Is patient at risk for CKD?

Susceptibility
– Age > 60 years
– Family history of CKD

Direct Risk Factors
– Diabetes
– High blood pressure
– Autoimmune diseases
– Lower urine tract obstruction
– Hx acute renal failure

Progressive Risk Factors
– Systemic infections
– Urinary tract infection
– Urinary stones
– Drug toxicity
– Exposure drugs/contrast

- Yes
- No

Perform routine screening for CKD for patients at increased risk
– Serum creatinine to determine estimated eGFR
– Assessment of proteinuria
– Urinalysis for presence of white & red blood cells

Does patient have abnormal eGFR > 3 months?

Yes

Follow Up CKD Monitoring
– Test patients at risk for CKD annually
– Counsel patients at risk for CKD but found not to have CKD to reduce risk factors when possible

Does patient have urinary albumin-creatinine (ACR) ratio > 30 mg/g?

Yes

Consult nephrologist if action plan cannot be performed or carried out or eGFR < 60

Assess barriers to treatment adherence
– Family and social support
– Depression
– Income & unemployment concerns
– Stress and coping mechanisms
– Perceptions of illness & treatment
– Limited access to medications and/or care

Review medication usage at follow-up visits
– Evaluate for necessary dose adjustments based on level of kidney function
– Evaluate for adverse effects of medications on kidney function (NSAIDs, IV contrast)
– Evaluate for drug interactions
– Counsel patient to avoid nephrotoxic drugs and IV contrast
– Evaluate appropriateness for ARB/ACE inhibitor with diagnosis of HTN/diabetes
– Evaluate need for therapeutic drug monitoring

Consult/Refer to Nephrologist
– Consult nephrologist at Stage 1 if hematuria or significant proteinuria present
– Consult nephrologist at Stage 2 if eGFR declines > 4 mL/min/yr
– Consult nephrologist at Stage 3 for all patients with CKD
– Refer patient to nephrologist for evaluation when eGFR < 30 mL/min/1.73²

No

Stage 1 - 2
eGFR > 60
ACR > 30 mg/g x 2

Stage 3
eGFR 30-59

Stage 4
eGFR 15-29

Stage 5
eGFR < 15

Begin CKD Treatment: Develop Clinical Action Plan
Collaborate with nephrologist to develop action plan to include:
– Evaluate and manage comorbid conditions (Primary care, all stages)
– Slow the loss of kidney function (Co-management, all stages)
– Prevent & treat cardiovascular disease (Primary care, all stages)
– Prevent & treat complications of decreased kidney function (Co-management, all stages)
– Prepare for kidney failure and replacement therapy (Nephrology, stage 4)
– Spare non-dominant arm above wrist from venipuncture and IV catheters (Co-management, all stages)
– Avoid subclavian central lines and PICC lines if eGFR < 45 (Co-management, stage 3-5)
– Consider vascular surgery consultation for “fistula only” if eGFR < 30 (Nephrology, stage 4-5)
– Replace kidney function (Nephrology, stage 5)

Consult nephrologist if action plan cannot be performed or carried out or eGFR < 60

Determine Stage of CKD

Yes

No

Does patient have abnormal eGFR > 3 months?

No

Consult nephrologist at Stage 1 if hematuria or significant proteinuria present

Consult nephrologist at Stage 2 if eGFR declines > 4 mL/min/yr

Consult nephrologist at Stage 3 for all patients with CKD

Refer patient to nephrologist for evaluation when eGFR < 30 mL/min/1.73²

No

STOP

Prepared by the Renal Network of the Upper Midwest, Inc. Please call 1-800-973-3773 for questions or reprint requests.

The Kidney Disease Outcomes Quality Initiative (KDOQI) recommendations for Chronic Kidney Disease: Evaluation, Classification, and Stratification were used to develop portions of these documents.
CKD Treatment Algorithm

**CKD Stage 1 - 2**
- eGFR ≥ 60 mL/min/1.73 m²
- Urinary albumin-creatinine (ACR) > 30 mg/g x 2

**Primary Care**

**Assess Complications**

**LABS**
- BP monitoring q 3-12 mo.
- eGFR q 12 mo.
- Urinalysis q 3 -12 mo. to assess hematuria, proteinuria, microalbuminuria
- Lipids q 12 mo.
- If diabetic, Hgb A1C and microalbuminuria q 12 mo.
- Hgb q 12 mo. if > 11 g/dL

**RISK ASSESSMENT**
- Avoidance of nephrotoxic agents & dyes
- Spare non-dominant arm above wrist from venipuncture and IV catheters
- Immunizations
  - Flu vaccine q 12 mo.
  - Pneumovax, as indicated
  - Hep B vaccine, as indicated
- Assess cardiovascular risk:
  - Smoking cessation
  - Physical activity

**EDUCATION**
- Cardiovascular risk
- Medications to avoid
- Immunizations

**CO-MANAGEMENT**

**Assess Complications**

**LABS**
- BP monitoring q 3-12 mo.
- eGFR q 3-12 mo.
- Urinalysis q 6-12 mo.
- Lipids q 12 mo.
- If diabetic, Hgb A1C and microalbuminuria q 12 mo.
- Hgb > 11 g/dL
- If diabetic, Hgb A1C and microalbuminuria q 12 mo.
- Hgb q 3-6 mo, monthly if on ESA
- PTH, Ca, P q 3-6 mo.

**RISK ASSESSMENT**
- Avoidance of nephrotoxic agents & dyes
- Spare non-dominant arm above wrist from venipuncture/IV cath
- Avoid subclavian and PICC lines
- Immunizations
  - Flu vaccine q 12 mo.
  - Pneumovax, as indicated
  - Hep B vaccine, as indicated
- Assess cardiovascular risk:
  - Smoking cessation
  - Physical activity

**EDUCATION**
- Cardiovascular risk
- Medications to avoid
- Immunizations
- Nutrition: Diet low in salt & K+
- Renal bone disease
- Vascular access placement
- Modality options

**NEPHROLOGY**

**Assess Complications**

**LABS**
- BP monitoring q 3-6 mo.
- eGFR q 3-6 mo.
- Lipids q 12 mo.
- If diabetic, Hgb A1C and microalbuminuria q 12 mo.
- Hgb q 3-6 mo, monthly if on ESA
- PTH, Ca, P q 3-6 mo.
- Measure 25(OH)D
- HBV titer

**RISK ASSESSMENT**
- Avoidance of nephrotoxic agents & dyes
- Spare non-dominant arm above wrist from venipuncture/IV cath
- Avoid subclavian and PICC lines
- Immunizations
  - Flu vaccine q 12 mo.
  - Pneumovax, as indicated
  - Hep B vaccine, as indicated
- Assess cardiovascular risk:
  - Smoking cessation
  - Physical activity

**EDUCATION**
- Cardiovascular risk
- Medications to avoid
- Immunizations
- Nutrition: Diet low in fluids, salt, phos. & K+
- Renal bone disease
- Anemia
- Vascular access monitoring
- Modality options

**REFERRALS**
- Surgeon for “fistula only” placement if hemodialysis modality choice
- Transplant center for eval

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