UNDERSTANDING LAB WORK

for patients with Chronic Kidney Disease (CKD)

Learn about some commonly requested lab values that your doctor may use in the management of CKD and associated conditions.

WHAT IS CHRONIC KIDNEY DISEASE (CKD)?

CKD is characterized by a gradual loss of kidney function over time. The estimated Glomerular Filtration Rate (eGFR) indicates how well the kidneys are functioning. As kidney disease gets worse, the GFR number goes down.

STAGES OF CHRONIC KIDNEY DISEASE		GFR
STAGE 1 (G1)	Kidney damage with normal kidney function	90 or higher
STAGE 2 (G2)	Kidney damage with mild loss of kidney function	89 to 60
STAGE 3A (G3A)	Mid to moderate loss of kidney function	59 to 45
STAGE 3B (G3B)	Moderate to severe loss of kidney function	44 to 30
STAGE 4 (G4)	Severe loss of kidney function	29 to 15
STAGE 5 (G5)	Kidney failure	Less than 15

Kidneys are crucial for essential body functions, including waste removal, red blood cell production, bone strengthening, and maintaining a balanced mineral metabolism. Kidney disease impairs these abilities, leading to various complications, such as chronic kidney disease-mineral and bone disorder (CKD-MBD).

OPKO RENAL

WHAT IS CKD-MBD?

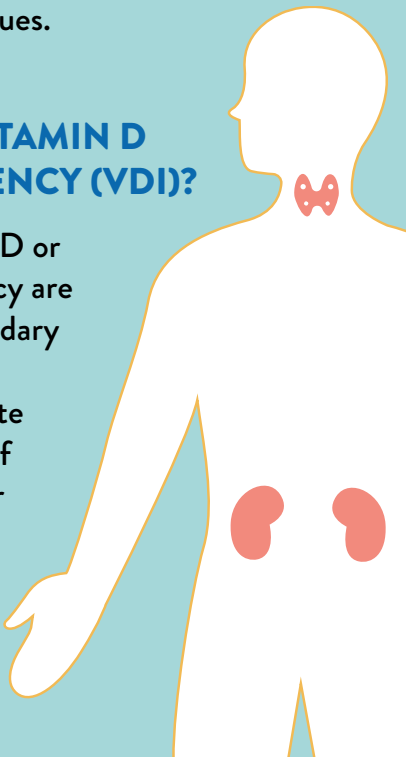
CKD-MBD happens when there is an imbalance in your blood levels of calcium (Ca), phosphorus (P), parathyroid hormone (PTH), and vitamin D. These imbalances can affect your bones, heart and blood vessels, and may lead to a condition called secondary hyperparathyroidism (SHPT).

WHAT IS SECONDARY HYPERPARATHYROIDISM (SHPT)?

SHPT is associated with CKD and is caused by imbalances in Ca, P, PTH, and vitamin D, all of which are common when CKD is present. If left untreated or not effectively managed, the overproduction of PTH can lead to bone disease and cardiovascular issues.

WHAT IS VITAMIN D INSUFFICIENCY (VDI)?

Low levels of vitamin D or vitamin D insufficiency are associated with secondary hyperparathyroidism (SHPT) and contribute to the development of bone disease, vascular calcification, and increased morbidity and mortality.



BLOOD TESTS

Patients with CKD should be routinely monitored for iPTH, Ca, P, and vitamin D [25(OH)D]. Frequency of these blood tests depend on CKD stage.

Intact Parathyroid Hormone (iPTH)

iPTH levels should be measured as GFR falls below 60 (CKD Stage 3 or higher). Consistently high levels of iPTH may indicate SHPT. In patients with CKD G3a–G5 not on dialysis, the optimal PTH level is not known. Patients with levels of intact PTH progressively rising or persistently above the upper normal limit for the assay should be evaluated for modifiable factors, including hyperphosphatemia, hypocalcemia, high phosphate intake, and vitamin D deficiency. Ask your doctor at what level of PTH you should start treatment.

Vitamin D [25(OH)D]

Low vitamin D levels can lead to low calcium levels and SHPT. A level below 30 ng/mL indicates insufficiency, while a level below 20 ng/mL is considered deficiency. Low levels of vitamin D can be managed by nutritional supplements or prescription drug.

Calcium (Ca)

Ca balance is important for bone and cardiovascular health. Low Ca levels may lead to SHPT, which may cause calcium to leave bone and accumulate in other tissues. It is suggested to avoid hypercalcemia in adult patients with CKD G3a–G5.

Phosphorus (P)

As kidney function declines, your body is less able to excrete P. In addition, a diet with normal P levels will also tend to increase blood P levels in patients with CKD. Elevated P levels may lead to SHPT and increased morbidity and mortality. High P can be managed by diet and a prescription drug called a phosphate binder to lower P. It is suggested to lower elevated phosphate levels toward the normal range in patients with CKD G3a–G5.

DO YOU KNOW YOUR D*?

*25(OH)D levels

Vitamin D testing is considered medically necessary when you have:

- Stage 3-5 Chronic Kidney Disease and End Stage Renal Disease
- Secondary Hyperparathyroidism
- High risk for vitamin D insufficiency
- Vitamin D deficiency and are on replacement therapy (to monitor your current treatment)

Assessment and monitoring for CKD-MBD parameter should start as early as CKD STAGE 3

OPKO RENAL

If you have chronic kidney disease, ask your doctor which tests you will have and how often they will be done. Speak to your doctor about your results. If your numbers are not in the normal range, ask how to improve them.

References:
Kidney Disease: Improving Global Outcomes (KDIGO) CKD-MBD Update Work Group. KDIGO 2017 Clinical Practice Guideline Up-date for the Diagnosis, Evaluation, Prevention, and Treatment of Chronic Kidney Disease–Mineral and Bone Disorder (CKD-MBD). Kidney Int Suppl (2011). 2017;7:1–59.
Chronic Kidney Disease (CKD) - Assessment and Diagnosis FAQs for Professionals
https://www.bioreference.com/wpcontent/uploads/2021/07/diagnosingkidney-disease.pdf
OPKO Renal is a division of OPKO Health, Inc.

OP-US-0524-022024v.2