

# CKD Management

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# Objectives

- ▶ Diagnose CKD
- ▶ Causes of CKD
- ▶ Identify and treat complications of CKD
- ▶ When to refer to Nephrology

# COI

▶ None

# CKD

- ▶ CKD is defined by the presence of kidney damage **or** decreased kidney function **for three or more months**, irrespective of the cause ( KDIGO and KDOQI)
- ▶ The persistence of the damage or decreased function for at least three months is **necessary** to distinguish CKD from acute kidney disease.

- ▶ Kidney damage refers to pathologic abnormalities, whether established via renal biopsy or imaging studies, or inferred from markers such as urinary sediment abnormalities or increased rates of urinary albumin excretion.
- ▶ Decreased kidney function refers to a decreased glomerular filtration rate (GFR), which is usually estimated (eGFR) using serum creatinine and one of several available equations.

Prognosis of CKD by GFR and albuminuria category

Prognosis of CKD by GFR  
and Albuminuria Categories:  
KDIGO 2012

				Persistent albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30-300 mg/g 3-30 mg/mmol	>300 mg/g >30 mg/mmol
GFR categories (ml/min/ 1.73 m <sup>2</sup> ) Description and range	G1	Normal or high	≥90	Green	Yellow	Orange
	G2	Mildly decreased	60-89	Green	Yellow	Orange
	G3a	Mildly to moderately decreased	45-59	Yellow	Orange	Red
	G3b	Moderately to severely decreased	30-44	Orange	Red	Red
	G4	Severely decreased	15-29	Red	Red	Red
	G5	Kidney failure	<15	Red	Red	Red

Green: low risk (if no other markers of kidney disease, no CKD); Yellow: moderately increased risk; Orange: high risk; Red, very high risk.

# Causes of CKD

- ▶ Persistent pre renal or post renal causes
- ▶ GN ( including DM )
- ▶ HTN
- ▶ Hereditary causes
- ▶ Drugs

# Identify CKD

- ▶ Compare to baseline if known
- ▶ Presence of complications of CKD
- ▶ Kidney imaging changes
- ▶ Biopsy features of chronicity



# Complications of CKD

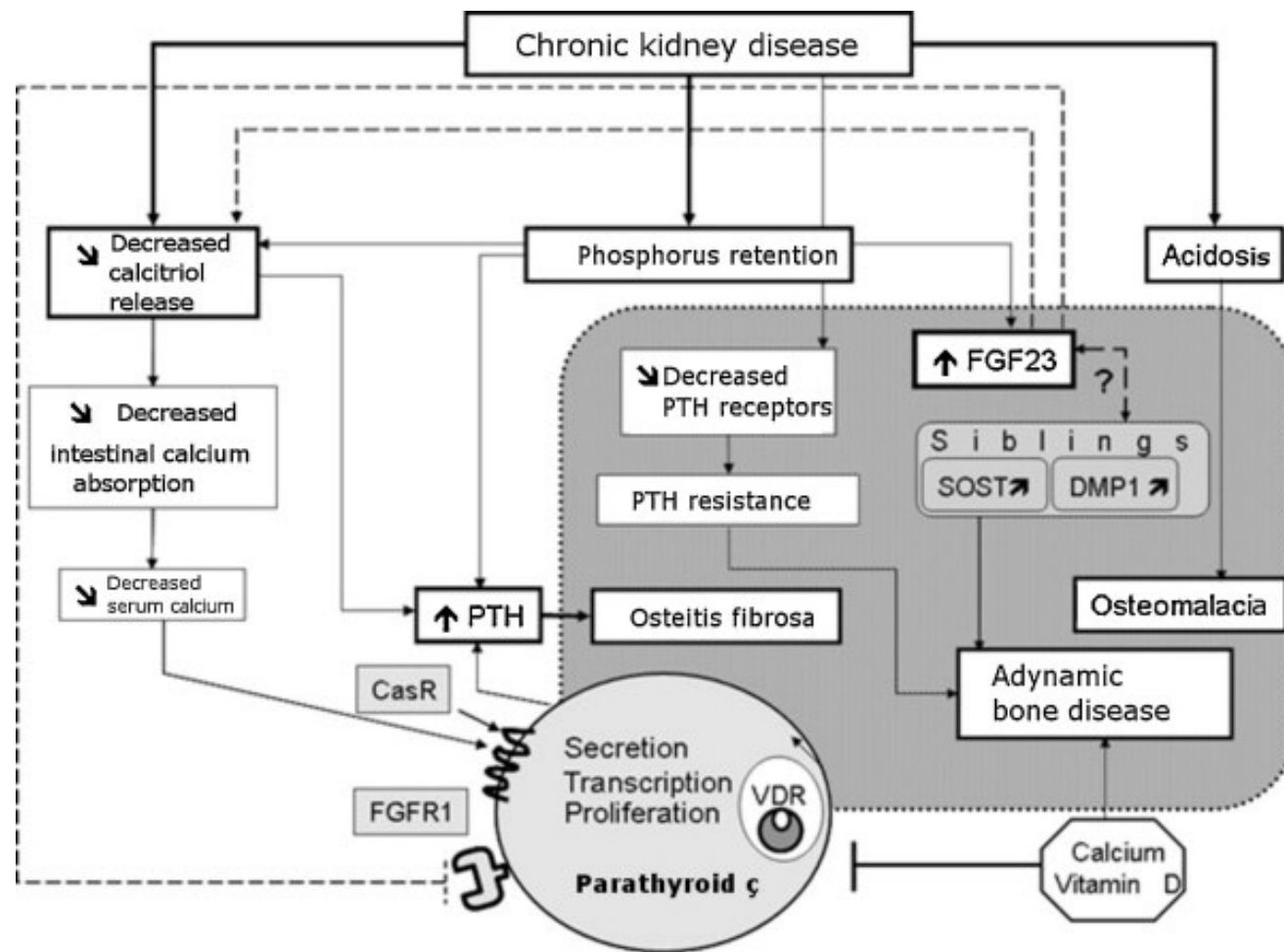
- ▶ **Anemia**
- ▶ KDIGO guidelines identifies anemia as below 130 for males and below 120 in females.
- ▶ Screening for anemia should be done annually for CKD stage 3 and biannually for stage 4 and every 3 months for stage 5
- ▶ If anemia is found, approach the patient as any person with anemia and do an anemia work up prior to labeling them as anemia of CKD

# Complications of CKD

- ▶ Anemia management:
- ▶ After ruling out other causes of anemia, first line of management is to tackle iron deficiency by supplementing iron ( po as first line in CKD )
- ▶ Target is tsat above 0.3 and or ferritin above 500
- ▶ If targets achieved and anemia persists then epo can be initiated.
- ▶ Do not target a higher hgb level as it increases the risk of strokes, heart attacks, worsening HTN and malignancy progression

# Complications of CKD

- ▶ **Mineral Bone Disease**
- ▶ Three important parameters need to be dealt with are Phos, Ca and PTH



# Complications of CKD

- ▶ Targets and treatment
- ▶ Calcium and phosphorus levels to be checked every 6-12 months for stage 3, 3-6 months for stage 4 and 1-3 months for stage 5.
- ▶ Phosphorus target in CKD should reach normal levels
- ▶ Calcium target in CKD should reach normal levels however asymptomatic hypocalcemia can be tolerated

# Complications of CKD

- ▶ PTH levels in CKD pre dialysis should reach normal levels
- ▶ Bone density measurement is recommended for CKD stage 3a and lower if results will impact treatment
- ▶ Also if needing confirmation bone biopsy is also an ungraded recommendation

# Complications of CKD

- ▶ First hormone to target in treatment is Phosphorus
- ▶ Treatment options are
  - ▶ Diet control
  - ▶ phosphate binders ( several )
- ▶ Treatment high PTH includes Vitamin D ( monitor Ca and phosphorus as it may increase it)
- ▶ Cinacalcet is another option to reduce hypocalcemia and PTH
- ▶ Parathyroidectomy is the last solution

# Complications of CKD

- ▶ **Acidosis**
- ▶ As CKD progress, the patient develops acidosis
- ▶ To prevent bone buffering and progression of CKD target a serum bicarb of more than 22 by supplementing oral sodium bicarb
- ▶ Need rule out other causes of acidosis prior to starting treatment



# Complications of CKD

## ▶ Hypertension

- ▶ New KDIGO guidelines recommend that SBP should be lower than 120 in CKD irrespective of concomitant DM or not based on the SPRINT trial
- ▶ First line of therapy is RAAS blockade regardless if there was DM or albuminuria but of course indication is stronger if there was DM or albuminuria

# Complications of CKD

- ▶ **Other preventative measures to delay progression**
- ▶ Smoking cessation
- ▶ Decrease protein intake ( 0.8/kg/ day if gfr less than 30 ) and not to exceed 1.3gm / kg/ day with CKD at risk of progression.
- ▶ Decrease salt intake to less than 2 gm / day
- ▶ Avoid nephrotoxic medications
- ▶ Weigh benefits vs risks prior to doing imaging with contrast
- ▶ Glycemic control of A1c less than 7
- ▶ Exercise for 30 minutes 5 days a week

# Referral to Nephrology

- ▶ AKI or abrupt sustained fall in GFR  $<30$  ml/min/1.73 m<sup>2</sup> (GFR categories 4-5)
- ▶ Consistent finding of significant albuminuria (ACR  $>300$  mg/g [ $>30$  mg/mmol] or AER 300 mg/24 hours, approximately equivalent to PCR  $>500$  mg/g [ $>50$  mg/mmol] or PER 500 mg/24 hours)

# Referral to Nephrology

- ▶ Progression of CKD
- ▶ Urinary red cell casts, RBC 420 per high power field sustained and not readily explained
- ▶ CKD and hypertension refractory to treatment with 4 or more antihypertensive agents
- ▶ Persistent abnormalities of serum potassium recurrent or extensive nephrolithiasis;
- ▶ Hereditary kidney disease.

# Questions