



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

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# Objectives



- **Discuss the importance of screening for chronic kidney disease**
- **Describe the key elements included in the VA/DoD Clinical Practice Guideline for the Management of Chronic Kidney Disease (CKD)**
- **List the stages of CKD**
- **Know the indications for nephrology referral**
  - **eGFR**
  - **Proteinuria**
  - **Urgent conditions**
- **Use strategies to slow the progression of CKD**
- **List five topics to cover as part of patient education on CKD**

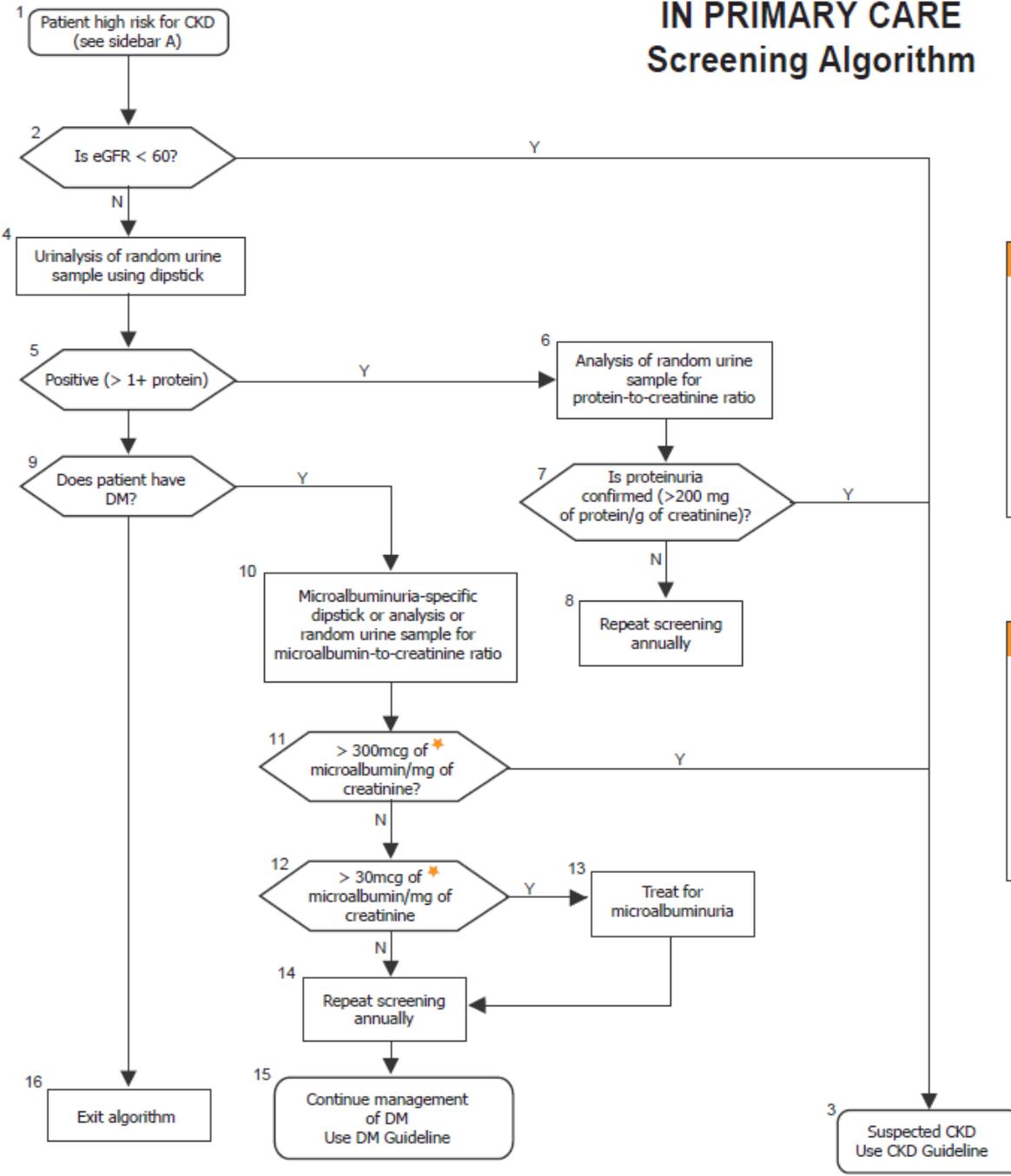


# **Chronic Kidney Disease (CKD) Importance of Screening**



- **Frequently unrecognized and progressive**
- **Accompanied by multiple co-morbidities**
- **Early recognition and treatment can improve outcomes**
- **9<sup>th</sup> leading cause of death in U.S.**

# MANAGEMENT OF CHRONIC KIDNEY DISEASE IN PRIMARY CARE Screening 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	
*Condition (UACR)	Random Urine for Alb-to-Cr Ratio (mg/g creatinine)
Normal	< 30
Microalbuminuria	30 - 300
Macroalbuminuria	> 300



# Early Detection of Chronic Kidney Disease/Screening



- **Screen annually in patients at risk [C]**
- **Screening for CKD may be considered in patients with other conditions [C]**
- **Testing for kidney disease includes urinalysis and estimation of the glomerular filtration rate (eGFR) [B]**
- **Patients with diabetes who have a negative urine protein by dipstick should be tested for the presence of microalbuminuria [B]**

**(Screening can be performed using a microalbumin-sensitive dipstick or measurement of microalbumin-to-creatinine ratio in a morning urine sample.)**



# Assessment and Management of Chronic Kidney Disease



# **CKD Clinical Practice Guideline**

## **Key Elements**



- **Diagnostic criteria and identification of early disease**
- **Identification of susceptibility factors (for developing CKD)**
- **Identification of progression factors (for worsening kidney damage and subsequent loss of kidney function)**
- **Evaluation of patients with kidney disease (estimate of GFR, blood pressure, and assessment of proteinuria as a marker of kidney damage)**



# **CKD Clinical Practice Guideline**

## **Key Elements (cont.)**



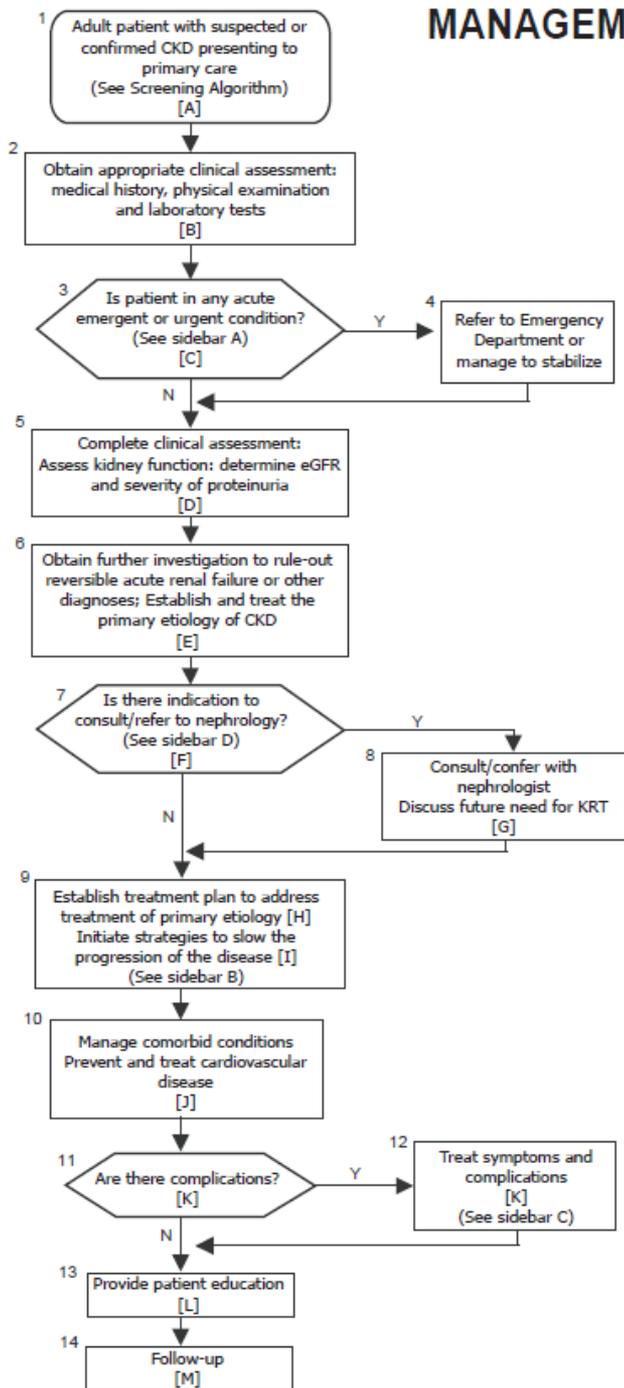
- **Slowing the progression of CKD and prevention of conditions that exacerbate chronic disease**
- **Management of co-morbidities**
- **Indications for consultation and referral to a nephrologist**
- **Outline of patient education and preparation for kidney replacement therapy**



# Key Changes in Guideline Update

- **Provides guidance to primary care providers in the management of CKD in the primary care setting**
- **Classification of CKD based on calculated eGFR rather than serum creatinine**
- **Unified approach to management of common aspects of CKD**
  - **Complications of CKD (anemia, CVD, dyslipidemia)**
  - **Strategies to slow the progression of eGFR**

# MANAGEMENT OF CHRONIC KIDNEY DISEASE IN PRIMARY CARE



Stage	eGFR (ml/min/1.73m <sup>2</sup> )	Description
1	≥ 90	Kidney damage with normal or increased GFR
2	60 - 89	Kidney damage with mildly decreased GFR
3	30 - 59	Moderately decreased GFR
4	15 - 29	Severely decreased GFR
5	< 15 or dialysis	Kidney failure

## 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/1.73m<sup>2</sup>
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



# Definitions of Chronic Kidney Disease



<b>CKD</b>	<b>Definitions</b>
<b>Persistent decreased eGFR</b>	<b>eGFR &lt; 60 ml/min on 2 tests at least three months apart</b>
<b>Persistent proteinuria</b>	<b>(&gt; 1+) on dipstick or urine protein-to-creatinine ratio &gt; 0.2, confirmed on two tests at least three months apart</b>
<b>Persistent microalbuminuria</b>	<b>albumin-to-creatinine ratio &gt; 30, confirmed on two out of three consecutive urine tests in patients with diabetes mellitus (DM)</b>
<b>Known structural disease</b>	<b>defined by imaging or pathologic examination (e.g., polycystic kidney disease [PCKD])</b>

**Estimated glomerular filtration rate (eGFR) is the preferred method to assess kidney function.**



# Classification of Chronic Kidney Disease



- **The most common criterion for chronic kidney disease is a glomerular filtration rate (GFR)  $< 60$  ml/min/1.73m<sup>2</sup> for at least 3 months**
- **Patients who meet criteria for CKD may be assigned to a CKD stage based on the presence or absence of abnormalities on urinalysis or imaging and their estimated level of glomerular filtration rate (eGFR)**



# Classification of Chronic Kidney Disease



Stage	Description	eGFR	Common Complications
1	Kidney damage with normal eGFR	Normal or $\geq 90$ ml/min/1.73m <sup>2</sup> with other evidence of chronic kidney damage *	Hypertension more frequent than amongst patients without CKD
2	Mild impairment	60 - 89 ml/min/1.73m <sup>2</sup> with other evidence of chronic kidney damage *	Hypertension frequent
3	Moderate impairment	30 - 59 ml/min/1.73m <sup>2</sup>	Hypertension common Decreased dietary calcium absorption Reduced renal phosphate excretion Elevation of parathyroid hormone Altered lipoprotein metabolism Reduced spontaneous protein intake Renal anemia Left ventricular hypertrophy Salt and water retention Decreased renal potassium excretion
4	Severe impairment	15 - 29 ml/min/1.73 m <sup>2</sup>	As above but more pronounced plus: Metabolic acidosis
5	Established renal failure	< 15 ml/min/1.73m <sup>2</sup> 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 microalbuminuria or proteinuria, hematuria or low eGFR)



# Evaluation of Patient with Chronic Kidney Disease

- **Medical History**
  - a. **Assess for chronic diseases, genito-urinary tract or other systemic illnesses**
  - b. **Symptoms of CKD**
  - c. **Medications contributing to renal impairment**
  - d. **Family history**
- **Physical Exam**
  - Vital signs**
  - Head/Neck, Chest, Abdomen, Skin, Extremities**
- **Laboratory Tests**
  - CBC, UA, Chemistry Panel, Lipid Profile**
  - Random micro-albumin-to-creatinine ratio**
  - Other specialized studies**



# Estimating GFR



- **The severity of CKD should be classified based on the level of the estimated glomerular filtration rate (eGFR)**
- **Serum creatinine alone should NOT be used as a measure of kidney function [B]**



# Assessing Proteinuria



- **Proteinuria should initially be assessed using a conventional dipstick. A first morning specimen is preferred, but random urine specimens are acceptable**
- **Microalbuminuria – in patients with diabetes should be assessed using a laboratory method expressed as an albumin-to-creatinine ratio**



# Indications to Refer to Nephrology

		<b>BLOOD RESULTS</b>			
		<b>eGFR &gt; 60</b>	<b>eGFR 30 - 59</b>	<b>eGFR &lt; 30</b>	
<b>URINE RESULTS</b>	Protein < 1 gram/day without hematuria	Reassess patient annually with eGFR and urine protein determination	Manage according to recommendations for non-diabetic renal disease according to stage of disease. Consider one time referral to a renal specialist.	<b>Refer to Renal Specialist</b>	
	Protein 1 - 3 grams/day without hematuria	Consider diabetic nephropathy. If confirmed: <ul style="list-style-type: none"> <li>■ Offer ACE inhibitor (or ARB if intolerant) unless contraindications.</li> <li>■ Treat blood pressure (aim for 120 - 129/&lt;80mmHg).</li> <li>■ Treat HbA1c to target.</li> <li>■ Treat Hyperlipidemia to target.</li> <li>■ Continue to monitor eGFR and urine protein excretions at least annually.</li> </ul> If diabetic nephropathy is unlikely, consider referral to a renal specialist.			
	Protein >1 gram/day with hematuria	<b>Refer to Renal Specialist</b>			
	Protein >3 grams/day with or without hematuria				



# Imaging the Kidneys



- **Consider kidney ultrasound in cases of unknown etiology**
  - **evaluate for kidney size, anatomical abnormality, or urinary tract obstruction**



# Urgent/Emergent Conditions



- **Evaluation should identify metabolic and clinical complications**
  - a. **Acute renal failure**
  - b. **Fluid overload (pulmonary edema)**
  - c. **Hyperkalemia (potassium > 6.0 mEq/L)**
  - d. **Metabolic acidosis (bicarbonate < 16 mEq/L)**
  - e. **Pericarditis**
  - f. **Encephalopathy**
  - g. **Uremic symptoms, such as nausea, vomiting, and anorexia**



# Reversible Conditions



- **Consider acute kidney failure with any rapid reduction in eGFR [I]**
  
- **Evaluate for reversible causes prior to determining ↓ kidney function is related to progression of CKD [I]**



# Primary Etiology of Kidney Disease



- Use history, physical exam, lab tests, and imaging to establish the most likely etiology [I]
- Patients with CKD not related to hypertension or diabetes or in whom the etiology is uncertain may benefit from a referral to a nephrologist for evaluation and treatment [I]
- A kidney biopsy should be considered in patients with nephrotic range proteinuria (urine protein-to-creatinine ratio  $> 3$ )
- Urology should be consulted for patients with urinary tract obstructions [I]



# Consultation with/Referral to Nephrology



## Indications for a nephrology referral in CKD:

- Underlying cause is unclear after the basic work-up
- Kidney biopsy is indicated
- $eGFR < 30 \text{ ml/min/1.73m}^2$
- Rapid progression of CKD
- Superimposed acute kidney failure
- Management is beyond the comfort of the provider



# Discuss Future Need for KRT



**1. ESKD and kidney replacement therapy (KRT) should be discussed with patients by the primary care provider while referring to nephrology for assistance in evaluation and treatment:**

- a. Discuss in general terms, the progression of kidney disease to ESKD**
- b. Explain why the patient needs to see the nephrologist**
- c. Reinforce and review the information provided by the nephrologist**
- d. Discuss in general terms, the principles of dialysis (peritoneal dialysis or hemodialysis) and transplantation**
- e. Maintain consistency of information between the primary care provider and the nephrologist**



# Strategies to Slow the Progression of CKD



- **Control of hypertension**
- **Use of an ACEI or ARB**
- **Control of hyperglycemia in patients with diabetes**
- **Avoidance of nephrotoxic drugs and adjusting medication doses as indicated**
- **Smoking cessation**
- **Control of dyslipidemia**



# **Complications and Considerations in the Management of CKD**

- **Disorders of potassium balance**
- **Disorders of calcium and phosphate metabolism (bone mineral)**
- **Acid based abnormalities**
- **Hematologic abnormalities (anemia)**
- **Volume overload**
- **Disorders of Nutrition**
- **Adjustment of medication doses**
- **Immunizations**



# Prevent and Treat Cardiovascular Disease

- **Patients with CKD should be evaluated for cardiovascular disease**
- **Patients with CKD should be assessed for cardiovascular risk**
  - **fasting lipid profile**
  - **blood pressure**
  - **tobacco use**
  - **family history of premature cardiovascular disease,**
  - **obesity**
  - **physical activity level**
- **Implement strategies to reduce cardiovascular risk factors**



# Patient Education



- **Patient education should begin soon after the diagnosis of kidney insufficiency [I]**
- **Assessment for adherence or barriers to therapy and strategies to overcome [I]**
- **Patients should be provided with information about: [I]**
  - a. Risk factors**
  - b. Lifestyle changes**
  - c. Vaccinations**
  - d. KRT**
  - e. Protecting non-dominant arm for access**



# Classification of CKD and Follow-Up Frequency by Primary Care



<b>Stage</b>	<b>Description</b>	<b>eGFR</b>	<b>Follow-up</b>
<b>1</b>	<b>Kidney damage with normal or increased GFR</b>	<b>≥ 90</b>	<b>Not more than routine</b>
<b>2</b>	<b>Kidney damage with mildly decreased GFR</b>	<b>60 - 89</b>	<b>12 months*</b>
<b>3</b>	<b>Moderately decreased GFR</b>	<b>30 - 59</b>	<b>6 – 12 months*</b>
<b>4</b>	<b>Severely decreased GFR</b>	<b>15 - 29</b>	<b>3 – 6 months* Refer to Nephrology</b>
<b>5</b>	<b>Kidney failure</b>	<b>&lt; 15 or dialysis</b>	<b>Refer to Nephrology</b>

**\*Patients who are newly diagnosed or in whom kidney disease is progressing rapidly should be seen more frequently.**

**Kidney function should also be checked during intercurrent illness or peri-operatively in all patients with stage 2-5 CKD**



# Appendices in CKD CPG



## A. Guideline Development Process

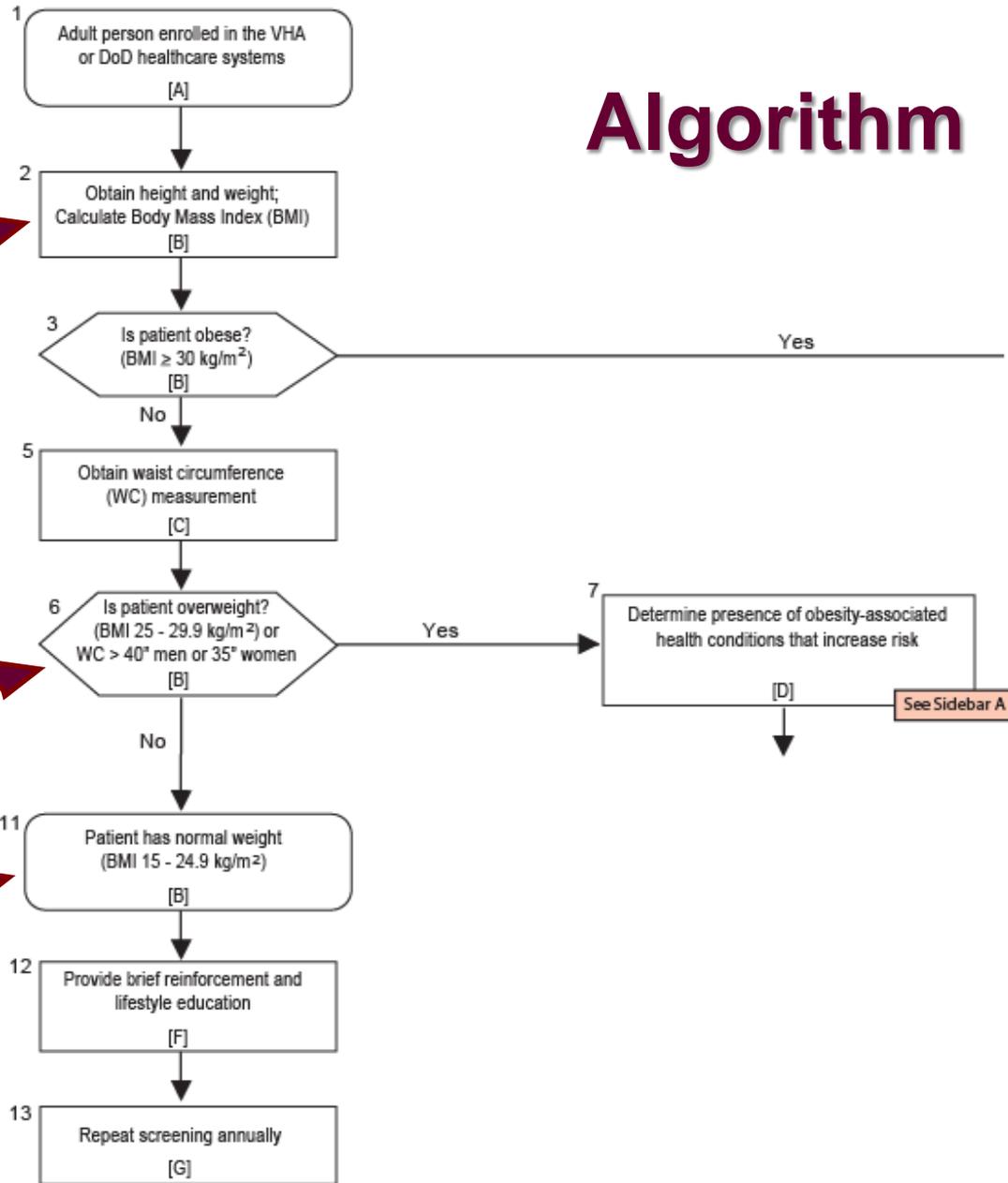


# Algorithm

DO Box

Decision Box

State Box



# Strength of Recommendation Rating System



- A Strongly Recommend** to offer or provide this service.  
*There is **good** evidence that the intervention improves important health outcomes -- **benefits substantially outweigh harm.***
- B Recommend** to offer or provide this service.  
*There is **fair** evidence that the intervention improves health outcomes -- **that benefits outweigh harm.***
- C Consider** offering or providing this service.  
*There is **poor** evidence that the intervention can improve health outcomes -- **balance of benefit and harm is too close to justify a general recommendation.***



# Strength of Recommendation Rating System (cont'd)



**D** Recommend against routinely offering or providing the service *Fair/Good evidence that the intervention is ineffective or that harm outweighs benefits.*

**I** **Insufficient Evidence** is to recommend for or against routinely providing the intervention. *Evidence that the intervention is effective is lacking or of poor quality, or conflicting, -- balance of benefits and harms cannot be determined.*



# Appendices in CKD CPG (cont.)



## **B. Assessment**

**B-1. Screening Algorithm for CKD**

**B-2. Etiologic Evaluation**

**B-3. Specialized Laboratory Studies for the Diagnosis of Kidney Disease**

**B-4. Kidney Imaging Studies**

## **C. Slowing Progression of CKD**

**C-1. Blood Pressure Control**

**C-2. Pharmacologic Therapy (ACE or ARB) Supporting Studies**



# Appendices in CKD CPG

## D. Pharmacotherapy

D-1 Dosing Recommendations for ACEIs and ARBs

D-2: Cautions in the Use of Selected Medications in Patients with CKD

## E. Complications of Kidney Disease

## F. Nutrition

F-1. Phosphorous

F-2. Potassium

## G. Patient Education

## H. Follow-up for Chronic Kidney Disease

# Pharmacotherapy

## Angiotensin Converting Enzyme Inhibitors (ACEIs)

DRUG	USUAL DOSE RANGE	COMMENTS/CAUTIONS
Benazepril	10 – 40 mg divided once or twice daily	<ul style="list-style-type: none"> <li>■ 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.</li> <li>■ Use with caution in patients with renal artery stenosis.</li> <li>■ Monitor potassium and renal function after initiation.</li> <li>■ Concomitant therapy with potassium-sparing diuretics and/or potassium supplements may result in hyperkalemia.</li> <li>■ 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.</li> <li>■ Contraindicated in patients with a history of angioedema on an ACEI</li> </ul>
Captopril	25 – 150 mg divided two to three times daily	
Enalapril	5 – 40 mg divided once or twice daily	
Fosinopril	10 – 40 mg once daily	
Lisinopril	10 – 40 mg once daily	
Moexipril	7.5 – 30 mg divided once or twice daily	
Perindopril	4 – 8 mg divided once or twice daily	
Quinapril	10 – 80 mg divided once or twice daily	
Ramipril	2.5 – 20 mg divided once or twice daily	
Trandolapril	1 – 4 mg once daily	

## Angiotensin II Receptor Blockers (ARBs)

Candesartan	8 – 32 mg once daily	<ul style="list-style-type: none"> <li>■ Alternative to ACEIs in patients unable to tolerate an ACEI.</li> <li>■ Consider lower doses in patients with intravascular volume depletion (e.g., patients currently being treated with a diuretic).</li> <li>■ Use with caution in patients with renal artery stenosis.</li> <li>■ Monitor potassium and renal function after initiation.</li> <li>■ Concomitant therapy with potassium-sparing diuretics and/or potassium supplements may result in hyperkalemia.</li> <li>■ Contraindicated in 2nd and 3rd trimesters of pregnancy due to potential neonatal/fetal morbidity and death.</li> <li>■ Use with caution in patients with a history of angioedema on an ACEI.</li> </ul>
Eprosartan	400 – 800 mg divided once or twice daily	
Irbesartan	150 – 300 mg once daily	
Losartan	50 – 100 mg divided once or twice daily	
Olmесartan	20 – 40 mg once daily	
Telmisartan	40 – 80 mg once daily	
Valsartan	80 – 320 mg once daily	

Refer to [www.pbm.va.gov](http://www.pbm.va.gov) or <http://vawww.pbm.va.gov> for a current list of medications on the One VA National Formulary

a. Adapted from KDOQI Clinical Practice Guidelines on Hypertension and Antihypertensive Agents in Chronic Kidney Disease. Guideline 11:

Use of angiotensin-converting enzyme inhibitors and angiotensin receptor blockers in CKD at [http://www.kidney.org/professionals/kdoqi/guidelines\\_bp/guide\\_11.htm](http://www.kidney.org/professionals/kdoqi/guidelines_bp/guide_11.htm)

b. Adapted from McEvoy GK, ed. American Hospital Formulary Service Drug Information, Bethesda, MD: American Society of Health-System Pharmacists, Inc., 2006.

c. Adapted from Hebel SK ed. Drug Facts and Comparisons, St. Louis, Missouri: Facts and Comparisons Inc., May 2006.

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



## Websites:

[www.healthquality.va.gov](http://www.healthquality.va.gov)

[https://www.QMO.amedd.army.  
mil](https://www.QMO.amedd.army.mil)