Primary hyperoxaluria type 1 (PH1): an underdiagnosed rare disease

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When should it be suspected?

PH1 is a genetic disease caused by **a build-up of calcium oxalate** in the **kidneys**. Over time, these oxalate deposits can cause a **progressive decline in the glomerular filtration rate** and develop into stage 5 chronic kidney disease (CKD) and systemic oxalosis.[1,2]

Recognising the warning signs and various evaluations allow for an **early diagnosis** and implementation of the **appropriate care** in order to slow the decline in renal function.[1,2]

PATIENTS AFFECTED BY PH1 MAY PRESENT WITH ONE OR MORE OF THE FOLLOWING CLINICAL MANIFESTATIONS:[1-3]

- **Recurrent urolithiasis, often bilateral**
- **Kidney stone in a child**
- **Nephrocalcinosis**
- **Growth retardation (infants and children)**
- **Progressive change in renal function**
- **Family history of lithiasis**

Extrarenal signs suggestive of systemic oxalosis:[1,2,4]

- **Bone pain and fractures**
- **Erythropoietin-refractory anaemia**
- **Vision disorders, retinopathy**

Although adult patients often have a history of sporadic stones, more than **50%** present with **advanced CKD at the time of PH1 diagnosis**.[1,2]

Additional investigations in case of suggestive clinical manifestations[2,4–6]

Examination of morphology and the IR spectroscopy* of any retrieved kidney stones is essential.

This analysis alone allows a **diagnosis of PH1 to be made**.[6]
NOTE that the biochemical analysis of stones is nonspecific and should no longer be performed.

Endoscopic view	Microscopic view
	

- Analysis of the stone's morphology and constitution shows a **type Ic calcium oxalate monohydrate kidney stone**, with a budding appearance.[5,6]

Analysis of crystalluria is of benefit in the diagnosis and monitoring of PH1. In particular, it provides **a guide to diagnosis** in cases where analysis of the morphology and constitution of a kidney stone is not possible. It can reveal **crystals of whewellite** (or **calcium oxalate monohydrate**).[5]

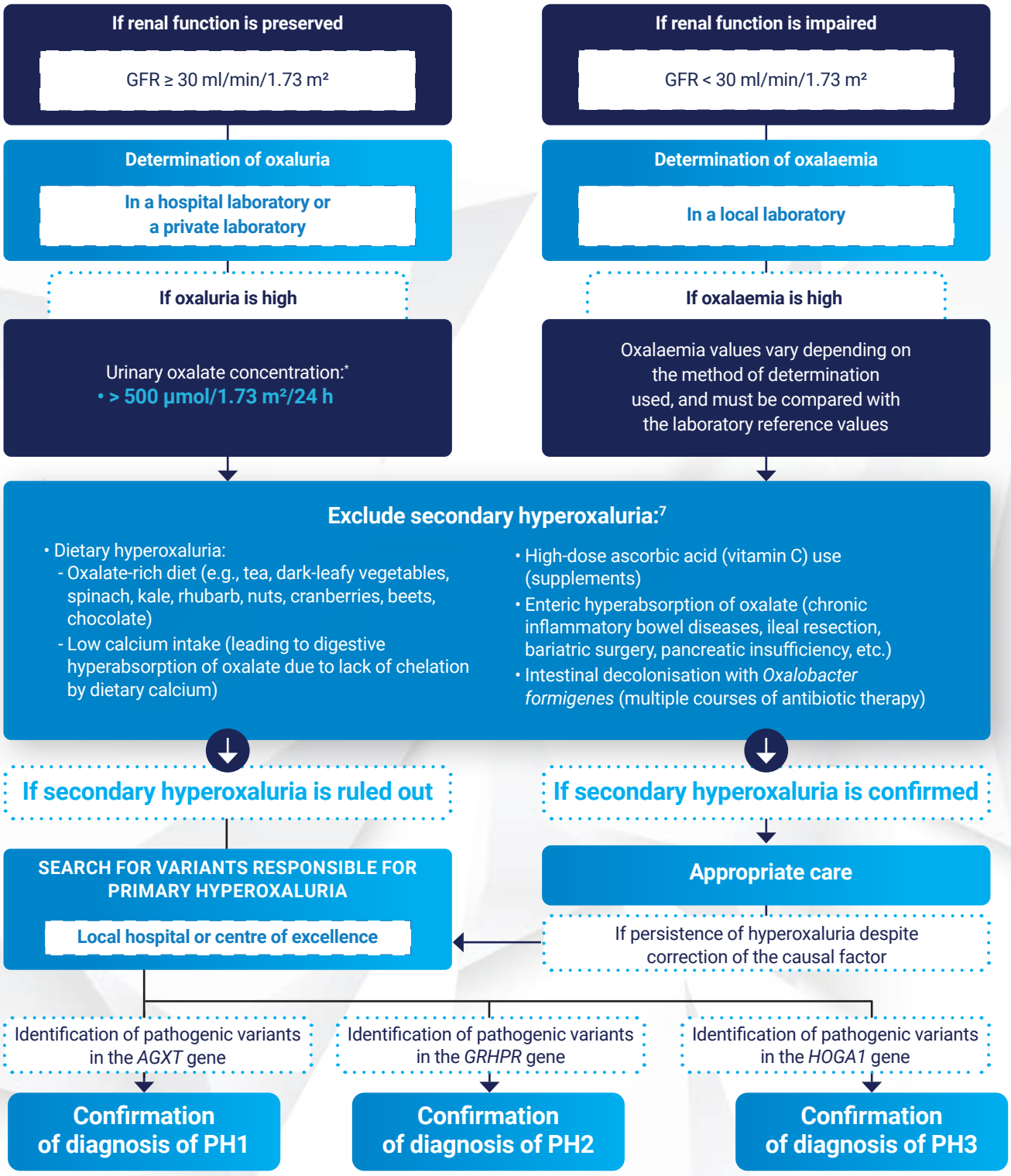
A **full metabolic evaluation** is required if there is any **anomaly in the initial evaluation** or a clinical manifestation suggestive of PH1.[2]

Certain types of kidney stones necessitate **referral to a local specialist in the metabolic evaluation of urolithiasis** (e.g. a nephrologist, endocrinologist or specialist urologist) for **early diagnosis** and guidance towards **genetic counselling**.[2,4]

A genetic analysis is essential to confirm a diagnosis of PH and to identify its type, which is of both **diagnostic and prognostic importance**. The identification of a mutation in the ***AGXT gene*** will direct the **diagnosis towards PH1**, the ***GRHPR gene*** **towards primary hyperoxaluria type 2 (PH2)** and the ***HOGA1 gene*** **towards primary hyperoxaluria type 3 (PH3)**.[1]

*IR, infrared

Procedure in case of hyperoxaluria[2,4]



*These values are representative of hyperoxaluria in adults. The oxalate values are to be interpreted according to the standards of each laboratory.

All photos presented on this poster were provided by Dr Daudon and Dr Estrade.

AGXT, alanine-glyoxylate aminotransferase; CKD, chronic kidney disease; GFR, glomerular filtration rate; PH, primary hyperoxaluria; GRHPR, glyoxylate reductase/hydroxypyruvate reductase; HOGA1, 4-hydroxy-2-oxoglutarate aldolase 1; PH1, primary hyperoxaluria type 1.

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5. Estrade V, et al. *BJU Int.* 2021;128(3):319–330.
6. Corrales M, et al. *Eur Urol Focus.* 2021;7(1):13–21.
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