OSTEOPENIA PROTOCOL

**Risk Factors**

- History of non-traumatic long bone/vertebral fracture (12)
- Rickets (12)
- Osteogenesis imperfecta (12)
- Previous osteopenia diagnosis (4)
- Glucocorticoids for > 3 days (4)
- Dialysis > 4 weeks (4)
- TPN > 4 weeks (4)
- Chemical immobilization (4)
- Severe malnutrition due to malabsorption (4)
- Vacterl or DiGeorge (3)
- Prematurity < 37 weeks (3)
- Current chylothorax (3)
- History of NEC requiring surgery (3)
- Antiepileptic drug use (3)
- Proton pump inhibitor >14 days (3)
- Patients less than 1 year (3)
- Osteopenia or bone demineralization on X-ray (12)
- Cystic fibrosis (4)
- Loop diuretics >14 days (3) or >30 days (12)
- >4 weeks 3x normal creatinine (4)
- Glucocorticoids for > 3 days (4)
- Dialysis > 4 weeks (4)
- TPN > 4 weeks (4)
- Chemical immobilization (4)
- Severe malnutrition due to malabsorption (4)
- Vacterl or DiGeorge (3)
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Any patient scoring 12 pts or greater on the risk factors is at risk.
- Activate Osteopenia Risk order set in EMR
  - Alkaline Phosphatase Lab order
  - Precaution and Preventative Measures Instructions

**Precautions and Preventative Measures**

- RN to initiate safe handling precautions (safe handling sign at bedside, fragile sign at door, apply cushion to side rail as applicable for age of child)
- RN to educate patient family regarding safe patient handling
- RN to notify ancillary staff of risk when patient off unit
- RT to discuss risk vs. benefit with attending if utilizing CPT
- Dietitian to ensure optimum Vitamin D, Calcium and Phosphorous intake.
- Consider thiazide diuretic if giving loop diuretics to decrease overall need for loop diuretics
- Metabolic bone consultation if alkaline phosphatase is > 500 U/L

Consider PT evaluation if the following criteria are met:
- Patient is medically stable, able to begin out-of-bed activity and is not doing so on a regular basis
- Patient is older than 12 months and is not able to bear weight to lower extremities

Consider OT evaluation if the following criteria is met:
- Patient is medically stable, able to perform ADLS and has not been doing so without assistance

**Screening Tests**

- Initial lab test Alk Phos
- If <500U/L, recheck every 2 weeks
- If >500U/L, further labs are needed: Urine Calcium, Serum 25(OH) D, Serum Calcium, Serum Phosphorus and iPTH

**Goals:**

- Alkaline Phosphatase <500U/L
- Serum Total Calcium: >9mg/dL
- Serum Phosphorus: 5-6.5mg/dL
- iPTH: 10-89 pg/mL
- Vitamin D 25(OH): >32ng/ml
- Urine Calcium/Creatinine Ratio: < 7mo (<0.86 mg/mg); 7 mo to 18 mo (<0.60 mg/mg); 19 mo to 6 yrs: (<0.42mg/mg); >19yrs (<0.22 mg/mg).
- Complete xray if suspected fracture

**Disclaimer:** Pathways are intended as a guide for practitioners and do not indicate an exclusive course of treatment, nor serve as a standard of medical care. These pathways should be adapted by medical providers, when indicated, based on their professional judgment and taking into account individual patient and family circumstances.

Updated 11/12/18
If all labs are normal

- Dieticians to perform risk level on regular assessment.
- Check Alkaline Phosphatase every two weeks
- If patient was previously at risk, remove from risk list and signage from room

>500 U/L Alkaline Phosphatase

- Check Urine Calcium, Serum 25(OH) D, Serum Calcium, Serum Phosphorus and iPTH
- Consult Metabolic Bone

Low Serum Calcium, Vitamin D, or Phosphorous level

- Dietitian to maximize nutritional supplementation

Elevated Ca/Creatinine Ratio

- Renal Ultrasound
  - If abnormal, consult Nephrology

Follow up

For patients who receive an Metabolic Bone consult during their stay, an outpatient metabolic bone follow-up visit should be scheduled before discharge.

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