Urological Tumours

1 Kidney tumours

2 Bladder tumours

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Kidney tumours

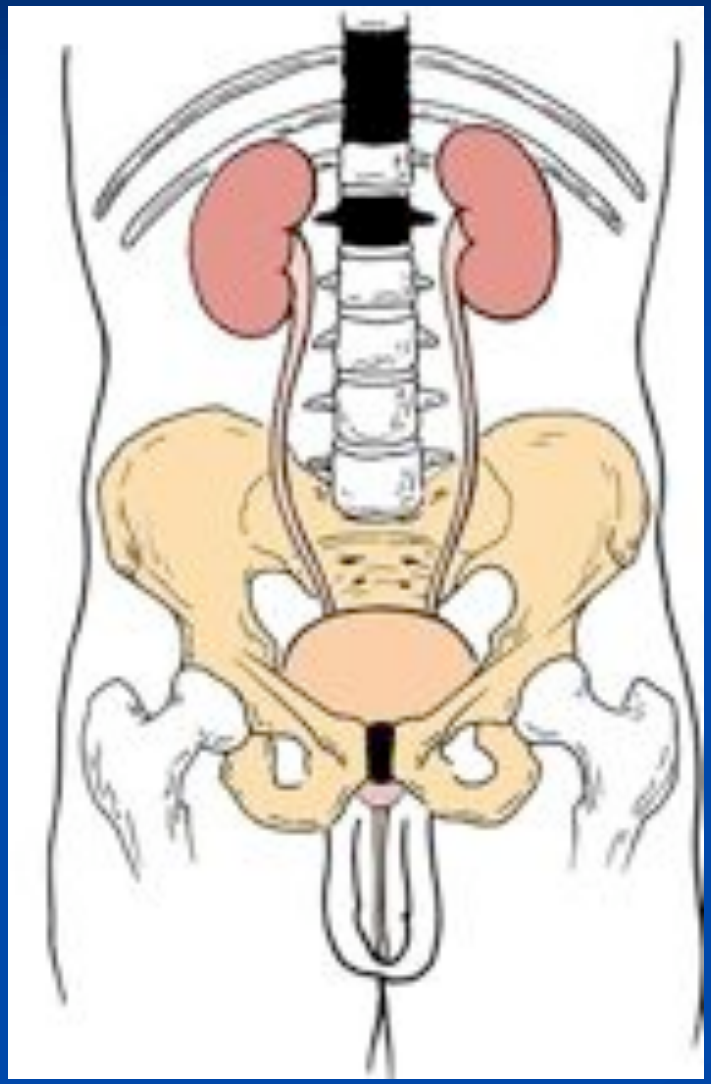
What are we going to talk about?

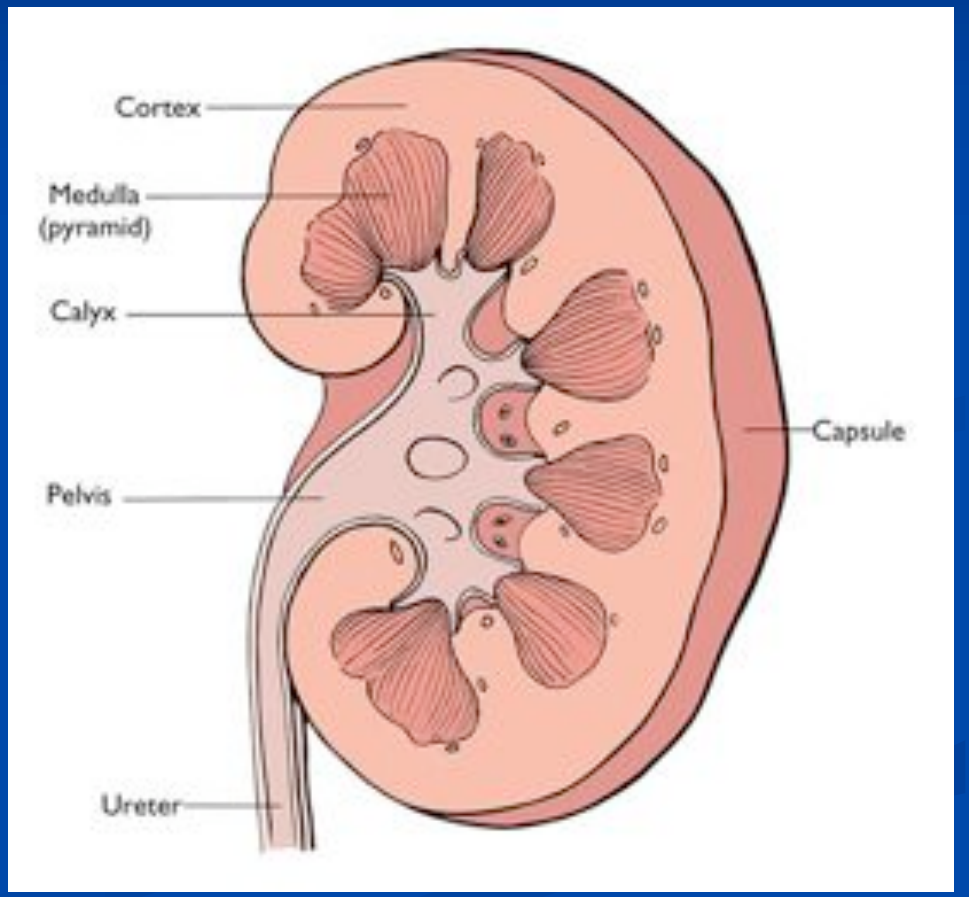
- Anatomy of urinary tract
- Types of kidney tumours
- Epidemiology
- Clinical features
- Investigations and Management

Where are the kidneys located anatomically?

What are their main anatomical divisions?

Anatomy





How can we classify renal tumours?

What is the commonest type of renal tumour?

Benign

Adenoma
Oncocytoma
Metanephric adenoma
Angiomyolipoma

Lipoma
Leiomyoma
Fibroma
Haemangioma
Schwannoma

Nephrogenic rests

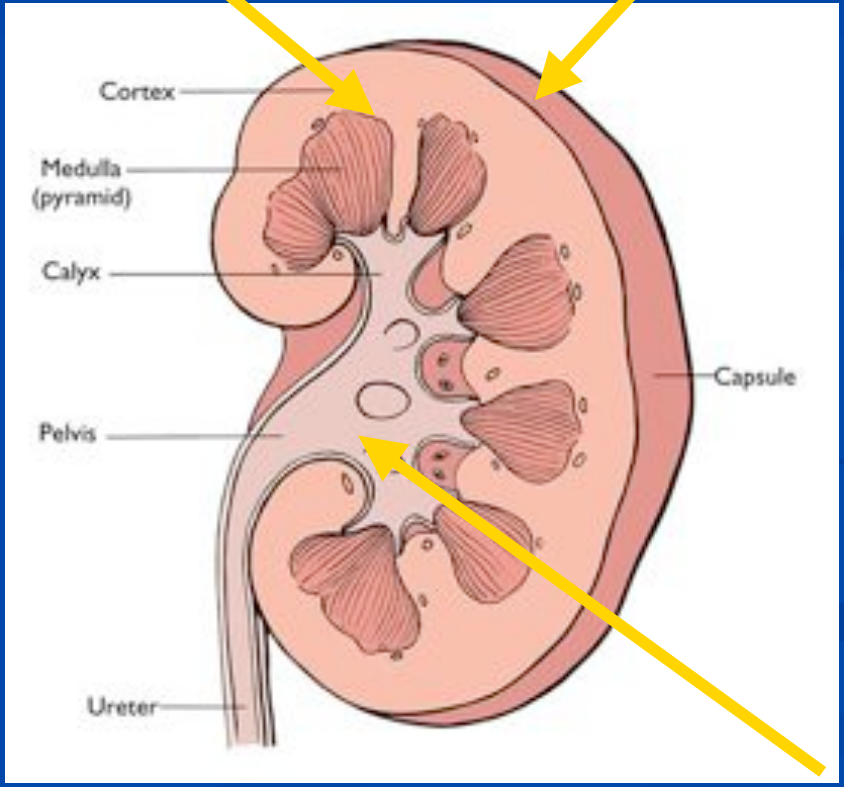
Malignant

Renal cell carcinoma
- Clear cell
- Papillary
- Collecting duct

Liposarcoma
Leiomyosarcoma
Fibrosarcoma
Lymphoma

Nephroblastoma (Wilms' tumour of childhood)

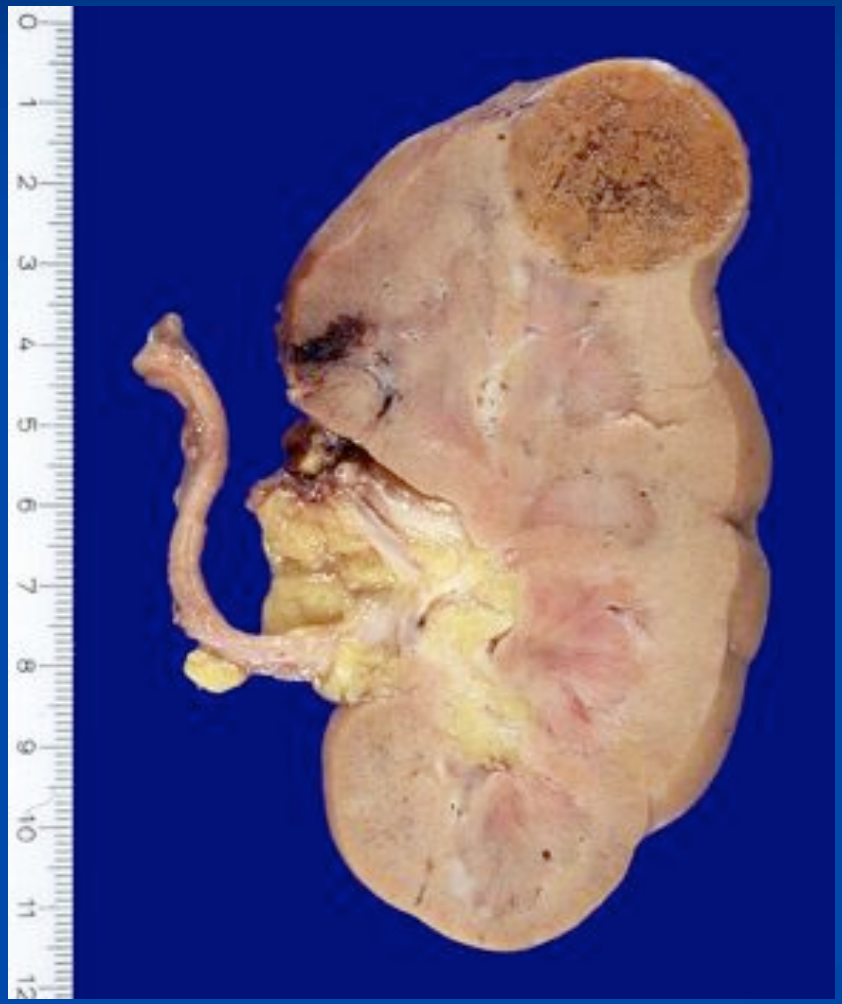
Transitional cell carcinoma

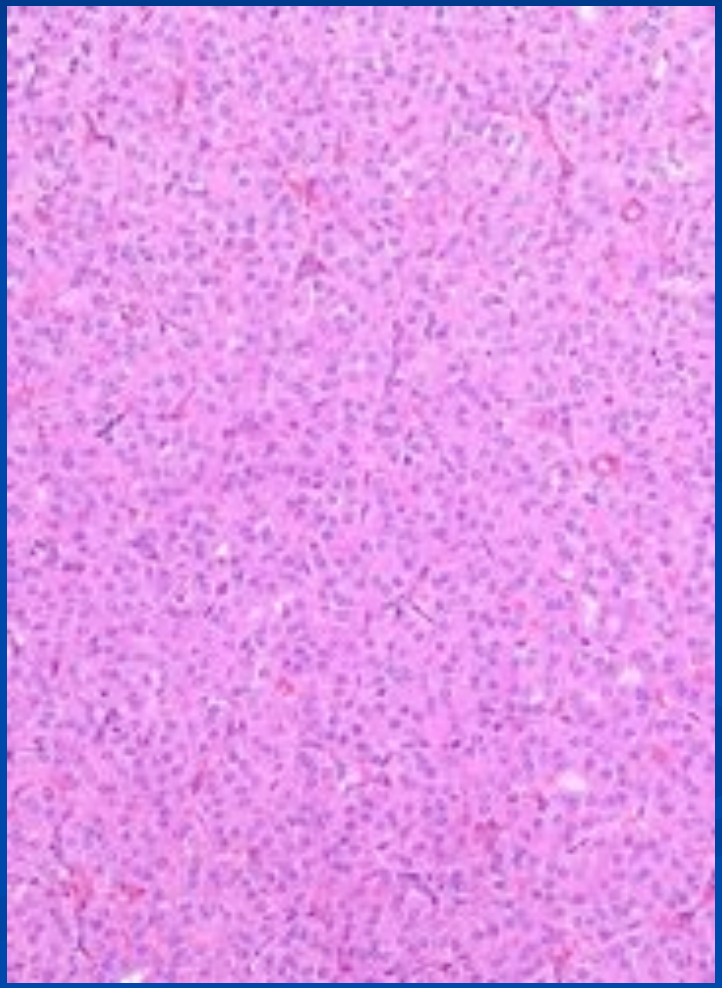


Adenoma

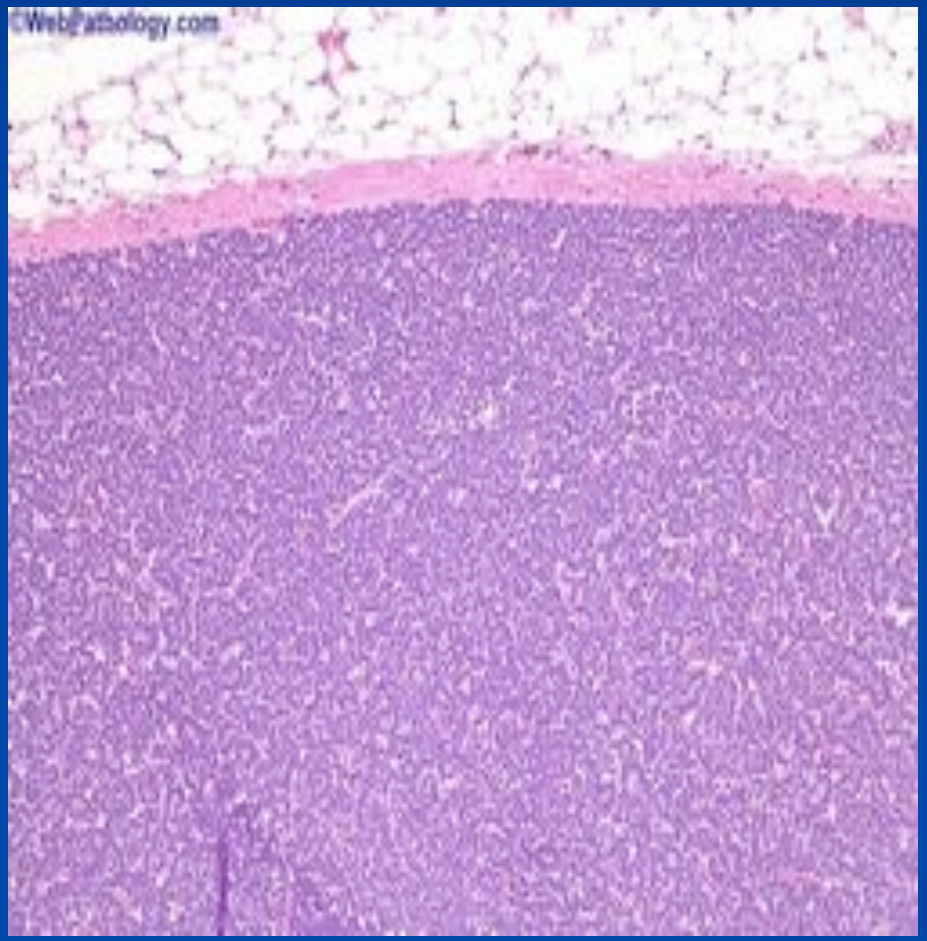
- Found in cortex often at PM
- Only distinguished from renal carcinomas by size (less than 3cm = adenoma)
- Note: Share same cytogenetic features of adenoca (trisomies 7 &17)
- Follow-up scans

Renal Oncocytoma





Metanephric Adenoma



- Recently described (<100 cases)
- May be large, but benign
- Composed of small tubules.
- Cytogenetics.
  - Trisomy 7 or 17.
  - Loss of Y chromosome.
- Renal adenoma, metanephric adenoma & Papillary adenoca share same abnormalities
- Polycythaemia in 20%

Angiomyolipoma

- Less than 1% adult tumours
- Benign but can cause haemorrhage and be misdiagnosed as carcinoma
- Half associated with tuberous sclerosis; suspect TS if multiple

Malignant Epithelial Neoplasms

Renal cell carcinoma (RCC)

- Classification
- Epidemiology
- Clinical features
- Pathological features
- Investigation and Management

RCC Classification

Done on histological appearances & genetics

- Clear cell (conventional) RCC
- Papillary RCC – better prognosis
- Collecting duct carcinoma – poorer prognosis
- Unclassifiable (5%) – mixture of above

- *Sarcomatoid change in RCC is **NOT** a separate category and my be seen in all above. It indicates progression and is a poor prognostic factor.*

What risk factors do you know for renal carcinoma?

RCC - Epidemiology

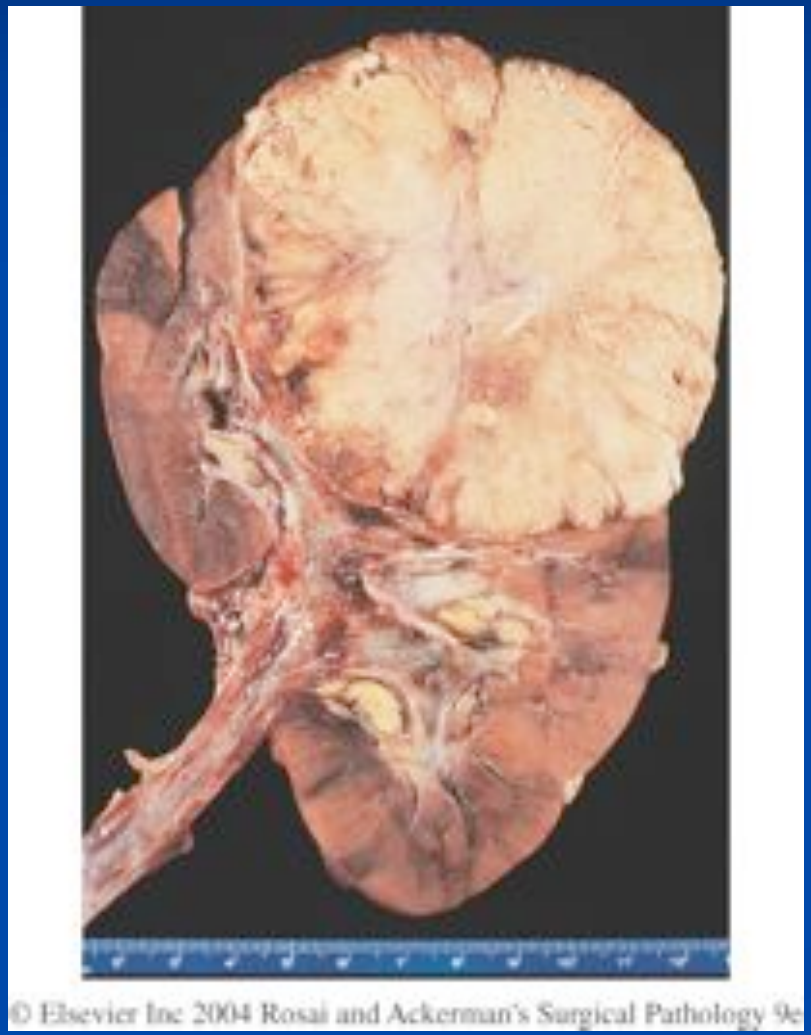
- 3% of adult malignancies, RCC makes up 95% of kidney tumours
- Tobacco most prominent risk factor
- Males > Females (M:F = 3:1) but obesity in F
- Increased incidence in long term dialysis
- Most cases are sporadic but approx. 4% are familial
- Familial cases – *Von Hippel-Lindau* (VHL)
- VHL – Brain & Retinal Tumours, Renal Cysts and Renal cell carcinomas
- Tuberous sclerosis

How can renal carcinomas present clinically?

RCC Clinical features

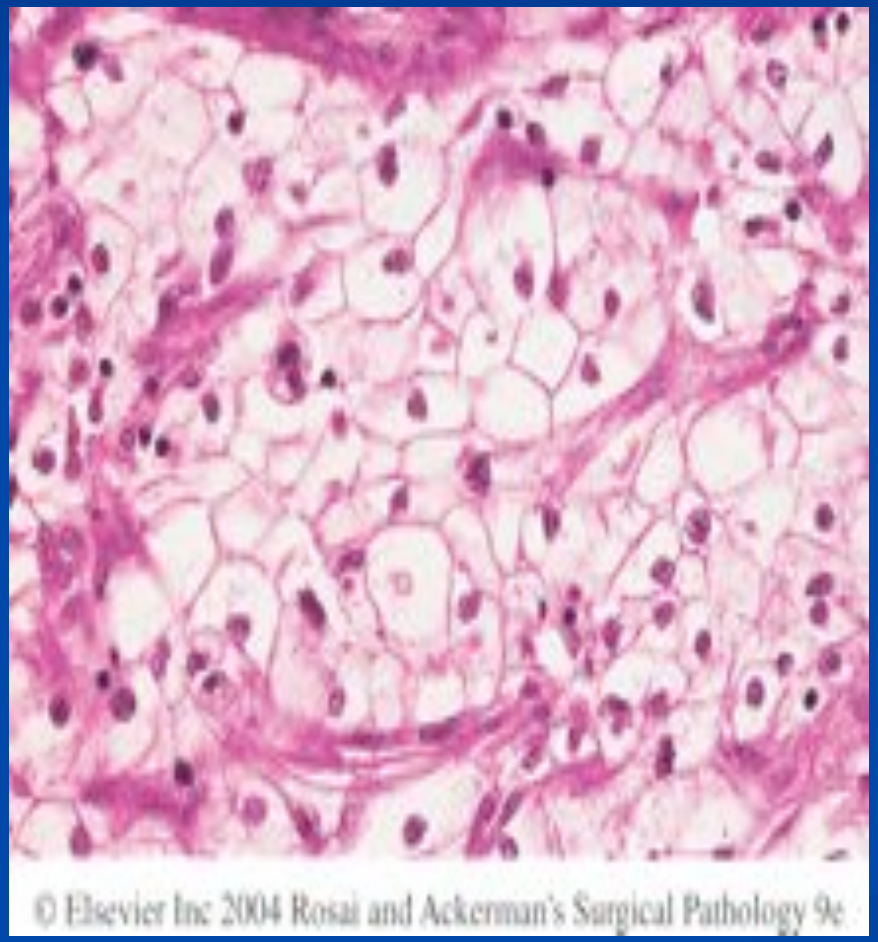
- Classical triad (back pain, mass, haematuria) only found in 10%
- Common "incidentaloma"
- Tumour may be large before detected
- Mass with abdominal bruit
- Mets, pathological fractures
- **Paraneoplastic symptoms**
  - Polycythaemia, hypercalcaemia, hypertention, feminisation/ musculisation, Cushing's, amyloidosis.

RCC (Clear Cell Ca) Macro



- Arise anywhere but more common in upper pole ("hypernephroma")
- Bright yellow – grey
- Solitary lesion
- Tendency to invade renal vein, can extend into IVC and above diaphragm

RCC (Clear Cell Ca) - Micro



- Rounded / Polygonal cells
- Clear cytoplasm
- "vegetable appearance"
- Nuclear size used to grade tumour (Furhman grading)

What tests or investigations would you request in the clinic for a patient with a suspected kidney tumour?

Investigations

- Bedside: urine dipstix, cytology
- Bloods: FBC, U+E, Ca, G+S
- Imaging: CXR, USS, CT, MRI, bone scan
- Invasive: core biopsy
  - Risk/benefit ratio!

Outline the principles of management for a patient with renal cell carcinoma

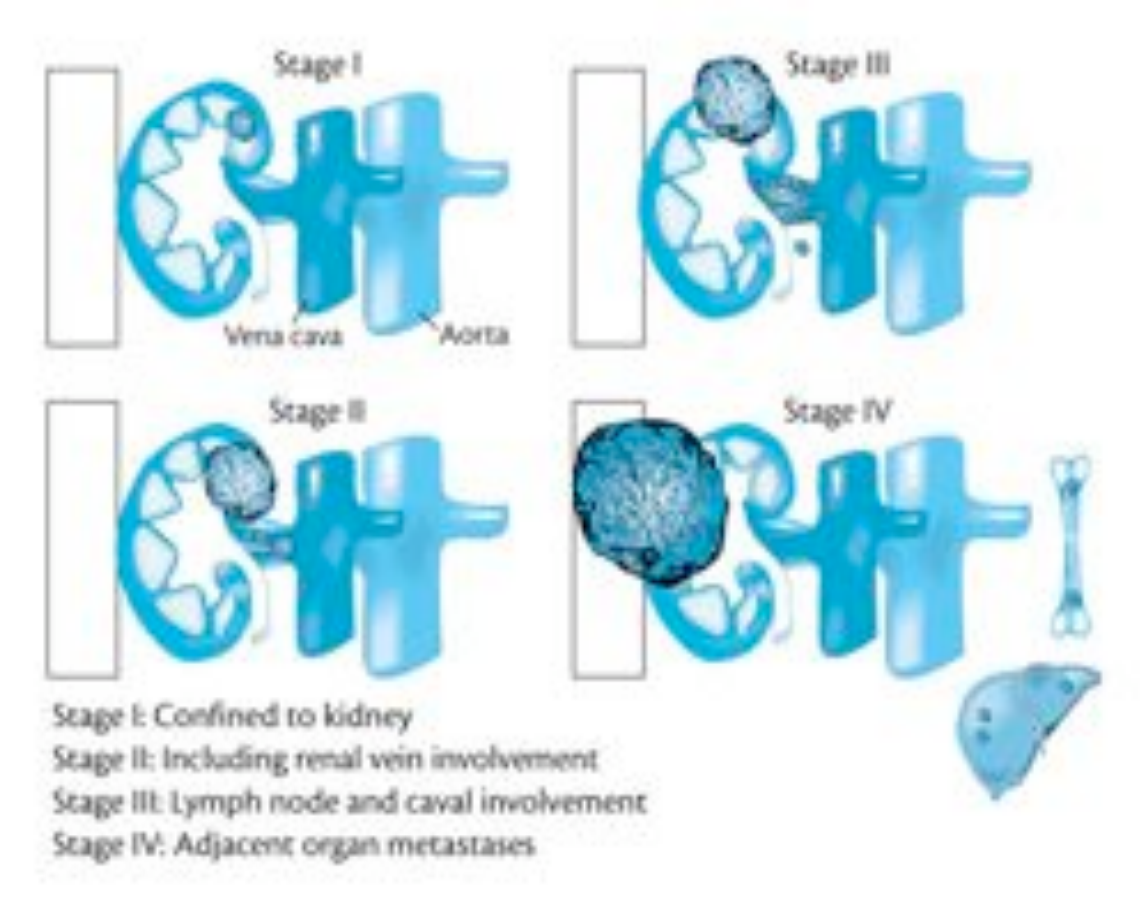
Management

- Conservative, Medical and Surgical!
- Importance of MDT (holistic approach!)
- Small incidentals can be monitored with scans
- Radical nephrectomy
- Laparoscopic and nephron sparing surgery increasingly popular
- Poor response to chemotherapy
- Recent interest in immunotherapy (interferons, IL-2 and vaccine trials)

How do renal cancers tend to spread?

What are the 3 commonest sites for metastasis?

Staging of RCC



- 70% survival for all stages!
- ~60% for stage I-III combined
- BUT…. A third of patients are Stage IV at diagnosis and 5-10% 5 year survival

What have we talked about?

- Anatomy of urinary tract
- Benign and malignant renal tumours
- Epidemiology, Aetiology and Risk Factors
- Clinical Presentation and investigations
- Basics of Management
- Staging and prognosis
- Any Questions?

Bladder cancer

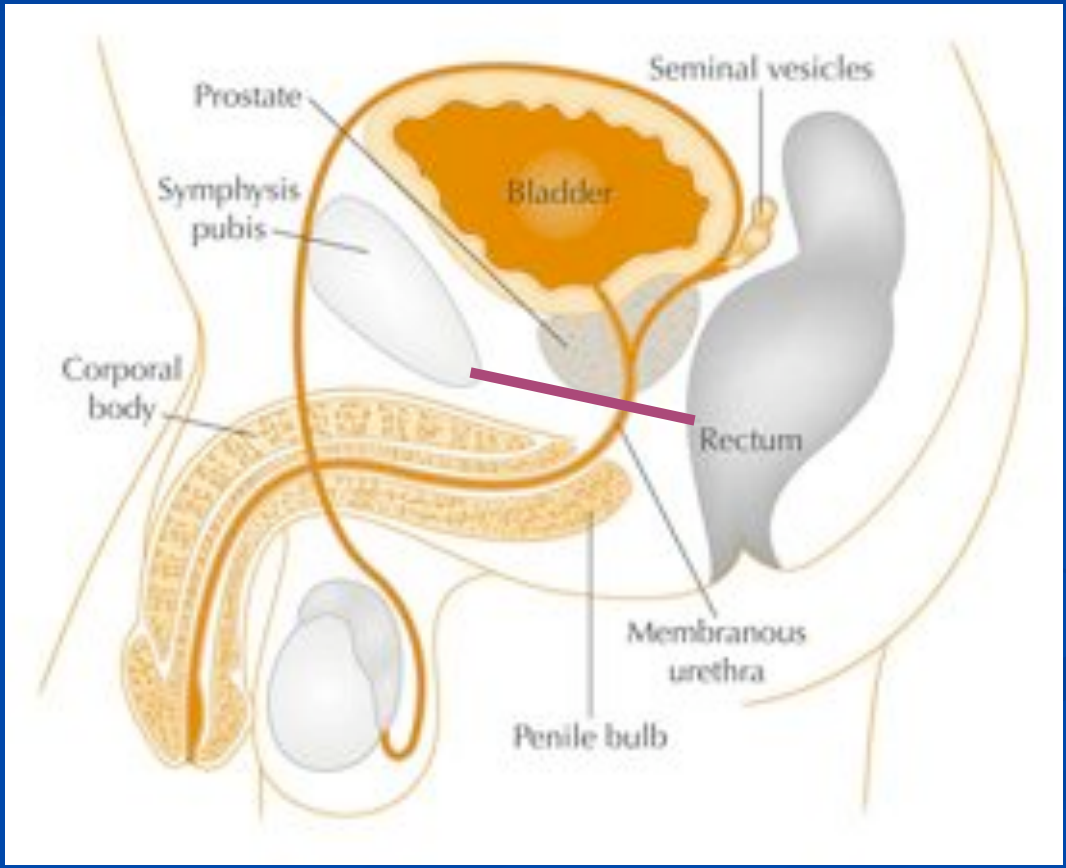
Tim Bracey
Histopathology

What are we going to talk about?

- Anatomy of bladder
- Cancer types
- Epidemiology, aetiology and risk factors
- Presenting symptoms and signs
- Investigations and Management
- Operations for bladder cancer

Name 4 anatomical relations of the bladder

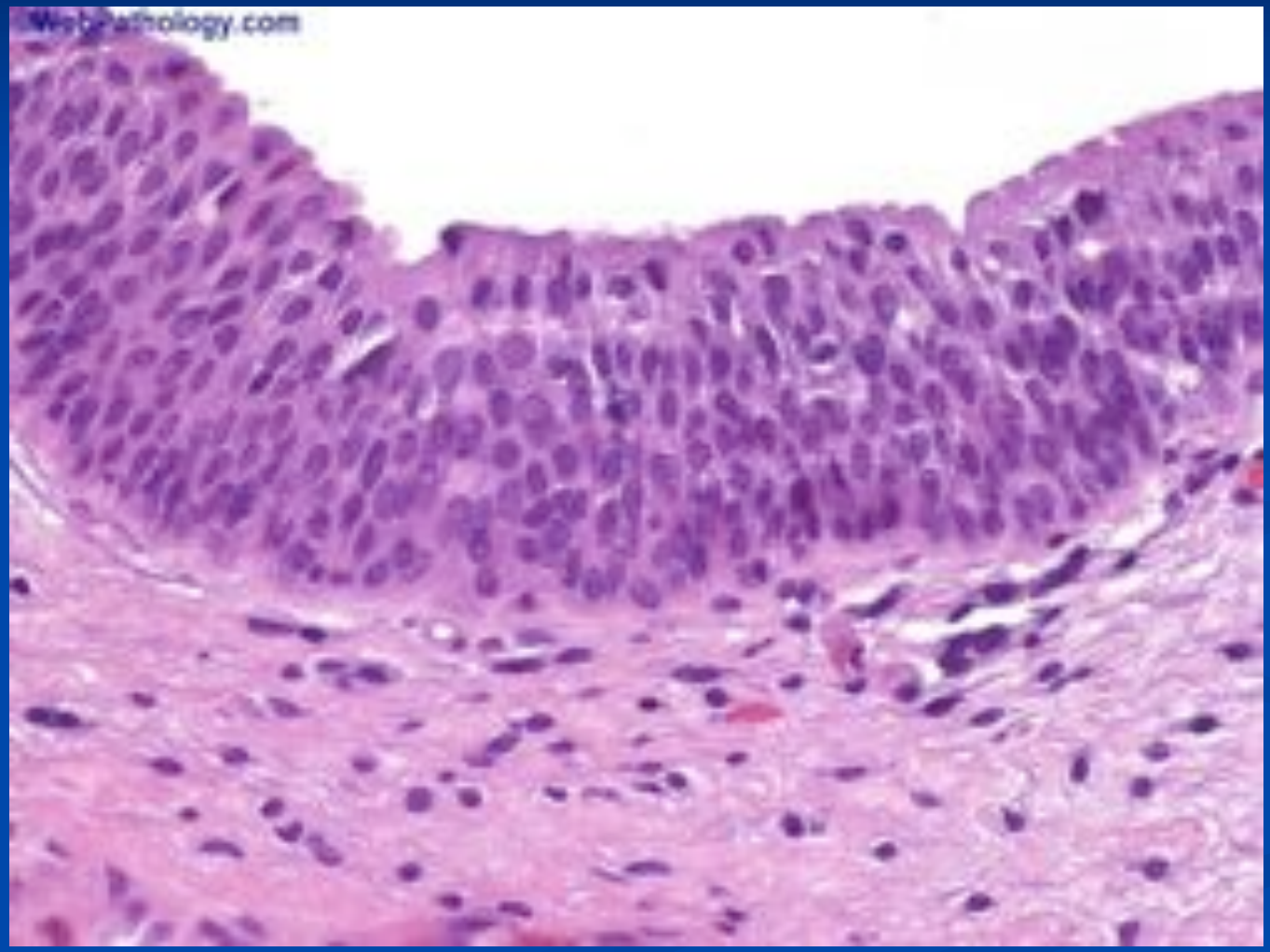
Anatomy


Seminal vesicles
Prostate
Bladder
Symphysis pubis
Corporal body
Rectum
Membranous urethra
Penile bulb

What are the layers of the bladder wall?

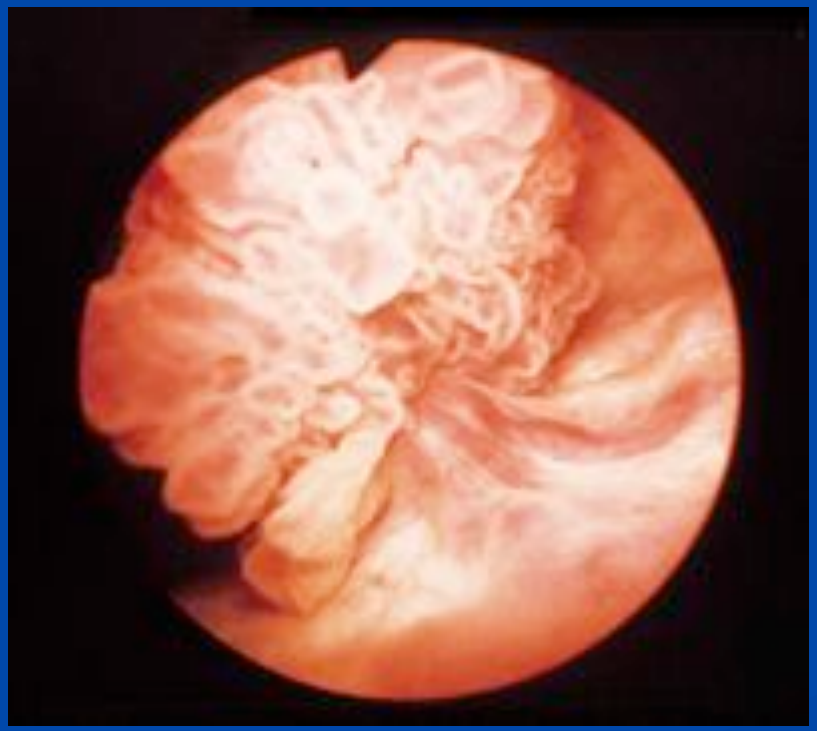
What types of bladder tumours are commonly encountered in clinical practice?

Histology



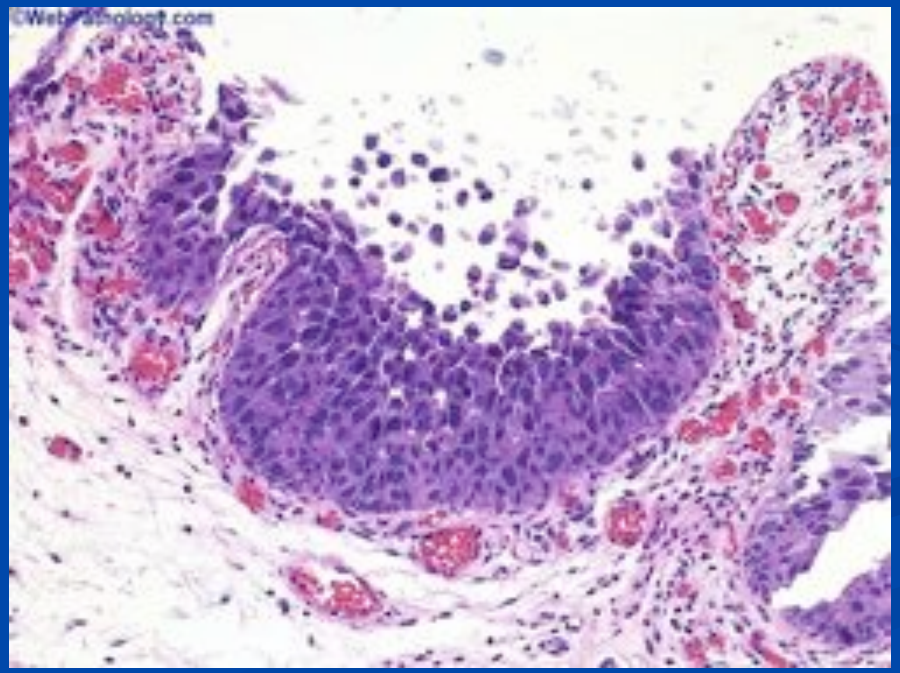
Pathology

- Almost all epithelial (ie. Carcinomas)
- 90% transitional cell carcinomas and identical in “upper tracts”
- 5% SCC, 2% adenocarcinoma



Carcinoma in situ (cis)

- Important precursor lesion (cancer without invasion)
  - High risk for future invasion
  - poor prognostic factor with invasive cancer
  - Easily detected by urine cytology



Epidemiology

- 4th most common cancer in men in western world
- In developing countries 75% are SCCs
- 3:1 Male to Female ratio

What are the main risk factors for bladder cancer?

Aetiology / Risk factors

- Increased incidence with age
- Occupational exposure (Industrial nations)
  - 20% thought to be related to exposures particularly aniline dyes
- Smoking (causes 50% of all bladder ca)
- Pelvic irradiation eg. for cancer of cervix
- Schistosomiasis for squamous cell ca
- Long term catheterisation (16-20x SCC)

How do bladder cancers present clinically?

Clinical Features

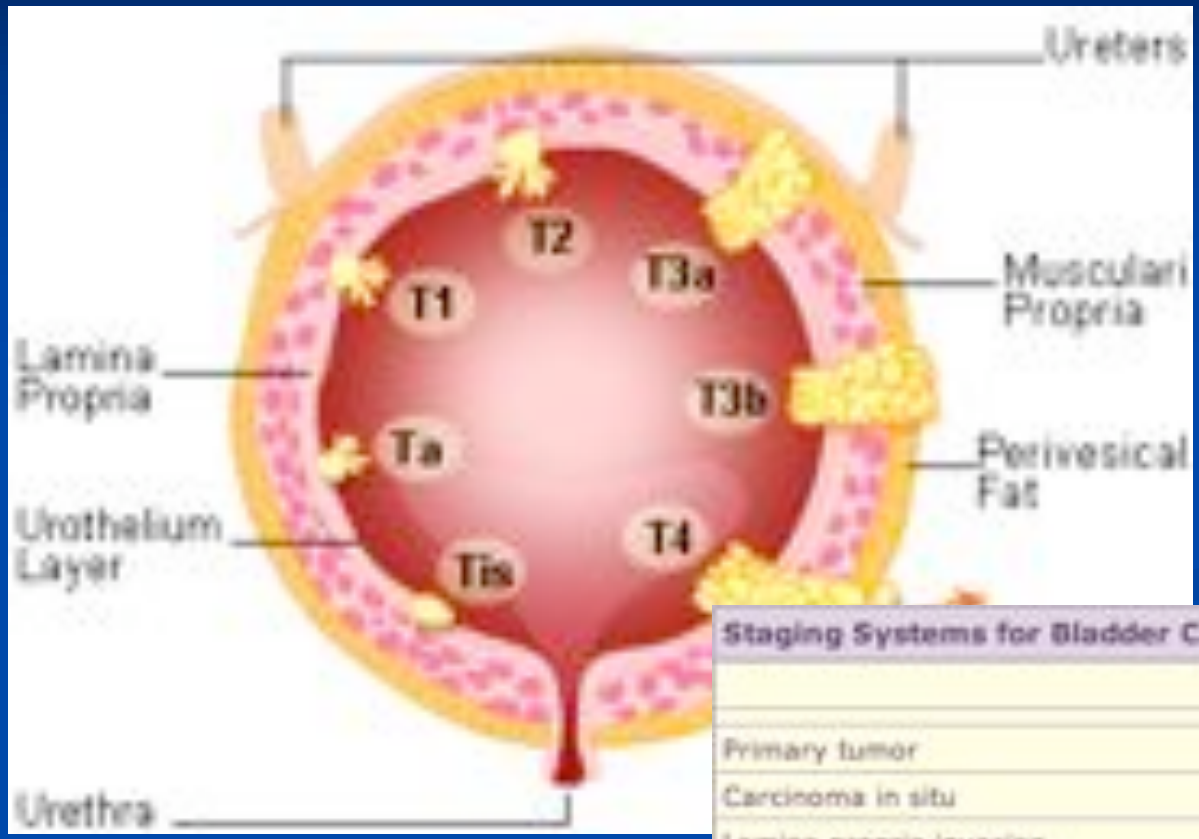
- 80% present with painless haematuria
- Treatment resistant UTI
- Flank pain from ureteric obstruction
- LUTS suggestive of muscle invasion
- Bony pain, metastatic symptoms

How would you investigate a patient with suspected bladder cancer?

Investigations

- Bedside: Urinalysis (haematuria clinic)
  - MSU and dipstix
  - Urine cytology
- Bloods: FBC, U+E
- Imaging: CXR, USS, CT, IVP
  - Consider synchronous upper tract tumours!
- Invasive: Flexi cystoscopy
  - Biopsy needs to include muscle

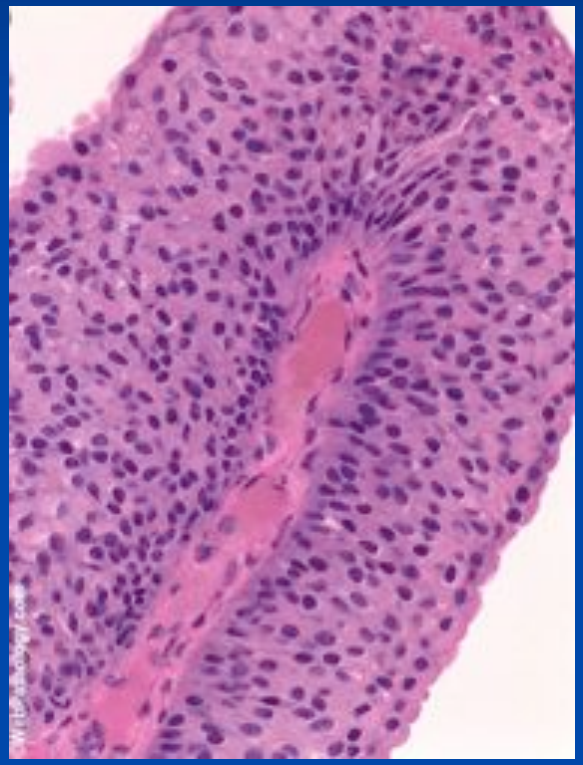
Staging of bladder TCC



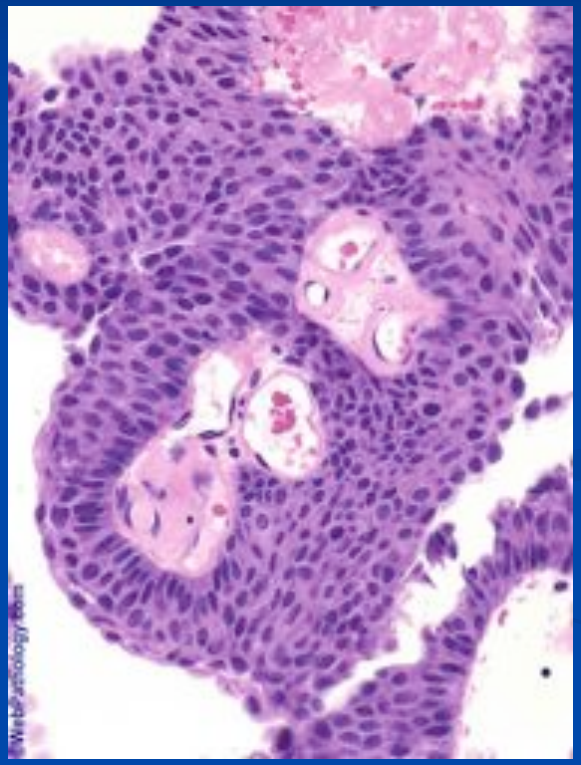
Staging Systems for Bladder Cancer

	JSM	TNM	5-y Survival, %
Primary tumor	0	Tis	
Carcinoma in situ	0	To	80-95
Lamina propria invasion	B1	T1	80-90
Superficial muscle invasion	B2	T2a	70
Deep muscle invasion		T2b	60-70
Perivesical fat invasion	C	T3a (microscopic)	
		T3b (extravesical mass)	30-40
Prostate, uterus, and vagina invasion	D1	T4a	10-20
Pelvic or abdominal wall invasion	D1	T4b	< 10

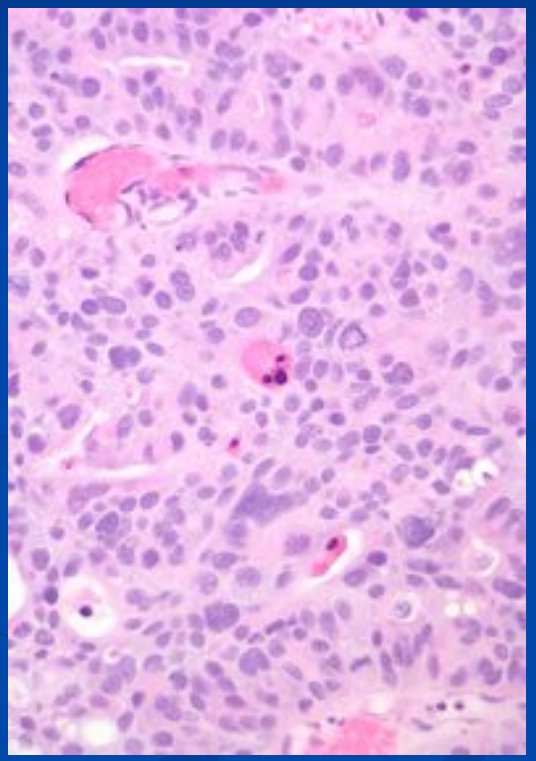
Grading of TCC



Grade 1
Well differentiated



Grade 2
Moderately



Grade 3
Poorly differentiated

What are the principles of management of bladder cancer?

Management

- Superficial TCC
  - TURBT and regular follow up
  - Prophylactic intravesical chemotherapy
  - BCG intravesical immunotherapy (live attenuated *Mycobacterium bovis*)
- Carcinoma in situ
  - 60% progress to muscle invasion
  - Cystectomy if no response to intravesical therapy
- Invasive TCC
  - Radical cystectomy (high operative morbidity and mortality) vs radiotherapy

Do you know any operations for bladder cancer?

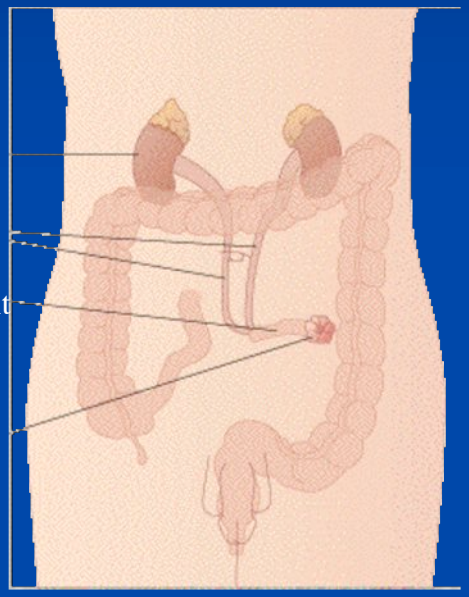
Operations for bladder cancer

- TURBT (transurethral resection of bladder tumour)
- Partial cystectomy (not possible for adeno or cis)
- Radical cystectomy
  - In males, prostate also removed (cystoprostatectomy)
  - In females pelvic exenteration (TAH and BSO)

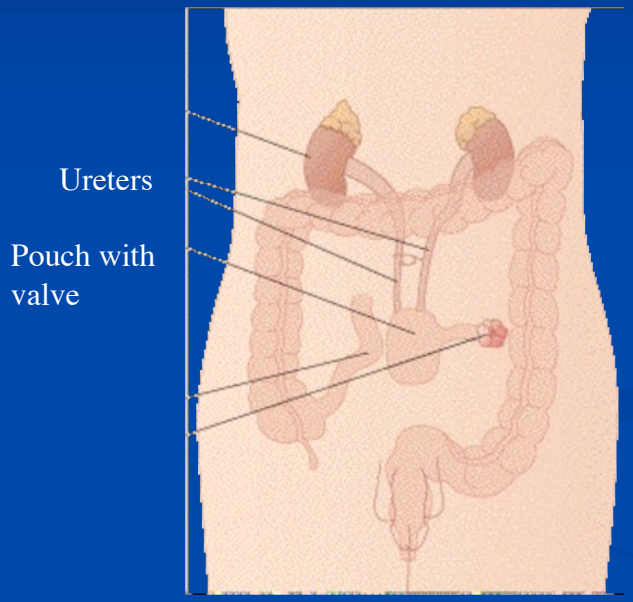
..after cystectomy need one of the following

- Urinary diversion (incontinent or continent)
  - *Incontinent*: conduit from ileum or colon
  - *Continent*: Pouch or neobladder (catheterise or void by Valsalva)

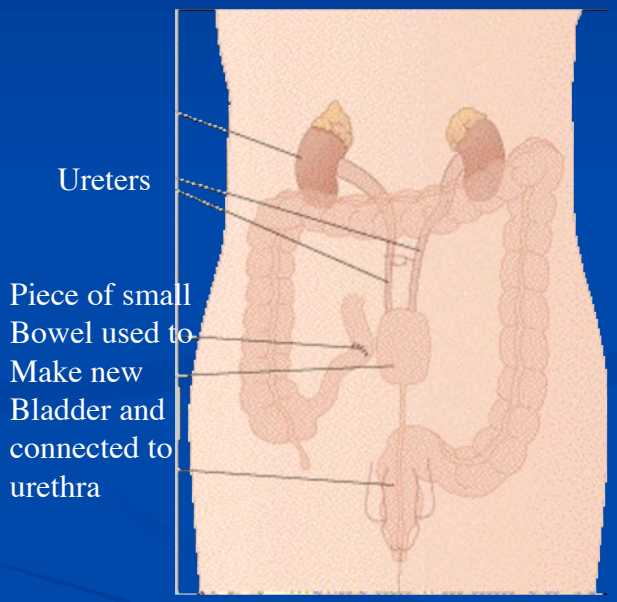
Operations for bladder cancer



Ileal conduit
(incontinent)



Pouch
(continence valve)



Neobladder
(continent)

What have we talked about?

- Anatomy
- Pathology of TCC and importance of cis
- Epidemiology, Aetiology and Risk Factors
- Clinical Presentation and investigations
- Staging and grading
- Management and operations for bladder cancer
- Any Questions?