TUTORIALS

PG Residency

Pediatrics

Disorder of Bone & Joints

Smart Notes. Better Scores.

Table of Content

Neonatal Skull Swellings: The Anatomical Basis

Introduction

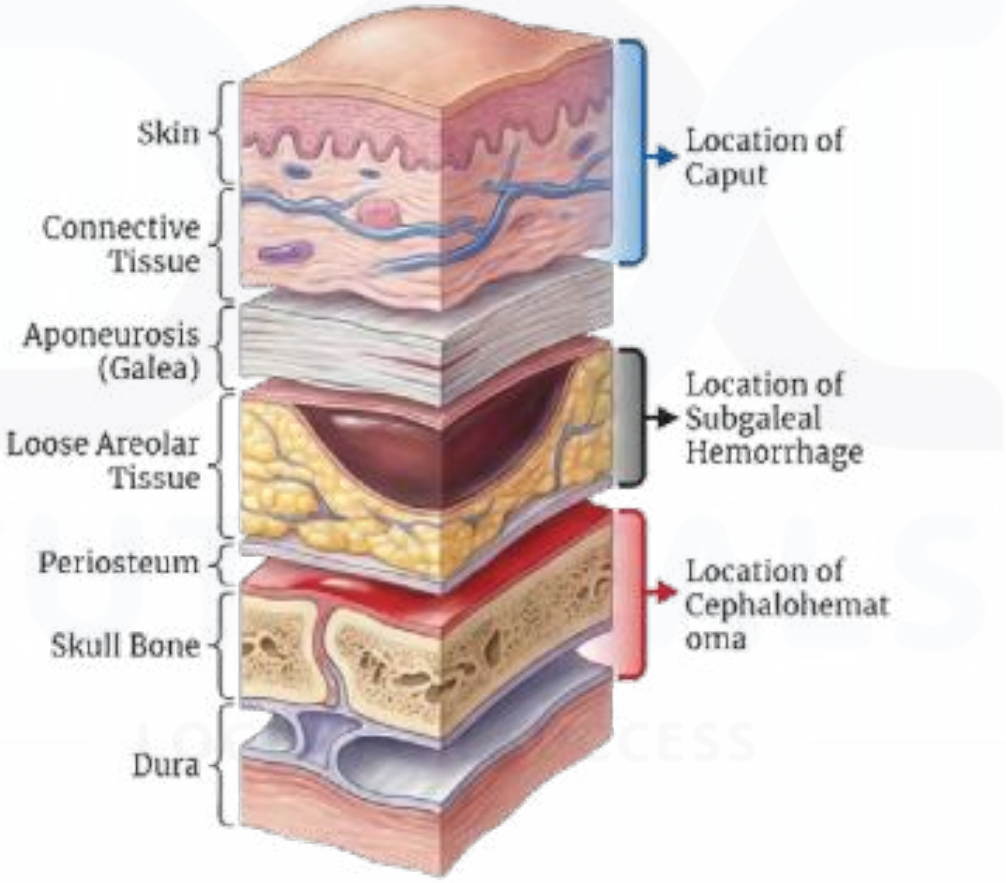
Clinical Context: Scalp swellings are frequent encounters in the first 1-2 days of life. Accurate diagnosis relies on identifying the specific anatomical layer involved.

The Three Main Pathologies:

1.Caput Succedaneum (Soft Tissue Edema)

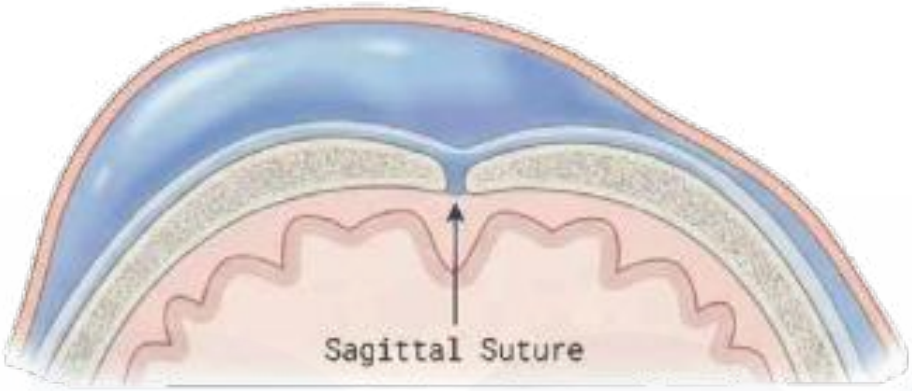
2.Cephalohematoma (Subperiosteal Bleeding)

3.Subgaleal Hemorrhage (Subaponeurotic Bleeding - Critical)



Caput Succedaneum

Benign Soft Tissue Swelling



NATURE

- **Clinical Hallmark:** Crosses midline and suture lines.
- **Pathology:** Diffuse, poorly defined soft tissue edema.
- **Timing:** Maximum size at birth. Resolves within 48-72 hours (up to 1 week).
- **Etiology:** Associated with normal vaginal delivery (vertex presentation).

MANAGEMENT

- **Management:** Supportive therapy only. No incision/ drainage.
- **Bleeding Risk:** Usually none. Rare variants include

  'Ecchymotic Caput' (bruising/jaundice risk) or

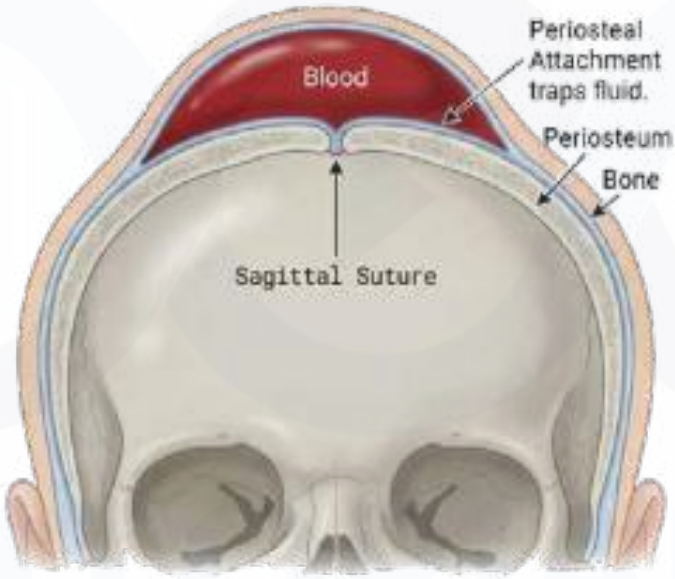
  'Hemorrhagic Caput' (Shock risk requiring transfusion).

Cephalohematoma

Bounded Subperiosteal Hemorrhage

Nature

- **Clinical Hallmark:** Well-defined, tense mass that DOES NOT cross suture lines.
- **Pathology:** Rupture of superficial veins between skull and periosteum.
- **Evolution:** Palpable rim often detected by day 2. No overlying scalp ecchymosis.
- **Resolution:** 2weeks to 3 months (may calcify).



Associations

- **Jaundice Risk:** Lysis of trapped RBCs produces bilirubin (exaggerates physiological/patho-logical jaundice).
- **Fracture Risk:** 10-25% associated with non-depressed linear skull fracture.
- **Incidence:** 1-2% of live births (common in instrumental delivery).

Subgaleal Hemorrhage

CRITICAL ALERT: Life-Threatening Pathology

Nature & Etiology

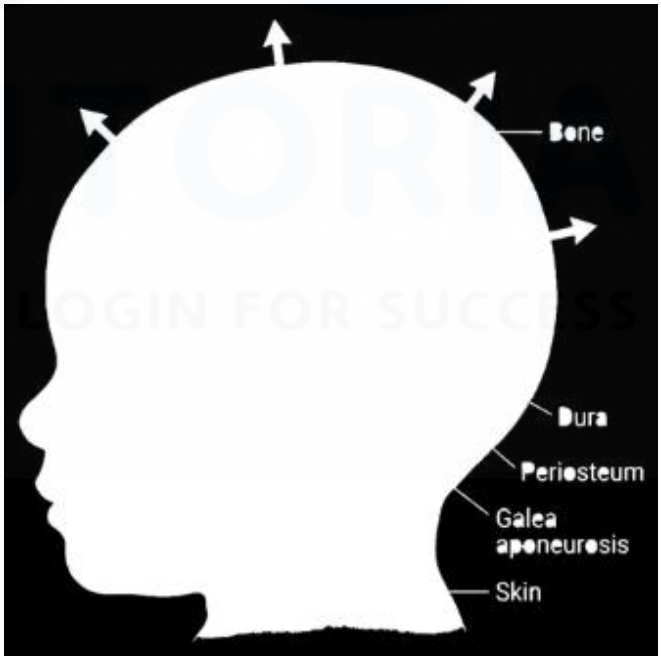
- Rupture of emissary veins (often vacuum delivery).
- **Clinical Hallmark:** Fluctuant mass that INCREASES in size after birth.
- Diffuse, boggy swelling that crosses sutures.

The Safety Non-Negotiables

- **WARNING:** Massiveblood loss into potential space leads to SHOCK.
- **Triad of Signs:** Pallor+ Fluctuant Swelling + Increasing Size.
- **Complications:** Severe anemia, jaundice, coagulopathy (e.g., hemophilia).
- **Mortality:** 12-14%ifextensive.

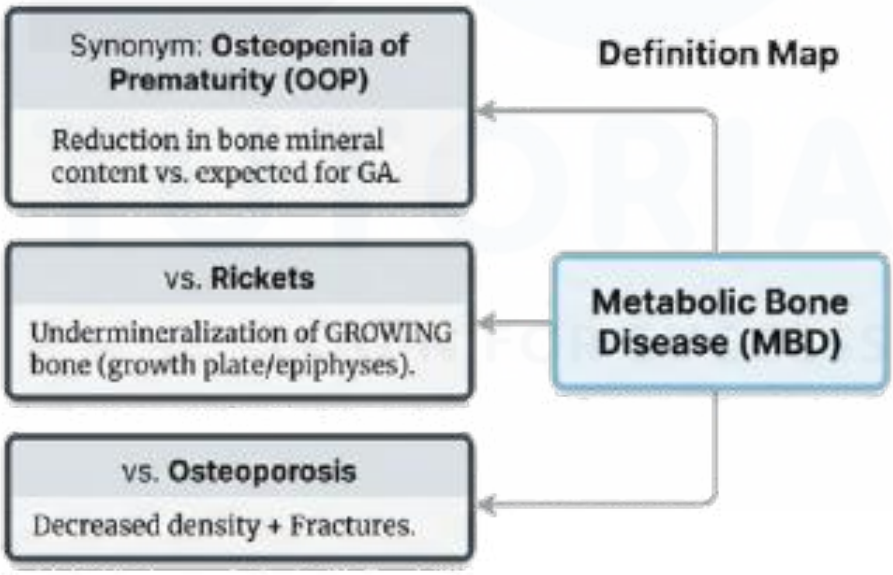
Management

- Monitor for shock and coagulopathy.
- Conservative management (do not remove swelling).



Differential Diagnosis: Neonatal Skull Swellings

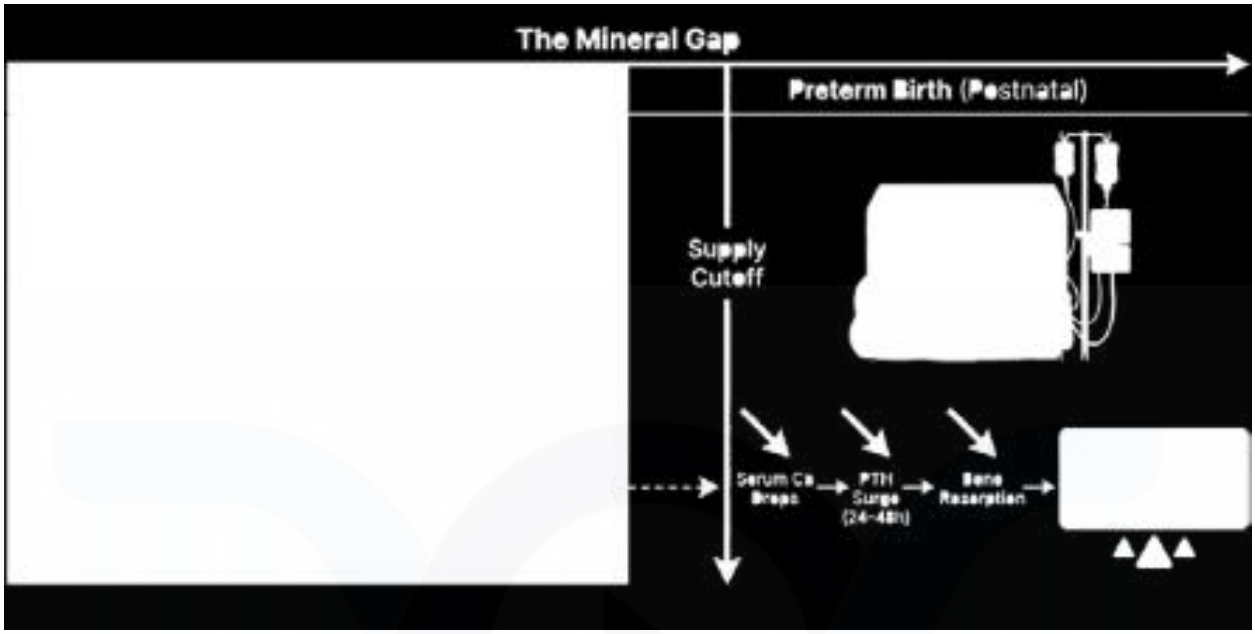
Metabolic Bone Disease (MBD) of Prematurity



Incidence & Scope

- VLBW (<1500g): **~25%** Incidence
- ELBW (<1000g): **Up to 50%** Incidence
- **Core Issue:** A lag in bone mineralization driven by prematurity constraints.

Pathophysiology: The Missing Trimester



Risk Factors for MBD

Nutritional

- **Prematurity:** Missed in -utero accretion.
- **TPN:** Hypophosphatemia (60% incidence).
- **Enteral:** Unfortified human milk is inadequate.

Medications

- **Loop Diuretics (Furosemide):** Increases renal calcium loss.
- **Glucocorticoids:** Reducesgutabsorption, inhibits formation.
- **Methylxanthines (Caffeine):** Increases renal calcium loss.

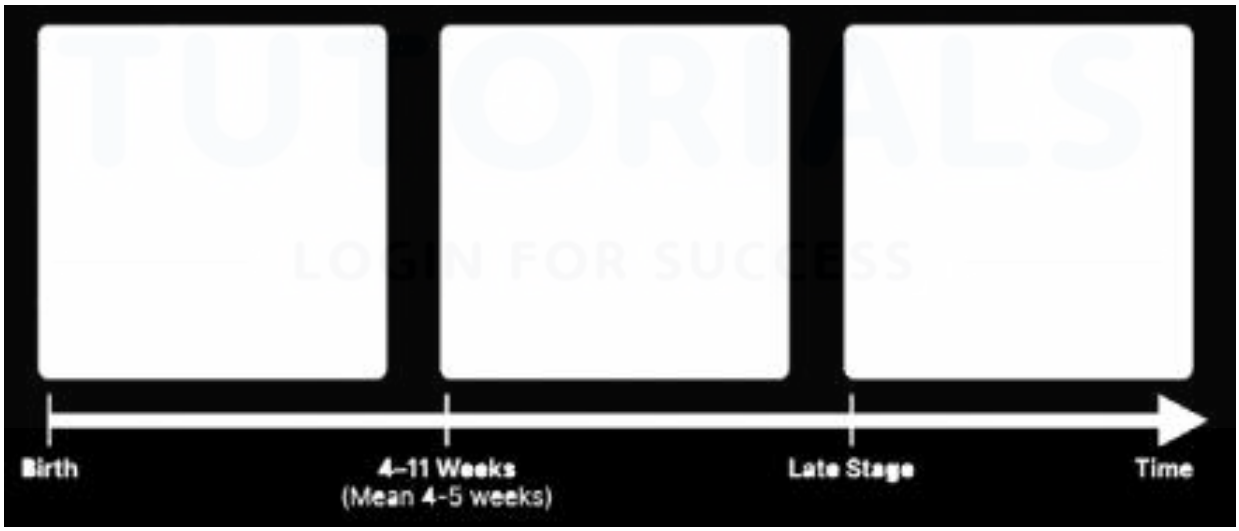
Mechanical

- **Immobility:** Reduced mechanical stimulation increases resorption.

Clinical Conditions

- **NEC:** Poorabsorption,prolonged TPN.
- **Chronic Lung Disease (BPD):** High energy needs, fluid restriction.

Clinical Presentation Timeline



Clinical signs are LATE. Significant bone loss occurs before detection.

Biochemical Diagnosis & Cutoffs

The Screeners

Alkaline Phosphatase (ALP)

>900 IU/L

With Phos <5.6 mg/dL.
High sensitivity/specificity.

Serum Phosphorus

<5.6 mg/dL

Severe: <3.5 mg/dL

Hypophosphatemia is the primary driver.

The Confirmers

Parathyroid Hormone (PTH)

>180 pg/mL

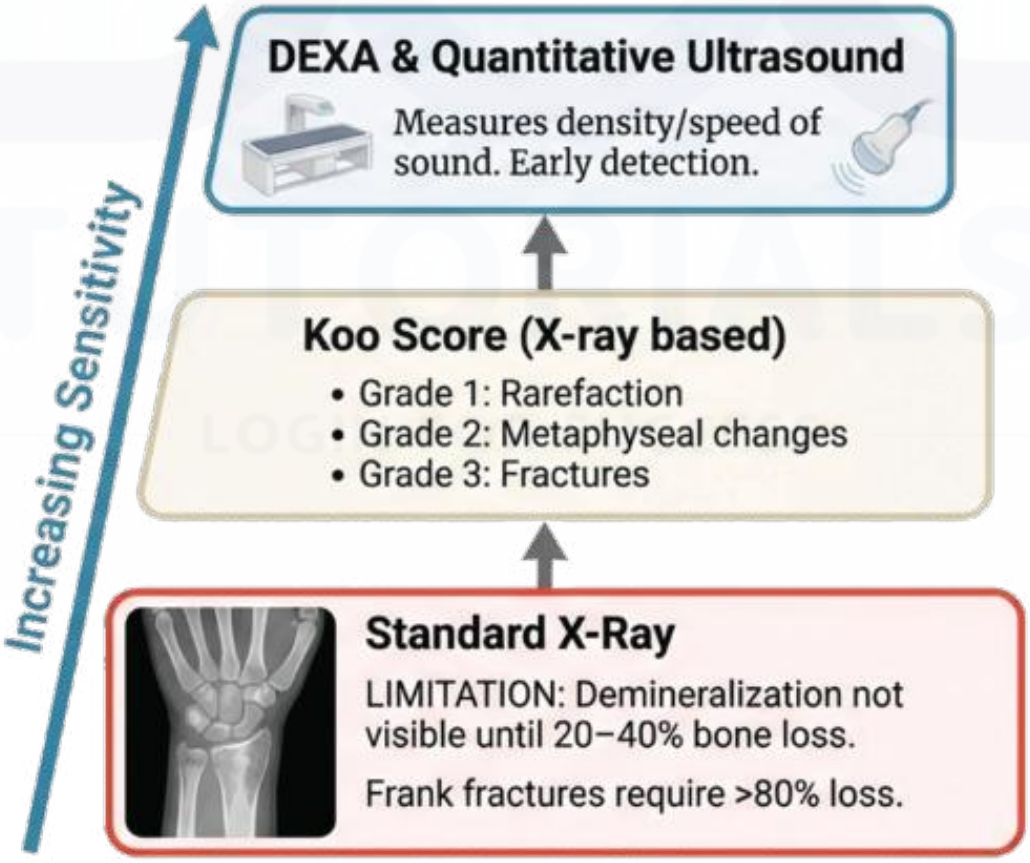
Early marker of calcium deficiency.

Tubular Reabsorption of Phosphate (TRP)

>95%

Kidney conserving Phos (Inadequate intake).

Imaging Diagnosis: Sensitivity Ladder



Nutritional Management Strategy

Goal: Mimicin-uteroaccretion.

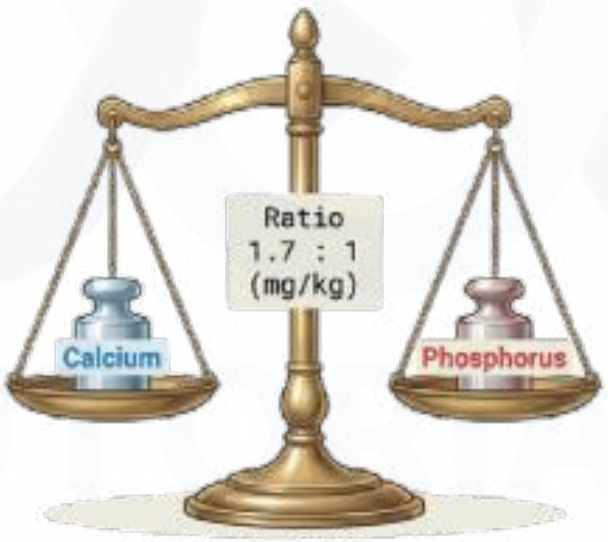
Safety Rule:Neveradminister Calcium without Phosphate for >1-2 days.

Enteral Dosing Targets (ESPGHAN 2022)

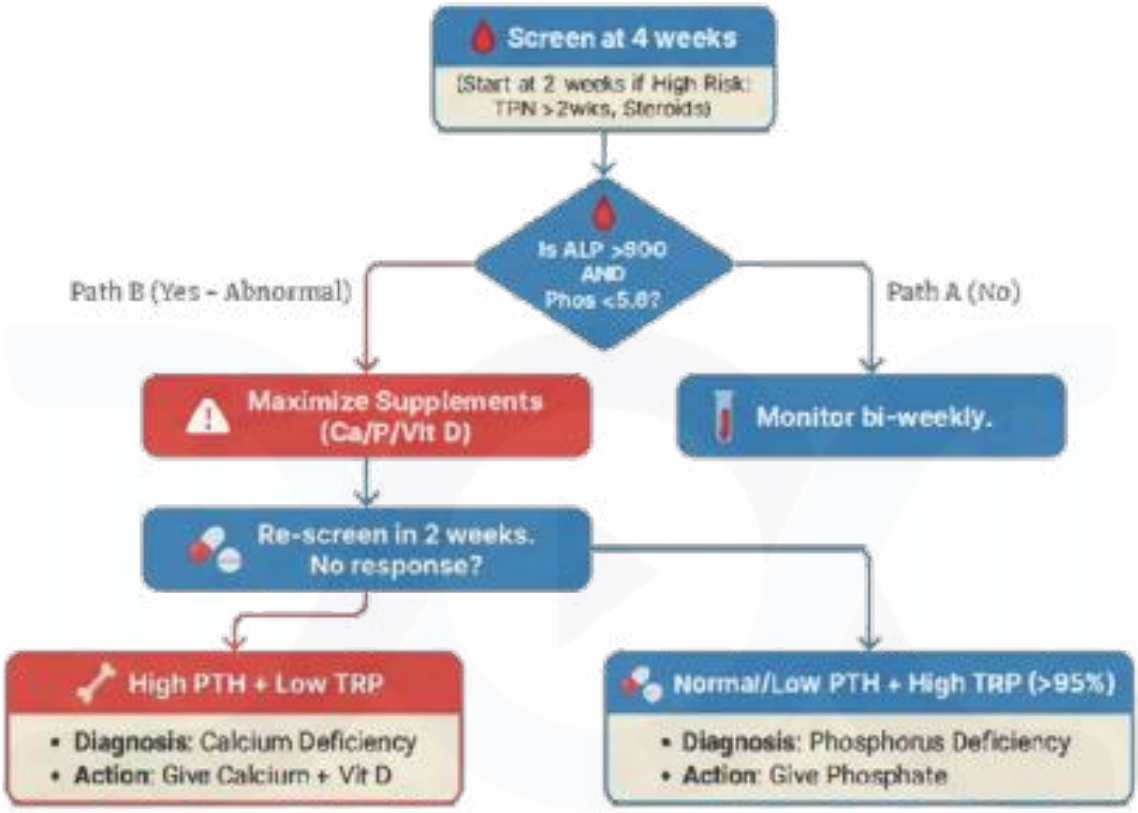
- Calcium: 120-200 mg/kg/day
- Phosphorus: 66-110 mg/kg/day
- Vitamin D: 400-700 IU/kg/day

Human Milk Fortification

- MANDATORY for <1500g birth weight.
- Unfortified milk provides only ~52 mg Ca/kg (Target is ~180).



AIIMS Screening & Treatment Algorithm



Bone Health Non-Negotiables

- **PreventionisKey:** Fortifymother's milk; unfortified milk is inadequate for VLBW.
- **Screen Early**:Startby2-4weeks; clinical signs are too late.
- **The Ratio Matters**:Maintain Ca:P ratio ~1.7:1 (mg/kg).s
- **Medication Stewardship**:Stop loop diuretics and steroids as soon as feasible.
- **Safety Rule:** Neveradminister Phosphate alone (risk of hypocalcemia).
- **Formula Choice** :Ifnobreastmilk, use Preterm Formula (not Term).

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