JNP

Guidelines for Chronic Kidney Disease: Defining, Staging, and Managing in Primary Care

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ABSTRACT

Nurse practitioners encounter and have the opportunity and responsibility to identify and manage patients with chronic kidney disease. In this article we discuss the Kidney Disease: Improving Global Outcomes international guidelines for defining, classifying, and managing patients with chronic kidney disease and provide a synopsis of these guidelines as recommended by the National Kidney Foundation commentary workgroup for a United States–specific patient population.

Keywords: chronic kidney disease, detection, diagnosing, guidelines, management

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Chronic kidney disease (CKD) is a burden to individuals, families, and society. It is associated with poor health outcomes, increased cardiovascular (CV) complications, early death, and progression to kidney failure.[1] CKD affects 14.8% of adults living in the United States, with the highest prevalence in CKD stage 3.[2] Kidney disease is the ninth leading cause of death in the US.[3] The 2 leading causes of CKD are diabetes and hypertension.[2] Risk factors include family history of kidney failure, age $\geq$ 60 years, smoking, obesity, kidney stones, and cardiovascular disease (CVD).[4]

CKD symptoms do not usually appear until the late stages, which contribute to the lack of awareness by patients and providers.[5] CKD awareness among those affected is $<$ 10%.[2] Early identification and treatment of CKD can slow, or possibly prevent, progression to kidney failure; therefore, it is vitally important that nurse practitioners (NPs) and other providers in primary care recognize and treat CKD in the early stages. National guidelines on CKD management exist; however, providers are often unaware or not updated on the most recent ones and may persist in traditional, less accurate diagnostic techniques and treatments, as well as late referral to a nephrologist.[6,7] NPs are ideally positioned to intervene on their patients' behalf using evidence-based guidelines.

Kidney Disease: Improving Global Outcomes (KDIGO), an international expert panel of kidney practitioners, updated the original National Kidney Foundation 2002 CKD guideline.[8] This article provides a synopsis of these guidelines as recommended for the US-specific patient population by the National Kidney Foundation (NKF) commentary workgroup. The full guidelines are available at http://kdigo.org/home/guidelines/ckd-evaluation-management/.

DEFINITION OF CKD

CKD is defined as abnormalities of kidney structure or function present for $\geq$ 3 months and with implications for health.[8] Not all kidney structural or functional abnormalities are equal when it comes to determining impact on health. For example, a person may be born with 1 kidney, which is a structural abnormality, yet that person's health may not be negatively impacted and not be considered a CKD patient. The criteria of 3 months allows for discrimination between acute and chronic kidney disease, 2 distinctly different disease processes requiring different treatments. Acknowledgment of the time period is important both clinically and for

research purposes.[8] The criteria for determining abnormalities of kidney structure or function are described in detail in Table 1.

SCREENING FOR CKD

Individuals with diabetes, hypertension, urinary stones, history of acute kidney injury, family history of CKD, and exposure to renal toxic drugs should be screened for CKD. Screening for populations at risk include those $\geq$ 60 years, minorities (defined as African Americans, Hispanics Asians, Pacific Islanders, and Native Americans), those exposed to chemical/environmental conditions, and low socioeconomic status (below poverty level).[8-10]

CLASSIFICATION OF CKD

KDIGO maintains the 2002 classification with 3 notable changes:

- Addition of cause of CKD.
- Addition of albuminuria (A) categories.
- Stratifying glomerular filtration rate (G) categories by splitting the former stage 3 into 2 stages (G3a and G3b).

The NKF workgroup cautioned that specialized diagnostic testing for CKD cause is not practical in the busy primary care setting and did not endorse this criterion for the US audience. Although cause may not be known with certainty, it can be considered for prognostication and treatment purposes.[11] Determining the cause, whether from a systemic disease affecting the kidneys (ie, diabetes, systemic autoimmune diseases, systemic infections, drugs, hypertension, etc) or from nonsystemic and more localized cause (ie, urinary tract infections, stones, obstruction, renal dysplasia, etc) helps guide in the management of CKD and possibly prevent progression.[8,12]

Table 1. Criteria for Determining Abnormalities of Kidney Structure or Function

Either of the Following Present for >3 Months:	Description	Examples Include, But Not Limited to:
Markers of kidney damage (one or more)	Albuminuria (ACR $\geq$ 30 mg/g)	A2 (ACR 30-300 mg/g = moderate increase—formerly referred to as "microalbuminuria); or A3 (ACR > 300 mg/g = severe increase—formerly referred to as "macroalbuminuria"
	Urine sediment abnormalities	Microscopic hematuria with abnormal RBC morphology, RBC casts, WBC casts, oval fat bodies or fatty casts, granular casts, and renal tubular epithelial cells
	Electrolyte and abnormalities due to tubular disorders	Renal-related acidosis, potassium wasting, magnesium wasting, non-albumin proteinuria, and cysteinuria
OR	Inferred or histologically detected abnormalities	Diabetes, autoimmune diseases, systemic infections, drug toxicity, neoplasia, atherosclerosis, hypertension, ischemia, vasculitis, thrombotic microangiopathy, urinary tract infections, stones, obstruction, cystic, and congenital diseases
	Image detected structural abnormalities	Polycystic kidneys, dysplastic kidneys, obstruction-related hydronephrosis, cortical scarring, renal masses, infiltrative disease-related enlarged kidneys, renal artery stenosis, and small/hyperechoic kidneys
	History of kidney transplantation	Recipients of kidney transplants are defined as having CKD, irrespective of the level of GFR or presence of markers of kidney damage, based on histologic studies and mortality risks
Decreased GFR	GFR <60 mL/min/1.73 m^2	GFR categories G3a-G5

CKD is defined as abnormalities of kidney structure or function, present for > 3 months, with implications for health. ACR = albumin:creatinine ratio; CKD = chronic kidney disease; GFR = glomerular filtration rate; RBC = red blood cell; WBC = white blood cell.