Type 2 Diabetes - Chronic Kidney Disease

CKD is eGFR < 60 ml/min or kidney damage for ≥ 3 months (e.g. urine sediment, abnormal imaging, or albuminuria (UACR < 30 mg/g = nl, 30-300 = micro, >300 = macro))

Stages of Chronic Kidney Disease (CKD)

<table>
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<tr>
<th>Stage</th>
<th>eGFR  &gt; 60</th>
<th>60 ≥ eGFR &gt; 30-59</th>
<th>30-15-29</th>
<th>15-&lt; 15 ml/min/1.73 m²</th>
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Markers of progression: decreasing eGFR, increasing albuminuria, poor BP control

Workup of CKD and to rule out non-diabetes causes

CMP, UA, UACR, Uric Acid, Phos, CBC, ANA, RF, C3, C4, Hep B eAg, Hep C Ab, dilated retinal exam, and renal U/S; if patient > 40 yrs & UACR is positive then check SPEP and UPEP

Referrals

Nephrologist: When eGFR < 30 or sooner if unsure of etiology or problems

Nutrition: Refer to RD for consult (protein, Na+, K+, PO₄, fluids, saturated fat)

Managing Complications of CKD – Stages 3-5

Acidosis

If CO₂ < 22 mmol/L
- Start sodium bicarbonate 325-650 mg (1-2 tabs) TID-QID

Anemia

Check Hb at least yearly: Anemia = Hb < 13.5 g/dL adult men, < 12 g/dL adult women; r/o B12/folate deficiency, GI blood loss, other causes

Baseline Labs: Ferritin, transferrin % sat, iron studies (Fe, % Sat, TIBC), CBC+diff
- Start oral iron therapy if ferritin/iron studies low
- Ferrous Sulfate (FeSO₄) 325 mg daily to TID-QID
- Consider docusate 100 mg daily to reduce constipation

Monitor ferritin to avoid iron overload
- Consider IV iron or blood transfusion if needed

Safety of erythropoiesis stimulating agents (ESA) unclear; reserve for patients on dialysis, pending renal transplant, or Hb < 9 with symptoms unresponsive to treatment above

Blood Pressure

Most effective CKD intervention: BP goal < 130/80; continue ACEI/ARB (watch K+)

Cardiovascular Disease (CVD)

CVD: CKD increases CVD risk – patients on aspirin (if no contraindications)
- Achieve lipid targets, encourage tobacco cessation

Diabetes

Blood sugar control—as renal fxn declines pts’ BGs often improve—titrate meds down as needed; Caution setting an A1c target < 7% if advanced CKD or CVD

D/C metformin when Creatinine > 1.5 men or > 1.4 women

Peripheral Neuropathy: Foot ulcers common, check feet each visit, refer to shoe clinic

Retinopathy: Ophthalmic/retinal visits regularly

Autonomic Neuropathy: Frequent BP fluctuations, including orthostatic symptoms.

Edema/Fluid Overload

Establish patient’s dry wt; Titrate furosemide 20-240 mg BID (diuresis lasts 6 hours–give AM & mid-day)

Metabolic Bone Disease

Evidence Based

Phosphorus (PO₄): if > 4.6 mg/dL, start binder (calcium); Refer to RD for dietary PO₄ restriction

Calcium (Ca): if < 8.4, start/increase calcium supplementation; target: 8.4-9.5 mg/dL

If > 10.2, correct causes (often 2° meds), need to hold Ca and/or Vit D/calcitrol

Consensus Opinion: If iPTH elevated, measure 25(OH) Vitamin D; If 25(OH)D > 30 mg/mL, start calcitrol
If 25(OH) Vitamin D < 30 mg/mL, start ergocalciferol (Vitamin D2)

Follow Ca, PO₄, iPTH, and 25(OH)D (Vitamin D); if Ca or PO₄ above target or if iPTH below target, hold calcitrol and/or calcium

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Ref: KDOQI/NKF and UK Renal Assoc 4th Ed. Clinical Practice Guidelines for Complications of CKD


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