

Muscle Mass in Kidney Health: Why Muscles Matter



In Kidney Disease
January 2026

Outline

- 1) Protein Practice Standards
- 2) Why Protein Matters
- 3) Why Exercise Matters
- 4) How To Get Started: Patient Experience
 - a) Tamara
 - b) Don
- 5) Questions and Discussion

SUPPLEMENT TO
kidney[®]
INTERNATIONAL



**KDIGO 2024 Clinical Practice Guideline for the
Evaluation and Management of Chronic Kidney Disease**

VOLUME 105 | ISSUE 4S | APRIL 2024

www.kidney-international.org

<https://kdigo.org/wp-content/uploads/2024/03/KDIGO-2024-CKD-Guideline.pdf>

Protein Practice Standards (KDIGO 2024)

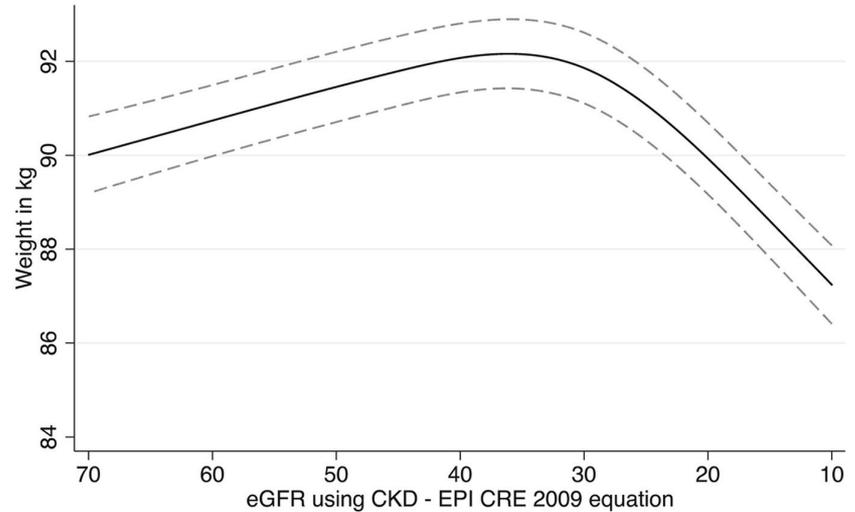
Recommendation 3.3.1.1: We suggest maintaining a **protein intake of 0.8 g/kg** body weight/d in adults with CKD G3–G5 (2C). **Avoid high protein intake >1.3g/kg body weight/d.**

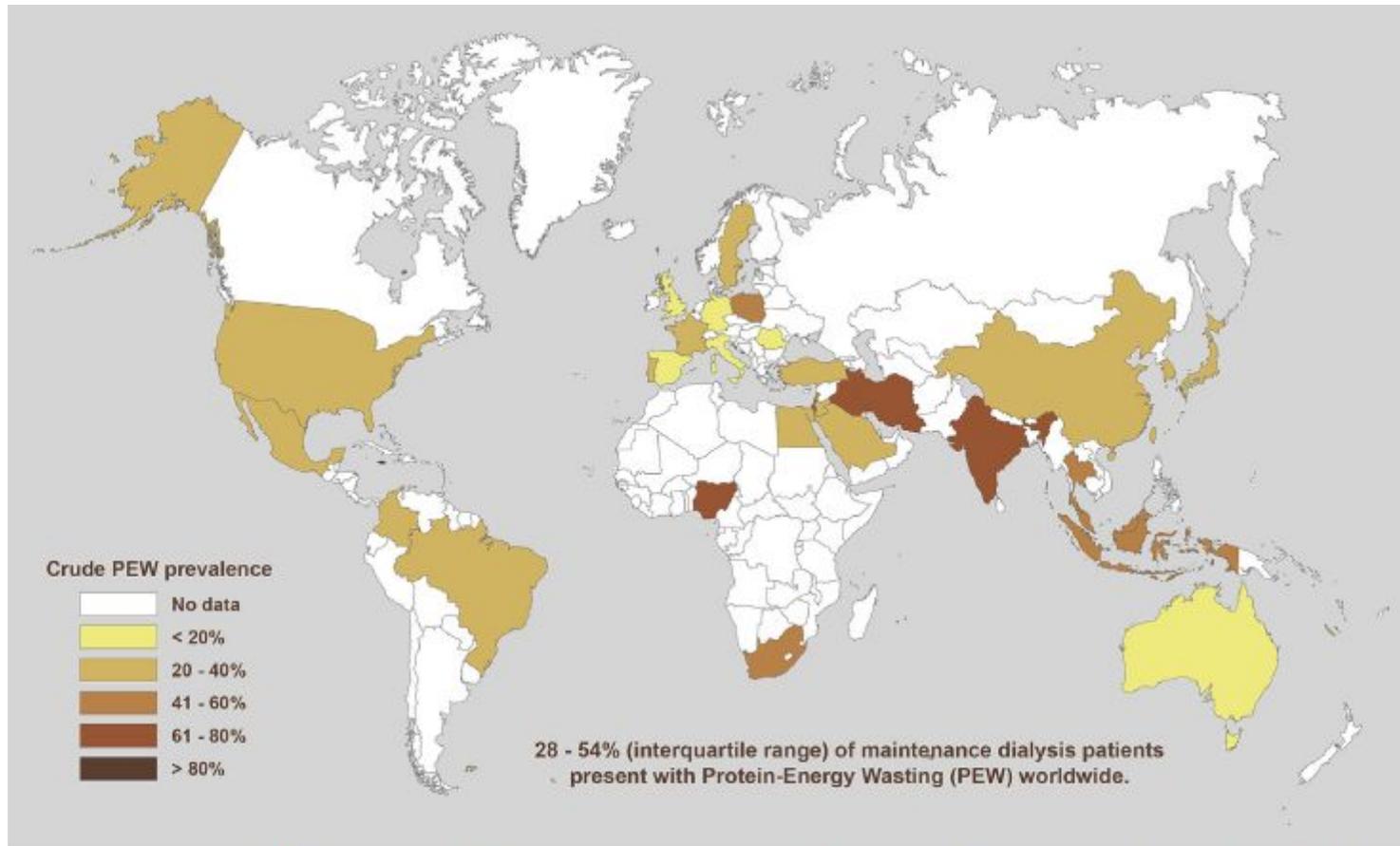
Practice Point 3.3.1.3: **Do not prescribe low- or very low–protein diets** in metabolically unstable people with CKD.

Practice Point 3.3.1.5: In older adults with underlying conditions such as **frailty** and **sarcopenia** (slow progressive muscle loss), **consider higher protein and calorie dietary targets.**

“Protein Energy Wasting” and Nutritional status in CKD

- Prevalence of protein-energy wasting:
 - Non-dialysis CKD: 11-54%
 - Dialysis: 28-54%
- As kidney function worsens, so does muscle mass/weight loss
- Can happen with or without weight loss (that is why BMI is problematic)





MUSCLE MASS LOSS

REDUCED STRENGTH AND ACTIVITY

Inflammation
Insulin Resistance
Immune Response Mediation

01

Inadequate Nutrition
Low protein and
fruit and vegetable intakes
Poor appetite
Vitamin D deficiency

02

Uremia (low eGFR)
Toxin build up in the body
worsens inflammation

03

Anorexia (Poor Appetite)

04

From uremia
Social isolation
Low mood
High disease burden

Dietary Restriction

05

Misinformation
Food security
Cooking literacy

Disease Burden

06

Reduced nervous system
innervation to muscle

INJURY/HOSPITALIZATION/DEPENDENCE

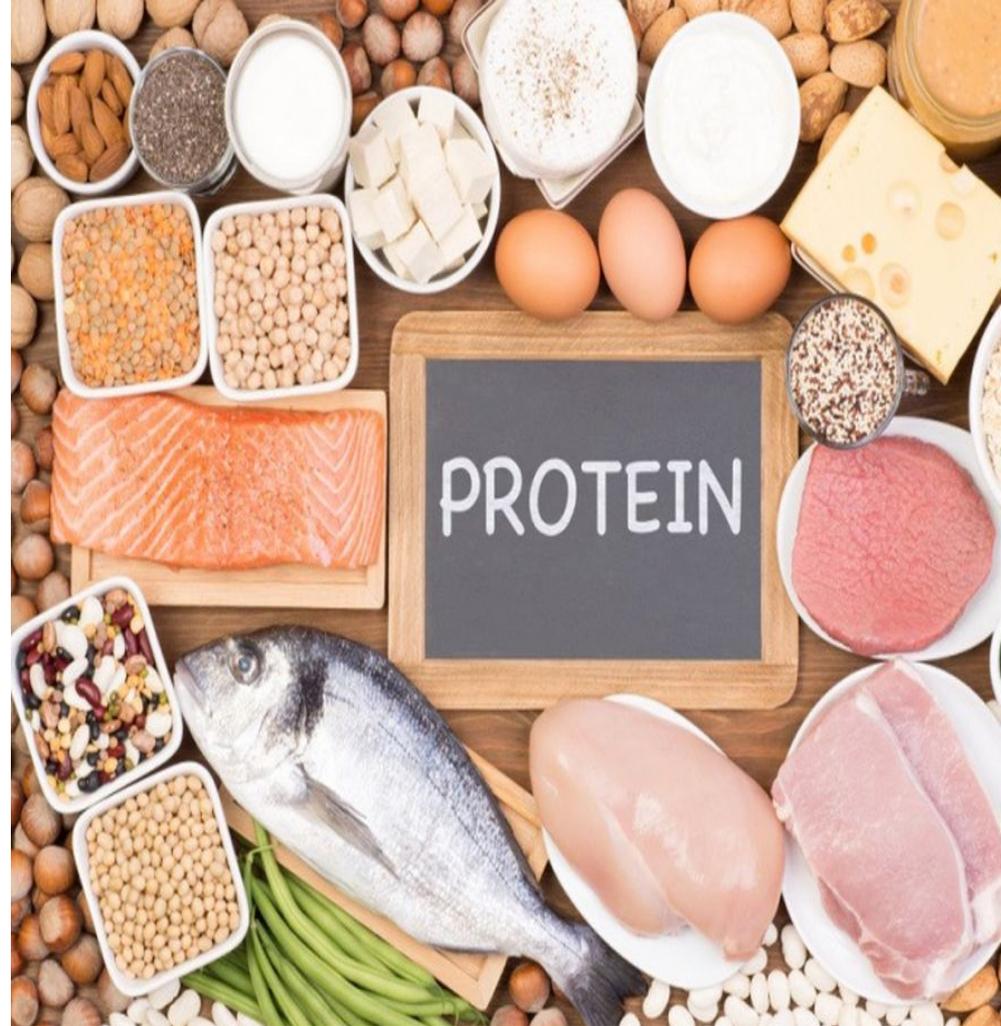
Protein Concerns

Excessive Protein:

- Contribute to uremic toxins
- Promote uric acid production
- Increase phosphate and potassium
- kidney stones

Inadequate Protein:

- Malnutrition
- Muscle wasting
- Fluctuating blood sugars



Malnutrition Treatment and Monitoring

Monitoring:

- Ongoing nutritional screening and counselling to optimize dietary intake
- Use of Subjective Global Assessment
- Food recall
- Physical assessment (Handgrip Strength)

Treatment:

- Optimize dietary intake
- Promote physical activity



*Blood tests are **NOT** a good indicator of nutrition status as it is affected by inflammation, fluid and other factors*

IS ONE TYPE OF PROTEIN BETTER THAN THE OTHER FOR BUILDING MUSCLE MASS?



Muscle Mass

Protection



Muscle Strength



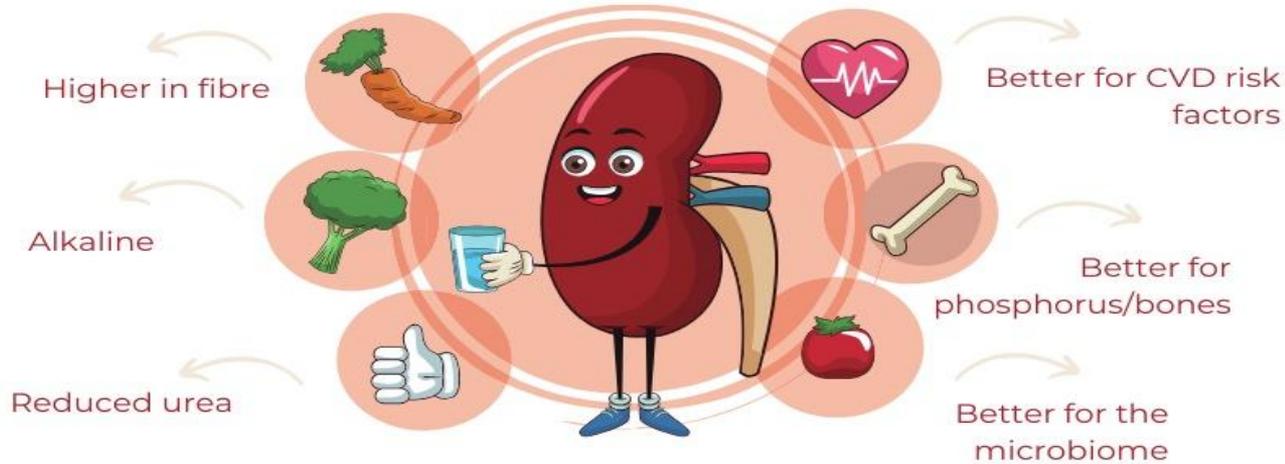
TOTAL PROTEIN MATTERS MOST

Lean Mass Gains: slightly better with animal but no absolute difference



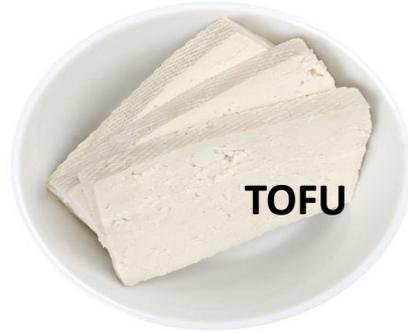
**Building Blocks for Muscle:
Choose from plant and animal sources**

POTENTIAL BENEFITS OF PLANTS



It is hypothesized that plant proteins could be better for the kidney's

TYPES OF PLANT PROTEINS (INCLUDE DAILY):



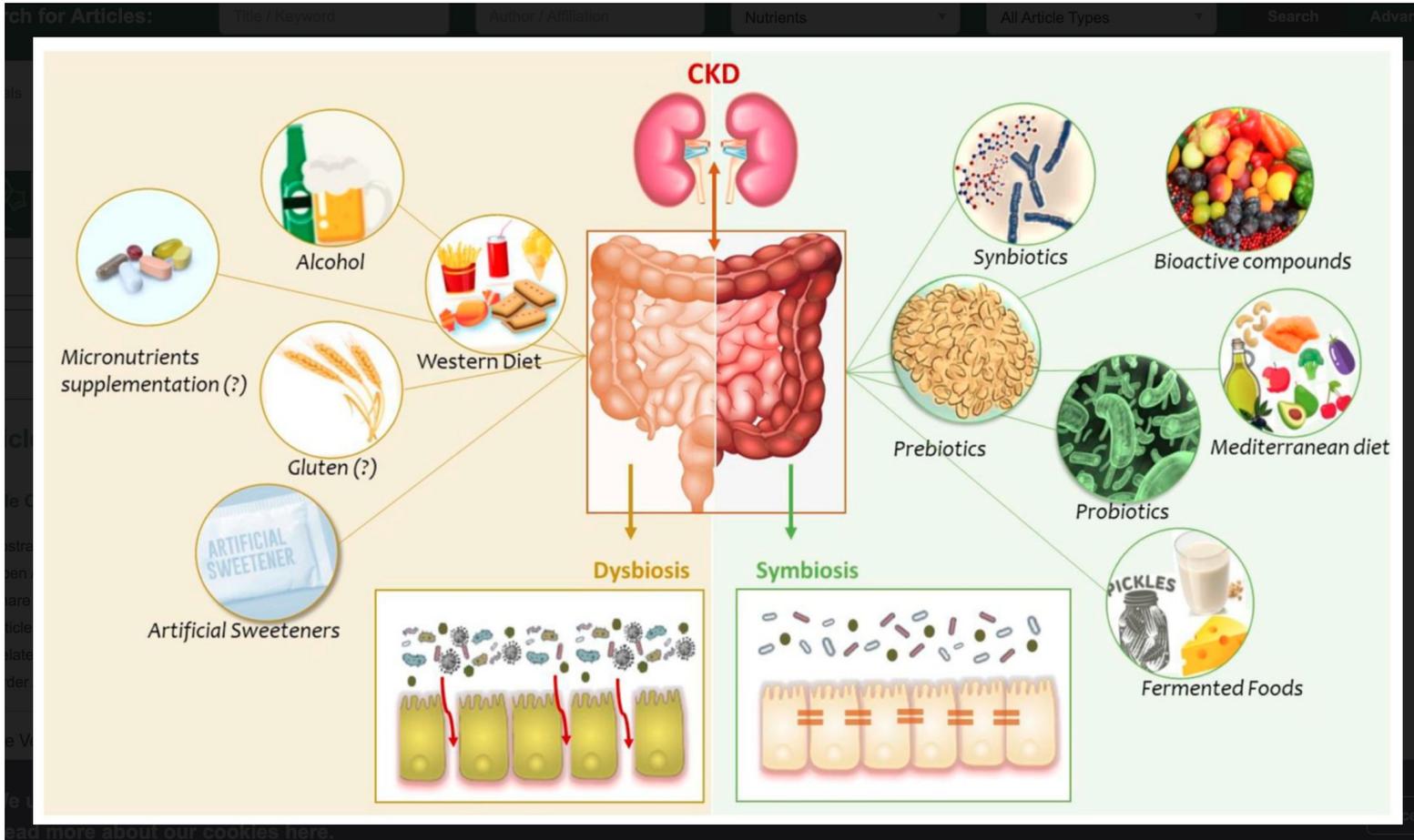
**SEEDS:
SESAME, HEMP,
PUMPKIN, CHIA**



CHICKPEAS



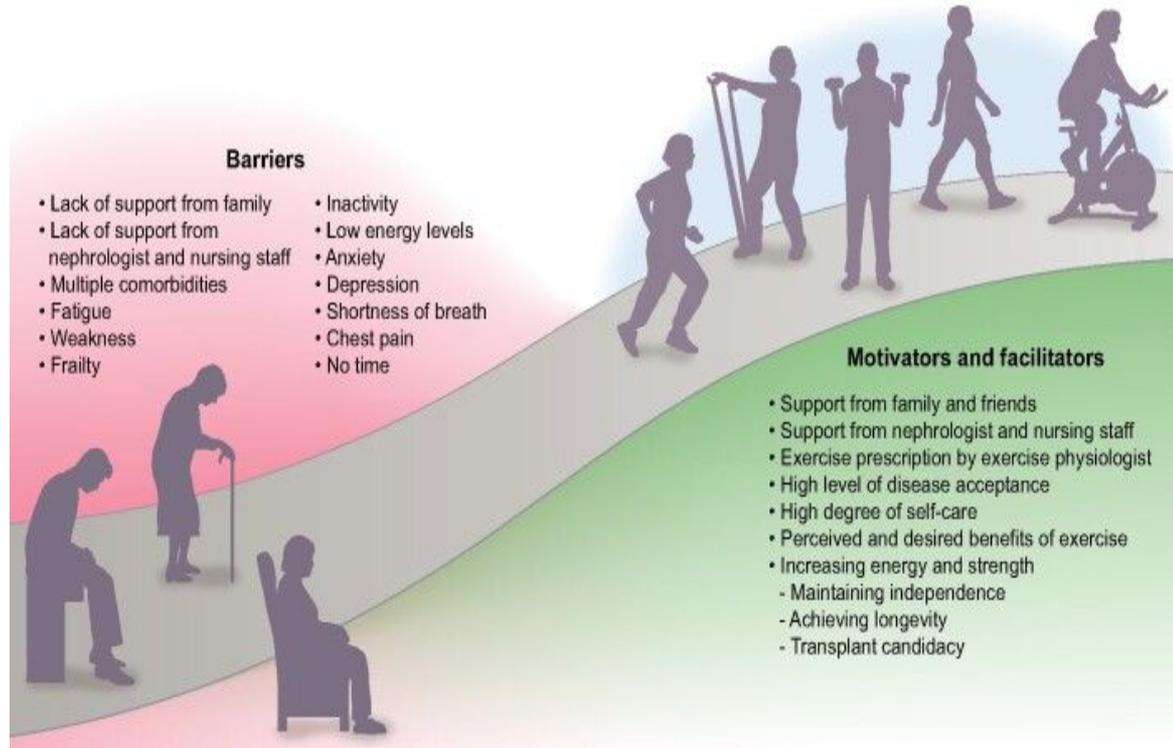
LENTILS



Resistance Exercise - What We Know

- Most studies conducted for aerobic exercise
- Future studies needed to measure effect of resistance exercise
- Patients seek guidance from their provider about exercise

“WHY MUSCLE MATTERS”



<https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD003236.pub2/abstract>

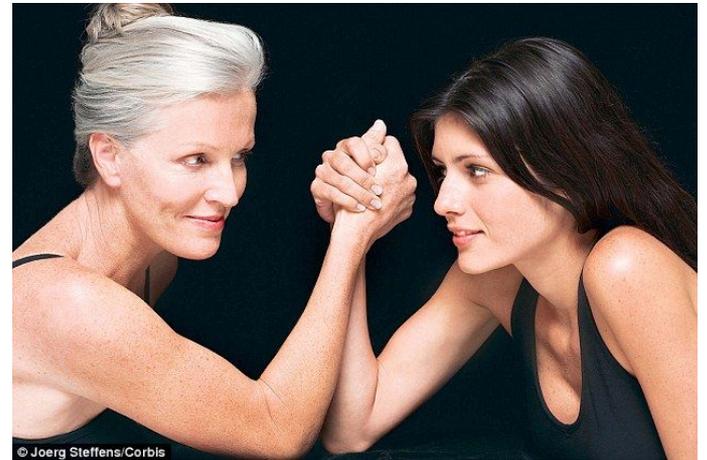
Journal of Cachexia, Sarcopenia and Muscle 2021; 12: 1621–1640 Published online 28 September 2021 in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/jcsm.12791
Clyne N, Anding-Rost K. Exercise training in chronic kidney disease-effects, expectations and adherence. Clin Kidney J. 2021 May 6;14(Suppl 2):ii3-ii14. doi: 10.1093/ckj/sfab012.
PMID: 33981415; PMCID: PMC8101627.

Benefits of Exercise

- Aging muscle responds to exercise, especially resistance exercise

Improved:

- physical function
- insulin sensitivity
- glucose utilization,
- protein synthesis
- nutrient uptake



Hand Grip Strength



Where to Start?

On-Demand Classes

To help you stay active, we have created a variety of classes to suit all fitness levels and accommodate the different stages of kidney disease. These classes are taught by certified instructors, including those affected by kidney disease.



Have A Nourishing Snack with Exercise

Fruit and Vegetable Group	Starch Group	Protein Group
Fruit (size of a tennis ball)	Low sodium whole grain crackers	¼ cup hummus
1 Cup of vegetables	1 piece of whole grain toast	1 cup yogurt
1 cup vegetable soup	⅓ cup cooked brown rice	½ cup Canned plain beans or lentils (drained and rinsed)
1 cup cabbage salad (link to recipe)	2 cups popcorn	¼ cup Canned tuna/salmon (drained and rinsed)





FOOD, FUNCTIONAL FITNESS, AND FUN

Tamara Graham
Patient Partner

2015: A NEW JOURNEY BEGINS

Biopsy and official Stage 4
Chronic Kidney Disease diagnosis



- Prognosis was failure within 2 years
- Still stable in Stage 4 largely due to diet and exercise



FIRST TIME COOKING WITH TOFU

Whole wheat bun with vegan cheese, fried tofu, and raw veggies

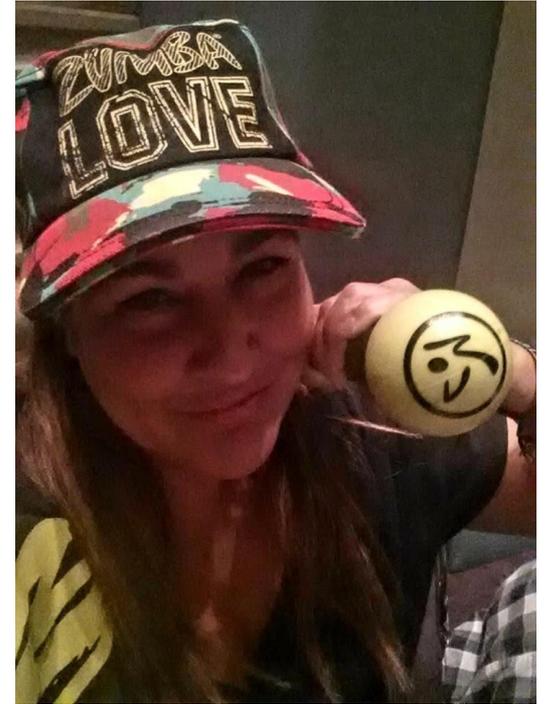
FUN IN FITNESS



2015

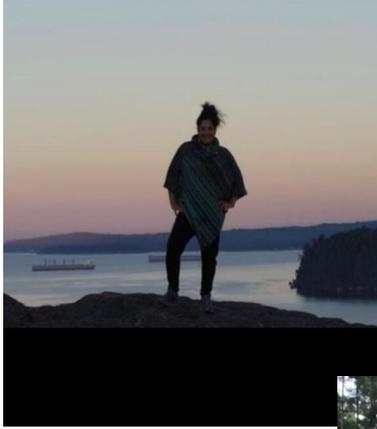


2016



2017

FITNESS AT 50



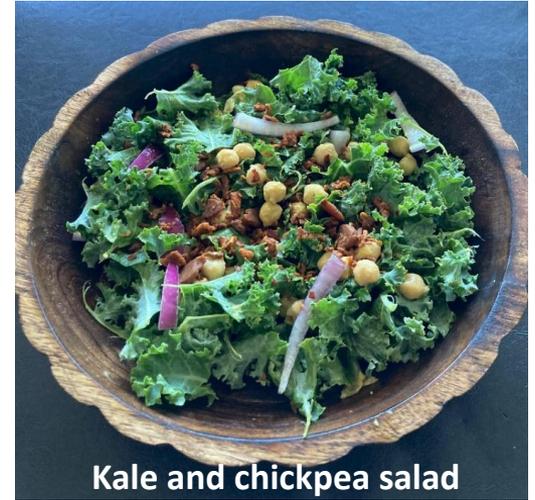
2020

PLANT PROTEIN

- Tofu
- Lentils
- Tempeh
- Chickpeas
- Beans
- Peas
- Edamame
- Soy Curls
- Quinoa

- Nutritional Yeast
- Seeds

(Hemp, Chia, Sesame, Pumpkin)



Kale and chickpea salad



Tofu with tofu peanut sauce



Cannelini bean hummus

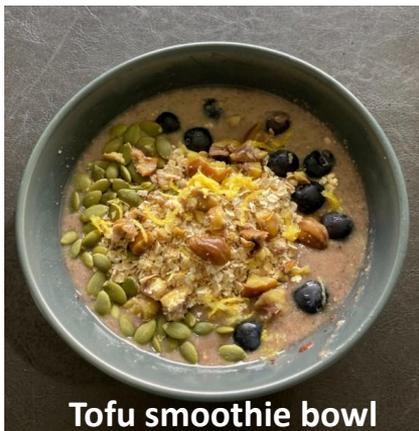


Lentil walnut spaghetti



Soy curls souvlaki

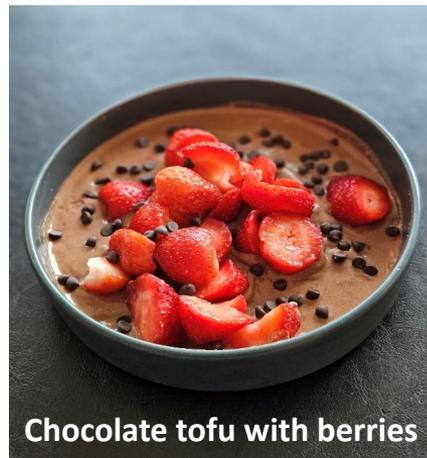
WHEN TOFU BECOMES THE STAR



Tofu smoothie bowl



Puffed tofu noodle bowl



Chocolate tofu with berries



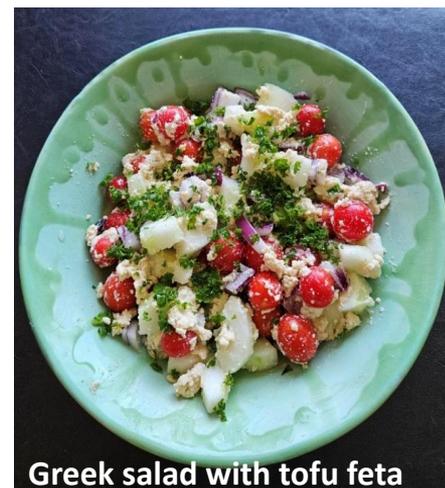
Tofu veggie skewers



Raw tofu with scallions



Tofu & cabbage dumplings



Greek salad with tofu feta

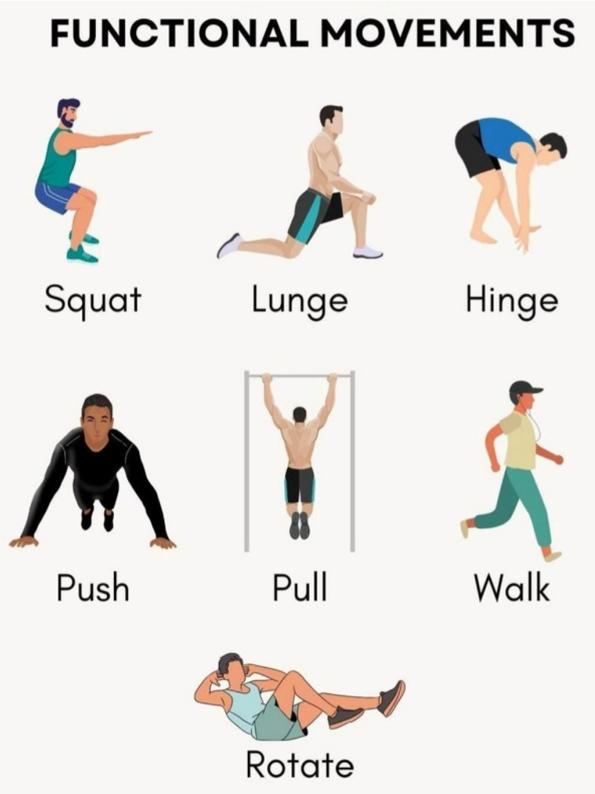


Tofu squash mac n cheese

FUNCTIONAL FITNESS

Bodyweight exercises that mimic common movements so we can safely keep doing everyday activities.

FUNCTIONAL MOVEMENTS



Squat

Lunge

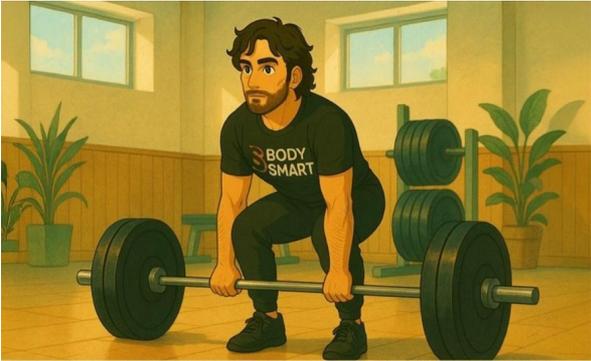
Hinge

Push

Pull

Walk

Rotate



Deadlifting will help you pick up your grandkids



7 FUNCTIONAL MOVEMENTS



EVERYDAY ACTIVITIES

TYPE

MUSCLES

MOVEMENTS

PULL

Biceps, forearms, upper and mid-back, delts



Opening doors, pulling chairs, picking up items, taking out the trash

PUSH

Chest, shoulders and triceps



Pushing doors open, putting dishes away, getting up from lying down

SQUAT

Quads, glutes, hamstrings, calves, hip flexors, adductors, abs



Sitting down, picking up a child, reaching for low-level objects

LUNGE

Abs, glutes, hamstrings, quads, calves



Walking up the stairs, hiking, walking on an incline

HINGE

Hips, glutes, hamstrings, lower back and abs



Bending at the hips, touching toes, picking up a newspaper, petting dog

ROTATION

Abs, obliques, glutes



Walking, running, throwing, kicking, reaching across your body

GAIT

Quads, hamstrings, calves, hip adductors, glutes, abs



Walking or carrying items



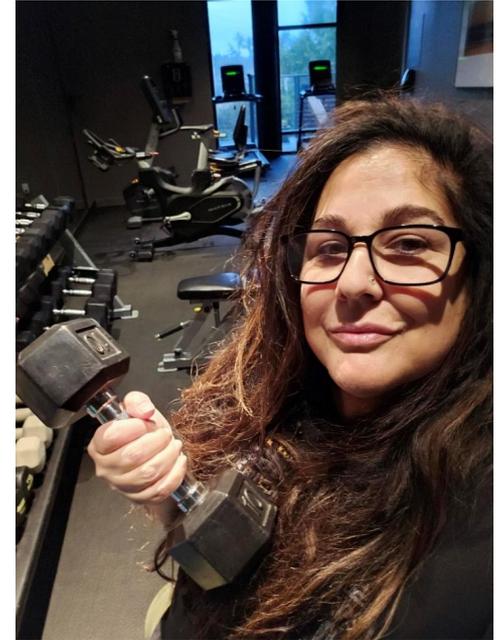
FALL 2025



The new E Bike



The end of an era

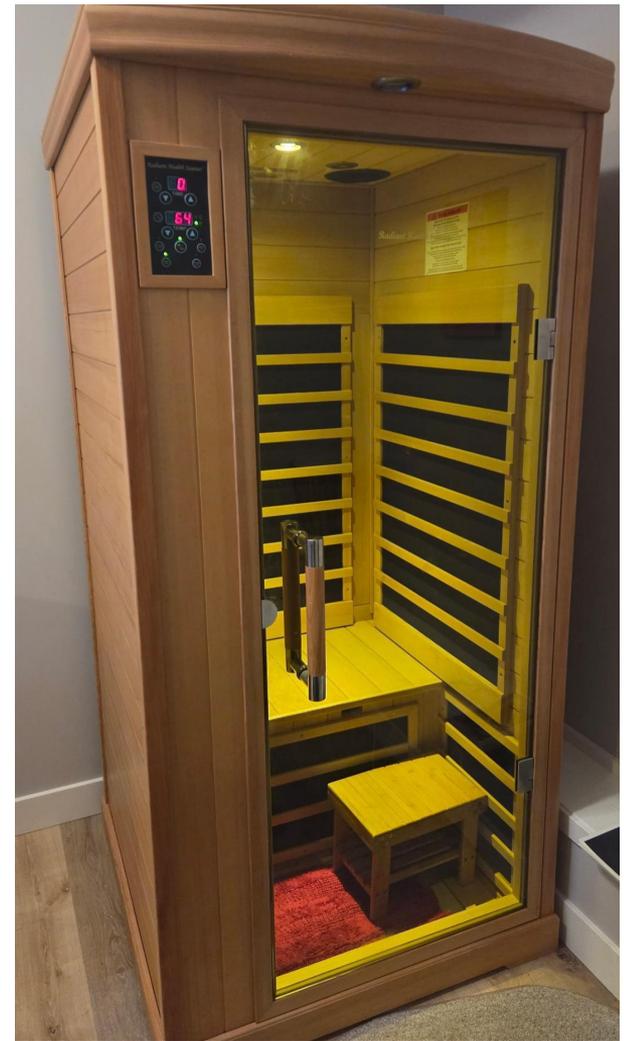


The path of resistance

UNEXPECTED CHALLENGES - A NEW PLAN



January
2026



Don:

“My Food and Movement in a Week”







Kidney Wellness
b Kid...ey Health

Opinion
Coates o

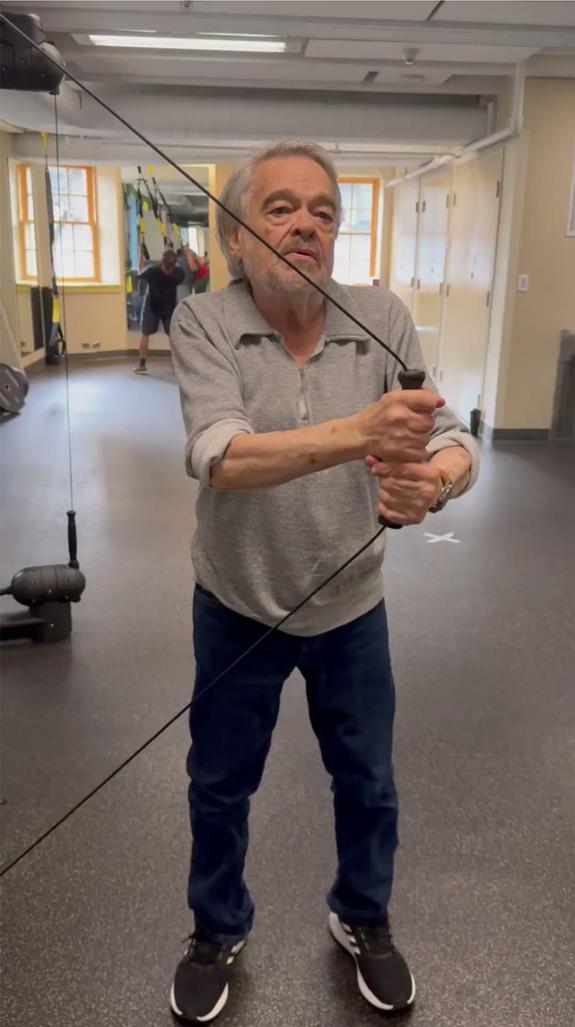
EESY SALMON
H LE...YouTube

See How
Kirk's D...

What Could Go
ong?... YouTube

0-1.jpeg

unnamed.jpg





Pro delivery
Don't → Buzz 101 OR 109
Take Pic from Outside
651-139-609

Today's Plan might:

Possibilities that may cut risk of heart failure in 4K's study suggests

Delivery...













What are you hungry for?

- RELATED • [50 Incredible Vegan Dinners](#)
- [25 Cheap Dinner Ideas For Two](#)
- [75 Cheap & Easy Dinner Recipes](#)
- [30 Winter Dinners That Come Tog](#)

40 High-Protein Vegetarian Meals So Good You Won't Miss The Meat

Plant-based proteins FTW.

By [Mackenzie Filson](#) and [Camille Lowder](#) UPDATED: JAN 21, 2025

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Questions/Discussion