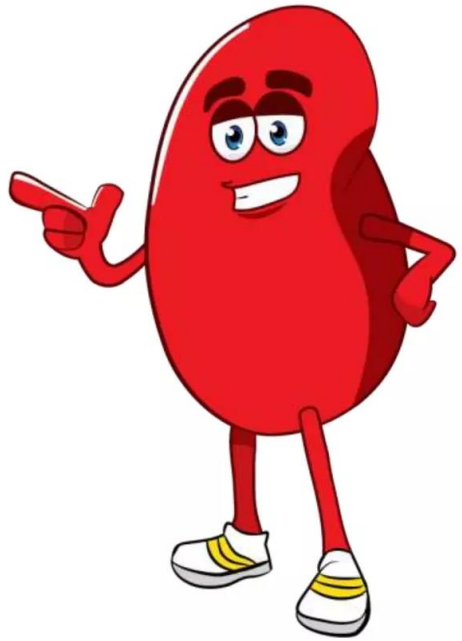
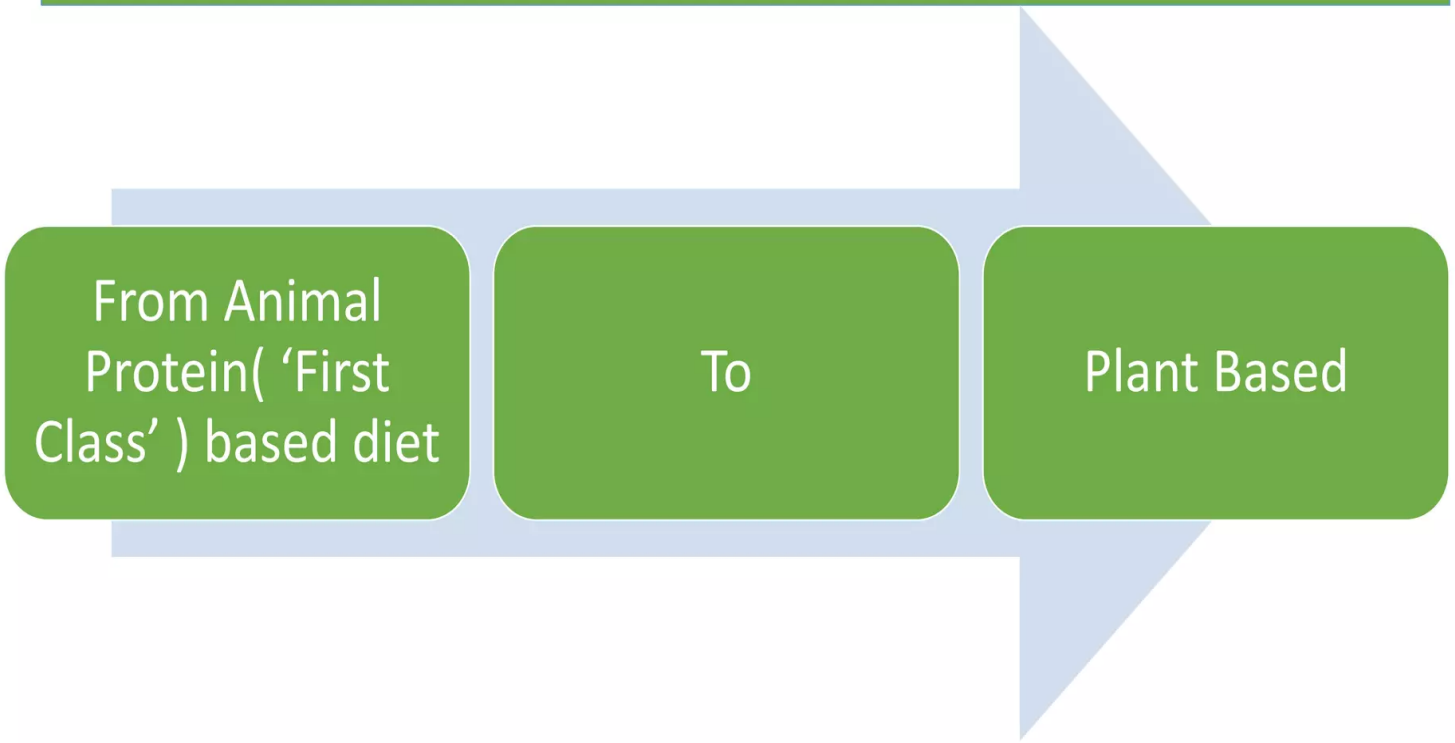
Protein foodsfor the patients of the Chronic Kidney Diseases

Overview of Guidelines in CKD:

- Daily protein intake of 0.6- 0.8gm/kg
- Caloric intake 30-35kcal/kg/day
- Fat <30% of total energy intake
- Fibres 25-38gms/day
- Sodium intake <2–2.3gms/day
- Potassium intake to be guided by serum levels
- Calcium intake <1500mg/day
- Phosphorus intake 0.8-1gm/day



Protein Restriction –Shifting Focus

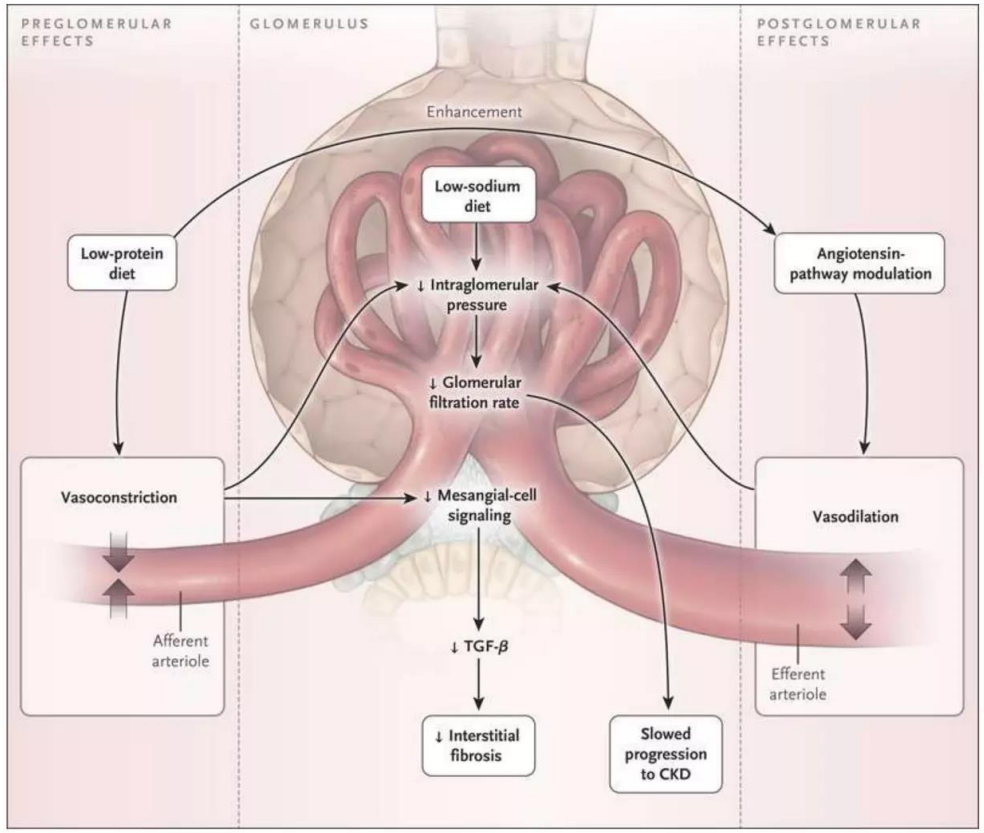


Protein restriction

Experimental data suggest daily protein intake >1.5gm/day may cause glomerular hyper filtration & proinflammatory gene expression.

Protein restriction mitigates proteinuria besides other benefits including lower urea generation, microbiome modulation, lower phosphorus intake & control of metabolic acidosis.

Despite abundant observational studies, no RCT has shown definitive benefit in retarding the progression of CKD.



Kalantar-Zadeh K, Fouque D. Nutritional Management of Chronic Kidney Disease. N Engl J Med. 2017 Nov 2;377(18):1765-1776

Table 1. Recommended protein intake for different stages of kidney disease

	Normal kidney function (eGFR >60[a]) and no proteinuria but at higher CKD risk, for example, diabetes, hypertension or solitary kidney[b]	Mild to moderate CKD (eGFR 30–<60[a]) without substantial proteinuria (<0.3 g/day)[c]	Advanced CKD (eGFR <30[a]) or any CKD with substantial proteinuria (>0.3 g/day)[c]	Transitioning to dialysis therapy with good RKF, including incremental dialysis preparation[c]	Prevalent dialysis therapy or any CKD stage with existing or imminent PEW[d]
Dietary protein (g/kg/day based on IBW[e])	<1.0 g/kg/day, increase proportion of plant-based proteins	<1.0 g/kg/day (consider 0.6–0.8 if eGFR <45 mL/min and fast progression)	0.6–0.8 g/kg/day including 50% HBV or <0.6 g/kg/day with the addition of EAA/KA	0.6–0.8 g/kg/day on nondialysis days (e.g. incremental dialysis) and >1.0 g/kg/day on dialysis days	1.2–1.4 g/kg/day, may require >1.5 g/kg/day if hypercatabolic

Adapted from Kalantar-Zadeh and Fouque [2].

Benefits of Plant based diets:

Differing amino acid profiles may have different effects on renal hemodynamics including reduced expression of RAAS system

Higher fibre content

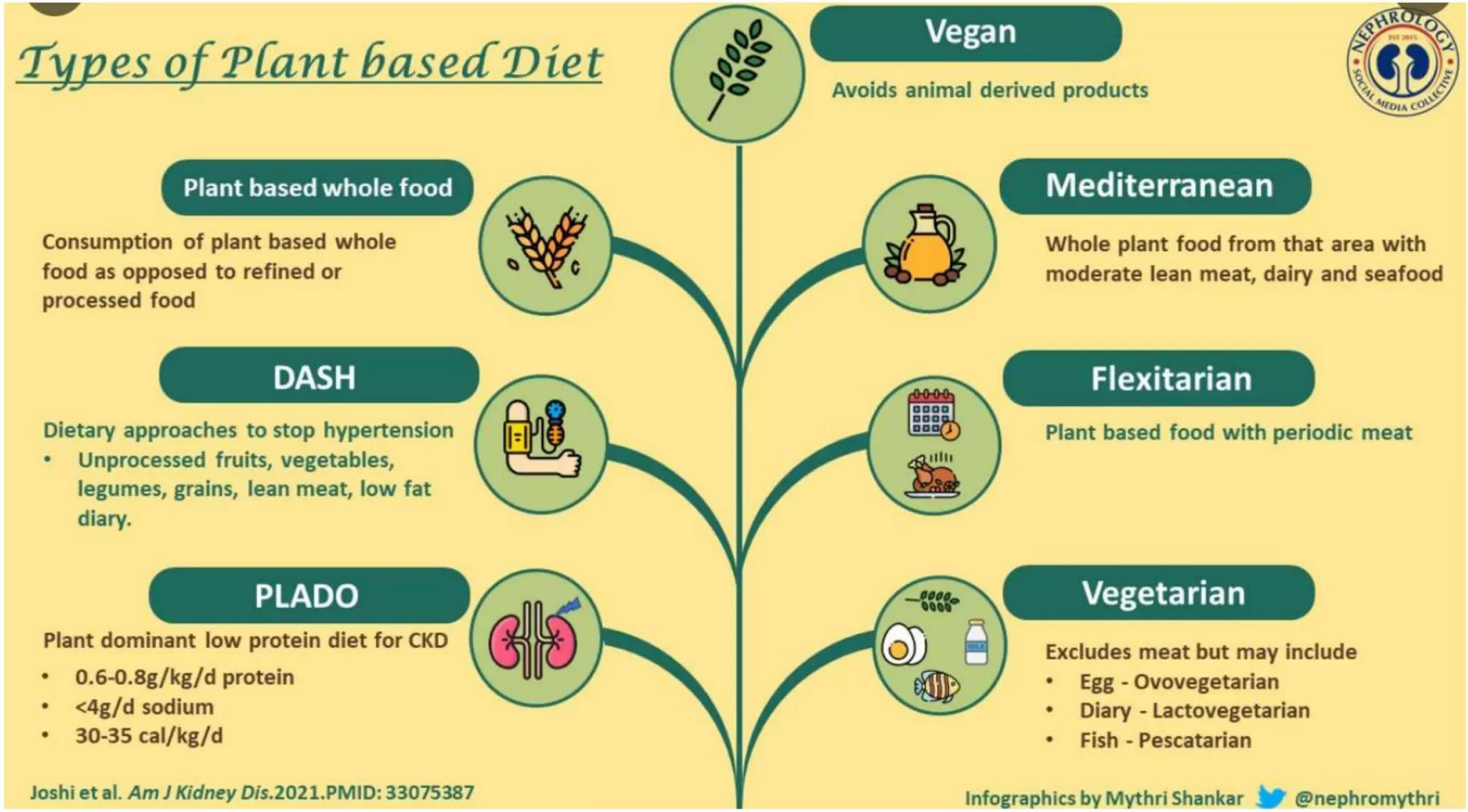
- Increased bowel motility & nitrogen excretion, thus decreasing the uremic load.
- Lowers cholesterol & reduced incidence of metabolic syndrome
- Alters gut microbiome towards more saccharolytic type, which ferment dietary fibres to release short chain FA & promote gut barrier integrity.
- Also confer anti-inflammatory properties.

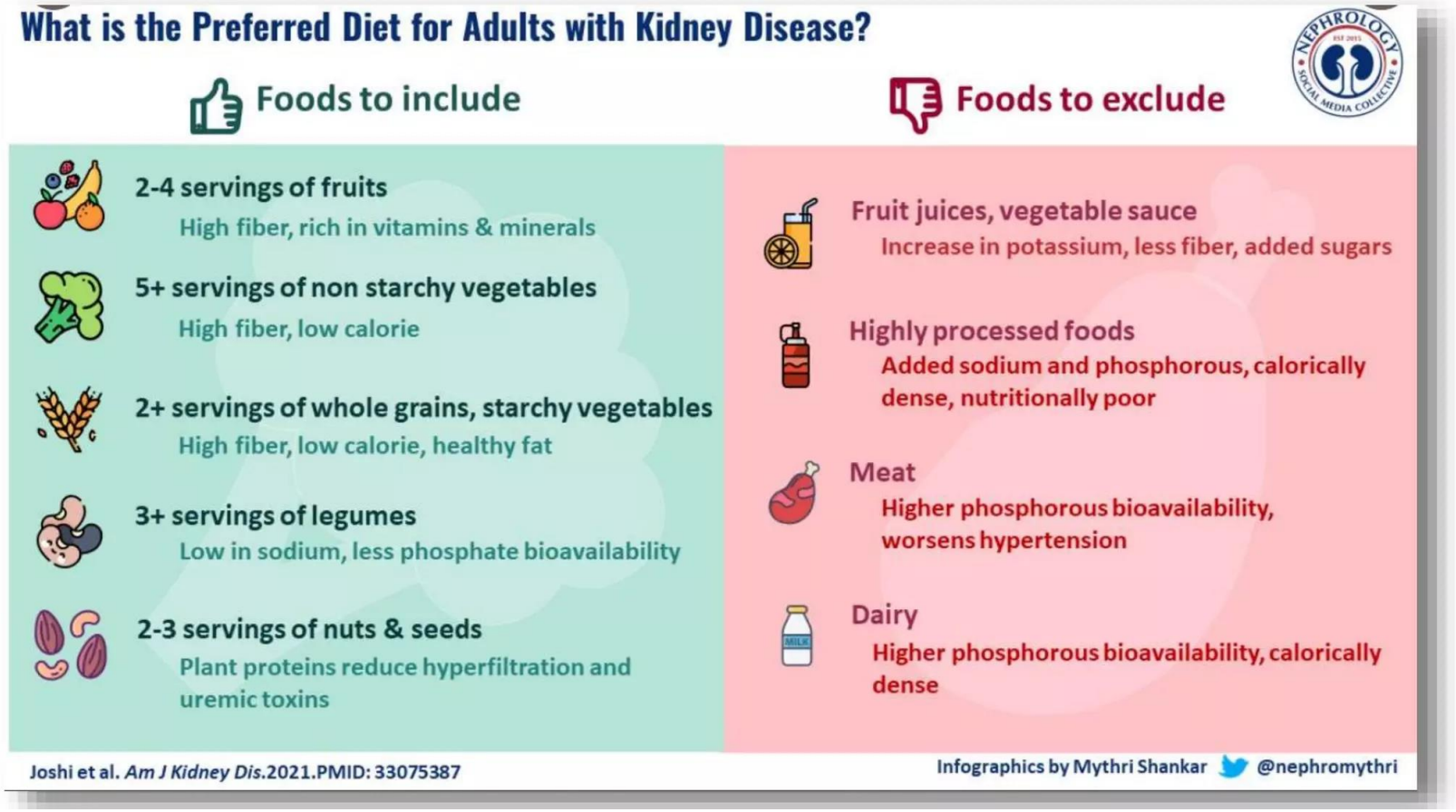
Dietary Patterns

Individual nutrient restrictions while sound in theory, don't often translate to good practical dietary advice.

People often consumed mixed meals. Makes more sense then to prescribe dietary patterns.

Several dietary regimens have gained prominence over the last decade including the DASH diet, Mediterranean diet etc.


Types of Plant based Diet
Vegan
Avoids animal derived products
Plant based whole food
Consumption of plant based whole food as opposed to refined or processed food
Mediterranean
Whole plant food from that area with moderate lean meat, dairy and seafood
DASH
Dietary approaches to stop hypertension
• Unprocessed fruits, vegetables, legumes, grains, lean meat, low fat diary.
Flexitarian
Plant based food with periodic meat
PLADO
Plant dominant low protein diet for CKD
• 0.6-0.8g/kg/d protein
• <4g/d sodium
• 30-35 cal/kg/d
Vegetarian
Excludes meat but may include
• Egg - Ovovegetarian
• Diary - Lactovegetarian
• Fish - Pescatarian
Joshi et al. Am J Kidney Dis.2021.PMID: 33075387
Infographics by Mythri Shankar @nephromythri


What is the Preferred Diet for Adults with Kidney Disease?
Foods to include
Foods to exclude
2-4 servings of fruits
High fiber, rich in vitamins & minerals
5+ servings of non starchy vegetables
High fiber, low calorie
2+ servings of whole grains, starchy vegetables
High fiber, low calorie, healthy fat
3+ servings of legumes
Low in sodium, less phosphate bioavailability
2-3 servings of nuts & seeds
Plant proteins reduce hyperfiltration and uremic toxins
Fruit juices, vegetable sauce
Increase in potassium, less fiber, added sugars
Highly processed foods
Added sodium and phosphorous, calorically dense, nutritionally poor
Meat
Higher phosphorous bioavailability, worsens hypertension
Dairy
Higher phosphorous bioavailability, calorically dense
Joshi et al. Am J Kidney Dis.2021.PMID: 33075387
Infographics by Mythri Shankar @nephromythri

Conclusion

Moderate protein restriction of 0,8 gm/kg/day seems to be beneficial in retarding the progression of CKD, without increased risk of malnutrition

Go Green !!

Plant based diets may serve as the ideal low protein diets with added benefit low bioavailable phosphorus.

Rather than focusing on individual nutrients, it'd be more prudent to focus on dietary patterns. Easier to understand for the patients and ensure better compliance.