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)**

- **1**
  - eGFR > 60
- **2**
  - 60 > eGFR ≥ 30-59
- **3**
  - 15-29
- **4**
  - < 15 ml/min/1.73m^2

**Markers of progression:** decreasing eGFR, increasing albuminuria, poor BP control

**Workup of CKD and to rule out non-diabetes causes**
- CMP, UA, UACR, Phos, CBC, ANA, RF, C3, C4, HepB sAg, HepC 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 < 22mmol/L: Start sodium bicarbonate 325-650mg Goal: CO2 ≥ 22mmol/L

**Anemia**
- Check Hb at least yearly: Anemia = Hb < 13.5 g/dL adult men, <12 g/dL adult women; rule out 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) 325mg daily to TID-QID
- Consider docusate 100mg BID to reduce constipation
- Monitor ferritin to avoid iron overload

**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

**Autonomic Neuropathy:** Frequent BP fluctuations, including orthostatic symptoms

**Edema/Fluid Overload**
- Establish patient’s dry wt; Titrate furosemide 20-240mg 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 Ca < 10.2, correct causes (often ≥ 2 med’ls), need to hold Ca and/or Vit D/calcitrol

- **Consensus Opinion:** If iPTH elevated, measure 25(OH) Vitamin D; if >25(OH)D ≥ 30mg/mL, start calcitrol
  - If 25(OH) Vitamin D <30mg/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**

**Ref: KDOQIN/KNF and UK Renal Assoc 4th Ed. Clinical Practice Guidelines for Complications of CKD**


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