

KIDNEY STONE

Urolithiasis or genito urinary stone.

Urolithiasis is process of froming stones in genitourinary tract, in kidney ureter, bladder or urethra

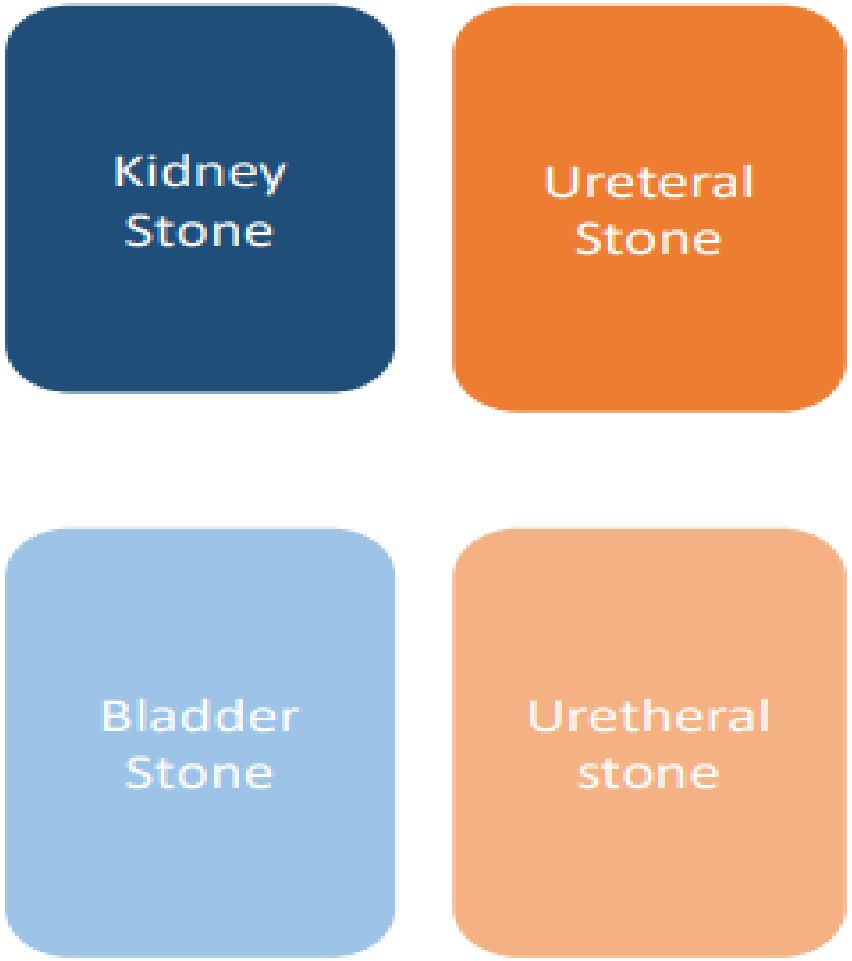


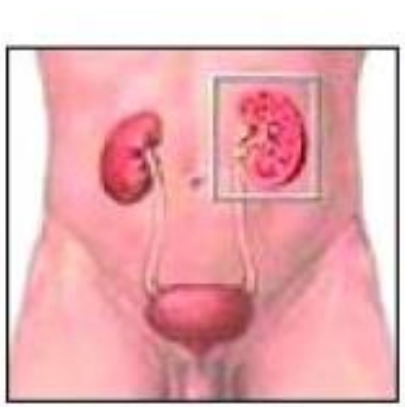


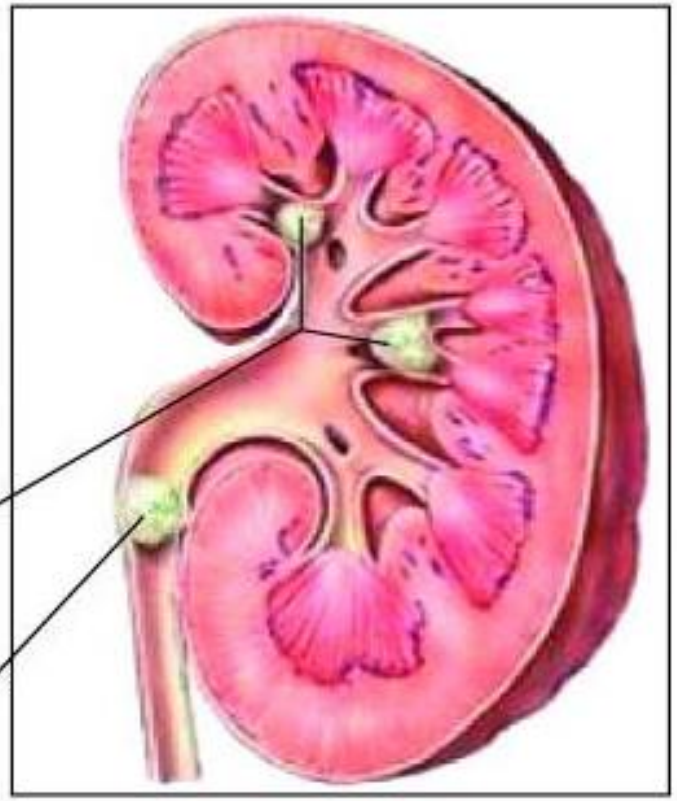




GENITOURINARY STONES

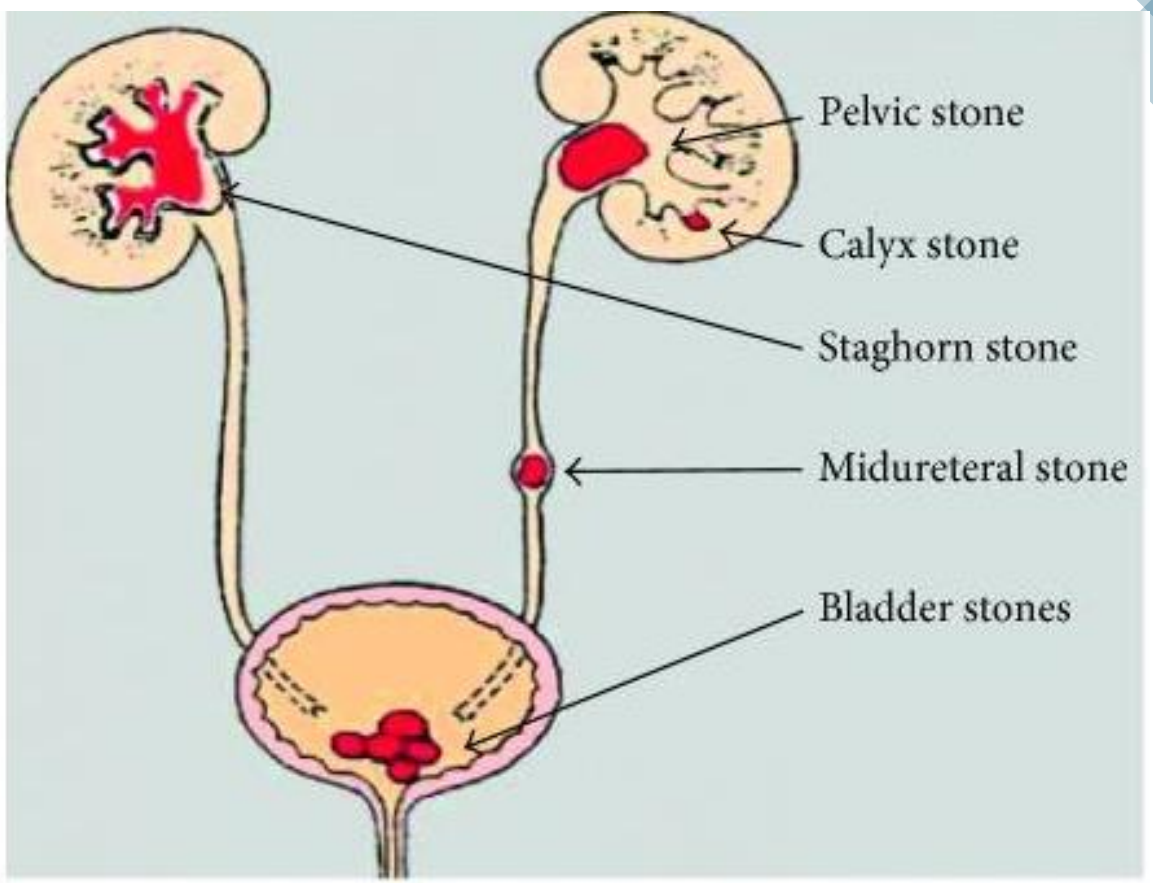


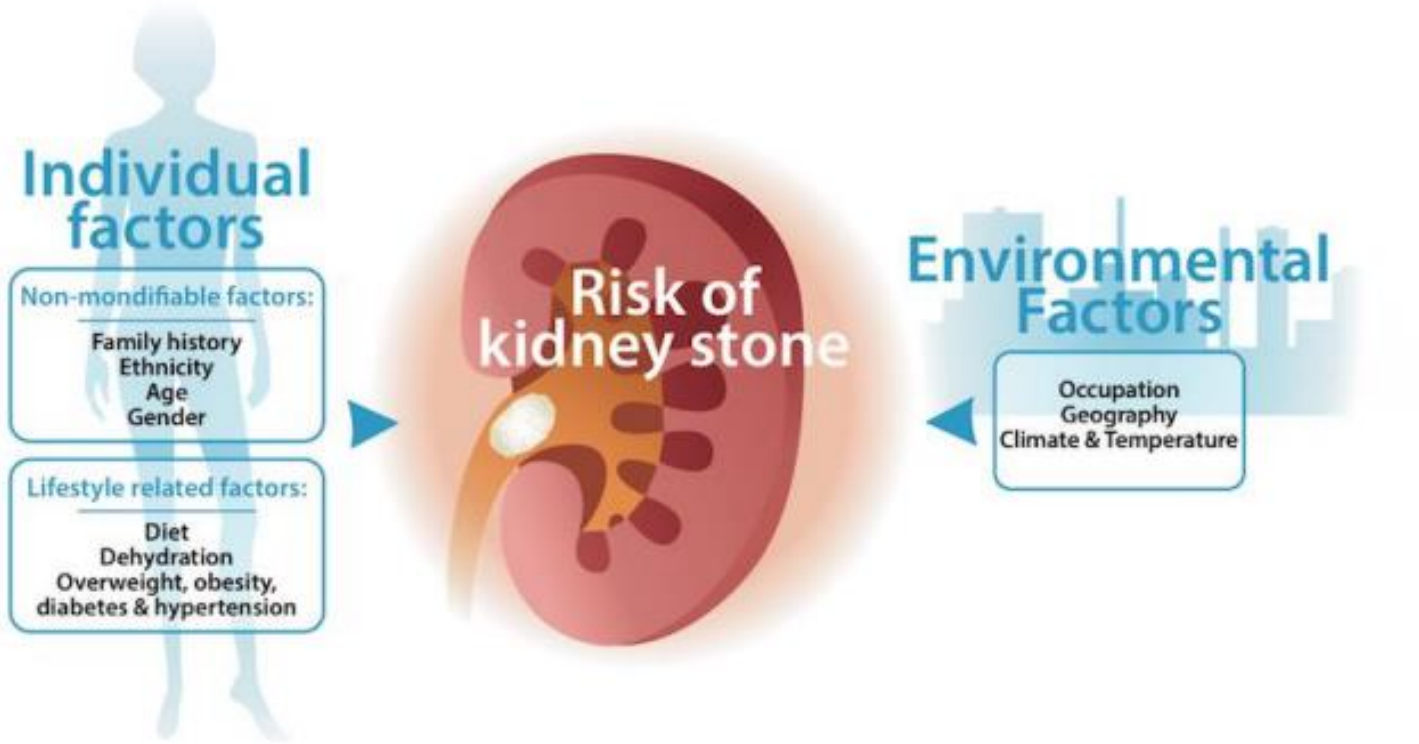




Kidney stones in the minor and major calyces of the kidney

Kidney stone in the ureter

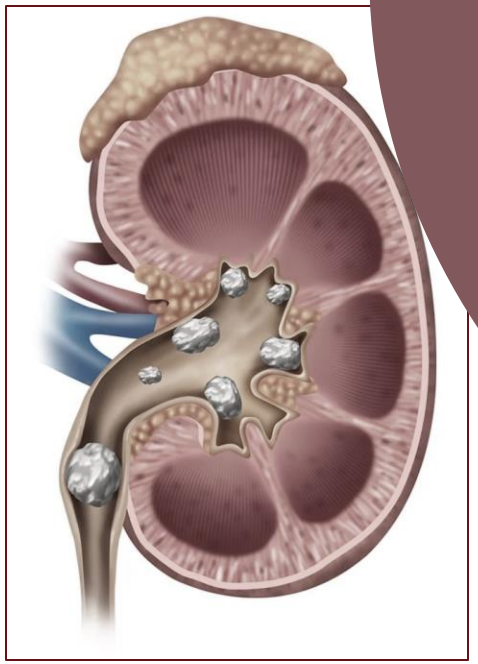




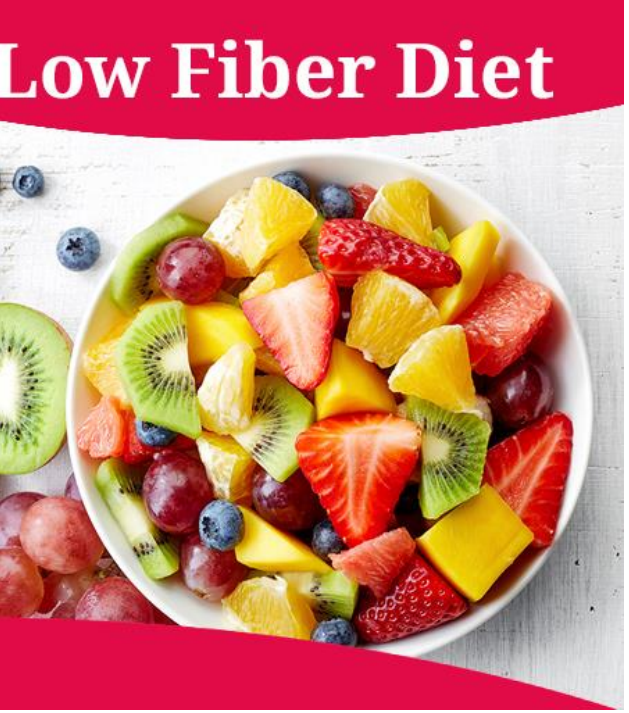
Urolithiasis – Etiological factors

Urolithiasis





- ✓ **Crystal aggregations of dissolved materials in the urine.**
- ✓ Also known as nephrolithiasis, renal stone or renal calculi.
- ✓ **Affects 12% of world population.**
- ✓ Affects all ages, sexes, and races.
- ✓ **More incidence in men than in women (age of 20–49 years) .**
- ✓ **Whites> Asians> Hispanics> African American. More in SE Asians.**
- ✓ **Individual with high BMI, comorbid illness like DM, CKD, IHD & metabolic syndrome.**





More poultry and animal protein



Less water intake



High sugar intake



High salt intake

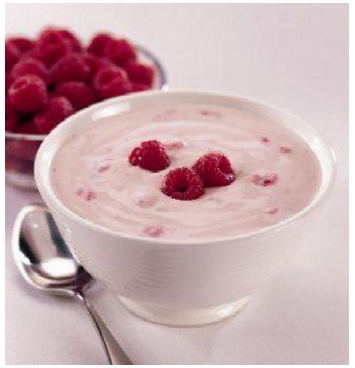
Urolithiasis – Etiological factors

Disturbances in the colloid-crystalloid balance	Metabolic disturbances like hypercalciuria, hyperoxaluria and cystinuria	Pus, bacteria and desquamated epithelial cells	Sometimes, chronic UTIs may also be a factor

Food stuffs with high Calcium

- Milk.
- Curds/ Yoghurt.
- Soft Cheese.
- Hard cheese.













Food stuffs with high Oxalates

- Spinach.
- Tea leaves.
- Nuts.
- Beetroot.





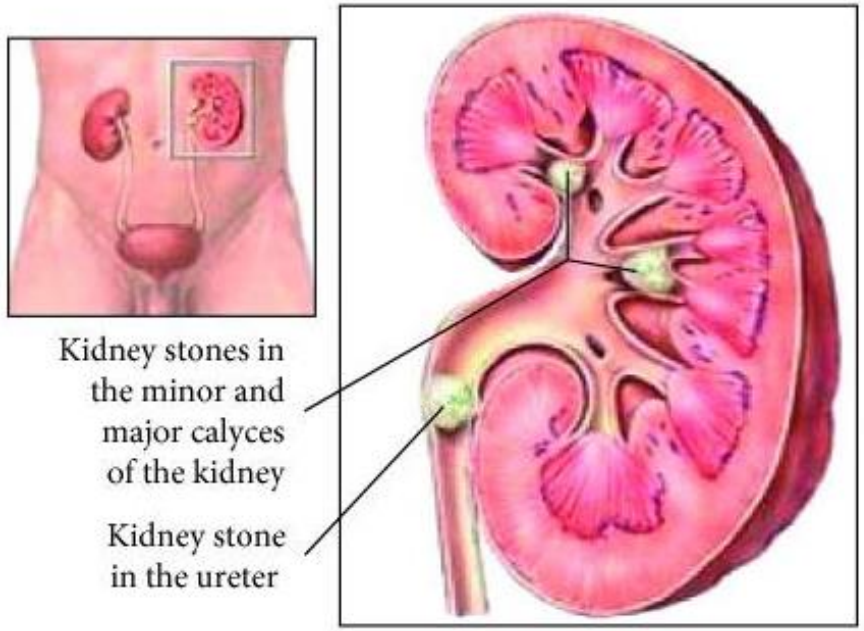


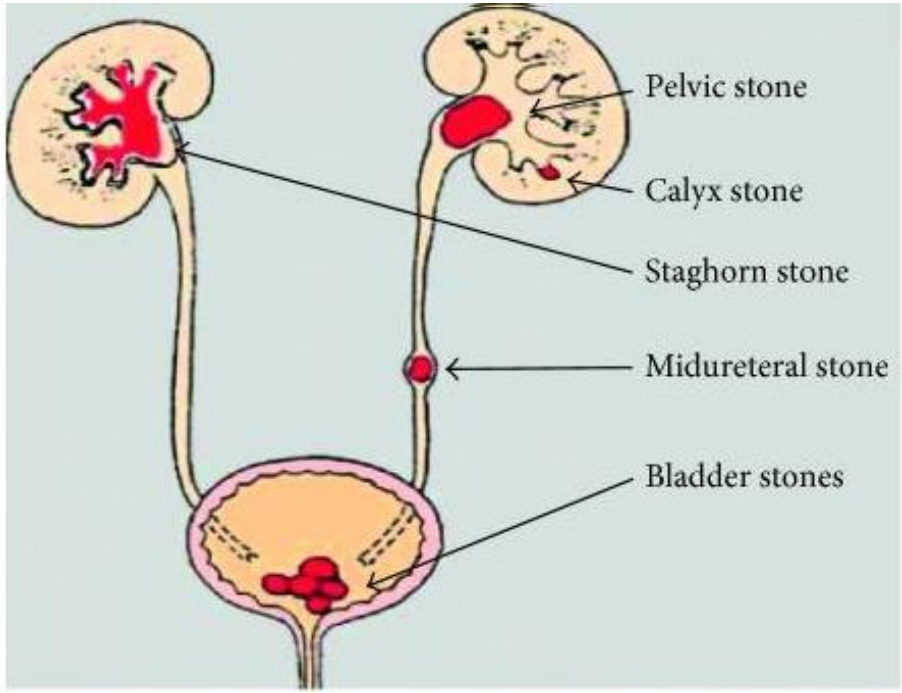




Stone location

- Kidney Stone
- Ureteral Stone
- Bladder Stone
- Uretheral stone



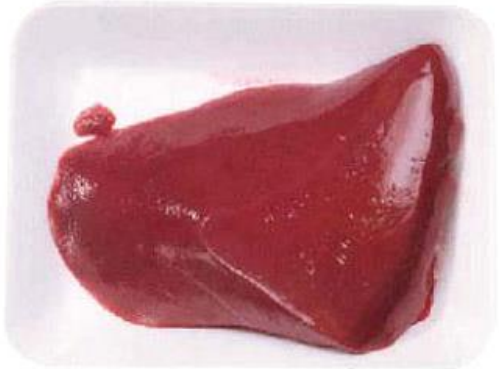


Food stuffs with high Phosphate

- Nuts.
- Beans.
- Soft Cheese.
- Hard cheese .
- Liver.







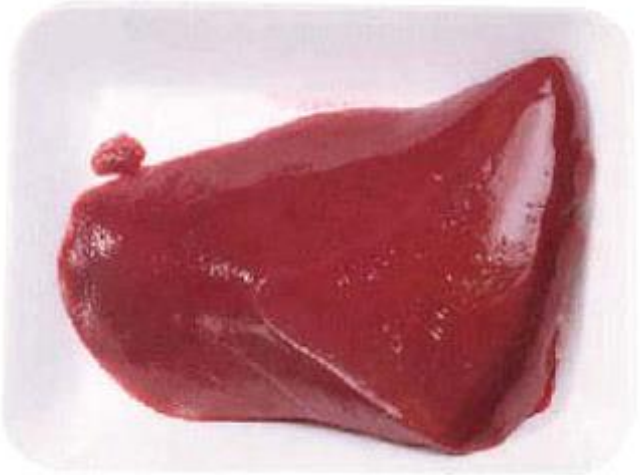




Food stuffs with high Urate

The intake of urate should not be more than 500mg/day. Below are examples of food rich in urate :

- Calf thymus.
- Liver .
- Kidneys .
- Poultry skin.
- Herring with skin, sardines, anchovies, sprats.



Stone promoters

- Excessive calcium, oxalate, sodium, uric acid & phosphate in diet.
- Supersaturation of urine due to dehydration & excessive sweating.
- High phosphate.

Stone inhibitors

- Tamm Horsfall protein.
- Neprocalcin.
- Nephropontin.
- Citrate, magnesium.

1. Urinary saturation
2. Super saturation
3. Nucleation
4. Crystal growth
5. Crystal aggregation
6. Crystal retention
7. Stone formation.



The sequence of events in the formation of any urinary stone.

Stone types



Calcium Oxalate



Calcium Phosphate



Uric Acid Stones

They vary in size & shape and when they grow up to 2.3mm, they can be symptomatic or cause obstruction of the ureter.



Struvite Stones



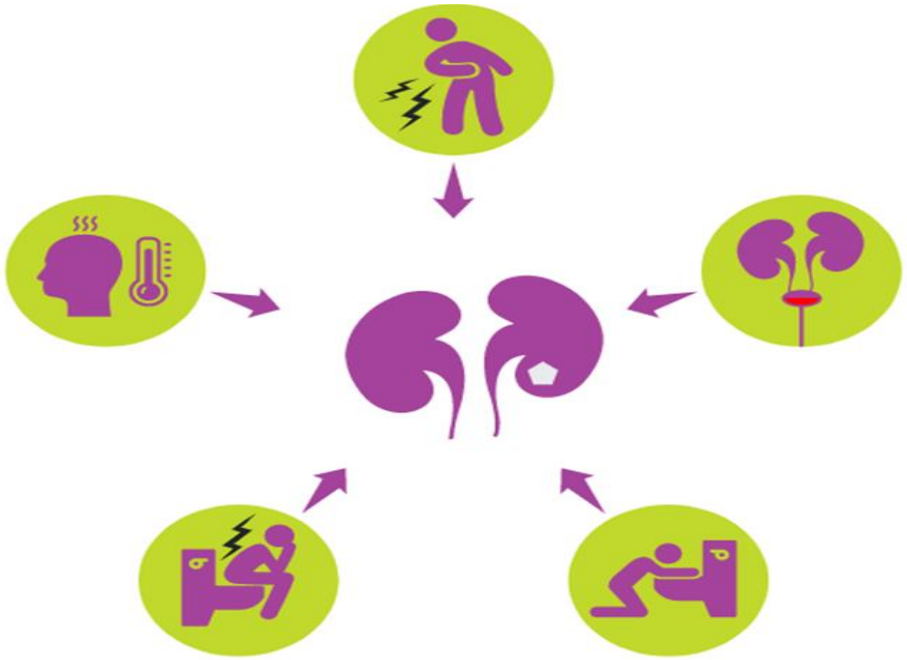
Cystine Stones

Stone types

Kidney stone type	Occurrence in population	when do they form
Calcium(oxalate, phosphate)	75-80%	when urine is acidic or alkaline
Uric acid	5-10%	When urine is persistently acidic
Struvite	10-15%	Infections in the kidney
Cystine	1-2%	Rare genetic disoder



Symptoms



Obstruction with dilation or stretching of the upper ureter & renal pelvis

→ Spasm leading to severe episodic abdominal pain & Dysuria

Acute loin to groin colicky pain,

may associated with **nausea & vomiting**

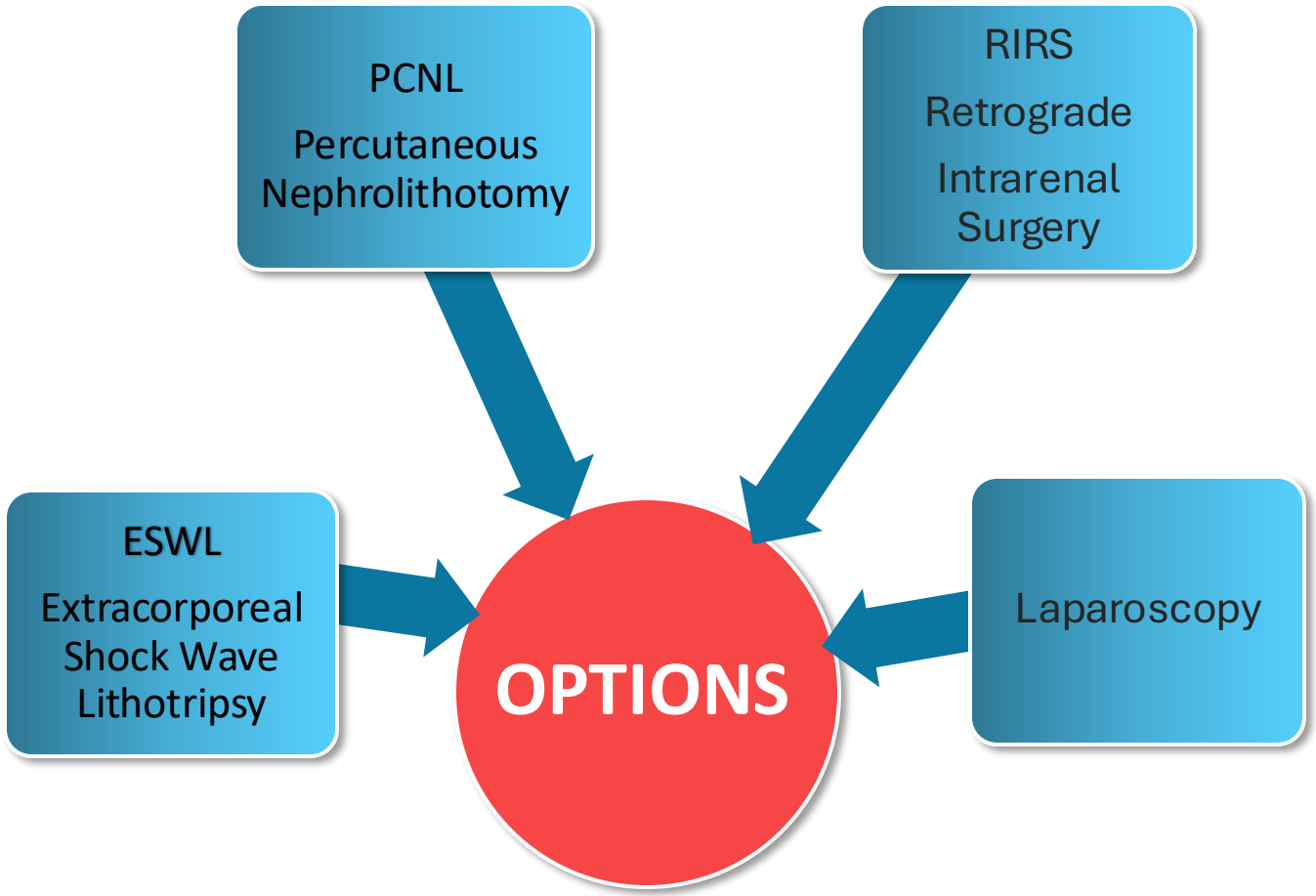
→ Renal angle tenderness & microscopic **haematuria**

INVESTIGATION

- Routine blood investigation: mainly s.cr and total count.
- Xray KUB and IVP rarely used to diagnose stone.
- Initial modality to diagnose is Ultrasound abdomen and pelvis.
- CT KUB plain and contrast is a gold standard investigation to diagnose stone.

<5mm	• May be flushed out in urine without any medical intervention • Except occasional analgesics & antispasmodics.
>5mm	• Less likely to be flushed out in urine on their own • Get larger in size over a period of time.
>10mm	• Either removed by surgery or by external shock wave lithotripsy (ESWL).

Current available treatment modalities



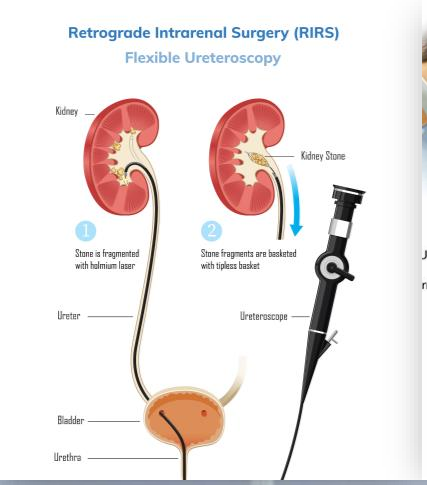
Recurrence

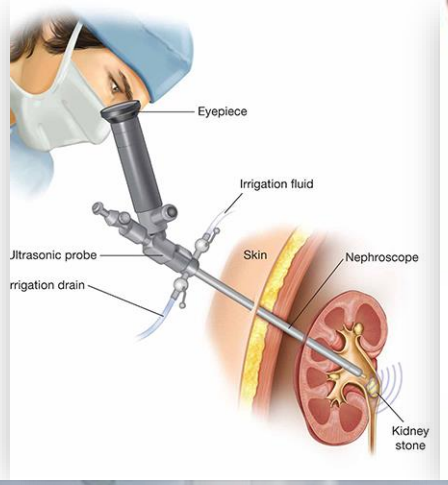
70-80%
chances after
the first attack

Cumulative
10% chance
per year

Chances of recurrence

- 15% at 1 year
- 35-40% at 5 years
- 50% at 10 years
- 75% at 20 years







STONE TREATMENT



- FLEXIBLE URS.
- PCNL.
- RIGID URS.
- ESWL

AVOIDING STONE RECCURENCE

LIFE-STYLE CHANGES: Exercise, avoid alcohol and smoking.
High fiber diet consumption.
Avoid high consumption of meat, dairy products and poultry.
Maintain adequate body mass index.
Adequate hydration by consuming around 3lts of water per day.