



**Dr. Muddassar Sharif Bhatti**  
**Department of Paediatrics**  
**BBH Rawalpindi**



*RICKETS-*

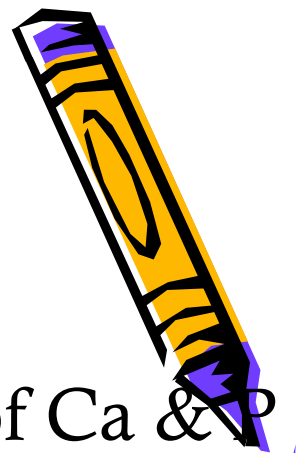
*'WRICKKEN'- TO TWIST*

It is the failure in mineralization of growing bone or osteoid tissue.



# FUNCTIONS OF VIT.D

- Facilitation of intestinal absorption of Ca & P
- Reabsorption of P in the kidneys and
- A direct effect on mineral metabolism of bone (deposition & reabsorption)
- In conjunction with parathormone and calcitonin, homeostasis of Ca & P in body fluids and tissues.



# Pathology

Vit. D deficiency



Decrease in serum calcium & phosphate



Lack of normal growth of epiphyseal cartilage & its calcification



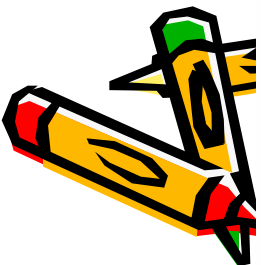
Growth at distal end of epiphyseal plate continues



epiphyseal plate is enlarged & swollen due to accumulation of osteoid tissue



Wide irregular, frayed end of shaft of long bone is produced



## Metabolism of Vit.D

Two forms of vitamin D are of practical importance.

Vitamin D<sub>2</sub> , or **calciferol**,

Vitamin D<sub>3</sub> , (naturally present in human skin in the provitamin stage as 7-dehydrocholesterol.)

↓  
activated photochemically

↓  
Cholecalciferol

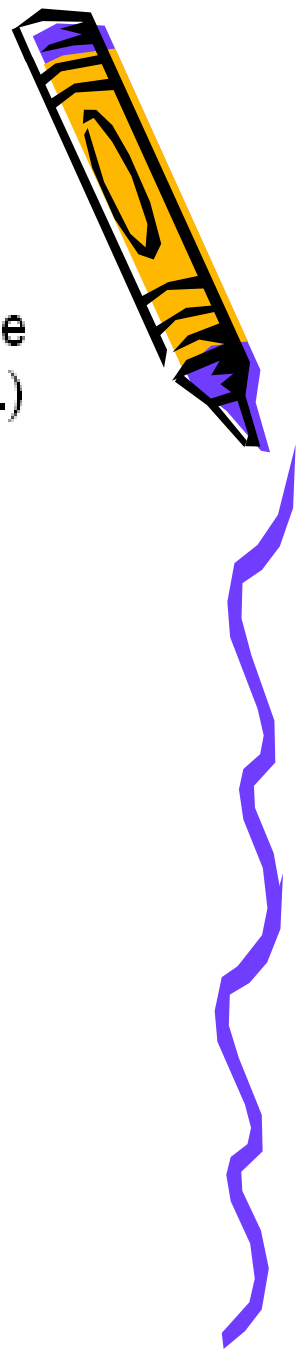
↓  
hydroxylated in the liver

↓  
25-OH-cholecalciferol

↓  
hydroxylated in the renal cortical cells

↓  
1, 25-dihydroxycholecalciferol,

↓  
which functions as a hormone.



# ETIOLOGICAL CLASSIFICATION

1. **Nutritional rickets**
2. **Intestinal malabsorbtion**
3. **Hepatic rickets**
4. **Renal rickets**

- \*Chronic renal failure
- \*Renal tubular acidosis
- \*Fanconi's syndrome

5. **Hereditary**

- \*Hereditary type I Vit.D resistant rickets-
- \*Hereditary type II Vit.D dependant rickets-
- \*Familial X-linked hypophosphatemic rickets.



# CLINICAL FEATURES

## GENERAL

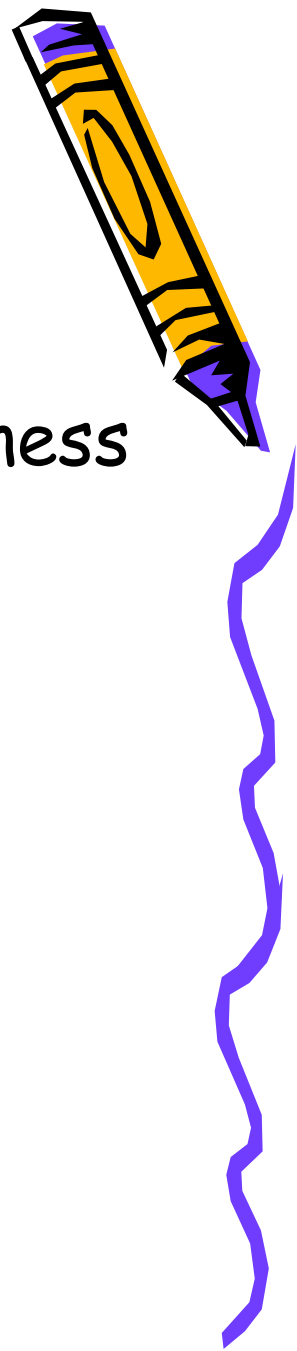
Failure to thrive, Listlessness  
Protuding abdomen, Muscle weakness  
Fractures

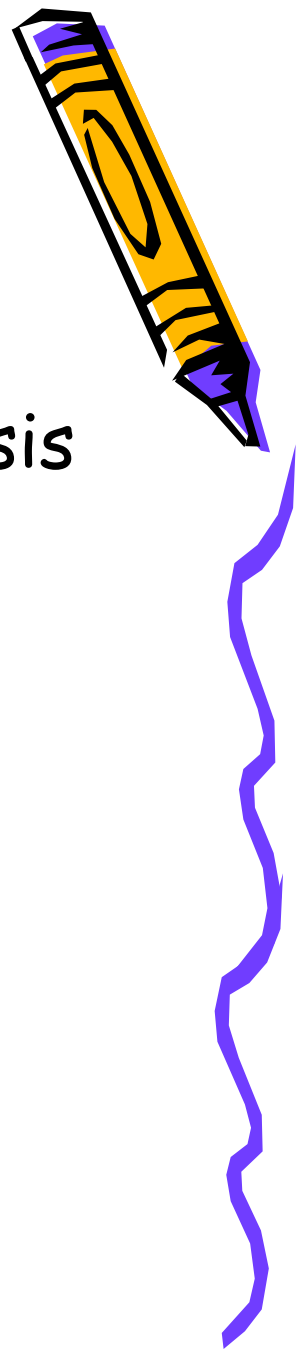
## HYPOCALCEMIC SYMPTOMS

Tetany, Seizures  
Stridor due to laryngeal spasm

## HEAD

Craniotabes, Frontal bossing  
Delayed fontanelle closure  
Delayed dentition





## **CHEST**

Rachitic rosary, Harrison groove  
Respiratory infections and atelectasis

## **BACK**

Scoliosis, Kyphosis, Lordosis

## **EXTREMITIES**

Enlargement of wrists and ankles  
Valgus or varus deformities  
Bowling of Legs



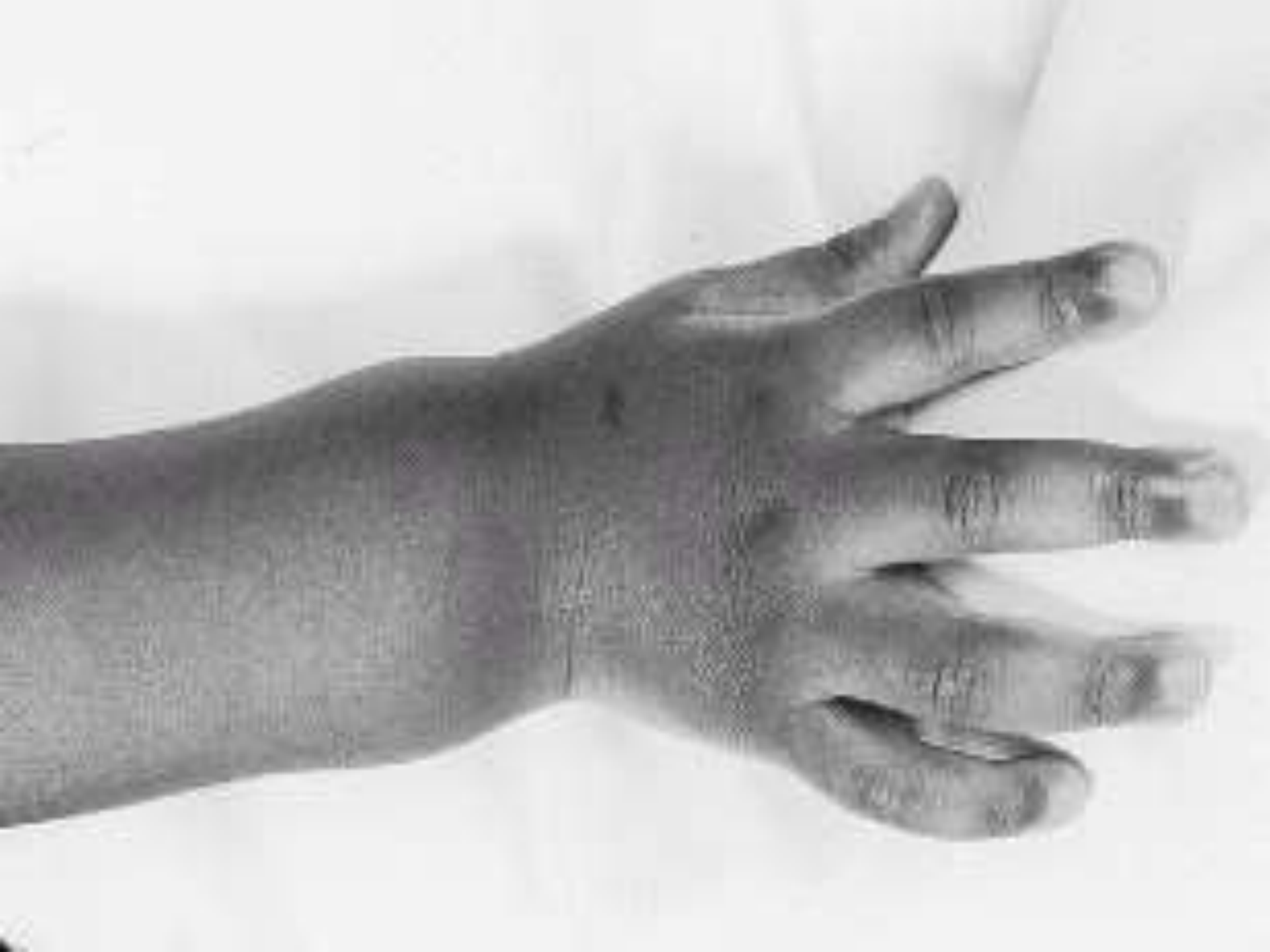


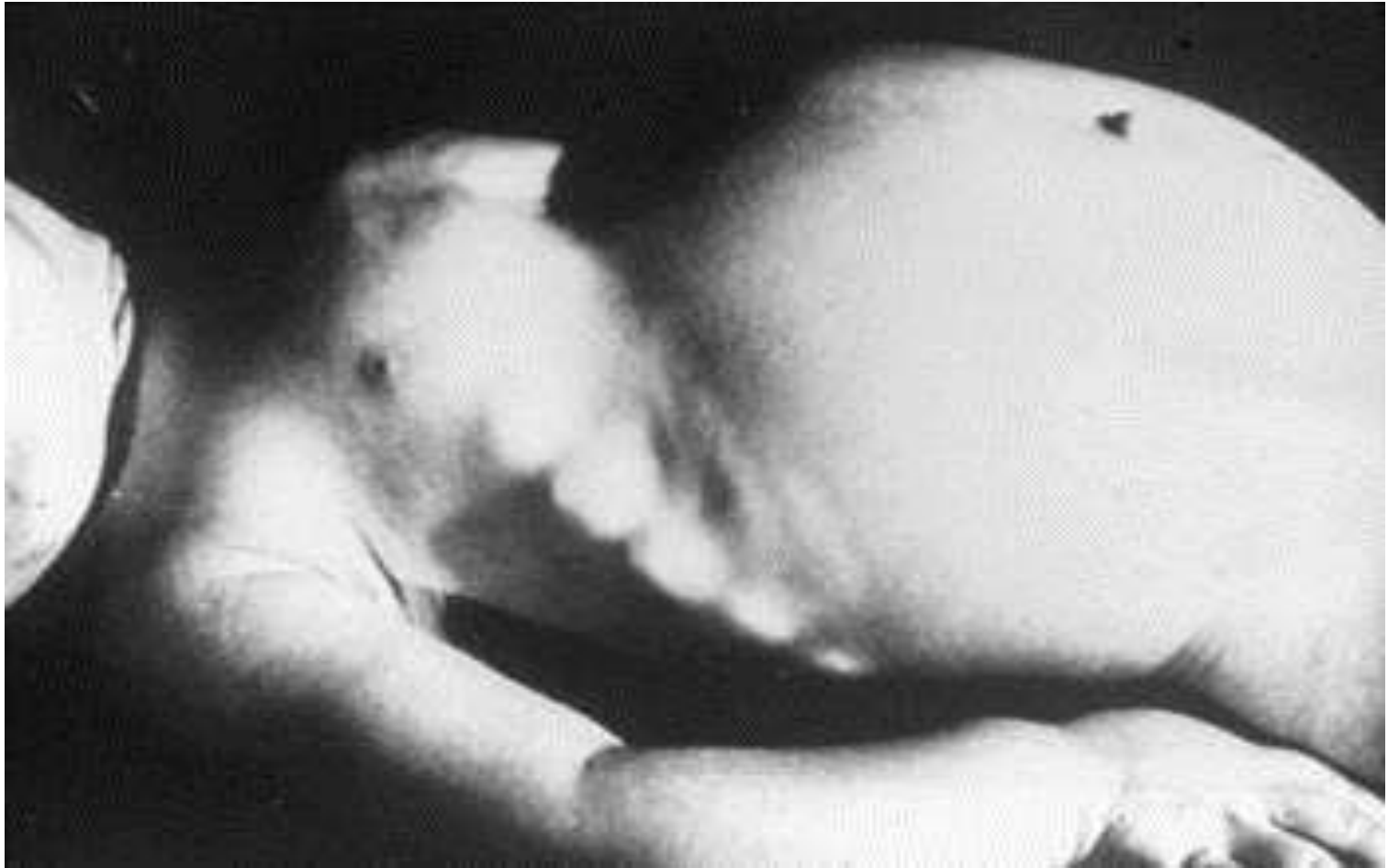
## Diagnosis:

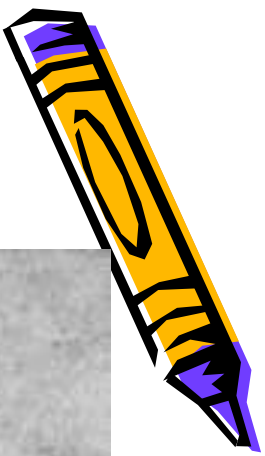
X-Ray wrist- Fraying, flaring & Cupping of the epiphysis of long bones.

The serum Ca, P, Alk. Phosphatase

Serum Calcium	Serum phosphate	Serum alkaline phosphatase	Vit.D	PTH
↓	↓	↑	↓	↑











# DIFFERENTIAL DIAGNOSIS:

1. **Craniotabes** - hydrocephalus and OI
2. **Enlargement of the costochondral junctions**  
scurvy & chondrodystrophy.
3. **Other epiphyseal lesions**  
Blounts disease  
Renal osteodystrophy



# PREVENTION:

- \*Exposure to ultraviolet light or oral Vit.D
- \*The daily requirement of Vit. D is 10 mg or 400IU.
- \*Premature infants or breast-fed infants whose mothers are not exposed to adequate sunlight should receive supplemental vitamin D daily.
- \*Vitamin D should also be administered to pregnant & lactating mothers



# TREATMENT:

1. **Inj. Vit.D3**- 6 Lakh units single dose

2. **Alpha Leo drops**

(I, Alpha hydroxy cholecalciferol)--liver--  
I,25 dihydroxy cholecalciferol

Drops-0.1ug(2ug/ml)

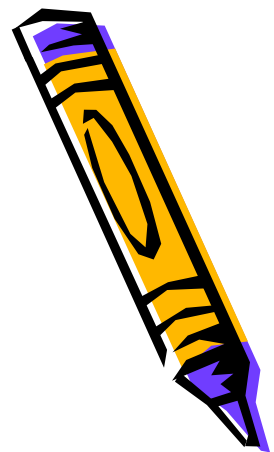
Solution-0.2ug/ml

Injection- 2ug/ml I/v

Dose <20Kg -- 0.05ug/Kg/day

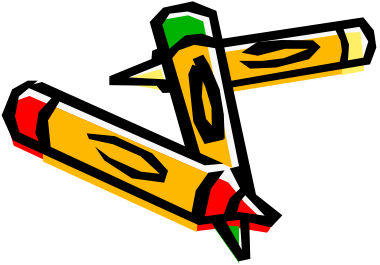
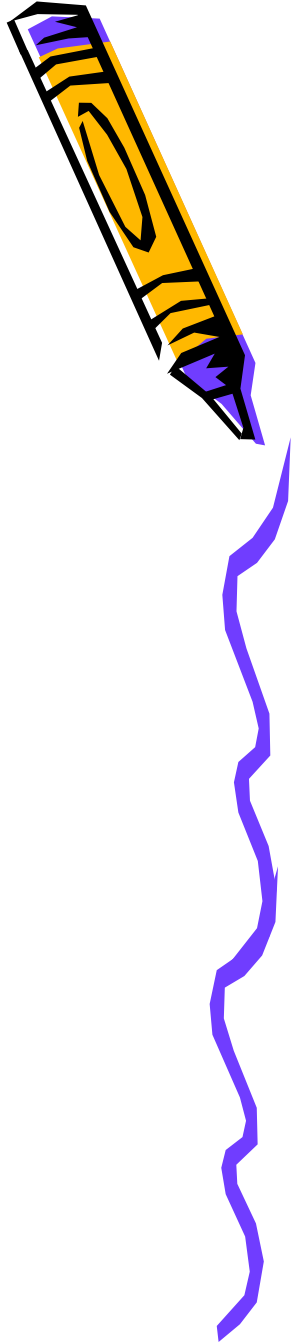
>20Kg -- 1ug/day

Healing on X-ray within 2-4 wks





zone of  
preparatory  
calcification

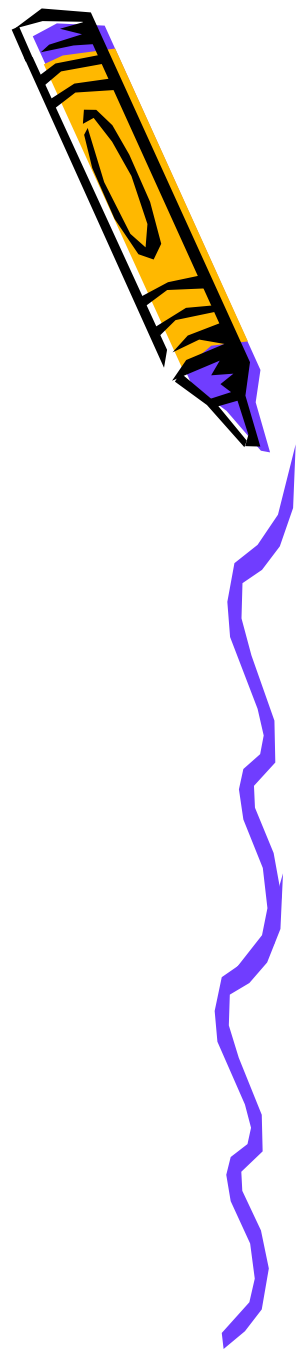


# COMPLICATIONS:

\*Respiratory infections

\*Anemia

\*CPVD



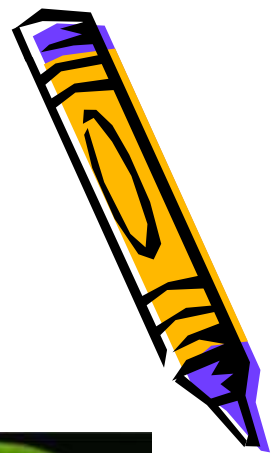
## PROGNOSIS:

Healing begins within a few days and progresses slowly until the normal bony structure is restored.

Rickets in itself is not a fatal disease, but complications and intercurrent infections such as pneumonia, tuberculosis, and enteritis are more likely to cause death of rachitic children



THANK YOU





## SOURCES OF VIT. D

Exposure to sunlight (ultraviolet light);  
Fish oils, fatty fish,  
Egg yolks, and  
Vit. D–fortified formula, milk, cereals, and bread.



# Hypervitaminosis D:



\*Symptoms develop after 1-3 mo of large intakes of vitamin D.

\*Symptoms include

hypotonia, anorexia, irritability,  
constipation, polydipsia, polyuria, and pallor.  
Aortic valvular stenosis, vomiting, hypertension,  
retinopathy, & clouding of the cornea and conjunctiva may occur.

\*Hypercalcemia and hypercalciuria are notable.

\*The urine may show proteinuria.

renal damage and metastatic calcification occur.

\*X-ray of the long bones - metastatic calcification and generalized  
osteopetrosis.

