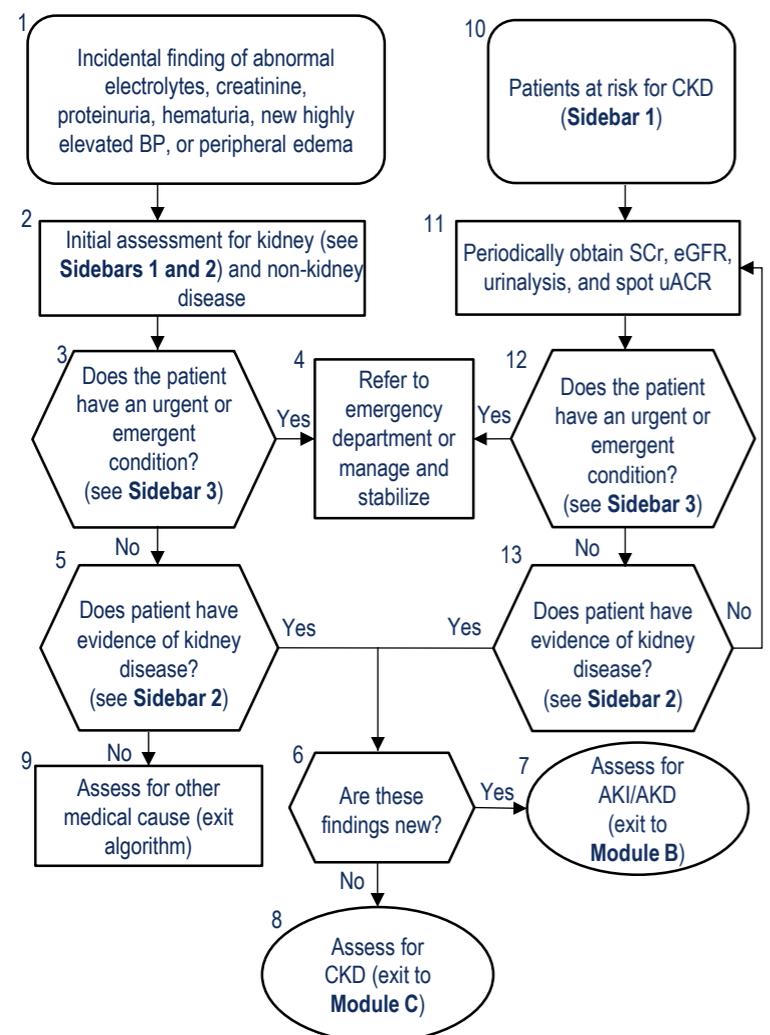


The Management of Chronic Kidney Disease (CKD)



Module A: Screening for CKD and Initial Assessment



Access to the full guideline and additional resources are available at the following link: <https://www.healthquality.va.gov/guidelines/CD/CKD/>

### Sidebar 1: At-Risk Population

- DM, hypertension, cardiac disease/congestive heart failure, or vascular disease
- Systemic illness (e.g., HIV, systemic lupus erythematosus, multiple myeloma)
- Urinary tract abnormalities
- History of AKI, proteinuria, or other known kidney disease
- Family history of kidney disease (e.g., ADPKD)
- Patients age 60 and above
- Ethnicities associated with increased risk (e.g., African Americans, Hispanics, Native Americans)

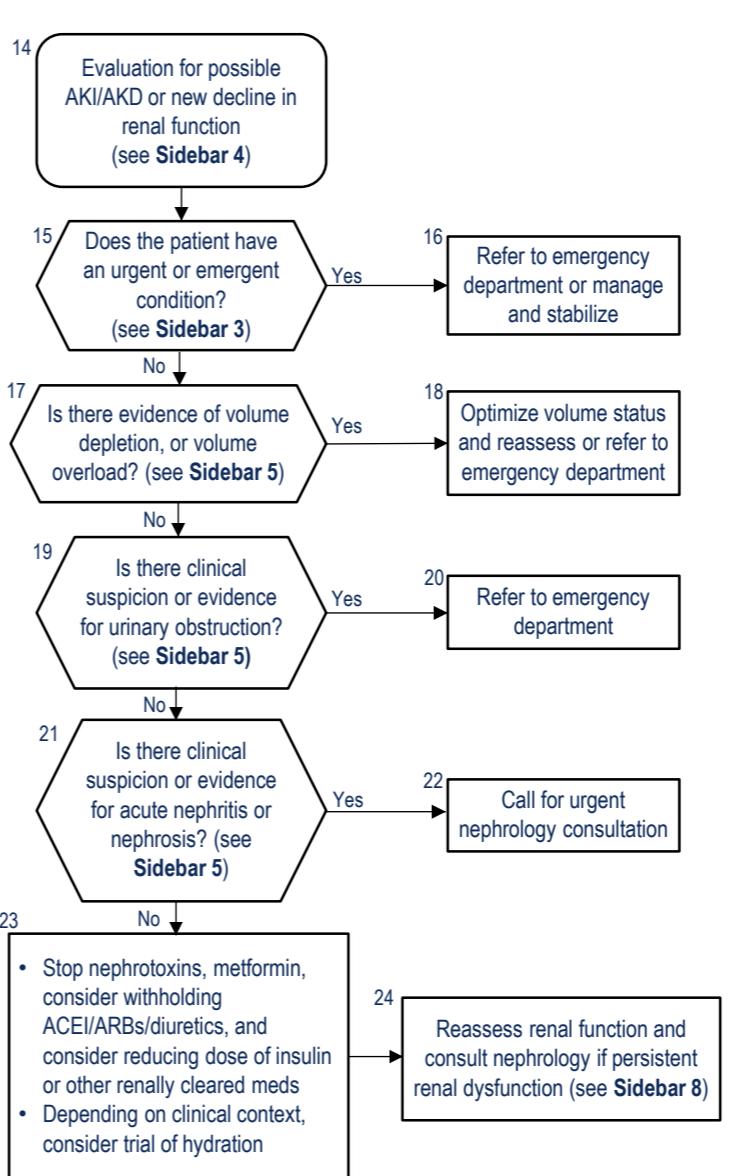
### Sidebar 2: Assessment for Kidney Disease

- History:
  - Symptoms of volume depletion (lightheadedness, dizziness) or overload (pedal edema, dyspnea)
  - Cause of volume depletion (diarrhea, vomiting, decreased oral intake, heat exposure)
  - Medications and supplements (NSAIDs, diuretics, BP med changes)
  - Recent illnesses/infections (upper respiratory infection, osteomyelitis)
  - Urinary changes (hematuria, obstruction)
  - Rheumatologic symptoms
- Physical: vital signs, peripheral edema, volume status
- Labs: assess for abnormal labs (e.g., electrolytes, creatinine, hematuria, microalbuminuria/proteinuria) and lab trends then repeat labs (as clinically appropriate)

### Sidebar 3: Urgent/Emergent Conditions

- Clinical signs:
  - Unstable vital signs
  - Decompensated heart failure/symptomatic volume overload
  - Signs or symptoms of uremia
  - Anuria
- Abnormal labs:
  - Significantly abnormal potassium (<2.5 mEq/L or ≥6 mEq/L)
  - Acute unexplained decline in kidney function
  - Severe acid-base disturbance

Module B: Evaluation for AKI or New Decline in Renal Function



### Sidebar 4: Definition of AKI and AKD

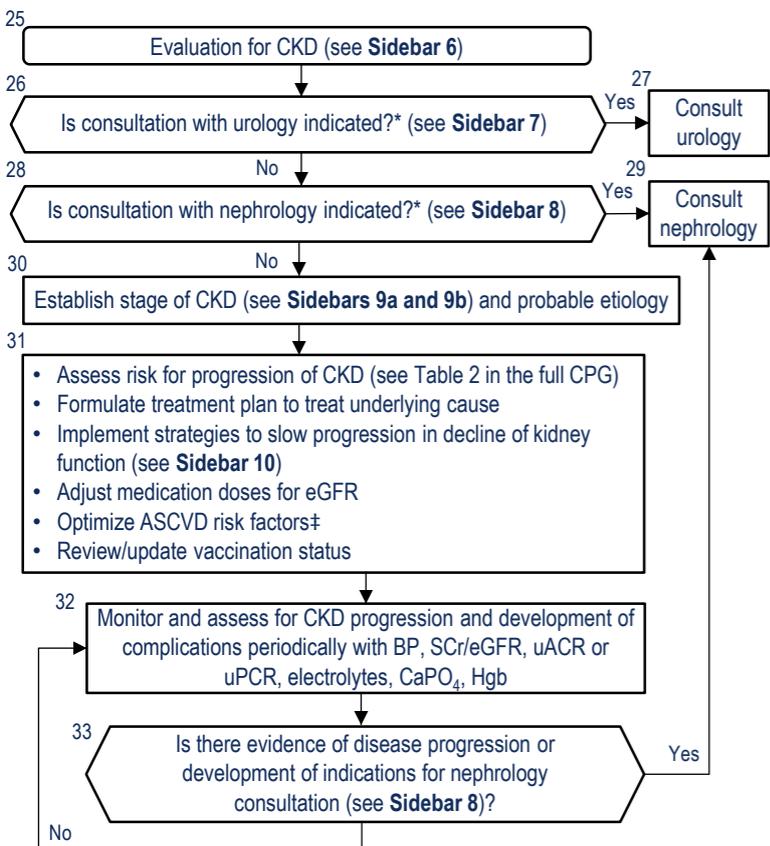
- Definition of AKI (presence of any of the following):
  - Increase in SCr of >0.3 mg/dL over not more than 48 hrs
  - Increase in SCr of >50% as compared to baseline, presumed to have occurred over not more than 7 days
  - Urine output of <0.5 mL/kg/hr over 6 hrs
- Definition of AKD (presence of any of the following):
  - GFR <60 mL/min/1.73 m<sup>2</sup> for <3 months
  - Decrease in GFR by >35% or increase in SCr by >50% for <3 months
  - Kidney damage (structural) for <3 months

### Sidebar 5: Assessment for AKD

- For volume depletion, e.g.,:
  - Lightheadedness or dizziness
  - Hypotension
  - Orthostasis
- For volume overload, e.g.,:
  - Shortness of breath
  - Rales
  - Edema
  - Jugular vein distension
- For urinary obstruction, e.g.,:
  - Symptoms of voiding dysfunction
  - Flank pain or hematuria
  - Elevated post-void bladder volume
  - Evidence of obstruction on kidney imaging (e.g., hydronephrosis)
- For suspicion of acute nephritis or nephrosis (hematuria, dysmorphic RBCs or RBC casts, new onset proteinuria) with:
  - Recent illness (e.g., infection)
  - Constitutional or rheumatologic symptoms
  - Rash
  - Edema
  - Hemoptysis

Abbreviations: ACEI: angiotensin-converting enzyme inhibitor; ADPKD: autosomal dominant polycystic kidney disease; AKD: acute kidney disorder; AKI: acute kidney injury; ARB: angiotensin receptor blocker; ASCVD: atherosclerotic cardiovascular disease; BP: blood pressure; Ca: calcium; CKD: chronic kidney disease; CPG: clinical practice guideline; dL: deciliter; DM: diabetes mellitus; DoD: Department of Defense; eGFR: estimated glomerular filtration rate; GFR: glomerular filtration rate; hr: hour; HTN: hypertension; kg: kilogram; L: liter; m: meter; mEq: milliequivalent; mg: milligram; min: minute; mL: milliliter; NSAID: non-steroidal anti-inflammatory drug; PO<sub>4</sub>: phosphate; RBC: red blood cell; SCr: serum creatinine; SGLT2: sodium-glucose transport protein 2; STEMI: ST-segment elevation myocardial infarction; uACR: urine albumin-to-creatinine ratio; uPCR: urine protein-to-creatinine ratio; VA: Department of Veterans Affairs

**Module C: Evaluation for CKD**



\*Referral should be made following shared decision making with patient that ensures the referral focus is consistent with the patient values and preferences

‡As appropriate, refer to the following VA/DoD Clinical Practice Guidelines: Chronic Heart Failure, Diabetes, Hypertension, Dyslipidemia, Overweight and Obesity, and Tobacco Cessation

**Sidebar 6: Criteria for CKD**

**Sustained abnormality for ≥3 months of either:**

- eGFR <60 mL/min/1.73 m<sup>2</sup>

**or any of the following:**

- Albuminuria (uACR >30) or proteinuria (uPCR >0.2)
- Hematuria or abnormal urinalysis/microscopy
- Solitary or horseshoe kidney
- History of abnormal renal histology
- History of renal transplantation

**Sidebar 7: Indications for Urology Consultation**

- Isolated or gross hematuria
- Renal masses or complex renal cysts
- Symptomatic or obstructing nephrolithiasis
- Hydronephrosis or bladder abnormalities
- Urinary symptoms (e.g., nocturia, hesitancy, urgency, incontinence)

**Sidebar 8: Potential Indications for Nephrology Consultation\***

- eGFR <30 mL/min/1.73 m<sup>2</sup>
- Rapid decline of eGFR (>5 mL/min/1.73 m<sup>2</sup> per year)
- Non-diabetics with heavy proteinuria (24 hr urine protein >500 mg, uPCR >0.5, uACR >300)
- Diabetics with >3 g proteinuria (uPCR >3) or hematuria
- Unclear cause of CKD, hematuria, or proteinuria
- Complications of CKD (e.g., anemia, acidosis, hyperphosphatemia, hyperparathyroidism)
- ADPKD
- Renal transplant
- Metabolic management (prevention) of kidney stone disease
- Electrolyte abnormalities (e.g. hyperkalemia, hyponatremia)
- Patient's level of disease exceeds the comfort level of the primary care provider

**Sidebar 9a: Stage of CKD\* – GFR Categories**

Stage	eGFR (mL/min/1.73 m <sup>2</sup> )	Description
G1	≥90	Kidney damage with normal or increased GFR
G2	60 – 89	Kidney damage with mildly decreased GFR
G3a	45 – 59	Mildly to moderately decreased GFR
G3b	30 – 44	Moderately to severely decreased GFR
G4	15 – 29	Severely decreased GFR
G5	<15 or dialysis	Kidney failure

**Sidebar 9b: Stage of CKD\* – Albuminuria Categories**

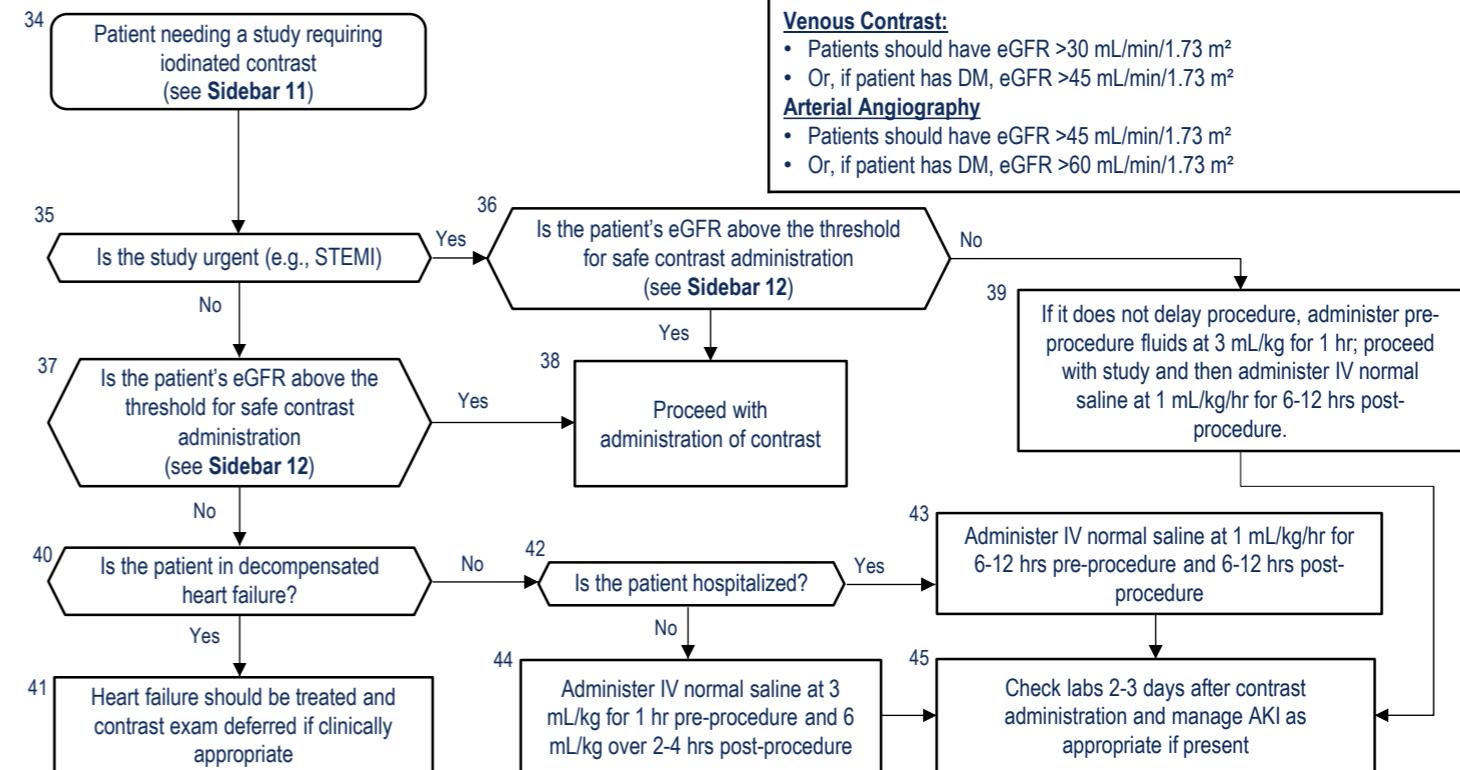
Category	uACR (mg/g)	Description
A1	<30	Normal to mildly increased
A2	30 – <300	Moderately increased
A3	≥300	Severely increased

\*Consider one-time cystatin C measurement to confirm CKD diagnosis and stage (see Recommendation 3 in the full CPG)

**Sidebar 10: Strategies to Slow Progression of CKD**

- Control of hypertension with preferential use of either ACEI or ARB in patients with albuminuria/proteinuria
- Individualized control of DM
- Use of SGLT2 inhibitors in patients with type 2 DM and an eGFR > 30 mL/min/1.73 m<sup>2</sup>
- Eliminate/avoid nephrotoxic agents whenever possible (e.g., NSAIDs, iodinated contrast)
- Refer to dietitian for medical nutrition therapy (e.g., protein intake, sodium restriction, weight loss)

**Module D: Management of Patients with CKD Requiring Iodinated Contrast**



**Sidebar 11: Considerations for When Studies Requiring Iodinated Contrast are Indicated**

- Consider non-contrast studies as alternative
- Use minimum amount of contrast necessary for appropriate testing
- Consider holding metformin due to risk of lactic acidosis (see Recommendation 16 discussion section in the full CPG)
- Assess for risk factors for CA-AKI:
  - Decreased kidney function
  - DM
  - Proteinuria
  - Heart failure
  - Volume depletion
  - Para-proteinemia

**Sidebar 12: eGFR Cutoffs for Contrast**

**Venous Contrast:**

- Patients should have eGFR >30 mL/min/1.73 m<sup>2</sup>
- Or, if patient has DM, eGFR >45 mL/min/1.73 m<sup>2</sup>

**Arterial Angiography**

- Patients should have eGFR >45 mL/min/1.73 m<sup>2</sup>
- Or, if patient has DM, eGFR >60 mL/min/1.73 m<sup>2</sup>