SMF PCP Treatment & Referral Guideline
Chronic Kidney Disease
March, 2012

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**Introduction**

Chronic kidney disease (CKD) is a common condition in primary care patients, leading to a variety of serious complications including electrolyte abnormalities, secondary hyperparathyroidism, renal osteodystrophy, anemia, malnutrition, cardiovascular disease, and the need for renal replacement. Patients with CKD should be screened for these complications, as specific interventions can prevent and delay their development and improve patient outcomes. Sutter Medical Group and Capital Nephrology jointly wrote this screening, treatment and referral guideline for CKD based on KDOQI and KDIGO recommendations from the National Kidney Foundation and based on the diabetes standards of care by the American Diabetes Association. This guideline is intended to help providers make decisions about when screening tests should be performed, what treatment should be considered based on the results, and when to refer to a Nephrologist. In general referral should be considered when there is uncertainty about the etiology of the kidney disease, abnormalities on screening tests, the development of complications, difficult management issues, or advanced kidney disease. All decisions should be made within the context of the specific situation for each patient, including current health, quality of life, life expectancy, and patient preference.

### 1. Screening and Referral Recommendations for Chronic Kidney Disease

- **Generally use serum creatinine to calculate eGFR based on MDRD formula in ml/min/1.73m².** CKD diagnosis is made based on GFR or kidney results for ≥ 3 months.
- **Consider renal imaging at time of diagnosis to evaluate for parenchymal renal disease.**
- **Refer to table in section 2 below for recommendations based on results of screening tests.**
- **Note: it is important to include CKD diagnosis when documenting and coding medical conditions.**

#### STAGE 1

**Marker of Kidney Damage**: Albuminuria (urine microalbumin to creatinine ratio > 30) or Urine sediment abnormality or Pathologic kidney abnormality or Kidney imaging abnormality

**GFR > 90**

**Screen Annually:**
- **Electrolytes:**
  - Potassium
  - Bicarb
- **Nutritional status:**
  - Albumin
- **Bone disease:**
  - Calcium
  - Phosphorus
  - Alkaline Phosphorus
- **Intact PTH**
- **25 OH Vit D**
- **Anemia**
  - Hemoglobin
- **Proteinuria**
  - Urine microalbumin/creatinine ratio

**Additional considerations**
- **Dexa scan (as per age appropriate screening)**
- **Lipids:** screen and treat as high CVD risk equivalent (See SHARP study reference)
- **Treat underlying conditions as appropriate**

**Monitor Patient**

#### STAGE 2

**Marker of Kidney Damage**: Albuminuria (urine microalbumin to creatinine ratio > 30) or Urine sediment abnormality or Pathologic kidney abnormality or Kidney imaging abnormality

**GFR 60-90**

**Screen q 12 mo:**
- **Electrolytes:**
  - Potassium
  - Bicarb
- **Nutritional status:**
  - Albumin
- **Bone disease:**
  - Calcium
  - Phosphorus
  - Alkaline Phosphorus
- **Intact PTH**
- **25 OH Vit D**
- **Anemia**
  - Hemoglobin
- **Proteinuria**
  - Urine microalbumin/creatinine ratio

**Additional considerations**
- **Dexa scan (as per age appropriate screening)**
- **Lipids:** screen and treat as high CVD risk equivalent (See SHARP study reference)

**Consider referral to nephrology if screening results abnormal**

**Screen q 6-12 mo for the following:**
- Electrolytes:
  - Potassium
  - Bicarb
- **Nutritional status:**
  - Albumin
- **Bone disease:**
  - Calcium
  - Phosphorus
  - Alkaline Phosphorus
  - Intact PTH
  - **25 OH Vit D**
- **Anemia**
  - Hemoglobin
- **Proteinuria**
  - Urine microalbumin/creatinine ratio

**Additional considerations**
- **Referral to diettian to:**
  - determine ideal daily calories
  - recommend 0.8 g protein/kg/day
  - Dexa scan (as per age appropriate screening)
  - Lipids:
  - screen and treat as high CVD risk equivalent (See SHARP study reference)

**Labs Normal**

**Refer to Nephrology**

#### STAGE 3a

**GFR 45-60**

**check eGFR q 6 mo**

**Consider referral to nephrology if screening results abnormal**

**Screen q 6-12 mo for the following:**
- Electrolytes:
  - Potassium
  - Bicarb
- **Nutritional status:**
  - Albumin
- **Bone disease:**
  - Calcium
  - Phosphorus
  - Alkaline Phosphorus
  - Intact PTH
  - **25 OH Vit D**
- **Anemia**
  - Hemoglobin
- **Proteinuria**
  - Urine microalbumin/creatinine ratio

**Additional considerations**
- **Referral to diettian to:**
  - determine ideal daily calories
  - recommend 0.8 g protein/kg/day
  - Dexa scan (as per age appropriate screening)
  - Lipids:
  - screen and treat as high CVD risk equivalent (See SHARP study reference)

**Labs Abnormal**

**Refer to Nephrology**

#### STAGE 3b

**GFR 30-45**

**check eGFR q 3 mo**

**Consider referral to nephrology regardless of screening results**

**Screen q 3-6 mo for the following:**
- Electrolytes:
  - Potassium
  - Bicarb
- **Nutritional status:**
  - Albumin
- **Bone disease:**
  - Calcium
  - Phosphorus
  - Alkaline Phosphorus
  - Intact PTH
  - **25 OH Vit D**
- **Anemia**
  - Hemoglobin
  - Proteinuria
  - Urine microalbumin/creatinine ratio

**Additional considerations**
- **Referral to diettian to:**
  - determine ideal daily calories
  - recommend 0.8 g protein/kg/day
  - Dexa scan (as per age appropriate screening)
  - Lipids:
  - screen and treat as high CVD risk equivalent (See SHARP study reference)

**Labs Normal**

**Refer to Nephrology**

#### STAGE 4 and 5

**GFR < 30**

**Refer to nephrology**

**Labs Abnormal**

**Refer to Nephrology**

### Note:

- it is important to include CKD diagnosis when documenting and coding medical conditions.
### 2. Treatment Recommendations for Chronic Kidney Disease

<table>
<thead>
<tr>
<th>Labs</th>
<th>Target</th>
<th>Treatment Recommendations (note make decisions based on trends)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potassium</strong></td>
<td>3.5-5.1</td>
<td><strong>≤ 4.5:</strong> No dietary changes recommended</td>
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<td>4.6-5.0: Educate to avoid high K foods (limit 2-3 gram/day).</td>
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<td>• Recheck 2 month until stable</td>
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<td></td>
<td></td>
<td><strong>&gt; 5.0:</strong> Educate to avoid high K foods (limit 2-3 gram/day).</td>
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<td></td>
<td></td>
<td>• Consider medication changes to lower K</td>
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<td></td>
<td>• Recheck q 4 weeks</td>
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<tr>
<td><strong>Calcium</strong> (correct if albumin &lt; 4.0)</td>
<td>8.4-10.2</td>
<td>If calcium elevated restrict calcium intake to &lt; 2000 mg/day</td>
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<td>If calcium decreased plus hypocalcemia symptoms or PTH elevated (see goal below) then refer to nephrology</td>
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<tr>
<td><strong>Bicarbonate</strong></td>
<td>23-25</td>
<td>Consider bicarbonate replacement if &lt; 20. Initial treatment: sodium bicarbonate 650 mg daily</td>
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<tr>
<td><strong>Phosphorus</strong></td>
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<td>If Phosphorus or PTH elevated then restrict dietary phosphorus to 800-1000 mg/day (adjusted to protein needs)</td>
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<td>If Phosphorus persists elevated despite dietary changes, then add phosphate binder</td>
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<td>• If serum calcium normal then can use calcium based: calcium acetate (Phoslo) or calcium carbonate (Tums)</td>
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<td>• If serum calcium elevated, or PTH persistently low, then use non-calcium based: sevelamer hcl (Renagel) or carbonate (Renvela) or lanthanum carbonate (Fosrenol)</td>
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<td>• Avoid the long term use of aluminum containing phosphate binders</td>
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<td><strong>Intact PTH</strong></td>
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<td>Target depends on stage of CKD:</td>
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<td>Stage 3 (eGFR 30-59):</td>
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<td>• target intact PTH 35-70 (measure q 12 mo)</td>
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<td>Stage 4 (eGFR 15-29):</td>
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<td>• target intact PTH 70-110 (measure q 3 mo)</td>
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<td>Stage 5 (eGFR &lt;15):</td>
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<td>• target intact PTH 150-600 (measure q 3 mo) or &lt; 2-9 times the upper normal limit</td>
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<td><strong>25 OH Vit D</strong></td>
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<td>&gt; 30 ng/ml</td>
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<td>If low, supplement with Vit D2 (ergocalciferal) or Vit D3 (cholecalciferol). Discontinue therapy if calcium or phosphorus elevated above target range.</td>
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<td><strong>Hemoglobin</strong></td>
<td>Goal 9.0-11.0 gm/dL</td>
<td>If Hb low, evaluate for other causes of anemia (ie Iron deficiency, vit B12 or folate deficiency). If Hb &lt; 9.0 consider Erythropoeitin Stimulating Agent to maintain Hb 9.0-10.0</td>
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<tr>
<td><strong>Urine Protein</strong></td>
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<td>If urine microalb/creat ratio &gt; 30 (microalbuminuria) then consider treatment with ACE or ARB</td>
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<td></td>
<td>If urine microalb/creat ratio &gt; 300 (macroalbuminuria) then consider check urine protein/creatinine ratio</td>
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<td>• If urine protein/creatinine ratio &gt; 3000 then referral to nephrology if etiology is unclear and not felt to be explained by diabetes alone and/or if sudden rise in proteinuria which could possibly be explained by another disease process.</td>
</tr>
<tr>
<td><strong>Urine Sediment</strong></td>
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<td>If urine sediment abnormal consider earlier referral to nephrologist</td>
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### 3. Goal and Treatment of Hypertension in Chronic Kidney Disease

#### Goal for Blood Pressure in Chronic Kidney Disease
- Less than 130/80

#### Treatment of Blood Pressure in Chronic Kidney Disease
- Limit sodium to 2.4 g/day. Consider referral to dietician
- Use **ACE inhibitor or ARB** (especially if patient has diabetes or urine protein/creatinine ratio > 200)
  - Use in moderate to high doses (as used in clinical trials) if tolerated
  - Caution with use of other medications than can potentially raise potassium levels (e.g. Bactrim/Septra, spironolactone, NSAIDs.)
  - If one class not tolerated, substitute the other
  - May can consider adding spironolactone, especially if significant proteinuria.
- If serum creatinine increases > 30% (or K persists > 5.5 mEq/L) after beginning ACE/ARB then consider reducing the dose of the medication or discontinuing the medication
- Consider adding a **diuretic** to reach target (especially if edema)
  - Thiazide diuretic (if eGFR ≥ 30 or serum creatinine > 2.5 mg/dl) (caution in elderly due to hyponatremia) or
  - Loop diuretic (if eGFR <30)
- Consider adding **beta-blockers and/or calcium channel blockers** if needed to control BP
- Recheck metabolic panel in 5-7 days after initiation of new anti-hypertensive medications to evaluate for electrolytes and renal function abnormalities
- Consider referral to Nephrology if BP difficult to control
References

   http://www.kidney.org/professionals/KDOQI/
   http://www.nature.com/ki/archive/index.html
   http://www.nature.com/ki/archive/index.html
4. American Diabetes Association Standards of Medical Care in Diabetes—2012 
   Diabetes Care January 2012 vol. 35 no. Supplement 1 S11-S63 
   http://care.diabetesjournals.org/content/35/Supplement_1/S11.full.pdf+html
7. Aranesp (darbepoetin alfa) Package Insert 2011 
   http://www.accessdata.fda.gov/drugsatfda_docs/label/2002/darbamg071902LB.pdf
8. Epogen(epoetin alfa) Package Insert 2011 
   http://pi.amgen.com/united_states/epogen/epogen_pi_hcp_english.pdf
PCP Treatment & Referral Guideline: Chronic Kidney Disease
Created: March, 2012

**APPROVAL:**

[Signature]
SMF Medical Director

March 14, 2012
Date

**Approval/Revision Summary:**

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