How to Manage Your CKD Patients

Conditions of ↑ CKD Risk?
- Diabetes
- Hypertension
- Cardiovascular Disease
- Obesity

Screen for CKD
- "Spot" urine for albumin-to-creatinine ratio (ACR) to detect albuminuria
- Serum creatinine to estimate glomerular filtration rate (GFR)

Is either of the following present for 3 months or more?
- eGFR <60 mL/min/1.73 m²
- ACR >30 mg/g

Assign Albuminuria Category
- <30 = normal or mild
- 30-299 = moderately
- >299 = severely

Assign GFR Category
- 45-59 = 3a
- 30-44 = 3b
- 15-29 = 4
- <15 = 5

Patient Safety
- eGFR <60 = Patient Safety Risk
  - Drug dosing consider eGFR
  - Reduce risk of AKI volume depletion
  - Avoid contrast or minimize dose
  - Consider isotonic saline infusion before, during and after procedure
  - Withhold metformin, RAAS blockers and diuretics

- eGFR 45-59
  - Avoid prolonged NSAIDs
  - Continue metformin use

- eGFR 30-44
  - Avoid prolonged NSAIDs
  - Use metformin with close monitoring at 50% dose

- eGFR <30
  - Avoid any NSAIDs
  - Avoid bisphosphonates
  - Avoid metformin
  - Avoid PICC; lines use single and double lumen central catheters instead
  - Monitor PT INR closely given increased risk of warfarin anticoagulation bleeding

CKD Progression + Complications
- Blood Pressure Goal <140/90
- Consider BP goal <130/80 only if ACR >300
  - ACE-I or ARB for HTN if ACR >30
  - Avoid ACE-I and ARB in general
  - Diuretic usually required
  - Dietary sodium <2000 mg/day
  - Avoid prolonged NSAIDs
  - Avoid any NSAIDs
  - Avoid metformin
  - Avoid PICC; lines use single and double lumen central catheters instead
  - Monitor PT INR closely given increased risk of warfarin anticoagulation bleeding

Nephrology Referral
- eGFR <30 or ACR >300 mg/g
- 25% decrease in eGFR (AKI or progressive CKD may be difficult to distinguish)
- 2° hyperparathyroidism
- Persistent hyperkalemia / metabolic acidosis
- Recurrent kidney stones
- Unexplained hematuria
- Hereditary or unknown cause of CKD

CKD and CVD
- CKD = ↑ CVD risk
- Consider lipid lowering therapy
  - All >50 years
  - 18-50 years at high CVD risk (h/o CAD, DM, h/o ischemic CVA, 10 yr risk of MI >10%)
  - ASA for secondary prevention unless bleeding risk outweighs benefits

Abbreviations
- ACE-I, angiotensin-converting enzyme inhibitor; ACR, albumin-to-creatinine ratio; AER, albumin excretion rate; AKI, acute kidney injury; ARB, angiotensin receptor blocker; ASA, acetylsalicylic acid (aspirin); B stage, Albuminuria category; BP, blood pressure; CAD, coronary artery disease; CKD, chronic kidney disease; CKD-MBD, chronic kidney disease mineral and bone disorder; CVA, cerebrovascular accident; CVD, cardiovascular disease; DM, diabetes mellitus; eGFR, estimated glomerular filtration rate; ESA, erythropoietin-stimulating agent; Hb, hemoglobin; HTN, hypertension; iPTH, intact-parathyroid hormone; NSAIDs, nonsteroidal anti-inflammatory drugs; 25-OH vitamin D, 25-OH vitamin D; PICC, peripherally inserted central catheter line; PT INR, prothrombin time, international normalized ratio; RAAS, renin angiotensin aldosterone system.

How to Evaluate for Chronic Kidney Disease

Know the criteria for chronic kidney disease (CKD).

- Abnormalities of kidney structure or function, present for >3 months, with implications for health
- Either of the following must be present for >3 months:
  - Markers of kidney damage (one or more)
  - GFR <60 ml/min/1.73 m²

Screen for CKD with two simple tests.

- “Spot” urine for albumin-to-creatinine ratio (ACR) to detect albuminuria
- Serum creatinine to estimate glomerular filtration rate (GFR)

What if CKD is detected?

- Classify CKD based on cause, GFR category, and albuminuria category
- Implement a clinical action plan based on patient’s CKD classification (see flip side)
  - Consider co-management with a nephrologist if the clinical action plan cannot be carried out
  - Refer to a nephrologist when GFR <30 mL/min/1.73 m² or ACR >300 mg/g
- Learn more at www.kidney.org/professionals

Why should you classify CKD?

- To have a more precise picture of each patient’s condition
- To guide decisions for testing and treatment
- To evaluate patient’s risk of progression and complications
- Because neither the category of GFR nor the category of albuminuria alone can fully capture prognosis of CKD

How do you classify CKD?

- Identify cause of CKD*
- Assign GFR category
- Assign albuminuria category

*Cause of CKD is classified based on presence or absence of systemic disease and the location within the kidney of observed or presumed pathologic-anatomic findings.

### GFR categories in CKD

<table>
<thead>
<tr>
<th>Category</th>
<th>GFR (ml/min/1.73 m²)</th>
<th>Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>≥90</td>
<td>Normal or high</td>
</tr>
<tr>
<td>G2</td>
<td>60-89</td>
<td>Mildly decreased*</td>
</tr>
<tr>
<td>G3a</td>
<td>45-59</td>
<td>Mildly to moderately decreased</td>
</tr>
<tr>
<td>G3b</td>
<td>30-44</td>
<td>Moderately to severely decreased</td>
</tr>
<tr>
<td>G4</td>
<td>15-29</td>
<td>Severely decreased</td>
</tr>
<tr>
<td>G5</td>
<td>&lt;15</td>
<td>Kidney failure</td>
</tr>
</tbody>
</table>

*Relative to young adult level.

In the absence of evidence of kidney damage, neither GFR category G1 nor G2 fulfill the criteria for CKD.

### Albuminuria categories in CKD

<table>
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<tr>
<th>Category</th>
<th>ACR (mg/g)</th>
<th>Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>&lt;30</td>
<td>Normal to mildly increased</td>
</tr>
<tr>
<td>A2</td>
<td>30–300</td>
<td>Moderately increased*</td>
</tr>
<tr>
<td>A3</td>
<td>&gt;300</td>
<td>Severely increased*</td>
</tr>
</tbody>
</table>

*Relative to young adult level. ACR 30–300 mg/g for >3 months indicates CKD.

*Including nephrotic syndrome (albumin excretion ACR >2220 mg/g)

References


Abbreviations
A Stage, albuminuria category; ACE-I, angiotensin-converting-enzyme inhibitor; ACR, albumin-to-creatinine ratio; AER, albumin excretion rate; AKI, acute kidney injury; ARB, angiotensin receptor blocker; ASA, acetylsalicylic acid (aspirin); CAD, coronary artery disease; CKD, chronic kidney disease; CKD-MBD, chronic kidney disease mineral and bone disorder; CVA, cerebrovascular accident; CVD, cardiovascular disease; DM, diabetes mellitus; GFR, estimated glomerular filtration rate; ESA, erythropoietin-stimulating agent; G Stage, GFR category; Hb, hemoglobin; HTN, hypertension; iPTH, intact-parathyroid hormone; NSAIDs, nonsteroidal anti-inflammatory drugs; PICC, peripherally inserted central catheter line; PT INR, prothrombin time; international normalized ratio; RAAS, renin angiotensin aldosterone system.