Important tumors in kidneys, urinary bladder and prostate:

- **Kidneys:**
  - **Nephroblastoma (Wilm’s tumor) in children:**
    - It is a common intra-abdominal tumor occurring in children < 10 years of age.
    - Occasionally bilateral (affecting both kidneys).
    - It is a highly malignant tumor arising from mesoderm (renal blastema). At time of diagnosis, the tumor is already spread to the lungs!
    - **Gross (image-1):** big tumor presenting as abdominal mass which extends through renal capsule.
    - **Histologic features (image-2):**
      - Epithelial and mesenchymal tissue.
      - Primitive glomeruli and tubules.

  - Excellent response when treated with a combination of nephrectomy, chemotherapy and radiotherapy.

- **Renal cell carcinoma (adenocarcinoma of the kidney) in adults:**
  - Commonest renal malignancy in adults (90% of cases).
  - Increased incidence with smoking and obesity.
  - Most common in men 50-70 years old.
  - Large bulging tumor at the upper renal pole.
  - **Gross (image-3):** yellowish cut surface with cysts and hemorrhage. The tumor has sharp margins due to the formation of a pseudocapsule.
  - **Histologic features (image-4):**
    - It is derived from renal tubular cells.
    - Presence of clear cells (clear cytoplasm because it contains glycogen and fat).

  - **Spread:**
    - Local: invading perinephric fat or pelvi-calyceal system.
    - Lymphatic: para-aortic lymph nodes.
    - Blood: invading renal veins and metastasizing to lungs and bones.

  - **Prognosis:**
    - Overall 5 year survival: 50%
    - 70% if there is no metastasis.
    - 15%-20% if renal vein is involved.
Metastatic cancers in kidneys:
- Image (5) shows nodular tumors with central umbilications.

Transitional cell carcinoma of renal pelvis.

- **Urinary bladder:**
  - Transitional cell (urothelial) carcinoma (most common):
    - *Associated with:* Phenacetin, smoking, aniline dyes and cyclophosphamide.
    - Notice that the behavior of these tumors can change with time to become more malignant. Malignancy is preceded by dysplasia and carcinoma-in-situ.
    - Mostly affecting white males 50-70 years old.
    - Arising anywhere in the urinary tract (but especially in the base of the bladder)
    - Often, the tumor is polypoidal or papillary (image-6):
      - If the tumor is benign it will be called “transitional papilloma” while if it is malignant it will be called “transitional carcinoma”.
      - *These tumors present with:*
        - Hematuria.
        - Urinary infection and/or obstruction.
      - Tumor cells exfoliate (shed) into urine, so cytological examination of urine can sometimes help in diagnosis.
      - Images (7), (8) and (9) showing transitional cell carcinoma of renal pelvis, ureter and urinary bladder, respectively.

Squamous cell carcinoma of the bladder (rare!):
- *Risk factors:* Schistosoma hematobium infection (common in middle east), chronic cystitis, smoking and chronic nephrothiasis.
- **Prostate**: main causes of prostatic enlargement:
  - **Benign Prostatic Hyperplasia (BPH):**
    - Affecting most males around age of 50.
    - Incidence and severity increase with age (75% by 70s).
    - There will be hyperplasia of connective tissue and glands (prostate = 60-100 g instead of the normal 30 g).
    - Involving more the central parts of the gland especially the median lobe.
  - **Adenocarcinoma of prostate:**
    - It is the commonest male cancer.
    - Family history increases the risk (X2 or X3).
    - Common in elderly (60s to 80s) or younger patients with family history.
    - **Risk factors**: age, race, family history, hormone levels and environmental factors (increased consumption of fats!).
    - The carcinoma is arising from Prostatic Intraepithelial Neoplasia (PIN) and is androgen-dependent.
    - **Morphology**: images (10) and (11):
      - **Spread**:
        - **Local**: seminal vesicles and base of bladder.
        - **Lymphatic**: spread is common and often before spread through blood going initially to obturator lymph nodes.
        - **Blood (image-12)**: Lumbar spine, proximal femur, pelvis, thoracic spine and ribs.
      - **Markers**:
        - Prostate Specific Antigen (PSA).
        - Prostatic acid phosphatase.