

Muscle Loss and Protein Supplementation in dialysis patients

Clinical Paper Review

Dietary Protein and Physical Activity Interventions to Support Muscle Maintenance in End-Stage Renal Disease Patients on Hemodialysis

Hendriks FK et al.

Maastricht University Medical Centre

Nutrients 2019, 11, 2972;

UK Clinical Experience

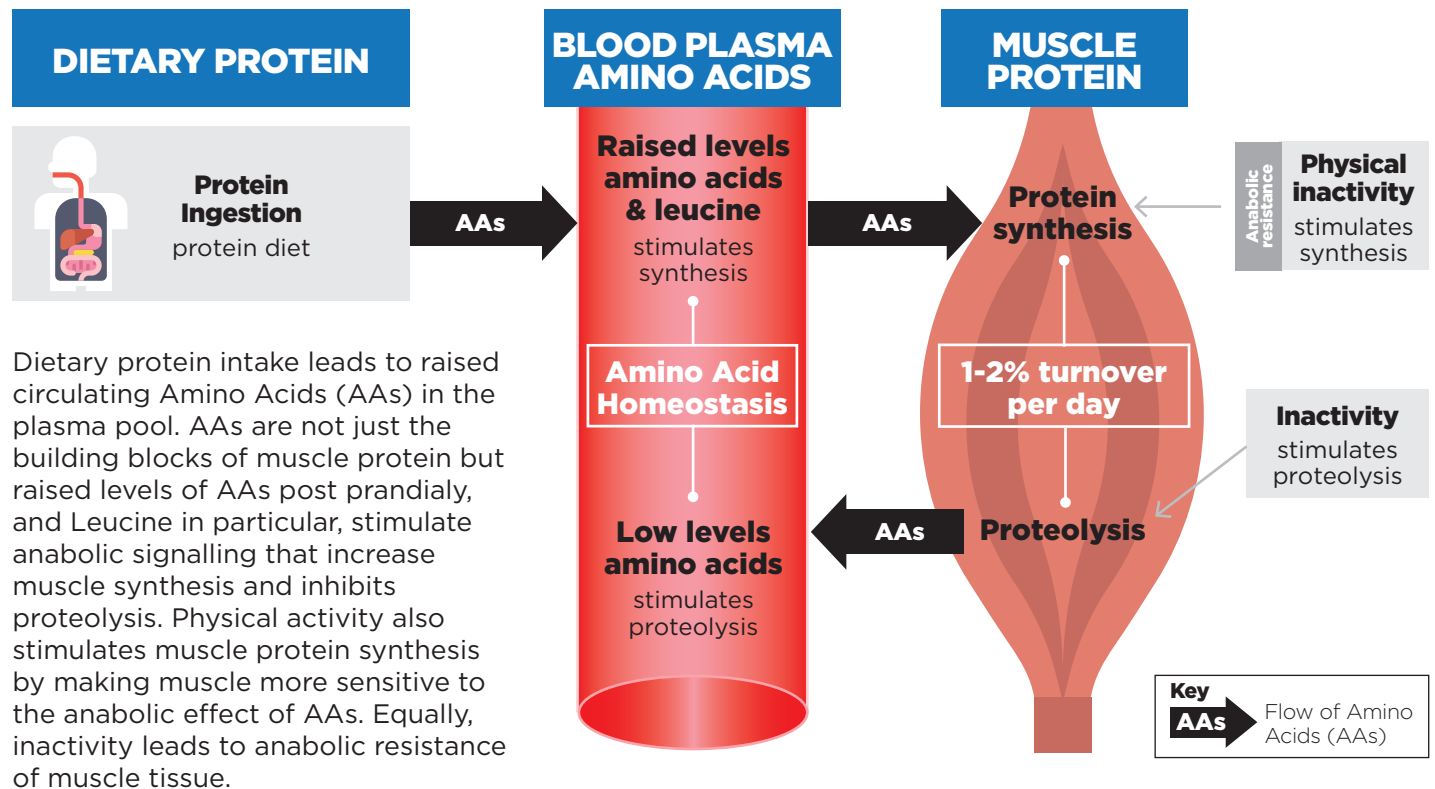
The role of Protein Supplementation for the Management of Protein-Energy Wasting in Chronic Kidney Disease

Jesty K.

Royal Berkshire NHS Foundation Trust

Complete Nutrition (CN), 21 (6): 57-59

Retention of muscle protein in healthy adults



Dietary Protein & Muscle Mass in Haemodialysis Patients

Hendriks F et al. Nutrients, Dec 2019

Dialysis...

reduces protein appetite

In chronic haemodialysis patients “studies have observed dietary protein intake of 0.9-1.0g protein/kg/day. On dialysis days, factors such as time constraints and reduced appetite make it difficult for patients to consume ample dietary protein. ... ~0.8 g protein/kg on dialysis days compared to ~1.0 g protein/kg on non-dialysis days.”

“We suggest that haemodialysis patients should ingest well above 20g high-quality protein per main meal to compensate for the blunted muscle protein synthetic response to feeding,”

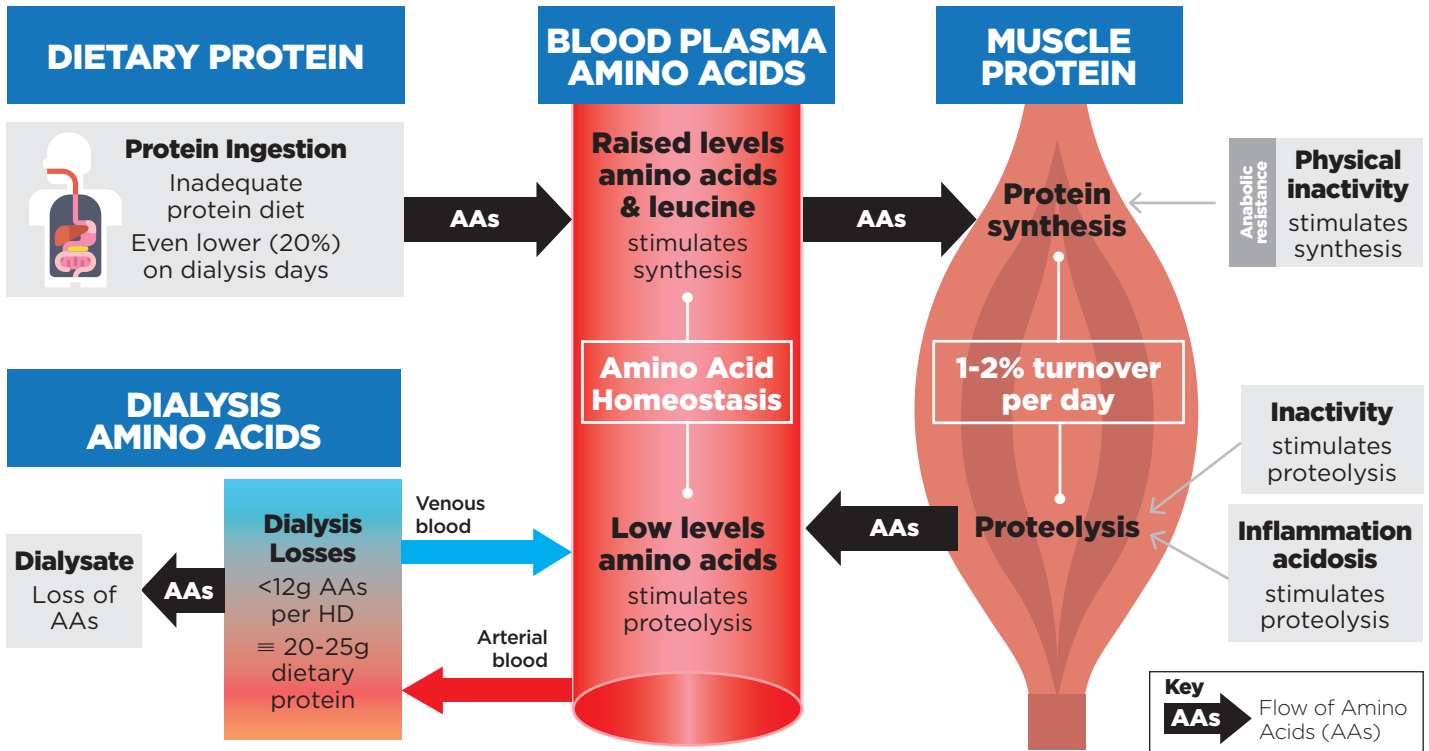
increases protein losses

“the protein equivalent of a meal is extracted from the circulation during HD”

“During a single HD session, ~12g amino acids are extracted from the circulation in haemodialysis patients... This amount equals the quantity of amino acids that are released into the circulation following ingestion of a typical meal (containing 20-25g protein).

“Provision of protein-rich nutrition during HD is often recommended to increase dietary protein intake on dialysis days. Ingestion of 40-60 g protein has been shown to prevent the HD-induced decline in plasma amino acid concentrations in multiple studies.”

Loss of muscle protein in chronic HD patients



“The gradual loss of skeletal muscle mass in HD patients accelerates after initiation of intermittent HD treatment. Muscle protein breakdown rates in Chronic Haemodialysis patients are increased, while muscle protein synthesis rates fail to match this increase due to insufficient protein ingestion, amino acid extraction during HD, and the

prevalence of anabolic resistance. Protein intake of CHD patients should be increased on dialysis days to compensate for extraction of circulating amino acids during HD and to compensate for the blunted muscle protein synthetic response to feeding in these patients.”

Dialysis...

stimulates proteolysis

“Previous work has reported increased muscle proteolysis in haemodialysis patients due to inflammation, metabolic acidosis, and the dialysis procedure itself”.

“The HD-induced decline in plasma amino acid concentrations has been shown to cause substantial catabolism of skeletal muscle tissue in fasted haemodialysis patients.”

increases anabolic resistance

“Haemodialysis patients suffer from a blunted muscle protein synthetic response to feeding, ... it has been shown that the anabolic resistance of skeletal muscle tissue can be overcome through ingesting a greater amount of protein (at least 30g of a high-quality protein).”

“Haemodialysis patients will need to ingest well above 20g high-quality protein during HD to allow a post-prandial increase in skeletal muscle protein synthesis and an inhibition of proteolysis.”

increases muscle loss

“Loss of skeletal muscle mass and strength predisposes CHD patients to frailty and substantially reduces their quality of life. Furthermore, the decline in skeletal muscle mass and strength is associated with higher hospitalization and mortality rates in CHD patients.”

UK Clinical Experience

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Clinical Practice Summary

Protein-energy wasting	“PEW is a form of malnutrition commonly seen in CKD, especially those on dialysis. It is associated with significant morbidity and mortality.”
Protein target	“For both dialysis modalities, we assume a minimum protein requirement of 1.2g/kg IBW/day but requirements can often be as high as 1.4g/kg IBW in those with comorbidity.”
Protein source	“we usually aim for around 70% of total protein intake to come from higher quality proteinFoods of animal origin and soya protein tend to score best on the various measures of protein quality. In general, it is often easier for those who consume meat and fish to meet their minimum protein requirements.”
Protein intake	“For those on haemodialysis, we heavily promote the consumption of significant amounts of protein a) prior to leaving home or en route to the unit and b) during the first hour or two of dialysis. This may include protein from oral nutrition supplements (ONS)”
Protein and muscle loss	“It has been shown that a dialysis-induced fall in plasma amino acids leads to muscle protein breakdown, but if the plasma amino acid pool is augmented from protein digestion during dialysis, then the balance of muscle protein synthesis and breakdown can prevent such muscle loss.”

Protein intake on dialysis

“we aim for an intake of at least 25-30g protein in total before and during dialysis. The types of protein source recommended as options will depend upon patients’ usual blood potassium and phosphate levels as well as their haemodynamic stability (as some can only tolerate small volumes of food or drink on dialysis ... where there is any doubt we would rather prescribe extra protein in order to decrease the risk of PEW.”

Protein supplements

“Patients need guidance on how to achieve their protein and calorie requirements. ONS products and modular protein supplements can be very useful in this regard.” Regarding product choice consider:

1. protein content (range from 12g-20g)
2. protein quality (essential amino acid profile)
3. energy content (calories may or may not be needed)
4. volume (important where fluid restricted)
5. micronutrients (limit potassium, phosphate, sodium calcium.)
6. ease of use (ready to use products versus powders)
7. patient preference (is the patient prepared to take it?)

Protein and physical activity

“Dialysis patients can often be relatively sedentary and this contributes to loss of muscle mass and functional capacity. Resistance exercise in particular has been shown to mitigate such losses.”

Renapro[®] Shot

Oral & tube feed

HIGH PROTEIN CONTENT

- **20g protein**
- **All essential amino acids**

LOW CALORIE

- Only 100kcal
- 2.9g carbohydrate, <0.5g fat
- Avoids over-feeding on calories

LOW VOLUME

- Only 60ml fluid
- Water-like viscosity
- Ideal where fluids restricted

LOW MINERAL CONTENT

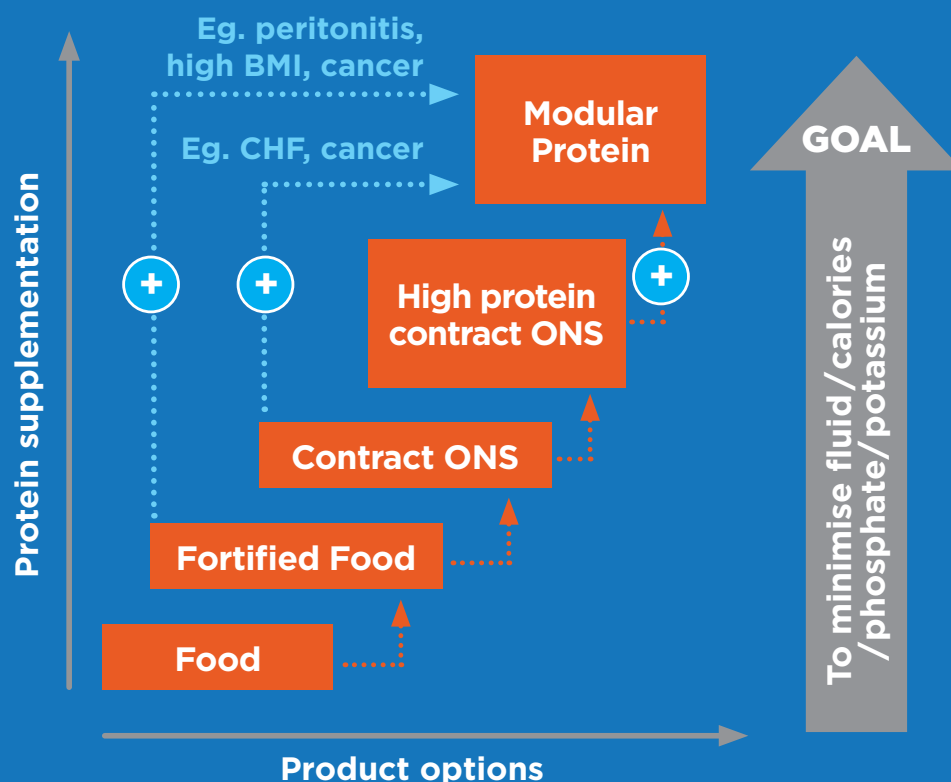
- 12mg potassium, 1.6mg phosphorus
- Ideal for renal patients

WELL TOLERATED

- Halal & Kosher certified
- Milk free, non-allergenic, gluten free
- Contains hydrolysed collagen of bovine source

HIGHLY PALATABLE

- Cola, Peach, and Wild Berry flavours
- Pleasant, ready to drink shot
- Virtually no after-taste



Protein requirements of patients can be met by food, contract ONS products and modular proteins. The choice of supplement has to be balanced against the requirement not to exceed calorie requirements and to minimise additional fluid, phosphate and potassium.



NEW... ACBS indication for hypoproteinaemia*

Renapro[®] Shot

Product data sheet

1. TRADE NAME OF THE FOOD FOR SPECIAL MEDICAL PURPOSES

Renapro[®] Shot

2. INDICATIONS

For the dietary management of hypoproteinaemia.

For the dietary management of dialysis patients with biochemically proven hypoproteinaemia on the recommendation of a specialist dietitian.

Renapro[®] Shot may be used in gluten and fibre-free diets with defined protein and electrolyte content.

Nutritionally incomplete. Suitable for supplemental nutrition.

Suitable for use in adults and children, but not for infants below 1 year of age.

3. NUTRITIONAL COMPOSITION

	per 100ml	per 60ml		per 100ml	per 60ml
Nutrient:			Carbohydrates	4.9 g	2.9 g
Energy	711 kJ	427 kJ	of which sugars (= Fructose)	4.9 g	2.9 g
	167 kcal	100 kcal			
Protein	33 g	20 g	Fat	<0.5 g	<0.5 g
Essential Amino Acids:			of which saturated fatty acids	<0.1 g	<0.1 g
Isoleucine	0.50 g	0.30 g	Fibre	0 g	0 g
Leucine	0.96 g	0.57 g	Minerals:		
Lysine	1.12 g	0.67 g	Sodium	160 mg (6.96 mmol)	96 mg (4.18 mmol)
Methionine	0.20 g	0.12 g	Potassium	20 mg (0.52 mmol)	12 mg (0.31 mmol)
Phenylalanine	0.69 g	0.42 g	Calcium	15 mg (0.38 mmol)	9 mg (0.22 mmol)
Threonine	0.63 g	0.38 g	Magnesium	3.0 mg (0.13 mmol)	1.8 mg (0.074 mmol)
Tryptophan	0.10 g	0.06 g	Phosphorus	2.6 mg (0.08 mmol)	1.6 mg (0.052 mmol)
Valine	0.79 g	0.48 g	Osmolality = 114mOsm/kg water		
Conditionally Essential Amino Acids:			Phosphorus-Protein-relationship: 0.08		
Histidine	0.26 g	0.16 g	Ingredients:		
Arginine	2.77 g	1.66 g	Water, bovine collagen peptides, acidifier (citric acid), fructose, preservation (potassium sorbate, sodium benzoate), sweetener (sucralose), flavour.		
Glutamine	4.09 g	2.46 g			
Glycine	6.80 g	4.08 g			
Proline	3.80 g	2.28 g			
Tyrosine	0.17 g	0.10 g			
Non Essential Amino Acids:					
Alanine	2.67 g	1.60 g			
Asparagine	2.18 g	1.31 g			
Serine	1.12 g	0.67 g			
Hydroxy-Lysine	0.40 g	0.24 g			
Hydroxy-Proline	3.76 g	2.26 g			

4. DOSAGE

The amounts may need to be modified according to the age and clinical condition of the patient.

Referral to a dietitian is always recommended when there is any doubt about an individual patient's nutritional requirement.

Dosage for Children: As prescribed by a physician or dietitian - depending on dietary conditions & protein requirements.

5. DIRECTIONS FOR USE

Renapro[®] Shot is a ready to drink shot. Shake well before use.

Renapro[®] Shot can also be added without the need for pre-mixing, directly into hot or cold foods, drinks, supplements. Renapro[®] Shot may be administered with enteral tube feeds.

Drinks & Supplements - add 1 bottle directly to hot / cold drinks or supplements, stir in and consume.

Food - add 1 bottle directly to hot / cold food, stir in and consume.

Enteral Tube Feeding - Flush feeding tube. Infuse 1 bottle via feeding tube using a syringe. Once infused, flush tube with 30ml water and then continue enteral tube feeding as prescribed.

6. SPECIAL WARNINGS AND SPECIAL PRECAUTIONS FOR USE

Renapro[®] Shot is not a complete food and is not suitable for use as a sole source of nutrition.

Renapro[®] Shot must be used under medical supervision.

Renapro[®] Shot should not be used with infants under 1 year of age.

Renapro[®] Shot is not for parenteral use.

Allergen Statement: Renapro[®] Shot contains no common allergen corresponding to (EU) No. 1169/2011.

May not be suitable for vegetarians, Contains beef derivatives.

7. DESCRIPTION

Renapro[®] Shot contains hydrolysed collagen.

Collagen is the most abundant protein in the human body. A key constituent of all connective tissue, it provides the infrastructure of the musculoskeletal system and is the main structural element of the skin.

Collagen peptides are a hydrolysed form of collagen. Renapro[®] Shot collagen peptides are unique, high-purity bioactive collagen peptides. They are manufactured using a gentle enzymatic process, enabling a precise degree of hydrolysis and optimal molecular weight of only 2,000 Dalton to ensure superior performance and ease of use.

Renapro[®] Shot collagen peptides are highly digestible. After resorption of the collagen peptides by the enterocytes, the human body can transfer the collagens easily into proteins. Studies have demonstrated that over 90% of hydrolysates are digested and available in connective tissues within a few hours of ingestion. This rapid availability ensures the effective delivery of essential peptides and amino acids to the body.

Renapro[®] Shot is Halal & Kosher certified.

Contains beef derivatives.

8. NAME AND ADDRESS OF MANUFACTURER

RenaCare NephroMed GmbH, Werrastrasse 1a, 35625 Hüttenberg, Germany

9. DISTRIBUTION IN UK AND IRELAND

Stanningley Pharma Ltd, BioCity, Pennyfoot Street, Nottingham NG1 1GF.

Tel: 0115 9124253 • Fax: 0115 9124289

E-mail: info@stanningleypharma.co.uk

10. STORAGE

Store at room temperature in a dry place. Keep open shot in the fridge and consume open product within three days.

11. PRESENTATION

Renapro[®] Shot is supplied in boxes of 30 x 60ml bottles.

12. FLAVOURS

Renapro[®] Shot is available as cola, peach, and wild berry flavours.

13. NOTIFICATIONS/APPROVALS

Notified to FSA: January 2016

This product complies with Commission Directives 1999/21/EC of 25th March 1999 and Commission Directive 2001/15/EC of 15th Feb 2001.

14. COUNTRY OF ORIGIN

Germany

15. DATE/REVISION OF TEXT

Datasheet prepared by Stanningley Pharma Limited.

Date of text: February 2021

ORDERING

Renapro[®] Shot is available from Stanningley Pharma and through wholesalers eg. Alliance, AAH. Each pack contains 30 shots

Product	EAN	PIP code
Peach		
20g protein in 60ml x 30 shots	4027052109624	413-3435
Wild Berry		
20g protein in 60ml x 30 shots	4027052103967	401-9576
Cola		
20g protein in 60ml x 30 shots	4027052109631	417-4496

SAMPLE REQUEST

Please contact: samples@stanningleypharma.co.uk
or call 0115 912 4253

Enjoy the taste!



 **Stanningley**
Pharma

For further information, please visit:

www.stanningleypharma.co.uk or get in touch:

info@stanningleypharma.co.uk or call **0115 912 4253**