Absorbable Sutures

Overview

- Introduction
- Natural Absorbable
- Synthetic Absorbable
- Advantages and Disadvantages

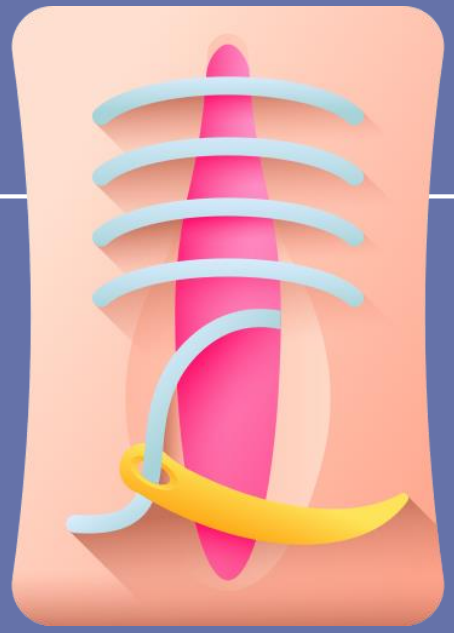
INTRODUCTION

- A surgical suture, also known as a stitch or stitches, is a strand or fiber used to hold body tissues together and approximate wound edges after an injury or surgery.
- Application generally involves using a needle with an attached length of thread.
- Selection of surgical suture should be determined by the characteristics and location of the wound or the specific body tissues

CLASSIFICATION

NEEDLE

Shape of Needle
Needle Point Geometry



THREAD

Material
- Absorbable Thread
- Non-absorbable Thread

Sizes
Tensile Strength
Elasticity
Tissue Reactivity
Knot Security

Absorbable Sutures

- History tells us that **catgut** suture had its origin around AD 150 in the time of the Greek physician Galen.
- Absorbable sutures are either degraded via proteolysis or hydrolysis.
- Absorbable suture material can be either natural or synthetic.
- Natural Absorbable:
  - **Catgut**

    Synthetic Absorbable:
  - Polyglactic Acid
  - Polyglycolic acid
  - Poliglecaprone
  - Polydioxanone
  - Polytrimethylene carbonate

Suture Basics

Catgut Sutures - Suture Basics

Catgut suture is a type of surgical suture made of twisted strands of purified collagen taken from the small intestine of domesticated ruminants or beef tendon

Feed Real Institute

beef tendon

Sushruta: the ancient Indian

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Figure 2 from Sushruta: The first Plastic Surgeon in 600 B.C. |...

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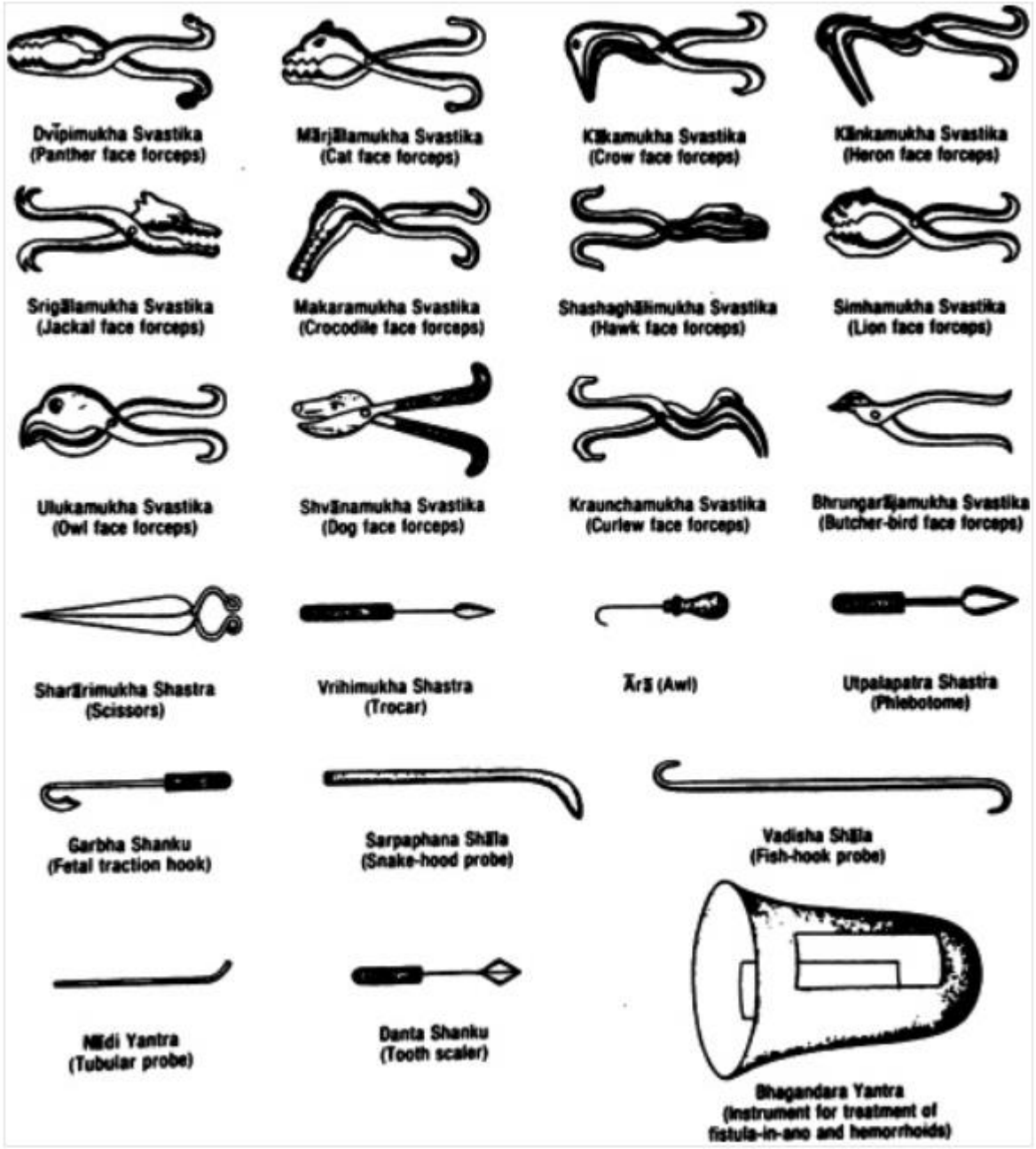
PLASTIC SURGERY IN ANCIENT HISTORY OF INDIA

29/12/2018 · by deemagclinic · in neuropsychiatry · Leave a comment

Although many people consider Plastic Surgery as a relatively new specialty, the origin of the plastic surgery had his roots more than 4000 years old in India, back to the Indus River Civilization. The mythico-religious shlokas (hymns) associated with this civilization were compiled in Sanskrit language between 3000 and 1000 B.C. in the form of Vedas, the oldest sacred books of the Hindu religion. This era is referred to as the Vedic period (5000 years B.C) in Indian history during which the the four Vedas, namely the Rigveda, the Samaveda, the Yajurveda, and the Atharvaveda were compiled. All four Vedas are in the form of shlokas (hymns), verses, incantations and rites in Sanskrit language. 'Sushruta Samhita' is believed to be a part of Atharvaveda.



Catgut

- Catgut suture is a type of surgical suture that is naturally degraded by the body's own proteolytic enzymes.
- It comes from the dried, twisted intestines of animals, mainly from sheep intestines.
- Enzymatic degradation is a process where proteolytic enzymes that are usually found in the digestive tract dissolve the natural suture.
- These enzymes can also be referred to as peptidase, proteinase, or protease.
- The enzyme is separated into two different groups **endopeptidase, and exopeptidase.** They work together to break the protein down into an amino acid.

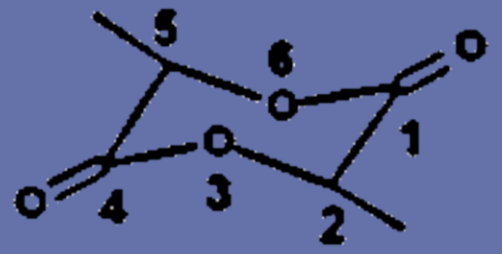
Synthetic Sutures

- Common Biodegradable polymers for medical devices are constructed from synthetic linear aliphatic polyesters.
- Polyglycolic acid and polylactic acid are considered here

Starting material/compound

Dimer form of Glycolic acid and Lactic acid

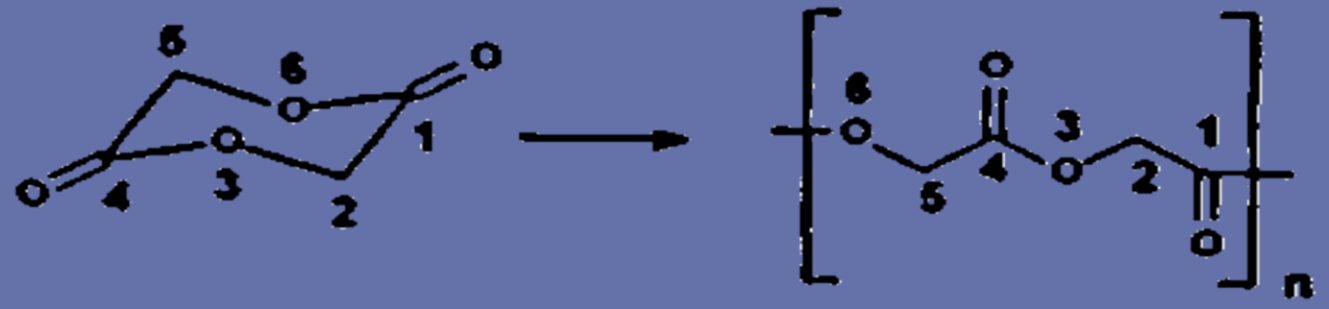
Glycolide



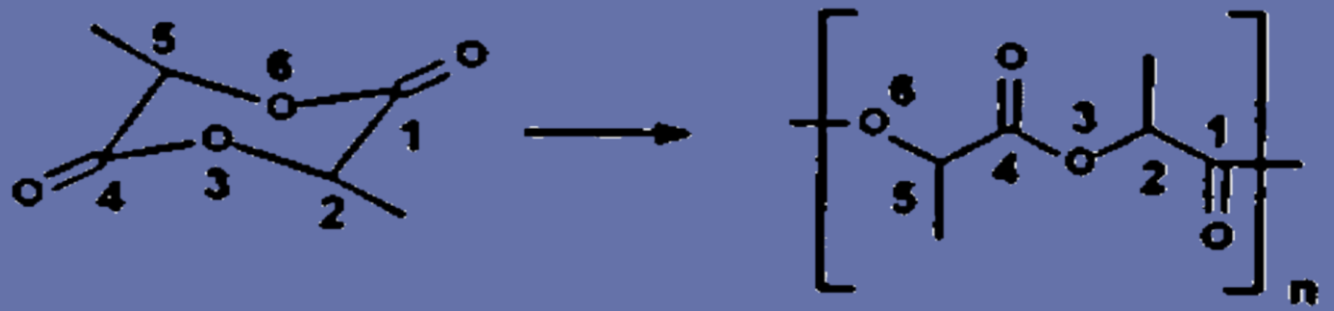
Lactide

Polymerization

Polymerization of dimer of glycolic acid gives poly(glycolic acid) and polymerization of lactic acid gives poly(lactic acid)



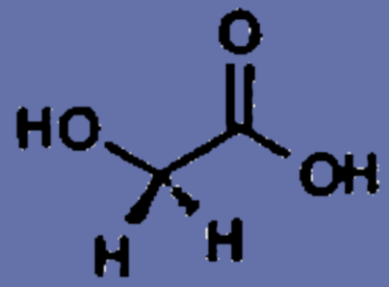
Poly(glycolic acid)



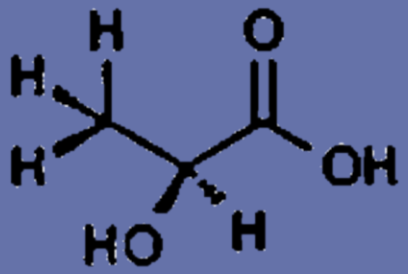
Poly(lactic acid)

Degradation

PGA degrades by hydrolysis to produce glycolic acid. Hydrolytic degradation of PLA gives Lactic acid



Glycolic acid



Lactic acid

Advantages

- The biggest benefit of absorbable stitches is the fact that the body breaks them down over time.
- Can be used internally
- Another benefit of absorbable stitches is that they tend to be more flexible than non-absorbable stitches
- Good knot security

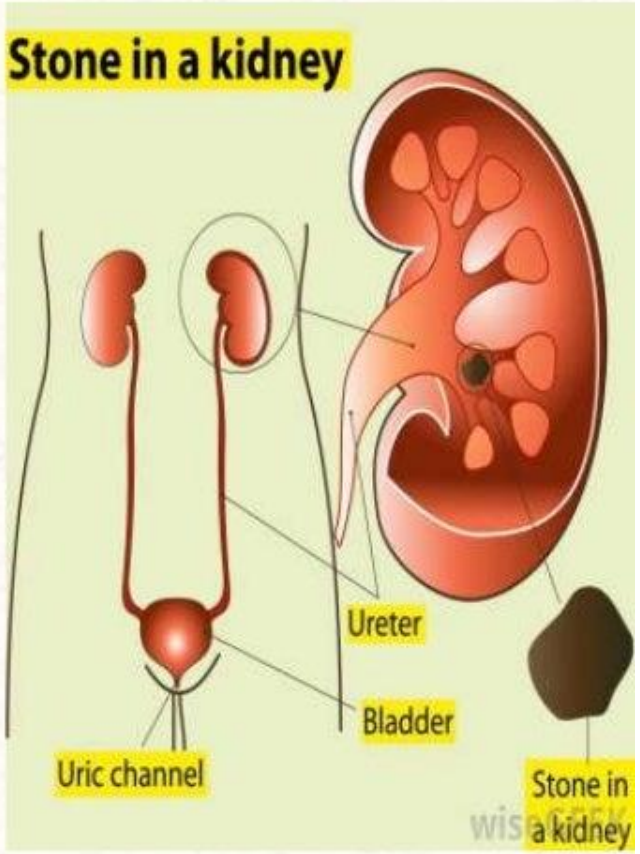
Disadvantages

- Consideration of wound support time
- Your body may be extra-sensitive to absorbable sutures, as it recognizes the material as a foreign substance. This can cause a reaction and delay the process of wound healing.

Kidney Stones

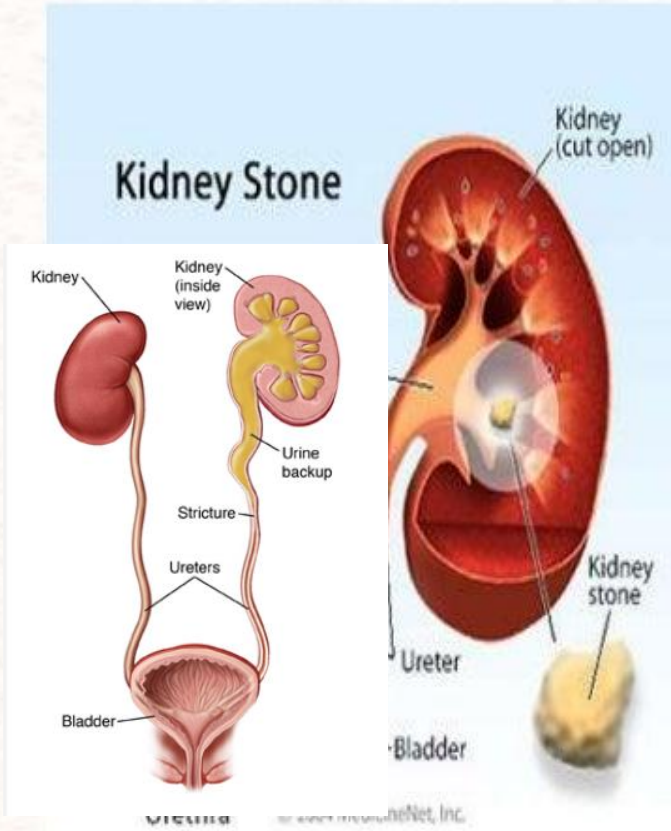
INTRODUCTION

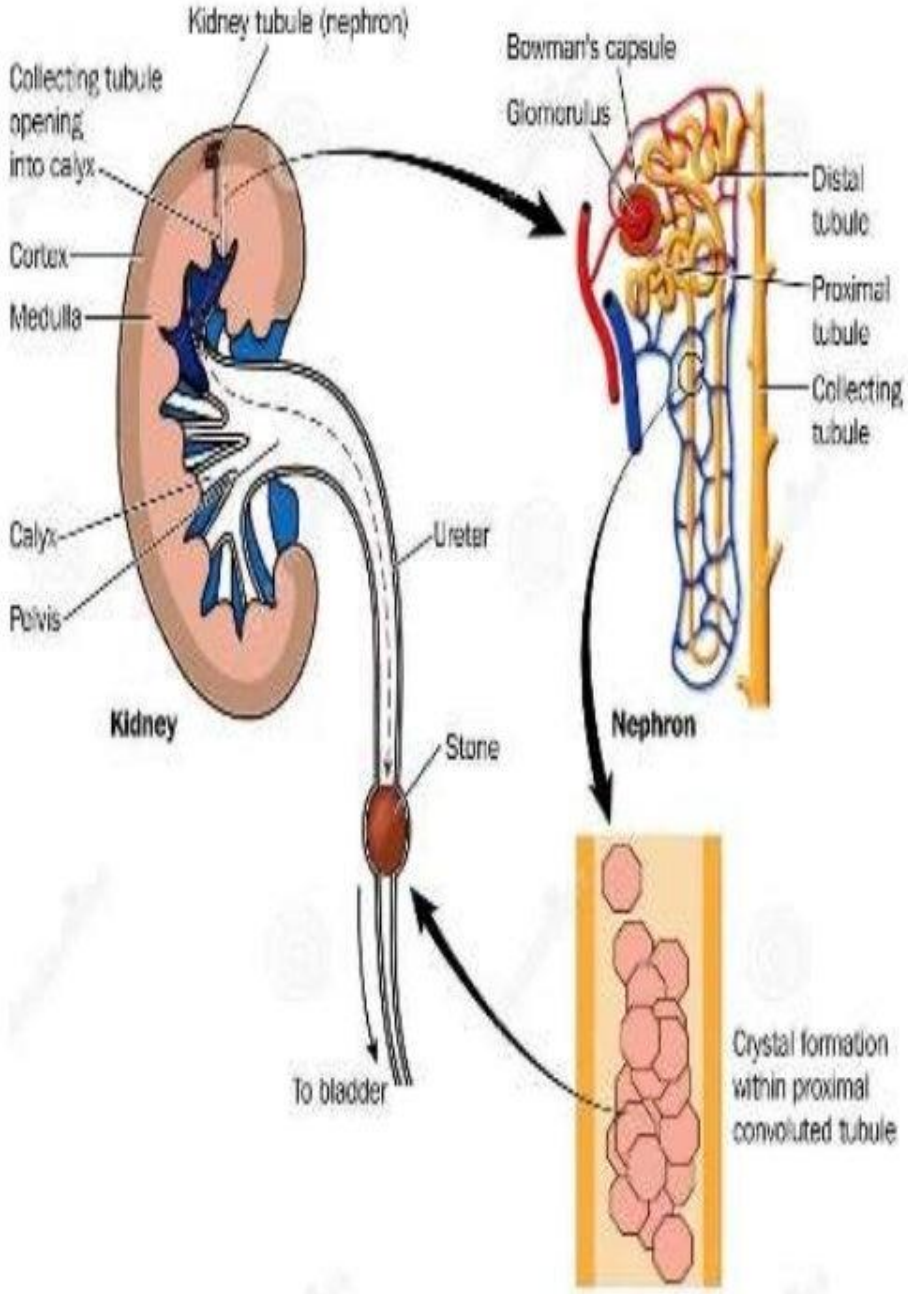
- Kidney Stones, also known as **renal calculus** or **nephrolith**, are small, hard deposits of mineral and acid salts on the inner surfaces of the kidneys.
- If stones grow to sufficient size they can cause blockage of the ureter.
- ***kidney-***------- stone (calcium)
  gall bladder---- stone (cholesterol oxalates)
  intestine ------- jejunum (hard substance)

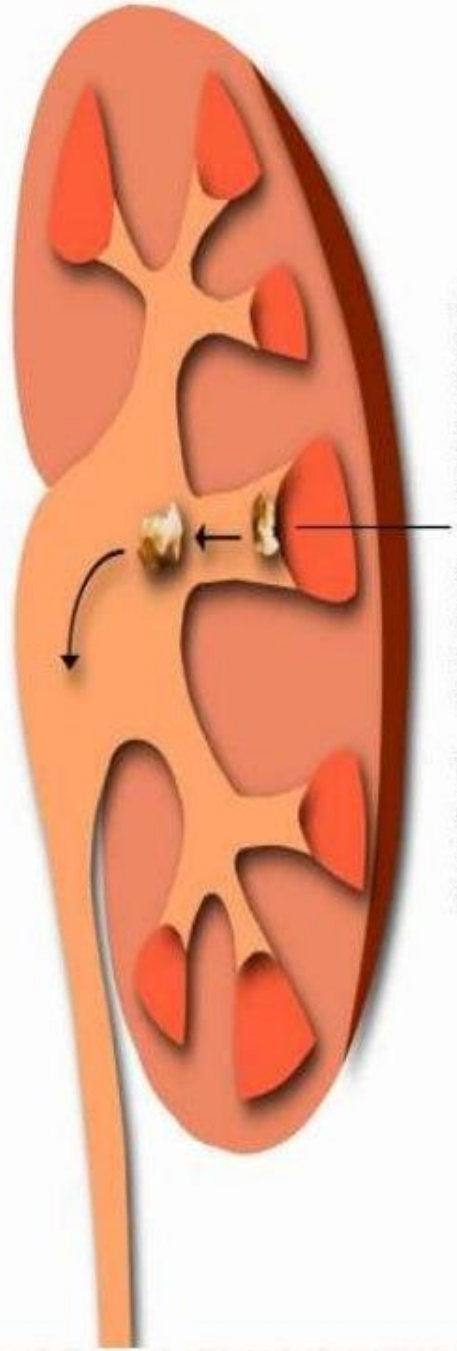


STONE FORMATION

- Highly concentrated urine constituents crystallize and harden to form calculi.
- Kidney stones form when our urine contains more crystal-forming substances — such as calcium, oxalate and uric acid.
- At the same time, our urine may lack substances that prevent crystals from sticking together, creating an ideal environment for kidney stones to form.
- The crystals get deposited on the nucleus and continue to grow. These can some times adhere to the renal papillae.







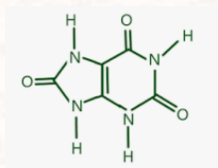
As the stone becomes larger, it may become unattached, floating into the larger renal pelvis and down the ureter. As it moves down the ureter, it can cause blockage, leading to a kidney stone "attack".

It is not clear what initiates detachment. Some stones are small when they become unattached while others will not detach until they are larger.

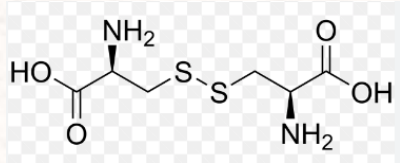
Occasionally, some stones do not move down the ureter but instead continue to grow until they fill the entire kidney, taking on a "staghorn" appearance.

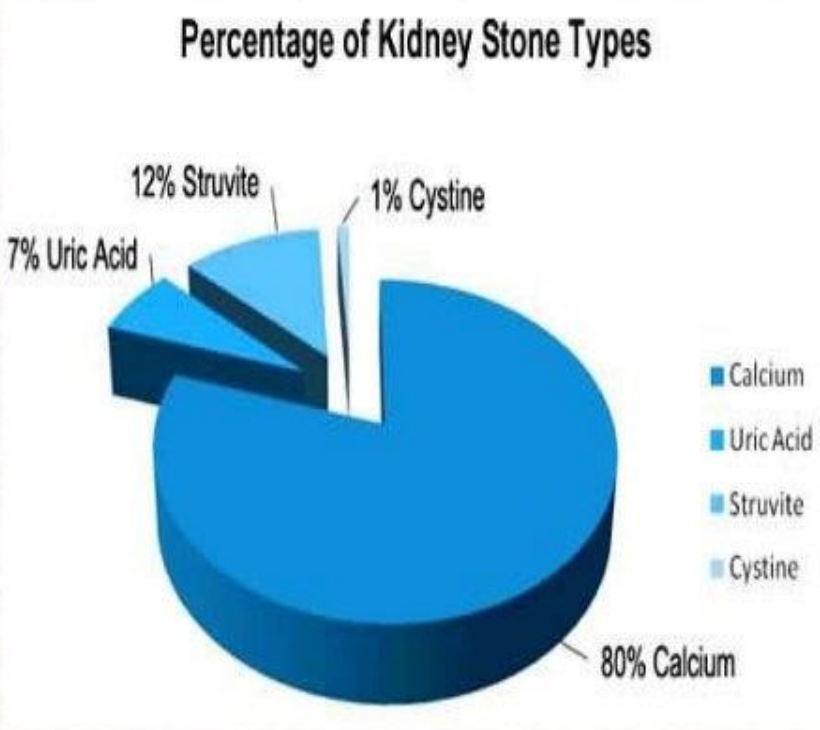
TYPES OF KIDNEY STONES

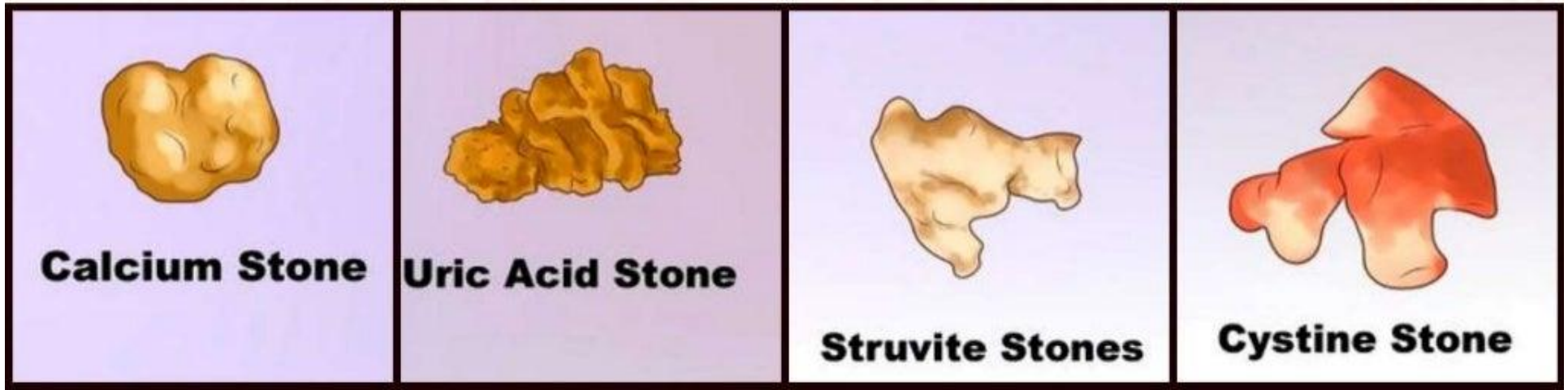
- Calcium oxalate
- Calcium phosphate
- Struvite
- Uric acid



- Cystine

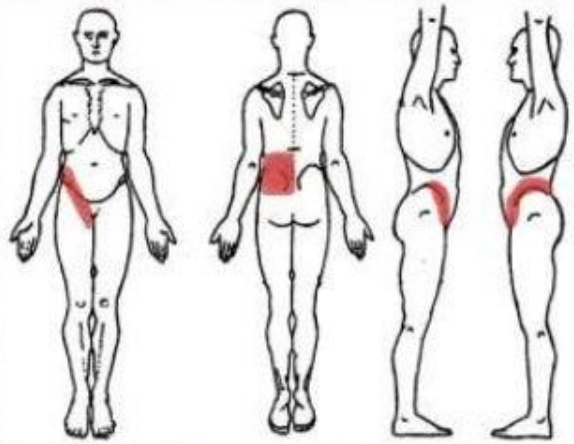






CLINICAL MANIFESTATIONS

- Severe flank pain
- Abdominal pain
- Nausea and vomiting
- Fatigue
- Elevated temperature, BP, and respirations
- Steady Pain
- Pain on urination; Pink, red or brown urine
- Oliguria and anuria in obstruction
- Hematuria
- Renal colic
- Hydronephrosis



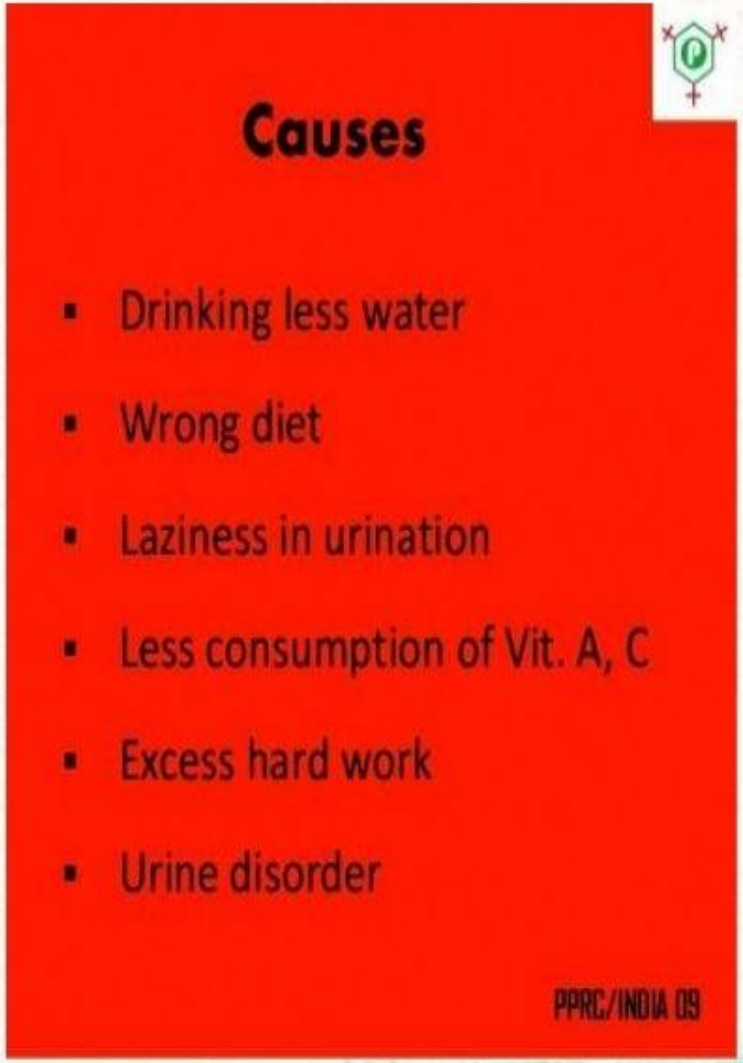
Oliguria occurs when the urine output in an infant is less than 0.5 mL/kg per hour for 24 hours or is less than 500 mL/1.73 m^2 per day in older children.

Anuria is defined as the absence of any urine output.

An important point to remember is that healthy newborns may have no urine output for 24 hours after birth

CAUSES

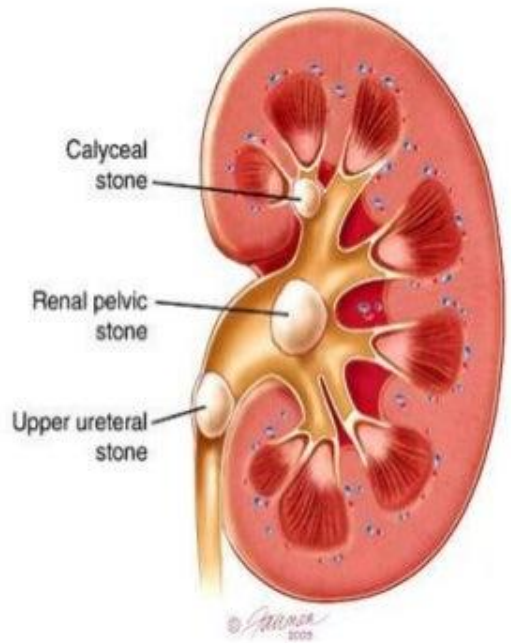
- Supersaturation of urine is the key to stone formation
- Imbalance of pH in urine
- Gout
- Hyperparathyroidism
- Inflammatory Bowel Disease
- UTI (Urinary Tract Infections)
- Dehydration
- Crystal aggregation

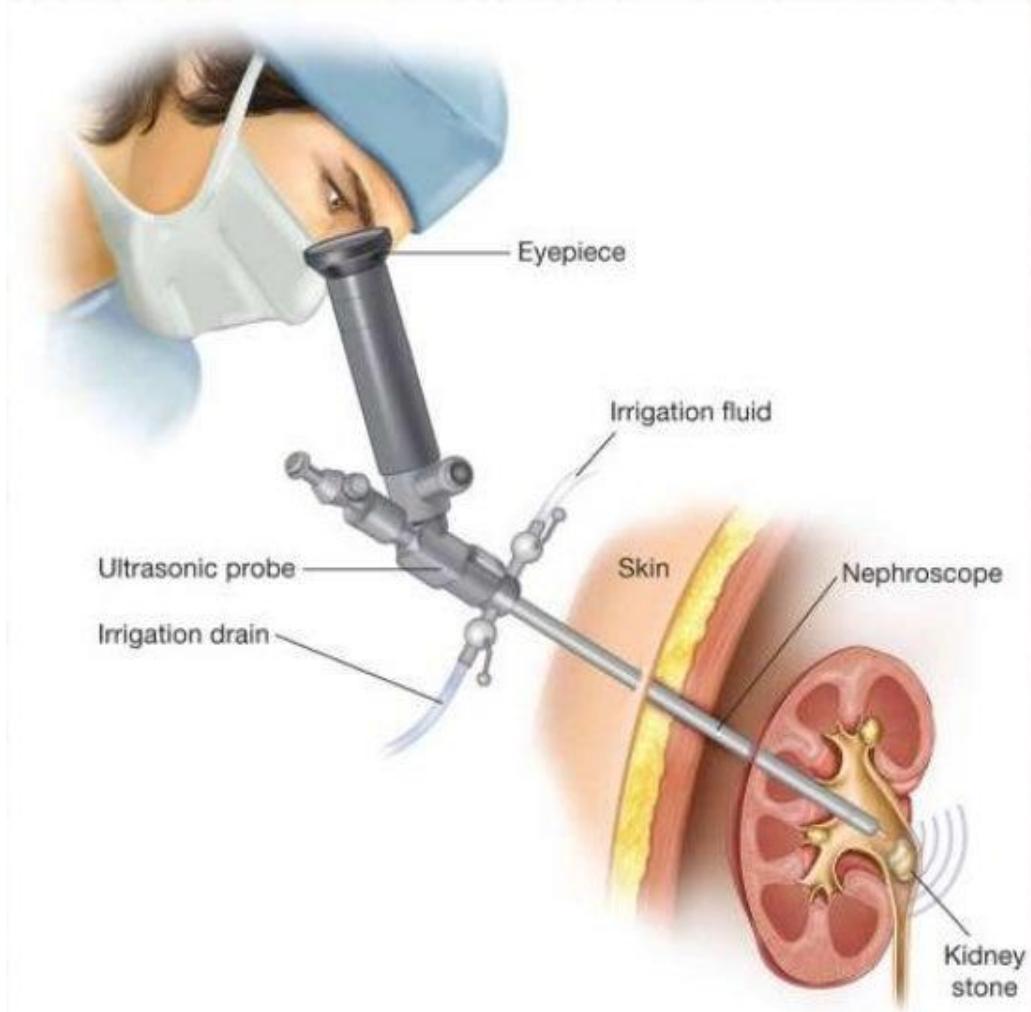


TREATMENT & PREVENTION

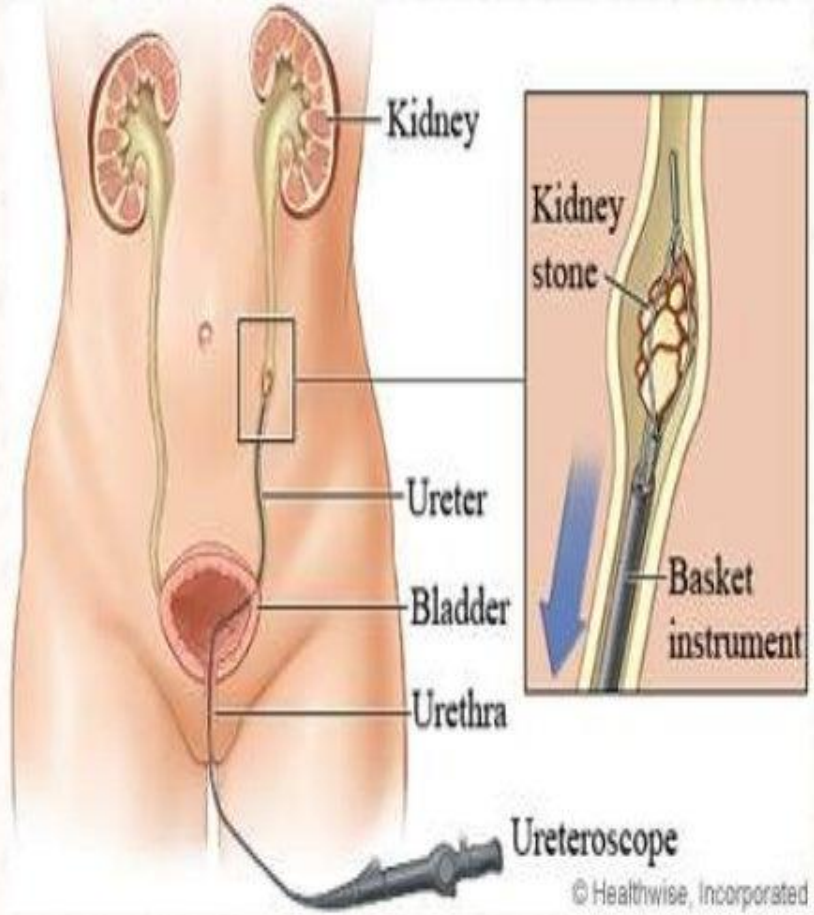
Acute Treatment:

- Pain Medication!!
- Strain urine for stones
- Keep Hydrated
- Ambulation
- Diet Restrictions
- Emotional Support
- Invasive Procedure (may be necessary)





Lithotripsy



Basket Extraction

PREVENTION

- **Hydration**
  - Drink 3 liters of fluid per day (14 cups)
  - Ideally water
  - Lemonade (citrate decrease stone formation)
- **Diet**
  - Low sodium & calcium intake.
  - Avoid intake of oxalate-containing foods (eg, spinach,strawberries, rhubarb, tea, peanuts, wheat bran).
  - Low protein intake is required.
- **Exercise/Increase Activity**

  -Avoid activities leading to sudden increases in environmental temperatures that may cause excessive sweating and dehydration.

EAT WELL, STAY WELL....

Home Remedies for Kidney Stones

Drink plenty of coconut and barley water regularly.

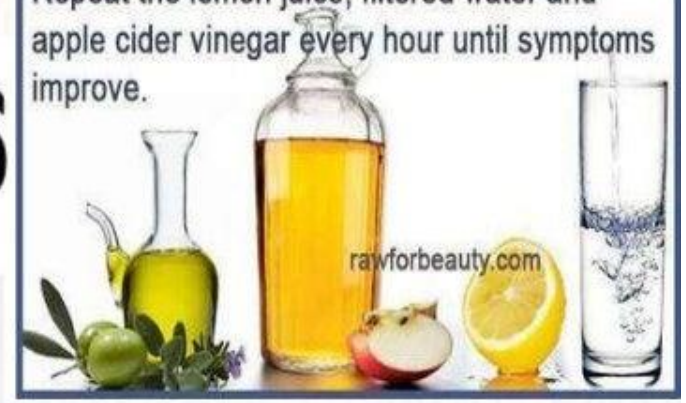
Avoid eating meat products, poultry and fish.

Have fresh ripe apples, melons and grapes.

Avoid foods with vitamin D, antacids and calcium base.

Dissolve Kidney Stones Recipe:

At first symptom of stone pain, mix 2 oz. of olive oil and 2 oz. of lemon juice. Drink straight and follow with 12 oz. of filtered water.
Wait 30 minutes.
Squeeze the juice of half a lemon into 12 oz. of filtered water, add one Tbsp. apple cider vinegar and drink.
Repeat the lemon juice, filtered water and apple cider vinegar every hour until symptoms improve.



In a meeting of the World Kidney Day Steering Committee in September 2023, the theme of WKD 2024 was decided as 'Kidney Health for All - Advancing Equitable Access to Care and Optimal Medication Practice'.

LOVE YOUR kidneys

Thank you