CHRONIC KIDNEY DISEASE
Adults with CKD GFR <60mL/min/1.73m² (as estimated by 4-variable MDRD formula) or persistent proteinuria without guideline exclusions (See Box A)

Cardiovascular risk
Manage per CMI guidelines

Diabetes
Manage per CMI guidelines

Update Labs at least annually (lytes, Cr and GFR, microAlb/Cr or UPi/Cr, Hgb)

Blood pressure

Proteinuria (see Box D)

Anemia

Meds

Diet

ABBREVIATIONS:
CKD: Chronic Kidney Disease
GFR: glomerular filtration rate
LVH: left ventricular hypertrophy
UPi/Cr: urinary protein to creatinine ratio

BLOOD PRESSURE
• Target: <140/90 mmHg in absence of proteinuria
• Use caution in lowering BP when diastolic BP is already <70
• Lowering BP reduces cardiovascular risk, proteinuria and progression of kidney disease.

PROTEINURIA
• BP Target <130/80 if UPi/Cr ratio >0.5
• Target UPi/Cr ratio <1.0
• If UPi/Cr ≥0.3, use ACEI or ARB, unless nondiabetic normotensive with UPi/Cr <1.0.
• When used, ACEIs and ARBs should be titrated up to moderate to high doses (e.g., lisinopril 40 mg bid, losartan 100 mg q day) and may be combined as needed, if significant proteinuria present.
• ACEIs and ARBs should not be combined in the absence of proteinuria.

MICROALBUMINURIA
• For pts with diabetes and CKD with microalbuminuria, use of an ACEI/ARB delays the appearance of overt proteinuria, but evidence of long-term benefit is limited.
• ACEIs or ARBs can be continued if GFR decline is <30% from baseline or creatinine increase is >30% and serum potassium is <5.5 mEq/L.
• When titrating doses, measure electrolytes and Cr/GFR upon initiation or in 2-4 weeks.

DIURETICS
• Diuretics are reasonable antihypertensive meds in many pts with CKD.
• When titrating doses, measure electrolytes and Cr/GFR upon initiation or in 2-4 weeks.
• Use thiazides when GFR >30.
• Use loop diuretics when GFR <30.
• Potassium-sparing diuretics should be used with caution when GFR <30 or with ACEIs or ARBs.

REFER TO nephrology for:
• Proteinuria >0.3
• Systolic Cr ratio >1.5
• Annualized loss of GFR

REFER TO dietitian for:
• Recommendations for sodium, potassium, protein, fat intake

REFER TO med pharmacist for:
• Medications to avoid depending on GFR

REFER TO medications to use with caution in CKD
• Medications safe to use but with adjustment for CKD

REFER TO anemia
• Anemia Management using EPO for Patients with CKD, Hawaii Clinical Practice Guidelines

Prepared by Nephrology Guideline Group
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BOX A
GUIDELINE EXCLUSIONS
• Reversible disease (e.g. acute renal failure)
• Terminal illness
• Very advanced age (>85)

BOX B
REFERRAL GUIDELINES
• Patient at high risk because of decreased GFR or proteinuria that persists on repeat measurement:
  • High risk for ESRD*
  • Heavy proteinuria (UPi/Cr >4) refractory to intervention by PCP, even with normal GFR
  • Unclear diagnosis, especially in young patients.
  • Potentially unstable disease, such as lupus nephritis
  • Refractory hypertension: (failure to achieve goals despite 4-5 drug regimen)
  • Clear evidence of rapid progression, with annualized loss of GFR >10mL/min

*Includes:
1. GFR <20
2. GFR <40, UPi/Cr ≥2

BOX C
MEDICATIONS
AVOID IF Cr <30:
• Biphosphonates (alendronate, risedronate, zoledronic acid)
• Hydrochlorothiazide
• Gadolinium

AVOID IF Cr <60:
• Glyburide
• Metformin
• Nitrofurantoin
• Phenazopyridine
• Probenecid

USE WITH CAUTION:
Morphine sulfate, NSAIDs, Spironolactone

ADJUST FOR CKD:
Allopurinol, Antibiotics (acyclovir, valacyclovir, imipenem), Digoxin, Enoxaparin, Metoclopramide, Phenytoin

BOX D
ASSESSING PROTEINURIA
• UPi/Cr approximates a 24 hour urine protein, in grams
• Urine microAlb/Cr is more sensitive for lower level proteinuria. Very roughly, microAlb/Cr divided by 500 gives the 24 hour urine protein in grams
• UPi/Cr levels: <0.3 is normal, while >= 3.5 is nephrotic-range