



## KNOW THE SIGNS & SYMPTOMS

Hypophosphatasia (HPP) and Low Alkaline Phosphatase (Alk Phos)

# Could it be HPP?

**For some difficult-to-diagnose patients, symptoms may appear perplexing on their own. However, making the connection could lead to a diagnosis of HPP.<sup>1</sup>**

If you have adolescent or adult patients like this, review the following questions about potential symptoms and experiences. Select the relevant factors for more details to help determine whether you should consider a diagnosis of HPP.

**START**



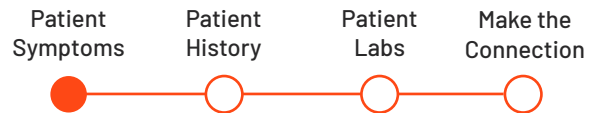
# Q.1 Patient Symptoms

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Have your patients reported experiencing any of the following?

(Select all that apply)

Bone/muscle pain	Limited mobility	Interruption of daily activities



# Q.2 Patient History

Exploring your patients' history may provide additional clues to help you make a proper diagnosis.<sup>1</sup> Have they had, or do they have, any of the following?

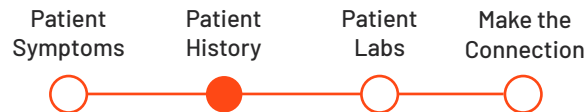
(Select all that apply)

Poor dentition or dental symptoms, including premature tooth loss occurring before the age of 5

Lack of response to common treatments for other conditions (possible misdiagnoses)

Growth and developmental delays or complications

Personal or family history of unusual fracturing

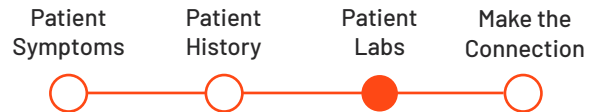


# Q.3 Patient Labs

Look for a value on a comprehensive metabolic panel (CMP). For each patient you're considering, which of the following applies?

Adult

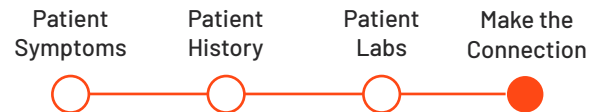
Pediatric (under 18)



**CONNECTION TO HPP** →

# Connecting perplexing symptoms to low alkaline phosphatase may lead to a hypophosphatasia (HPP) diagnosis.<sup>1</sup>

This value on a CMP could be the crucial diagnostic factor you need for solving those puzzling cases. Looking for low alkaline phosphatase may help you correctly identify HPP as the cause of your patient's perplexing symptoms.<sup>1,4,5</sup>

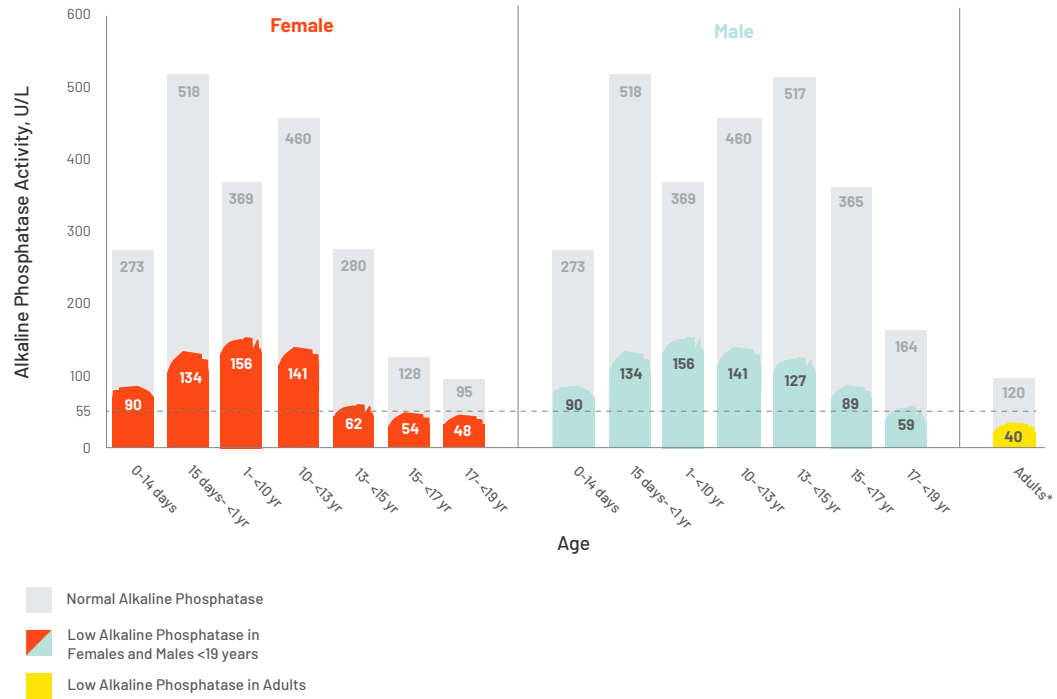


# Alkaline phosphatase plays an important role in bone mineralization and development.<sup>1</sup>

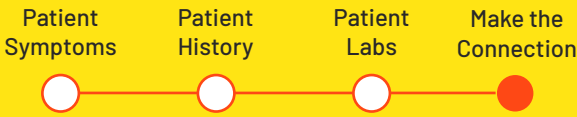
Reduced levels of this enzyme activity causes an increase of substrates which leads to a disruption of bone mineralization. This makes it difficult to build strong, healthy bone. The excess substrates and disrupted bone growth result in the life-limiting symptoms your patients experience.

In HPP, a patient's alk phos values will be persistently low throughout their entire life.<sup>1</sup>

Age- & Sex-Adjusted Alk Phos Reference Intervals (U/L)<sup>4-9</sup>



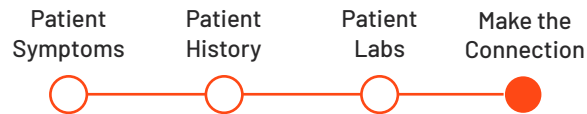
\*Check with your lab for their appropriate age- and sex- adjusted reference range.



# If you suspect that one of your current patients has hypophosphatasia (HPP), check their CMP history.

A persistently low alkaline phosphatase value of  $<40$  U/L\* for adults suggests an HPP diagnosis.<sup>4-9</sup>

GET MORE INFORMATION ABOUT LOW ALK PHOS →



\*Limitations: An alk phos level of below 40 U/L is not conclusive for diagnosis of HPP. Patient should be evaluated for other symptoms of HPP and differential diagnoses should be ruled out. Check with your lab for their appropriate age- and sex- adjusted reference range.

**References:** 1. Bianchi ML, Bishop NJ, Guañabens N, et al. Hypophosphatasia in adolescents and adults: overview of diagnosis and treatment. *Osteoporos Int.* 2020;31(8):1445-1460. 2. Weber TJ, Sawyer EK, Moseley S, Odrlijin T, Kishnani PS. Burden of disease in adult patients with hypophosphatasia: results from two patient-reported surveys. *Metabolism.* 2016;65(10):1522-1530. 3. Weber TJ, Sawyer EK, Moseley S, Odrlijin T, Kishnani PS. Burden of disease in adult patients with hypophosphatasia: results from patient-reported outcome surveys. Poster presented at: The Endocrine Society's 97th Annual Meeting; March 5-8, 2015; San Diego, CA, USA. 4. Adeli K, Higgins V, Nieuwesteeg M, et al. Biochemical marker reference values across pediatric, adult, and geriatric ages: establishment of robust pediatric and adult reference intervals on the basis of the Canadian Health Measures Survey. *Clin Chem.* 2015;61(8):1049-1062. 5. Schumann G, Klauke R, Canalias F, et al. IFCC primary reference procedures for the measurement of catalytic activity concentrations of enzymes at 37 degrees C. Part 9: reference procedure for the measurement of catalytic concentration of alkaline phosphatase International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) Scientific Division, Committee on Reference Systems of Enzymes (C-RSE)(1). *Clin Chem Lab Med.* 2011;49(9):1439-1446. 6. Quest Diagnostics. Alkaline phosphatase. Accessed January 25, 2021. <https://testdirectory.questdiagnostics.com/test/test-detail/234/alkaline-phosphatase?cc=MASTER> 7. Labcorp. Alkaline phosphatase. Updated December 16, 2019. Accessed January 25, 2021. <https://www.labcorp.com/tests/001107/alkaline-phosphatase> 8. ARUP Laboratories. Alkaline phosphatase isoenzymes, serum or plasma. Accessed January 25, 2021. <https://ltd.aruplab.com/Tests/Pub/0021020> 9. Colantonio DA, Kyriakopoulou L, Chan MK, et al. Closing the gaps in pediatric laboratory reference intervals: a CALIPER database of 40 biochemical markers in a healthy and multiethnic population of children. *Clin Chem.* 2012;58(5):854-868.