

# NUTRITION FOR PEOPLE WITH REDUCED KIDNEY FUNCTION



## Content

	Pages
What do kidneys do?	01
What is Chronic Kidney Disease (CKD)?	02
Know the stages of CKD	03
Slowing the progression of CKD	03
The important role of diet and nutrition	04
Nutrition and reduced kidney function: a basic guide	05
Reduced kidney function and diabetes	16
What you need to know about dialysis	17
About Nepro® LP	19
How to incorporate Nepro® LP into your diet?	21
Healthy recipes with Nepro® LP	22
Your meal plan	24
Know your daily nutrition targets	25
Your health chart	26

## What do kidneys do?

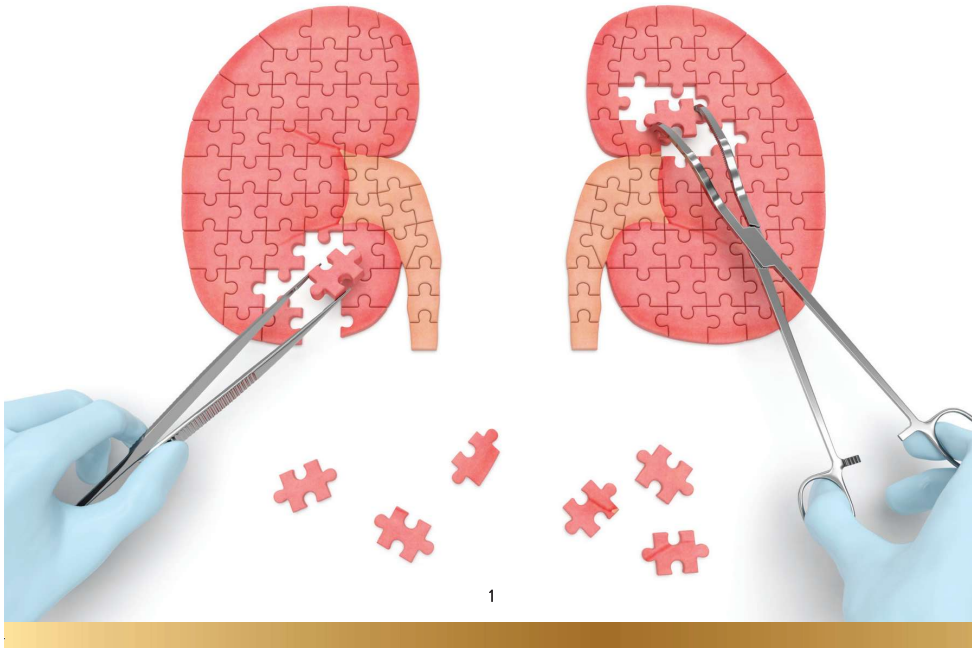
A key function of the kidneys is to remove waste products and excess fluid from the body through urine.

When the protein we eat is digested, a waste product called urea is formed.

Urea and other wastes are combined with water in the kidneys to form urine.

The kidneys also perform other important functions in the body, such as:

- Maintaining the body's balance of water, minerals (e.g. calcium & phosphorus) and electrolytes (e.g. sodium & potassium)
- Releasing hormones which stimulate red blood cell production and help regulate blood pressure
- Producing an active form of Vitamin D that helps to keep bones strong



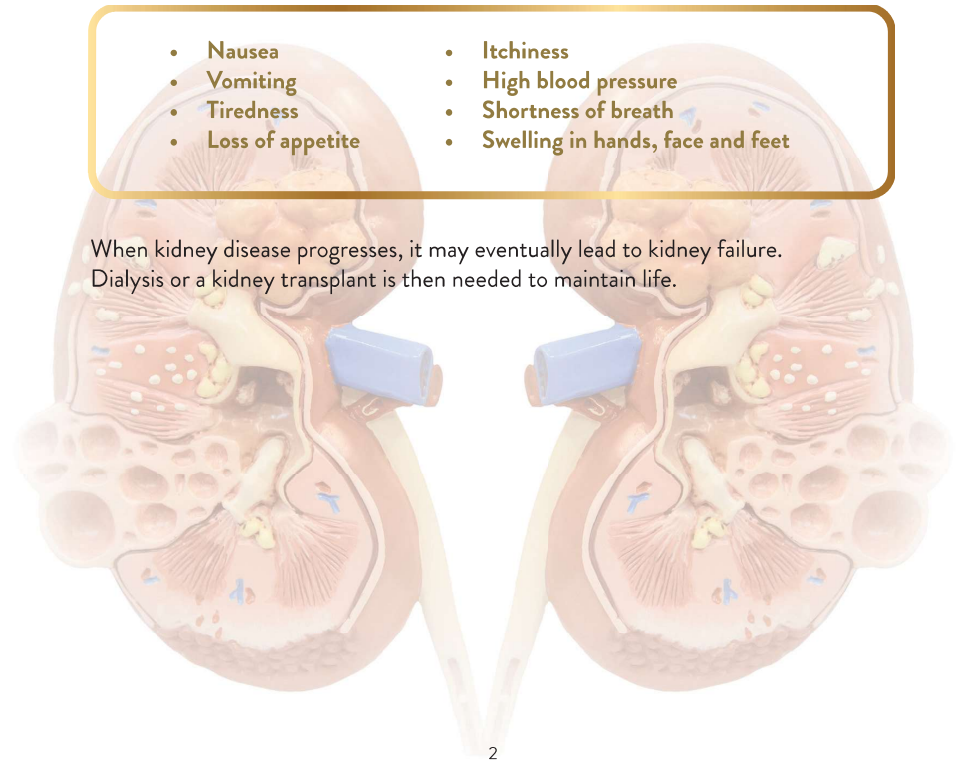
## What is chronic kidney disease (CKD)?

Chronic kidney disease (CKD) refers to a gradual loss of kidney function. Damaged or diseased kidneys do not filter enough waste products from the blood, causing them to build up in the blood and act like poison. People with CKD may also develop complications like high blood pressure, anemia, weak bones, poor nutritional status and nerve damage. CKD also increases the risk of having heart and blood vessel diseases over time.

Common causes of CKD include diabetes, high blood pressure, glomerulonephritis (inflammation and damage to the kidney's filtering units) and hereditary kidney diseases. Individuals can lose more than half their normal kidney function before they start to notice symptoms of kidney disease. Some of these symptoms are:

- Nausea
- Vomiting
- Tiredness
- Loss of appetite
- Itchiness
- High blood pressure
- Shortness of breath
- Swelling in hands, face and feet

When kidney disease progresses, it may eventually lead to kidney failure. Dialysis or a kidney transplant is then needed to maintain life.



## Know the stages of CKD

There are 5 stages of kidney disease, based on the presence of kidney damage and level of kidney function (as measured by glomerular filtration rate, GFR). As CKD progresses, the GFR number decreases.

Stage	Description	GFR (mL/min/1.73m <sup>2</sup> )
1	Kidney damage (e.g. protein in urine) with normal GFR	≥90
2	Kidney damage with mild decrease in GFR	60-89
3	Moderate decrease in GFR	30-59
4	Severe reduction in GFR	15-29
5	Kidney failure	<15

Source: NKF KDOQI guidelines

Consult your doctor if you have any questions about your stage of kidney disease.

It is important that you know which stage of CKD you are at, in order to better manage your condition.

## Slowing the progression of CKD

Although CKD is generally progressive and irreversible, there are steps you can take to slow its progression and reduce risk of complications.

- **Control blood pressure**

High blood pressure is both a cause and complication of CKD. Uncontrolled high blood pressure can accelerate the loss of GFR.

- **Reduce albuminuria**

When the kidneys are damaged, albumin passes from the blood into the urine. Lowering your urine albumin levels may help reduce risk of CKD progression.

### WHAT IS ALBUMIN AND WHY IS IT IMPORTANT?

Albumin is a type of protein in the blood. On a regular basis, your albumin level will be measured. Low albumin levels in patients with CKD have been associated with poor health outcomes. Consult your doctor to find out what your target albumin level should be and talk to your dietitian about nutritional options to help you reach that target.

- **Manage blood glucose levels**

If you have diabetes, managing your blood glucose levels can help slow progression of the disease. Try to keep your glucose level within recommended target range as advised by your healthcare professional.

Diet is a key component of these steps to help slow the progression of CKD. For instance, limiting sodium intake may improve blood pressure, while limiting excessive dietary protein intake may decrease albuminuria. Learn more about diet and nutrition in the following pages.

## The important role of diet and nutrition

Eating right is a crucial part of living well with reduced kidney function. People with reduced kidney function need to be mindful of their food intake to prevent excess wastes and fluid from building up, as their kidney function decreases.

For people with reduced kidney function who are not on dialysis, good nutrition can help to:

- Provide the energy needed to carry out daily activities
- Minimize loss of muscle mass
- Maintain a healthy body weight
- Support the immune system to reduce the risk of infections
- Preserve existing kidney function and slow down the progression of CKD

## Nutrition and reduced kidney function: a basic guide

The dietary needs of people with reduced kidney function vary depending on factors such as body size, activity level, stage of CKD and blood test results. If the individual is following a diet plan for diabetes or other health conditions, he or she has to continue on it as well.

To reduce risk of malnutrition, it is crucial for people with reduced kidney function to obtain enough calories and sufficient, but not excessive, protein from their diet. Sometimes, the use of a specialized kidney nutrition supplement may be helpful.

It can be challenging for people with reduced kidney function to manage their diet, hence they are strongly encouraged to consult a dietitian for personalized guidance on food intake.

## Dietary goals at a glance



### Calories

You have to eat enough calories to supply your body with the energy to function properly and carry out daily activities.



### Protein

People with reduced kidney function who are not on dialysis need to watch their protein intake. Eating less protein helps to preserve kidney function and prevent additional stress on the kidneys.



### Potassium

High potassium levels in the blood can cause irregular heartbeat or a heart attack. Foods which are high in potassium, such as certain type of fruit and vegetables may need to be limited or avoided. Soaking and cooking these food items with extra water and draining it off, may help lower potassium content as well.



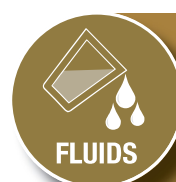
### Phosphorus

The build-up of phosphorus in the blood can draw calcium out of your bones, making them weak. Foods high in phosphorus such as dairy products, organ meats, fish with edible bones, whole-grains and beans may need to be reduced.



### Sodium

Consuming too much sodium can lead to fluid retention, causing swelling of the legs and feet and increasing blood pressure. Restriction of sodium intake can help to maintain normal fluid balance.



### Fluids

You do not need to limit the amount of fluids you drink at early stages of CKD. However, as your kidney function decreases to reach advance stages of CKD, you may need to restrict your fluid intake to prevent your body from being overloaded with fluid as urine output decreases. Getting the right amount of fluid will help you feel your best. Consult your doctor, dietitian or nurse about your daily fluid allowance.



## Calories

You need to have sufficient calories in the diet to supply your body with energy to function properly and carry out daily activities. If too few calories are consumed, the body may break down muscles for energy and also utilize dietary protein as an energy source. This is not desirable as protein then cannot perform the valuable function of building body tissues. Such can also lead to weakness and potentially cause damage to the kidneys.

To help make up your daily calorie needs, you need to eat your prescribed diet, which includes approved food items from each of the food groups. Adding more fat and sugar (such as margarine, oils, honey and jam) to the diet can help you increase energy intake. Discuss with your dietitian on how you can ensure adequate calorie intake while making appropriate food choices. This is especially important if you have diabetes and need to maintain good sugar control (see section on “Reduced kidney function and diabetes”).



## Protein

Your protein intake may need to be limited. This is because as CKD progresses, the kidneys gradually lose its ability to remove waste products that are formed when protein is ingested. The build-up of waste products in the blood will lead to discomfort like nausea, loss of appetite, vomiting and weakness. Eating less protein helps to preserve kidney function and prevent additional stress on kidneys.

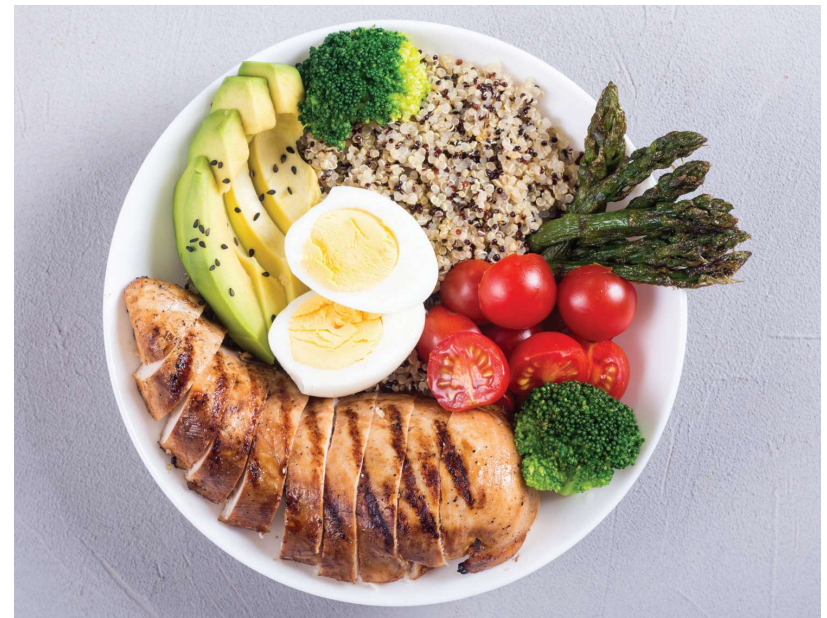
### Protein is found in both animal and plant foods:

1. Animal protein- meat, poultry, fish and other seafood, eggs, milk and milk products
2. Plant protein - beans and bean products (e.g. tofu), nuts, lentils, bread and rice

### Remember!

You will still need to consume **adequate** protein in your diet. Consult your dietitian to find out the amount of protein that is right for you.








Protein from animal sources is the best in quality, which means they are efficiently used by the body and so should make up most of the protein in the diet.







## Protein Exchanges



Each food in the protein exchange list below contains 7g of protein. Protein exchange helps provide variety in choosing suitable protein sources in your diet.

Please consult your dietitian to learn more and find out the number of protein exchanges you require in a day.

ANIMAL PROTEIN:		
	Egg	1 (medium)
(Cooked)		
	Fish	30g or 1 matchbox size
	Chicken	
	Mutton	
	Beef	
	Pork	
	Prawn	4 (medium)

MILK & MILK PRODUCTS <sup>†</sup> :		
	Fresh Milk or UHT	1 cup (200ml)
	Milk Powder	4 tablespoons (150g)
	Yoghurt	1 small tub (150g)
	Cheese*	1½ slice (30g)

LEGUMES <sup>†</sup> :		
	Beans/Lentils (cooked)	½ cup (120g)
	Taukua	½ square firm (60g)
	Tofu	½ large block soft (150g)

NUTS/SEEDS <sup>†</sup> :		
	Nuts and Seeds	½ cup (30g)
	Peanut Butter	2 dessert spoons (30g)

\* High in sodium

† High in phosphate

### USEFUL TIP

Spread out the intake of protein evenly throughout the day for better utilization by the body.

# Potassium

Potassium is a mineral that helps your nerves, muscles and heart work properly. For people with CKD, the kidneys can no longer remove excess potassium.

Choose foods which are low or moderate in potassium more frequently and consume in moderation. Foods which are high in potassium should be limited or avoided.

## Fruits – limit to 2 servings per day

**Low**  
< 150mg potassium  
per serving

**Medium**  
150 – 250mg potassium  
per serving

**High**  
> 250mg potassium  
per serving

Apple 1 small  
Blueberries ½ cup  
Cranberries 100g  
Durian 2 seed  
Dragon fruit ½ fruit  
Grapes 10 small  
Grapefruit ½ fruit  
Guava ½ fruit  
Lemon 1 small  
Lime 1 whole  
Longan 10 medium  
Mangosteen 4 medium  
Pear 1 small  
Pineapple 1 wedge  
Rambutan 4 medium  
Water apple 4 medium  
Watermelon 1 wedge  
Canned fruit ½ cup  
(juices drained)

Cherry 10 medium  
Chiku 1½ medium  
Duku 10 medium  
Langsat 10 medium  
Lychee 6 medium  
Orange 1 small  
Papaya 1 slice  
Passion fruit 3½ medium  
Peach 1 medium  
Persimmon 1 medium  
Plum 2 small  
Pomelo 3 segment  
Raspberries 1 cup  
Strawberries 1 cup  
Tangerines 1 medium  
Dried fruit 20g  
e.g. Raisins

Apricots 4 small  
Avocado 1 medium  
Banana 1 small  
Custard apple 1 medium  
Dates 2 pieces  
Figs 2 small  
Honeydew 1 slice  
Jackfruit 2 seed  
Kiwi 1 medium  
Mango ½ medium  
Nectarine 1 medium  
Pomegranate ½ medium  
Prunes 4 pieces  
Rockmelon 1 slice  
Soursop 1 slice

Source: National Kidney Foundation, Singapore

## Vegetables – limit to 2 servings per day

1 serving = 100g (¾ cup) cooked; 100g raw non-leafy; 150g raw leafy

**Low**  
< 200mg potassium  
per serving

**Medium**  
200 – 350mg potassium  
per serving

**High**  
> 350mg potassium  
per serving

Bean sprouts  
Brinjal  
Cabbage  
Capsicum  
Carrot (frozen/boiled)  
Cucumber  
French bean  
Gourd – all types  
Kangkung  
Lettuce  
Long bean  
Mushroom  
– Canned, drained  
– Dried, soaked and drained  
Onion  
Peas (frozen/boiled)  
Spring onion  
Turnip  
Winter melon

Asparagus  
Chinese cabbage  
Cauliflower  
Carrot  
Celery  
Chives  
Chili (green/red)  
Ladies finger  
Leeks  
Lentils (boiled/dhal)  
Lima bean  
Peas (raw/dried)  
Snow peas  
Pumpkin  
Sweetcorn (frozen/boiled)  
Tomato (raw, canned)

Bamboo shoot  
Broccoli  
Mustard green/Chye sim  
Chick peas  
Fern shoot (pucuk paku)  
Fresh mushroom  
Kale (Kai Lan)  
Lotus root  
Petai  
Potatoes  
Seaweed  
Spinach  
Sweet potato  
Sweet potato leaves  
Tomato (paste/puree)  
Water chestnut

Source: National Kidney Foundation, Singapore

## Beverages

**Low**

**Medium**

**High**

Syrup-based  
drinks

Barley  
Chinese tea  
Non-cola beverage  
Sugar cane juice

Strong coffee or tea  
All fresh/canned fruit  
& vegetable juice  
Herbal medicine drinks  
Cocoa & malted beverage  
Milk  
Wine

## USEFUL TIP

- To remove some of the potassium from vegetables:
  - Cut vegetables into smaller pieces
  - Soak vegetables in water for 1-2 hours
  - Drain water before cooking
- Drain juice or syrup from canned fruits and vegetables
- Use whole rather than ground spices

# Phosphorus

In kidney disease, the body cannot keep a balance between calcium and phosphorus. The result is too little calcium and too much phosphorus in the blood. A high serum phosphate level tends to attract calcium from the bones, making them weak and brittle. It also results in the deposition of hard calcium phosphate salts in the soft tissue, leading to conditions like skin itchiness, joint pains and eye irritation.

Phosphorus is mainly found in animal foods and dairy products. Some plant food such as whole-grain and nuts contain high phosphorus as well.

## FOODS HIGH IN PHOSPHORUS

Milk	Fish with edible bones (sardines)
Yoghurt	Organ meat (e.g. liver, kidney)
Cheese	Egg yolk
Legumes (e.g. tofu, soybean milk)	Extracts (Marmite/Bovril)
Nuts and products (e.g. peanut butter)	Anchovies (ikan bilis)
Seeds and products (e.g. sesame oil)	Dried prawn
Coconut and products (e.g. coconut milk)	Dried fish
Cola drinks/dark colored soda	Dried mushroom
Malted and cocoa-based drinks	Seaweed
Cheese, nut and chocolate-based biscuits	Oats
Chocolate	Muesli/Weet-Bix
Keropok (fish and prawn cracker)	Brown rice
Bones (chicken wing or feet soup stocks)	Wholemeal/Wholegrain bread/biscuits

Source: National Kidney Foundation, Singapore

### USEFUL TIP

Don't forget to take phosphate binders (e.g. calcium carbonate) with meals! If prescribed, these pills bind phosphate from food and prevent their absorption into the blood. Taking them without a meal makes them ineffective.

# Sodium

Sodium is a major part of table salt and can be commonly found in sauces, condiments, preservatives, preserved foods and canned foods. Too much sodium increases thirst and causes fluid build-up in the body, which increases blood pressure and can hurt your heart.

Here are some steps to help reduce your sodium intake.

1. Most sodium come from processed food and is present in many different forms. Read the ingredient labels. The product is likely to be high in sodium if the first three ingredients contain any of these:
  - Sodium chloride/table salt
  - Monosodium glutamate (MSG)
  - Rock/sea/iodized salt
  - Baking powder
  - Sodium nitrite
  - Sodium benzoate
2. Avoid the use of lower sodium salts as they usually contain potassium.

### USEFUL TIPS

- Limit sodium-rich processed food such as luncheon meat or hot dogs and choose fresh vegetables, poultry and meat.
- When cooking at home, use whole spices, lemon juice or natural seasonings such as shallots, onions, garlic and parsley to spice up your cooking instead of adding table salt.
- Only add salt or sauces sparingly after cooking. Taste the food before salt is added.
- Avoid having pickles, sambal belachan, papadum or chutneys with your meal.
- Minimize the number of times you eat out as most food sold outside is highly salted.
- When dining out, ask for less gravy, avoid drinking the soup and limit preserved foods such as 'ikan bilis'. Remember to request for freshly cooked items without salt, MSG or soy sauce.
- When purchasing foods, choose foods that have the 'Healthier Choice' symbol or those labelled in 'Low In Sodium' or 'No Added Salt'.
- Read food labels to compare similar foods per 100g and choose the lower sodium version.

## Fluids

As your kidney function decreases to reach advance stages of CKD, you may need to restrict your fluid intake. Consumption of too much fluid may cause:

- Shortness of breath
- Increase in blood pressure
- Heart problems, e.g. fast pulse, weakened heart muscles and an enlarged heart

Sources of fluid include liquids like water, tea, coffee, cordial drinks, milk and soup. Other food items can contribute fluid too, such as porridge, jelly, ice cube, ice cream and ice kacang.

Here are some ways to help control your fluid intake:

- Measure the fluid allowed for the day in a jug. Each time you consume any fluid, pour out the same amount from the container. When it runs out of water, you know you have reached your daily allowance.
- Suck on an ice cube to moisten dry mouth (the fluid content should be accounted for).
- Rinse mouth with water but do not swallow it.
- Limit salty food so you will feel less thirsty.

### Fluid Content Of Common Measures

Item	Volume (ml)
1 tablespoon	15
1 Chinese soup spoon	30
1 ice cube	20
1 Chinese bowl of porridge	100
1 tea cup	150
1 cup	250

## Reduced kidney function and diabetes

If you have diabetes, your doctor may adjust your medication to help optimize blood sugar control. Diet management also becomes even more important.

Carbohydrate foods affect blood sugar the most, so your carbohydrate intake would need to be adjusted to help manage your blood sugar levels. Carbohydrates include both starchy foods like rice, bread, noodles and fruits, as well as sugary foods like candies and sweet desserts.

Consult your dietitian to find out the type and amount of carbohydrates that is sufficient to meet your needs and the type of carbohydrate foods to eat.





## What you need to know about dialysis

When CKD progresses to reach end stage renal failure, you will be advised to go on dialysis.

### What is dialysis?

Dialysis is an artificial filtering procedure which acts like the normal kidney to remove extra water from the body and waste products that have built up in the body.

There are two kinds of dialysis – hemodialysis and peritoneal dialysis.

### Hemodialysis (HD)

HD is the process of removing toxins and excess fluid from the body by continually circulating the blood through a filter called a dialyzer. This filter is used with a dialysis machine 3 to 4 times a week.

### Peritoneal Dialysis (PD)

In PD, the abdominal cavity is filled with a cleansing solution called dialysate. The walls of the abdominal cavity are lined with a membrane called peritoneum, which allows waste products and extra fluid to pass from the blood into the dialysate. The dialysate typically stays in the peritoneum for 4-5 hours, before it is drained and replaced.

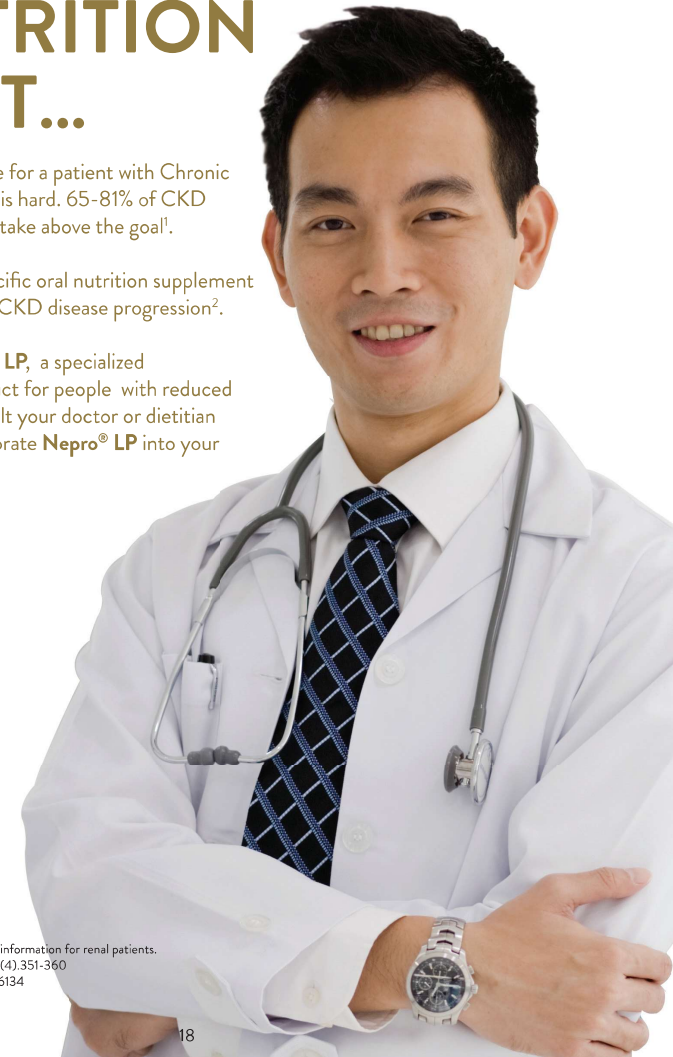
Your nutrition requirements will change when you go on dialysis. For instance, due to protein loss from dialysis sessions, you will need to take more protein than previously in order to replenish the protein loss. Consult your doctor, nurse or dietitian to find out more about your dietary requirements.

## WHEN YOU NEED A NUTRITION BOOST...

Following a diet suitable for a patient with Chronic Kidney Disease (CKD) is hard. 65-81% of CKD patients have protein intake above the goal<sup>1</sup>.

A low protein renal specific oral nutrition supplement may help to slow down CKD disease progression<sup>2</sup>.

Consider using **Nepro® LP**, a specialized medical nutrition product for people with reduced kidney function. Consult your doctor or dietitian on how you can incorporate **Nepro® LP** into your daily diet.



This section contains product-specific information for renal patients.

<sup>1</sup> Betz M et al. J Ren Nutr. 2021 Jul;31(4):351-360

<sup>2</sup> Yan B et al. 2018 Nov 7;13(11):e0206134

## Nepro® LP supports nutritional needs of people with reduced kidney function



\* European Best Practice Guidelines (EBPG), European Society for Clinical Nutrition and Metabolism (ESPEN), National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (KDOQI®), Kidney Disease: Improving Global Outcomes (KDIGO®) guidelines - when used as sole source of nutrition

\* 44.2% less protein v.s. Nepro® HP per serving (9.94g VS 17.82g)

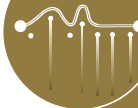
## OTHER FEATURES OF NEPRO® LP

**401 kcal**

**Rich in calories**  
To meet energy needs (401kcal/bottle)

**REDUCED WATER**  
162 ml

**Reduced water content**  
(162ml/220ml bottle)



**Suitable for people with Diabetes**  
Advanced, slow-digesting, low Glycemic Index (GI) carbohydrate complex



**Contains Omega-3**  
& monounsaturated fatty acids (MUFA)

*Nepro® LP has low Glycemic Index of 44, which makes it also suitable for people who have both reduced kidney function and diabetes.*



# How to incorporate Nepro® LP into your diet?\*

✓ 1-2 servings/day\*



**YOUR WEIGHT STATUS**

**UNDERWEIGHT**

**NORMAL WEIGHT, OVERWEIGHT**

**HOW TO ADD NEPRO® LP TO YOUR DAILY DIET**

**SUPPLEMENT between main meals**

**TOTAL / PARTIAL REPLACEMENT of ONE meal**

**MANY WAYS TO ENJOY NEPRO® LP**

**Customize serving temperature**

- Warm
- Chilled
- Frozen

**Flavor by blending with chosen powder**

- Sesame
- Green tea
- Cocoa

**Add texture**

- Set with agar-agar, gelatin, or cornstarch
- Add fruit or berries

# Add variety to your diet with Nepro® LP recipes.

## Vegetable Soup in Bread Bowl

Servings: 2

### Ingredients:

- 1 bottle vanilla Nepro® LP (220ml)
- 40g of broccoli
- 40g of cauliflower
- 40g of onion
- 40g of mushrooms
- 40g of carrots
- 40g of butter
- 2tbsp cornstarch
- 420ml water
- pinch of black pepper
- 1/4 tsp salt
- round french loaf (approx. 200g)



### Nutrition Facts

#### Amount per serving

Kcal	677
Protein	15 g
Carbohydrate	85 g
Fat	29 g
Sodium	905 mg
Potassium	532 mg
Calcium	163 mg
Phosphorus	246 mg

### Directions:

1. Cut open the top of a round bread loaf and hollow the middle, leaving the bread crust intact. Set aside to use as soup bowl.
2. Blanch chopped broccoli, cauliflower, onions, mushrooms and carrots in boiling water to remove potassium content.
3. Stir fry blanched vegetables in heated saucepan with butter. Once cooked, add in boiling water.
4. Add cornstarch to water and mix thoroughly. Add mixture to boiling vegetable soup to thicken, and remove from stove. Set aside to cool. Once cooled, add Nepro® LP and mix well.
5. Pour soup into bread bowl and season with black pepper. Serve hot.

### \*Note:

Suggestion only, consult your dietitian to ensure Nepro® LP is used appropriately and aligned with your specific nutritional needs and treatment plan.

Nutrition Millet Porridge

- Servings: 2
- Ingredients:
- 1 bottle vanilla Nepro® LP (220ml)
  - 80g of millet
  - 420ml of water
- Directions:
1. Wash the millet clean. Add millet and water into the electric rice cooker to cook. Once cooked, add Nepro® LP and mix thoroughly. Serve warm.



Nutrition Facts	
Amount per serving	
Kcal	352
Protein	9 g
Carbohydrate	50 g
Fat	12 g
Sodium	90 mg
Potassium	204 mg
Calcium	84 mg
Phosphorus	186 mg

Strawberry Smoothie

- Serving: 2
- Ingredients:
- 1 bottle vanilla Nepro® LP (220ml) (chilled)
  - ½ cup frozen strawberries
  - 4 tbsps water
- Directions:
1. Combine the ingredients in the jar of a blender.
  2. Blend on 'high' until smooth.
  3. Serve immediately.



Nutrition Facts	
Amount per serving	
Kcal	213
Protein	5 g
Carbohydrate	24 g
Fat	11 g
Sodium	98 mg
Potassium	202 mg
Calcium	87 mg
Phosphorus	81 mg

Your Meal Plan

Consult your dietician for a personalized CKD-friendly meal plan tailored to meet your nutritional needs.

Meal	Time	Food Item/portion	Remark
Breakfast			
Snack			
Lunch			
Snack			
Dinner			

## Talk to your dietitian on what your daily nutrition targets should be.

### Calories

Target calories per day \_\_\_\_\_

### Protein

Target grams per day \_\_\_\_\_

### Phosphorus

Target milligrams per day \_\_\_\_\_

### Potassium

Target milligrams per day \_\_\_\_\_

### Fluids

Target milliliters per day \_\_\_\_\_

### Dry Weight

Target kilograms per day \_\_\_\_\_

Ask your dietitian how you can include Nepro® LP in your daily meal plan.

## Your Health Chart

Name: \_\_\_\_\_ Date of Birth: \_\_\_\_\_

Height: \_\_\_\_\_ cm Gender: Male/Female

			Date of Examination		
Key measurements	Units	Range	/ /	/ /	/ /
Weight	kg				
BMI		18.5 - 23			
Blood Pressure (BP)	mmHg	120/80			
<b>Renal Profile</b>					
Potassium	mmol/L	3.5-5.5			
Sodium	mmol/L	135-150			
Chloride	mmol/L	96 - 108			
Bicarbonate	mmol/L	>20 <24			
Pre Creatinine	Variable on body mass and gender				
Post Creatinine	µmol/L	442			
Pre Urea	mmol/L	>20 <40			
Post Urea	mmol/L	< 6.67			
<b>Bone Profile</b>					
Calcium	mmol/L	2.2-2.60			
Phosphate	mmol/L	< 1.18			
<b>Lipid Profile</b>					
Total Cholesterol	mmol/L	< 6.1			
Triglycerides	mmol/L	< 2.3			
HDL-cholesterol	mmol/L	1.0-2.0			
LDL-cholesterol	mmol/L	< 3.334			
Albumin	g/L	> 35g			
<b>Endocrine Function</b>					
HbA1c	%	4.6-6.4			
Glucose Random	mmol/L	4.0-9.0			



## NOTES 笔记

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Date of Examination					
/ /	/ /	/ /	/ /	/ /	/ /



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# 肾功能衰退者营养讯息



## 目录

	Pages
肾脏有什么功能?	01
什么是慢性肾病 (CKD)?	02
慢性肾病 (CKD) 的不同阶段	03
延缓慢性肾病 (CKD) 的发展	03
饮食和营养的重要性	04
营养与肾功能衰退: 基本指南	05
肾功能衰退与糖尿病	16
洗肾所需知识	17
了解 Nepro® LP	19
如何把 Nepro® LP 纳入您的饮食计划?	21
Nepro® LP 的健康食谱	22
您的饮餐计划	24
了解你的日常营养目标	25
你的个人健康图表	26

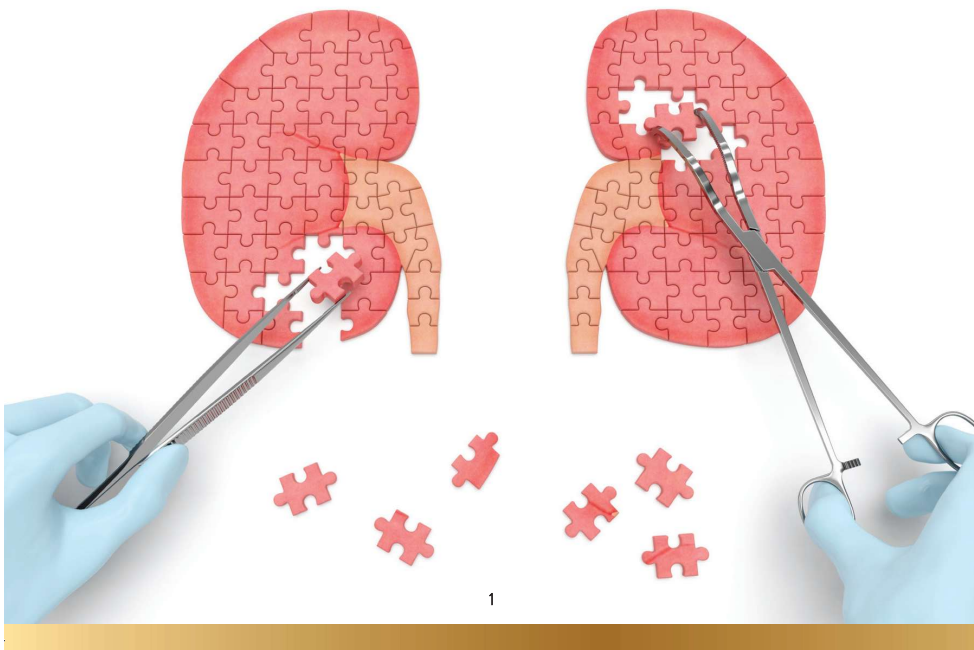
## 肾脏有什么功能？

肾脏的一个重要功能是通过尿液清除体内的废物和多余的体液。

当蛋白质被消化时,一种叫做尿素的废物产品会形成。尿素和体内的其他废物会在肾脏中与水结合,形成尿液。

肾脏在体内也有其他重要的功能,如:

- 保持身体的水、矿物质(如钙、磷)和电解质(如钠和钾)的平衡
- 释放刺激红细胞生成和有助于调节血压的激素
- 制造有助强化骨骼的活性维生素D



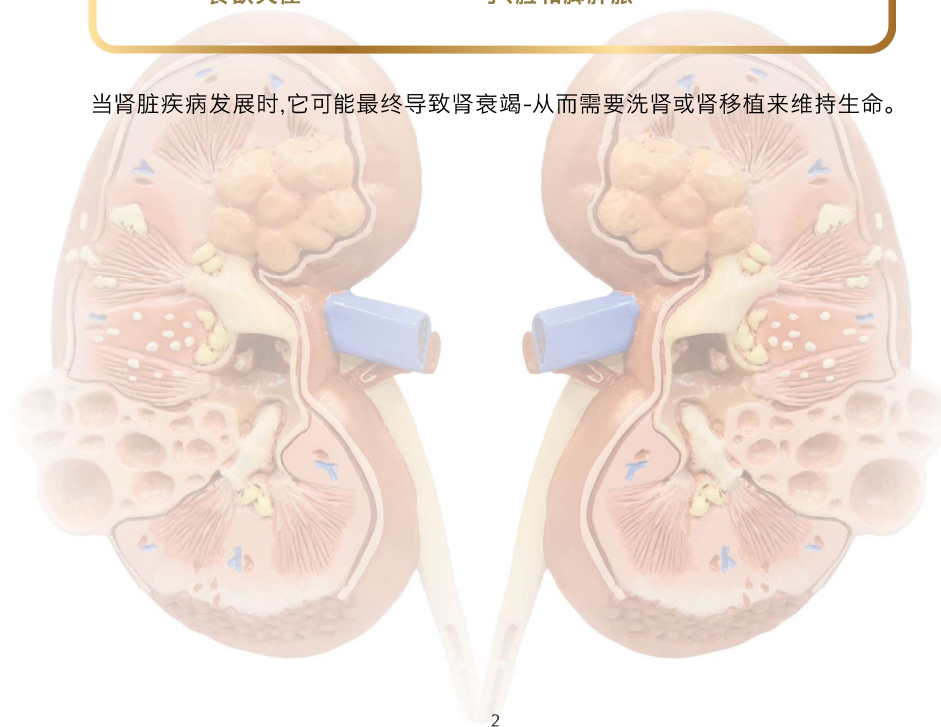
## 什么是慢性肾病 (CKD) ？

慢性肾病 (CKD) 是指肾功能逐渐衰退。受损或患病的肾脏不能从血液中过滤足够的废物,导致它们在血液中累积,并像毒药一样产生毒副作用。CKD 患者可能出现并发症,如高血压、贫血、骨质疏松、营养状况差和神经损伤。长久之下,CKD 也增加患心脏病和血管疾病的风险。

慢性肾脏病 (CKD) 的常见病因包括糖尿病、高血压、肾炎(肾脏的过滤单元发炎和损伤)和遗传性肾脏疾病。在您开始注意到肾脏病的病症前,您的肾脏可能已经失去了一半以上的正常功能。慢性肾脏病的病症包括:

- 恶心
- 呕吐
- 疲劳
- 食欲欠佳
- 发痒
- 高血压
- 呼吸急促
- 手、脸和脚肿胀

当肾脏疾病发展时,它可能最终导致肾衰竭-从而需要洗肾或肾移植来维持生命。



## 了解慢性肾病 (CKD) 的不同阶段

依据肾脏损坏的程度以及肾功能指数, 肾病可分为 5 个阶段。

肾功能是以肾小球滤过率 (Glomerular filtration rate/GFR) 来判断, 而当肾病逐渐发展时, 肾小球滤过率也会随着减少。

阶段	阶段形容	肾小球率 (mLmin/ 1.73m <sup>2</sup> )
1	正常或高肾小球滤过率	≥90
2	肾小球滤过率微下降	60-89
3	肾小球滤过率中等下降	30-59
4	肾小球滤过率严重下降	15-29
5	肾损坏	<15

参考资料: NKF KDOQI 準則

如有对于有关慢性肾病阶段的疑问, 请向您的医生咨询。  
您应知道自己的慢性肾病是哪一个阶段, 以更有效的掌控病况。

## 延缓慢性肾病 (CKD) 的发展

虽然慢性肾病是不可逆转的疾病, 但您可采取适当步骤以延缓病情的发展和减少患并发症的风险。

### • 控制血压

高血压是造成慢性肾病的因素之一, 也是慢性肾病可导致的其一并发症。  
控制不佳的血压可加快肾小球滤过率下降的速度。

### • 减少白蛋白尿

当肾脏已损坏, 白蛋白会从血液渗到尿液中。减少尿液中的白蛋白可有助延缓慢性肾病的发展。

#### 白蛋白是什么, 为什么它如此重要?

白蛋白是血液中的一种蛋白质, 是一个衡量您整体营养健康的指标。您的白蛋白水平将被定期测试。在 CKD 患者中, 过低的白蛋白水平与不良病诊结果, 是被信为有着密切关连的。

向您的医生咨询您的白蛋白标准水平, 并和营养师讨论如何正确饮食以帮助您达到目标。

### • 控制血糖

如您有糖尿病, 控制血糖水平可有助延缓慢性肾病发展。您的血糖应维持在医生建议的标准水平内。

饮食是帮助延缓慢性肾病发展的重要元素之一。如减少食用钠可有助血压控制, 而减少食用过量的蛋白质可减少白蛋白尿。您可在本刊接下来的部分了解更多有关饮食的资料。

## 饮食和营养的重要性

正确的饮食对于肾功能衰退者是至关重要的。肾功能衰退者需注意食用的食物种类以预防多余的水分或体液在体内累积。

对于还没步入洗肾阶段的肾功能衰退者来说, 良好的营养有助:

- 提供所需能量以维持一日活动
- 减少肌肉质量的流失
- 维持健康体重
- 提升免疫系统, 减少受感染机率
- 维持肾功能, 延缓肾病的发展



## 营养与肾功能衰退: 基本指南

肾功能衰退者的饮食需求取决于各种因素, 比如体积、活跃水平和血液检测结果等因素。如果该患者在使用一个针对糖尿病或其它健康状况的饮食计划, 他或她也必须继续坚持该计划。

如要减少肾衰退者营养不足的风险, 在饮食当中摄取足够的热量和适量(不可过量)的蛋白质是至关重要的。适当的使用为洗肾者特制的营养品也可有帮助。饮食管理对于肾功能衰退者是具有挑战性的, 因此强烈建议他们咨询营养师以获得对食物摄入和营养的个人化指导。

## 饮食目标概述



### 卡路里

您必须摄取足够的热量来提供能量, 让身体能正常运作和进行日常活动。



### 蛋白质

还没步入洗肾阶段的肾功能衰退者需注意蛋白质摄取量。减少蛋白质摄取能有助维持肾功能和减缓肾脏的负担。



### 钾

在血液中过高的钾水平会导致心跳不规则或心脏病发作。含钾量高的食物(如某些类型的水果和蔬菜)可能需要限制或避免食用。用额外的水浸泡和烹饪这些食物并将其沥干, 也可能有助于降低钾含量。



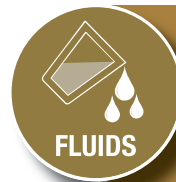
### 磷

如磷在血液中累积, 可能会导致钙质从骨骼中流失, 使骨骼变弱。含磷量高的食物(如乳制品、内脏、含食用骨头的鱼类、全谷物和豆类), 可能需要减少或避免摄取。



### 钠

摄取过多的钠会导致体液滞留, 引起腿和脚水肿和血压升高。限制钠的摄取可有助维持正常的体液平衡。



### 液体

在慢性肾病的初期, 您无须控制饮用的液体量。但当肾功能逐渐的下降导致步入肾病的后期, 您须密切控制饮用的液体量。这是因为到了后期, 身体排除的尿液会减少而如液体摄取量过多, 过多的水分将存积在体内导致不适。因此您应咨询医生, 营养师或护士以了解您每日可摄取的正确液体量。

## 卡路里

您需要摄取足够的热量来提供能量,让身体能正常运作和进行日常活动。如果摄取过少热量,身体会分解肌肉获取能量,也会利用食物中的蛋白质作为能量来源。这是不可取的,因为这样蛋白质就不能实现有价值的功能-建立人体组织。

为了达到您的每日热量需求,您需按照规定的饮食计划,从各种食物组别中摄取获准食品。在饮食中添加更多的脂肪和糖 (如人造牛油,蜂蜜和果酱)也可帮助增加您摄取的热量。与您的营养师讨论如何确保您摄取足够的热量,同时做出适当的食物选择。如果您患有糖尿病,您需保持良好的血糖控制,这是尤其重要的 (见下节“肾功能衰退与糖尿病”)。



## 蛋白质

您应限制蛋白质的摄取量。

当肾功能衰退,肾脏会逐渐不能排除因服食蛋白质而产生的废物。在血液中积累的废物,会导致不适如作呕、胃口欠佳、呕吐和虚弱感。减少蛋白质摄取量能有助保留肾功能和减少肾脏所承受的压力。

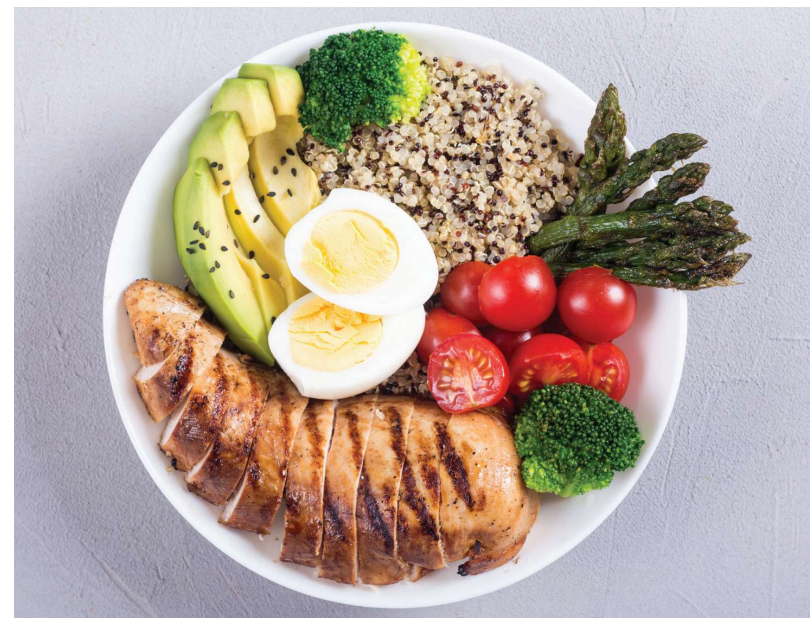
**在动物和植物性食物中都可找到蛋白质:**

1. 动物蛋白质-肉类、家禽、鱼类及其他海产品、蛋、奶和奶制品
2. 植物蛋白质-豆类及豆制品(如豆腐)、坚果、扁豆、面包、米饭

动物来源的蛋白质质量最好,其意味着它能有效的被身体运用,应占据您摄取蛋白质来源的绝大部分。

### 切记!








您须确保在饮食当中摄取足够的蛋白质。咨询您的医生以了解您每日可摄取的蛋白质分量






# 蛋白质替换表



以下蛋白质替换列表中的每种食物含有 7g 蛋白质。蛋白质替换有助您在进行饮食选择时能更有效选择合适的蛋白质来源。

请咨询您的营养师,以计划出您一天需要的蛋白质替换量。

动物蛋白质:		
	鸡蛋	1 粒 (中等大小)
(熟)		
	鱼	1 个火柴盒大小 30g
	鸡	
	羊肉	
	牛肉	
	猪肉	
	虾	4 只 (中等大小)

牛奶及乳制品*:		
	牛奶 (新鲜或超高温灭菌)	1 杯 (200ml)
	奶粉	4 汤匙 (150g)
	酸奶	1 杯 (150g)
	奶酪(切达干酪)*	1½ 片 (30g)

豆类*:		
	豆类/扁豆(熟)	½ 杯 (120g)
	豆干	½ 块 (60g)
	豆腐	½ 块 (150g)

坚果/种子*:		
	坚果与籽类	½ 杯 (30g)
	花生酱	2 甜品勺 (30g)

\*高盐分  
\*高磷酸盐

## 提示

均匀分散一天当中所摄取的蛋白质,以便身体更有效的运用。

钾

钾是一种矿物质,能帮助神经、肌肉和心脏正常运作。因为肾功能下降,CKD 患者的肾脏不能清除多余的钾。

经常选择钾含量低或中等的食物,并适量食用。限制或避免高钾的食物。

水果 - 每天限制为2份

低		中等		高	
每份含<150mg 钾		每份含150 - 250mg 钾		每份含>250mg 钾	
苹果	1 小粒	樱桃	10 粒 (中等大小)	杏子	4 小粒
蓝莓	½ 杯	慈菇 (Chiku)	1½ 粒 (中等大小)	鳄梨	1 粒 (中等大小)
蔓越莓	100 g	杜古 (Duku)	10 粒 (中等大小)	香蕉	1 小支
榴莲	2 瓣	冷刹 (Langsat)	10 粒 (中等大小)	释迦	1 粒 (中等大小)
火龙果	½ 粒	荔枝	6 粒 (中等大小)	枣	2 片
葡萄	10 小粒	橙	1 小粒	无花果	2 小粒
葡萄柚	½ 粒	木瓜	1 片	蜜瓜	1 片
番石榴	½ 粒	百香果	3¼ 粒 (中等大小)	菠萝蜜	2 瓣
柠檬	1 小颗	桃子	1 粒 (中等大小)	奇异果	1 粒 (中等大小)
青柠	1 整粒	柿子	1 粒 (中等大小)	芒果	½ 粒 (中等大小)
龙眼	10 粒 (中等大小)	李子	2 小粒	油桃	1 粒 (中等大小)
山竹	4 粒 (中等大小)	柚子	3 瓣	石榴	½ 粒 (中等大小)
梨	1 小个	覆盆子	1 杯	西梅干	4 片
黄梨	1 块 (楔形)	草莓	1 杯	哈密瓜	1 片
红毛丹	4 粒 (中等大小)	柑橘	1 粒 (中等大小)	红毛榴莲	1 片
水苹果/连雾	4 个 (中等大小)	水果干如葡萄干	20 g		
西瓜	1 块 (楔形)				
罐头水果	½ 杯 (沥干汁水)				

参考资料: 国家肾脏基金会

蔬菜 - 限制为每天2份  
1份=100g (¾ 杯) 熟; 100g(无叶)生; 150g(有叶)生

低	中等	高
每份含 <200 mg 钾	每份含 200 - 350mg 钾	每份含 >350mg 钾
豆芽	芦笋	竹笋
茄子	大白菜	西兰花
包菜	花椰菜	芥末绿/菜心
灯笼椒	胡萝卜	鹰嘴豆
胡萝卜 (冷冻/煮熟)	芹菜	蕨菜芽 (巴古菜)
黄瓜	韭菜	新鲜蘑菇
四季豆	红辣椒 (绿/红)	芥兰
葫芦 — 各种类型	羊角豆	莲藕
空心菜	韭葱	臭豆
茼蒿	扁豆 (煮熟/扁豆汤)	马铃薯
豆角	利马豆	海藻
蘑菇	豌豆 (生/晒干)	菠菜
— 罐装, 挤干	荷兰豆	番薯
— 干燥、浸泡、挤干	南瓜	番薯叶
洋葱	甜玉米 (冷冻/煮熟)	番茄 (酱/泥)
豌豆 (冷冻/煮熟)	番茄 (生、罐装)	马蹄
葱		
茼蒿		
冬瓜		

参考资料: 国家肾脏基金会

饮料

低	中等	高
糖浆饮料	薏米 中国茶 非可乐饮料 甘蔗汁	浓咖啡或茶 所有新鲜/罐装水果和 蔬菜汁 草药饮料 可可和麦芽饮料 牛奶 酒

提示

- 1. 要从蔬菜中去一些钾, 您可:
  - 将蔬菜切成更小片
  - 将蔬菜泡在水中1至2个小时
  - 在烹煮前滤沥干水分
- 2. 沥干罐头水果和蔬菜的果汁或糖浆
- 3. 使用香料而不是香料粉

# 磷

当患有肾病，患者的身体不能有效维持钙质与磷水平之间的平衡。这因而导致血液含有过少钙质和过高的磷水平。过高的磷水平会导致骨骼中的钙质被抽出，使其变弱变脆。这也会导致坚硬的磷酸钙盐在软组织中沉积，导致各种疾病，如皮肤发痒、关节疼痛和眼睛发炎。

磷主要存在于动物性食品和乳制品中。一些植物食品（如全谷物和坚果）中亦含有高磷。限制高磷食物的摄取量。

## 高磷食物

牛奶	可食骨鱼（沙丁鱼）
酸奶	内脏（比如，肝、肾）
奶酪	蛋黄
豆类（如豆腐、豆浆）	提取物（妈蜜酱/肉汁）
坚果和其加工品（如花生酱）	凤尾鱼（江鱼仔）
种子和其加工品（如芝麻油）	虾米
椰子和其加工品（如椰奶）	鱼干
可乐饮料/深色汽水	蘑菇干
麦芽和可可饮料	海藻
奶酪、坚果和巧克力饼干	燕麦
巧克力	什锦燕麦片/维多麦
炸鱼饼和虾饼	糙米
骨头类（鸡翅膀或鸡脚高汤）	全麦/全谷面包/饼干

参考资料：国家肾脏基金会

### 提示

不要忘了随餐服用磷酸盐结合剂(如碳酸钙)! 磷酸盐结合剂可结合食物中的磷酸盐,预防磷酸盐被吸收到血液中。如没有随餐服用,磷酸盐结合剂将无效。

# 钠

钠是食盐的主要部分，可以在酱料、调味品、防腐剂、腌制食品和罐头食品中找到。过多的钠会使我们容易口渴和导致体液累积，而这会导致血压升高和伤害您的心脏。

### 以下步骤可帮助您减少钠摄取量:

1. 钠大多来自加工食品，存于许多不同的形式。所以您需阅读成分标签。如果前三种成分中含有以下任何成分，该食品可能是高钠食品：
  - 氯化钠/精盐 (Sodium chloride/table salt)
  - 味精 (MSG)
  - 岩盐/海盐/加碘盐 (Rock/sea/iodized salt)
  - 烘焙粉 (Baking powder)
  - 亚硝酸钠 (Sodium nitrite)
  - 苯甲酸钠 (Sodium benzoate)
2. 避免使用代盐品，因为它们通常含有钾

### 提示

- 限制钠量高的食物，如加工食品（如午餐肉或热狗），选择新鲜蔬菜、家禽和肉类
- 在家里做饭时用香料、青柠汁或天然调味料（如葱、洋葱、大蒜和欧芹）来提味，而不是添加精盐
- 只在烹调后加少量盐或调味汁。在加入盐前品尝食物
- 少吃腌制食品、多用途马来叁巴酱、印度薄饼或酸辣酱等食物
- 尽量减少您在外用餐的次数，因在外用餐大部分的食物都是高盐的
- 外出用餐时，要求更少的肉汁，避免饮用汤，限制腌制食品，如“江鱼仔”。尽量点不加盐、味精或酱油的新鲜烹煮的食物
- 在购买食品时，选择有“较健康选择”标志的食物，或标有“低钠”或“不添加盐”的食物
- 阅读食品标签，对比类似食品(每100g)，并选择钠含量低的食物



# 液体

当肾功能逐渐的下降导致步入肾病的后期, 您须密切控制饮用的液体量。  
当您饮用或者喝太多液体时, 您可能会患有以下问题:

- 呼吸急促
- 血压升高
- 心脏问题, 如脉搏快、心肌衰弱、心脏扩张

液体的来源包括水、茶、咖啡、甜果汁饮料、牛奶和汤的液体。其他食品如粥、果冻、冰块、雪糕、红豆冰, 也会给身体添加液体。

以下是一些帮助控制液体摄取量的方法:

- 用一个水壶测量当日允许的液体量。每次您饮用任何液体时, 都要从容器中倒出相同的量。当水壶的水被倒空后, 您就知道您已达到每日允许的饮水量
- 吮吸冰块湿润干燥的嘴巴 (液体量应被计算在内)
- 用清水漱口, 但不要吞咽
- 限制咸的食品, 这样您就不会感到那么口渴

## 有用提示 液体测量的常见方法

物品	量 (ml)
1 汤匙	15
1 中国汤匙	30
1 块冰块	20
1 中国碗盛的粥	100
1 茶杯	150
1 杯	250

# 肾功能衰退与糖尿病

如果您患有糖尿病, 您的医生可能会调整您的药物, 以提供血糖控制。饮食管理也变得更加重要。含碳水化合物的食物最会影响血糖, 所以您的碳水化合物的摄取量需要调整, 以帮助管理您的血糖水平。碳水化合物包括淀粉类食物(如米饭、面包、面条) 和水果, 以及含糖的食物 (像糖果和甜食)。

请向您的营养师咨询, 以了解您碳水化合物量的需求, 以及可食用的碳水化合物食物种类。



## 洗肾所需知识

当肾功能逐渐的下降导致步入肾病的后期,您须开始进行洗肾。

### 什么是洗肾?

洗肾是一种仿效正常肾脏运作的人工过滤程序,从体内去除多余的水和已经在身体里累积的废物。

有 2 种洗肾方式-血液洗肾与腹膜洗肾

### 血液洗肾 (HD)

HD 是通过不断循环血液,将其通过一个被称为洗肾器的过滤器,来去除体内的毒素和多余液体的过程。该过滤器与洗肾机一起使用,每周使用3至4次。

### 腹膜洗肾 (PD)

进行腹膜洗肾(PD)时,腹腔会被注入透析溶液。腹腔内的腹膜作为过滤网,清除液中的废物和多余液体,将其排到腹腔里的透析溶液。透析溶液通常停留在腹膜 4 - 5 小时,然后再将其排出和更换。

当您步入洗肾阶段,您的营养需求将改变。譬如,您需增加蛋白质摄取以补充洗肾过程所流失的蛋白质。向您的医生,护士或营养师咨询以了解您的饮食需求。

## 当您需要 增强 营养时...

遵循适合慢性肾病 (CKD) 患者的饮食很难。65-81% 的 CKD 患者的蛋白质摄入量超过目标<sup>1</sup>。

低蛋白肾脏专用口服营养补充剂可能有助于减缓 CKD 病情进展<sup>2</sup>。

考虑使用 **Nepro® LP**, 一个为肾功能衰退者特制的营养品。向您的医生或营养师咨询了解如何把 **Nepro® LP** 纳入您的饮食计划中。

本节包含提供给肾病患者产品具体信息。

<sup>1</sup> Betz M et al. J Ren Nutr. 2021 Jul;31(4):351-360

<sup>2</sup> Yan B et al. 2018 Nov 7;13(11):e0206134



## Nepro® LP 辅助肾功能衰退者的营养需求



\* European Best Practice Guidelines (EBPG), European Society for Clinical Nutrition and Metabolism (ESPEN), National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (KDOQI™), Kidney Disease: Improving Global Outcomes (KDIGO®) guidelines - when used as sole source of nutrition

\* 每餐份 (220ml) 比 Nepro® HP 的蛋白质摄入量少于44.2% (分别为 9.94g 克与 17.82g 克)

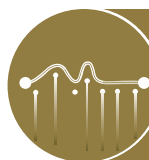
## NEPRO® LP 其他产品特点

**401  
kcal**

高热量以符合热量需求  
(401千卡/瓶)

**REDUCED  
WATER  
162 ml**

较低水分  
(162毫升/220毫升瓶装)



适合同时代有肾功能衰退和糖尿病者  
先进、慢消化、低升糖指数(GI)的碳水化合物



含有 OMEGA-3  
脂肪酸和单不饱和脂肪酸(MUFA)

Nepro® LP 的血糖生成指数  
低至 44, 也适合同时代有肾功  
能衰退和糖尿病者使用



# 如何把 Nepro® LP 纳入您的饮食计划？\*



**\*注意：**  
请咨询您的营养师，以确保正确使用 Nepro® LP 并符合您的特定营养需求和治疗计划。

# 使用 Nepro® LP 食谱让您的饮食更多样化

## 面包蔬菜奶油汤

份量：2

配料：

- 1 瓶香草 Nepro® LP (220ml)
- 40克西兰花
- 40克花椰菜
- 40克洋葱
- 40克蘑菇
- 40克胡萝卜
- 40克黄油
- 2汤匙玉米淀粉
- 420毫升水
- 黑胡椒
- 1/4茶匙盐
- 圆形法式面包 (约200克)

做法：

1. 将圆形法国面包挖空，外皮当汤盅备用。
2. 将青花菜、花椰菜、洋葱、蘑菇、红萝卜切碎后川烫，以去除钾。
3. 将奶油加热后和全部蔬菜翻炒之后加入热水(煮沸)。
4. 太白粉加水调匀成太白粉水，加入煮沸的汤汁勾芡。
5. 熄火。待汤汁降温之后，再倒入 Nepro® LP 拌匀即可，可用少许黑胡椒粒调味。
6. 最后倒入挖空的面包中即可。



## 营养价值

每一人份含量

千卡路里	677
蛋白质	15 g
碳水化合物	85 g
脂肪	29 g
钠	905 mg
钾	532 mg
钙	163 mg
磷	246 mg

营养小米粥

- 份量: 2
- 配料:
- 1 瓶香草 Nepro® LP (220ml)
  - 80克小米
  - 420毫升水
- 做法:
1. 小米洗净后, 加水放入电锅中煮熟。
  2. 将 Nepro® LP 加入煮熟的小米粥搅拌均匀即可。



营养价值	
每一人份含量	
千卡路里	352
蛋白质	9 g
碳水化合物	50 g
脂肪	12 g
钠	90 mg
钾	204 mg
钙	84 mg
磷	186 mg

草莓冰沙

- 份量: 2
- 配料:
- 1 瓶香草 Nepro® LP (220ml) (冷藏)
  - ½ 杯冷冻草莓
  - 4 汤匙水
- 做法:
1. 将去蒂的草莓、糖、水及 Nepro® LP 一起放入果汁机中搅打即可。



营养价值	
每一人份含量	
千卡路里	213
蛋白质	5 g
碳水化合物	24 g
脂肪	11 g
钠	98 mg
钾	202 mg
钙	87 mg
磷	81 mg

您的饮餐计划

请咨询您的营养师, 制定满足您营养需求的个性化膳食计划。

餐点	时间	食物/ 分量	备注
早餐			
点心			
午餐			
点心			
晚餐			

# 向您的营养师咨询您的日常营养目标数值。

## 卡路里

每日目标卡路里数值 \_\_\_\_\_

## 蛋白质

每日目标克数值 \_\_\_\_\_

## 磷

每日目标毫克数值 \_\_\_\_\_

## 钾

每日目标毫克数值 \_\_\_\_\_

## 液体

每日目标毫升数值 \_\_\_\_\_

## 干重

每日目标公斤数值 \_\_\_\_\_

咨询您的营养师如何可以将 Nepro® LP 纳入您的日常饮食计划中。

# 您的健康图表

姓名: \_\_\_\_\_ 出生日期: \_\_\_\_\_  
身高: \_\_\_\_\_ cm 性别: 男性/女性

			体检日期		
关键指标	单位	范围	/ /	/ /	/ /
体重	kg				
身体质量指数(BMI)		18.5 - 23			
血压	mmHg	120/80			
肾功能分析					
钾	mmol/L	3.5-5.5			
钠	mmol/L	135-150			
氯化物	mmol/L	96 - 108			
碳酸氢钠	mmol/L	>20 <24			
肌酐(前)	范围取决于体重和性别				
肌酐(后)	μmol/L	442			
尿素(前)	mmol/L	>20 <40			
尿素(后)	mmol/L	< 6.67			
骨骼分析					
钙	mmol/L	2.2-2.60			
磷酸盐	mmol/L	< 1.18			
脂肪分析					
总胆固醇	mmol/L	< 6.1			
甘油三酯	mmol/L	< 2.3			
高密度脂蛋白胆固醇	mmol/L	1.0-2.0			
低密度脂蛋白胆固醇	mmol/L	< 3.334			
白蛋白	g/L	> 35g			
内分泌功能分析					
糖化血红蛋白(HbA1c)	%	4.6-6.4			
随机血糖	mmol/L	4.0-9.0			



## NOTES 笔记

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