Diabetes, Advancing Chronic Kidney Disease Management Panel

Test Code: 91713

Specimen Requirements
Preferred: 3 mL refrigerated serum **and** 2 mL frozen serum **and** 5 mL room-temperature whole blood (EDTA, lavender-top tube) **and** 10 mL room-temperature random urine

Minimum: 1 mL refrigerated serum **and** 1 mL frozen serum **and** 1 mL room-temperature whole blood **and** 2 mL urine

Patient should fast for 9 to 12 hours prior to specimen collection.

CPT Codes*: 80051, 82570, 82043, 82565, 85018, 83970, 82310, 84100, 82306

CLINICAL USE

- Monitor chronic kidney disease in patients with diabetic nephropathy

CLINICAL BACKGROUND

Chronic kidney disease (CKD) due to diabetes occurs in 20% to 40% of patients and is the most common cause of end-stage renal disease.[1] Both type 1 and type 2 diabetes patients are at risk. Throughout its early course, CKD has no symptoms. Symptoms appear as kidney damage slowly gets worse and may include fatigue and weakness, nausea and vomiting, swelling of feet and ankles, loss of appetite, and persistent itching. Metabolic bone disease characterized by hyperparathyroidism, hyperphosphatemia, and vitamin D deficiency is a common complication. This and other complications, such as acidosis, anemia, hypertension, and hypoalbuminemia, increase as kidney damage increases and the estimated glomerular filtration rate (eGFR) decreases.[2]

The Kidney Disease Improving Global Outcomes (KDIGO) guideline defines CKD as albuminuria ≥30 µg/mg creatinine or eGFR <60 mL/min/1.73m^2 for >3 months.[2] The American Diabetes Association (ADA) recommends screening for CKD using microalbumin testing beginning ≥5 years after diagnosis of type 1 diabetes and at diagnosis of type 2 diabetes.[1] According to the ADA, testing for the complications of CKD should begin when the GFR is <60 mL/min/1.73m^2 (**Table 1**).[1] The KDIGO guideline recommends such testing when the GFR is <45 mL/min/1.73m^2.[2]

The Diabetes, Advancing Chronic Kidney Disease Management Panel includes the tests recommended for detection of most of the complications (**Table 2**). Such testing, combined with early treatment of the abnormalities identified, can slow the progression of kidney damage and associated complications.[2] Components of the panel are listed in **Table 2** and can be ordered separately.

INDIVIDUALS SUITABLE FOR TESTING

- Individuals with type 1 or type 2 diabetes and eGFR <60 mL/min/1.73m^2 or albuminuria ≥30 µg/mg creatinine[2]

Table 1. Monitoring Chronic Kidney Disease in Patients with Diabetes[a]

	Recommendation	
GFR (mL/min/1.73m^2)	**Testing Frequency**	**Test**
All patients	Yearly	Creatinine, microalbumin, potassium
45-60	Every 6 months	eGFR
	Yearly or more often	Electrolyte panel, hemoglobin, calcium, phosphorus, PTH, 25-hydroxyvitamin D
30-44	Every 3 months	eGFR
	Every 3 to 6 months	Electrolyte panel, hemoglobin, calcium, phosphorus, PTH, 25-hydroxyvitamin D, albumin, weight
<30		Refer to a nephrologist

GFR, glomerular filtration rate; eGFR, estimated GFR; PTH, parathyroid hormone.
[a] Adapted from reference 1.

Table 2. Individual Tests Included in the Diabetes, Advancing Chronic Kidney Disease Management Panel[a]

Test Code	Test Name	Method
375	Creatinine with eGFR, Serum	Spectrophotometry
34392	Electrolyte Panel[a] Includes sodium (836), potassium (733), chloride (330), and carbon dioxide (310)	Ion-selective electrode (Na^+, K^+, Cl^-); spectrophotometry (CO_2)
510(X)	Hemoglobin	Electronic cell sizing/counting/cytometry
6517	Microalbumin, Random Urine with Creatinine	Turbidimetry
718	Phosphate (as Phosphorus)	Spectrophotometry
8837	PTH, Intact and Calcium	Immunoassay (PTH); spectrophotometry (Ca^{2+})
17306	Vitamin D, 25-Hydroxy, Total, Immunoassay	Immunoassay

[a] Components of the panel can be ordered separately.

METHOD

The method used for each component in the panel is shown in **Table 2**.

INTERPRETIVE INFORMATION

In patients with CKD, KDIGO guidelines recommend addressing complications when 1) carbon dioxide is <22 mmol/L (metabolic acidosis); 2) hemoglobin is <13.0 g/dL in males and <12.0 g/dL in females (anemia); and 3) markers of metabolic bone disease are abnormal (↑ phosphorus, ↑ PTH, ↓ vitamin D).[2] A multifactorial treatment approach is required to overcome these complications (**Table 3**).

References

1. American Diabetes Association. Standards of medical care in diabetes—2017. *Diabetes Care*. 2017;40(suppl 1):S1-S120.
2. Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 clinical practice guideline for the evaluation and management of chronic kidney disease. *Kidney Int Suppl*. 2013;3:1-150.
3. National Institute of Diabetes and Digestive and Kidney Diseases. Mineral and bone disorder in chronic kidney disease. https://www.niddk.nih.gov/health-information/kidney-disease/chronic-kidney-disease-ckd/mineral-bone-disorder. Updated November, 2015. Accessed January 23, 2017.

Table 3. Treatments for Complications of Chronic Kidney Disease in Patients with Diabetes[a,2,3]

Complication	Therapeutic Target	Treatment Considerations
Acidosis	CO_2 level within reference range	Bicarbonate supplement
Anemia	Hemoglobin[b] ≥12.0 g/dL (females >15 y) ≥13.0 g/dL (males >15 y)	Iron replacement; erythropoiesis-stimulating agent
Metabolic Bone Disease		
Hyperparathyroidism	Not established	Vitamin D supplements; calcimimetics[c] (eg, cinacalcet); removal of the parathyroid glands
Hyperphosphatemia	Phosphorus level within reference range	Phosphate binders; reduce dietary intake
Vitamin D deficiency	25-hydroxyvitamin D >30 ng/mL	Vitamin D supplements/analogs

[a] The table is provided for informational purposes only and is not intended as medical advice. A physician's test selection and interpretation, diagnosis, and patient management decisions should be based on his/her education, clinical expertise, and assessment of the patient.
[b] See reference 2 for hemoglobin thresholds for children and pregnant women.
[c] Calcimimetics suppress parathyroid hormone secretion.

* The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.