VA/DoD Clinical Practice Guideline for the Management of Chronic Kidney Disease in Primary Care (2008)

PROVIDER REFERENCE CARDS
Chronic Kidney Disease
Key Elements

1. Diagnostic criteria and identification of early disease.

2. Identification of susceptibility factors (adult patients at increased risk for developing CKD).

3. Identification of progression factors (adult patients at high risk for worsening kidney damage and subsequent loss of kidney function).

4. Evaluation of patients with kidney disease (estimate of GFR, blood pressure, and assessment of proteinuria as a marker of kidney damage).

5. Slowing the progression of CKD and prevention of conditions that exacerbate chronic disease.


7. Indication for consultation and referral to a nephrologist.

**MANAGEMENT OF CHRONIC KIDNEY DISEASE IN PRIMARY CARE**

1. Adult patient with suspected or confirmed CKD presenting to primary care
   (See Screening Algorithm)

2. Obtain appropriate clinical assessment: medical history, physical examination and laboratory tests

3. Is patient in any acute emergent or urgent condition? (See sidebar A)

4. Refer to Emergency Department or manage to stabilize


7. Is there indication to consult/refer to nephrology? (See sidebar D)

9. Establish treatment plan to address treatment of primary etiology [H]

10. Manage comorbid conditions

11. Are there complications? [K]

12. Treat symptoms and complications [K] (See sidebar C)

13. Provide patient education [L]

14. Follow-up [M]

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### Sidebar A: Urgent/Emergent Conditions
- Acute unexplained decline in kidney function
- Heart failure / volume overload
- Hyperkalemia (potassium >6 mEq/L)
- Signs or symptoms of uremia

### Sidebar B: Strategies to Slow Progression
1. Control of hypertension
2. Use of ACEI / ARB
3. Control of hyperglycemia
4. Avoid toxic drugs
5. Smoking cessation
6. Control of dyslipidemia

### Sidebar C: Prevention and Treatment of Complications
- Metabolic disorders:
  - potassium balance
  - calcium, phosphate balance
  - acidosis
- Anemia
- Volume overload
- Overuse of renally excreted drugs
- Nutrition

### Sidebar D: Indications for Nephrology Consultation
1. eGFR <30 ml/min/1.73m²
2. Rapid decline of GFR
3. Severe complications of CKD (e.g. recalcitrant anemia, calcium or phosphorus abnormalities)
4. Nephrotic range proteinuria (>3.5 grams/24 hours)
5. Hematuria with Proteinuria
6. Underlying cause of CKD is unclear after basic work-up
7. Kidney biopsy is indicated
8. Patient's level of disease exceeds comfort level of primary care provider

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ACEI - Angiotensin Converting Enzyme Inhibitor, ARB - Angiotensin II Receptor Blockers, DM - Diabetes Mellitus, eGFR - Estimated Glomerular Filtration Rate, KRT - Kidney Replacement Therapy
### Classification of Chronic Kidney Disease Stages (based on KDOQI, 2002)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>eGFR (ml/min/1.73m²)</th>
<th>Common Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kidney damage with normal eGFR</td>
<td>Normal or ≥ 90 ml/min/1.73m² with other evidence of chronic kidney damage*</td>
<td>Hypertension more frequent than amongst patients without CKD</td>
</tr>
<tr>
<td>2</td>
<td>Mild impairment</td>
<td>60 - 89 ml/min/1.73m² with other evidence of chronic kidney damage*</td>
<td>Hypertension frequent</td>
</tr>
</tbody>
</table>
| 3     | Moderate impairment | 30 - 59 ml/min/1.73m² | Hypertension common
- Decreased dietary calcium absorption
- Reduced renal phosphate excretion
- Elevation of parathyroid hormone
- Altered lipoprotein metabolism
- Reduced spontaneous protein intake
- Anemia
- Left ventricular hypertrophy
- Salt and water retention
- Decreased renal potassium excretion |
| 4     | Severe impairment | 15 - 29 ml/min/1.73m² | As above but more pronounced plus:
- Metabolic acidosis |
| 5     | Established renal failure | < 15 ml/min/1.73m² or on dialysis | All the above (with greater severity) plus:
- Salt and water retention causing edema and apparent heart failure
- Anorexia
- Nausea, Vomiting
- Pruritus (itching without skin disease)
- Neuropathy, altered mental status |

* The “other evidence of chronic kidney damage” may be one of the following:
  - Persistent microalbuminuria in a diabetic
  - Persistent proteinuria
  - Persistent hematuria of renal origin
  - Structural abnormalities of the kidneys demonstrated on ultrasound scanning or other radiological tests,
    - e.g., polycystic kidney disease, reflux nephropathy
  - Biopsy-proven chronic kidney disease such as glomerulonephritis or interstitial nephritis
    (most of these patients will have microalbumuria or proteinuria, hematuria or low eGFR)
MANAGEMENT OF CHRONIC KIDNEY DISEASE
IN PRIMARY CARE

Screening Algorithm

1. Patient high risk for CKD (see sidebar A)

2. Is eGFR < 60?
   - Y: Suspected CKD
     - Use CKD Guideline
   - N: Urinalysis of random urine sample using dipstick

4. Positive (> 1+ protein)

5. Analysis of random urine sample for protein-to-creatinine ratio

6. Is proteinuria confirmed (>200 mg of protein/g of creatinine)?
   - Y: Treat for microalbuminuria
   - N: Repeat screening annually

7. Repeat screening annually

8. Continue management of DM

9. Does patient have DM?
   - Y: Microalbuminuria-specific dipstick or analysis or random urine sample for microalbumin-to-creatinine ratio
   - N: Exit algorithm

10. Microalbuminuria-specific dipstick or analysis or random urine sample for microalbumin-to-creatinine ratio

11. > 300mcg of microalbumin/mg of creatinine?

12. > 30mcg of microalbumin/mg of creatinine

13. Treat for microalbuminuria

14. Repeat screening annually

15. Continue management of DM
Use DM Guideline

16. Exit algorithm

Sidebar A: High Risk Patient
1. Diabetes mellitus
2. Hypertension
3. Cardiovascular disease
4. Family history
5. Frequent urinary tract infection/obstruction
6. Systematic illness affecting the kidney

Definitions of Abnormalities in Albumin Excretion

<table>
<thead>
<tr>
<th>Condition (UACR)</th>
<th>Random Urine for Alb-to-Cr Ratio (mg/g creatinine)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt; 30</td>
</tr>
<tr>
<td>Microalbuminuria</td>
<td>30 - 300</td>
</tr>
<tr>
<td>Macroalbuminuria</td>
<td>&gt; 300</td>
</tr>
</tbody>
</table>

*Condition (UACR) Random Urine for Alb-to-Cr Ratio (mg/g creatinine)
## Indications for Nephrology Referral for Proteinuria

### BLOOD RESULTS

<table>
<thead>
<tr>
<th>Urine Results</th>
<th>eGFR &gt; 60</th>
<th>eGFR 30 - 59</th>
<th>eGFR &lt; 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein &lt; 1 gram/day without hematuria</td>
<td>Reassess patient annually with eGFR and urine protein determination</td>
<td>Manage according to recommendations for non-diabetic renal disease according to stage of disease. Consider one time referral to a renal specialist.</td>
<td>Refer to Renal Specialist</td>
</tr>
<tr>
<td>Protein 1 - 3 grams/day without hematuria</td>
<td>Consider diabetic nephropathy. If confirmed:</td>
<td>Refer to Renal Specialist</td>
<td>Refer to Renal Specialist</td>
</tr>
<tr>
<td></td>
<td>□ Offer ACE inhibitor (or ARB if intolerant) unless contraindications.</td>
<td>Refer to Renal Specialist</td>
<td>Refer to Renal Specialist</td>
</tr>
<tr>
<td></td>
<td>□ Treat blood pressure (aim for 120-129/&lt;80mmHg).</td>
<td>Refer to Renal Specialist</td>
<td>Refer to Renal Specialist</td>
</tr>
<tr>
<td></td>
<td>□ Treat HbA1c to target.</td>
<td>Refer to Renal Specialist</td>
<td>Refer to Renal Specialist</td>
</tr>
<tr>
<td></td>
<td>□ Treat Hyperlipidemia to target.</td>
<td>Refer to Renal Specialist</td>
<td>Refer to Renal Specialist</td>
</tr>
<tr>
<td></td>
<td>□ Continue to monitor eGFR and urine protein excretions at least annually.</td>
<td>Refer to Renal Specialist</td>
<td>Refer to Renal Specialist</td>
</tr>
<tr>
<td>Protein &gt;1 gram/day with hematuria</td>
<td>Refer to Renal Specialist</td>
<td>Refer to Renal Specialist</td>
<td>Refer to Renal Specialist</td>
</tr>
<tr>
<td>Protein &gt;3 grams/day with or without hematuria</td>
<td>Refer to Renal Specialist</td>
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<td>Refer to Renal Specialist</td>
</tr>
</tbody>
</table>

VA/DoD Clinical Practice Guideline for the Management of CKD - 2008
DoD: https://www.QMO.amedd.army.mil
## Pharmacotherapy

### Angiotensin Converting Enzyme Inhibitors (ACEIs)

<table>
<thead>
<tr>
<th>DRUG</th>
<th>USUAL DOSE RANGE</th>
<th>COMMENTS/CAUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benazepril</td>
<td>10 – 40 mg divided once or twice daily</td>
<td>- Start with lower or less frequent doses in patients with CKD (except fosinopril as partial compensation by hepatobiliary elimination) or in patients currently being treated with a diuretic.</td>
</tr>
<tr>
<td>Captopril</td>
<td>25 – 150 mg divided two to three times daily</td>
<td>- Use with caution in patients with renal artery stenosis.</td>
</tr>
<tr>
<td>Enalapril</td>
<td>5 – 40 mg divided once or twice daily</td>
<td>- Monitor potassium and renal function after initiation.</td>
</tr>
<tr>
<td>Fosinopril</td>
<td>10 – 40 mg once daily</td>
<td>- Concomitant therapy with potassium-sparing diuretics and/or potassium supplements may result in hyperkalemia.</td>
</tr>
<tr>
<td>Lisinopril</td>
<td>10 – 40 mg once daily</td>
<td>- Due to the potential risk for fetal morbidity and mortality in patients taking ACEIs during pregnancy, it is recommended that therapy be discontinued as soon as a woman becomes pregnant; alternate therapy should be considered. ACEIs should only be prescribed in pregnant women when the benefit clearly outweighs the potential risk for fetal abnormalities.</td>
</tr>
<tr>
<td>Moexipril</td>
<td>7.5 – 30 mg divided once or twice daily</td>
<td>- Contraindicated in patients with a history of angioedema on an ACEI</td>
</tr>
<tr>
<td>Perindopril</td>
<td>4 – 8 mg divided once or twice daily</td>
<td></td>
</tr>
<tr>
<td>Quinapril</td>
<td>10 – 80 mg divided once or twice daily</td>
<td></td>
</tr>
<tr>
<td>Ramipril</td>
<td>2.5 – 20 mg divided once or twice daily</td>
<td></td>
</tr>
<tr>
<td>Trandolapril</td>
<td>1 – 4 mg once daily</td>
<td></td>
</tr>
</tbody>
</table>

### Angiotensin II Receptor Blockers (ARBs)

<table>
<thead>
<tr>
<th>DRUG</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Candesartan</td>
<td>8 – 32 mg once daily</td>
<td>- Alternative to ACEIs in patients unable to tolerate an ACEI.</td>
</tr>
<tr>
<td>Eprosartan</td>
<td>400 – 800 mg divided once or twice daily</td>
<td>- Consider lower doses in patients with intravascular volume depletion (e.g., patients currently being treated with a diuretic).</td>
</tr>
<tr>
<td>Irbesartan</td>
<td>150 – 300 mg once daily</td>
<td>- Use with caution in patients with renal artery stenosis.</td>
</tr>
<tr>
<td>Losartan</td>
<td>50 – 100 mg divided once or twice daily</td>
<td>- Monitor potassium and renal function after initiation.</td>
</tr>
<tr>
<td>Olmesartan</td>
<td>20 – 40 mg once daily</td>
<td>- Concomitant therapy with potassium-sparing diuretics and/or potassium supplements may result in hyperkalemia.</td>
</tr>
<tr>
<td>Telmisartan</td>
<td>40 – 80 mg once daily</td>
<td>- Contraindicated in 2nd and 3rd trimesters of pregnancy due to potential neonatal/fetal morbidity and death.</td>
</tr>
<tr>
<td>Valsartan</td>
<td>80 – 320 mg once daily</td>
<td>- Use with caution in patients with a history of angioedema on an ACEI</td>
</tr>
</tbody>
</table>

Refer to www.pbm.va.gov or http://www.ww.pbm.va.gov for a current list of medications on the One VA National Formulary

d. One hour before meals, on an empty stomach.