Diverse Plates and Common Goals in Kidney Nutrition: Evidence, Evolution, and Empowerment

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Opening Karakia

Whakataka te hau ki te uru
Whakataka te hau ki te tonga
Kia mākinakina ki uta
Kia mātaratara ki tai
E hī ake ana ti atakura
He tio, he huka, he hau hū
Tīhei mauri ora!

Cease the winds from the west
Cease the winds from the south
Let the breeze blow over the land
Let the breeze blow over the ocean
Let the red-tipped dawn come with a sharpened air
A touch of frost, a promise of a glorious day

Goals of today

Gain a deeper understanding of the new diet guidelines and common challenges faced by our patients.

Increase your confidence in starting nutrition conversations and when to refer to a Dietitian.

We do not expect you to be experts on Nutrition.

Today in brief

Time	Topic	Speaker
1300-1320	Introduction/house keeping	Jo Stockings
1320-1400	Evolution: From Nutrients to Nourishment	Sharleen Nancekivell
1400-1440	Evidence: Identifying and managing malnutrition, frailty and sarcopenia	Suzy Jackson
1445-1515	Afternoon Tea Break	
1515-1555	Diverse Plates: Why don't they don't they follow the recommendations?	Jo Stockings
1555-1640	Empowerment and common goals: Common patient discussions	Hilary Dumbleton
1640-1650	Questions/reflections	Panel
1650-1700	Close and repolling	Jo Stockings

But first, some questions

https://www.menti.com/alf4vb9h9bsi



Evidence: From Nutrients to Nourishment

Sharleen Nancekivell

Sharleen Nancekivell
Senior Renal Dietitian Waitematā,,
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From Nutrients to Nourishment

Replacing the ‘Renal diet’ with realistic, holistic nutrition care

Sharleen Nancekivell
Senior Renal Dietitian Waitematā

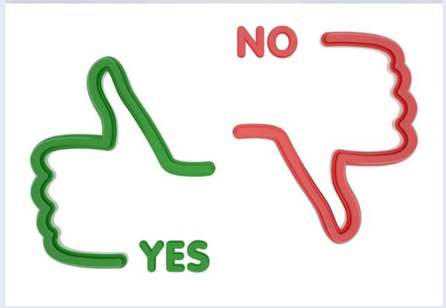
Te Kāwanatanga o Aotearoa
New Zealand Government

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Te Whatu Ora

Moving from nutrients to whole food and diet quality















Nutrients to Nourishment

Outline



01 **Nourishment for kidney health**

Ultra-processed foods
Plant based diets
Sodium



02 **Turning nutrients into nourishment**

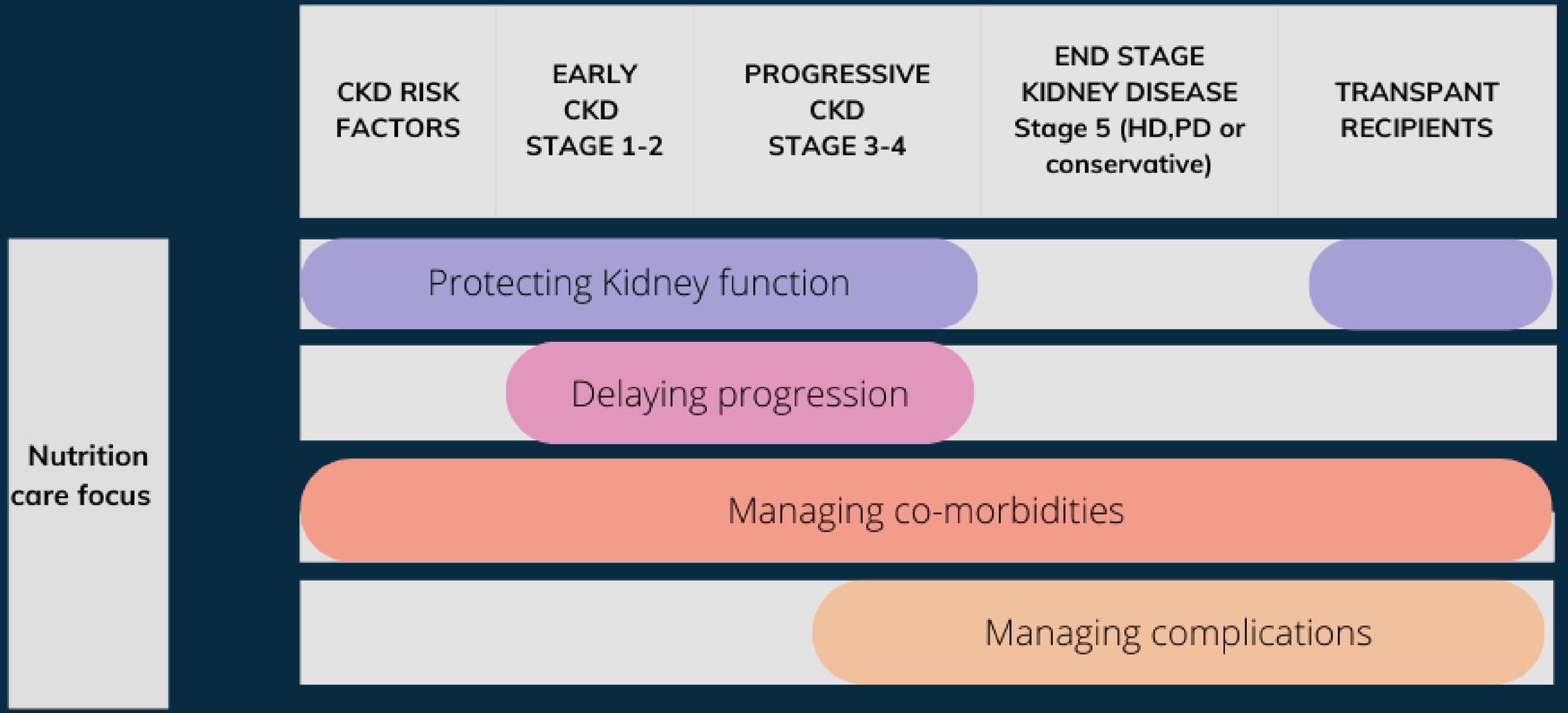
Potassium
Phosphate



03 **Practical Activity**

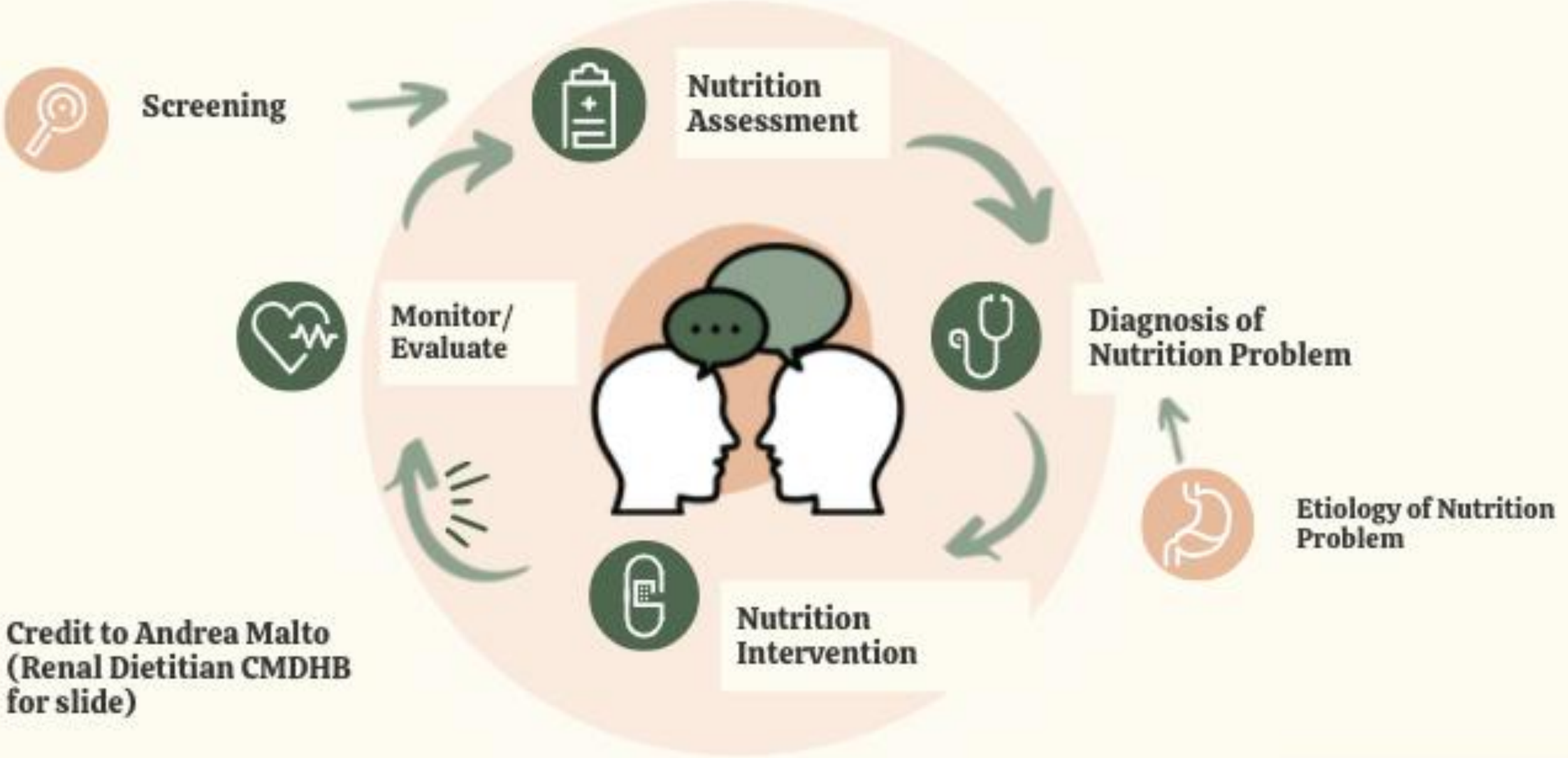
Label reading
Give it a go!

NUTRITION ACROSS THE KIDNEY DISEASE JOURNEY



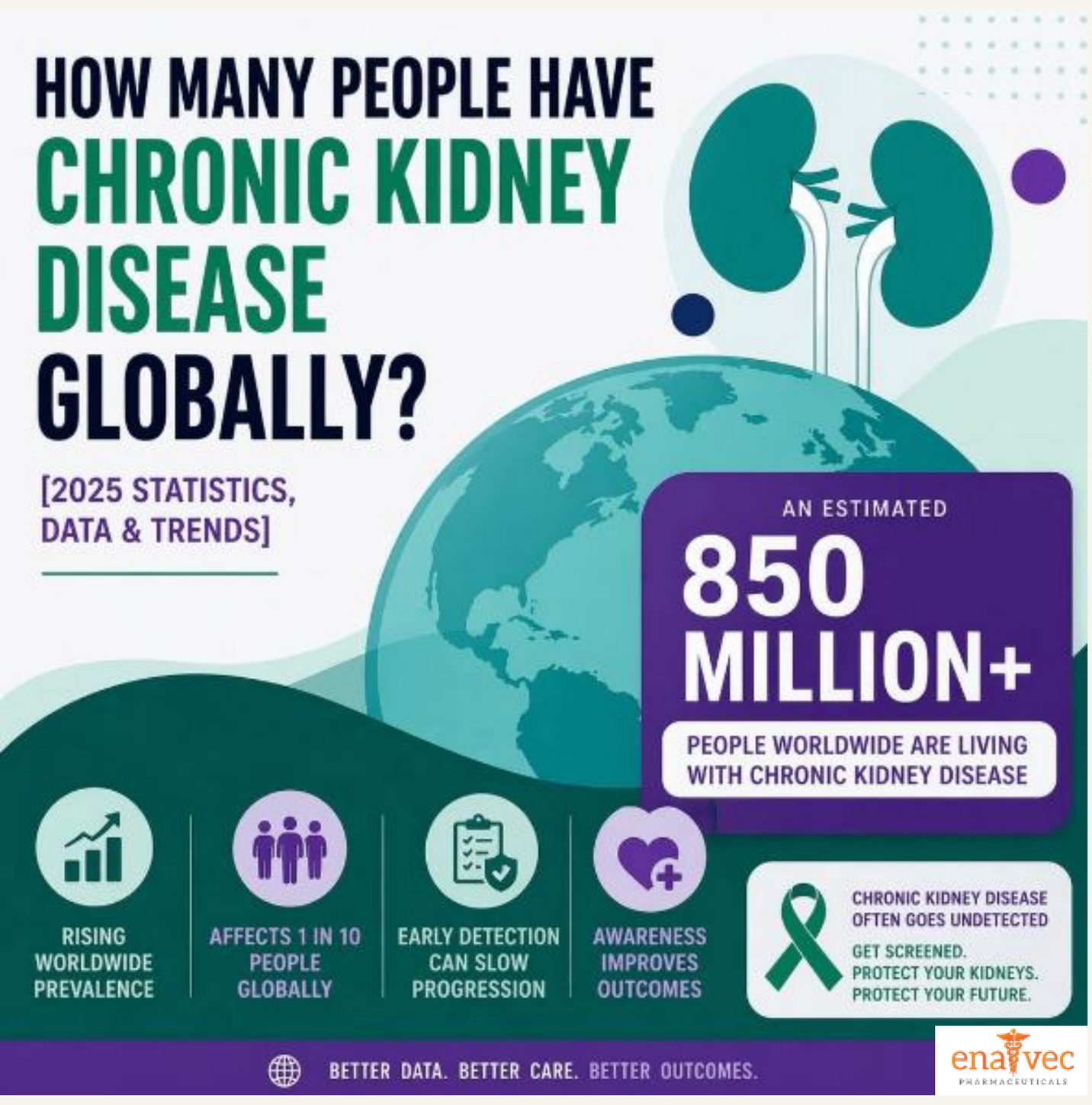
S Nancekivell Renal Dietitian May 2023

Nutrition Care



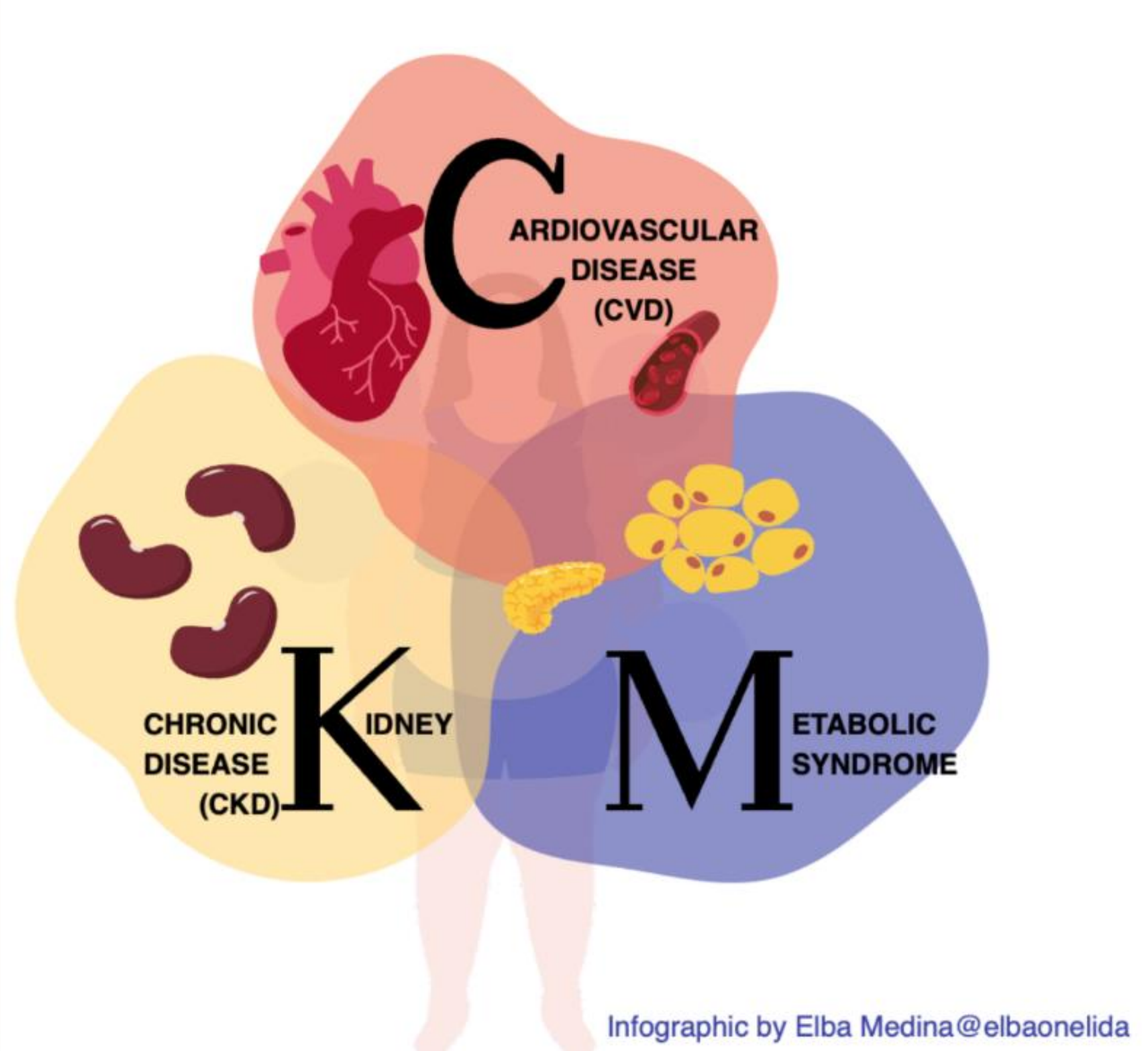
Credit to Andrea Malto (Renal Dietitian CMDHB for slide)

[3] J Am Diet Assoc 2015; 105:825-34



Healthier diet patterns lower risk of CKD, slow decline, and reduce mortality in those with CKD [1,2,3]

Cardio-Kidney-Metabolic Syndrome(CKM)



CKM is a systemic health disorder that recognizes the interconnection of heart disease, kidney disease, diabetes, and obesity.

These conditions share risk factors and can lead to one another.

Nutrition is a common modifiable lifestyle risk factor in managing risk of these conditions.

Increases in CKD also parallels diet transition [4]
Traditional diet → Westernised diet





Characteristics of Traditional diet and Westernised diet

Approx 50% of intake (5)



Traditional diet
- Whole foods
- Minimally processed



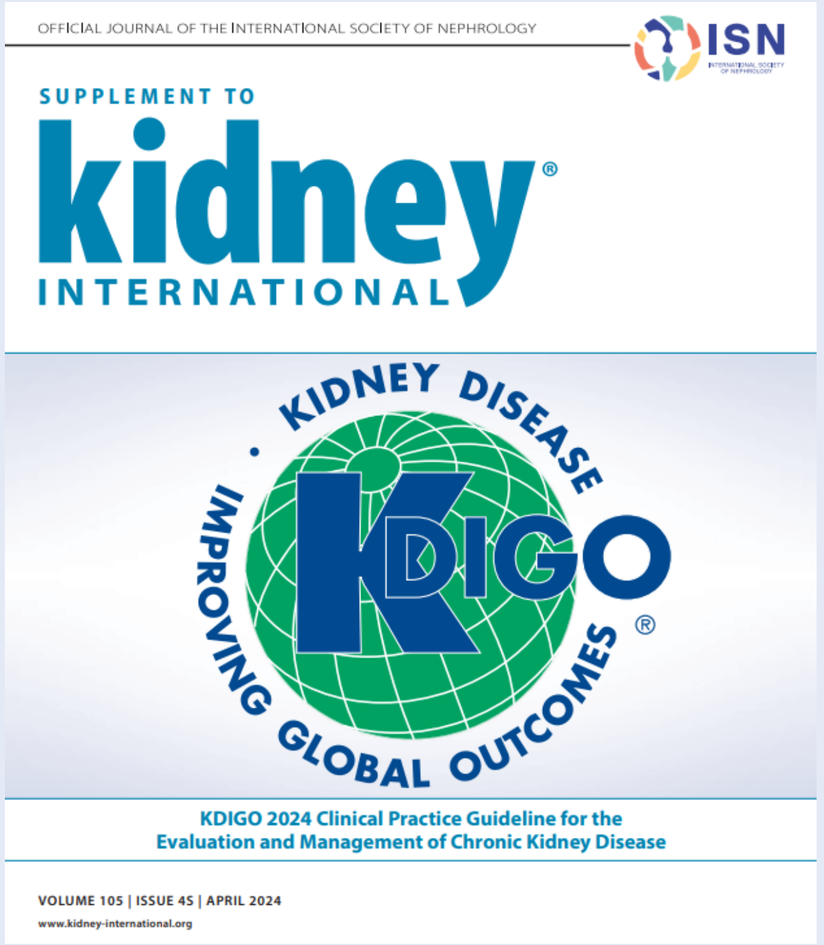
‘Westernised’ diet
- Less whole foods
- Ultra-processed foods
- Increased saturated fat
- Increased sugar and salt
- Additives
- Low fibre

Nutrition for prevention and slowing progression of CKD

3.3 Diet

Practice Point 3.3.1: Advise people with CKD to adopt healthy and diverse diets with a higher consumption of plant-based foods compared to animal-based foods and a lower consumption of ultraprocessed foods. (6)

Recommendation 3.3.2.1: We suggest that sodium intake be <2 g of sodium per day (or <90 mmol of sodium per day, or <5 g of sodium chloride per day) in people with CKD (2C). (6)





Ultra-processed foods (UPF) associated with adverse health outcomes (5)

World Cancer Research Fund

nutrients

MDPI

Review

Ultra-Processed Food and Chronic Kidney Disease Risk: A Systematic Review, Meta-Analysis, and Recommendations

Kristin E. Leonberg [1,*], Manish R. Maski [2], Tammy M. Scott [1] and Elena N. Naumova [1]

Nutrients 2025 (7)

- 7 studies found
- Studies suggest there is an association between higher UPF intake and CKD risk.
- 7-74% higher risk of incident CKD
- Further high quality research required

AJKD

Original Investigation

Ultraprocessed Foods and Kidney Disease Progression, Mortality, and Cardiovascular Disease Risk in the CRIC Study

Valerie K. Sullivan, Lawrence J. Appel, Cheryl A.M. Anderson, Hyunju Kim, Mark L. Unruh, James P. Lash, Marsha Trego, James Sondheimer, Mirela Dobre, Nishigandha Pradhan, Panduranga S. Rao, Jing Chen, Jiang He, and Casey M. Rebholz, on behalf of the CRIC Study Investigators

AJKD 2023 (8)

- Large cohort of people with CKD (n=2626 for CKD progression, n= 2778 for all cause mortality)
- UPF significantly associated with a higher risk of CKD progression in early CKD (Stage 1-2) but not later stages (Stage 3a-5)
- Each additional serving of UPF was associated with a 3% higher risk of progression
- UPF associated with higher risk of all-cause mortality.
- No link with incident CVD found

Sodium – Beyond table salt

Recommendation 3.3.2.1: We suggest that sodium intake be <2 g of sodium per day (or <90 mmol of sodium per day, or <5 g of sodium chloride per day) in people with CKD ((6)



- Consistent evidence for benefit on blood pressure and proteinuria in early-stage CKD (9)
- Potential benefit in slowing progression (9)
- As much as 75% comes from processed foods



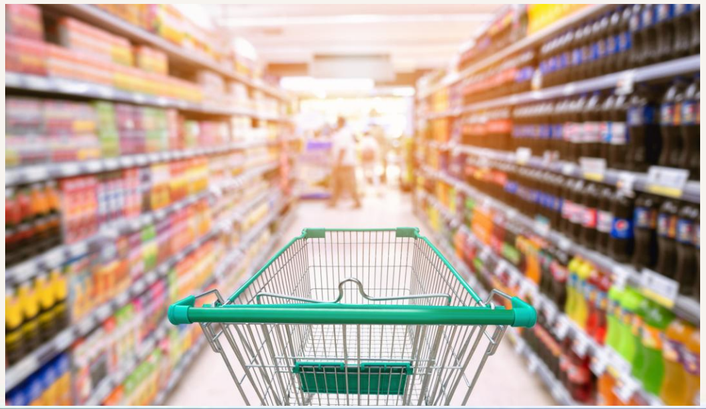
➡ Reduce added salt at the table/cooking AND

reduce salt from processed foods.

Ultra-processed foods, not all ‘created equal’

Some benefits:

- Prolonged shelf life
- Food safety
- Added nutrients eg: Iron, calcium
- Convenience and accessibility
- Consistent reliable taste



A realistic approach:

- Consider the nutritional value of the food
- Focus on avoiding those with known high health risk **(Eg: High in saturated fat, salt and sugar)**
- Encourage foods closer to how they are found in nature
- Work alongside the patient
- Label reading

Plant-based and chronic kidney disease

KDIGO 2024 (6):

..higher consumption of plant-foods compared to animal based..

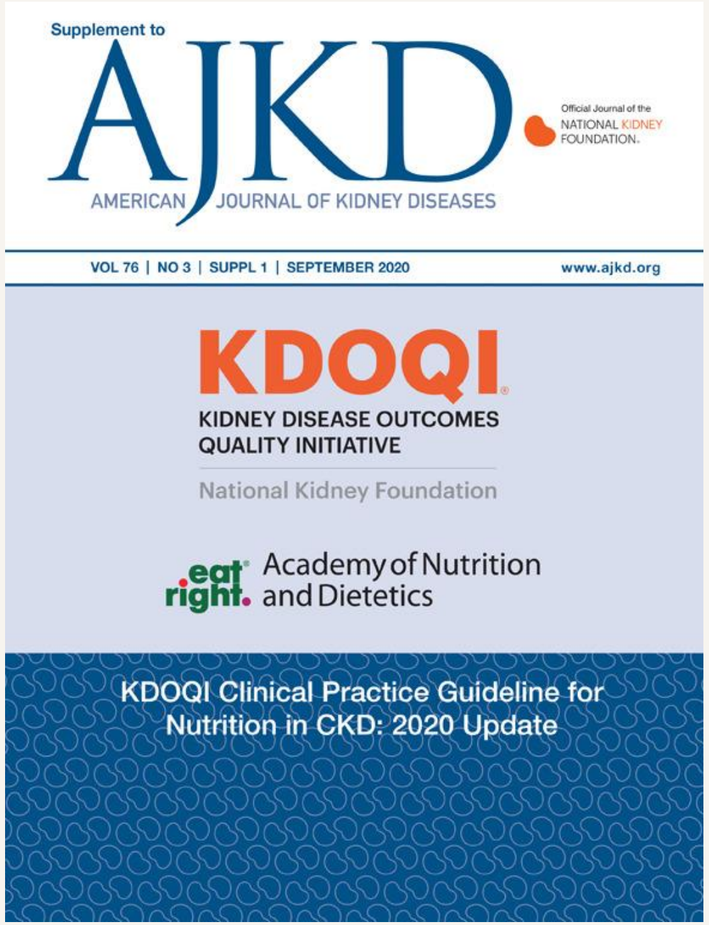
KDOQI 2020(10):

Mediterranean Diet

…we suggest that prescribing a Mediterranean Diet may improve lipid profiles (2C)

Fruits and Vegetables

...we suggest that prescribing increased fruit and vegetable intake may decrease body weight, blood pressure, and net acid production (NEAP) (2C)".



Benefits of plant-based diet in CKD (11)



Manage risk factors and comorbidities

- Cardiovascular disease
- Hypertension

Growing evidence of benefit in CKD

- Heart health
- Reduce metabolic acidosis
- Fibre-gut microbiome
- Slower CKD progression

Plant foods and metabolic acidosis

Studies have shown diet reducing acid producing foods and increasing base-producing foods can improve metabolic acidosis, preserve kidney function in people with CKD (12)

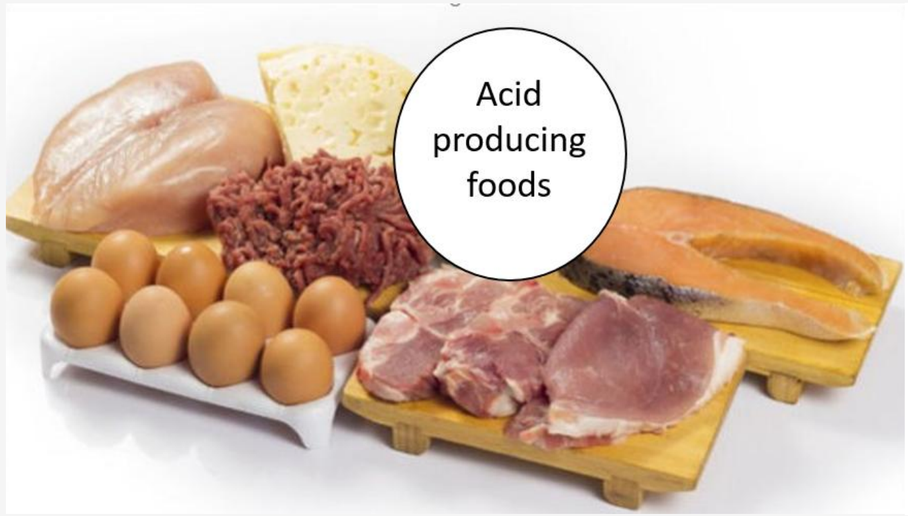


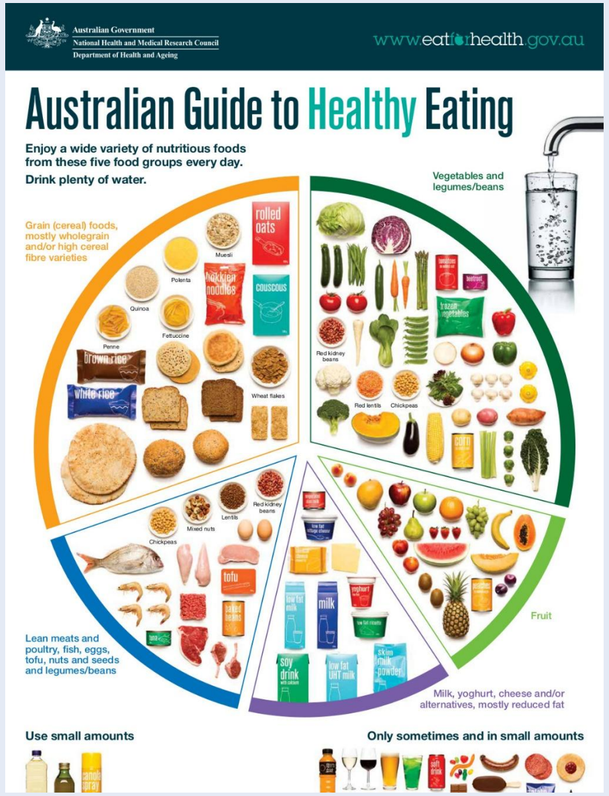


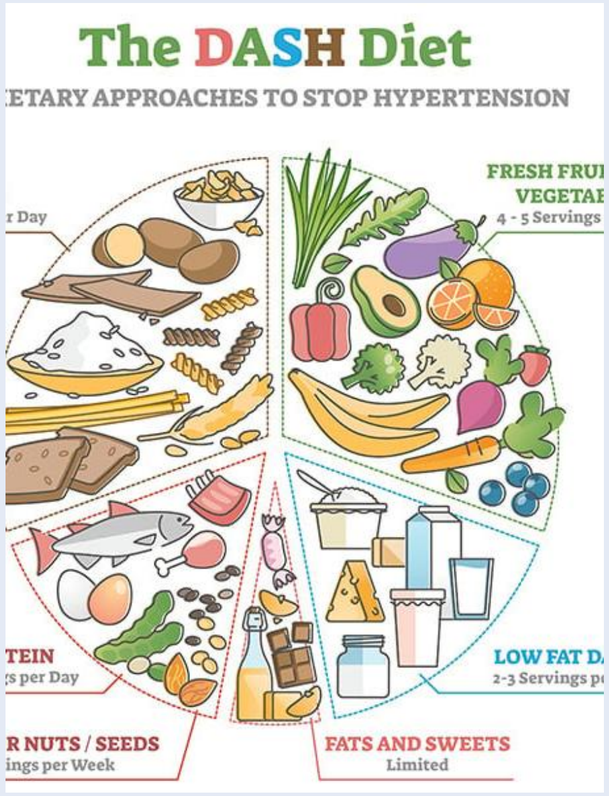
Image Credit oil: fabrikasinf on freepik



Image Credit: Elena Schweitzer/Shutterstock.com

Plant-based – not exclusively vegetarian










HYPERKALEMIA
First10EM


K



Potassium across the stages of CKD

Early CKD - kidney protective

Higher potassium intake = lower mortality

- DASH diet
- Blood pressure control
- Hyperkalemia rare

CKD stage 3-5 – Manage risk

At risk of hyperkalemia

KDOQI 2020[10]**:** CKD 3-5D – “it is reasonable to adjust dietary potassium intake to maintain serum potassium within the normal range (OPINION.)”

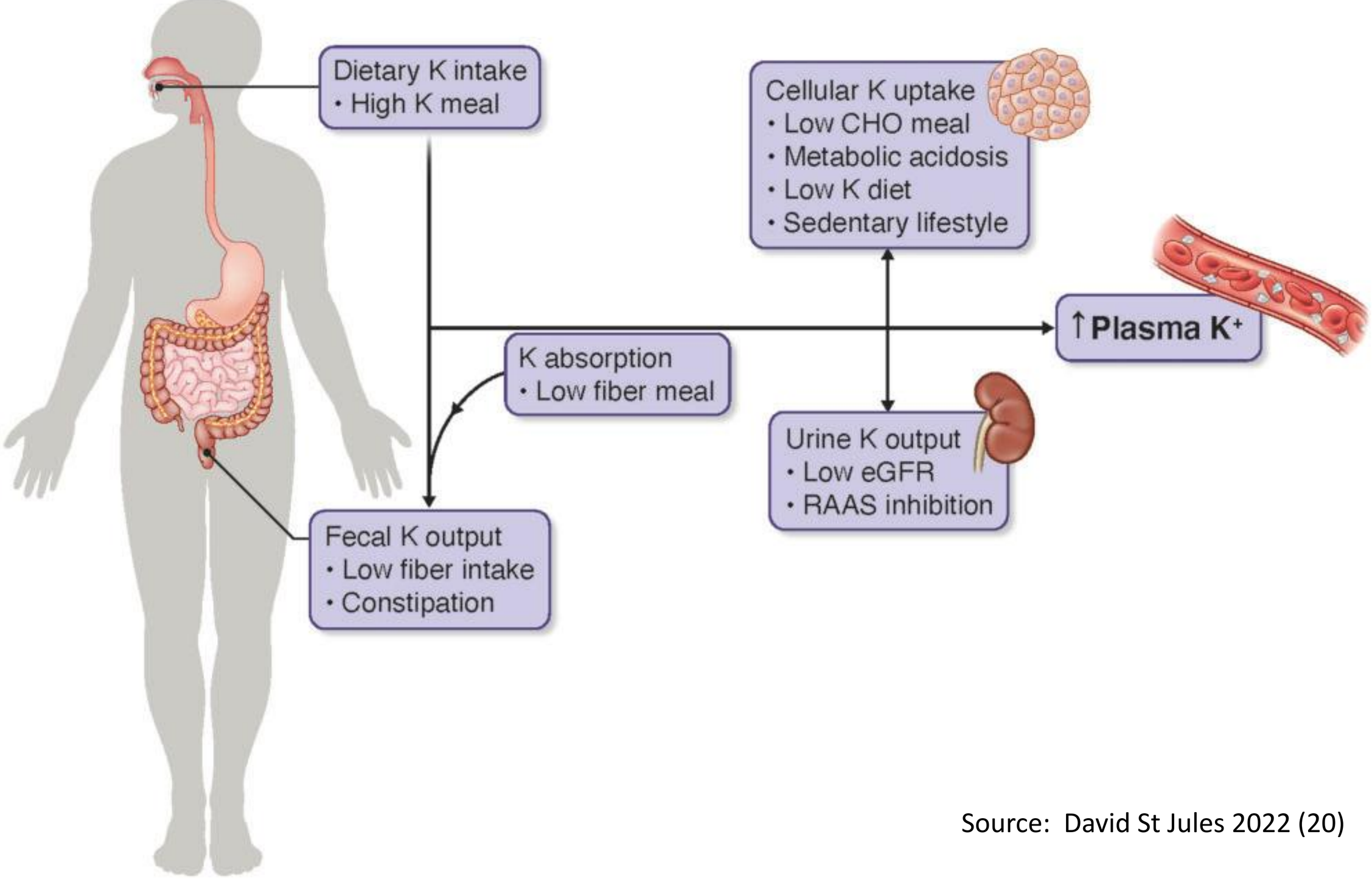
Evidence for a changing approach to nutrition management of hyperkalemia

The Evidence

- Post prandial elevation of serum potassium after administration of potassium salts (Winkler et al 1941 (13), Keith et al 1947 (14)
- Wet cooking methods reduce potassium content of foods (18)

Lack of Evidence

- No interventional studies to show direct relationship between dietary potassium intake and either serum levels or clinical outcomes (KDOQI 2020(10))
- Slight increase serum K with very large increase in K intake. MacLaughlin 2023(18)
- Several studies failed to show hyperkalemia with increased potassium from plant foods (Babich et al 2022 (19))
- No evidence for historical K restriction of 1 mmol/kg



Source: David St Jules 2022 (20)

Bioavailability of potassium



Plant-based foods

Absorption rate
50%–60%

Plant-based foods may have low absorption rate, net alkalizing effect, and carbohydrate content encourages K^+ shifts into intracellular space, minimizing impacts on serum K^+



Animal-based foods

Absorption rate
70%–90%

Animal-based protein has higher absorption and net acid effect results in higher amounts of K^+ remaining in serum



Processed foods

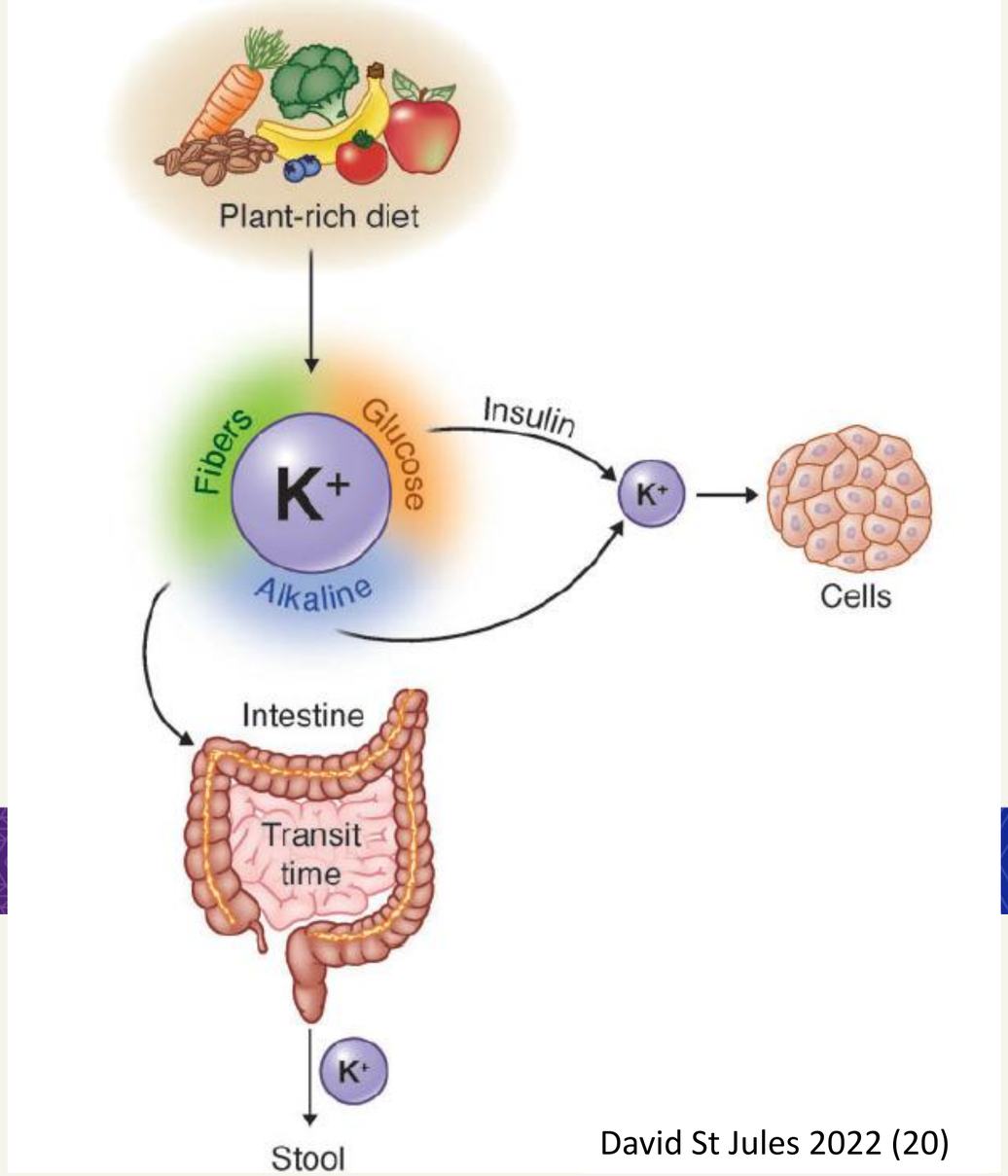
Absorption rate
90%

Potassium salts (often found in processed foods) absorption rate has been reported to be 90%

Figure 33 | Potassium absorption rates of plant-based, animal-based, and processed foods. Data from Picard K, Griffiths M, Mager DR, Richard C. Handouts for low-potassium diets disproportionately restrict fruits and vegetables. *J Ren Nutr*. 2021;31:210–214.[592]

Plant-rich diet and potassium

- Beneficial for Cardiovascular disease
- Beneficial for blood pressure
- Provide alkaline load
- Provide fibre
- Lower bioavailability
- Provide carbohydrate and insulin response



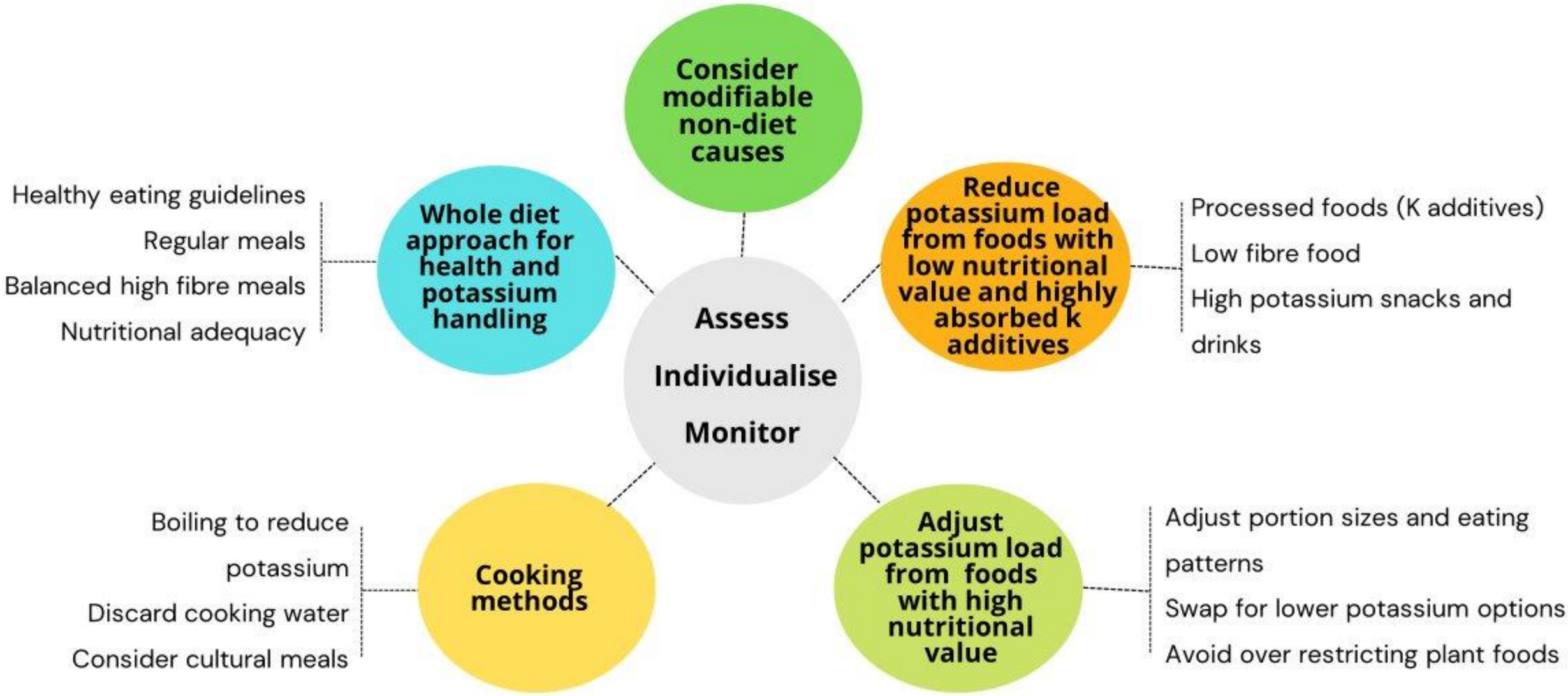
David St Jules 2022 (20)

Non Dietary factors effecting serum potassium

MDT work together to identify and treat modifiable causes

- GI problems like vomiting, diarhoea, constipation and bleeding
- Cell Damage e.g injury, surgery, infection, rhabdomyolysis
- Dehydration
- Hyperglycaemia
- Metabolic acidosis
- Medications - eg; ACE-inhibitors and ARBs, Potassium sparing diuretics
- Over supplemntation eg; Span-K®, Chlorvescent®
- Herbal remedies/complementary therapies
- Haemolysed sample/sample delay
- Missed dialysis/pood dialysis adequacey

A holistic approach to nutrition management of hyperkalemia



Phosphorus across the stages of CKD

Early CKD – Manage high intakes

- Hyperphosphatemia rare
- Adaptations keep levels normal, PTH rises first
- Greater all-cause and CVD mortality with higher levels within ref ranges for CKD and general population (21)
- Interest in phosphorus lowering earlier in the disease to slow or prevent CKD-MBD (22)

CKD stage 3-5 – Manage high levels

- Hyperphosphatemia common
- Hyperphosphatemia known risk factor for renal bone disease, CVD mortality and vascular calcification(22)

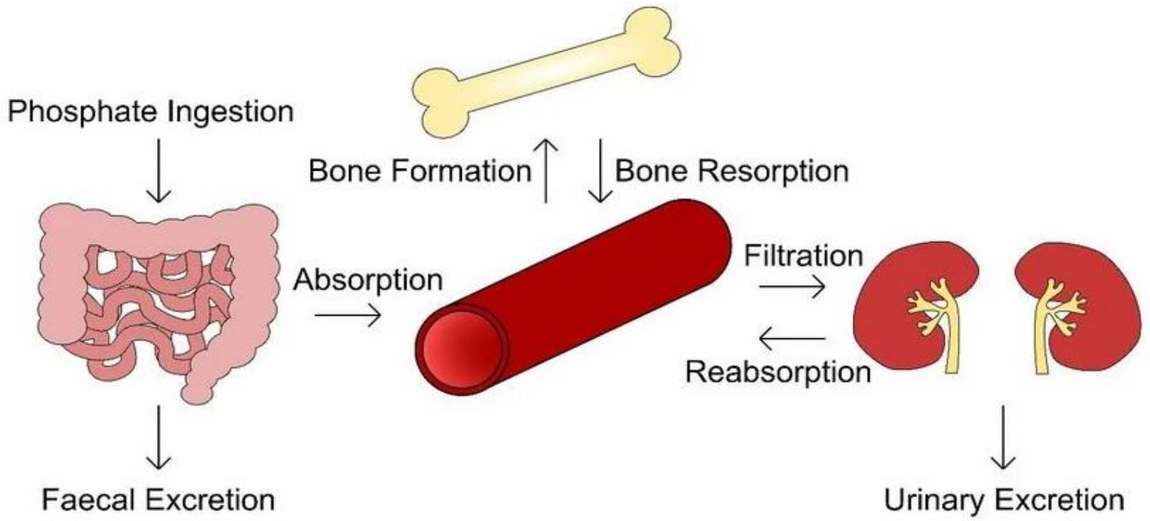


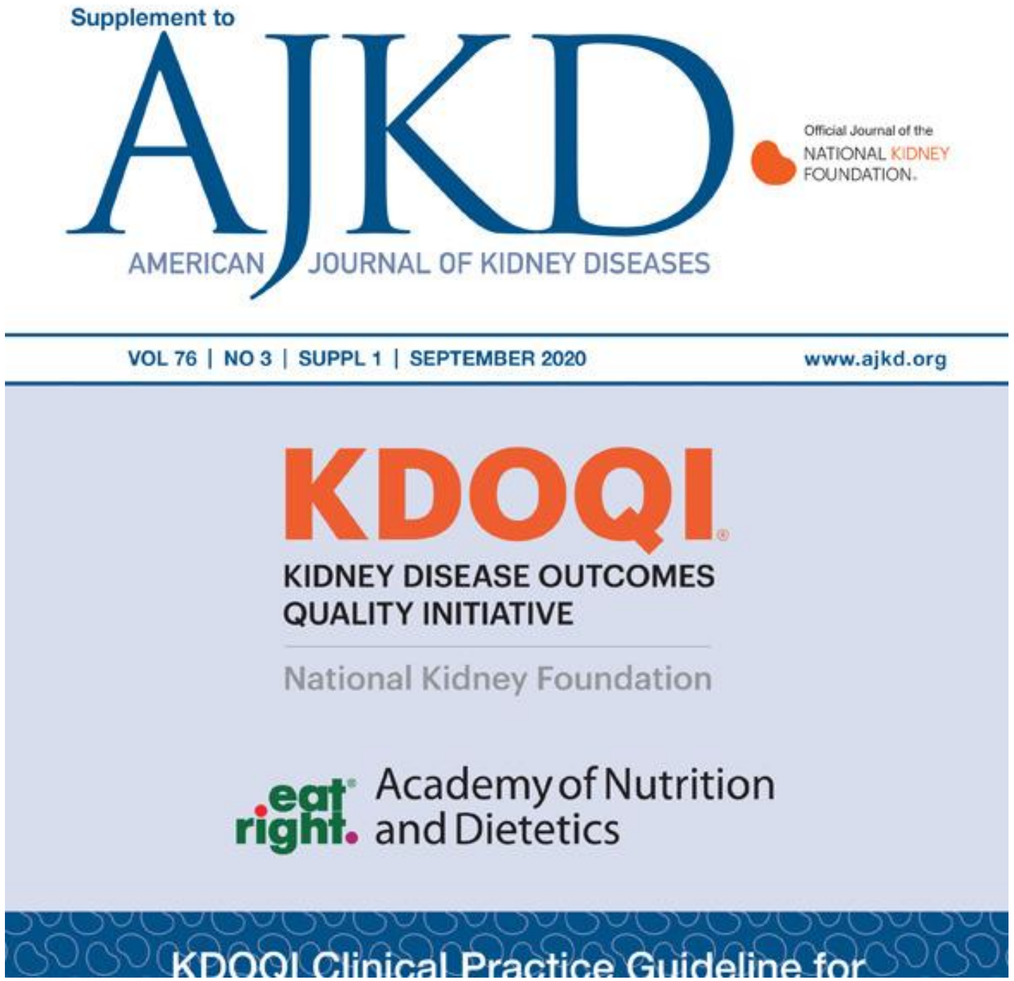
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Guideline statements on phosphorus

- **KDOQI 2020: …**CKD 3-5D we recommend adjusting dietary phosphorous intake to maintain serum phosphate levels in the normal range (1B)

- **KDOQI 2020:** …CKD 1-5D… consider the bioavailability of phosphorous source. (eg: animal, vegetable, additives) (OPINION)

- No longer a guidelines on g/day intake



Evidence for changes to nutrition management of hyperphosphatemia

The Evidence

- Historical low protein diets(also low phosphorus) were associated with managing phosphorus levels (21)
- Dietary phosphorous along with other factors associated with serum phosphorus levels (10)
- Diet interventions shows modest improvement serum phosphate levels in HD population (10)
- Bioavailability differs, Plant-based 20-50%, Animal-Based 40-60%, Additives 100% (23)
- Wet cooking methods remove 50% of phosphorus(10)

Lack of Evidence

- No evidence for historical phosphorus restriction of 800-1000mg/day (10)



Phosphorus Bioavailability

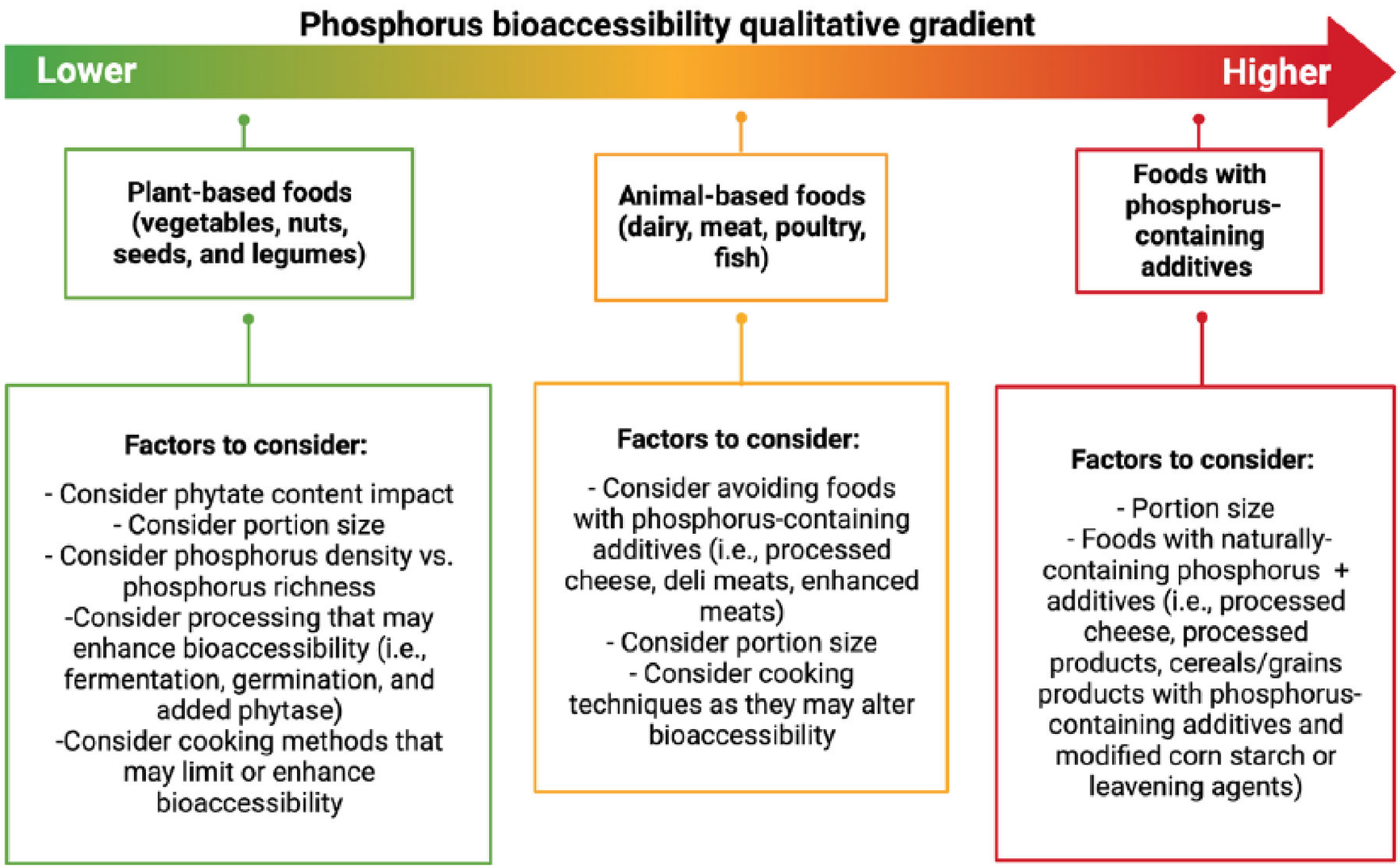


Figure 1: Phosphorus bioaccessibility qualitative gradient.

Source: Biurete et al (21)



1 glass of cola
0g protein
42mg PO4
PO4 additive 338
Inorganic PO4

1 cup chick peas
10g protein
159mg PO4
Organic plant
Source of fibre





80g Steak
24g Protein
200g PO4
Organic animal

2 Sausages
20g Protein
300mg PO4
PO4 additive 450,451
Inorganic and organic



Changes in phophorous management

Historical

Prescriptive

- 800-1000mg/d
- Restriction based on total phosphorous content
- Risk of malnutrition as phosphorous content of protein foods is high

Nourishment

Individualised

- Consider bioavailability
- Consider nutrition value protein/nutrients of foods
- Consider cooking methods
- Teach food label reading

Replacing the ‘Renal Diet’ ⟶



Individualised realistic, holistic nutrition for chronic kidney disease

Individualised
Based on individual needs, stage of CKD, comorbidities, biochemistry, treatment

Food based advice
Focus on real food rather than individual nutrients

Nourishment
Diet quality to ensure nutrition for overall good health

Diverse people, diverse plates
Working with patients and whanau for realistic change

S Nancekivell Renal Dietitian
Health NZ Waitematā 2026

References (1 of 2)

1. Khatri, M.; Moon, Y.P.; Scarmeas, N.; Gu, Y.; Gardener, H.; Cheung, K.; Wright, C.B.; Sacco, R.L.; Nickolas, T.L.; Elkind, M.S. The association between a Mediterranean-style diet and kidney function in the Northern Manhattan Study. Clin. J. Am. Soc. Nephrol. 2014, 9, 1868–1875. [CrossRef]
2. Rebholz, C.M.; Crews, D.C.; Grams, M.E.; Steffen, L.M.; Levey, A.S.; Miller, E.R., 3rd; Appel, L.J.; Coresh, J. DASH (Dietary Approaches to Stop Hypertension) Diet and Risk of Subsequent Kidney Disease. Am. J. Kidney Dis. 2016, 68, 853–861. [CrossRef] [PubMed]
3. Kelly, J.T.; Palmer, S.C.; Wai, S.N.; Ruospo, M.; Carrero, J.J.; Campbell, K.L.; Strippoli, G.F.M. Healthy Dietary Patterns and Risk of Mortality and ESRD in CKD: A Meta-Analysis of Cohort Studies. Clin. J. Am. Soc. Nephrol. 2017, 12, 272–279. [CrossRef] [PubMed]
4. Vásquez, F.; Tiscornia, C.; Aicardi, V.; Vásquez, S. Dietary Transitions and the Rising Global Burden of Chronic Kidney Disease: Insights from Nutritional Epidemiology. *Nutrients* 2026, *18*, 911. https://doi.org/10.3390/nu18060911
5. Monteiro C, Louzada M, Steele-Martinez E et al. Ultra-processed foods and human health: the main thesis and the evidence The Lancet, 2025; 406, 2667-2684
6. KDIGO Work Group. KDIGO 2024 clinical practice guideline for the evaluation and management of chronic kidney disease. *Kidney Int*. 2024;105(4S):S117-S314
7. Leonberg KE, Maski MR, Scott TM, Naumova EN. Ultra-Processed Food and Chronic Kidney Disease Risk: A Systematic Review, Meta-Analysis, and Recommendations. Nutrients. 2025 Apr 30;17(9):1560. doi: 10.3390/nu17091560. PMID: 40362869; PMCID: PMC12073181.
8. Sullivan VK, Appel LJ, Anderson CAM, Kim H, Unruh ML, Lash JP, Trego M, Sondheimer J, Dobre M, Pradhan N, Rao PS, Chen J, He J, Rebholz CM; CRIC Study Investigators. Ultraprocessed Foods and Kidney Disease Progression, Mortality, and Cardiovascular Disease Risk in the CRIC Study. Am J Kidney Dis. 2023 Aug;82(2):202-212. doi: 10.1053/j.ajkd.2023.01.452. Epub 2023 Apr 6. PMID: 37028638; PMCID: PMC10524102.
9. Stockings J, Chacko B. Reassessing Sodium Restriction in CKD Management: An Evidence-Based Perspective. Nephrology (Carlton). 2025 Jul;30(7):e70072. doi: 10.1111/nep.70072. PMID: 40550497.
10. Ikizler T, Burrowes J, Byham-Gray L KDOQI Clinical Practice Guideline for Nutrition in CKD: 2020 Update American Journal of Kidney Diseases, 76, S1-S107
11. Carrero et al plant-based diets to manage the risks and complications of CKD, Nature reviews 2022, Moloudopour et Al 2024, Dang et al 2025
12. Goraya, Simoni et al Clin J Am, Soc Nephrol. 2013 8 371-381, Goraya, Simoni et al, Am J Nephrol 2019; 49(6): 438-448
13. Winkler AW, Hoff HE, Smith PK. The toxicity of orally administered potassium saltsin renal insufficiency. J Clin Invest. 1941;20:119–126.
14. Keith NM, Osterberg AE. The tolerance for potassium in severe renal insufficiency:a study of ten cases. J Clin Invest. 1947;26:773–783.

References (2 of 2)

15. Leonberg-Yoo AK, Tighiouart H, Levey AS, Beck GJ,Sarnak MJ. Urine potassium excretion, kidney failure, and mortality in CKD. Am J Kidney Dis. 2017;69(3):341-349

16. Noori N, Kalantar-Zadeh K, Kovesdy CP, Murali SB, Bross R, Nissenson AR, Kopple JD *Dietary potassium intake and mortality in long-term hemodialysis patients. Am J Kidney Dis 56: 338–347, 2010*

17. He J, Mills KT, Appel LJ, et al. Urinary sodium and potassium excretion and CKD progression. J Am Soc Nephrol. 2016;27(4): 1202-1212.

18. MacLaughlin HL, McAuley E, Fry J, Pacheco E, Moran N, Morgan K, McGuire L, Conley M, Johnson DW, Ratanjee SK, Mason B. Re-Thinking Hyperkalaemia Management in Chronic Kidney Disease-Beyond Food Tables and Nutrition Myths: An Evidence-Based Practice Review. Nutrients. 2023 Dec 19;16(1):3. doi: 10.3390/nu16010003. PMID: 38201833; PMCID: PMC10780359.

19 Babich JS, Kalantar-Zadeh K, Joshi S. Taking the Kale out of Hyperkalemia: Plant Foods and Serum Potassium in Patients With Kidney Disease. J Ren Nutr. 2022 Feb 5:S1051-2276(22)00013-9

20. St-Jules DE, Fouque D. Etiology-based dietary approach for managing hyperkalemia in people with chronic kidney disease. Nutr Rev. 2022 Apr 28:nuac026. doi: 10.1093/nutrit/nuac026. Epub ahead of print. PMID: 3548261

21. Biruete A, Hill Gallant KM, Lloyd L, Meade A, Moe SM, St-Jules DE, Kistler BM. 'Phos'tering a Clear Message: The Evolution of Dietary Phosphorus Management in Chronic Kidney Disease. J Ren Nutr. 2023 Nov;33(6S):S13-S20. doi: 10.1053/j.jrn.2023.05.004. Epub 2023 Jun 19. PMID: 37343779; PMCID: PMC10728341.

22. Kidney Disease: Improving Global Outcomes (KDIGO) CKD-MBD Update Work Group. KDIGO 2017 Clinical Practice Guideline Update for the Diagnosis, Evaluation, Prevention, and Treatment of Chronic Kidney Disease–Mineral and Bone Disorder (CKD-MBD). *Kidney Int Suppl.* 2017;7:1–59

23.Hughes, Erik & Robinson, Tom & Cox, Sophie & Bassett, David & Grover, Liam. (2019). Critical and Diverse Roles of Phosphates in Human Biomineralisation Processes. Journal of Materials Chemistry B. 7. 10.1039/C9TB02011J.

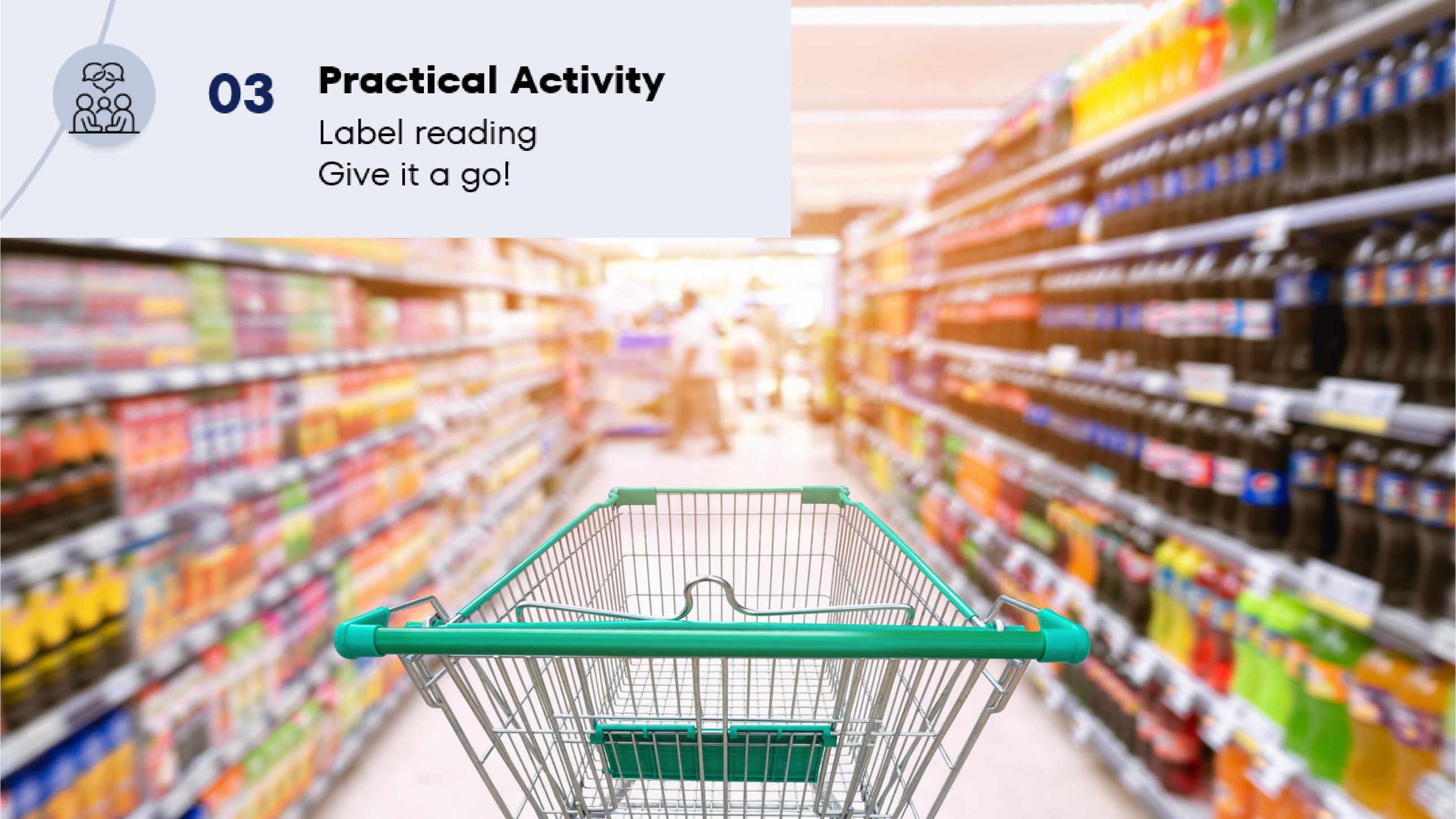
24.Kalantar-Zadeh K, Gutekunst L, Mehrotra R, Kovesdy CP, Bross R, Shinaberger CS, Noori N, Hirschberg R, Benner D, Nissenson AR, Kopple JD. Understanding sources of dietary phosphorus in the treatment of patients with chronic kidney disease. Clin J Am Soc Nephrol. 2010 Mar;5(3):519-30. doi: 10.2215/CJN.06080809. Epub 2010 Jan 21. PMID: 20093346.

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03 Practical Activity

Label reading

Give it a go!



What to look for on a label for people with CKD

Sodium

Compare products per 100g

Aim for less than 400mg of sodium per 100g

How much in a serve? Daily sodium should be less than 2300mg.

Compare products to get the lowest

Other Nutrients

Is it a good source of protein or fibre?

Is it high in sugar, or fat?

Potassium additives

326- Potassium Lactate
332 Potassium Citrate
340 Potassium Phosphate
508 Potassium Chloride



Phosphate additives

338 Phosphoric acid
339 Sodium phosphates
341 Calcium phosphates
450,451,452 Types of potassium or sodium phosphates
541 Sodium aluminium phosphate

Chicken Nuggets

Nutritional info

Serving/pack: 8 Serving size: 120g

Nutrient	Per 100g	Per Serving
Energy	908kJ	1,090kJ
Protein	11.2g	13.4g
Fat - Total	15.3g	18.4g
Fat - Saturated	2.7g	3.2g
Carbohydrates	8.9g	10.7g
Sugar - Total	2g	2.4g
Sodium	330mg	396mg

Sodium/100g is 330mg. Below 400g.
This is ok, but compare other products for lowest sodium options

Ingredients

Chicken (50%), Water, Flour (**Wheat**, Maize), Starch (Maize), Salt, Lactose (**Milk**), Vegetable Oil (Canola, Maize), Spice & Spice Extracts (Pepper , Turmeric, Celery), Mineral Salts (500, 450, 451), Sugar, Emulsifier (433), Antioxidants (321, 320, 310), Whey Powder (**Milk**), Anticaking Agent (551), Acidity Regulator (327), **Soy** Protein, Thickener (1442)

Contains phosphate additives 500 and 450
Check other brands for a better option

Malnutrition, frailty and sarcopenia:
Tipping the Scales

Suzy Jackson,
Clinical Lead Dietitian, Alfred Care Group,
Bayside Health (Melbourne/Naarm)

Bayside Health

Acknowledgement of country



The Soul of Country
Artwork by Jarra Karalinar Steel

Definitions

Malnutrition

- Deficiencies in nutrient intake, imbalance of essential nutrients or impaired nutrient utilisation.
- Associated with inadequate nutrient intake.

Diagnosis:

- Changes in weight,
- Muscle mass,
- Nutrition intake
- Disease state.

Sarcopaenia

- Age related decrease in muscle mass, strength & muscle-specific strength.
- Can be associated with malnutrition, decreased mobility and activity and disease states.

Diagnosis

- Objective measures of strength (Hand Grip Strength, sit to stand)
- Muscle assessment (DEXA, BIA, CT, US)

Frailty

- State of vulnerability characterised by loss of reserve across multiple physiological systems.
- Impairments can be in physical function, mobility, mental health & cognition, and resistance to physiological stressors.

Diagnosis::

- Physical function,
- Cognitive function,
- Nutritional status.
- Self-reported symptoms (exhaustion) OR
- Objective measures (gait speed, grip strength)

Associated with poor physical & healthcare utilisation outcomes, potentially reversible.

GLIM and MIS

	Phenotypic criteria
Unintentional Weight loss (%)	> 5% within past 6 months
	> 10% beyond 6 months
BMI (kg/m²)	< 20 if < 70 years (Asia: < 18.5)
	< 22 if ≥ 70 years (Asia: < 20)
Muscle mass	Reduced
	Etiologic criteria
Reduced food intake	Ingestion ≤ 50% of needs from 1 to 2 weeks
	Any reduction for > 2 weeks
or **Assimilation**	Any chronic GI condition that adversely impacts food assimilation or absorption
Disease burden/ Inflammation	Presence of acute disease/injury or chronic disease related

MALNUTRITION INFLAMMATION SCORE

MEDICAL HISTORY / Change if goal dry weight in past 3-6 months

0	1	2	3
<0.5kg	0.5-1.0kg	>1kg but <5%	≥5%

DIETARY INTAKE

0	1	2	3
Good appetite, no deterioration	Sub-optimal solid dietary intake	Moderate overall decrease and/or full liquid diet	Hypo-caloric liquid diet to starvation

GASTROINTESTINAL SYMPTOMS

0	1	2	3
No symptoms w/ good appetite	Mild symptoms, poor appetite, or nauseated occasionally	Occasional vomiting or moderate GI symptoms	Frequent diarrhea or vomiting or severe anorexia

FUNCTIONAL CAPACITY (nutrition-related)

0	1	2	3
Feeling fine – normal to improved functional capacity	Feeling tired frequently – occasional difficulty w/ baseline ambulation	Difficulty w/ otherwise independent ADLs	Bed/chair ridden, little to no physical activity

CO-MORBIDITY

0	1	2	3
On dialysis <1 year and no co-morbidity	Dialyzed 1-4 years, or mild comorbidity (excluding MCC*)	Dialyzed >4 years or moderate comorbidity (including 1 MCC*)	Any severe multiple comorbidity (≥2 MCCs*)

PHYSICAL EXAM / Decreased Fat Stores – triceps, biceps, chest, below the eyes

0	1	2	3
No change	Mild	Moderate	Severe

SIGNS OF MUSCLE WASTING – temple, clavicle, scapula, ribs, quadriceps, knee, interosseous

0	1	2	3
No change	Mild	Moderate	Severe

BODY SIZE / Body Mass Index (BMI)

0	1	2	3
≥20	18-19.9	16-17.99	<16

LABORATORY PARAMETERS / Serum albumin (g/L)

0	1	2	3
≥4.0	3.5-3.9	3.0-3.4	<3.0

SERUM TOTAL IRON BINDING CAPACITY (mg/dL)

0	1	2	3
≥250	200-249	150-199	<150

SGA and PGSA

Subjective Global Assessment

Name:
Date:

Medical History			A	B	C
WEIGHT	Usual weight.....	Current weight.....			
Wt change past 6 months	Amount weight loss.....	% weight loss.....			
0-<5% loss			•		
5-10% loss				•	
>10% loss					•
Weight change past 2 weeks		Amount.....			
No change; normal weight			•		
Increase to within 5%			•		
Increase (1 level above)			•	•	
No change, but below usual wt				•	
Increase to within 5-10%				•	
Decrease					•
DIETARY INTAKE					
No change; adequate			•		
No change; inadequate				•	
Change	**Duration of change**.....				
Suboptimal diet				•	
Full liquid				•	
Hypocaloric liquid					•
Starvation					•
Intake borderline; increasing			•		
Intake borderline; decreasing				•	
Intake poor; no change				•	•
Intake poor; increasing				•	
Intake poor; decreasing					•
GASTROINTESTINAL SYMPTOMS					
	Frequency (never, daily, no. of times/week)	Duration (<2wk, >2wk)			
Nausea	.....	.....			
Vomiting	.....	.....			
Diarrhoea	.....	.....			
Anorexia	.....	.....			
None; intermittent			•		
Some (daily >2 week)				•	
All (daily >2 week)					•
FUNCTIONAL CAPACITY					
No dysfunction	Duration of change		•		
Difficulty with ambulation/normal activities				•	
Bed/chair-ridden					•
Change past 2 week					
Improved			•		
No change				•	
Regressed					•

Scored Patient-Generated Subjective Global Assessment (PG-SGA)

Patient Identification Information

History: Boxes 1 - 4 are designed to be completed by the patient.
[Boxes 1-4 are referred to as the PG-SGA Short Form (SF)]

1. Weight *(See Worksheet 1)*

In summary of my current and recent weight:

I currently weigh about _____kg
I am about _____ cm tall

One month ago I weighed about _____ kg
Six months ago I weighed about _____ kg

During the past two weeks my weight has:

☐ decreased (1) ☐ not changed (0) ☐ increased (0)

Box 1 ☐

2. Food intake: As compared to my normal intake, I would rate my food intake during the past month as

- ☐ unchanged (0)
- ☐ more than usual (0)
- ☐ less than usual (1)

I am now taking

- ☐ *normal food* but less than normal amount (1)
- ☐ little solid food (2)
- ☐ only liquids (3)
- ☐ only nutritional supplements (3)
- ☐ very little of anything (4)
- ☐ only tube feedings or only nutrition by vein (0)

Box 2 ☐

3. Symptoms: I have had the following problems that have kept me from eating enough during the past two weeks (check all that apply)

- ☐ no problems eating (0)
- ☐ no appetite, just did not feel like eating (3)
- ☐ nausea (1)
- ☐ constipation (1)
- ☐ mouth sores (2)
- ☐ things taste funny or have no taste (1)
- ☐ problems swallowing (2)
- ☐ pain; where? (3) _____
- ☐ other (1)** _____
- ☐ vomiting (3)
- ☐ diarrhea (3)
- ☐ dry mouth (1)
- ☐ smells bother me (1)
- ☐ feel full quickly (1)
- ☐ fatigue (1)

**Examples: depression, money, or dental problems

Box 3 ☐

4. Activities and Function:
Over the past month, I would generally rate my activity as:

- ☐ normal with no limitations (0)
- ☐ not my normal self, but able to be up and about with fairly normal activities (1)
- ☐ not feeling up to most things, but in bed or chair less than half the day (2)
- ☐ able to do little activity and spend most of the day in bed or chair (3)
- ☐ pretty much bed ridden, rarely out of bed (3)

Box 4 ☐

The remainder of this form is to be completed by your doctor, nurse, dietitian, or therapist. Thank you.

Additive Score of Boxes 1-4 ☐ **A**

©FD Ottery 2005, 2006, 2015, 2020 v4.3.20

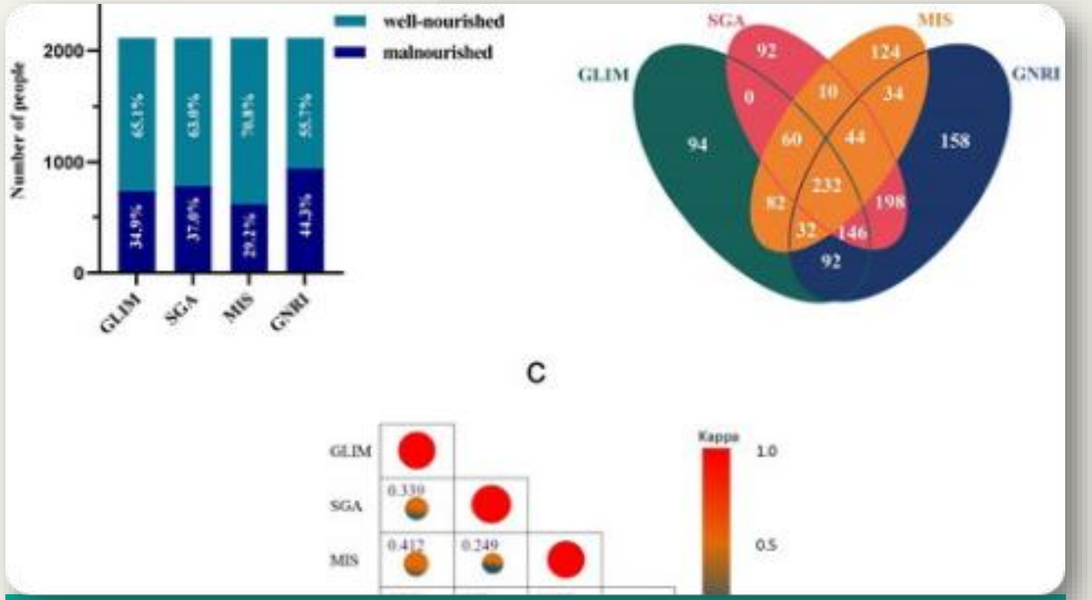
Malnutrition Tools: Performance in Dialysis

Agreement & Diagnostic Utility

- **Fair Agreement:** between GLIM vs SGA / MIS (κ = 0.22 – 0.33).
- **Clinical Accuracy:** GLIM showed lower sensitivity for identifying MHD-specific wasting characteristics.

Comparative Prevalence

- **Italy Cohort (n=121):** Prevalence was highest using GLIM (38.8%) vs. MIS (29.7%) and 7p-SGA (25.6%).
- **Brazil Cohort (n=169):** Prevalence was highest using 7p-SGA (59.8%) vs. MIS (49.7%) and GLIM (47.9%).



PREVALENCE COMPARISON (ITALY VS. BRAZIL)

39% VS 48%	30% VS 50%	26% VS 60%
GLIM	MIS ASSESSMENT	7P-SGA

Reference: Avesani CM, Sabatino A, Guerra A, et al. A comparative analysis of nutritional assessment using Global Leadership Initiative on Malnutrition versus SGA and MIS in hemodialysis patients. J Ren Nutr. 2022;32(4):476-482.

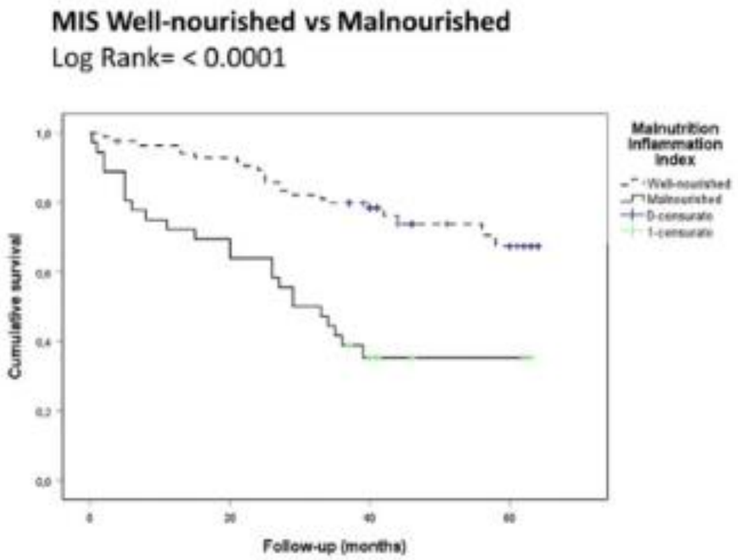
Malnutrition Tools: Prognostic accuracy

Mortality risk predictive value

- All tools successfully predicted mortality in crude analysis.
- Adjusted models favored 7pSGA / MIS
- MIS showed higher predictive value, especially in younger patients, likely due to albumin and transferrin inclusion.

Clinical Practice

- 7p-SGA and MIS remain preferred for MHD clinical setting due to superior prognostic capacity.



MIS CRUDE HAZARD RATIOS (Italy / Brazil)

3.7	2.40
(95% CI 2.04-6.7, p= <.001)	(95% CI 1.31-4.29, p= <.001)

Reference: Avesani CM, Sabatino A, Guerra A, et al. A comparative analysis of nutritional assessment using Global Leadership Initiative on Malnutrition versus SGA and MIS in hemodialysis patients. J Ren Nutr. 2022;32(4):476-482.

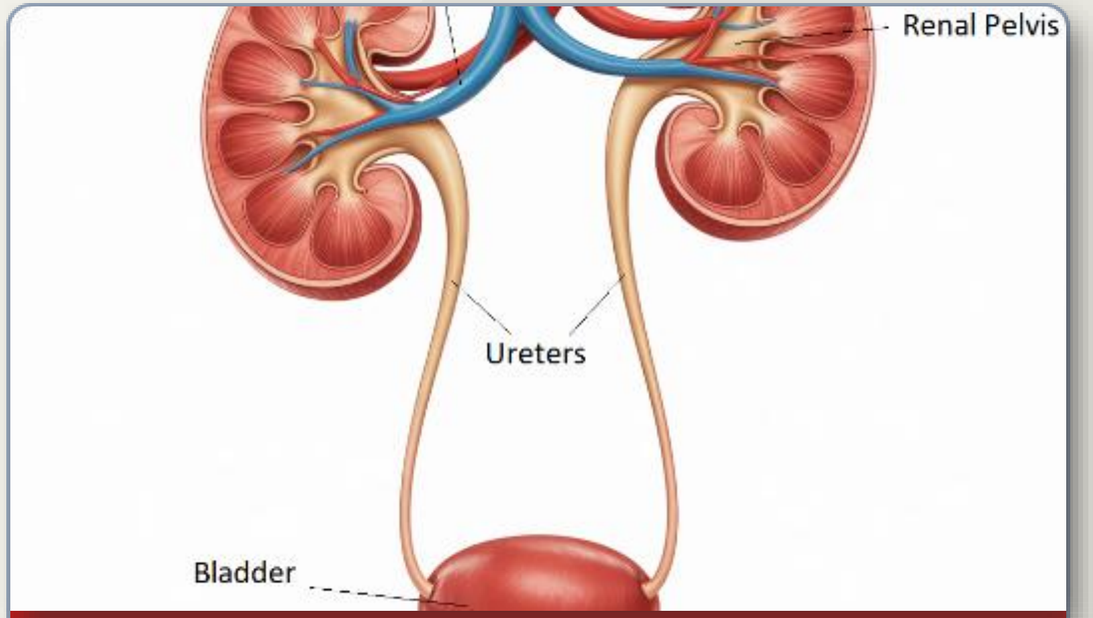
GLIM Criteria & Kidney Dysfunction

Study Population

6,712 Hospitalized adult patients (Retrospective cohort 2018–2019).
Renal States: No Kidney Disease, AKI, & CKD stratified by eGFR.
Incidence of all cause mortality investigated.

Important Clinical Outcomes

- **Combined Risk:** Malnutrition + eGFR ≤ 29 increases mortality 3.31-fold.
- **Severity Effect:** Death risk increases with severe malnutrition (HR 2.18) compared to moderate (HR1.38)..
- **Universality:** GLIM-based malnutrition predicted mortality across all renal states.



MORTALITY HAZARD: eGFR < 29 & malnutrition severity

No Maln: 2.08
(95% CI 1.48 – 2.93, p=0.05)

Maln: 3.31
(95% CI 2.51 – 4.25 p=<.05)

Reference: Yamaguchi M, Sugiyama H, Asai A, et al. Clinical impact of malnutrition according to the GLIM criteria combined with kidney dysfunction to determine mortality in inpatients. J Ren Nut 2024. https://doi.org/10.1053/j.jrn.2024.03.010

Long-Term & Short-Term Risks of SGA

Longitudinal Profile

1,601 Incident dialysis pts from the NECOSAD-II cohort.
7-year follow-up with serial 7-point SGA assessments.

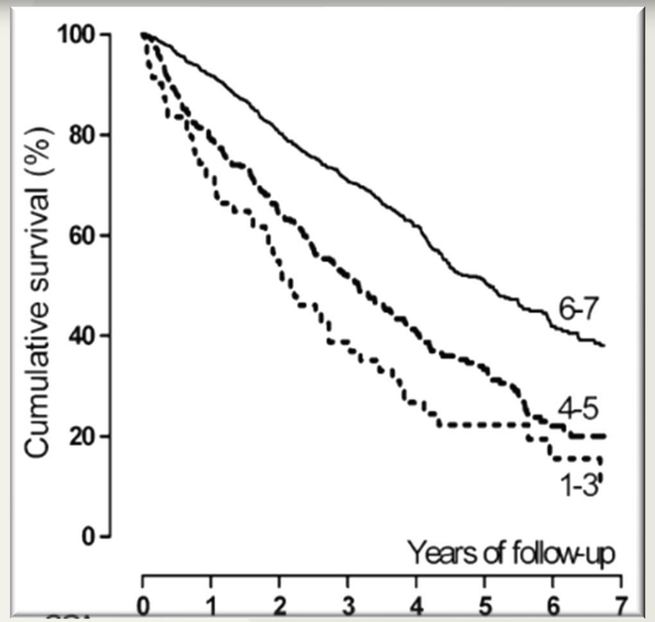
ADJUSTED MORTALITY HAZARD RATIOS BY BASELINE SGA

Moderate: 1.9
(95% CI 1.6, 2.2)

Severe: 2.6
(95% CI 2.0, 3.5)

Mortality Risk

- 23% with moderate PEW, 5% Severe PEW at baseline
- Dose dependant trend of status of SGA, each 1-point lower score was associated with a higher mortality risk
- Baseline severe PEW increases 7-year risk by 2.1-fold
- Time-dependent severe PEW triggers a 5.2-fold risk.



Reference: de Mutsert R, et al. Subjective global assessment of nutritional status is strongly associated with mortality in chronic dialysis patients. Am J Clin Nutr. 2009; 89: 787-93;

Fried Frailty Phenotype vs Clinical Frailty Scale

Physical Frailty Phenotype

Scoring: ≥3/5 criteria met indicates frailty; 1-2/5 indicates pre-or-intermediate frailty; 0/5 indicates non-frail.

Frailty Criterion	Definition
Unintentional Weight loss	**Meets criteria for weight loss if:** Lost >5% body weight unintentionally in last year, or BMI <18.5kg/m^2 Equipment: scale for body weight; stadiometer for height.
Exhaustion	**Meets criteria for exhaustion if answer:** Felt unusually tired or unusually weak 'all of the time' or 'most of the time' or reported energy level was ≤3, using the following questions. **1.a. "In the past month, on the average, have you been feeling unusually tired during the day?"** Yes □ No □ Refused □ Don't Know □ **1.b. "If yes, have you been feeling unusually tired:"** □ All of the time □ Most of the time □ Some of the time □ Refused / Don't Know **2.a. "In the past month, on the average, have you felt unusually weak?"** Yes □ No □ Refused □ Don't Know □ **2.b." If yes, have you been feeling weak:"** □ All of the time □ Most of the time □ Some of the time □ Refused / Don't Know **3. "Using the scale below, please rate your usual energy level on a scale from 0 to 10 where 0 is no energy and 10 is the most energy that you have ever had. Please give a number between 0 and 10 that describes your usual energy level while awake in the last month?"** Energy Level: ____
Slowness	**Meets criteria for slow walking speed over 4 meters if:** **Men** / **Women** ≤0.65m/s for height ≤173 cm (68 inches) / ≤0.65m/s for height ≤159cm (63 inches) ≤0.76m/s for height >173 cm (68 inches) / ≤0.76m/s for height >159cm (63 inches) Equipment: 4-meter course, a stopwatch. Participant attempts to walk 4-meter length twice at his or her usual pace. Use average of 2 trials.
Low Activity Level	**Meets criteria for low activity if:** **Men:** <128 kcal of physical expenditure on activity scale per week (6 items[1]) / **Women:** <90 kcal of physical expenditure on activity scale per week (6 items[1])
Weakness	**Meets criteria for grip strength weakness if:** **Men** / **Women** ≤29 kg for BMI ≤24 / ≤17 kg for BMI ≤23 ≤30 kg for BMI 24.1–26 / ≤17.3 kg for BMI 23.1–26 ≤30 kg for BMI 26.1–28 / ≤18 kg for BMI 26.1–29 ≤32 kg for BMI >28 / ≤21 kg for BMI >29 Equipment: (Jamar) hand dynamometer. Participant attempts to squeeze the dynamometer maximally 3 times with the dominant hand. Use maximal score with dominant hand.

[1] Physical activity is based on modified Minnesota Leisure Time Activities Questionnaire, asking about walking (w = 3.5), strenuous household chores (w = 4.5), strenuous outdoor chores (w = 4.5), dancing (w = 5.5), bowling (w = 3.0), and exercise (w = 4.5).
To compute kcals expended per week, use the formula: Kcals (Kilocalories / week) = w * Frequency (sessions per week) * Duration per session (minutes) * Body Weight (kg)/60, where w is the task-specific MET intensity score.

Clinical Frailty Scale*



1 **Very Fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.



2 **Well** – People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g. seasonally.



3 **Managing Well** – People whose **medical problems are well controlled,** but are **not regularly active** beyond routine walking.



4 **Vulnerable** – While **not dependent** on others for daily help, often **symptoms limit activities.** A common complaint is being "slowed up", and/or being tired during the day.



5 **Mildly Frail** – These people often have **more evident slowing,** and need help in **high order IADLs** (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.



6 **Moderately Frail** – People need help with **all outside activities** and with **keeping house**. Inside, they often have problems with stairs and need **help with bathing** and might need minimal assistance (cuing, standby) with dressing.



7 **Severely Frail** – **Completely dependent for personal care**, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).



8 **Very Severely Frail** – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.



9. **Terminally Ill** - Approaching the end of life. This category applies to people with **a life expectancy <6 months**, who are **not otherwise evidently frail.**

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

* 1. Canadian Study on Health & Aging, Revised 2008.
2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.

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DALHOUSIE UNIVERSITY *Inspiring Minds*

Bidirectional Relationship of Frailty & CVD

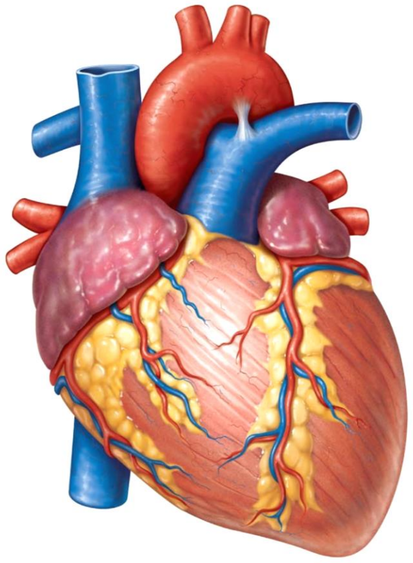
Shared Biologic Interconnection

- Frailty and Cardiovascular Disease (CVD) share a bidirectional relationship and biological mechanisms.
- Core pathways: chronic inflammation, immune activation, and metabolic dysregulation.

Prognostic Impact

Individuals with frailty are predisposed to CVD risk
Physical frailty increased major adverse cardiac event risk in some studies*

*HR 1.37 (95% CI, 1.27–1.48) to 1.77 (95% CI, 1.53–2.06)



PREVALENCE BURDEN IN CVD COHORTS

80%	74%
HEART FAILURE	AORTIC STENOSIS

Reference: James K, Jamil Y, Kumar M, et al. Frailty and cardiovascular health. J Am Heart Assoc. 2024;13:e031736.

Impact of Frailty & Malnutrition

Study Population

85 Elderly patients (Mean age 80);

- 60 Conservative Kidney Management (CKM)
- 25 Dialysis aged > 75.

Baseline: 56% Frail and 33% Malnourished.

Clinical Outcomes

- **Survival (CKM group):** 47% at 2 years

  Frailty Median survival 549 days vs > 2 years

  Malnutrition doubles 2-year mortality rate

- **Hospitalisation:**

  Frailty linked to higher rate of hospitalisations* & longer stays**

  Driven by dialysis group - 33% for not frail & 85% for frail#

  No difference in CKM group related to frailty status.

*(1 vs 0), **Median 12 days, IQR 0-24 vs 0, p=0.004).. #(p=0.009)



2 YEAR MORTALITY HAZARD (CKM COHORT) / ADMISSIONS (HD COHORT)

2.10 (95% CI 1.13-3.9, p=0.0024)	33% vs 85% (p=0.0009)

Reference: Dawson J
, et al. The impact of frailty on hospitalization and survival in people with kidney disease. J Nephrol. 2025; 38 (8); 2251-2258

Impact of Frailty & Malnutrition

GI symptoms prevalence

- Median of 2 gastrointestinal (GI) symptoms
- Median GI symptom severity score 1.3 (Slight to severe)

Quality of life

- Those with frailty rated QOL as poorer*
- In CKM, those with frailty reported more deficits in:
- Mobility, ability to self-care, participation in usual activities, pain, anxiety / depression and poorer self-reported health status
- Effects not seen for Malnutrition

*Median 50 (IQR 50-70) vs Median 82.5 (IQR 55-90), p= 0.012

Symptom	Prevalence
Sore / dry mouth Anorexia	n=56 (66%) n=41 (48%)
Frail participants; Dry / sore mouth Anorexia	 76% (vs 46%) 58% vs vs 30%
Those with Malnutrition: Anorexia Dry / sore mouth Taste changes	 82% (vs 32%) 86% (vs 56%) 50% (vs 28%)

PREDICTIVE VALUE FOR FRAILTY:

Maln: OR 5.6
(95% CI 1.4, 2.17, p=0.0013)

Severe GI: OR 2.8
(95% CI 1.1, 7.0, p=0.0025)

Reference: Dawson J, et al. The impact of frailty on hospitalization and survival in people with kidney disease. J Nephrol. 2025; 38 (8); 2251-2258

Dietary Intake & GI Symptoms

Malnutrition and Frailty overlap:

- 56% Frail and 33% Malnourished in kidney failure.
- Over 85% of malnourished individuals concurrently had frailty
- Malnutrition was associated with 5 x more likelihood of frailty

Symptoms and severity

- Anorexia strongly correlated with Frailty & Malnutrition.
- Frail participants:

Report more GI symptoms: 3 vs 2 (p=>0.001)

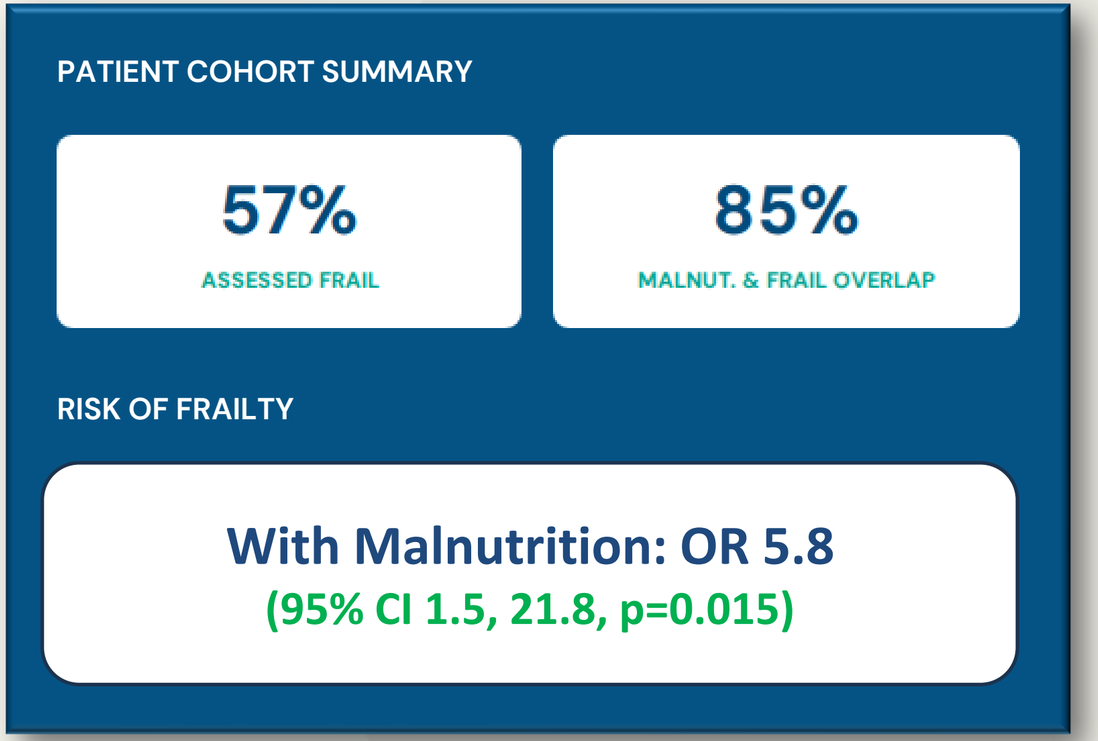
Report more severe symptoms 1.75 vs 1.0 (p=<0.001)

- Patients with Malnutrition:

Report more symptoms that were more severe

Consume lower energy: 1234 Kcal vs 1400 Kcal (p=0.01)

Consume lower protein: 51g vs 74g (p=<0.001)



Reference: McLean C, Randall AM, et al. The association of frailty and malnutrition with dietary intake and GI symptoms. J Ren Nutr. 2026;

Muscle Mass – Dialysis Outcomes

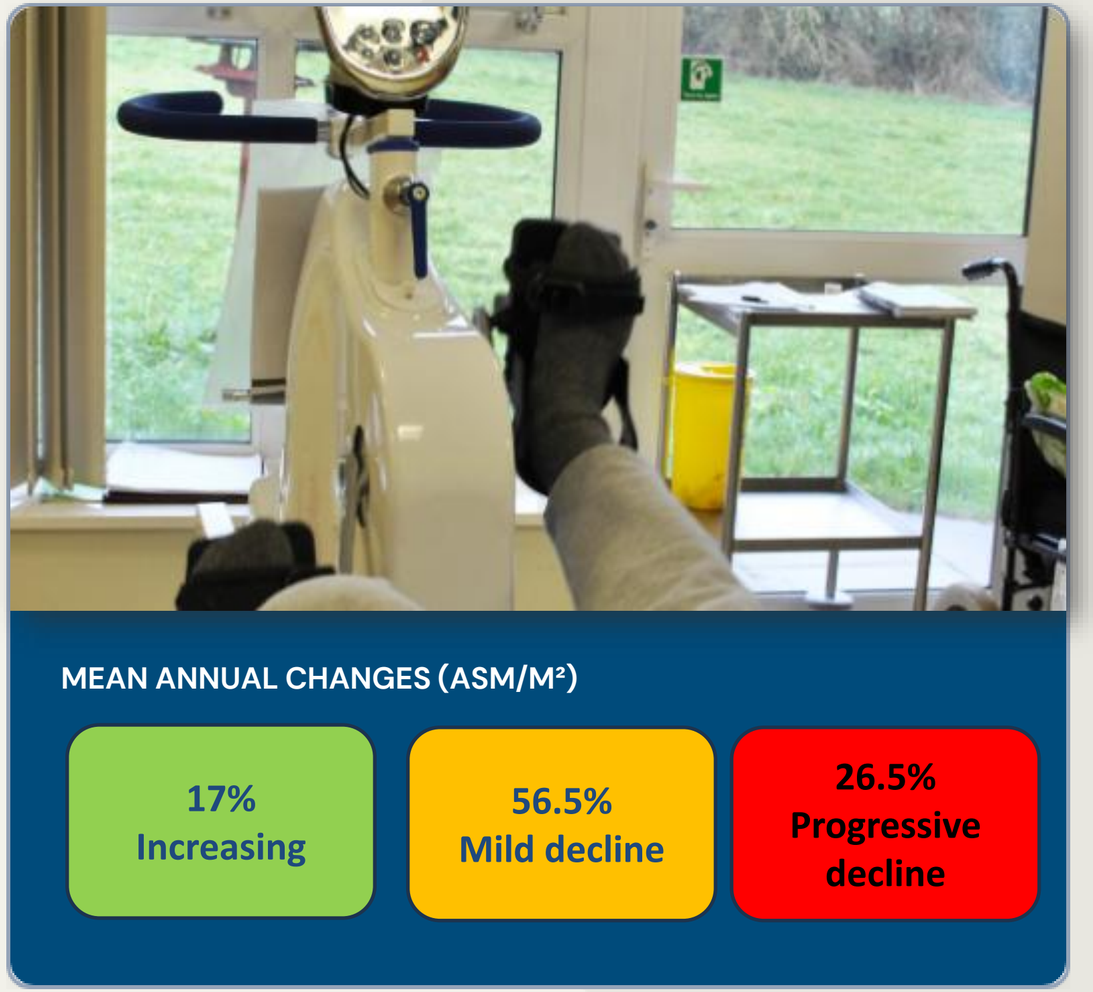
Study Population

283 Stable adult hemodialysis patients
All cause mortality tracked over 24.5 months
Mean age 63.6 years (+/- 12.1)
59.4% with diabetes mellitus.

Clinical Characteristics & Outcomes

- **Baseline prevalence of low muscle mass**: 62.5%
- Progressive decline group:
  Older, with highest CVD rates (54%)
- **Mortality:** 7.63-fold higher risk*.
- **Hospitalization:** Increased HR to 4.04**

*95% CI, 2.78–20.90; p<0.001), **95% CI, 2.78–20.90; p<0.001)



Reference: Kim SG, Jang J, Lee S, et al. Longitudinal muscle mass trajectories and their prognostic implications in haemodialysis patients. J Ren Nutr. 2026; 36 (2): 114-122.

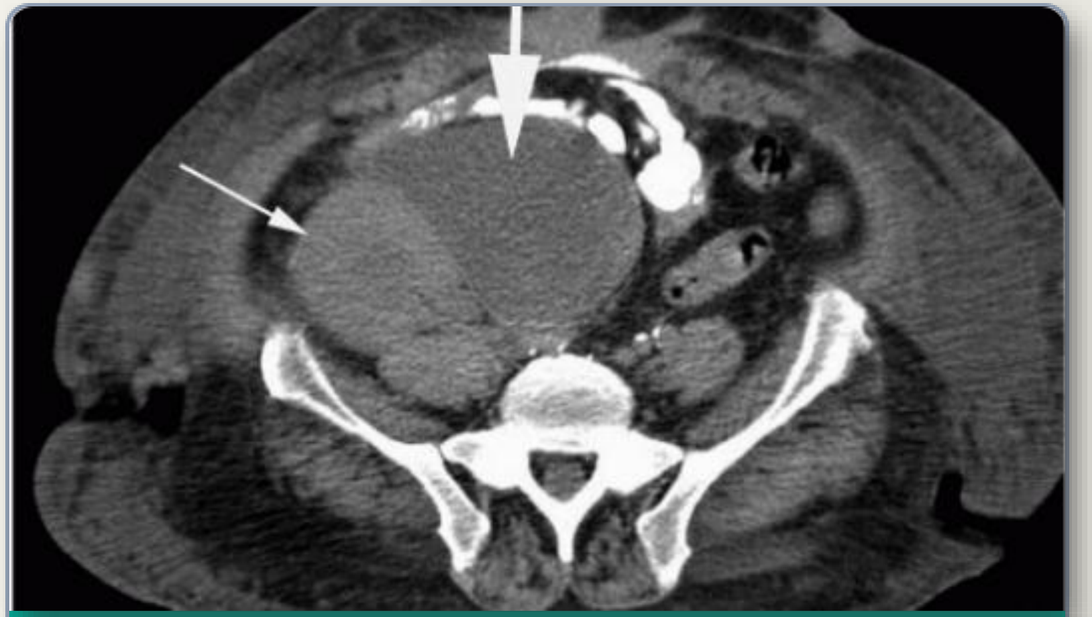
Prognostic Impact: Transplantation

Study Population

2,764 Kidney transplant recipients in 13 studies.
Preoperative CT evaluation of LMM and Myosteatosis.
Heterogeneity in method / definitions of LMM / myosteatosis.

Outcomes

- **Patient Survival:**
  Low Muscle Mass doubles mortality risk (HR: 2.08)
  Myosteatosis raises mortality risk (HR 1.82)
- **Graft Survival:**
  Myosteatosis significantly predicts graft loss (HR: 1.99).
  Effect also seen for low muscle mass (HR 1.42)
- **Recommend:** Development of standardized CT method and definitions



POOLED META-ANALYSIS PREVALENCE

28% (3-72%)
Low Muscle Mass

24% (10-33%)
Myosteatosis

Reference: Li Y, Wang Z, et al. Associations of low muscle mass and myosteatosis with kidney transplant outcomes: A systematic review. J Ren Nutr. 2026; Vol 36 (1): 4-12 .

Malnutrition & Muscle: Post-Transplant

Study Profile

- 599 Stable outpatient renal transplant recipients.
  Median time after transplantation: 3.1 years.
  GLIM criteria: PG-SGA to assess intake, BIA to assess muscle

Malnutrition and criteria met

- 14 % were diagnosed with malnutrition (1 in 7). Of those:
- 91% met criteria for reduced muscle mass when combined
- Only 11% met criterion for low BMI, but 99% met low BMI and low muscle mass together
- BMI was lower on average BUT 22% classified as malnourished were also overweight / obese
- 226 of all patients (38%) had reduced food intake



MALNUTRITION PREVALENCE AND CRITERION

Malnutrition: 14%

Malnourished with low muscle mass: 91%

Reference: Boslooper-Meulenbelt K, et al. Malnutrition according to GLIM criteria in stable renal transplant recipients. Clin Nutr. 2021; 40 (6): 3522-2530.

AST Consensus: Frailty in Kidney Transplant

Risk Assessment & Prevalence

- Frailty (FFP) impacts 52% of dialysis pts, 18% of wait-list candidates, and 20% of recipients.
- Standard FFP remains most validated; handgrip and sit-to-stand are essential objective markers.

Recommendations & Interventions

- Identification of sarcopaenia may allow targeted interventions to prevent or manage frailty.
- Physical rehabilitation may have benefit: more studies are needed to understand impact on transplant outcomes.
- Frailty at least partially reversible in other solid transplants



Reference: Kobashigawa J, et al. Report from the American Society of Transplantation on frailty in solid organ transplantation. Am J Transplant. 2019;19(4):984–994.

Emerging Role of Prehabilitation: KT

Optimization Strategy

Recipients: Aged >65 increased from 12 – 26% in last 20 years.

Prehabilitation: Multimodal strategy (exercise, nutrition, psychosocial) designed to optimize health prior to surgery. Demonstrated feasible and safe.

Clinical Evidence (FRAILMar RCT)

- Waitlisted cohort (n=121) mean age 63 years; 40% frail (FFP >2)
- Intervention: 8 weeks of aerobic exercise, resistance training, and inspiratory muscle training 3 times/week + protein supplementation.
- **Outcomes:** Improved exercise capacity, handgrip strength, respiratory muscle strength, and rectus femoris thickness.
- More research needed to develop body of evidence on clinically significant impacts



+12.8W
EXER. CAPACITY

+1.2mm
MUSCLE THICKNESS

51%
COMPLICATION REDUCTION

Reference: Lorenz EC, Moore LW, Yamagami M, Garibotto G, Sasangohar F, Dhala A. The Emerging Role of Prehabilitation in Kidney Transplant Candidates. Journal of Renal Nutrition. 2026. doi: https://doi.org/10.1053/j.jrn.2026.04.001.

Nutrition & Exercise Therapy: Non-Dialysis CKD

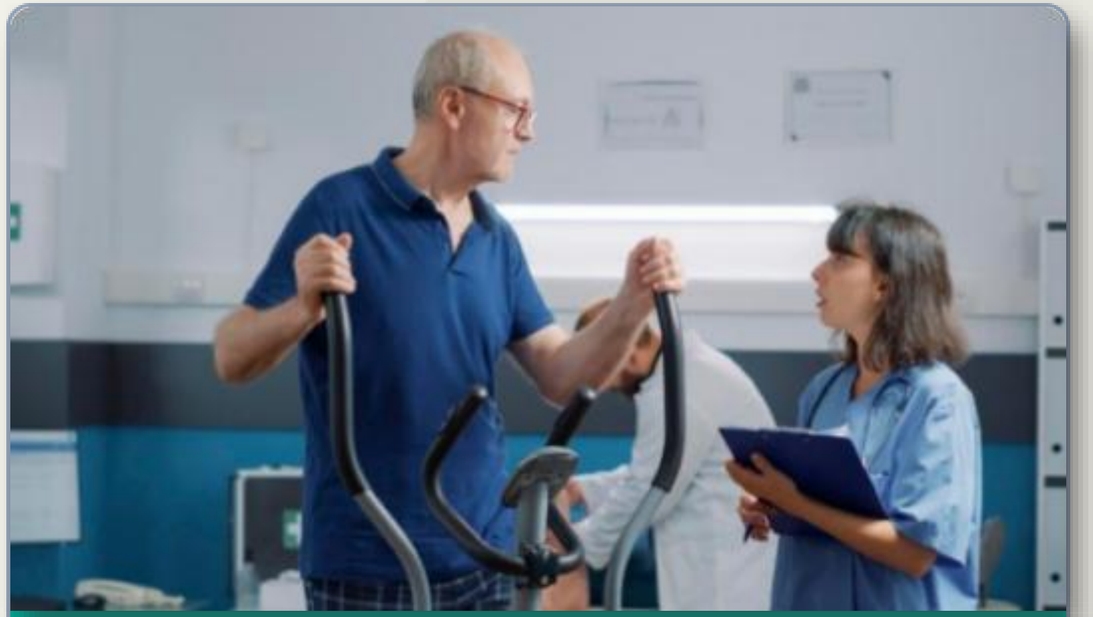
Systematic Review (5 RCTs)

- Analyzed 339 participants (Stages 3-5 CKD).
- Intervention: Combined exercise (aerobic/resistance) + nutrition (counselling +/- supplementation).

Core Findings & Limitations

- **Cardiovascular:** Significant improvement in VO2peak
- **Renal Preservation:** Meta-analysis revealed no statistically significant change or differences in kidney function (eGFR).

Evidence Certainty: Body of evidence "very low" GRADE score due to study heterogeneity and serious risk of bias.



SR META-ANALYSIS HIGHLIGHTS

+2.70	N/S
MD VO2 PEAK	EGFR CHANGE

Reference: Tsuchida Y, Kabasawa H, et al. Efficacy of combined exercise and nutritional intervention for non-dialysis CKD. J Ren Nutr. 2025.

Nutritional & Exercise Therapy: Dialysis

Systematic review & Meta-Analysis

9 trials (n=324 dialysis patients)

Effectiveness of paired nutritional and exercise training on frailty parameters.

Key Functional Outcomes

- **Walking Speed:** Significant gain of +0.09 m/s#
- **Cardiorespiratory Fitness:** Standardized mean difference improved*
- **Mobility:** Timed Up and Go Test performance improved**

(95% CI 0.02–0.16), *0.56 (95% CI 0.20–0.93). ** (95% CI -1.79 to -0.43)..

- **Uncertainty:** No difference body weight, fatigue, QOL
- **Safety:** Low reporting of adverse events across all studies



Clinical Improvement Metrics

+0.09	-1.11s
M/S GAIT SPEED	TUGT MOBILITY

0.56
FITNESS (SMD)

Reference: Zhang F, Wang H, Yan B, Huang L, Zhang H. Effects of Nutritional Supplementation Combined with Exercise Training on Frailty, Physical Function, and Quality of Life in Chronic Kidney Disease: A Systematic Review and Meta-Analysis. Journal of Renal Nutrition (2025), doi: https://doi.org/10.1053/j.jrn.2024.11.009.

Availability & Perception of Exercise: HD

Exercise Program Availability

- Multicenter study of 722 MHD patients across 74 Chinese dialysis units.
- Only 23.0% of units offered intradialytic exercise & 8.1% offered non-intradialytic programs.

Perception & Habits Link

- Availability of programs significantly associated with higher perceived benefits.
- Regular exercise participation (65.7%) strongly linked to lower perceived barriers.



PERCEIVED BARRIERS

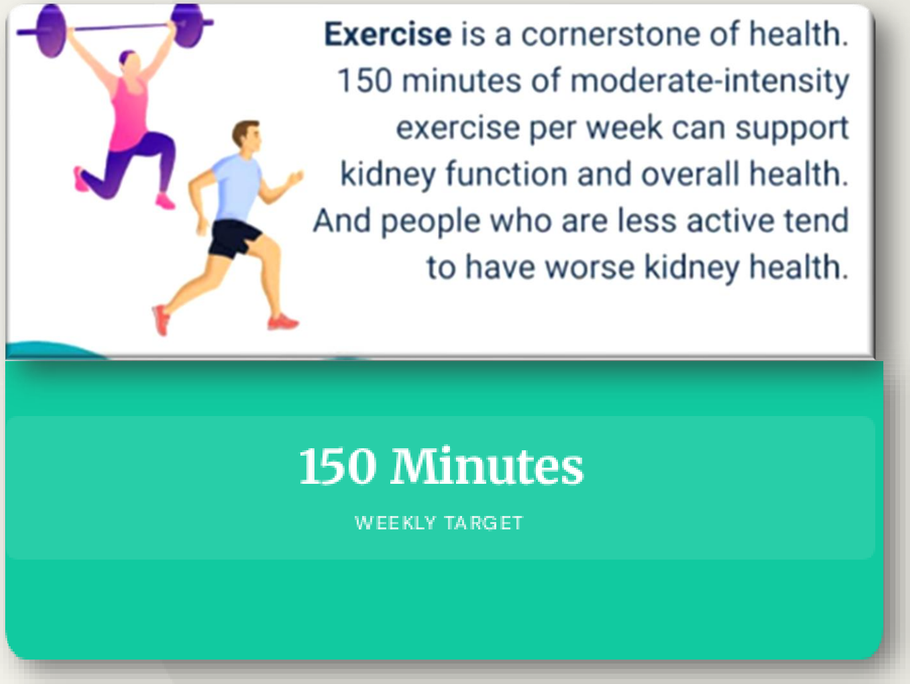
Busy dialysis staff
Limited patient participation due to lack of interest
Lack of exercise professionals.

Reference: Hu H, Wu C, Chau PH, et al. Perceived Exercise Benefits and Barriers in MHD. J Ren Nutr. 2025;35(5):568–577.

KDIGO CKD 2024: Physical Activity

Recommendation 3.2.2.1

- **Primary Goal:** At least **150 min/week** of moderate-intensity activity
- Adjust intensity to level compatible with CV and physical tolerance.
- Evaluate for fatigue, muscle wasting, and functional barriers
- For people at higher risk of falls, healthcare providers provide advice on intensity of physical activity (low, moderate, or vigorous) and type of exercises (aerobic vs. resistance, or both)
- Avoid sedentary behaviour



Reference: KDIGO Clinical Practice Guideline for the evaluation and management of chronic kidney disease. Kidney International (2024) 105 (Suppl 4S), S117–S314

KDOQI 2020: Clinical Practice Guideline for Nutrition in CKD

Nutrition screening

- **CKD 3-5D or post transplant:** at least biannually
- **Limited evidence** to suggest one tool over another

Body composition

- **Bioimpedance** and preferably multi-frequency bioelectrical impedance where available in MHD
- **DXA:** remains gold standard, use where available in CKD 1-5D or post- transplantation
- **Conduct at first assessment:** Combined with weight / BMI can monitor changes over time
- **Weight:** At least monthly (dialysis), every 3 months (CKD 4-5 / post-transplant, 6 monthly CKD 1-3
- **Hand Grip Strength:** may be used as an indicator of protein-energy status & functional status (serial measures)

Nutrition interventions

- **Dietitian:** at starting dialysis, biannually, or as indicated by screening.
- **Assess:** Subjective Global Assessment, Malnutrition Inflammation Score,
- **Energy:** Indirect calorimetry where available, or disease specific equations
- **Protein:**

Metabolically stable CKD 3-5: 0.55-60g dietary protein/kg bodyweight/**day under close clinical supervision.**

0.6-0.8g/kg/day with diabetes.

Metabolically stable CKD 5D; 1.0-1.2g/kg/day.

Reference: Ikizler, T.A., et al (2020) KDOQI Clinical Practice Guideline for Nutrition in CKD 2020 Update. A J Kid Diseases, 76; S1-S107

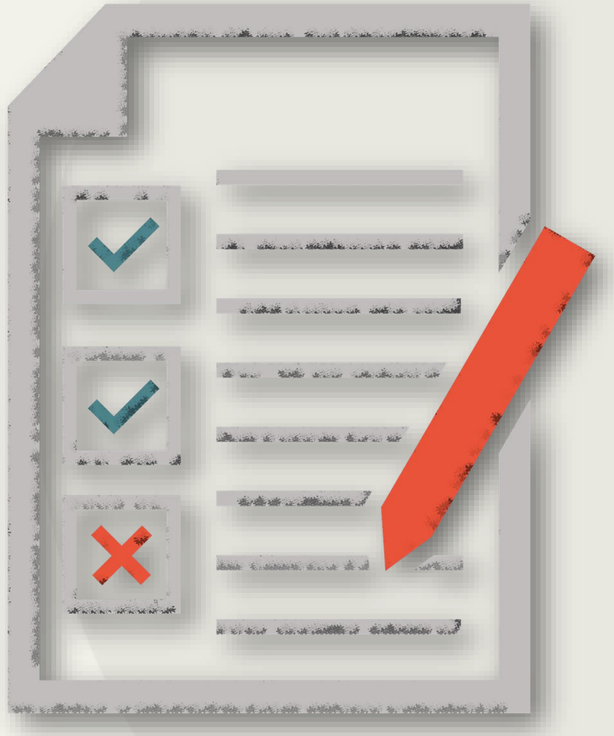
UK Guidelines: Undernutrition in CKD

Standardized Screening

Frequency: Screen stages 4–5 at every follow-up.

Protein: 1.1–1.4 g/kg (HD); 1.0–1.2 g/kg (PD).

Energy: 30–40 kcal/kg IBW/day.



Reference: Wright M et al. Clinical practice guideline on undernutrition in chronic kidney disease. BMC Nephrology; 2019; 20; 30.

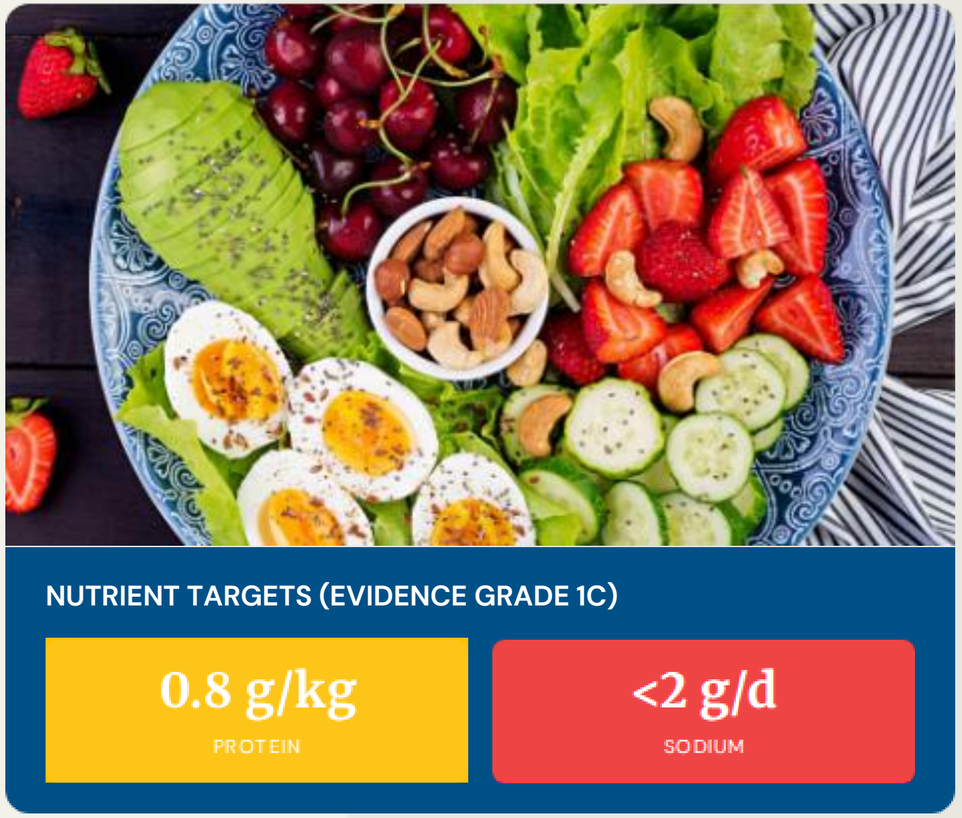
KDIGO CKD 2024: Dietary Management

Diet 3.3 Recommendations & Practice Points

- **Protein Target:** Maintain **0.8 g/kg/d** in adults with CKD G3–G5
- Avoid high protein intake (>1.3 g/kg/d) at risk of progression.

  Do not prescribe low or very low protein diets in metabolically unstable people with CKD

  In older adults with underlying conditions such as frailty and sarcopenia, consider higher protein and calorie dietary targets.



Reference: KDIGO Clinical Practice Guideline for the evaluation and management of chronic kidney disease. Kidney International (2024) 105 (Suppl 4S), S117–S314

Protein rich foods

DIET-HD Study

- **Population:** Multinational prospective cohort (n = 8110) Median follow-up: 3.8 years
- Examined relationship between total phosphorus, phosphorous source & mortality

Results

- 2953 deaths, 1160 CVD related.
- Higher total phosphorus intake associated with higher mortality
- **Source** of phosphate crucial -> Dietary advice should focus on quality, over quantity



1 SD INCREASE INTAKE ASSOCIATION WITH MORTALITY

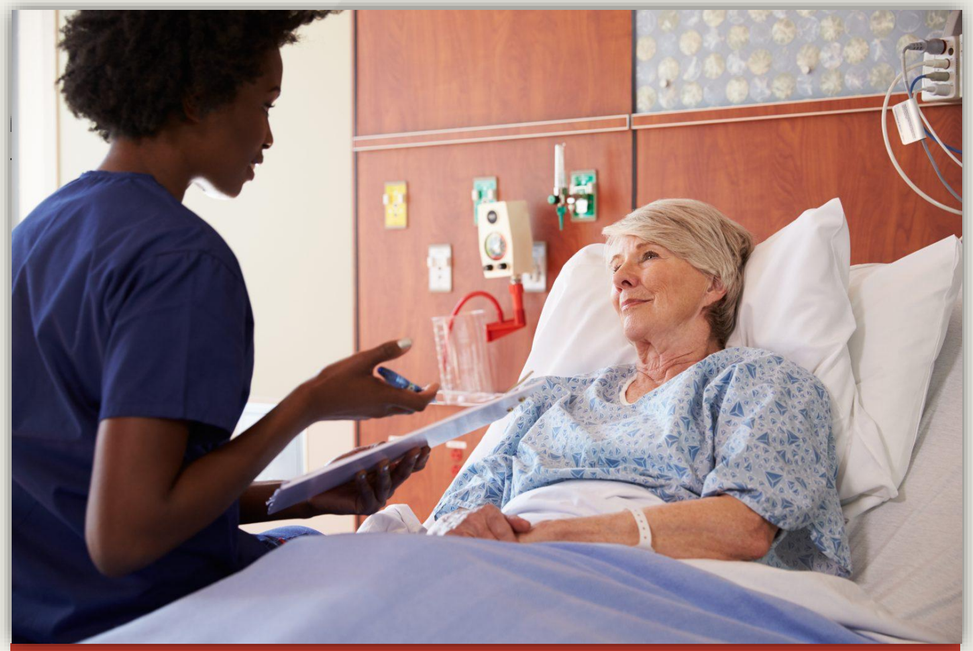
Total: 1.16 (95% CI 1.06-1.26	**Animal:** (95% CI 1.06-1.26
Plant: 1.16 (95% CI 1.06-1.26	**Additive: 1.16** (95% CI 1.06-1.26

Reference: Su et al. Dietary Phosphorus, It's sources, and mortality in adults on haemodialysis: The DIET-HD Study. Nutrients, 2022; 14: 4064. https://doi.org/10.3390/nu14194064

KDIGO CKD 2024: Symptom Management

5.2.2 Symptoms in CKD

- **Routine Assessment:** Ask about uremic symptoms (reduced appetite, nausea, fatigue) at **each consultation (validated tool)**.
- **Management:** Use evidence-informed strategies (exercise, sleep hygiene, pharmacological) to support living well.
- **Malnutrition Screening:** Screen high-risk groups (CKD G4–G5, Age >65) **twice annually**.
- Intervene for pain, sleep disorders, and uremic pruritus to improve Health Related QoL.



Clinical Monitoring

2x Annually

MALNUTRITION SCREENING

Reference: KDIGO Clinical Practice Guideline for the evaluation and management of chronic kidney disease. Kidney International (2024) 105 (Suppl 4S), S117–S314

Empowerment: Quiz Round 1

1. Name some criteria which can be counted in a Malnutrition Diagnosis using the GLIM framework

2. Which criteria is NOT included in a diagnosis of frailty using the Fried Frailty Phenotype criteria. Circle your choice from those below:

Weight loss Exhaustion Restless legs

3. True or false: Gastrointestinal symptoms are associated with malnutrition

4. True or false: The Clinical Frailty Scale can only be performed by a trained Clinician

5. True or false: Only a trained clinician can advise patients having dialysis treatment to increase their activity due to the risk of adverse events

6. Which foods are appropriate for a patient with malnutrition to have every day as a snack while on dialysis:

Protein enriched milk (600ml bottle) Handful of nuts (25g) Peanut butter on 1 slice toast

1 glass of milk (250 mls) Small tin (95g) Tuna in Springwater on 4 x water crackers

Empowerment: Quiz Round 2

1. Choose 1 team member to take part in a physical assessment for your team. The rest will be timing and counting for 30 seconds.

Instructions for a 30 second sit to stand (see information sheet)

Wait till the timer starts and count!

2. Choose 1 team member as a subject and one to complete a measurement.

3. See instruction sheet for how to complete a calf measurement:

4. Hand Grip Dynamometer:

Choose 1 participant at your table to try the Hand Grip Test

Remember to take 2 measurements and record the average of each.

Empowerment: Quiz Round 3

For each picture on your sheet, view the image and rate the image for muscle wasting:

- Normal Status
- Mild wasting
- Moderate Wasting
- Severe Wasting

Empowerment: Quiz Round 1

	Phenotypic criteria
Unintentional Weight loss (%)	> 5% within past 6 months
	> 10% beyond 6 months
BMI (kg/m²)	< 20 if < 70 years (Asia: < 18.5)
	< 22 if ≥ 70 years (Asia: < 20)
Muscle mass	Reduced
	Etiologic criteria
Reduced food intake	Ingestion ≤ 50% of needs from 1 to 2 weeks
	Any reduction for > 2 weeks
or **Assimilation**	Any chronic GI condition that adversely impacts food assimilation or absorption
Disease burden/ Inflammation	Presence of acute disease/injury or chronic disease related

2. Which criteria is NOT included in a diagnosis of frailty using the Fried Frailty Phenotype criteria. Circle your choice from those below:

Restless legs

3. True: Gastrointestinal symptoms are associated with malnutrition

4. False: The Clinical Frailty Scale can only be performed by a trained Clinician

5. false: Only a trained clinician can advise patients having dialysis treatment to increase their activity due to the risk of adverse events

6. Which foods are appropriate for a patient with malnutrition to have every day as a snack while on dialysis:

Handful of nuts (25g)

Peanut butter on 1 slice toast

1 glass of milk (250 mls)

Small tin (95g) Tuna in Springwater on 4 x water crackers

Protein enriched milk (600ml bottle)* Check Phosphate / potassium levels and consult with Dietitian

Empowerment: Quiz Round 3

For each picture on your sheet, view the image and rate the image for muscle wasting:

Temple - Look for the muscle at the temple. Look full at the patient and look for scooping at the temple. You can feel the muscle if you put your finger on the muscle and have the patient open and shut their teeth or clench.

Well-nourished	Mild to Moderate	Severe malnutrition	Elderly Well-nourished
			

Clavicle - Clavicle in nourished women should show slightly, in men it should not be visible. More prominence = more wasting.

Well-nourished	Mild to Moderate	Severe malnutrition	Elderly Well-nourished
			

Empowerment: Quiz Round 3

For each picture on your sheet, view the image and rate the image for muscle wasting:

Interosseous Muscle - Interosseous muscle should be flat or bulged when thumb/forefinger are put together. Scooping indicates loss of muscle tissues

Well-nourished	Mild to Moderate	Severe malnutrition	Elderly Well-nourished
			

Knee/Thigh - The knee should be covered with muscle and rounded without the appearance of prominent bone. Check with the patient about what is "normal" for him/her. Support the leg so that the thigh is not resting on the chair seat. Look for smooth, rounded appearance. When the thigh muscle is wasted, there is often a distinct line between muscle and fat/skin from the knee to the groin.

Well-nourished	Mild to Moderate	Severe malnutrition	Elderly Well-nourished
			

- Cedereholm T et al. GLIM criteria for the diagnosis of malnutrition e A consensus report from the global clinical nutrition community. Clin Nut. 2018; 38 (1): 1-9.
- Kalanter-Zadeh K et al. A malnutrition-inflammation score is correlated with morbidity and mortality in maintenance hemodialysis patients. Am J Kidney Dis. (2001); 38 (6): 1251-63.
- doi: 10.1053/ajkd.2001.29222.
- 7point SGA (NEMO) Adapted from Detsky et al. What is subjective global assessment of nutritional status? JPEN. (1987); 11: 8-13
- Ottery FD. Definition of standardized nutritional assessment & interventional pathways in oncology. Nutrition (1996) 12 (1 Suppl):S15-9
- Fried LP, Tangen CM, Walson J et al. Frailty in older adults: evidence for a phenotype. J Gerentol Med Sci: 2001; 56A-M156.
- Rockwood, K., Theou, O. (2024). Clinical Frailty Scale. In: Ruiz, J.G., Theou, O. (eds) Frailty. Springer, Cham. https://doi.org/10.1007/978-3-031-57361-3_16
- Avesani CM, Sabatino A, Guerra A, et al. A comparative analysis of nutritional assessment using Global Leadership Initiative on Malnutrition versus SGA and MIS in hemodialysis patients. J Ren Nutr. 2022;32(4):476-482.
- Yamaguchi M, Sugiyama H, Asai A, et al. Clinical impact of malnutrition according to the GLIM criteria combined with kidney dysfunction to determine mortality in inpatients. J Ren Nut 2024. https://doi.org/10.1053/j.jrn.2024.03.010
- de Mutsert R, et al. Subjective global assessment of nutritional status is strongly associated with mortality in chronic dialysis patients. Am J Clin Nutr. 2009; 89: 787-93
- James K, Jamil Y, Kumar M, et al. Frailty and cardiovascular health. J Am Heart Assoc. 2024;13:e031736.

- Dawson J, et al. The impact of frailty on hospitalization and survival in people with kidney disease. J Nephrol. 2025; 38 (8); 2251–2258
- McLean C, Randall AM, et al. The association of frailty and malnutrition with dietary intake and GI symptoms. J Ren Nutr. 2026; 24 (2): 177–184
- Kim SG, Jang J, Lee S, et al. Longitudinal muscle mass trajectories and their prognostic implications in haemodialysis patients. J Ren Nutr. 2026; 36 (2): 114–122.
- Li Y, Wang Z, et al. Associations of low muscle mass and myosteatosis with kidney transplant outcomes: A systematic review. J Ren Nutr. 2026; Vol 36 (1): 4–12.
- Boslooper-Meulenbelt K, et al. Malnutrition according to GLIM criteria in stable renal transplant recipients. Clin Nutr. 2021; 40 (6): 3522–2530.
- Kobashigawa J, et al. Report from the American Society of Transplantation on frailty in solid organ transplantation. Am J Transplant. 2019;19(4):984–994.
- Lorenz EC, Moore LW, Yamagami M, Garibotto G, Sasangohar F, Dhala A. The Emerging Role of Prehabilitation in Kidney Transplant Candidates. Journal of Renal Nutrition. 2026. doi: https://doi.org/10.1053/j.jrn.2026.04.001.
- Zhang F, Wang H, Yan B, Huang L, Zhang H. Effects of nutritional supplementation combined with exercise training on frailty, physical function and quality of life in chronic kidney disease: A systematic review and meta-analysis. J Ren Nutr (2025), https://doi.org/10.1053/jrn.2024.11.009
- Hu H, Wu C, Chau PH, et al. Perceived Exercise Benefits and Barriers in MHD. J Ren Nutr. 2025;35(5):568–577.
- KDIGO Clinical Practice Guideline for the evaluation and management of chronic kidney disease. Kidney International (2024) 105 (Suppl 4S), S117–S314
- Ikizler, T.A., et al (2020) KDOQI Clinical Practice Guideline for Nutrition in CKD 2020 Update. A J Kid Diseases, 76; S1-S107
- Wright M et al. Clinical practice guideline on undernutrition in chronic kidney disease. BMC Nephrology; 2019; 20; 30.
- Su et al. Dietary Phosphorus, It's sources, and mortality in adults on haemodialysis: The DIET-HD Study. Nutrients, 2022; 14: 4064. https://doi.org/10.3390/nu14194064

Afternoon Tea



Diverse Plates and Common Goals in Kidney Nutrition: Evidence, Evolution, and Empowerment

Joanna Stockings, APD

Dietitian, Community and Satellite Dialysis, John Hunter Hospital, Hunter New England LHD (Awabakal/Worimi/Wonnarua)

- Dietitian, Fresenius Kidney Care, Newcastle
- Dietitian, The Hunter Kidney Clinic

Hilary Dumbleton

Renal Dietitian, Christchurch Hospital, Health New Zealand/Te Whatu Ora

Suzy Jackson

Clinical Lead Dietitian, Alfred Care Group, Bayside Health (Melbourne/Naarm)

Sharleen Nancekivell

Sharleen Nancekivell
Senior Renal Dietitian Waitematā,, Health New Zealand/Te Whatu Ora

Today in brief

Time	Topic	Speaker
1300-1320	Introduction/house keeping	Jo Stockings
1320-1400	Evolution: From Nutrients to Nourishment	Sharleen Nancekivell
1400-1440	Evidence: Identifying and managing malnutrition, frailty and sarcopenia	Suzy Jackson
1445-1515	Afternoon Tea Break	
1515-1555	Diverse Plates: Why don't they don't they follow the recommendations?	Jo Stockings
1555-1640	Empowerment and common goals: Common patient discussions	Hilary Dumbleton
1640-1650	Questions/reflections	Panel
1650-1700	Close and repolling	Jo Stockings

Diverse Plates: Why don’t they follow the recommendations?

Joanna Stockings, APD

Dietitian, Community and Satellite Dialysis, John Hunter Hospital, Hunter New England LHD (Awabakal/Worimi/Wonnarua)

- Dietitian, Fresenius Kidney Care, Newcastle
- Dietitian, The Hunter Kidney Clinic
- (Newcastle/Awabakal)

Non-Adherence Rates (HD patients)

60.6% for fluid restriction

Range 17.9-97%

(VR and Kaur Kang 2022)

60.2% for diet

Range 14.1-98.3%

(VR and Kaur Kang 2022)

Knowledge of diet restriction does not equate with adherence (Betz et al 2021)

Why are adherence rates so low?

Cultural factors

Neurodiversity

Mental health

SES and food Insecurity

Cultural Diversity

- Unfamiliar foods
- Different cooking methods
- Language Barriers
- Access to culturally appropriate foods
- Social and Family connections
- Changing Lifelong habits
- Traditional roles
- Challenges in resettlement

The Mediterranean Diet



But why not

Latin American Heritage Diet *food pyramid*



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Illustration by: George Middleton
www.oldwayspt.org

African Heritage Diet *food pyramid*



© 2011 Oldways. All rights reserved.
Illustration by George Middleton
www.oldwayspt.org

Asian Heritage Diet *food pyramid*



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www.oldwayspt.org

Resources

Online

Neurodiversity

Sensory processing

Restrictive eating habits/food selectivity

Executive dysfunction

Medication affecting appetite

Safety – prediction of sameness

Food Jagging/ Neophobia



Resources

Mental health challenges

Poor Food Choices

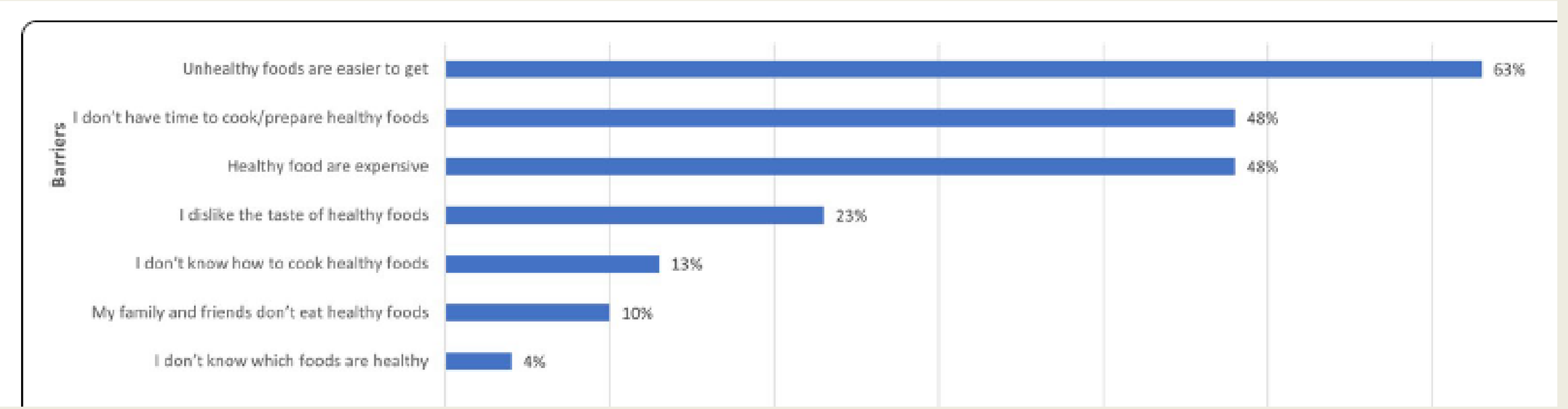
Medication

Lifestyle behaviors

Lower social determinants

behavioral problems

Mental health challenges



Source: Mawer et al (2022) BMC Health Service Research (2022) 22:789 - https://doi.org/10.1186/s12913-022-08182-0

Resources

Online

Food Insecurity

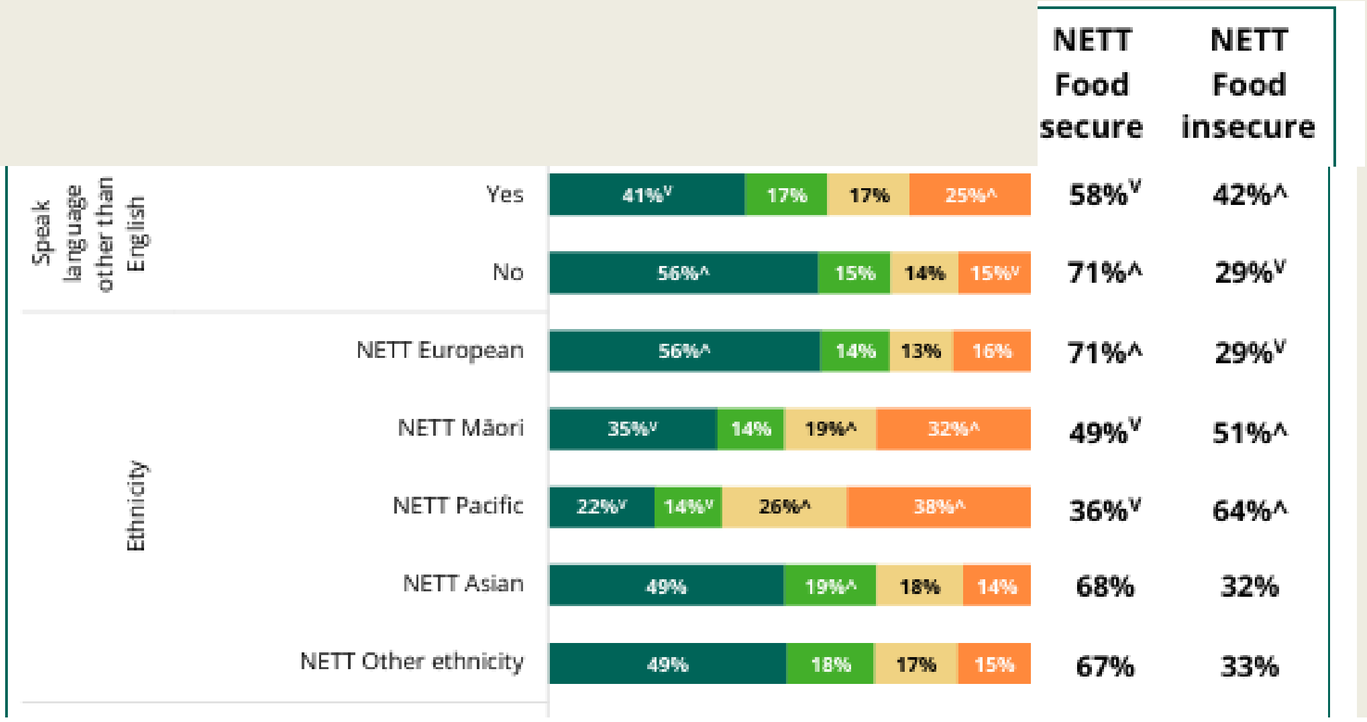
33% of Australian households experienced food insecurity

33% of New Zealand households experienced some form of food insecurity

Food Insecurity

- Financial
- Access to storage
- Cooking facilities
- Geographical
- Limited nutritional literacy (cooking/preparing food)
- Factors associated with disorder and disability
- Factors associated with social conditions

Food Insecurity



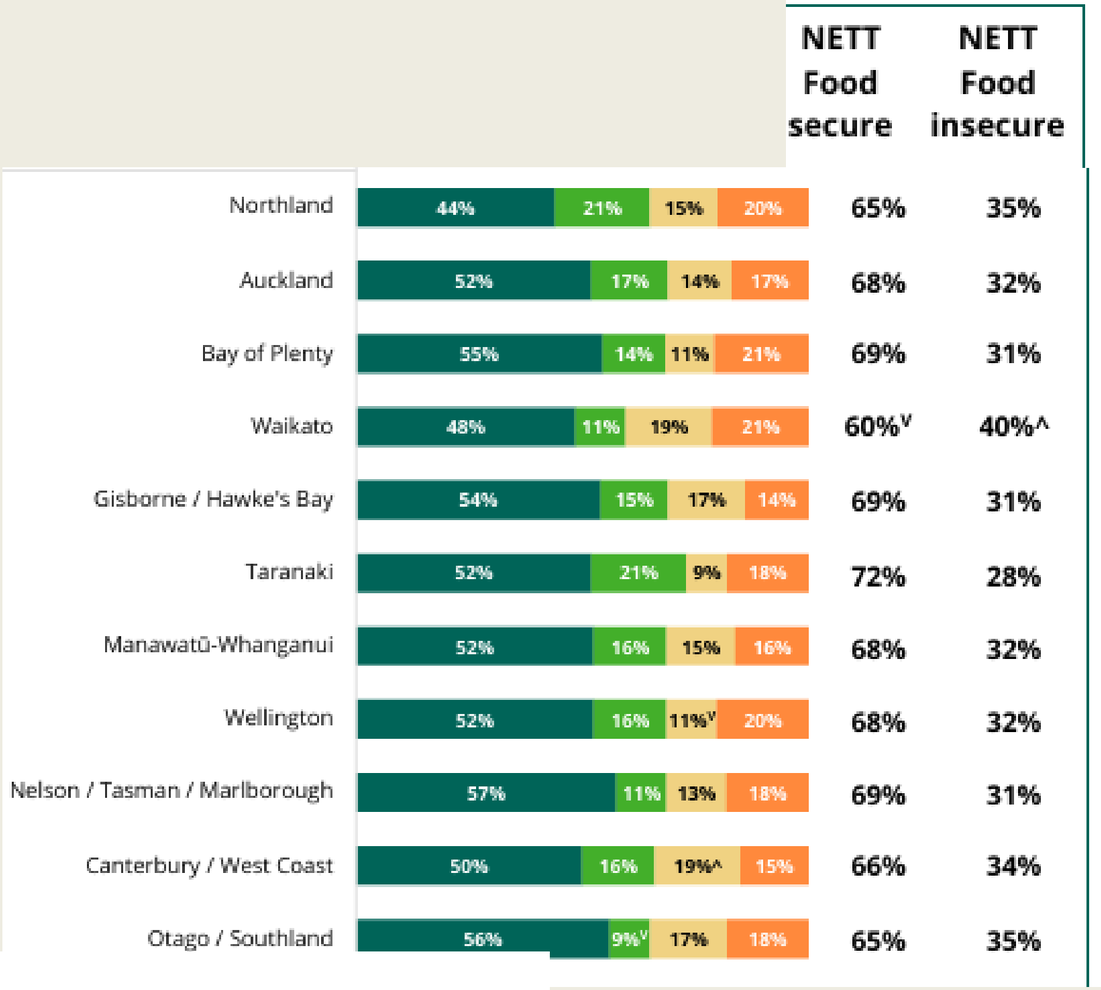


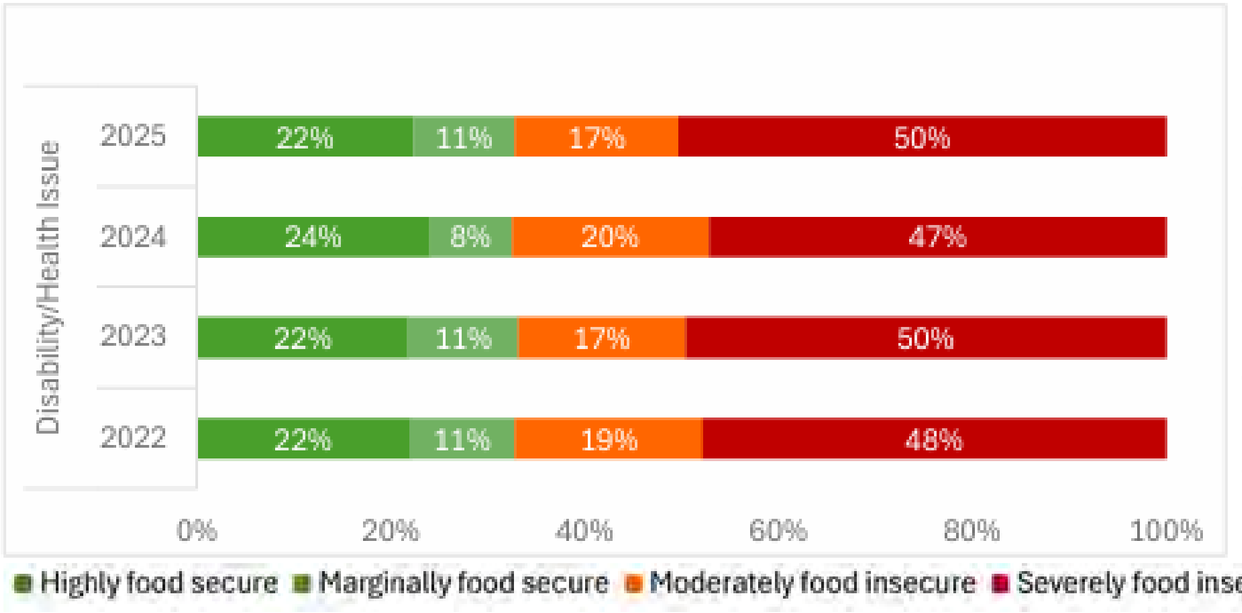
Chart 41: USDA food security segments in Aotearoa New Zealand

High food security ■ Marginal food security ■ Low food security ■ Very low food security

*USDA Food Security Summary – **Base:** Total respondents (n=3,000). **Note:** ^ / v – significantly higher / lower than total.*

Food Insecurity

Figure 12 Household representative's disability status among food security segments by year

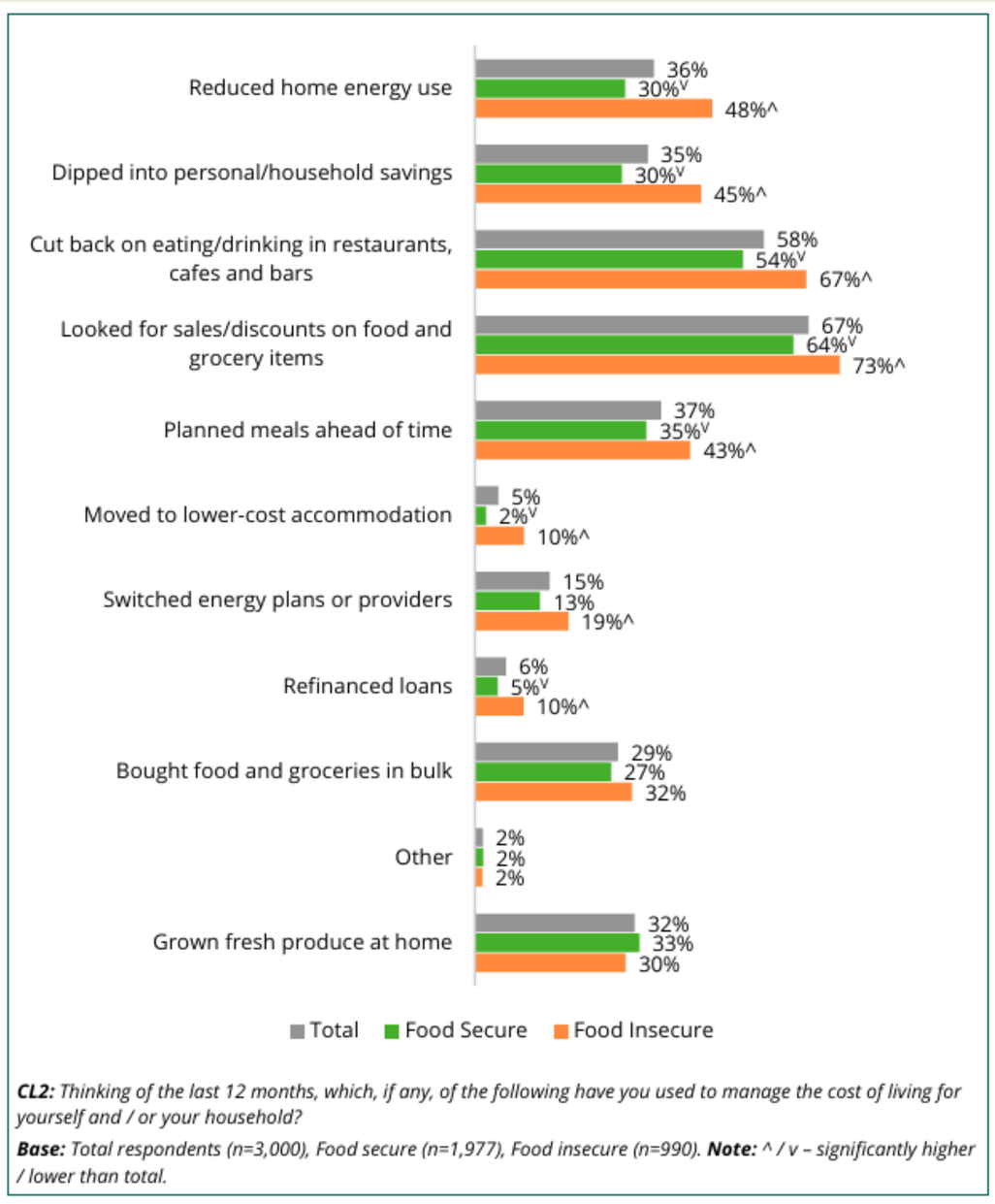


NET Food secure	NET Food insecure
33%	67%
32%	68%
33%	67%
33%	67%

↑↓ Represents a significant change when comparing results from the previous year.

USDA Food Security Summary from HFSSM 18 questions and Disability/Health Issue from 5 questions (Base [Total] 2022 n=4,024; 2023 n=4,342; 2024 n=4,260; 2025 n=4,260; Disability/health issue 2022 n=468; 2023 n=611; 2024 n=520; 2025 n=544).

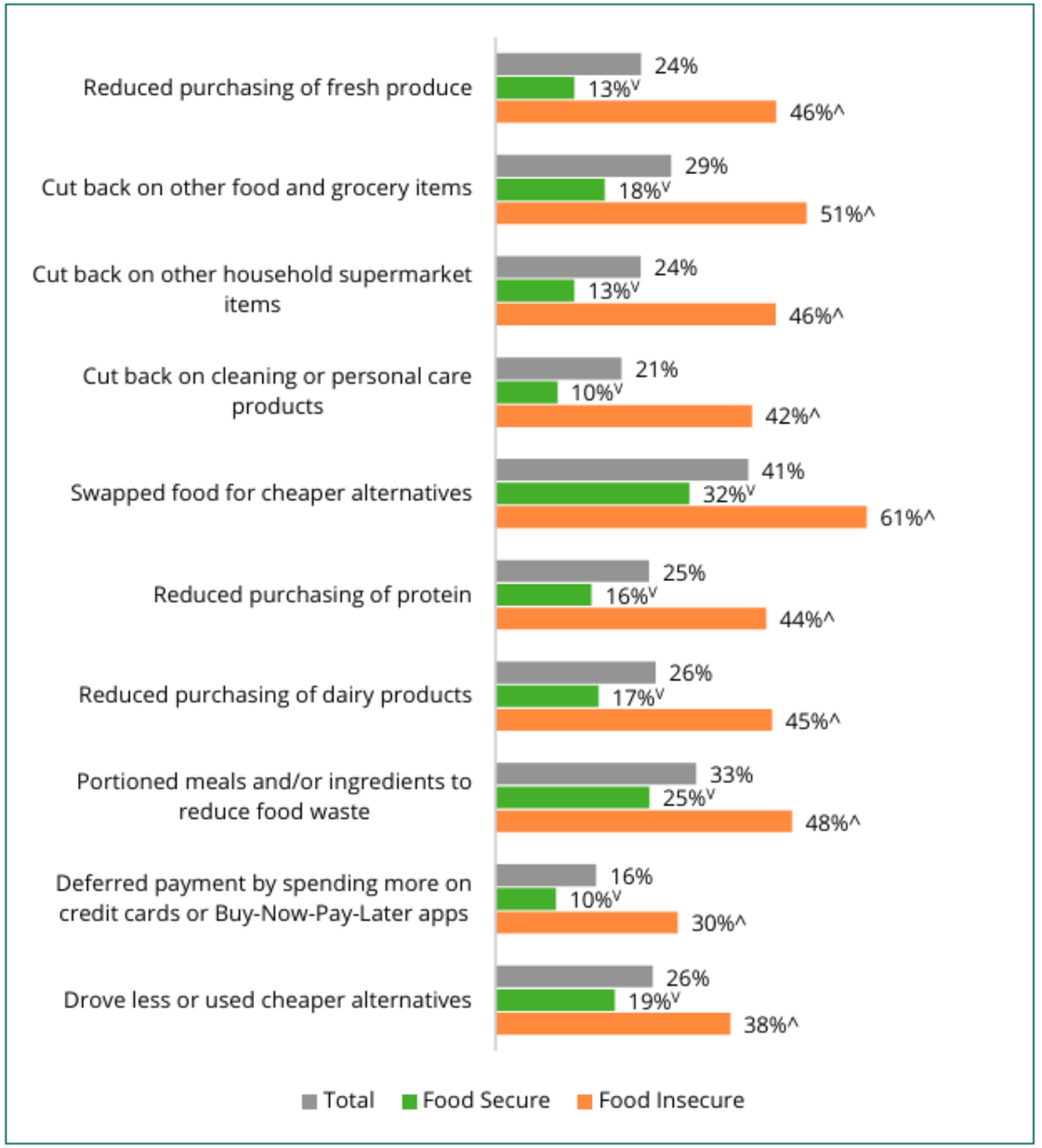
Food Insecurity



CL2: *Thinking of the last 12 months, which, if any, of the following have you used to manage the cost of living for yourself and / or your household?*

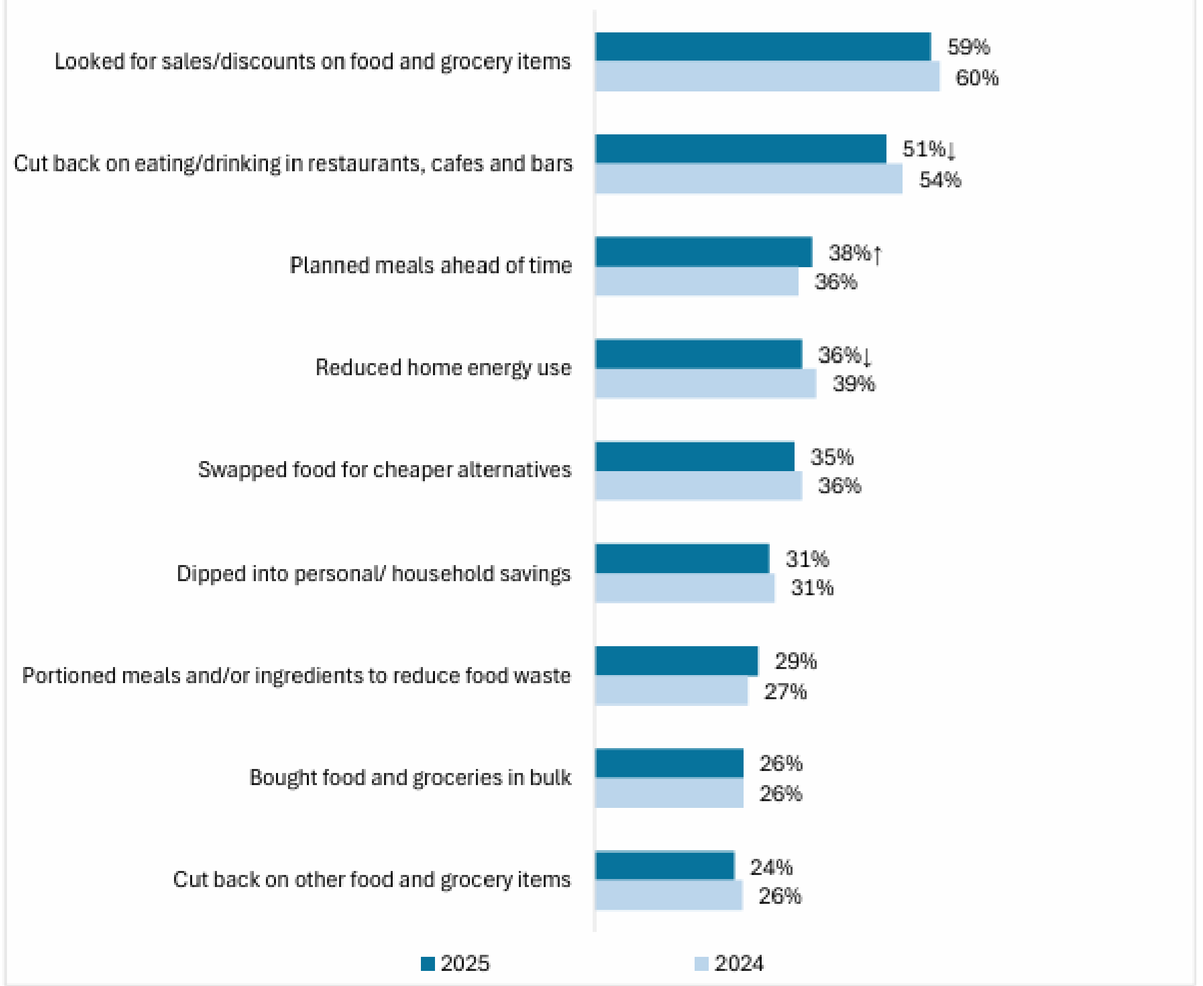
Base: *Total respondents (n=3,000), Food secure (n=1,977), Food insecure (n=990).* ***Note:*** *^ / v – significantly higher / lower than total.*

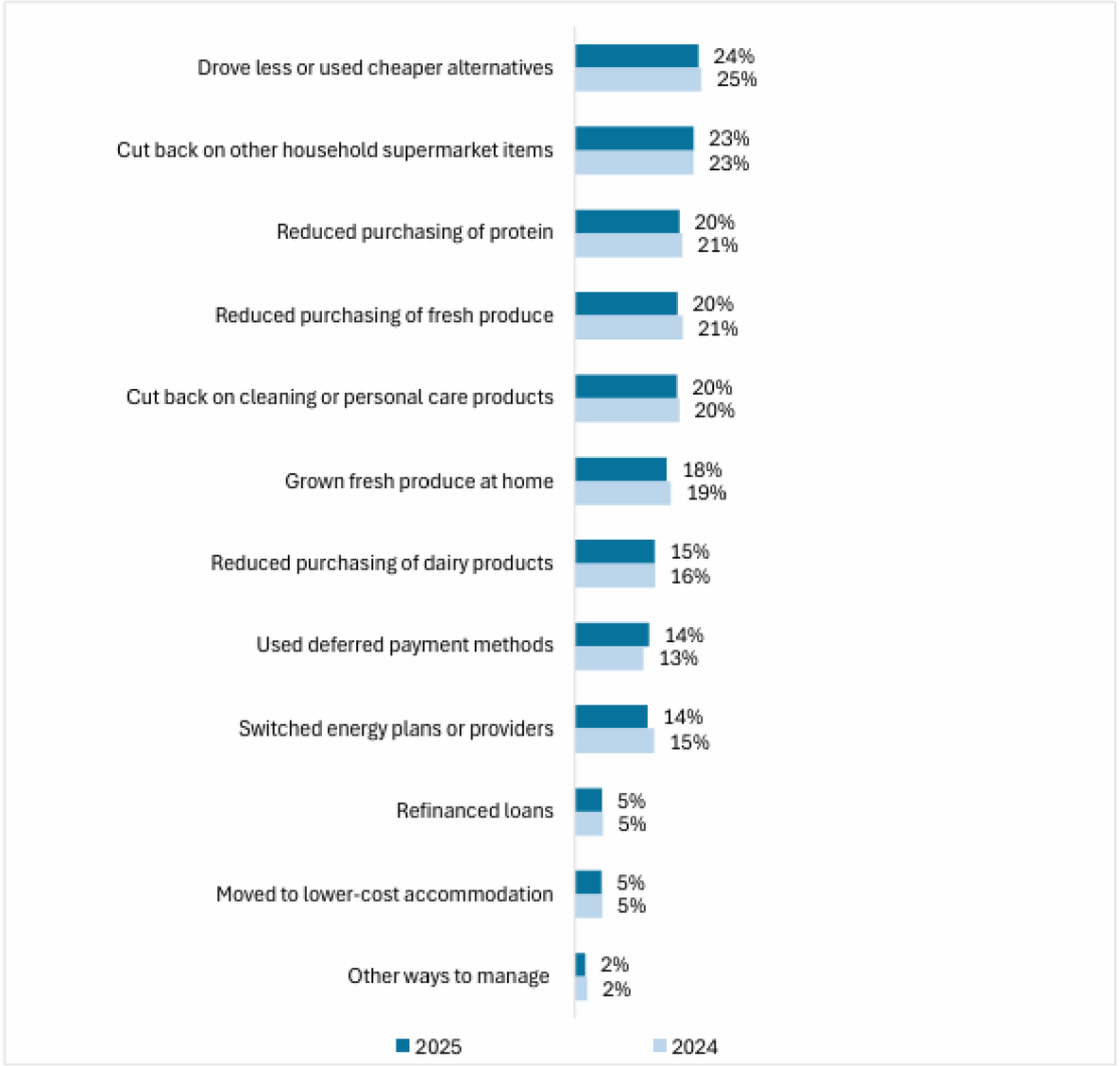
Chart 5: Actions taken to manage cost-of-living by food security, ranked by largest difference



Food Insecurity

Figure 6 Households managing the cost-of-living pressure





↑↓ Represents a significant change when comparing results from the previous year.
CL2 Thinking of the last 12 months, which, if any, of the following have you used to manage the cost-of-living for yourself and/or your household (Base [Total] 2024 n=4,260; 2025 n=4,260)

Resources

Online

- No Money No Time - https://nomoneynotime.com.au/

Health Care Professionals

- Social work

Charities and assistance

- Food banks
- Charities

Government assistance

- Centrelink
- WINZ

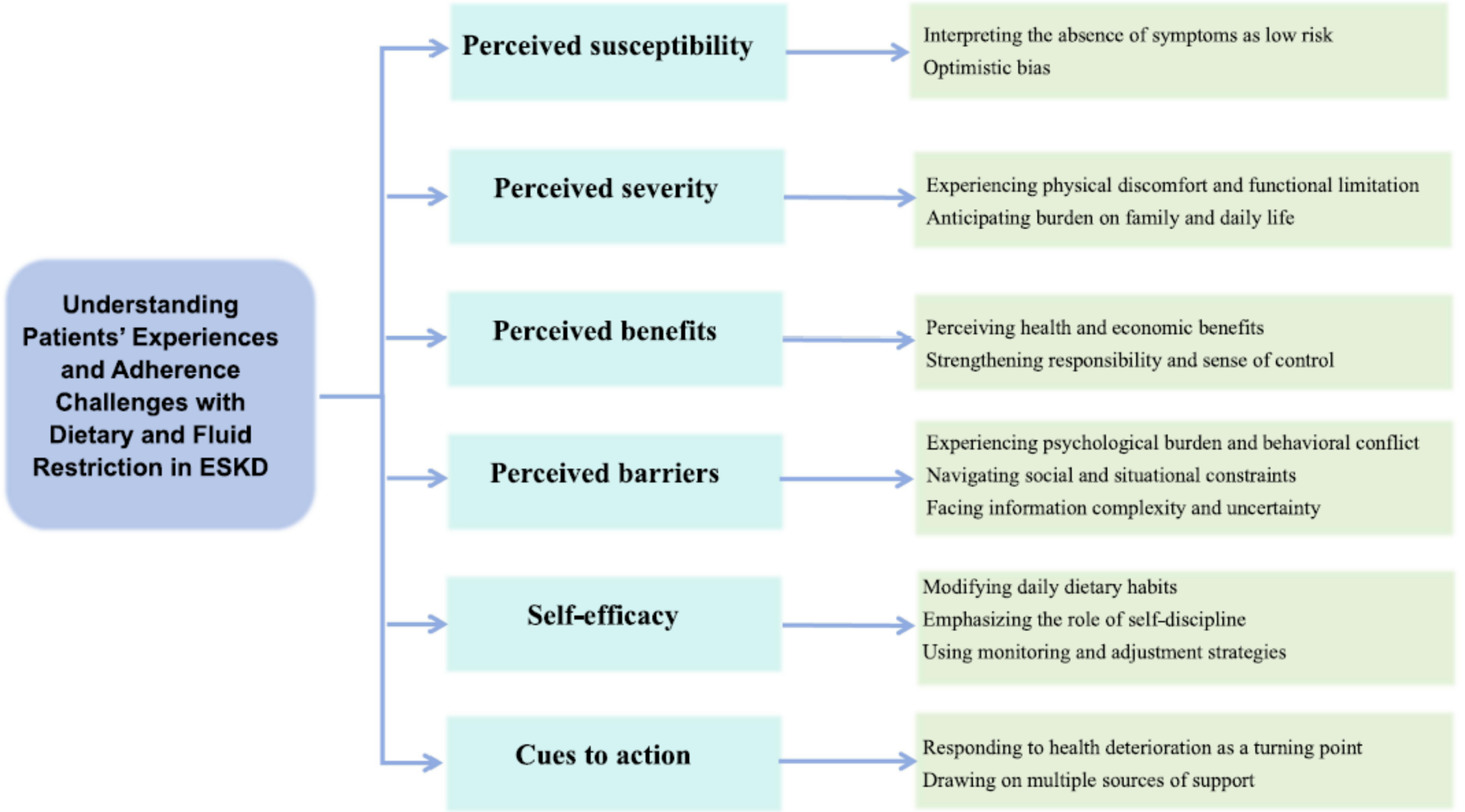


Figure 2 Understanding Patients' Experiences and Adherence Challenges with Dietary and Fluid Restriction in ESKD.

Source: Liao et al (2026) in Patient preference and Adherence 2026:20 578 03

What is the risk?

- How can we minimize all the risks?
- Understanding the individuals, motivation, barriers and facilitators is important



Activity



Do you have a mealtime ritual? Or “safe foods” /Unsafe foods



What would happen if you had to change your diet/fluid intake



How would you react? How would others react?



What would help you follow a new diet recommendation?

References

- Australian Bureau of Statics (accessed 18/05/2026) -https://www.abs.gov.au/statistics/health/food-and-nutrition/food-insecurity/latest-release
- New Zealand Food network Hunger Monitor 2025 (accessed 18/05/2026) - https://www.nzfoodnetwork.org.nz/wp-content/uploads/2026/03/NZFN-Hunger-Monitor-2025-Digital.pdf
- Australian Institute of Family studies Understanding Food insecurity in Australia (2020) Accessed 18/05/2026) - https://aifs.gov.au/resources/policy-and-practice-papers/understanding-food-insecurity-australia
- Tasmanian Government, Department of Health, Food Jags explained (accessed 18/05/2026) https://www.health.tas.gov.au/news/blog-posts/food-jags-explained
- Eating Disorders Victoria, 5 things you should know about eating disorders and neurodiversity (accessed 18/05/2026) 5 things you should know about eating disorders and neurodivergence - Eating Disorders Victoria
- Food Bank Hunger Report (2025) Ipsos Public Affairs https://reports.foodbank.org.au/foodbank-hunger-report-2025/ (Accessed 09/06/2026)
- Dietitian Australia Mental Health Evidence Brief 2024, https://dietitiansaustralia.org.au/sites/default/files/2024-04/Dietitians%20Australia%20Mental%20Health%20Evidence%20Brief%202024.pdf Dietitians Australia Mental Health Evidence Brief 2024Dietitians Australia (accessed 09/06/2026)
- Mawer et al The Knowledge, barriers and Opportunities to improve nutrition and physical activity amongst young people attending an Australian youth mental health service: a mixed methods study Mawer et al. BMC Health Services Research (2022) 22:789 https://doi.org/10.1186/s12913-022-08182-0
- Warren, A.; Frame, L.A.Restoring a Healthy Relationship with Food by Decoupling Stress and Eating: A Translational Review of Nutrition and Mental Health. Nutrients 2025, 17, 2466. https://doi.org/10.3390/nu17152466
- Betz M et al, Knowledge Does not correspond to Adherence of Renal restrictions in patients with Chronic Kidney Disease Journal of Renal Nutrition, Vol 31, No 4 (July), 2021: pp 351-360
- Cobert et al Neurodivergence, intersectionality, and eating disorders: a Lived experience-led narrative review: Cobbaert et al. Journal of Eating Disorders (2024) 12:187 https://doi.org/10.1186/s40337-024-01126-5
- The Old ways - https://oldwayspt.org/ Accessed 09/06/2026)
- Liao et al Understanding Patients Experience and Adherence Challenges with Dietary and Fluid Restrictions in End Stage Kidney Disease: A Qualitative study in Patient Preference and Adherence 2026:20 578103
- Tyson et al, C (2022) Self Perceives Barriers and Facilitators to Dietary Approaches to Stop Hypertension Diet Adherence Among Black Americans with Chronic Kidney Disease: A Qualitative Study Journal of Renal Nutrition, Vol 33, No 1 (January), 2023: pp 59-68
- Puchulu MB et al (2023) Food Insecurity and Chronic Kidney Disease: Considerations for Practioner Journal of Renal Nutrition, Vol 33, No 5 (September), 2023: pp 691-697
- Crews DC (2020) Food as medicine for CKD: Implications for disadvantaged populations. Clinical Nephrology, Vol 93 – Supple 1/2020 (S36-S41)

Empowerment and common Goals: Common conversations

Hilary Dumbleton

Renal Dietitian, Christchurch Hospital, Health New Zealand/Te Whatu Ora

Case study based discussions

- 15 min per case study

Scenario 1 – Fluid overload

Sarah (54y)

- ESRF due to T2DM
- On APD at night for the past 6 months, has recently lost all residual urine output (anuric)
- TW = 72kg
- BP 150/100, daily weight = 75.3kg today
- Waking up SOB, tight fingers under her wedding ring, puffy ankles
- HbA1c 75 (high)

Oral intake previous day ….

BF: Muesli, banana, milk + cup coffee & large glass water with tablets.

MT: cup of tea + biscuit

L: Filled roll + apple

AT: small chocolate bar

D: Friends birthday dinner at Chinese restaurant, many shared dishes + 1x glass wine

Thirsty before bed & has glass water. Sipping 500ml bottle water all day.

What signs & symptoms are pointing towards fluid overload?
Can you estimate how much fluid Sarah had yesterday?
How would you advise Sarah on her fluid management?
Do you think Sarah needs a dietitian review? Why/why not?

Scenario 2 – Hyperkalaemia

John (69y)

- Stage 4 CKD, GFR 19 (pre-dialysis)
- Retired, lives alone
- Nauseated, loss of interest in food, low energy
- Potassium 6.5 (high), phosphate 2.0 (high)
- Wt: 96kg, 5kg loss last 3/12
- Bowels open 2-3x / wk

Typical day …

- BF: 2x slices multigrain bread with peanut butter + milky coffee
- MT: banana + muesli bar
- L: Instant noodles or pie
- AT: energy drink
- D: takeaways 2x/wk, meat & vege 3x/wk, bacon & eggs on Sunday
- S: cup of tea + 2x timtams.

What are some likely causes of John's hyperkalaemia?
What level of K+ would you refer a patient to the dietitian?
Do you have any other nutrition concerns?

What is contributing to John's constipation?
What can John do to avoid constipation?

Scenario 3 – Hyperphosphatemia

Bob (76y)

- Commenced haemodialysis 18 months ago
- ESRF due to APCKD
- MHx: HTN, hyperlipidaemia
- Home with wife, retired engineer, 3x adult children, plays golf on weekends.
- Phosphate 2.8(high), Potassium 5.2
- Wt: 89kg Ht: 178cm
- Calcium carbonate 500mg, TDS

Typical day …

BF: 2x eggs on toast with side mushrooms, Latte

MT: Latte

L: sandwich with salami & cheese + orange OR instant pasta

AT: handful peanuts, Latte

D: fish/meat/chicken & vege, usually with can diet coke. Restaurant meals 1x weekly. Convenience protein e.g crumbled fish, smoked chicken

Which foods have the highest bioavailability of phosphate?
What are some alternatives you could suggest to replace these foods?
What advice would you provide around the timing of phosphate binder medications in relation to meals?

Questions and reflections?

Joanna Stockings, APD

- Hunter New England LHD
- Fresenius Kidney Care, Newcastle
- The Hunter Kidney Clinic
- (Newcastle/Awabakal)

Hilary Dumbleton

Suzy Jackson,

Alfred Care Group, Bayside Health
(Melbourne/Naam)

Sharleen Nancekivell

Evaluation

https://www.menti.com/alckug5m2ese

Closing Karakia

Unuhia, unuhia

Unuhia ki te uru tapu nui

Kia wātea, kia māmā,
te ngākau, te tinana, te wairua i te ara takatā

Koia rā e Rongo, whakairia ake ki runga

Kia tina! TINA! Hui e! TĀIKI E

Draw on, draw on

Draw on the supreme sacredness

To clear, to free the heart

The body and the spirit of mankind

Rongo, suspend high above us

Draw together! Affirm!

Thank-you

Joanna Stockings, APD

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