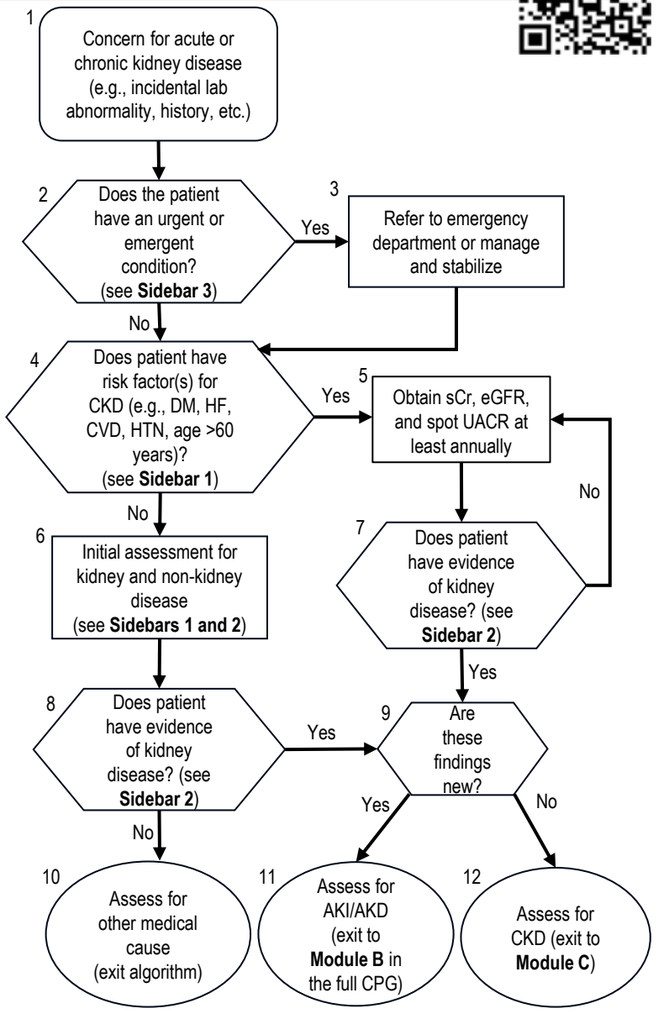
VA/DOD CLINICAL PRACTICE GUIDELINES

The Primary Care Management of CKD

Module A: Initial Assessment of Kidney Disease



Sidebar 1: At-Risk Populations

- Diabetes mellitus, hypertension, cardiovascular disease, heart failure
- Patients aged 60 years and over
- Systemic illness (e.g., systemic lupus erythematosus, multiple myeloma, malignancy)
- Systemic infections (e.g., HIV, Hepatitis B or C)
- Structural kidney or urinary tract abnormalities
- History of AKI/AKD, recurrent pyelonephritis, or nephrolithiasis
- Family history of kidney disease (e.g., ADPKD, ApoL1-associated kidney disease)
- Obesity, Metabolic Syndrome, or Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD)
- History of gout
- History of pregnancy complications (e.g., preeclampsia, pre-term delivery, gestational diabetes, small for gestational age, stillbirth)
- Nephrotoxins

Sidebar 2A: eGFR Calculation

- eGFR should be calculated using one of the CKD-EPI formulas without race
- For most individuals, the 2021 CKD-EPI creatinine formula is adequate for diagnosis and follow-up
- The 2021 CKD-EPI combined creatinine-cystatin C formula is more accurate and can be considered to confirm CKD, for dosing of medications with a narrow therapeutic window, or to better estimate risk of adverse outcomes (see Appendix J)
- Cystatin C formula alone should be used in patients with either:
  - Very low creatinine generation (e.g., neuromuscular disease, spinal cord injury, large lower extremity amputation, or severe muscle loss from malnutrition or disease)
  - Very high creatinine generation (e.g., body builders, anabolic steroid use, high muscle mass, or intake of creatine supplements)

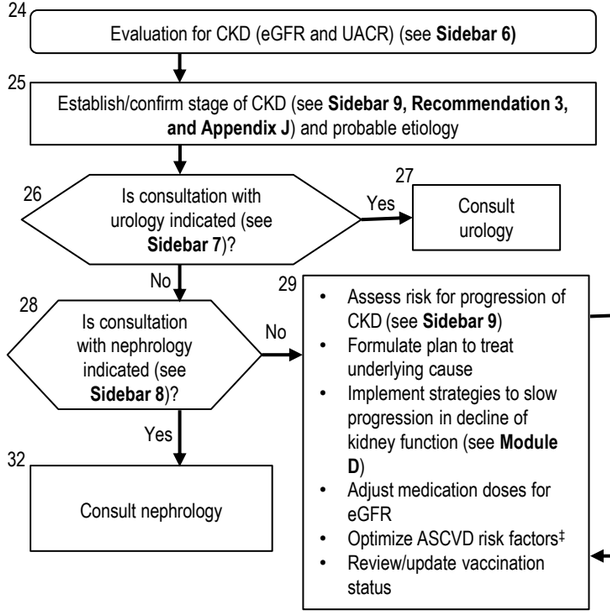
Sidebar 2B: Initial Assessment of Kidney Disease

- History:
  - Symptoms of volume depletion (e.g., lightheadedness, dizziness) or overload (e.g., pedal edema, dyspnea)
  - Cause of volume depletion (e.g., diarrhea, vomiting, decreased oral intake, heat exposure)
  - Medications and supplements (e.g., NSAIDs, diuretics, SGLT2i therapy, BP medication changes)
  - Recent illnesses/infections (e.g., upper respiratory infection, osteomyelitis)
  - Urinary symptoms (e.g., hematuria, obstructive symptoms)
  - Constitutional or rheumatologic symptoms
- Physical: vital signs, assessment of volume status
- Labs: electrolytes, creatinine, urinalysis, urine albumin-to-creatinine ratio/urine protein-to-creatinine ratio - assess lab trends then repeat labs as clinically appropriate
  - Rule out AKI/AKD (see Module B in the full CPG)
  - Consider checking cystatin C (see Sidebar 2A and Appendix J)

Sidebar 3: Urgent/Emergent Conditions

- Clinical signs:
  - Unstable vital signs
  - Signs or symptoms of decompensated heart failure/symptomatic volume overload (e.g., shortness of breath, rales, jugular venous distention)
  - Signs or symptoms of uremia (e.g., nausea, vomiting, altered level of consciousness, pericarditis)
  - Anuria or oliguria
- Abnormal labs:
  - Significantly abnormal potassium
  - Acute unexplained decline in kidney function
  - Severe acid-base disturbance

Module C: Evaluation and Management of CKD



‡As appropriate, refer to the following VA/DOD CPGs: Chronic Heart Failure, Diabetes, Hypertension, Dyslipidemia, Overweight and Obesity, and Tobacco Cessation

Recommendations can be accessed in the full guideline: https://www.healthquality.va.gov/.

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Sidebar 6: Criteria for CKD

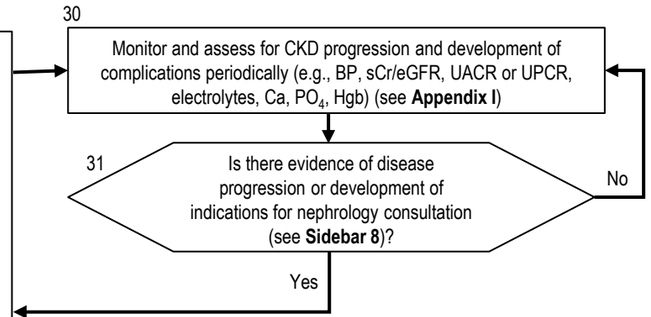
- Markers of kidney damage (1 or more):
  - Albuminuria (UACR ≥30 mg/g) on at least two measurements separated by ≥3 months
  - Urine sediment abnormalities
  - Persistent hematuria
  - Evidence of kidney tubular disorders (e.g., renal tubular acidosis)
  - Abnormalities detected by histology or imaging
  - History of kidney transplantation

AND/OR

- Decreased eGFR <60 mL/min/1.73 m^2 (GFR categories G3a-G5) for ≥3 months

Sidebar 7: Indications for Urology Consultation

- Gross hematuria
- Microhematuria in the absence of albuminuria
- Kidney masses or complex kidney cysts
- Symptomatic or obstructing nephrolithiasis
- Hydronephrosis or bladder abnormalities
- Persistent urinary symptoms despite treatment (e.g., nocturia, hesitancy, urgency, incontinence)
- Urinary retention

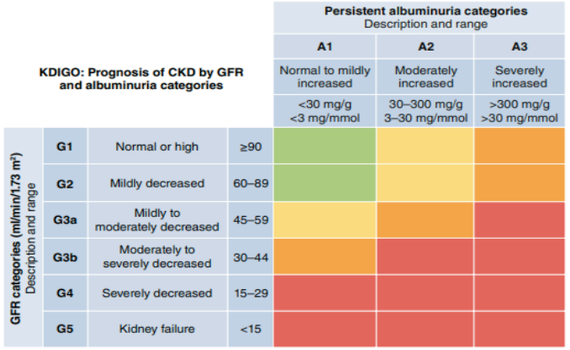


Abbreviations: ADPKD: autosomal dominant polycystic kidney disease; AKD: acute kidney disease; AKI: acute kidney injury; ASCVD: atherosclerotic cardiovascular disease; BP: blood pressure; Ca: calcium; CPG: clinical practice guideline; CVD: cardiovascular disease; DM: diabetes mellitus; eGFR: estimated glomerular filtration rate; HF: heart failure; Hgb: hemoglobin; HIV: human immunodeficiency virus; HTN: hypertension; NSAIDs: nonsteroidal anti-inflammatory drugs; PO_4: orthophosphate; sCr: serum creatinine; SGLT2i: sodium-glucose cotransporter-2 inhibitor; UACR: urine albumin-to-creatinine ratio; UPCR: urine protein-to-creatinine ratio

Sidebar 8: Potential Indications for Nephrology Consultation

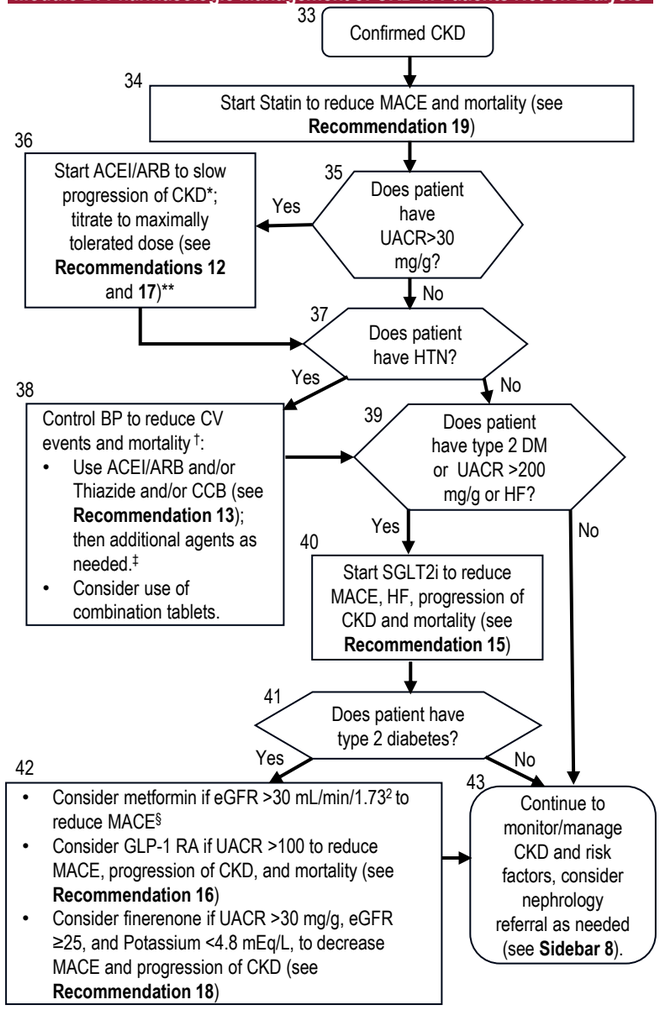
- eGFR <30 mL/min/1.73 m^2
- Rapid decline of eGFR (>5 mL/min/1.73 m^2 per year)
- 5-year risk of kidney failure >3-5% (see Risk Equations Table)
- Non-diabetics with confirmed heavy albuminuria (UACR >300 mg/g, 24-hr urine protein >500 mg, UPCR >0.5 g/g)
- Diabetes with persistent (>1000 mg/g) albuminuria despite RAASi/SGLT2i, or inability to use RAASi/SGLT2i
- Hematuria with albuminuria, glomerular hematuria (e.g., dysmorphic RBC, RBC casts), or hematuria after negative urologic work-up
- Polycystic kidney disease (PKD)
- Kidney transplant recipient
- CKD in a patient <45 years
- Suspected genetic cause of CKD
- Unclear origin of kidney dysfunction or albuminuria
- Metabolic management (prevention) of kidney stone disease
- Electrolyte abnormalities (e.g., hyperkalemia, hyponatremia)
- Complications of CKD (e.g., anemia, metabolic acidosis, hyperphosphatemia, hyperparathyroidism)
- Patient's level of disease exceeds the comfort level of the primary care provider

Sidebar 9: CKD Staging* and Prognosis



Reproduced from Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney Int*. 2024;105(4S): S117–S314.
*ICD-10 codes for CKD stages: G1 (N18.1); G2 (N18.2); G3a (N18.31); G3b (N18.32); G4 (N18.4); G5 (N18.5); G5D (N18.6, dialysis dependent kidney failure)
Green: low risk (if no other markers of kidney disease, no CKD); Yellow: moderately increased risk; Orange: high risk; Red: very high risk

Module D: Pharmacologic Management of CKD in Patients Not on Dialysis



* Strongest evidence for kidney protection with ACEI/ARB is in UACR>300 mg/g;
** In patients with HF, sacubitril/valsartan may be used as an alternative to ACEI/ARB; † See VA/DOD HTN CPG; ‡ Depending on co-occurring conditions; § See VA/DOD DM CPG

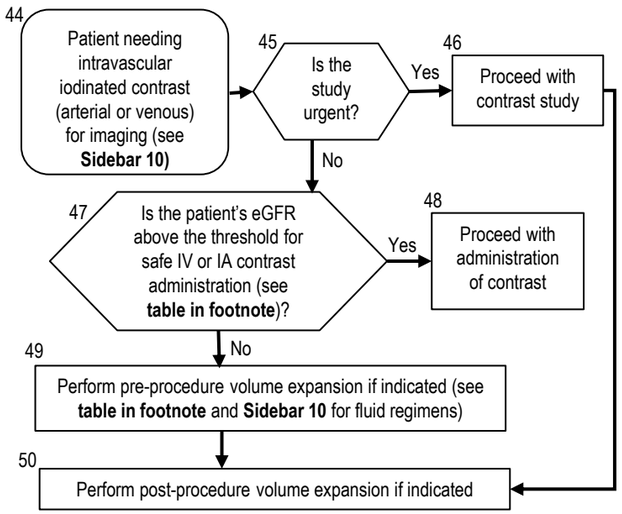
Useful Equations for CKD Diagnosis, Staging, and Risk Assessment

Clinical Utility	Useful for	Equation
Predicts 2- and 5-yr risk of kidney failure in patients with stage G3-G5 CKD	Patients with eGFR <60	Kidney Failure Risk Equation (KFRE) (https://www.kidneyfailurerisk.com/)
Estimates 2- and 4-yr risk of ESKD, CVD, and death	Patients with eGFR <30	CKD G4+ (CKD-PC) risk calculator (https://ckdpcrisk.org/lowgfrevents/)
Predicts risk of 40% decline in kidney function or kidney failure	Patients with eGFR >60	40% decline in kidney function in 3 years (https://ckdpcrisk.org/gfrdecline40/)
Estimates 5-year probability of eGFR <60 mL/min/1.73 m^2	Patients with CKD	Risk of Developing Reduced Kidney Function (http://ckdpcrisk.org/ckdrisk)
Estimates probability of having eGFR <60mL/min/1.73 m^2	Patients without known CKD	Screening for Occult Renal Disease (SCORED) score (https://nccd.cdc.gov/ckd/Calculators.aspx)
Conversion of UPCR or dipstick to UACR	Patients with or at-risk for CKD	Conversion of UPCR and dipstick to UACR (http://ckdpcrisk.org/pcr2acr)
Estimates 10- and 30-yr risk of CVD (composite CVD risk and individual risk of ASCVD and HF)	Patients without known CVD or HF, aged 30-79 yrs	AHA Predicting Risk of CV Disease Events (PREVENT) equations (https://professional.heart.org/en/guidelines-and-statements/prevent-calculator)

Sidebar 10: Considerations for When Studies Requiring Iodinated Contrast are Indicated

- Consider a non-iodinated contrast study as an alternative (e.g., CO_2, group 2 and 3 GBCM) (see Appendix Q)
- Use minimum amount of contrast necessary for appropriate testing
- Assess for risk factors for CA-AKI:
  - Decreased kidney function
  - Diabetes mellitus
  - Albuminuria
  - Heart failure
  - Volume depletion
  - Concomitant nephrotoxin exposure (especially NSAIDs)
- Fluid administration regimens (see Recommendation 22 and Appendix Q for additional information)
  - For outpatients or inpatients: isotonic electrolyte solution (e.g., 0.9% saline) infused at 3 mL/kg over one hour pre-procedure and 6 mL/kg over 2-4 hours post-procedure
  - For inpatients: 1 mL/kg per hour for 6-12 hours pre- and post-procedure

Module E: Management of Patients with CKD Requiring Iodinated Contrast



eGFR Threshold (mL/min/1.73 m^2)		Peri-Procedural Fluid Administration
CT (IV)	Angiography (IA)	
<30	<45	All patients
30-44	45-59	At discretion of ordering clinician in individuals with multiple risk factors (e.g., heavy albuminuria, high frequency NSAID administration.
>45	>60	Not indicated

Abbreviations: ACEI: angiotensin-converting enzyme inhibitor; ARB: angiotensin II receptor blocker; ASCVD: atherosclerotic CVD; BP: blood pressure; Ca: calcium; CCB: calcium channel blocker; CVD: cardiovascular disease; DM: diabetes mellitus; eGFR: estimated glomerular filtration rate; ESKD: end-stage kidney disease; GBCM: gadolinium-based contrast media; Hgb: hemoglobin; HF: heart failure; HTN: hypertension; IA; intra-arterial; IV: intravenous; MACE: major adverse CV events; NSAID: nonsteroidal anti-inflammatory drug; PO_4: orthophosphate; RAASi: renin-angiotensin-aldosterone system inhibitor; RBC: red blood cell; sCr: serum creatinine; SGLT2i: sodium-glucose cotransporter-2 inhibitor; UACR: urine albumin-to-creatinine ratio; UPCR: urine protein-to-creatinine ratio