



# DINH DƯỠNG ĐƯỜNG UỐNG cho NGƯỜI CAO TUỔI ± BỆNH THẬN

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Chủ tịch Hội Thận học-Lọc máu Tp HCM

Chủ tịch Hội Lọc máu Quốc tế

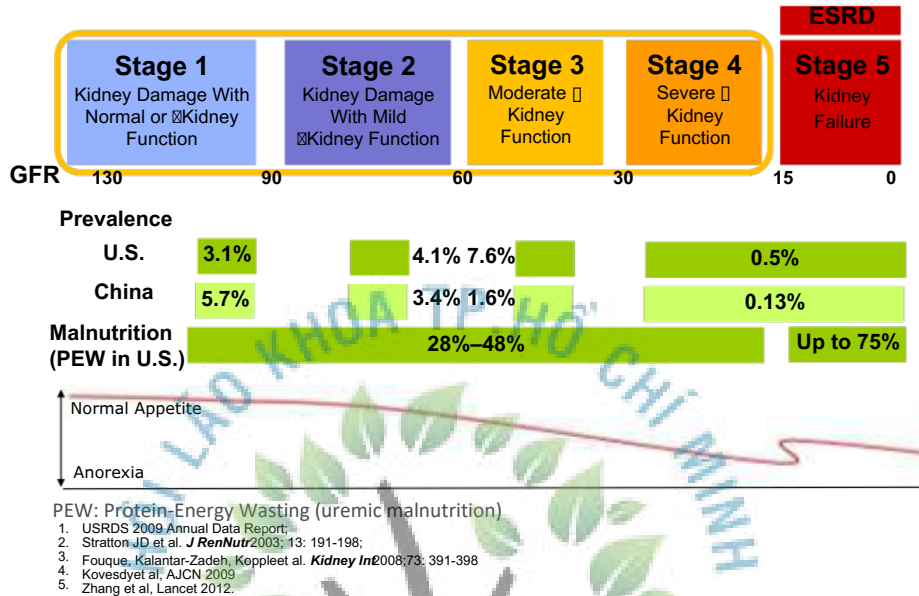
GS Thỉnh giảng ĐHYK Liege, Vương Quốc Bỉ

## KDOQI CLINICAL PRACTICE GUIDELINE for NUTRITION in CKD: 2020 UPDATE

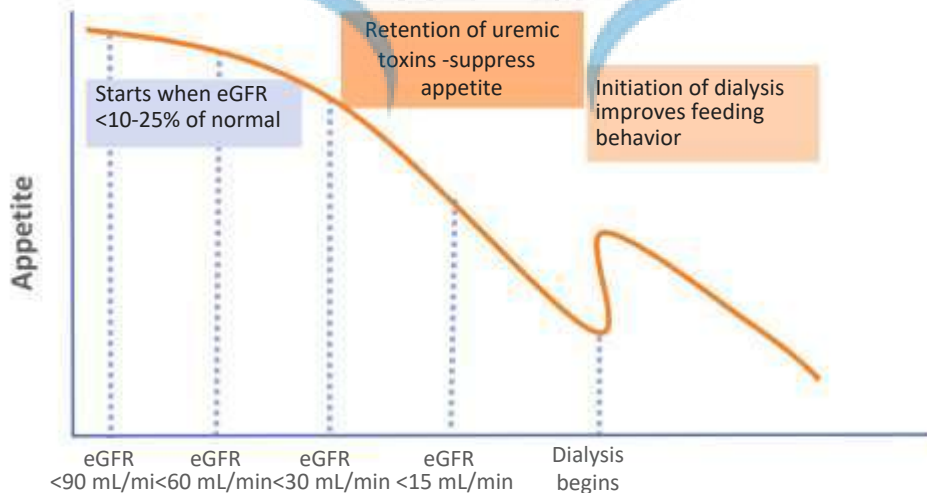
During progression of CKD, the requirements & utilization of different nutrients change significantly. → ultimately place patients with kidney disease at higher risk for nutritional & metabolic abnormalities.



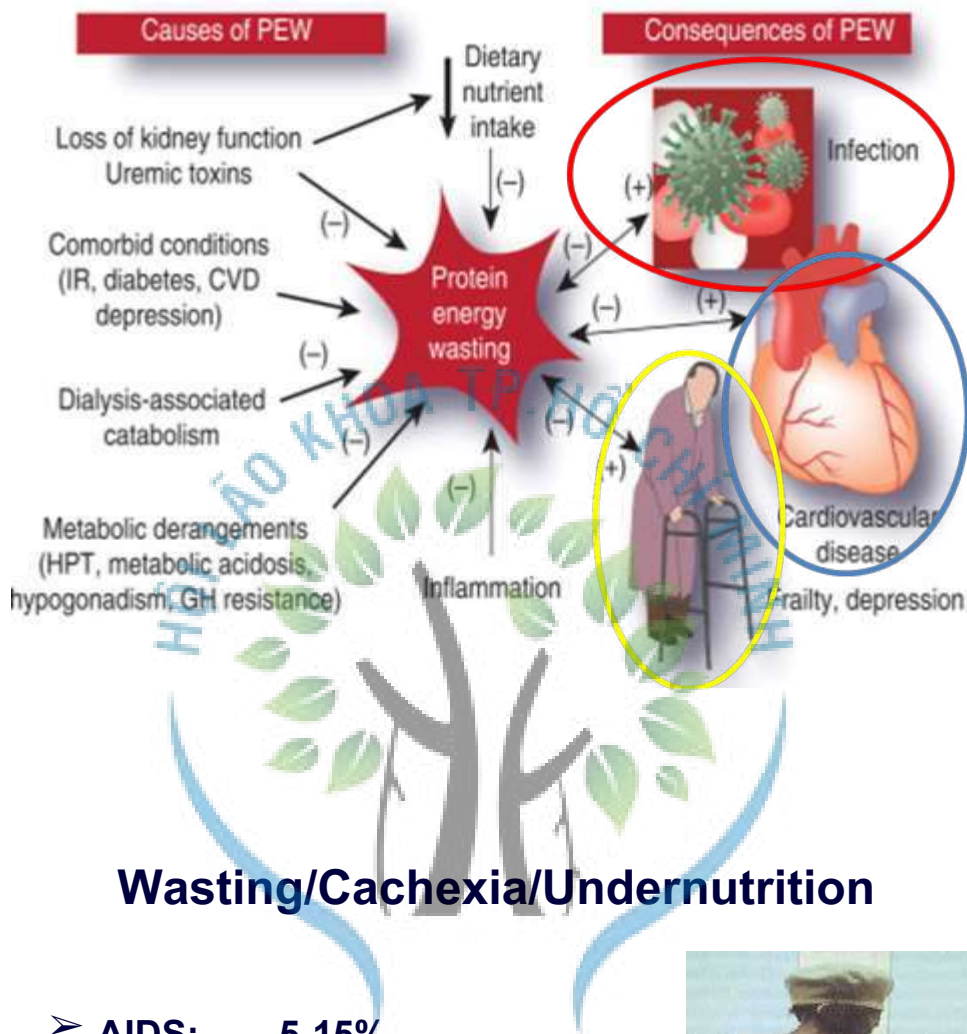
## CKD Stages & Protein-Energy Malnutrition/Wasting



## Appetite decreases as CKD progresses



Carrero JJ. *J Ren Nutr*. 2009;19:10-15.



## Wasting/Cachexia/Undernutrition

- **AIDS: 5-15%**
- **Cancer: 20-50%**
- **Oldage: 5-25%**
- **HD>CKD: 5-30%**

**>30% muscle loss**  
**• Risk of death**  
**• Pneumonia**



## Prevalence of frailty at different countries & regions.



Chan, Gordon Chun-Kauet al(2024). Frailty in patients on dialysis  
Kidney International, Volume 106, Issue 1, 35 -49

## Association Between Degrees of Malnutrition and Clinical Outcomes Among Non-critically Ill Hospitalized Adult Patients with Type 2 Diabetes Mellitus

Retrospective study, n=439



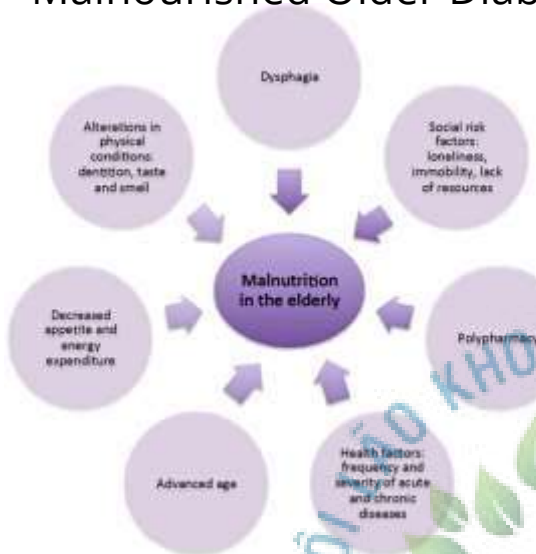
|                          | Mean Length of Stay | Mortality (n) |
|--------------------------|---------------------|---------------|
| Well-nourished:          | 4 days              | 0             |
| Moderately-malnourished: | 7 days              | 1             |
| Severely-malnourished:   | 8 days              | 9 (OR 9)      |

Severe malnutrition was associated with a longer hospital stay and higher mortality.

Spagna FD, et al.  
BMJ 2019; 369:1-11  
<https://doi.org/10.1136/bmj.n1111>

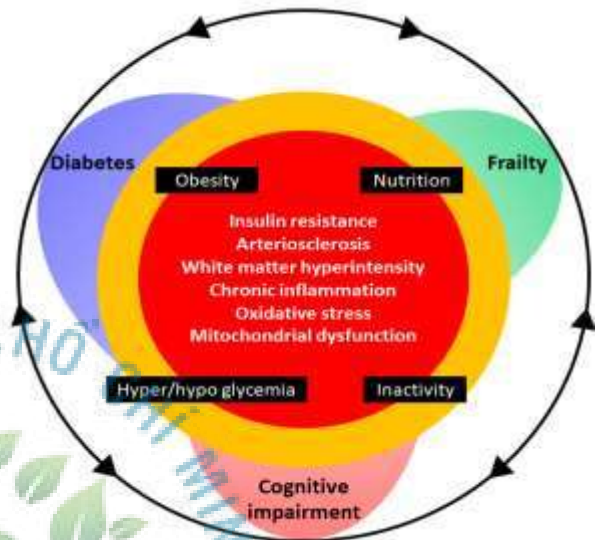


## Nutritional Status in Malnourished Older Diabetics

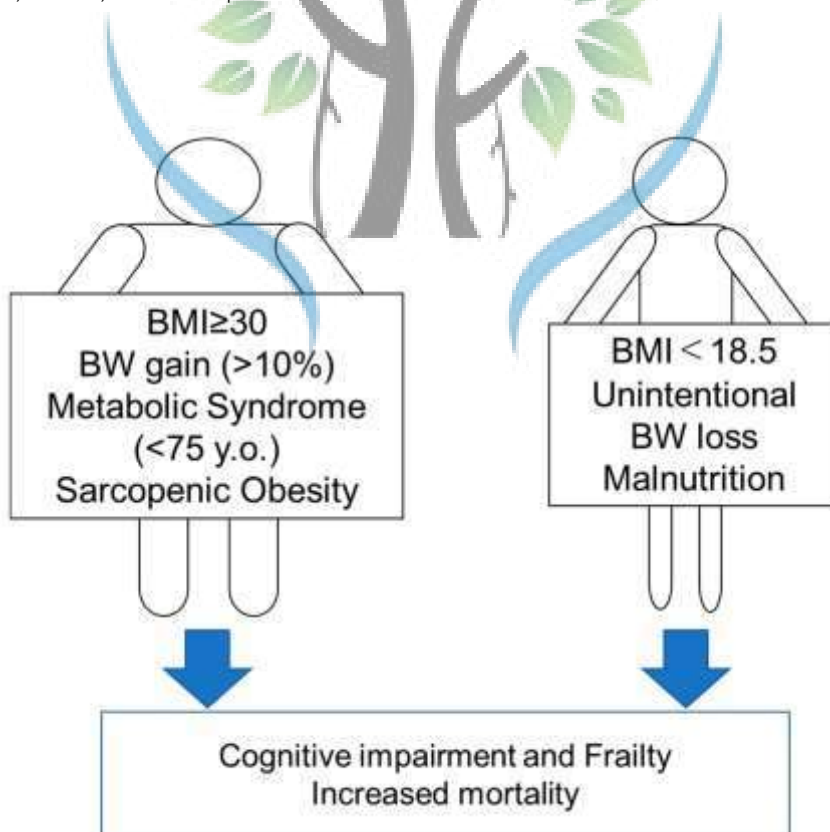


Sanz-París, A., Lardiés-Sánchez, B. (2019). Nutritional Status in Malnourished Older Diabetics. In: Preedy, V., Patel, V. (eds) Handbook of Famine, Starvation, and Nutrient Deprivation.

## Nutrition Management in Diabetes Older Adult



Tamura, Y.; Omura, T.; Toyoshima, K.; Araki, A. Nutrition Management Older Adults with Diabetes: A Review on the Importance of Shifting Prevention Strategies from Metabolic Syndrome to Frailty. *Nutrients* 2020.



Tamura, Y.; Omura, T.; Toyoshima, K.; Araki, A. Nutrition Management in Older Adults with Diabetes: A Review on the Importance of Shifting Prevention Strategies from Metabolic Syndrome to Frailty. *Nutrients* 2020, 12, 3367. <https://doi.org/10.3390/nu12113367>

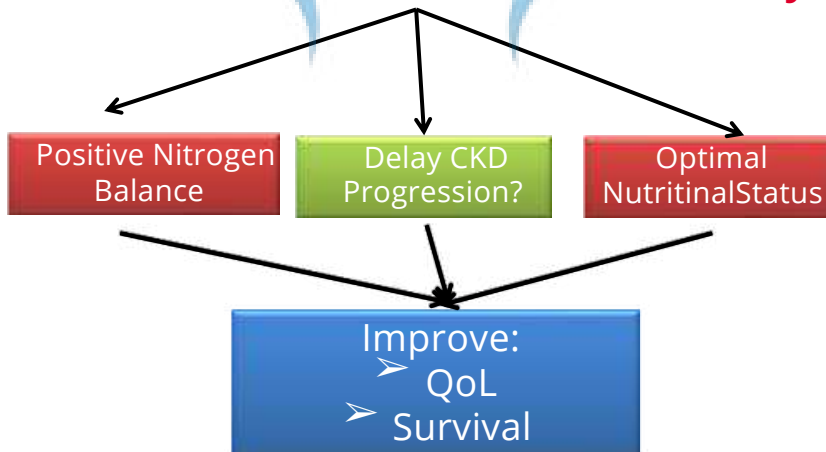
# MANAGEMENT



11

Goals

Nutritional intervention in CKD/Dialysis



12



## Protein

An essential part of the diet:

- Is needed for good health
- Repairs and replaces tissues and cells.



“BUILD BLOCKS  
of LIFE”



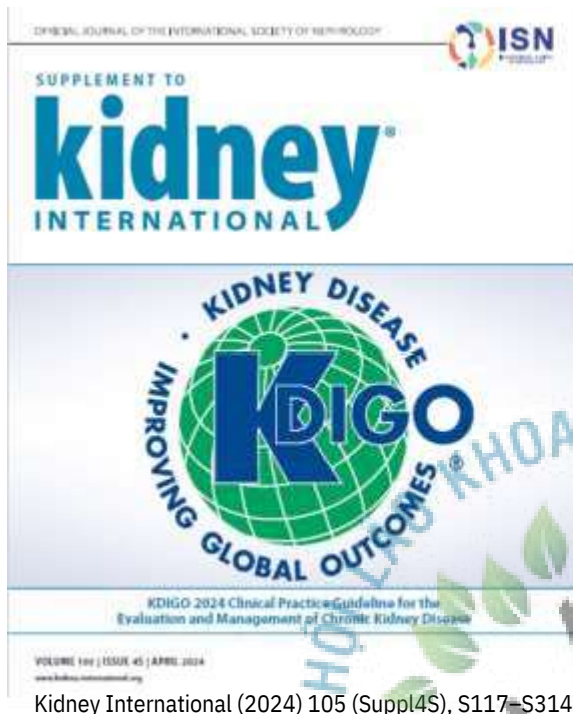
- For the prevention of frailty, optimal energy intake, sufficient protein and vitamin intake, and healthy dietary patterns should be recommended.

Tamura, Y.; Omura, T.; Toyoshima, K.; Araki, A. Nutrition Management in Older Adults with Diabetes: A Review on the Importance of Shifting Prevention Strategies from Metabolic Syndrome to Frailty. *Nutrients* 2020, *12*, 3367. <https://doi.org/10.3390/nu12113367>

## Nutritional Strategies to Prevent Muscle Loss & Sarcopenia in CKD Elderly Individuals

- Traditional recommendation for protein intake of 0.8 g of protein/kg/day for adults of all ages is currently being debated for elderly subjects.
- it is important to consider that Protein Restriction in Elderly individuals with CKD may potentially Cause or Exacerbate Sarcopenia → ↑ Risk of Adverse Outcomes: Physical Disability, Poor QoL, & †

Massini, G.; et al (2023). Nutritional Strategies to Prevent Muscle Loss and Sarcopenia in Chronic Kidney Disease: What Do We Currently Know? *Nutrients* 2023, *15*, 3107. <https://doi.org/10.3390/nu15143107>



**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).**

**Practice Point 3.3.1.1: Avoid high protein intake (>1.3 g/kg body weight/d) in adults with CKD at risk of progression.**

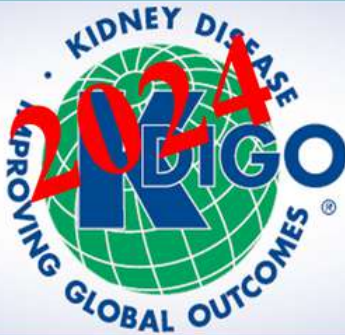
**Practice Point 3.3.1.2: In adults with CKD who are willing and able, and who are at risk of kidney failure, consider prescribing, under close supervision, a very low-protein diet (0.3–0.4 g/kg body weight/d) supplemented with essential amino acids or ketoacid analogs (up to 0.6 g/kg body weight/d).**

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

## NUTRITION: Why protein intake of 0.8 g ?

- Patients who are in advanced CKD may naturally decrease their oral intake → malnutrition.
- Limiting protein intake < 0.8 g/kg/d in a person with diabetes, who also may have been counseled to limit carbohydrates, fat, and alcohol → ↓ caloric content of the diet → significant weight loss → ↓ quality of life
- Protein intake on a diabetic diet is especially crucial to avoid episodes of hypoglycemia

KDIGO Clinical Practice Guideline on Diabetes Management in Chronic Kidney Disease 2020



The Work Group considers that the **evidence does not support a recommendation to follow low-protein diets alone (i.e., 0.4–0.6 g/kg of body weight/d) as a strategy to slow the progression of CKD.**

- In a **meta-analysis** of people with CKD without diabetes: **a low-protein diet compared with a normal-protein diet in participants with CKD G3a and G3b (9 studies) or CKD G4 (1 study) found little or no difference in mortality or eGFR**

Recommendation 3.1.1: We suggest maintaining a **protein intake of 0.8 g protein/kg (weight)/d** for those with CKD not treated with dialysis (2C). [Click to add title](#)

- Practice Point 3.1.2: Patients treated with **hemodialysis, and particularly peritoneal dialysis**, should consume between **1.0 and 1.2 g protein/kg (weight)/d**.
- Recommendation 3.1.2: 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 patients with diabetes and CKD (2C).
- Practice Point 3.1.3: Shared decision-making should be a cornerstone of patient-centered nutrition management in patients with diabetes and CKD.
- Practice Point 3.1.5: Health care providers should **consider cultural differences, food intolerances, variations in food resources, cooking skills, comorbidities, and cost when recommending dietary options to patients and their families.**

## More Protein Is Advantageous for Elderly Patients With CKD

- In old age → Protein requirement increases.
- Recommended protein intake is between 1.0 & 1.2 g per kg of actual body weight per day.
- For elderly patients with acute & chronic illnesses, injuries, or malnutrition, the protein requirement may be higher.

Nadine Eckert. *More Protein Is Advantageous for Elderly Patients With CKD*-Medscape-August 26, 2024.



- Để tổng hợp protein, cơ thể cần phải có đầy đủ các loại axit amin (thiết yếu + không thiết yếu) với tỉ lệ cân đối:
- Trong đó, có 8 loại axit amin thiết yếu không thể tổng hợp trong cơ thể, rất cần cung cấp từ nguồn dinh dưỡng bên ngoài.



## Protein Synthesis

Requires 20 Amino Acids

**ESSENTIAL** (Cannot be synthesized in the body; must be supplied from the diet)

- Leucine
- Valine
- Isoleucine
- Methionine
- Phenylalanine

Lysine  
Threonine  
Tryptophan  
Histidine

Provided from  
out-of-body sources

**NON-ESSENTIAL** (Can be synthesized through intermediary metabolism)

- Alanine
- Aspartic Acid
- Cysteine
- Serine
- Asparagine
- Tyrosine
- Glutamic Acid
- Glycine
- Proline

**CONDITIONALLY ESSENTIAL** (During hypermetabolic catabolism)

- Glutamine
- Arginine

BorumPR. Nutrient metabolism. In *The Science and Practice of Nutrition Support. A Case-Based Core Curriculum*. Silver Spring, MD, ASPEN2001; pp 17-30.

## Protein Problem in CKD/DIALYSIS patients

People having dialysis treatment should include “high quality” protein foods in the diet.

Foods containing protein used easily by the body & should be eaten at least twice per day.

- Meat
- Chicken
- Fish
- Eggs
- Milk and dairy food

➤ Anorexia/Appetite  
➤ ↑↑ PHOSPHATE

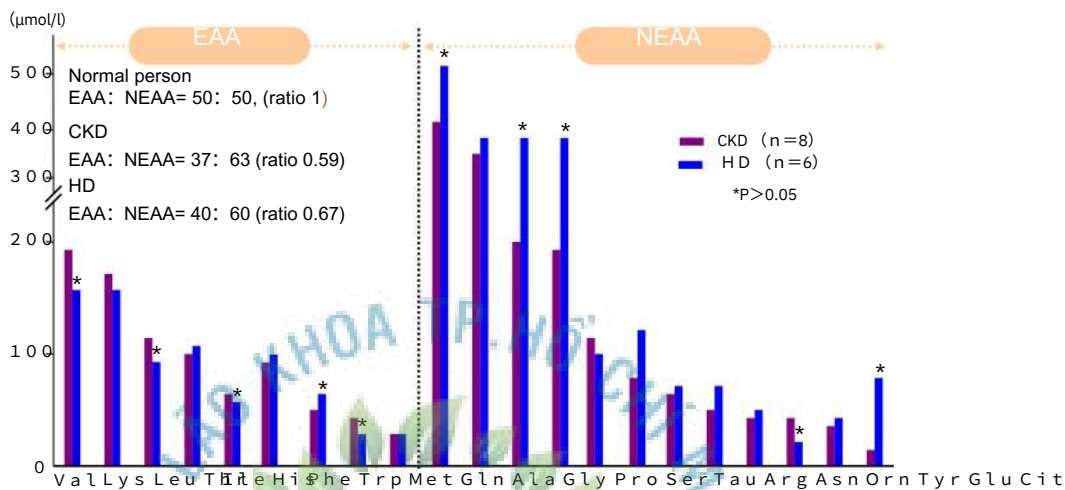
Protein  
Intake  
Insufficiency

- Nuts, beans, veggies, and cereal foods, but in lower amounts.

✓ When  $GFR < 10\text{ml/min}$  → CKD Pts themselves ↓protein intake  $< 0,6\text{g/kg/day}$ .



## Aminogram of CKD(plasma)



Decreased  
Essential amino-acids

Increased  
Non Essential amino-acids

原陽子他: 臨床栄養 VOL. 83 No.7 1993.12

## Nutrient Needs of CKD Patients as Defined by ESPEN Guidelines\*

| Condition                        | Protein<br>(Essential and Non-essential<br>Amino Acids) | Macronutrients<br>Energy<br>(non-protein calories) |
|----------------------------------|---------------------------------------------------------|----------------------------------------------------|
| <b>Non-dialysis CKD patients</b> |                                                         |                                                    |
| GFR = 25-70 mL/min               | 0.55-0.60 <sup>a</sup> (2/3 HBV)                        | 30-40 kcal/kg/d <sup>a</sup>                       |
| GFR < 25 mL/min                  | 0.55-0.60 (2/3 HBV)<br>or<br>0.28+EAA or EAA+KA         |                                                    |
| <b>Hemodialysis</b>              | 1.2-1.4 (>50% HBV)                                      | 35 kcal/kg/day                                     |
| <b>CAPD</b>                      | 1.2-1.5 (>50% HBV)                                      | -                                                  |

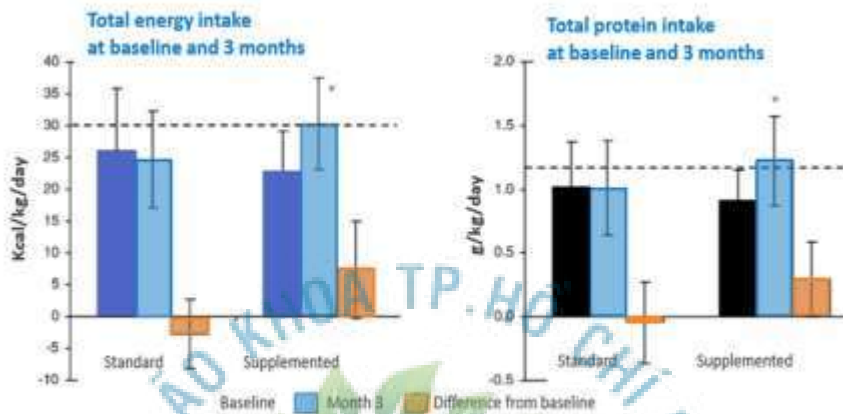
GFR = glomerular filtration rate; HBV = high biological value; EAA = essential amino acids; KA = ketoanalogues; CAPD=Continuous ambulatory peritoneal dialysis.

<sup>a</sup>Adapted to catcholism levels and to individual needs in case of underweight or obesity.

<sup>b</sup>Adjust as necessary for obese patients.

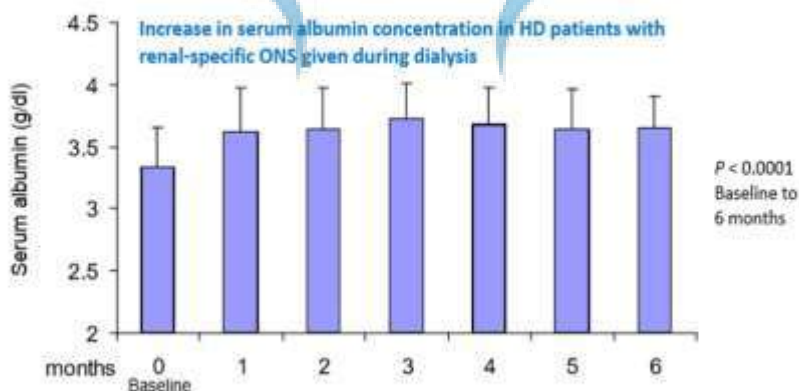
Case III, et al. Clin Nutr 2009;28(4):401-414.

## Renal-specific ONS increased intake energy and protein intake



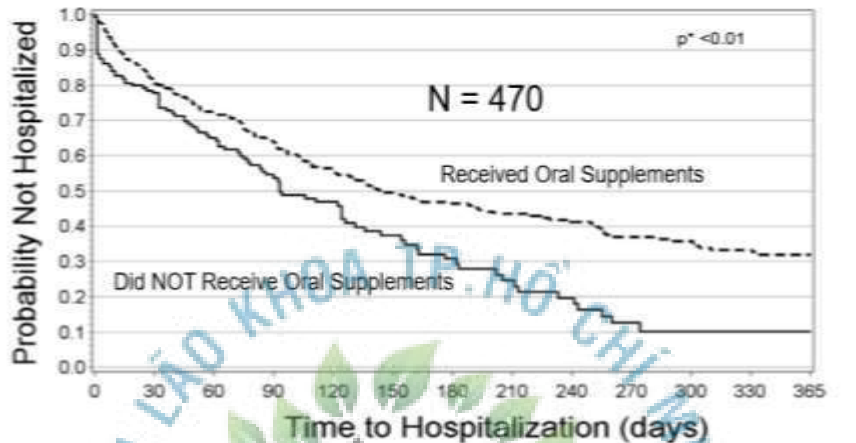
Pouque D, et al. *Nephrol Dial Transplant*. 2008;23:2902-2910.

## Serum albumin, prealbumin, and SGA scores increase with renal-specific ONS



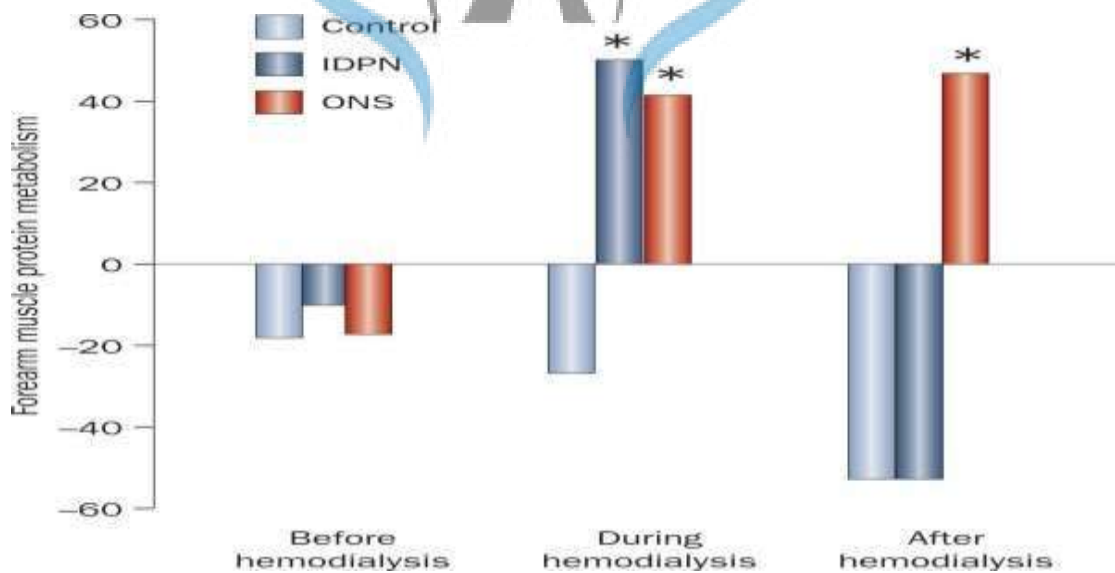
Caglar K, et al. *Kidney Int*. 2002;62:1056-1059.

### Receipt of Oral Supplements is Associated with Improved Hospitalization in MHD Patients



Cheu C et al. CJASN 2012

Diets and enteral supplements for improving outcomes in CKD



Ikizler TA. Clin J Am Soc Nephrol. 2013 Dec;8(12):2174-82. doi: 10.2215/CJN.04630513. Epub 2013 Aug

## PROSOURCE

- Tiêu chuẩn chất lượng axit amin PDCAAS100
- Cung cấp lượng đạm tinh khiết và các axit amin trong :
  - Suy dinh dưỡng đạm
  - Suy nhược cơ thể
  - Có nguy cơ /suy giảm thể trọng do bệnh lý (vd: CKD)
  - Bổ sung đạm giúp nâng nồng độ Albumine
  - Nhu cầu bổ sung hàm lượng đạm cao trong thể tích nước thấp



## PROSOURCE

- Ít Kali
- Ít Natri
- Ít Photpho

- Dễ hoà tan trong thức ăn và nước uống (chỉ cần lượng nước tối thiểu)
- Hơn 17 năm tín nhiệm tại các bệnh viện ở Hoa Kỳ



| Nutrition Facts                                                                                                                                                            |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 36 servings per container                                                                                                                                                  |           |
| Serving size 1 Scoop (7.5g)                                                                                                                                                |           |
| Amount Per Serving                                                                                                                                                         |           |
| <b>Calories</b>                                                                                                                                                            | <b>30</b> |
| % Daily Values*                                                                                                                                                            |           |
| Total Fat 0g                                                                                                                                                               | 0%        |
| Saturated Fat 0g                                                                                                                                                           | 0%        |
| Trans Fat 0g                                                                                                                                                               | 0%        |
| Cholesterol 10mg                                                                                                                                                           | 3%        |
| Sodium 45mg                                                                                                                                                                | 2%        |
| Potassium 10mg                                                                                                                                                             | 0%        |
| Phosphorus 35mg                                                                                                                                                            | 2%        |
| Total Carbohydrate 1g                                                                                                                                                      | 0%        |
| Dietary Fiber 0g                                                                                                                                                           | 0%        |
| Total Sugars 0g                                                                                                                                                            | 0%        |
| Includes 0g Added Sugars                                                                                                                                                   | 0%        |
| Protein 6g                                                                                                                                                                 | 12%       |
| Vit. D 0mcg 0% • Calcium 44mg 3%                                                                                                                                           |           |
| Iron 0mg 0%                                                                                                                                                                |           |
| *The % Daily Values (DV) listed here are based on a nutrient in a serving of food contributing to a daily diet. 2,800 calories a day is used for general nutrition advice. |           |

- **Prosource** cung cấp 20 loại axit amin, đặc biệt bổ sung đầy đủ 8 loại axit amin thiết yếu với tỉ lệ cân đối cần thiết cho cơ thể
- Đạm Whey/Prosource còn đạt tiêu chuẩn PDCAAS 100 về bổ sung & hấp thu protein

## RENAMENT

- ↓ Nguy cơ chạy thận sớm ESRD?
- ↑ cường sức đề kháng CKD-ESRD-Dialysis.
- Bệnh nhân ăn uống kém.
- Bệnh nhân suy kiệt.
- Người lớn tuổi
- Người ăn kiêng, biếng ăn



## RENAMENT

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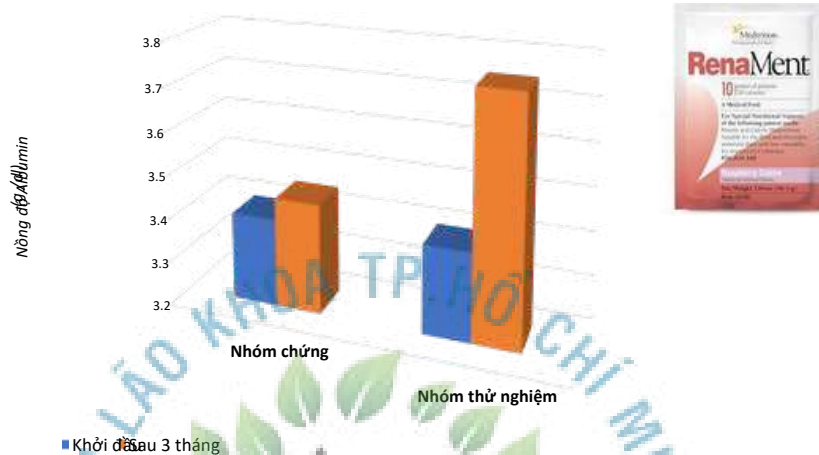
## RENAMENT

### Hỗ trợ điều trị bệnh thận - lọc máu

- Ít Kali
- Ít Natri
- Ít Photpho
- Giàu năng lượng
- Hòa tan hoàn toàn trong thể tích nước thấp
- Giàu đậm sinh học, tiêu chuẩn PDCAAS 100
- Vị trái cây dễ sử dụng.



## Đạm Sinh Học giúp tăng nồng độ Albumin ở bệnh nhân suy thận-lọc máu



PittaulisA, Phillip E. (2007). Can oral supplementation with a collagen-casein based hydrolyzed liquid protein improve serum albumin levels in hypoalbuminemic hemodialysis patients? *Dialysis & Transplantation*; 36,5:258-265

### Char acteristic

-Essential Amino Acids for Renal Failure-  
AMIYU® Granules

- Improvement clinical symptom and the delay of disease aggravation.
- Decreased blood urea nitrogen and the ratio of blood urea nitrogen/serum creatinine.
- Increased total protein and albumin.
- Increased red blood cells and hemoglobin.
- Elevated hematocrit level and improving anemia.

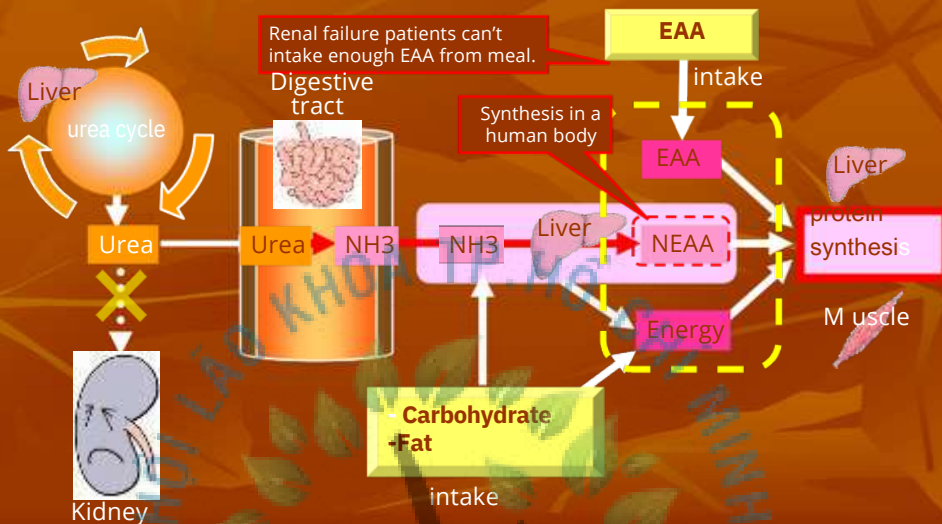
### Content



| Active Ingredients        | Content per 2.1236mg EAA per sachet |
|---------------------------|-------------------------------------|
| L-isoleucine              | 203.9 mg                            |
| L-leucine                 | 320.3 mg                            |
| L-lysine hydrochloride    | 291.0 mg                            |
| L-methionine              | 320.3 mg                            |
| L-phenylalanine           | 320.3 mg                            |
| L-threonine               | 145.7 mg                            |
| L-tryptophan              | 72.9 mg                             |
| L-valine                  | 233.0 mg                            |
| L-histidine hydrochloride | 216.2 mg                            |
| Amino acids total         | 2123.6 mg                           |

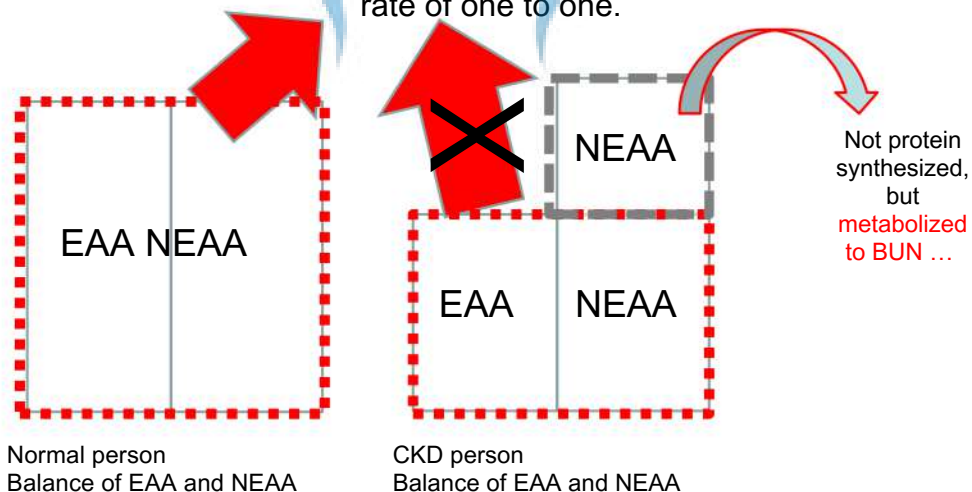
## Essential amino acid therapy

The patients with renal failure need low protein diet because of increasing urea nitrogen such as BUN, Cr...

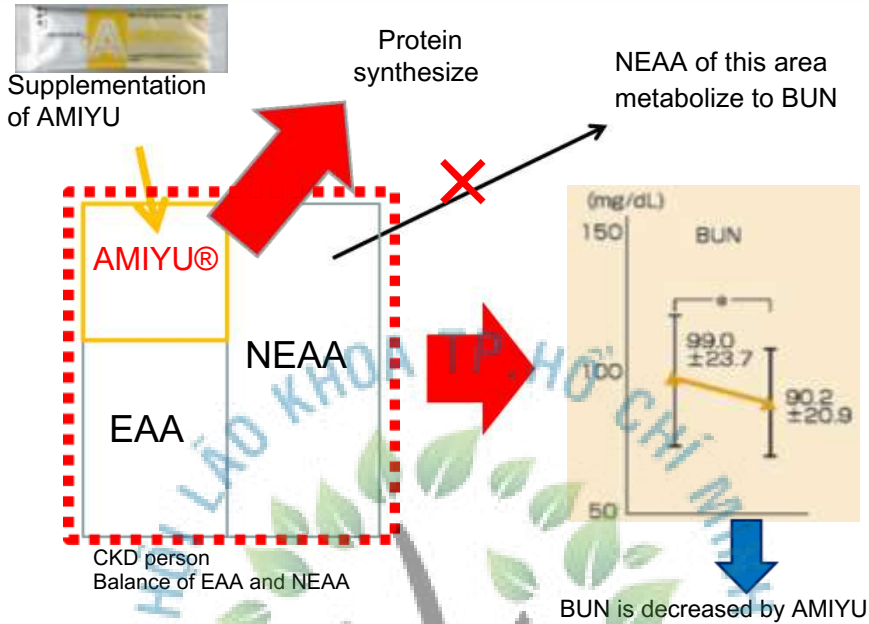


## Does AMIYU increase BUN??

Protein is synthesized with rate of one to one.



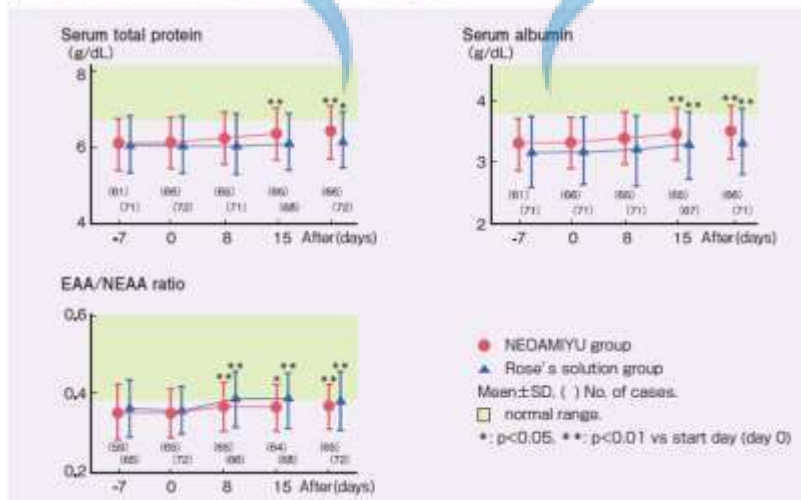
## Does AMIYU increase BUN??



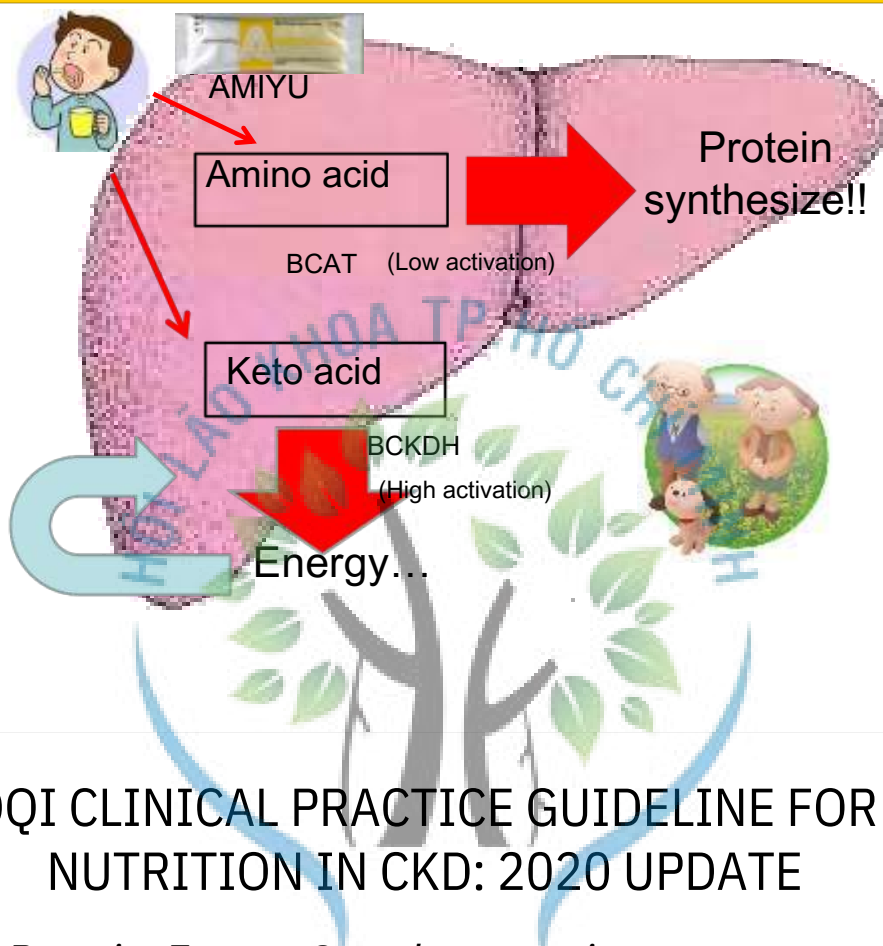
### Serum total protein, serum albumin, and EAA/NEAA ratio elevated significantly.

#### ● Improvement effect of nutritional state

Indices of nutritional state, that is, serum total protein, serum albumin, and serum aminogram (EAA/NEAA ratio) elevated after administration in both groups.



## Mechanism of Ketoacids and Amino acids.



## KDOQI CLINICAL PRACTICE GUIDELINE FOR NUTRITION IN CKD: 2020 UPDATE

### Oral Protein-Energy Supplementation

- 4.1.1 In adults with CKD 3-5D (2D) or posttransplantation(OPINION) at risk of or with protein-energy wasting, we suggest a minimum of a 3-month trial of oral nutritional supplements to improve nutritional status if dietary counseling alone does not achieve sufficient energy and protein intake to meet nutritional requirements.

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