RAMA UNIVERSITY

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FACULTY OF NURSING

Renal Calculi

BY:-

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Introduction:-

- A kidney stone is a hard solid mass of material that forms in the kidney from the substances in the urine.

- Kidney stones or calculi develop as a result of various metabloic disorders which affect the fate of calcium and other mineral elements in the body.
- Stones may be formed in the kidney, urinary bladder,ureter and urethra

Meaning:-

- A kidney stone, also known as a renal calculus or nephrolith, is a solid piece of material which is formed in the kidneys from minerals in urine

Etiology:-

- Unknown
- <u>Risk factor:-</u>
- Imbalance of pH in urine
  - Alkalic:-Calcium stone
  - Acidic:-Uric & cristine stone
- Gout
- Hyperparathyroidism

Type of renal stone:-

There are mainly 5 types:-

1. Calcium oxalate stone (Is the most common *80%*)
2. Calcium phosphate stone
3. Struvite stone (Triple stone)
4. Uric acid stone
5. Cystic stone

1.Calcium oxalate stone (Is the most common *80%*)-

- Caused by super –saturation of urine with calcium & oxalate Calcium oxalate stone tend to form in alkaline chemistry
- (Avoid food high in oxalate(beer, wheat germ, spinach)

2.Calcium phosphate stone (5–10%):- Caused by super –saturation of urine with calcium phasphate.

- Calcium phosphpate stone tend to form in alkaline chemistry (Avoid food high in calcium (Milk & dairy product)

3. Struvite stone (Triple phosphate stone):–

- Caused by urea splitting bacteria (Proteus, Pseudomonas, Klebsiella, Staphylococcus)–more common women then the man because of UTI
- Struvite stone stone tend to form in alkaline chemistry

4. Cystic stone (10-15%):- Caused by cystine crystal formation

Cystic stone stone tend to form in Acidic urine

(cystine source Avoid meat milk ,cheese, Egg)

5. Uric acid stone (5-10%):-Caused by excessive dietary purine or gout

Uric acid stone tend to form in Acidic urine

(Avoid purine sources eg. Meats, gravies, red wine)

Clinical manifestation:-

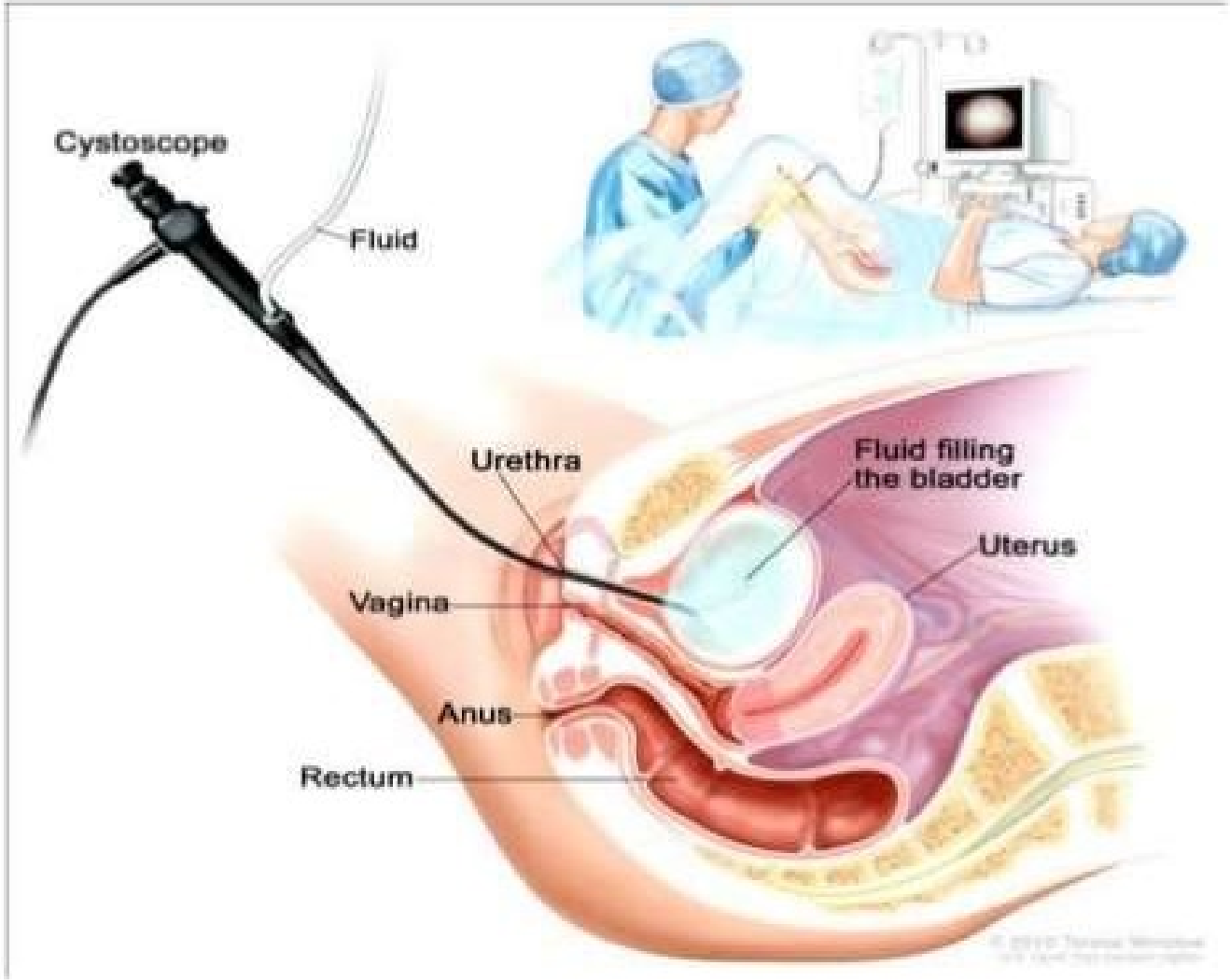
- Severe pain in the side and back, below the ribs
- Pain that spreads to the lower abdomen and groin
- Pain that comes in waves and fluctuates in intensity
- Pain on urination
- Cloudy or foul-smelling urine
- Nausea and vomiting
- Fever and chills if an infection is present
- Urinating small amounts of urine

Diagnostic evaluation:-

- Blood
- Urine-analysis
- Cystoscopy
- X-ray
- CT scan, MRI
- Intravenous urogram (IVU) or intravenous pyelogram
- USG
- KUB

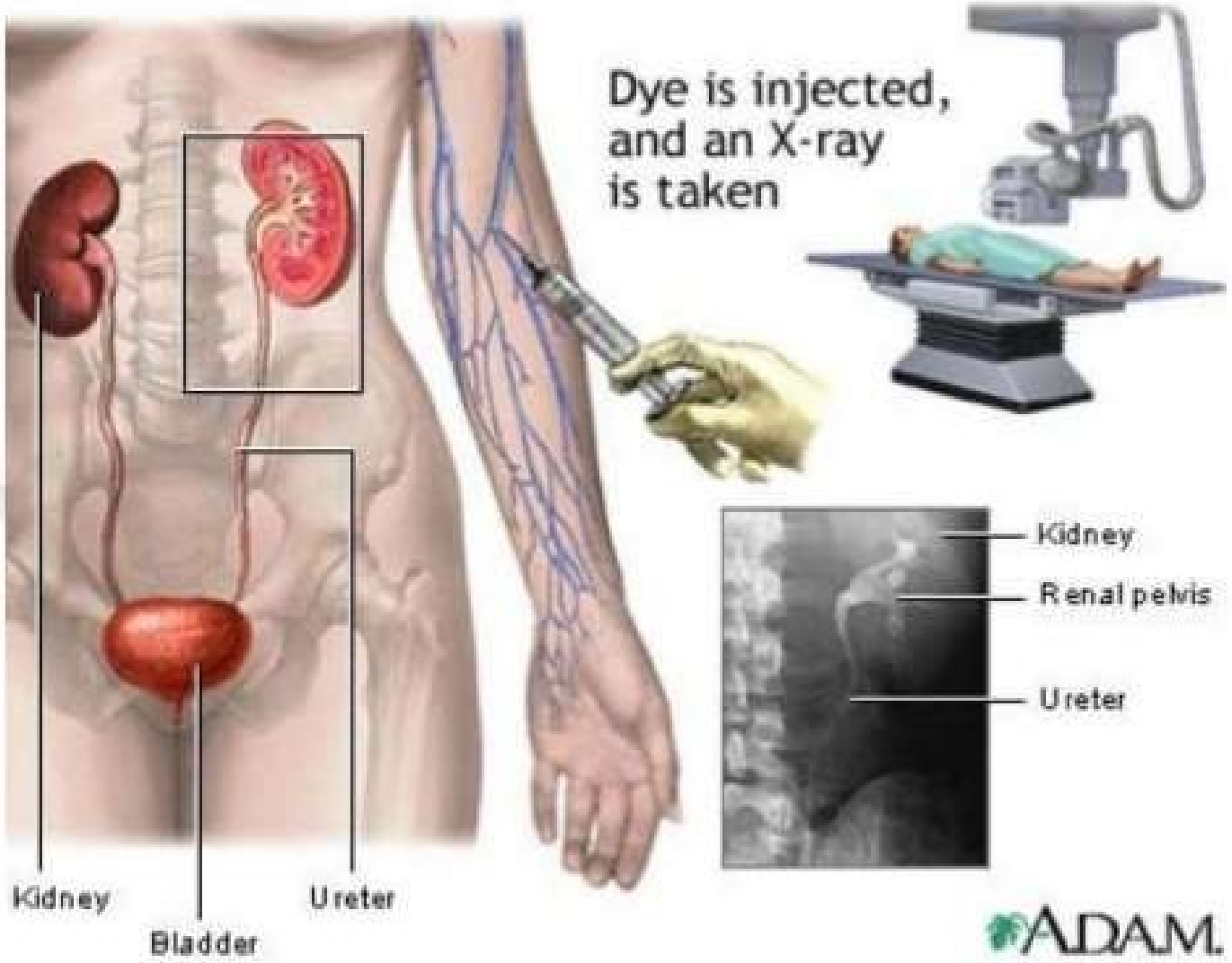
DIAGNOSTIC STUDIES

CYSTOSCOPY



DIAGNOSTIC STUDIES

IVP



DIAGNOSTIC STUDIES

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Management:-

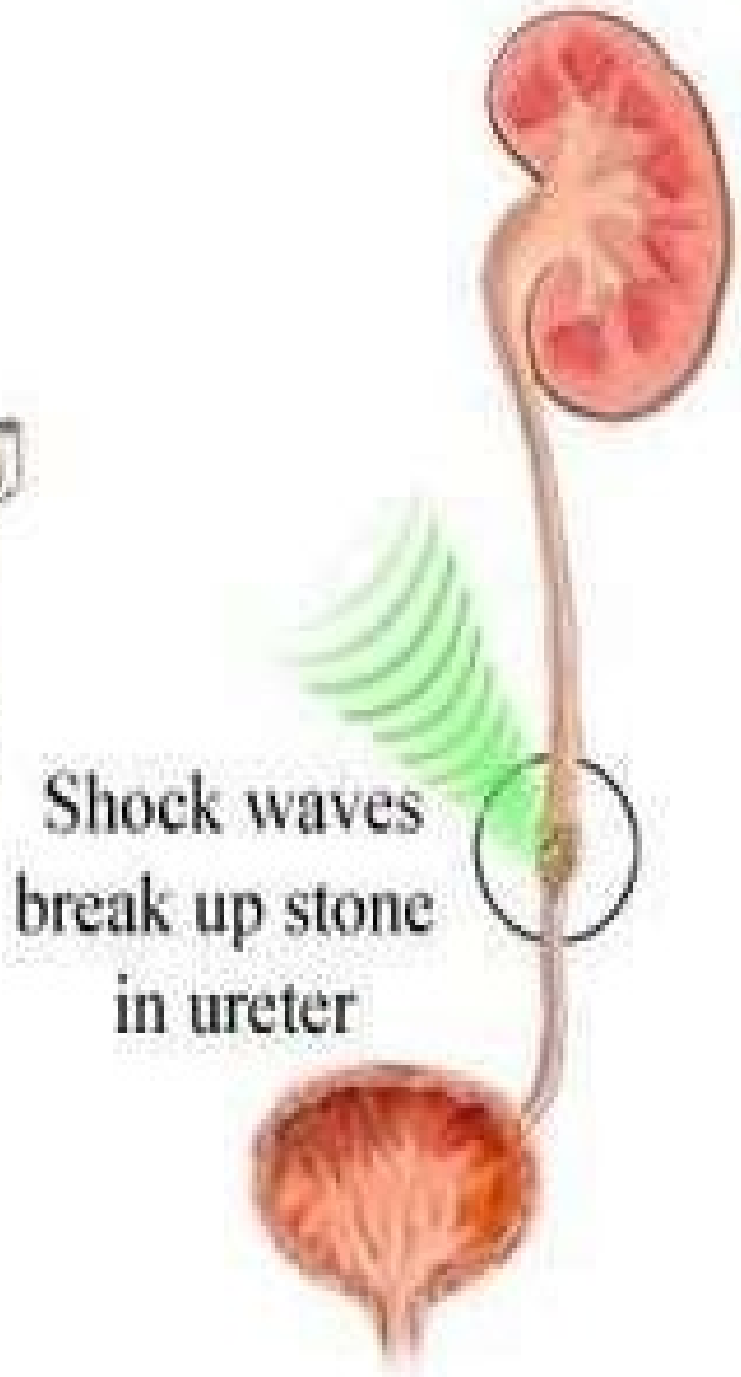
Medical management:-

- Analgesic
- Spasmotic eg Buscopan
- NSAIDs eg Steroid
- Maintain I/O charting
- Provide rest

Surgical management:-

- Close procedure:-
- Lithotripsy (Extracorporeal Shockwave lithotripsy (ESWL)- Noninvasive

Extracorporeal shock wave lithotripsy (ESWL) machine

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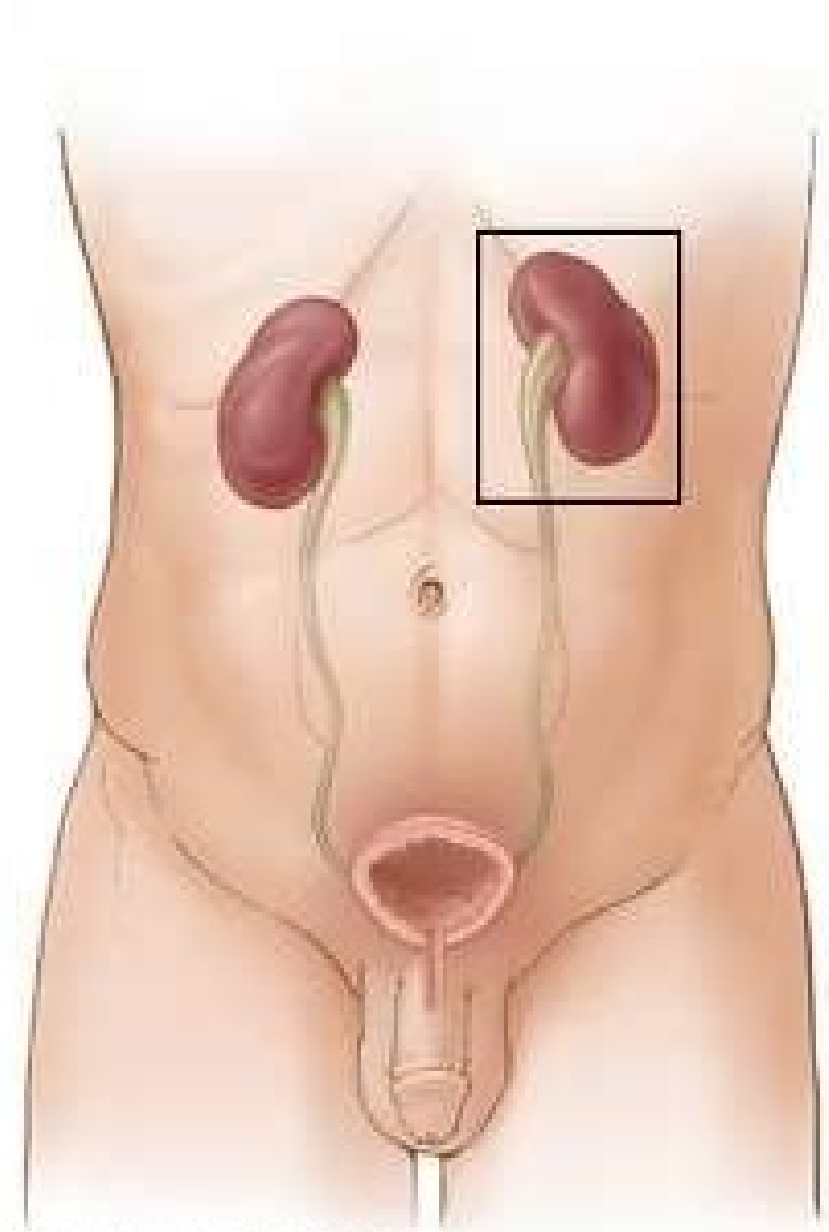
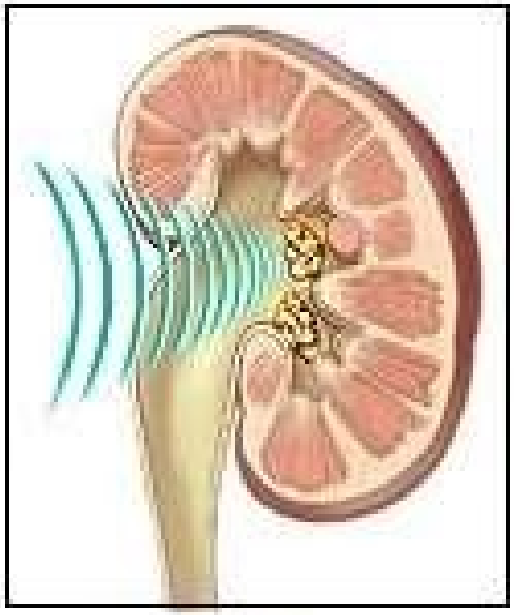
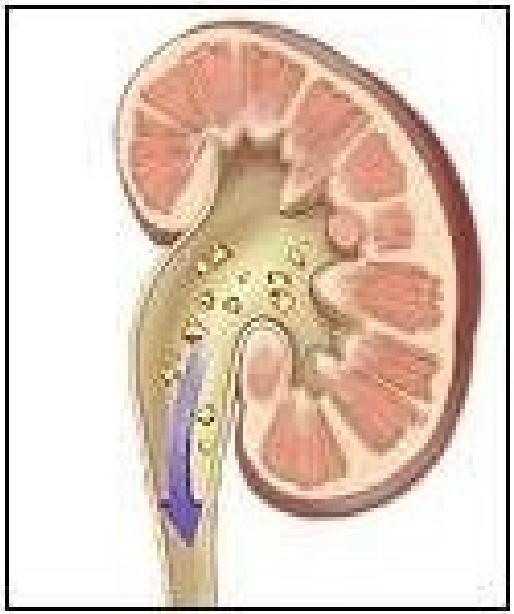
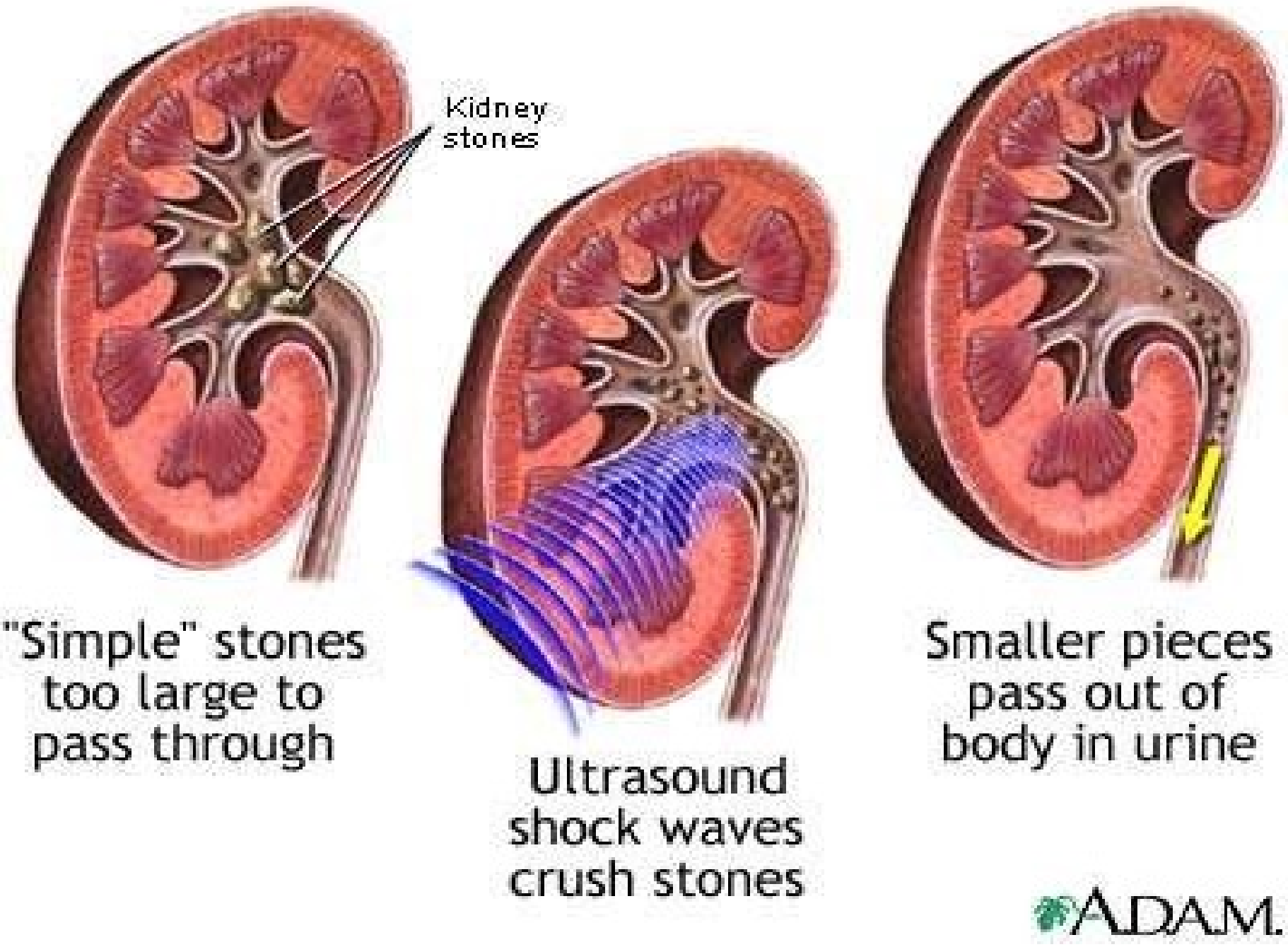


Shock waves break up kidney stones

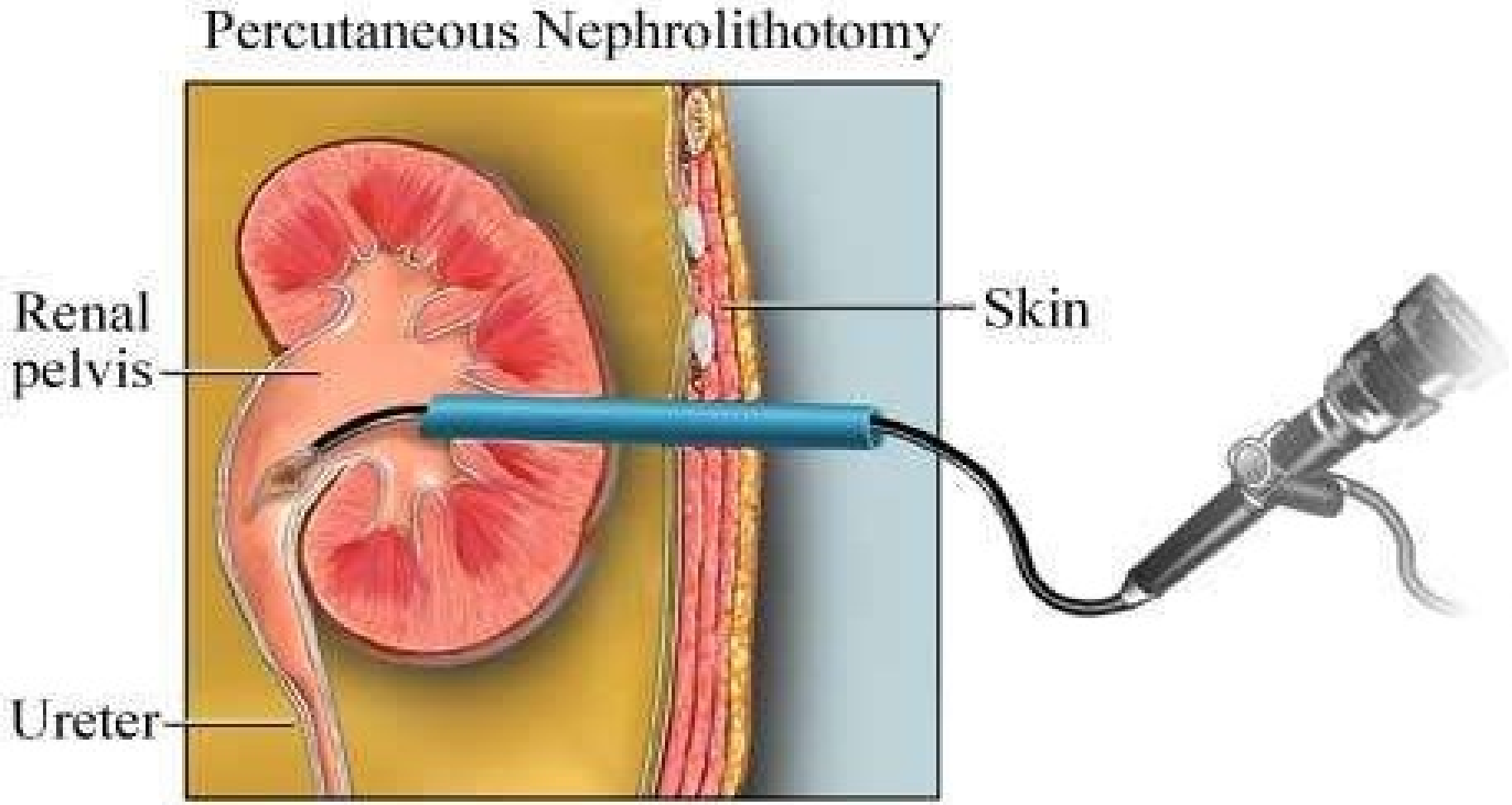


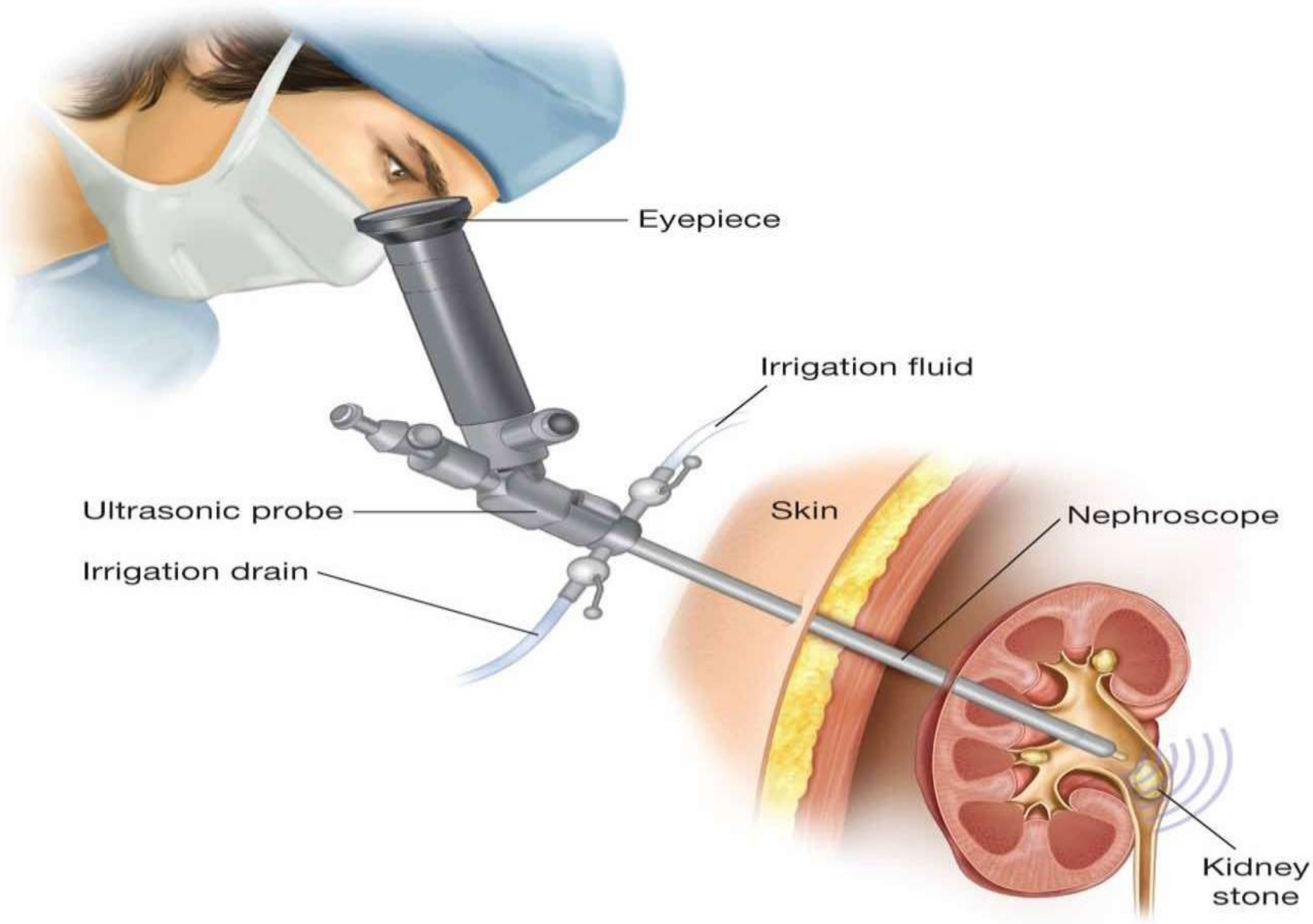
Small pieces pass through urinary tract

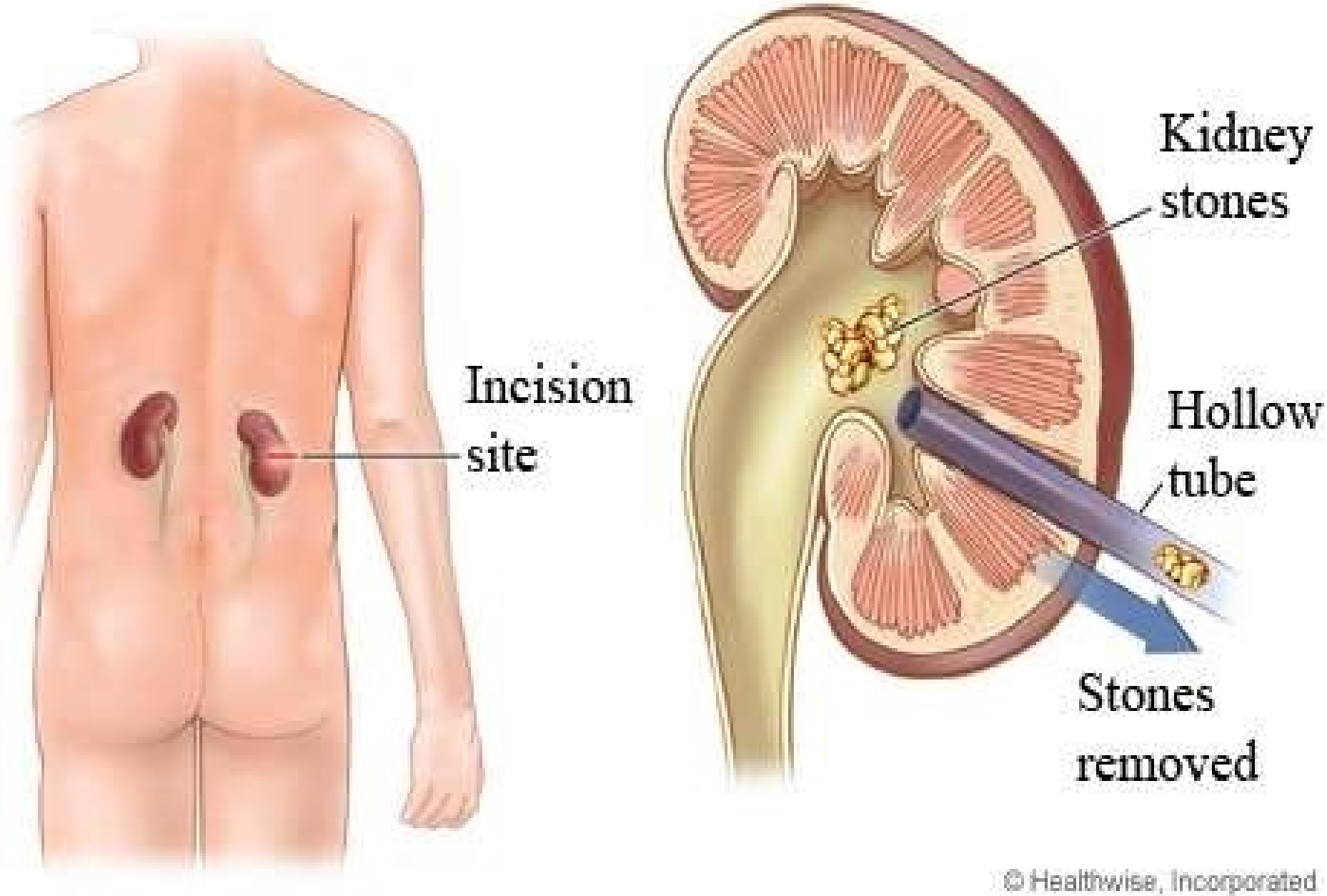



Kidney stones
"Simple" stones too large to pass through
Ultrasound shock waves crush stones
Smaller pieces pass out of body in urine
A.D.A.M.

Percutaneous lithotripsy:- Nephroscope




Eyepiece
Irrigation fluid
Ultrasonic probe
Irrigation drain
Skin
Nephroscope
Kidney stone


Incision site
Kidney stones
Hollow tube
Stones removed
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Open procedure:-

- Ureterolithotomy
- Pyelolithotomy
- Nephrolithotomy
- Partial or total nephrectomy

Nurses role:-

- Report increased redness in urine
- Monitor vital signs
- Fluid balance chart
- Observation for anuria
- Observation for signs of infection.

THANK YOU