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Osteoporosis in CKD: Diagnosis and Treatment

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1. Definition & Epidemiology ● Osteoporosis: Disease characterized by low bone mass and deterioration of bone microarchitecture → increased fracture risk. ● CKD patients are at higher risk due to overlapping CKD-MBD. ● Fracture-related mortality is high: e.g., 1-year mortality after hip fracture ≈ 22% (men), 15% (women). 2. Pathophysiology ● Contributing factors: SHPT, adynamic bone disease, medication-induced bone loss (e.g., steroids). ● Osteoclast action (bone resorption) > Osteoblast action (bone formation) 3. Diagnosis & Risk Assessment ● DXA: Standard test for BMD (lumbar spine, femoral neck). ● FRAX tool: Estimates 10-year fracture risk, useful across CKD stages. ● Lab tests: iPTH, calcium/phosphorus, 25(OH)D, bone turnover markers (bone-specific ALP, TRAP-5b) 4. Treatment Principles ● CKD G1–G3: Treat similarly to general population. ● CKD G4–G5D: Address CKD-MBD first, consider fracture risk, biochemical abnormalities, bone turnover status. ● Treat high-risk patients: T-score ≤ -2.5, fragility fracture, high FRAX score. 5. Management Options ● Lifestyle: Adequate calcium/vitamin D intake, weight-bearing exercise, fall prevention. ● Medications: ▶Bisphosphonates: Potent antiresorptive agent; renal dosing caution (eGFR>30) ▶Denosumab: Safe in all CKD stages; hypocalcemia risk, rebound risk upon discontinuation. ▶Teriparatide: For high-risk fracture patients; caution in ESRD. ▶Romosozumab: Avoid in recent CV events. 6. Summary ● CKD patients have elevated fracture and mortality risk. ● Individualized treatment based on CKD stage and bone turnover type. ● Proper diagnosis and monitoring (BMD, labs, fracture history) are essential.

Keywords: Osteoporosis, Chronic Kidney Disease, Diagnosis, Treatment, Fracture