Top 10

Top 10 Takeaways for Nephrologists on Evaluation of People with or at Risk of CKD from the KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease

Promote participation in high-quality research in CKD across the lifespan

1

CKD definition

CKD is defined as abnormalities of kidney structure or function, present for >3 months, with implications for health. The definition includes many different markers of kidney damage, not just decreased GFR and ACR and the cause of CKD should be actively sought (Figure 1). CKD is classified according to **C**ause, **G**FR and **A**CR to establish severity and guide the type and timing of interventions.

2

Distinguish between AKD and CKD

It is important to distinguish between AKD and CKD and to establish chronicity (Figure 2).

3

CKD care across the lifespan

CKD impacts people across the lifespan and as a chronic condition, care is influenced by changes in life circumstances (Figure 3). Use a personalized approach to diagnosis, risk assessment, and management that considers age, sex, and gender. At the extremes of age - the very young and the very old - diagnostic procedures, treatment aims, treatment modalities, and decision-making differ due to differences in prognosis, treatment options, and prioritization.

4

Diagnosis of CKD in older adults

Epidemiological population data support retaining the threshold GFR of 60 ml/min/1.73 m^2 for diagnosis of CKD in older adults, even in the absence of significant albuminuria, with consistently elevated and increasing relative risk of adverse outcomes below this threshold (Figure 4).

5

Improving accuracy of GFR assessment

Estimating GFR from a combination of creatinine and cystatin C (eGFRcr-cys) improves accuracy and strengthens risk relationships. GFR should be measured where more accurate ascertainment of GFR will impact treatment decisions.

6

Accuracy and reliability

Understand the variability of GFR and urinary albumin and the value and limitations of the methodology of assessment when determining whether a change is a true change. Implement the requisite laboratory standards of care to ensure accuracy and reliability.

7

Use a validated GFR estimating equation

Use a validated GFR estimating equation to derive GFR from serum filtration markers (eGFR) and use the same equation within geographical regions recognizing that these equations may differ for adults and children (Figure 2).

8

Point-of-care tests

Point-of-care tests (POCT) for creatinine (blood and saliva) and urine albumin measurement are available, and if adequately quality-assured, are accurate enough to facilitate the clinical pathway where access to a laboratory is limited.

9

Use validated risk assessment tools

Use validated risk assessment tools to aid in decision-making and timing of multidisciplinary care. Choose the appropriate tool for the event of interest: kidney failure treatment, cardiac events, or mortality.

10

Timing assessment and reevaluation

Timing of follow up and reassessment using validated risk prediction tools and clinical evaluation, together with education, may inform better selection of targets of care to support people and families living with CKD. This approach is part of longitudinal care.
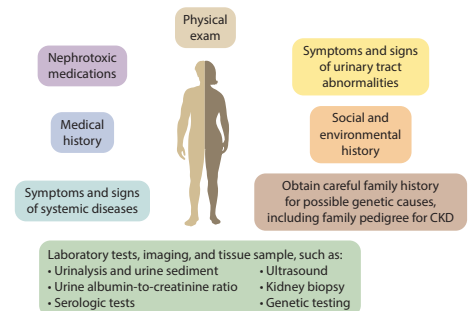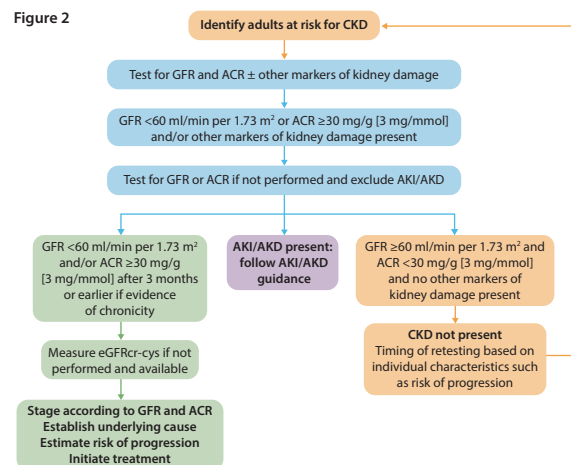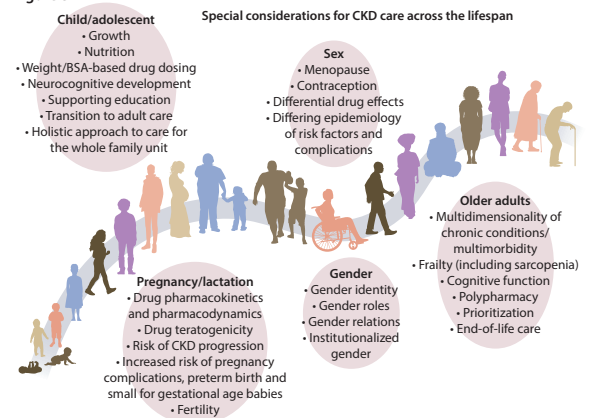
Figure 1

Nephrotoxic medications · Physical exam · Symptoms and signs of urinary tract abnormalities · Medical history · Social and environmental history · Symptoms and signs of systemic diseases · Obtain careful family history for possible genetic causes, including family pedigree for CKD

Laboratory tests, imaging, and tissue sample, such as:
- Urinalysis and urine sediment
- Urine albumin-to-creatinine ratio
- Serologic tests
- Ultrasound
- Kidney biopsy
- Genetic testing

Figure 2

Identify adults at risk for CKD

Test for GFR and ACR ± other markers of kidney damage

GFR <60 ml/min per 1.73 m² or ACR ≥30 mg/g [3 mg/mmol] and/or other markers of kidney damage present

Test for GFR or ACR if not performed and exclude AKI/AKD

GFR <60 ml/min per 1.73 m² and/or ACR ≥30 mg/g [3 mg/mmol] after 3 months or earlier if evidence of chronicity

AKI/AKD present: follow AKI/AKD guidance

GFR ≥60 ml/min per 1.73 m² and ACR <30 mg/g [3 mg/mmol] and no other markers of kidney damage present

Measure eGFRcr-cys if not performed and available

CKD not present
Timing of retesting based on individual characteristics such as risk of progression

Stage according to GFR and ACR
Establish underlying cause
Estimate risk of progression
Initiate treatment

Figure 3

Special considerations for CKD care across the lifespan

Child/adolescent
- Growth
- Nutrition
- Weight/BSA-based drug dosing
- Neurocognitive development
- Supporting education
- Transition to adult care
- Holistic approach to care for the whole family unit

Sex
- Menopause
- Contraception
- Differential drug effects
- Differing epidemiology of risk factors and complications

Older adults
- Multidimensionality of chronic conditions/multimorbidity
- Frailty (including sarcopenia)
- Cognitive function
- Polypharmacy
- Prioritization
- End-of-life care

Pregnancy/lactation
- Drug pharmacokinetics and pharmacodynamics
- Drug teratogenicity
- Risk of CKD progression
- Increased risk of pregnancy complications, preterm birth and small for gestational age babies
- Fertility

Gender
- Gender identity
- Gender roles
- Gender relations
- Institutionalized gender

Figure 4

Age 65+	ACR, mg/g				ACR, mg/g			
eGFRcr-cys	<10	10–29	30–299	300+	<10	10–29	30–299	300+
	All-cause mortality				**Myocardial infarction**			
105+	1.2	1.4	1.9	3.5	0.97	1.4	2.0	19
90–104	ref	1.2	1.4	2.0	ref	1.2	1.1	1.9
60–89	1.2	1.5	1.8	2.3	1.1	1.4	1.5	1.9
45–59	1.6	2.0	2.4	2.9	1.6	1.9	2.3	3.4
30–44	2.0	2.4	3.2	4.1	2.1	2.6	3.1	3.8
<30	3.4	4.1	5.1	6.5	4.9	3.0	5.1	5.0
	Cardiovascular mortality				**Stroke**			
105+	1.1	1.5	2.0	12	1.2	1.3	1.5	3.3
90–104	ref	1.4	1.4	3.4	ref	1.3	1.3	2.8
60–89	1.2	1.7	2.2	3.1	1.1	1.4	1.8	2.5
45–59	1.7	2.4	3.0	4.3	1.5	1.7	2.0	2.3
30–44	2.4	3.1	4.5	5.8	1.5	2.0	2.1	2.3
<30	5.7	5.2	5.1	7.8	1.7	2.0	2.4	4.8
	Kidney failure replacement therapy				**Heart failure**			
105+	2.0	1.0	2.1		0.99	1.5	1.7	7.0
90–104	ref	1.9	4.7	10	ref	1.3	1.5	2.2
60–89	1.4	2.6	6.2	19	1.2	1.5	2.0	3.2
45–59	3.7	7.9	16	42	1.6	2.0	2.9	4.1
30–44	14	14	46	137	2.3	2.9	3.5	6.1
<30	87	364	241	406	4.4	4.1	5.5	7.2
	Acute kidney injury				**Atrial fibrillation**			
105+	0.91	1.1	1.3	1.9	0.95	1.1	1.0	3.7
90–104	ref	1.3	1.4	3.9	ref	1.2	1.3	2.4
60–89	1.5	2.1	2.7	4.7	1.1	1.2	1.5	2.0
45–59	3.6	4.3	5.1	7.3	1.2	1.4	1.7	1.9
30–44	5.7	5.9	7.2	9.8	1.5	1.8	2.0	2.2
<30	10	11	11	22	1.8	1.8	2.2	3.2
	Hospitalization				**Peripheral artery disease**			
105+	1.0	1.1	1.2	2.2	1.1	2.3	2.9	4.9
90–104	ref	1.1	1.3	1.4	ref	1.3	2.0	4.8
60–89	1.1	1.2	1.3	1.5	1.3	1.6	2.0	3.2
45–59	1.2	1.2	1.4	1.6	2.0	2.8	3.1	3.1
30–44	1.5	1.4	1.6	2.0	3.5	2.8	3.8	5.9
<30	1.9	1.9	2.0	2.6	8.4	4.1	5.9	10

ACR, albumin-to-creatinine ratio; AKD, acute kidney disease; CKD, chronic kidney disease; cr, creatinine; cys, cystatin C; (e)GFR, (estimated) glomerular filtration rate