Chronic Kidney Disease (CKD)
Assessment and Diagnosis FAQs for Professionals

This is the approach that the National Kidney Foundation and leaders in the pathology community recommend for CKD testing.

What is the value of the Kidney Profile?

The Kidney Profile simplifies ordering the tests needed to detect and diagnose kidney disease by listing them together under one heading on the laboratory requisition. This eliminates the need to search for each test separately and increases the ease of monitoring.

What tests are included in the Kidney Profile?

Estimated glomerular filtration rate (eGFR) to assess kidney function, and urine albumin-creatinine ratio (ACR) to assess kidney damage, are both used to test for and diagnose CKD in primary care. The Kidney Profile combines: 1) eGFR (serum creatinine with eGFR: CPT 82565) and 2) urine ACR (albumin, urine [e.g., microalbumin], quantitative: CPT 82043 plus urine creatinine: CPT 82570).

Why is CKD assessment important?

Early detection of CKD offers an opportunity to prevent complications before symptoms occur and to slow loss of kidney function over time. Those with CKD diagnosed by a primary care clinician are more likely to: avoid risky use of nonsteroidal anti-inflammatory drugs; use angiotensin-converting-enzyme inhibitors or angiotensin receptor blockers when indicated; and receive appropriate nephrology care. Additionally, detection during advanced stages of CKD may help slow progression and promote timely preparation for dialysis and kidney transplantation.

Who should be tested for kidney disease and how often?

Most current clinical practice guidelines recommend at least annual testing in asymptomatic individuals who are at high risk for CKD, such as those with diabetes, hypertension, age over 60, family history of kidney disease, and African Americans. Although clinical practice guidelines can inform practitioners of when to test for kidney disease, clinical judgement and patient preferences will also determine the need for more or less frequent testing.[1-3] For individuals with pre-existing CKD, see the figure below for opinion-based recommendations on frequency of annual assessment.

Why are the tests included in the Kidney Profile important?

Estimated glomerular filtration (eGFR) rate and albuminuria are independent and complementary predictors of important clinical outcomes, including CKD progression, end-stage renal disease, acute kidney injury, cardiovascular mortality, and all-cause mortality.[1]

- Detection of CKD and assessment of kidney function is more accurate based on eGFR rather than serum creatinine alone. The CKD-EPI creatinine 2009 equation is more accurate than the MDRD Study equation in the adult population with an eGFR near 60 mL/min/1.73 m^2, and better predicts clinical risk for people with CKD.[1,2,4]

- Meausured GFR, measured creatinine clearance or estimated GFR from cystatin C can be used for confirmation of reduced estimated GFR from creatinine.

- Urine ACR in spot or random specimens is preferred over urine protein alone because ACR is a more sensitive and specific measure of kidney damage. Reporting albumin as a ratio indexed to the urine creatinine helps account for the variability in urinary albumin concentration measured in spot samples. Albuminuria is often detected before the eGFR drops below 60 mL/min/1.73 m^2, thus allowing for earlier CKD diagnosis and intervention. Urine albumin measurement and reporting is in the process of being standardized nationally to improve accuracy and reproducibility.[1-3]

- Protein-creatinine ratio (PCR) is often used interchangeably with ACR.

- The 24-hour urine is usually not needed as an initial test to assess proteinuria or albuminuria since the accuracy is limited by under and over collection. Spot urine specimens in adults have high correlation with 24-hour urine tests for both ACR and PCR. It can be used for confirmation of spot urine ACR and PCR.

What is the difference between the Kidney Profile and the Renal Function Panel?

The Kidney Profile is intended for detecting CKD and monitoring those at risk, whereas the Renal Function Panel is used only for monitoring patients with pre-existing impaired kidney function. The Renal Function Panel is a serum blood test that includes: sodium, potassium, chloride, carbon dioxide, urea nitrogen (BUN), creatinine, urea nitrogen/creatinine ratio, eGFR, glucose; calcium, phosphorus; and albumin. The Renal Function Panel can be ordered along with urine ACR when monitoring patients with pre-existing CKD.

How do I interpret the Kidney Profile?

Kidney disease is classified into 5 stages based on eGFR and 3 categories based on albuminuria. A minimum of 2 eGFR values at least 3 months apart should be used to diagnose and classify CKD.

				Albuminuria categories Description and range		
CKD is classified on the basis of: • Cause (C) • eGFR (G) • Albuminuria (A)				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30mg/g <3 mg/mmol	30-299 mg/g 3-29 mg/mmol	≥300 mg/g ≥30mg/mmol
eGFR categories (ml/min/1.73m²) Description and range	G1	Normal or High	≤ 90	1	1	2
	G2	Mildly decreased	60-89	1	1	2
	G3a	Mildly to moderately decreased	45-59	1	2	3
	G3b	Moderately to severely decreased	30-44	2	3	3
	G4	Severely decreased	15-29	3	3	4+
	G5	Kidney Failure	< 15	4+	4+	4+

Vassalotti JA, Centor R, Turner BJ, Greer RC, Choi M, Sequist TD; National Kidney Foundation Kidney Disease Outcomes Quality Initiative. Practical Approach to Detection and Management of Chronic Kidney Disease for the Primary Care Clinician. Am J Med. 2016 Feb;129(2):153-162.e7

The eGFR and albuminuria grid depicts the risk of progression, morbidity, and mortality by color, from best to worst (green, yellow, orange, red, deep red).

The numbers in the boxes are a guide to the frequency of assessment annually.

- Green: annual assessment for those at risk. (Green can reflect CKD with normal eGFR and albumin-to-creatinine ratio (ACR) only in the presence of other markers of kidney damage, such as imaging showing polycystic kidney disease or kidney biopsy abnormalities)

- Yellow suggests assessment at least once per year;

- Orange suggests assessment twice per year;

- Red suggests assessment three times annually;

- Deep red suggests assessment four times annually.

These are general parameters only, based on expert opinion and must take into account underlying comorbid conditions and disease state, as well as the likelihood of impacting a change in management for any individual patient.

References

1. KDOQI US Commentary on the 2012 KDIGO clinical practice guideline for the evaluation and management of CKD. *Am J Kidney Dis*. 2014;63:713-735.

2. Vassalotti JA, Centor R, Turner BJ, et al. A practical approach to detection and management of chronic kidney disease for the primary care clinician. *Am J Med*. 2015;129:153-162.

3. Berns JS. Routine screening for CKD should be done in asymptomatic adults….selectively. *Clin J Am Soc Nephrol*. 2014;9:1988-1992.

4. Matsushita K, et al. Clinical risk implications of the CKD Epidemiology Collaboration (CKD-EPI) equation compared with the Modification of Diet in Renal Disease (MDRD) Study equation for estimated GFR. *Am J Kidney Dis*. 2010;60(2):241-249.