# Diagnosis and Management of Adults with Chronic Kidney Disease

The following guideline recommends diagnosis and aggressive management of chronic kidney disease by clinical stage.

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<th>Eligible Population</th>
<th>Key Components</th>
<th>Recommendation and Level of Evidence</th>
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| All adults at increased risk for CKD | Screening | For patients at increased risk for CKD (e.g., diabetes mellitus, hypertension, family history of kidney disease, older age, obesity, metabolic syndrome, history of acute kidney injury) assess for markers of kidney damage:  
Measure blood pressure [A] at least two times/year. Creatinine (for eGFR), electrolytes, BUN, urinalysis, and urine dipstick for albumin, annually. |
| Testing for diagnosis and staging | | Assess for markers of kidney damage:  
Spot urine for albumin-to-creatinine ratio (ACR) to detect macro- or microalbuminuria.  
Serum creatinine for estimated glomerular filtration rate (eGFR) to trend over a 3-month period (if < 60 ml/min/1.73m², and no prior eGFR < 60 ml/min/1.73m², obtain renal ultrasound.  
Fasting lipid profile, CBC, glucose; review prior lab results. |
| Risk Factor Management & Patient Education | | At each routine health exam:  
Optimize management of comorbid conditions (e.g., diabetes mellitus [A1C], hypertension [≤ 130/80, if tolerated], urinary tract obstruction, cardiovascular disease)¹ ².  
Educate on therapeutic lifestyle changes: weight maintenance if BMI < 25, weight loss if BMI > 25, exercise and physical activity, nutrition therapy, moderation of alcohol intake, smoking cessation. |
| Adults with CKD | Core Principles of Treatment [D] | Intensive management of risk factors.  
Inform patient of serious progressive nature of CKD and its risks.  
Review medications for dose adjustment, drug interactions, adverse effects, and therapeutic levels. Modify dosage for renal cleared medications, e.g. Metformin, ciprofloxacin.  
Update vaccines: HBV, influenza, Tdap, and Pneumococcal Conjugate Vaccine (Prevnar®) and Pneumococcal Polysaccharide Vaccine (Pneumovax®)  
Salt restriction for patients with CKD and hypertension.  
Incorporate self-management behaviors into treatment plan at all stages of CKD [B].  
Develop clinical plan based on disease stage [B]. |
| Clinical plan based on CKD stage and albuminuria | Stage 1 (GFR ≥ 90): | Monitor eGFR and microalbuminuria at least annually based on risk, smoking cessation, consider ACE and/or ARB therapy. Nephrology referral if macroalbuminuria - 300 mg/g creatinine on spot ACR ratio (30 mg/dl on dipstick).  
Stage 2 (GFR 60-89): | Nephrology referral if eGFR decline > 5 mL/min/yr, or if macroalbuminuria.  
Stage 3a (GFR 45-59): | Nephrology referral if anemic or abnormal PTH, VitD, Ca, or phosphorus. Avoid contrast, if possible. Avoid NSAIDs. Low-dose ASA allowed.  
Stage 3b (GFR 30-44): | Nephrology referral.  
Stage 4 (GFR 15-29): | Nephrology co-management; consider case management if available. CKD education and discussion of choices and options, dialysis access, advance care planning.  
Stage 5 (GFR < 15): | Renal replacement therapy when needed. |

¹Reference MQIC guidelines on diabetes, hypertension, lipids, and obesity  
²Reference University of Michigan Health System Clinical Care Guidelines on diabetes, hypertension, lipids, and obesity

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**Levels of Evidence for the most significant recommendations:**  
- A = randomized controlled trials  
- B = controlled trials, no randomization  
- C = observational studies  
- D = opinion of expert panel


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