deciphehr™

connecting the dots of rare disease

HYPOPHOSPHATASIA (HPP)

A disease too important to miss

Rare diseases, like HPP, pose unique challenges in the recognition of affected patients. As a result, critical diagnoses can be delayed or missed.[1,2] **deciphEHR** provides educational resources to help health systems, hospitals, and specialty practices leverage their electronic health record (EHR) systems to help triage suspect patients for further clinician evaluation and employ diagnostic best practices.

Why is HPP patient recognition so important?

It is a **serious condition** that may lead to death in infants or young children or to severe physical impairment at any age.[2,3]

It is associated with **delayed diagnosis**, which may be due to its rarity and heterogeneous presentation.[2]

HPP can present at any age, from infancy through adulthood, causing varying degrees of impairment.[2]

Taking action is important. In rare diseases, missed or delayed diagnoses may potentially increase mistreatment, morbidity, and healthcare costs.[4]

Consult the *HPP Program Implementation Guide* or visit deciphEHRrare.com to get started.

HPP is a serious, multisystemic condition[3]

HPP is a serious and rare metabolic bone disease caused by deficient alkaline phosphatase (ALP) enzyme activity.[5]

Severe HPP occurs in 1:300,000 births and milder HPP has been reported by some sources to occur in up to 1:6,370 birth.[6]

The overall incidence and prevalence of all forms of HPP is not known.[7]

*Not an exhaustive list.

†Symptoms commonly seen in infants and young children.

HPP IS A HETEROGENOUS DISEASE. SIGNS AND SYMPTOMS CAN INCLUDE*†:

SKELETAL[5,8-10]	Bone/joint pain, fractures, rickets, osteomalacia, pseudofractures, osteopenia
DEVELOPMENT/ GROWTH[5,8]	Skeletal deformities, bowing, short stature
RESPIRATORY[5,11-13]	Chest deformities and improper development of ribs, difficulty breathing and the need for breathing support,† respiratory failure†
NEUROLOGIC[14]	Seizures,† fatigue, headache, sleep disturbances, mood disorder
RENAL[5,9,15]	Hypercalcemia, hypercalciuria, nephrocalcinosis
MUSCULAR[5]	Muscle pain or weakness, waddling gait, difficulty walking
DENTAL[5]	Premature tooth loss, abnormal dentition, periodontal disease

HPP is often underrecognized because the signs and symptoms overlap with other skeletal dysplasias.[5,16]

Mortality is high in patients who present during the perinatal and infantile periods[3]

The mortality rate in infantile HPP has been estimated at **approximately 50%** in the first year.[3]

Untreated severe HPP is associated with **73% mortality by age 5 years** due to respiratory failure and other complications.[3]

64% of patients aged <6 months require **respiratory support**.[3]

High disease burden may exist throughout a patient's lifetime.[2,17,18]

Disease manifestations may occur at any age and may include skeletal, muscular, and/or neurological symptoms. Patients may report symptoms common to HPP in their medical histories, such as dental and renal symptoms.[2,17,18]

FOR PATIENTS WITH HPP

The disease burden is substantial[19]

Patients with HPP may require **high healthcare utilization** to manage the clinical manifestations of the disease.[19,*]

Multiple clinician specialists may be needed, depending on a patient's age and disease course. The multidisciplinary care team may consist of a core team plus age-specific specialists.[20]

The average patient diagnosed with HPP may experience **4 inpatient** and **94 outpatient visits**.[21,†]

74%

of adults with HPP may **require surgery**.[18,‡,§]

32% of **adult patients** may require **home alterations** due to chronic disabilities.[18,§]

*Results of a 2018 study that evaluated healthcare utilization for 3 patients with differing severities of HPP.[19]

†Over a 24-year period. Based on analysis of data on 40 patients from the University of Utah Clinical Enterprise Data Warehouse (August 1, 1990 to December 31, 2014).[21]

‡Some procedures included insertion of internal hardware, dental procedures, and corrective skeletal interventions.[18]

§Results of a 2016 study that assessed patient-reported burden of disease in adults using 2 surveys specific for HPP symptomatology; the Hypophosphatasia Impact Patient Survey (HIPS) and the Hypophosphatasia Outcomes Study Telephone (HOST) interview. Data shown derived from the HIPS (n=133).[17]

Diagnostic delay remains a challenge in HPP[2]

HPP has a **heterogeneous presentation**, which may lead to missed or delayed diagnosis.[2]

Based on data from the Alexion-sponsored Global HPP Registry, many patients diagnosed in adulthood had HPP manifestations in childhood, **highlighting the importance of evaluating medical and family histories** for timely diagnosis.[2]

Key findings included:

8.4-MONTH DELAY

Median diagnostic delay from first manifestation in children aged 1 year to <18 years was **8.4 months**.[2]

24.5-YEAR DELAY

Median diagnostic **delay was 24.5 years** for adults who had earliest reported manifestations before 18 years of age.[2]

Data derived from an observational, multinational, prospective Global HPP Registry study conducted in adults (n=148, >18 years) and children (n=121, <18 years) from January 2015 to September 2017.[2]

Use of EHR systems can help efficiently triage patients and prioritize resources. They can also provide more coordinated care and foster improved outcomes.[22-25]

EHR systems enable quick access to patient records for more coordinated, efficient care.[22] The data necessary to help triage a suspect HPP patient may exist in your EHR.

To triage suspect patients, persistently low ALP enzyme levels, together with clinical features of HPP, should be considered.[5,26,27,*]

- According to the results of one study in an ambulatory care endocrinology practice, utilizing electronic medical records for surveillance of ALP levels as an initial HPP screening tool is reasonable[28]
- For more information, consult the HPP program implementation guide

Leveraging EHRs may help health systems triage patients for further evaluation[23,28]

*Age- and sex-adjusted ALP reference intervals must be used to correctly diagnose HPP; review lab results critically.[29]

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Alexion provides educational resources to help you leverage your EHR

These resources may help triage patients suspected of having HPP for further evaluation through the use of relevant patient history data, disease codes, and suspect patient lists.

Visit deciphEHRrare.com or contact your Alexion representative to find out how utilizing your EHR system can help you triage patients who would benefit from further clinician evaluation for HPP.

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