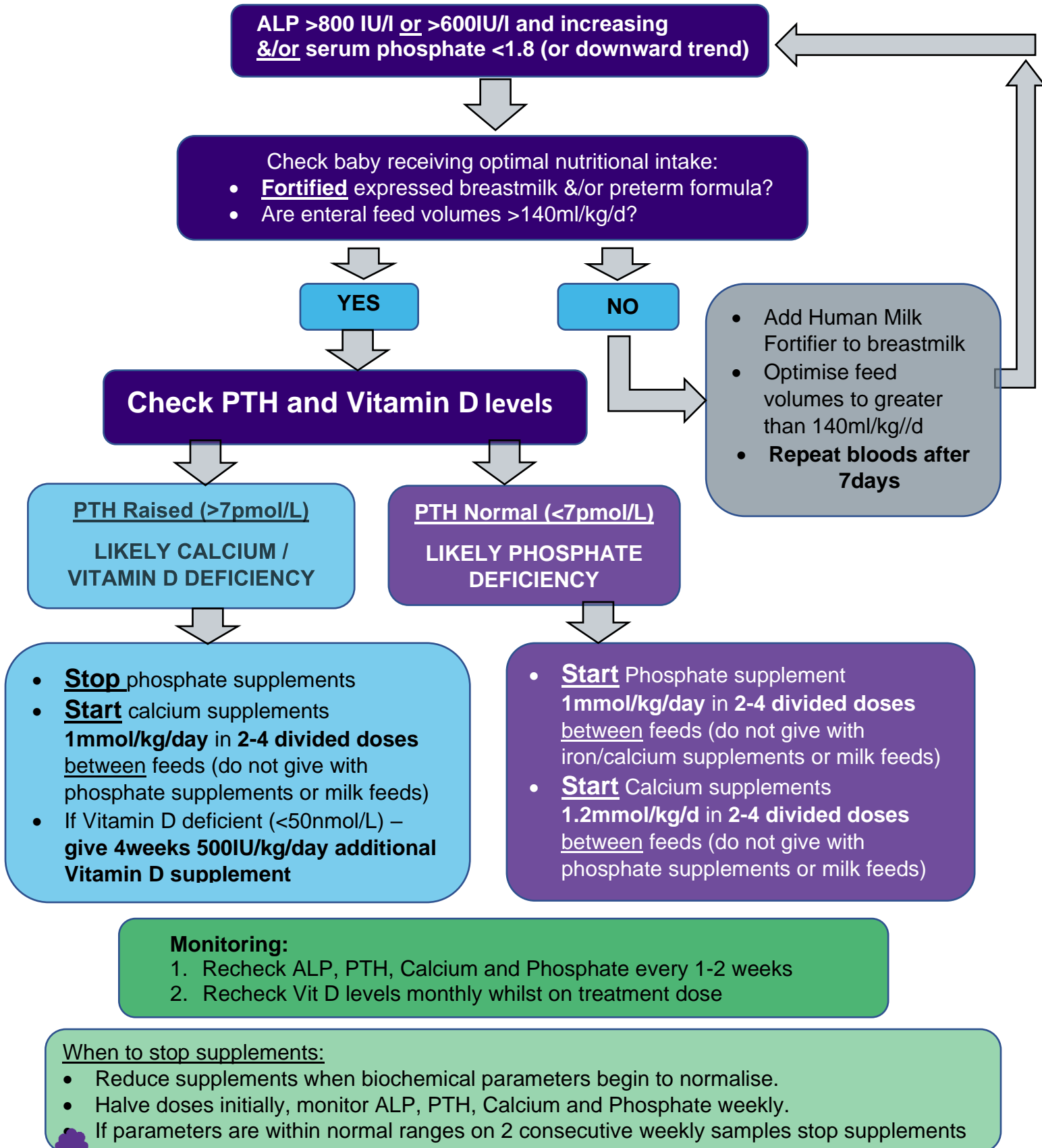# Nutritional Management of Metabolic Bone Disease

(Enteral Feeding Only)

Please refer to network guidelines for further information and guidance.

**ALP >800 IU/l or >600IU/l and increasing
&/or serum phosphate <1.8 (or downward trend)**

↓

Check baby receiving optimal nutritional intake:
- **Fortified** expressed breastmilk &/or preterm formula?
- Are enteral feed volumes >140ml/kg/d?

YES → **Check PTH and Vitamin D levels**

NO →
- Add Human Milk Fortifier to breastmilk
- Optimise feed volumes to greater than 140ml/kg//d
- **Repeat bloods after 7days**

PTH Raised (>7pmol/L)
LIKELY CALCIUM / VITAMIN D DEFICIENCY

- **Stop** phosphate supplements
- **Start** calcium supplements **1mmol/kg/day** in **2-4 divided doses** between feeds (do not give with phosphate supplements or milk feeds)
- If Vitamin D deficient (<50nmol/L) – **give 4weeks 500IU/kg/day additional Vitamin D supplement**

PTH Normal (<7pmol/L)
LIKELY PHOSPHATE DEFICIENCY

- **Start** Phosphate supplement **1mmol/kg/day** in **2-4 divided doses** between feeds (do not give with iron/calcium supplements or milk feeds)
- **Start** Calcium supplements **1.2mmol/kg/d** in **2-4 divided doses** between feeds (do not give with phosphate supplements or milk feeds)

Monitoring:
1. Recheck ALP, PTH, Calcium and Phosphate every 1-2 weeks
2. Recheck Vit D levels monthly whilst on treatment dose

When to stop supplements:
- Reduce supplements when biochemical parameters begin to normalise.
- Halve doses initially, monitor ALP, PTH, Calcium and Phosphate weekly.
- If parameters are within normal ranges on 2 consecutive weekly samples stop supplements

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Recommended screening for MBDP (adapted from Chinoy et al, 2019)

At risk groups **Who**	**Preterm: gestational age less than 28 weeks.**
	Low birth weight: less than 1500 g.
	Parenteral nutrition for over 2 weeks.
	Chronic lung disease/bronchopulmonary dysplasia.
	Necrotising enterocolitis.
	Prolonged prescribing of glucocorticoids, antacids or loop diuretics.
Screening **when**	**From 2–3 weeks of age.**
	1–2 weekly depending on degree of risk.
Screening **what**	**Bone profile: serum ALP, phosphate and adjusted calcium.**

References:

- Metabolic Bone Disease. West Midlands Neonatal Bedside Guidelines 2022-24
- Chinoy A, Mughal MZ, Padidela R. Metabolic bone disease of prematurity: causes, recognition, prevention, treatment and long-term consequences. Arch Dis Child Fetal Neonatal Ed. 2019 Sep;104(5):F560-F566. doi: 10.1136/archdischild-2018-316330. Epub 2019 May 11.
- Rayannavar A, Calabria AC. Screening for Metabolic Bone Disease of prematurity. Semin Fetal Neonatal Med. 2020 Feb;25(1):101086. doi: 10.1016/j.siny.2020.101086. Epub 2020 Jan 16. PMID: 32081592.
- Embleton, Nicholas et al. Enteral Nutrition in Preterm Infants (2022): A Position Paper from the ESPGHAN Committee on Nutrition and invited experts. Journal of Pediatric Gastroenterology and Nutrition ():10.1097/MPG.0000000000003642, October 21, 2022.

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