



National
Kidney
Foundation®

CKDinform:
A Primary Care Approach
to CKD Management

Learning Objectives

- Identify timely testing and intervention strategies in patients at-risk for chronic kidney disease (CKD).
- Explain appropriate clinical measures to manage risk, and increase patient safety in CKD.
- Recognize co-management and referral of patients to nephrology specialists, when appropriate, in order to improve outcomes in CKD.

Primary Care Practitioners – First Line of Defense Against CKD

- Primary care professionals can play a significant role in early diagnosis, treatment, and patient education.
- A greater emphasis on detecting CKD, and managing it prior to referral, can improve patient outcomes.

CKD is Part of Primary Care

CKD Risk Factors*

Modifiable

- Diabetes
- Hypertension
- History of AKI
- Frequent NSAID use

Non-Modifiable

- Family history of kidney disease, diabetes, or hypertension
- Age 60 or older (GFR declines normally with age)
- Race/U.S. ethnic minority status

Improved Diagnosis...

Studies demonstrate that clinician behavior changes when CKD diagnosis improves. Significant improvements realized in:¹⁻³

- Increased urinary albumin testing
- Increased appropriate use of ACEi or ARB
- Avoidance of NSAIDs prescribing among patients with low eGFR
- Appropriate nephrology consultation

Screening Tools: eGFR

- Considered the best overall index of kidney function.
- Normal GFR varies according to age, sex, and body size, and declines with age.
- The NKF recommends using the CKD-EPI Creatinine Equation (2009) to estimate GFR. Other useful calculators related to kidney disease include MDRD and Cockcroft-Gault.
- For GFR calculators search: [GFR calculator – The National Kidney Foundation](#).

Screening Tools: ACR

- Urinary albumin-to-creatinine ratio (ACR) is calculated by dividing albumin concentration in milligrams by creatinine concentration in grams.
- Creatinine assists in adjusting albumin levels for varying urine concentrations, which allows for more accurate results versus albumin alone.
- Spot urine albumin-to-creatinine ratio for quantification of proteinuria.
 - New guidelines classify albuminuria as mild, moderately or severely increased.
- First morning void preferable.
- 24hr urine test rarely necessary.

Criteria for CKD

- Abnormalities of kidney structure or function, present for >3 months, with implications for health.
- Either of the following must be present for >3 months:
 - ACR >30 mg/g
 - Markers of kidney damage (one or more*)
 - GFR <60 mL/min/1.73m²

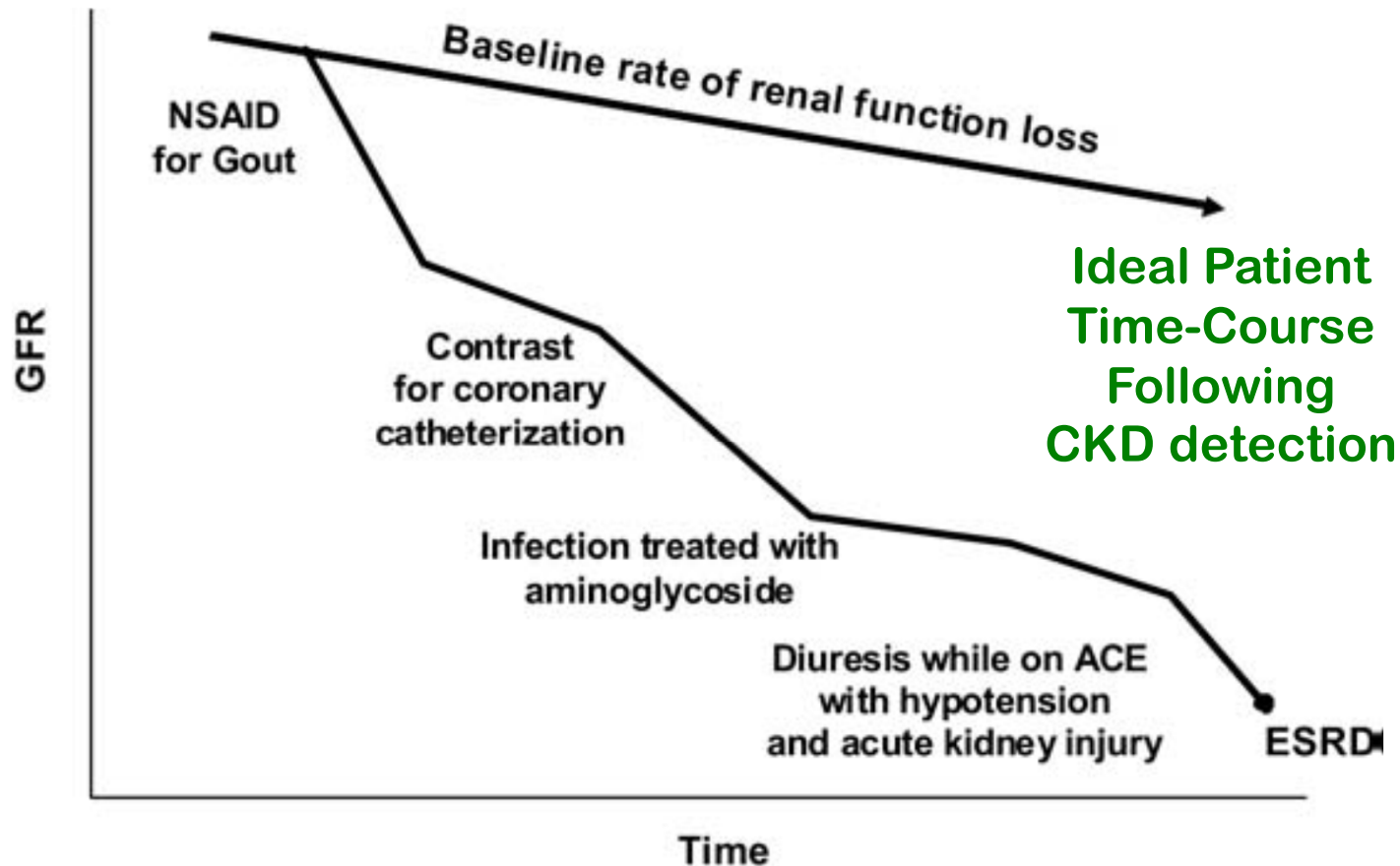
*Markers of kidney damage can include nephrotic syndrome, nephritic syndrome, tubular syndromes, urinary tract symptoms, asymptomatic urinalysis abnormalities, asymptomatic radiologic abnormalities, hypertension due to kidney disease.

Classification of CKD Based on GFR and Albuminuria Categories: "Heat Map"

Prognosis of CKD by GFR and Albuminuria Categories

				Albuminuria categories		
				Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30-299 mg/g 3-29 mg/mmol	≥300 mg/g ≥30 mg/mmol
GFR categories (mL/min/1.73m ²) Description and range	G1	Normal or high	≥90			
	G2	Mildly decreased	60-89			
	G3a	Mildly to moderately decreased	45-59			
	G3b	Moderately to severely decreased	30-44			
	G4	Severely decreased	15-29			
	G5	Kidney failure	<15			
Green: low risk (if no other markers of kidney disease, no CKD); Yellow: moderately increased risk; Orange: high risk; Red, very high risk. KDIGO 2012						

Impact of Primary Care CKD Detection with a Patient Safety Approach



Improved diagnosis creates opportunity for strategic preservation of kidney function.

CKD Patient Safety Issues

- **Medication errors**
 - Toxicity (nephrologic or other)
 - Improper dosing
 - Inadequate monitoring
- **Electrolytes**
 - Hyperkalemia
 - Hypoglycemia
 - Hypermagnesemia
 - Hyperphosphatemia
- **Miscellaneous**
 - Multidrug-resistant infections
 - Arm preservation/dialysis access



CKD Patient Safety Issues

- **Diagnostic tests**
 - Iodinated contrast media: AKI
 - Gadolinium-based contrast: Nephrogenic systemic fibrosis (NSF)
 - Sodium Phosphate bowel preparations: AKI, CKD
- **CVD**
 - Missed diagnosis
 - Improper management
- **Fluid management**
 - Hypotension
 - AKI
 - CHF exacerbation

Key Points on Medications in CKD

- CKD patients at high risk for drug-related adverse events.
- Several classes of drugs renally eliminated.
- Consider kidney function and current eGFR (not just SCr) when prescribing meds.
- Minimize pill burden as much as possible.
- Remind CKD patients to avoid NSAIDs.
- No Dual RAAS blockade.
- Any med with >30% renal clearance probably needs dose adjustment for CKD.
- No bisphosphonates for eGFR <30 mL/min/1.73m².
- Avoid GAD for eGFR <30 mL/min/1.73m².

Indications for Referral to Specialist Kidney Care Services for People with CKD

- Acute kidney injury or abrupt sustained fall in GFR
- GFR <30 mL/min/1.73m² (GFR categories G4-G5)
- Persistent albuminuria (ACR >300 mg/g)*
- Atypical Progression of CKD**
- Urinary red cell casts, RBC more than 20 per HPF sustained and not readily explained
- Hypertension refractory to treatment with 4 or more antihypertensive agents
- Persistent abnormalities of serum potassium
- Recurrent or extensive nephrolithiasis
- Hereditary kidney disease

*Significant albuminuria is defined as ACR ≥300 mg/g (≥30 mg/mmol) or AER ≥300 mg/24 hours, approximately equivalent to PCR ≥500 mg/g (≥50 mg/mmol) or PER ≥500 mg/24 hours

**Progression of CKD is defined as one or more of the following: 1) A decline in GFR category accompanied by a 25% or greater drop in eGFR from baseline; and/or 2) rapid progression of CKD defined as a sustained decline in eGFR of more than 5mL/min/1.73m²/year. KDOQI US Commentary on the 2012 KDIGO Evaluation and Management of CKD.