
- The external voluntary sphincter of the urethra is innervated by the pudendal nerves (S2-4) – cauda equina syndrome symptoms
- **Storage symptoms**: urgency, frequency, nocturia, urge incontinence
- **Voiding symptoms:** SHIPD- Straining to void, Hesitancy, feeling of Incomplete voiding, Poor stream, terminal Dribbling

| Disease/ condition | | Profile/ keywords | | Notes |
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| **UTI and associated inflammations** | **Cystitis** | Suprapubic discomfort | Mutual: Dysuria, Frequency Urgency Nocturia Urge incontinence Maybe: hematuria | |
| | **Urethritis** | | | |
| | **Acute prostatitis** | Severe perineal or rectal pain | | |
| | **Pyelonephritis** | Fever > 38°c<br>Vomiting<br>Flank pain<br>**Rigors** | | |
| **Outflow obstruction –** | | Storage symptoms<br>Voiding symptoms<br>+<br>L/C: hematuria<br>+<br>Severe "colicky" loin pain<br>"Patient moving around"<br><br>In ureteric caculi: Loin pain, radiating to labia or testicle | | Causes:<br>•Renal calculi<br>•Ureteric calculi<br>•Urethral calculi<br>•Prostatic enlargement<br>•Genital prolapse in females<br>•Ureteric obstruction Which is most commonly due to malignancy of the bladder, cervix, ovary or uterus. |
| **Renal or ureteric tumor** | | Loin pain<br>Storage symptoms | | •loin pain can be due to leaking aortic aneurysm or ectopic pregnancy |
| **Neurologic renal disease** | | Storage symptoms | | |
| **Diabetes insipidus** | | Polyuria<br>+ excessive fluid intake | | |
| **Renal cell carcinoma** | | Flank pain<br>Hematuria | | |

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| **IgA neuropathy** | | Hematuria preceded by non specific upper respiratory tract infection (mostly β hemolytic) | Results in Acute glomerulonephritis<br>And intrarenal Acute kidney Injury |
| **Nephrotic syndrome** | | Heavy proteinuria (>3.5 g/24 hrs) – frothy urine<br>Hypoalbuminemia<br>Edema (breathlessness due to plueral Eff./ ankle, facial swelling/ ascitis)<br><br>P/E: muehrcke's nails (p.243) | Can come on chronically/over months (e.g. membranous nephropathy) or acutely/over weeks (e.g. minimal change disease).<br>**The most common cause is DM**<br>Background associations: malignancy, RA, IBD, bronchiectasis |
| **Acute kidney injury**<br>**Definition:**<br>**Rise in serum creatinine + Drop in renal output** | **Prerenal** | History of diarrhea, vomiting, bleeding, dehydration, fluid loss, infection features, HF, or Liver disease.<br>Drug history of ACEI, diuretics and NSAIDs | **Volume depletion** is the main underlying pathology |
| | **Intrarenal** | **History may include:**<br>•Ischemia-reperfusion injuries caused by various systemic and renal diseases (pic. A)<br>•Rhabdomyolysis (prolonged immobilization)<br>•Drugs: NSAIDs, PPI, ABx<br>• **Accelerated-phase hypertension** causes AKI and shows with severe fundoscopy signs, such as flame haemorrhages and papilloedema. | **Direct injury to renal histology**<br>• First presentation of Underlying systemic disease like:<br>Myeloma<br>Infective endocarditis<br>Vasculitis or SLE<br>IgA nephropathy |
| | **Postrenal** | Associated with voiding symptoms and Suprapubic pain | Usually caused by **obstruction** from pelvis to urethra<br>-prostatic hyperplasia, Malignancies<br>-**Bilateral Ureteric obstruction** |
| **Chronic kidney disease** | | Proteinuria and kidney dysfunction for >=3 months<br><br>P/E: pallor, scratch marks, drowsiness, myoclonic twitching, asterixis, Lindsay's half & half nails<br>Conjunctival pallor due to associated **anemia** | Causes in History:<br>-DM, renovascular disease (renal bruits), HTN, hyperlipidemia, glomerulonephritis, nephrotic syndrome, ADPKD<br>-Previous proteinuria or hematuria |

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| | • Yellow skin in late stage<br>•Breathlessness due to fluid overload, or hyperventilation due to metabolic acidosis.<br>•Hiccupping may occur<br>•Retinal disease in patients with CKD caused by DM | -The presence of hypertensive retinopathy (such as arteriolar narrowing, arteriovenous nipping, cotton-wool exudates or blot haemorrhages) indicates chronic end-organ damage due to high blood pressure. |
| **End stage kidney disease/uraemia** | GFR <10 ml/min/1.73 $m^2$<br><br>Uremia symptoms: Anorexia, N&V, Lethargy, poor concentration, pruritis, breathlessness, edema<br><br>L/C: features of pericarditis or peripheral neuropathy | The JVP may be elevated due to fluid overload or, rarely, due to cardiac tamponade from uraemic pericarditis. |
| **Renal transplant complications** | Decline in renal function<br>-wt loss, cough, breathlessness, dysuria | A transplanted kidney may be palpated as a mass in either iliac fossa.<br>Any tenderness should be noted, as this may indicate **graft pyelonephritis or rejection.** |
| **Dialysis complications** | Hemodialysis can be complicated by:<br>**thrombus** in the AV fistula or an **infection** (fever, rigors & abdominal pain + cloudy fluid in case of peritoneal dialysis) | |
| **Autosomal dominant polycystic kidney disease**<br><br>**Character Triad: HTN, hematuria and worsening RF** | Bilateral enlarged kidneys with massive nodular surface<br>•Associated with **berry aneurysms, liver cysts and aortic valve abnormalities**<br><br>•History of Subarachnoid hemorrhages | Nephrectomy in history is an indicator.<br>Most common cause of palpable kidneys |
| **Alport syndrome**<br>"Can't see,<br>can't pee,<br>can't hear a bee" | Early onset **high tone senosrineural deafness**<br>Non visible **hematuria** in children<br>Significant **renal disease in teenage and adult** (proteinuria and renal failure) | Collagen IV abnormalities |

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| | Associated w/ **retinal abnormalities** | |
| **Systemic vasculitis** | **Glomerular disease which may lead to intrarenal AKI (features: hematuria/ proteinuria, decreased Kidney function, edema)**<br>Swelling of joints<br>Peripheral neuropathy<br>Scleritis, uveitis<br>Nail fold infarcts<br>Vasculitic rash<br>HTN | vasculitic rash will appear as purpura, most commonly on the legs (Fig. 12.10), and may be due to systemic vasculitis, Henoch–Schönlein purpura or cryoglobulinaemia, all of which can cause AKI and CKD |
| **Cauda equina syndrome/ spinal cord lesions** | **Urinary retention**<br>Fecal incontinence<br>Perineal numbness<br>L.limb weakness | |
| **Allergic interstitial Nephritis** | Drug rash<br>Intrarenal AKI<br>History of PPI, NSAIDS, ABx | |

Fluid overload occurs with cases of kidney failure and its signs may include - S3 sound, pleural effusion, pulmonary edema and flow murmur

Pic.A

**Intrarenal**

- Glomerular disease (e.g. systemic vasculitis, systemic lupus erythematosus, immunoglobulin A nephropathy)
- Interstitial nephritis (drug-induced)
- Acute tubular necrosis/injury (may follow a prerenal cause)
- Multiple myeloma
- Rhabdomyolysis
- Intrarenal crystal deposition (e.g. urate nephropathy, ethylene glycol poisoning)
- Thrombotic microangiopathy (e.g. haemolytic uraemic syndrome, scleroderma renal crisis)
- Accelerated-phase hypertension
- Cholesterol emboli