Monitor your patients with PK deficiency from the time of diagnosis

This assessment schedule was created based on selected information from the International Guidelines for the Diagnosis and Management of Pyruvate Kinase Deficiency and represents core health evaluations that allow healthcare providers to track disease progression over time for adult patients. The patient's physician will determine the actual frequency of necessary assessments based on individualized need for medical care and routine follow-up.

MONITORING FOR CHRONIC COMPLICATIONS[1]

	Q1 months	Q3 months	Q6 months	Q12 months	Q5 years
Iron overload screening					
Ferritin					
Regularly transfused patients	•*				
Non- and minimally transfused patients				•	
Liver MRI†					
Patients on chelation therapy				•	
Regularly transfused patients				•	
Non- and minimally transfused patients					•
Cardiac MRI‡					
Regularly transfused patients				•§	
Non- and minimally transfused patients	Scan less frequently than regularly transfused, depending on LIC.				
Pulmonary hypertension					
ECHO with TRJ				•‖	
Osteopenia and osteoporosis					
25-hydroxy vitamin D				•	
Bone density test (DXA scan)	Frequency of scans based on initial findings and individual risk factors.¶				
Endocrinology					
Diabetes screenings				•#	
Renal function					
Creatinine, phosphorous, magnesium, albuminuria, and UPCR	Monitor on the basis of individual risk factors.**				

*Perform every 1 to 3 months.

†Scan when serum ferritin >500 ng/mL.

‡Scan when LIC is greater than 7 mg/g dry weight.

§Scan every 12 months for high LIC or ineffective chelation, or every 24 months for LIC in trade range with effective chelation.

‖Frequency ranges between every 1 and 5 years and should be tailored based on individual risk factors such as relevant symptoms, previous ECHO measurements, and history of splenectomy.

¶Including fracture history, vitamin D status, and frequency of physical activity.

#Fasting glucose, oral glucose tolerance testing, or fructosamine measurements are recommended, as glycated hemoglobin A1C measurements are unreliable in hemolytic anemia.

**Including underlying renal impairment or use of chelation therapy.

DXA=dual-energy x-ray absorptiometry; ECHO=echocardiograph; HIV=human immunodeficiency virus; LIC=liver iron concentration; MRI=magnetic resonance imaging; TRJ=tricuspid regurgitation jet; UPCR=urine protein:creatinine ratios.

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Additional monitoring recommendations were created in conjunction with medical literature and the Steering Committee*

RECOMMENDED SCHEDULE OF ROUTINE ASSESSMENTS

	Baseline	Every visit	Q1 months	Q3 months	Q6 months	Q12 months
Medical history	•					
PKLR genotype[2]	•†					
Physical exam	•					•
Height and weight	•	•				
Laboratory tests[2]						
Complete blood count	•	•‡				•‡
Reticulocyte count	•	•‡				•‡
Bilirubin§	•	•‡				•‡
LDH						

CONDITIONAL TESTS BASED ON FINDINGS

Patient with evidence of iron overload[1]‖	Vitamin D deficiency	Elevated bilirubin	Aplastic crises[2,3]
Test for endocrinopathies dysfunction • Thyroid • Pituitary • Pancreatic	Consider frequency of DXA	Monitor for gallstones and other signs of gallbladder disease; consider abdominal ultrasound	To evaluate the cause of reticulocytopenia, screen for parvovirus B19 serology (including IgM) or PCR

ADDITIONAL POTENTIAL COMPLICATIONS[2,3]

Complications	Symptoms	Imaging
Gallstones and other gallbladder complications	• New or worsening abdominal symptoms • Worsening jaundice • Other related symptoms	Abdominal ultrasound
Extramedullary hematopoiesis	Back pain, hepatomegaly, or other signs	Image for evidence of paravertebral or hepatic extramedullary hematopoiesis

QUALITY OF LIFE ASSESSMENTS[1,4]

	Baseline	Every visit	Q1 months	Q3 months	Q6 months	Q12 months
Cognition (fogginess)	•					•
Depression/anxiety	•					•
Fatigue	•					•

*Members of the Agios Steering Committee were compensated for their time.

†To help direct patient monitoring.

‡Perform at every visit or at least annually. Frequency depends on acute stressors and transfusion needs.

§Or comprehensive metabolic panel, as patient health warrants.

‖Defined as serum ferritin concentrations greater than 1000 ng/mL or LIC greater than 5 mg/g dry weight.

IgM=immunoglobulin M; LIC=liver iron concentration; LDH=lactate dehydrogenase; PCR=polymerase chain reaction, PKLR=pyruvate kinase L/R.

For more information and additional resources, visit KnowPKDeficiency.com

References: 1. Al-Samkari H, Shehata N, Lang-Robertson K, et al. Diagnosis and management of pyruvate kinase deficiency: international expert guidelines. *Lancet Haematol.* 2024;11(3):e228-e239. doi:10.1016 S2352-3026(23)00377-0 **2.** Grace RF, Layton DM, Barcellini W. How we manage patients with pyruvate kinase deficiency. *Br J Haematol.* 2019;184(5):721-734. doi:10.1111/ejh.13128 **3.** Al-Samkari H, Van Beers EJ, Kuo KHM, et al. The variable manifestations of disease in pyruvate kinase deficiency and their management. *Haematologica.* 2020;105(9):2229-2239. doi:10.3324/haematol.2019.240846 **4.** Grace RF, Cohen J, Egan S, et al. The burden of disease in pyruvate kinase deficiency: patients' perception of the impact on health-related quality of life. *Eur J Haematol.* 2018;101(6):758-765. doi:10.1111/ejh.13128.

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