

# NUTRITIONAL SECRETS

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Diet for Early stages,  
Dialysis and Post Transplant

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Your guide to  
good healthcare  
developed by



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With support of many large hospitals

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## Our Associates





# Nutritional Secrets

## Part -1

Your mantra for healthy CKD, Dialysis and Post Transplant lies in diet and medication. This book tells you why you need to eat properly.

*Refer to the Part -2 for Recipes*

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Your healthy and safe living is important for all of us.

Best wishes,

From Kidney Warriors Foundation, Nephrologists and Dieticians



## Our Purpose

This book has been developed as an important information tool for chronic kidney patients living in India. Basic nutrition information may be common for any country, but recipes and the calculations are based on National Institute of Nutrition's data released in 2017 in Indian Food Composition Tables.

Though we have spent huge hours to get desired accuracy in outputs, any error or omission may be condoned as we, Kidney Warriors Foundation act in the best interests of people struggling to manage their disease. The information contained in 2 parts of Nutritional Secrets must always be used with consent of the treating nephrologists, based on individual blood reports and recommendations of doctors and dieticians.

The book is for public use. Any one can share information, with source credit to: Nutritional Secrets by Kidney Warriors Foundation.

This disclaimer protects the interests of the Kidney Warriors Foundation, supporting nephrologists and dieticians associated on this project.

Kidney Warriors Foundation was incorporated on 20th December 2017 under the Companies Act, 2013.

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**The book developed by Kidney Warriors Foundation  
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# Contents:

Introduction – Vishal Gadhia  
“Nutritional Secrets” aims to be a Renal Diet Bible

## PART 1: Basic concept of nutrition

(*The Hemodialysis section has detailed nutrition and how it affects your metabolism. The role of Carbohydrates, Proteins, Phosphorus, Sodium, Potassium, Fats and Fluid is common information. It changes at every stage, even among post transplant, due to medications.*)

### 1. Stage 5 – Hemodialysis

- Carbohydrates, your energy booster
- Proteins, your body builder
  - *Flow chart: Protein Sparing*
- Phosphorus – adds complexity to diet
  - *Flow chart: Excess Phosphorus impacts the Bone*
- Sodium, “key troublemaker!”
- Potassium, the King
- The Fiber saga
- Fats, you need it!
  - *Flow chart: When can fat affect your health!*
  - *Flow chart: Omega 3 & Omega 6 fatty acids*
- Fluid Control Is Not Only Water
  - #*Tips* – Guide to a good diet for hemodialysis

### 2. Stage 1-4: Maintenance of Kidney Functions

- Guidance to Keep Kidney Functions
- #*Tips* - Create a balanced diet plan to postpone ESRD

### 3. Choosing Peritoneal Dialysis (PD)

- Diet is easy for PD

### 4. Post Transplant Diet

- Introducing NODAT (new-onset diabetes after transplantation)
  - *Flow chart Insulin Resistance*
- #*Tips*- Stay healthy with a balanced diet plan (post transplant)

**# All diet plans are samples only. Please consult a dietitian for your special diet.**

## PART 2: RECIPES

Breakfast/ Snacks - Soups/ Rasam- Health Drinks - Salad - Chutney, Raita and Dips-  
Rice and Rice Dishes - Rotis and Parathas - Dals, Vegetables and Gravies - Sweet /Deserts  
*New Recipes will be updated*



## Introduction

You are not different.

You are like all of us.

You also need to eat.

You also need to drink.

But your kidney's condition tells you to be wise.

You need to be in control of your health.

To find ways to live long even with kidney disease.

All you need to do is:

Eat in small portions - Eat good quality proteins - Eat with less salt

Eat low amounts of oil, fats and fried food - Choose right fruits and vegetables

Enjoy low fat dairy products – Make a daily kidney-friendly mealplan!

You think you're making a sacrifice.

You are in fact making a choice.

A choice, to walk through life comfortably!

This small guide to your dialysis diet comes with plenty of careful planning. It is a joint product with help from doctors, hospitals, kidney warriors with an enthusiastic, dedicated effort from the experienced team of experts. They are renal nutritionists/dieticians. Some of them are our Facebook Associates, while others are from the hospitals supporting this project.

The dietician team worked together to open doors to those hidden secrets of a balanced diet that people with CKD, from Stage 1-5 need it desperately. The team made this enormous task of finding food, as simple as it can get. If you're confused about eating something, check this book, it could guide you.

This book is not a complete resource but simply a guide to any common man struggling to find a way to eat well and survive. You will still need a sitting with a "RENAL" dietician who can guide you specifically during your early stages or when you're struggling to plan your diet.

You are not alone. Everyone struggles to understand this simple diet, which has become complex because your kidney is not working.

By now you have heard those 'annoying' words - low salt, low protein, low potassium, low phosphorus and such other that make you lose your sleep.



Just remember.

- Choose wisely vegetables that you can eat more.
- It's not 'salt-free' but, it's 'less-salt'.
- If you ate enough protein at breakfast, at lunch take a small portion and see if you need to skip it at dinner.
- Your body will soon sing a diet song.
- It will know how to stay fit.
- But, you must make the first wise step.

Your friend and guide,

**Late Vishal Gadhia**

*State Co-ordinator Maharashtra*

Medical Information verified and approved by:

**Dr.Prashant Dheerendra,**

*Dharma Kidney Care*



# **“Nutritional Secrets” aims to be a Diet Bible**

## **About the book:**

Kidney Warriors Foundation felt that nutritional diet is very important for kidney patients along with medications and medical treatment. If your blood report says – high phosphorus, one cannot ignore it, can we? So we developed this book to guide patients like you to understand how to manage the kidney disease diet.

Taking this as a collaborated effort where senior, experienced nutritionists and dieticians, supported our diet expert, Late Vishal Gadhia, a dialysis person with seventeen years experience on renal diet, we could bring this wonderful book for you. To make it very simple for people new to the disease, he has developed explanatory flow charts. If you spend time to read these charts you will learn how by eating the right kind of food you will be able maintain your blood levels and blood pressure.

This book is written in a simple style so medical terms and nutrition terminology can be understood by one and all. As a kidney patient reading and following the suggestions, you will be taking the first step to take control over your kidney’s condition. Many people in India, US, Europe and other countries have lived on dialysis for 20-50 years. You can also do it.

So are you ready to learn and manage?

This book will guide you all the way through, in the best possible manner.

## **Your special diet**

As soon as you’re told you your kidney is will be starting dialysis, you need to take the first step to understand:

- What is this ‘special’ diet?
- Why should I follow a particular diet?
- What will happen if I don’t follow the diet?

Early learning will put you on the right track and keep you healthy.

All individual chapters will give you enough information. You are requested to read all the footnotes on pages. They will give you hints and guidance. They will keep reminding about things you may forget. When you’re scared, these tips will give you hope. Believe in them and you will be safe.

## **Page footnotes:your guidance to chapters**

- Limiting water is tough; but advised by doctors
- Manage how much you drink
- Use less milk in tea or coffee; choose cows milk
- Drink from a small glass; so you drink less
- Food with less salt, means less thirst
- Food with less spice = less salt = less water intake
- Use home made sauces with less salt



- Read your blood reports. Eat food so your blood levels remain normal
- Of total protein allowance –take large % of good quality protein
- Eat low potassium vegetables and fruits everyday
- Remember to take your phosphorus binders with meals
- Think of your blood report when you select a dish.
- Try to recall what you ate during other meal times.
- Choose a very small portion of your favorite dish if it is high in Potassium/ Phosphorus
- You may cheat on food for 1 meal, but get back to diet
- Being careless with diet puts your health in risk.
- You can control your destiny with wise action
- Your health is important to us.

### **Your kidney diet (including post transplant)**

This book has been developed to help you balance the nutrients so that your body is healthy and strong and you can withstand dialysis and handle a transplant. Once you start following the advice, you will soon learn what to eat in good quantity, so you have right amount of potassium, phosphorus and sodium that your body can safely handle.

Remember – apart from Protein, Sodium, Phosphorus, Potassium, Fats and Fiber – you need to consider Anti-oxidants.

Be in touch with your doctor and dietician. They will help you in managing your health on a daily basis.

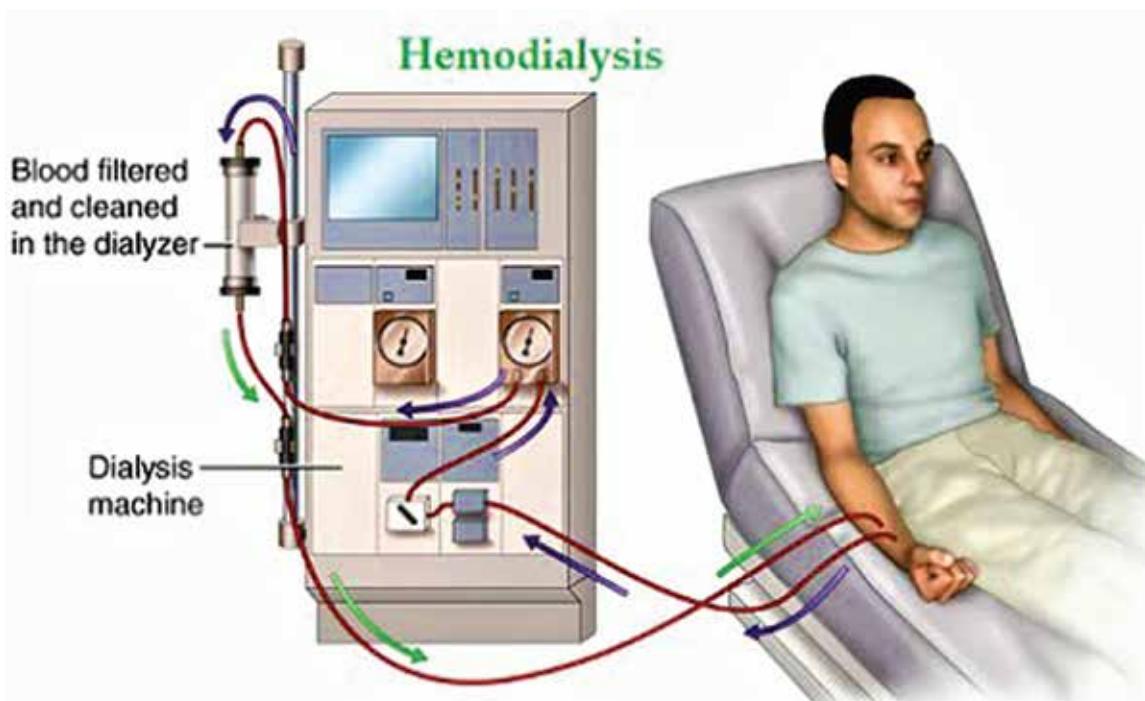
*(If you change your dialysis to peritoneal dialysis, please check for diet needed for this dialysis.)*

#### **Fact:**

Your kidneys are already damaged and cannot be cured or reversed. However, the hemodialysis diet can help you feel your best between dialysis treatments and afterwards. You must talk to your doctor about a kidney transplant.



## 1. Stage 5 – Hemodialysis



This section will give you some idea of nutrition and your body's metabolism -for Stages 1-5, Hemodialysis and Peritoneal dialysis.

Try to understand why your body behaves in a pattern when kidney's function goes down.  
This is important.



## CARBOHYDRATES, your energy booster

Carbohydrates are plant-based nutrients found in starchy foods like cereals, grains, fruits and some starchy vegetables. Your chapatti, rice, jowar, bread, pasta, oats and among vegetables you will find that potatoes and yam fall in this category.

How valuable is this nutrient!

- Carbohydrate is a nutrient that gets broken down to a simple sugar called 'glucose'. It is this simple sugar that becomes your main source of energy. Carbohydrates provide immediate energy to cells of your body. Every single cell needs glucose to function properly. Your brain and blood cells especially need glucose, which is their main source of energy.
- Apart from providing glucose, food with carbohydrates gives you satiety, a feeling of satisfaction, sending a signal that you've eaten enough. For about 3-4 hours after a carbohydrate rich meal your stomach will be full. This is good because when you are full, you won't get an urge to munch on unhealthy snacks at odd times of the day.
- Carbohydrates can be simple or complex, depending on its chemical structure.
  - Simple carbohydrates are found in natural foods like fruits, vegetables, milk, and milk products. It also includes sugars obtained from processing and refining.
  - Complex carbohydrates are found in whole grain breads and cereals, starchy vegetables and legumes. Many foods with complex carbohydrates are good sources of fiber.



Without doubt, you need carbohydrates!

- Every human being needs energy. Kidney patients like you need enough carbohydrates for living healthy and have enough energy to go through dialysis.
- Many people face fatigue and low energy when they are on dialysis. If you feel sluggish it could be due to energy deprivation caused by reduced food intake. Consumption of adequate carbohydrates is very important so that your energy is not depleted. Apart from carbohydrates you also need enough protein.
  - *Learn how to achieve the best balance of protein and carbohydrates.*  
*(Please see the note and flow-chart on protein sparing)*
- Your body gets energy from the food you eat and drink. Food containing carbohydrates, proteins and fats provide calories, which are used by your bodies to produce energy. The amount of calories you need depends on your age, size, gender, level of physical activity and nutritional levels as shown by blood reports.



- In case you're on peritoneal dialysis you will require lesser calories through diet as a considerable amount of calories will be absorbed from the Dialysate
- You will need energy through the day, so right amount of calories should be ideally spread throughout the day.

**There is therefore a need for a balanced diet.  
Enough of: carbohydrates, protein and fats.**

(Please read all the following pages to understand how to eat well on dialysis!)

**Shalini Arvind,**  
Fortis Hospital, Bengaluru

## PROTEINS, your body builder

Your first question to your doctor could have been, "Can I eat protein?"

You heard somewhere to limit protein. But that meant you can't have unlimited portions. You need to understand how much you need to manage well on hemodialysis.

Proteins are 'the building blocks of your body'.

You will find them in beans, legumes, milk and milk products, eggs, meat, poultry, fish, nuts and seeds and also in sprouts. To a smaller extent it is found in cereals and grains, fruits and vegetables, called the plant-protein.

The protein's role is huge.

- When your protein intake is digested, it gets broken into amino acids. These amino acids get absorbed into your blood – then it is rearranged to form different body proteins according to your body's needs. Proteins are needed to build your body's muscles, makes you strong by arming you with right immunity to fight illnesses and infections.
- Proteins also help to carry out many metabolic functions effectively. Your muscles, tissues, cells, blood, are all made up of proteins.

***Did you know?***  
**Every function in your body needs protein!**

- Your body will need enough protein - as the body breaks down the protein into long chains of amino acids – then into a single amino acid. The body's cells use these amino acids to make new proteins
- Proteins repair and heal your tissues
- It helps in making hormones
- It produces antibodies and enzymes
- It helps balance acid-base, fluid and electrolytes
- And it also provides some of the body's energy



What happens to your protein when you do dialysis?

- Protein consumed will create protein waste products. Your healthy kidneys use millions of nephrons that they have, to filter this waste. Your body's waste is removed through urine. Unhealthy kidneys lose the ability to remove protein waste and it starts to build up in the blood.
- But when you reach end-stage renal disease and begin dialysis the situation changes. In the process of hemodialysis you will lose **nearly 6-9g of protein**. You will need more protein than an average person to maintain all normal body functions and achieve best health! Protein therefore becomes an important aspect of your renal diet.
- To get adequate protein levels:
  1. You need to maintain lean body mass and metabolism
  2. Good fluid-control
  3. Greater immune function and improved energy levels
  4. Poor appetite could lead to inadequate protein levels and you may face very serious health risks. It may put you in a danger zone!

***Learn to watch your protein in-take. Short-cuts may harm you.***

### **DO YOU KNOW?**

**At every dialysis you lose proteins. They get washed away!**

**So, you must add more protein in your meal!**

#### **Now for actual amount of Protein**

Stage of kidney disease	Protein needed per kg weight	Calculated for person with 60kgs weight
Early stages – 1,2 and 3	0.8gms – so you delay progressing to end stage	About 50gms spread across meals.
On hemodialysis	1.2-1.3gms	About 72- 80gms spread across meals.
On Peritoneal dialysis	1.2-1.5gms	About 72-90gms spread across meals.

***Check your body weight and watch your protein intake.***

### **How to understand Protein and Malnutrition?**

You now know how important protein is for your body. If you eat less protein you will be under nourished. Slowly you will be malnourished and your health will be at risk. If your body feels deprived of right amount of carbohydrates + full protein quantity, it will mean it is malnourished.

Safe Zone - *measures*:

- When you are asked to take adequate protein –take this suggestion seriously. Apart from learning here, please talk to a dietitian for more specific information. That will give you a clear picture.
- A dietitian can guide you on exactly how much protein is needed for your body to be fit. Each person's needs are different. Foods with best sources of protein that you prefer can be selected so you get enough of the essential *amino acids*.
- Your Dietitian will monitor your diet's effect on your health and what changes are needed.



- Consumption of required amount of calories and protein are equally important.

Unsafe zone - *problems*:

- You won't know where the story of protein-energy malnutrition will begin.
- With CKD it will grow progressively and could lead into a very serious stage.
- 40% of all patients are already malnourished when are about to start dialysis treatment
- 20% -60% get into malnutrition when they are doing hemodialysis
- Protein-energy malnutrition may result in risks of cardiovascular death - both in CKD patients not yet on dialysis and people on dialysis
- So, you need to consume required amount of calories and protein. Both are equally important.

*Protein finder*

75% of your human body is made up protein. Protein allows your body to counterevery day's wear and tear, heal from injury, stop any bleeding and fight infections. Protein is made of a chain of 20 amino acids to keep your body healthy.

- 11 Eleven of these amino acids are produced by your liver
- 9 “essential” amino acids come from food.

When a food has all nine essential amino acids, it is considered a “complete” protein food.

#### ***Complete protein: most animal based, dairy and poultry***

- Including: cheese, eggs, fish, red meat, milk and poultry.
- Soybeans and many products made from soy are also considered complete proteins.

#### ***Other proteins: plant based***

- Grains, legumes, nuts and seeds are considered incomplete proteins
- They have low amounts of amino acid or are missing one or more essential amino acids.

**Complete Protein + Other Proteins = Will give your protein needs.**

- **VEGETARIANS:** If you're a vegetarian and have kidney disease - your dietitian will give you best combination of different of plant and vegetarian sources to meet your body's requirements. So you can have a well-balanced, complete protein meal on the kidney diet.

#### **Protein- sparing effect Relationship between protein-carbohydrates**

Protein-sparing effect

You have already read and understood that you need to eat enough carbohydrates and protein. You also know how much protein you should ideally consume while on dialysis. You also know protein is needed by your body as protein for performing other life-supporting roles, from building and repairing tissues and muscles to making antibodies and enzymes. So proteins have an important role to play in maintaining your health.



But new information for you is: If you do not consume enough carbohydrates, some of the valuable protein will be converted to manage your energy needs. This is simply explained as the protein-sparing effect. Please note this will have a negative effect on your health and is very harmful.

It is important that the proteins you consume are used for “protein’s work” and is not used for “carbohydrates work” as a source of energy.

You need to eat protein every day to meet your body’s needs. Proteins don’t get stored in your body like carbohydrates and fats. To improve quality of life you must optimize your body’s potential by consuming a well-balanced diet, with all nutrients in sufficient quantity.

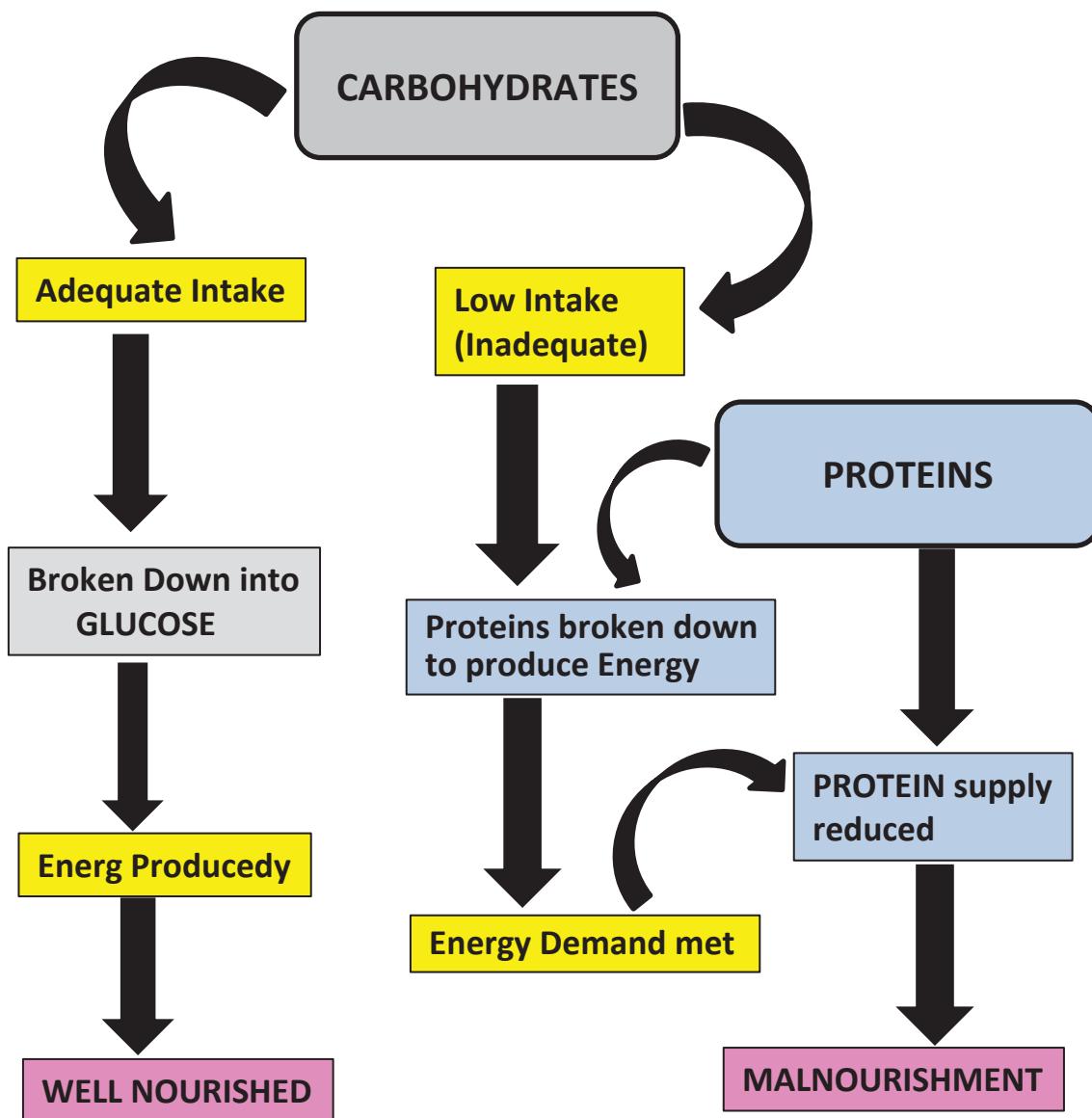
*In case you are unable to understand this, seek a dietician’s advice.  
See the “Protein Sparing Flow Chart”*

**Shalini Arvind**  
Fortis Hospital, Bengaluru



## Protect against Malnutrition

(Include adequate quantities of Carbohydrates and Protein in meals)



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## PHOSPHORUS – adds complexity to diet

You have phosphorus right inside you. Most of this mineral is present in the bones. Along with calcium, phosphorus is needed:

- For healthy bone and teeth
- To maintain the pH balance (acid/alkaline balance)
- To produce hormones that creates energy for various other functions in the body.

You get plenty of phosphorus from a nutritious diet, as it is found naturally in many foods. Normal working kidneys remove excess phosphorus and keep the calcium and phosphorus in balance in the blood. On dialysis, excess phosphorus cannot be removed. It is nice to keep your phosphorus within limits. (DO READ THE RANGE IN YOUR BLOOD REPORT)

Stage	Level of phosphorus in blood
Normal health	2.5 to 4.5 mg/dl
Stage 3 and 4 of CKD	2.7 to 4.6 mg/dl
Stage 5 and Dialysis	3.5 to 5.5 mg/dl

(Source: The National Kidney Foundation, USA)

*Ideal phosphorus levels for dialysis patients: 3.5- 5.5 mg/dl range.*

The CKD scenario:

When your kidneys are unable to remove phosphorus from the blood and get rid of the excess through urine it can lead to **hyperphosphatemia** (high levels of phosphorus in blood). This problem becomes worse as CKD advances from stage 3-4, or 4-5 and so on.

### Some Foods - High in Phosphorus



Meat

Fast Food

Cheese



Milk

Seeds

Canned Fish

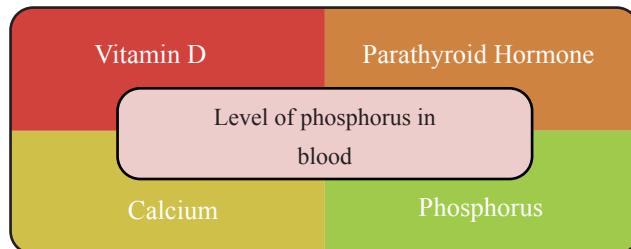


Cola



How are phosphorus, calcium, vitamin D and parathyroid hormone related;  
What happens in CKD?

Phosphorus, calcium, vitamin D and parathyroid hormone (PTH) interact with the kidneys to control the level of phosphorus in your blood.



When your kidney fails, this interaction gets disturbed.

What is the effect of this?

#### **Problem 1: Mineral Bone Disorder**

- The kidney cannot remove the excess phosphorus.
- Excess remains in the blood and the phosphorus binds with the calcium. So the blood calcium drops.
- Low calcium level in the blood makes the parathyroid glands (four small glands in the neck) make more PTH.
- So, this causes calcium to be pulled from the bone into the blood.
- Now, too much parathyroid hormone is in the body and it could cause your bones to become weak. They may break more easily.
- So it may lead to Mineral Bone Disorder (MBD).

#### **Problem 2: Vitamin D also joins in “Mineral Bone Disorder”**

Healthy kidneys could convert Vitamin D into an active hormone called calcitriol. This helps in more calcium absorption from the intestines into the blood. But in CKD this is not possible. So calcium is not absorbed adequately from the intestines and could weaken bones.

“High phosphorus and calcium levels also lead to dangerous Calcium deposits in blood vessels, lungs, eyes, and heart”.

So please manage your phosphorus on a front foot

- Keep your phosphorus level normal by understanding your diet and medications for phosphorus control.
- Choose your food wisely. Phosphorus is found in higher amounts in protein-rich foods such as meat, poultry, fish, nuts, beans and dairy products.
- Know that phosphorus found in animal foods is absorbed more easily than phosphorus found in plant foods.



High phosphorus foods:

Dairy	Milk, cheese, curds, ice cream and other processed dairy
Grains	bran, brown rice, red rice, whole grains, lentils,
Snacks	Nuts, seeds, chocolate, pizza, fast food and ready to eat instant mixes.
Beverage	Bottled drinks, beer, cola, milk based coffee, cocoa products
Vegetables	Avocado, Potatoes
Animal Protein	processed meats, organ meats, certain types of fish, and poultry.

Though white flour (Maida) is better for you during dialysis. White flour has “low nutritional value”. You need good nutrition + some fiber that comes from whole-wheat flour rotis. Lentils are your main source of protein if you’re a vegetarian. So you cannot avoid them altogether to reduce phosphorus in your diet.

#### ***Brilliant Tips:***

To control your phosphorus:

- Sieve flour to remove a part of the bran.
- Use more of de-husked lentils and less of whole lentils.  
(More often dals and less Rajma, channa and such others)
- Avoid processed dairy, but use milk and curd in advised amounts

Low Phosphorus foods:

Dairy	Low fat milk (cow's milk), Low fat curd
Grains	White rice, pasta, rice noodles (not instant variety), Sooji, vermicelli, poha
Snacks	Apple, carrot pieces, cucumber, Murmura bhel, puffed rice
Beverage	Black coffee, teas with low fat milk, low fat milk
Vegetables	Radish, Green beans, Cabbage, Eggplant, Cauliflower, Onion, lettuce
Animal Protein	Egg whites, Some fishes



## Portion size matters!

High phosphorus food should also be studied in relation to portion size.

Low phosphorus food consumed in a large portion will lead to high total value of phosphorus in your food.

- Take guidance from a dietitian based on your doctor's advice.
- Give your dietician a feedback if your blood levels are still not within range.
- Understand portion sizes.

Your "*Trump Card!*"

Phosphate binders: Your doctor may order a medicine called a phosphate binder for you to take with meals and snacks. This medicine will help control the amount of phosphorus your body absorbs from the foods you eat.

Some types also contain calcium, while others do not. You should only take the phosphate binder that is ordered by your doctor or dietitian.

Fooled by hidden phosphorus:

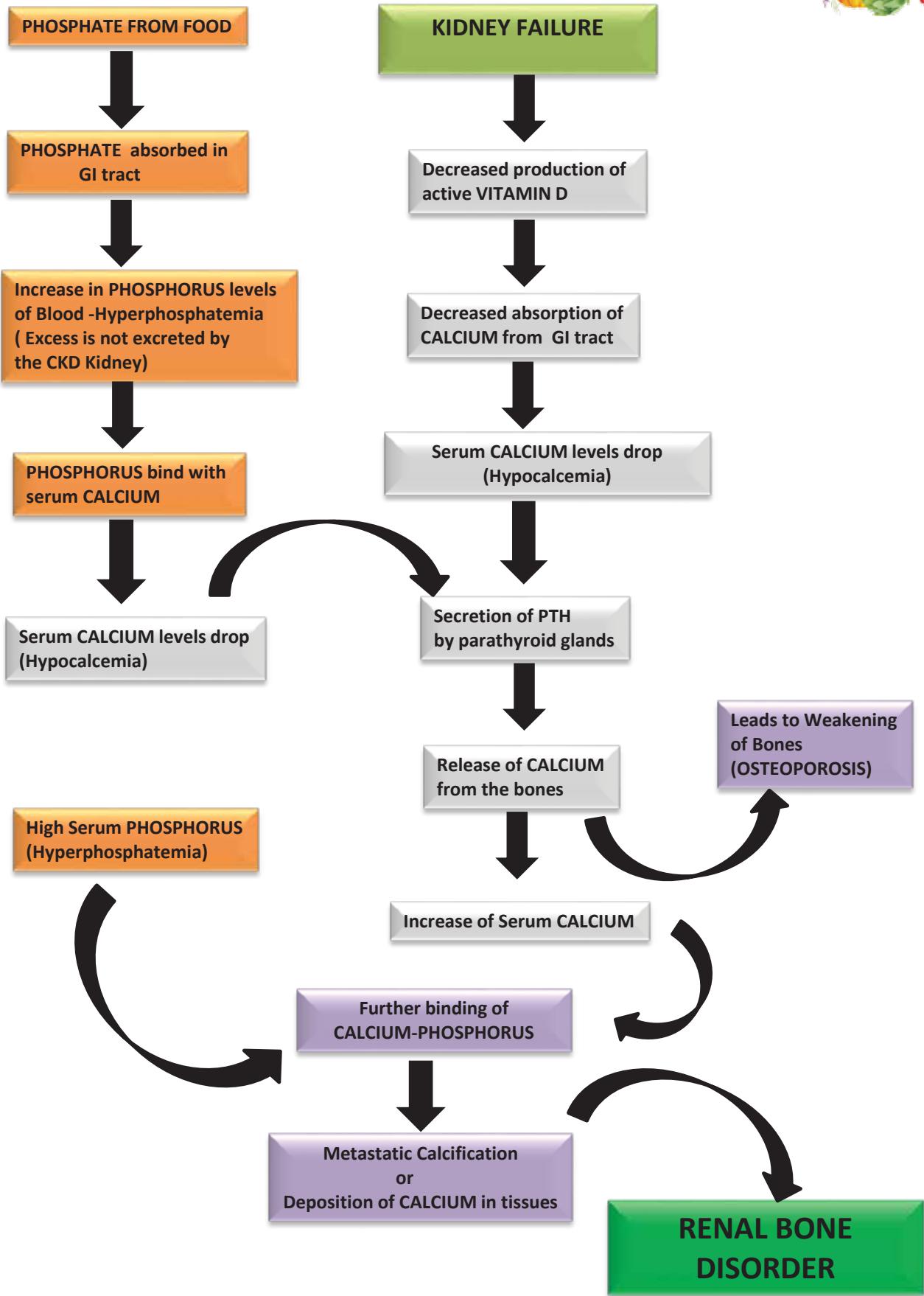
Today, phosphorus gets added to food as an additive or preservative (inorganic phosphorus). This is popular in foods such as fast foods, ready to eat foods, canned and bottle beverages, enhanced meats, and most processed foods. Phosphorus from food additives gets completely absorbed.

*Best Tip:* Try to avoid canned, processed and ready to eat foods.

\*\* Look for these ingredients that must be avoided at all costs from food packets/cans you purchase:

Phosphoric acid	Sodium polyphosphate
Pyrophosphate	Sodium tripolyphosphate
Polyphosphate	Tricalcium phosphate
Hexametaphosphate	Trisodium phosphate
Dicalcium phosphate	Sodium phosphate
Monocalcium phosphate	Tetrasodium phosphate
Aluminum phosphate	

**Suneetha Rao,**  
NU Hospitals, Bengaluru



## CALCIUM-PHOSPHORUS CORRELATION



## Sodium, “key troublemaker!”

Among the first things your nephrologist will tell you, “Watch your sodium!”

It becomes the starting point for your diet and decides how well you will be while on dialysis.

When kidney starts slowing down, your kidneys do not function properly, so extra sodium will stay in the body.

- You will feel thirsty and want to drink more fluids.
- More fluid, means more water retained in the body
- Blood pressure will rise
- You will have breathing difficulty
- All this will put a strain on heart and kidneys.

*Action:* Restrict Sodium in your diet.

*Daily allowance recommended by your doctor  
(ENJOY FULL QUANTITY, FOR STABLE HEALTH)*

Ingredient	Sodium allowed	Salt content in sodium
Sodium	1.6 gms – 2gms	---
Salt has sodium	2.5gms sodium	5gms (1tsp)
	<b>So - 2gms</b>	4gms (3/4thtsp)
Take 3/4th tsp salt: Breakfast, mid-morning snack, lunch, snack and dinner		

### *Salt and Sodium:*

- Salt contains Sodium. See the above table for arriving on quantity of salt and sodium to be consumed. Notice the difference in quantity.
- You can safely consume 4g (3/4Tsp) of salt for the whole day – for breakfast, mid-morning, lunch, snacks and dinner.
- For best control on Sodium, measure the prescribed quantity of salt into a small box every day morning. Use only this measured salt the whole day in your food (Food should be cooked without salt).
- The daily quota of salt must be completely used.
- You need salt restriction; not NIL salt

### *Tips:*

1. First steps: (suggestions that will help)
  - Use Common salt
  - Every morning, measure your 3/4thtsp salt and keep it aside. Mentally plan what will go into what meal.
  - Mix salt in a little water for adding in your portion so it becomes “salt-water”
  - Remove your portion from food cooked for family before salt is added.
  - Add salt to your dish from your “salt-water”
2. Small measures
  - Every morning plan your meal for the day.
  - What you will eat at home vs taking to school/work.
  - Hot meal at home can be with less salt, but carrying for eating later may need a little more



- When you plan the day's diet you can try to eat less sodium, more nutritious, rich fiber snacks like a fruit or salad. Without a plan you may binge on unhealthy snacks.
- A few drops of lemon at one mealtime – if added when eaten hot, will make food tasty and less salt will be possible.
- Add mint and such herbs to your food so less salt can be managed
- Spices like onion powder, garlic powder, white pepper when added make up for the reduced salt.

### 3. Form good habits

To manage your blood pressure, learning to eat food with less salt is always useful

- Always eat rice and rotis without salt. It tastes good
- Try to fit in salad and fruit at snack times, in portions recommended by your dietician. Stick to low potassium fruits and vegetables.
- Study food labels – you must know if it has high sodium, potassium, and sugar. Avoid if there are any added fruit concentrates, preservatives. If the sodium content per 100gms is high please refrain from consuming it.

Food and Drug Administration, USA has recommendation that permissible limits for sodium are as follows:

Label	What it means
Low sodium	< 140 mg sodium per serving size
Very low sodium	< 35 mg sodium per serving size
Sodium free	< 5 mg sodium per serving size
Reduced sodium	25% less sodium than what a normal serving size would contain.

In India all packaged foods do not have labels. This includes many snacks and namkeens, preserves from local vendors. So our advice to patients is to avoid all processed, packaged and ready to eat food. Read nutritional labels where available. Some small/ cottage industries cater to the communities needs of condiments like chutney powders, masala powders. These could have unexpected sources of sodium.

*Remember:* Small servings of a low sodium product will increase the total sodium intake. That means it will be high sodium consumption.

### 4. Big life change:

Some foods must be left behind, till you managed your health and have permission from your dietician. When you leave something, you will learn how to eat moderately. Breaking rules on diet can make you sick.



## HIGH SODIUM FOODS – You will put your health in great risk!

Snacks	Papad, Potato chips, Salted biscuits, Salted popcorns, Namkeens,
Salted	Nuts
Food accompaniments	Pickles, Ketchup, Sauces, Commercial salad dressing and sauces Canned or tinned foods have brine (a salt solution).
Preserved/canned foods	“Ready to serve” and “ready to eat” food. They have high sodium and preservatives, Readymade noodles, pasta. Canned or tinned foods have brine (a salt solution).
Additives	Baking powder, Sodium bicarbonate, cooking soda, Commercial readymade masala containing salt, Soup cubes, Ajinomoto (Monosodium Glutamate), Meat and yeast extracts like marmite.
Beverages	Carbonated drinks containing sodium benzoate, boost, bournvita, chocolate drinks
Dairy	Cheese, salted butter
Animal meat	Bacon, ham, sausages, Dried fish.
<b><i>DO NOT USE SALT SUBSTITUTES AS THAT CONTAINS POTASSIUM!!</i></b>	

**Uma Maheshwari**  
Happy Living Diet Clinic

## Potassium, the King

From the time you were detected with CKD you only watched the creatinine levels. Creatinine is certainly ‘an enemy’ for anyone with kidney disease but you will soon understand that the dietary mineral, potassium rules your life!

Know about potassium!

Potassium is known as a major dietary mineral that helps balance body’s pH (acidity and alkaline level) and fluids. This mineral has a way to regulate blood pressure, control muscle contraction and is important for the sensory motor of our nerves and brain function.

**Normal Potassium levels = normal rhythms of heartbeat.**

However, when you have kidney disease the potassium levels in the blood may be high. Kidneys are unable to filter out excess potassium. If you continue to consume food high in potassium you will burden your system and it can actually lead to cardiac arrest.

Hyperkalemia or high potassium in blood is a serious medical condition that could put you in extreme danger, leading to mortality.



Watch for signals of high potassium!

Nausea, weakness, numbness or slow pulse could be some of the signs for high potassium in your blood.

*Find more on how to track your Potassium!*

Take control of your health

For keeping you and your heart safe, this chart shows

- 'safe'levels,
- levels you need to be 'cautioned' for and need to take action to bring it within range and
- levelswhich are 'dangerous' for you and you need to be worried about.

After a blood test shows your potassium is high talk to your doctor. You may be prescribed a potassium binder.

That's a short-term plan.

Your long-term goal is to manage health with a proper planned diet.

Meet a dietician and talk about how to manage your potassium. Talking to an expert is the first step of taking control of your health.

	Potassium level (mEq/L)
<b>Safe Zone</b>	<b>3.5 – 5.0</b>
<b>Caution Zone</b>	<b>5.1 – 6.0</b>
<b>Danger Zone</b>	<b>&gt; 6.0</b>

Keeping your potassium in the Safe Zone

An healthy person's normal potassium intake =3.5g – 4.5g per day(average diet has up to 8g potassium)

Restricted potassium intake for some CKD =1.5 to 2g (40 to 50 mEq) per day. (Consult your nephrologist and dietitian as this will vary from person to person)

You can easily maintain a comfortable level with a proper choice of vegetables/fruits/grains/dairy and meat in proper portion sizes.

- Moderation is important. Small portions. Balance your intake each day.
- Make a decision to limit foods high in potassium.
- Open your mind to consume a variety of foods in moderation
- Avoid: Consuming canned fruits & vegetables as also juices/ soup from cooked meat
- Stick to the serving size recommended by your renal dietitian.



3 or 4 portions of low potassium food – will add and may become high potassium food!

Leaching of lentils and vegetables may be required in certain cases and will be indicated by your renal dietitian. Leaching may not be required for everyone and every vegetable.

#### Potassium *finder*

You will be wrong if you think potassium = fruits & vegetables.

Potassium is found in all foods. Potassium content depends on soil conditions and water quality among other things.

- Some cereal grains have high potassium. Pulses and whole lentils have high potassium too, but they are staple food in an Indian diet and hence cannot be avoided. Learn how much pulses and lentils you can have without increasing your potassium levels.
- Dairy products also have potassium. Discuss with your dietitian about your dairy intake. Dairy gives you the much-needed protein but may tip your potassium levels. Again, moderation is the key.

Talk to a dietitian to get your complete guidance of foods that will help you to maintain your levels.

- You may be advised to avoid some foods
- Some foods may be replaced
- Plenty of option to choose from

*Do not depend on the Internet values.*

*As soil conditions change so will potassium values.*

*So the fruits grown in other part of the world may have different potassium values. You will get misled.*

Conquer the King “potassium”

Your doctor or renal dietitian will help you plan your diet so you consume right amount of potassium based on your needs and your health condition – depending on your blood report. So it is an individual diet.

For your making the right food decision we have a list here of fruits and vegetables classified as low, medium and high potassium group based on their potassium content. You also have a list of other foods that are high in potassium listed below.

- Choose to consume vegetables low in potassium on a daily basis without leaching.
- Moderate potassium vegetables can be eaten in moderation.
- High Potassium vegetables need to be avoided or leached as per your dietitian’s advice.

Please choose to eat only low potassium fruits for your everyday meal plan. Also remember to eat in the prescribed quantity.

*Make an informed decision for better quality of life!*

# The Great Potassium Chart

POTASSIUM VALUES OF VEGETABLES			
LOW K (100mg)	MEDIUM K (100-200mg)	HIGH K (200-300mg)	VERY HIGH K (>300mg)
 Snake gourd	 Chowli/ long beans	 Fenugreek leaves	 Ash gourd/ white pumpkin
 Tinda / Round gourd	 Lauki/ Dudhi/ Bottle gourd	 Brinjal	 Green leafy vegetables
 Parwal	 Capsicum	 Baby corn	 Bitter gourd
	 Chow Chow	 Capsicum Red, yellow	 Broad Beans
	 Cucumber	 Ladies Finger	 Cluster beans
	 Raw Papaya	 Peas	 French beans
	 Raw Mango	 Pumpkin	 Jackfruit seed
	 Ridge gourd	 Tomato-green & ripe	 Knol Khol
	 Tomatoes (Hybrid)		 Plantain flower
	 Tindora Kovakkai	 Cabbage- green	 Green plantain
	 Cabbage -purple		 Plantain stem
			 Tender red gram
			 Cauliflower
			 Onion stalk
			 Green chillies
			 Curry leaves
			 Coriander leaves
			 Drumstick
			 Drumstick Leaves

*\*\*\*Curry leaves and coriander leaves – may be used for flavoring.*

POTASSIUM VALUES OF ROOTS & TUBER			
LOW K (100mg)	MEDIUM K (100-200mg)	HIGH K (200-300mg)	VERY HIGH K (>300mg)
	 Onion-small & big	 Carrot	 Beetroot
	 Radish-white	 Radish pink	 Garlic
			 Ginger
			 Potato
			 Colocasia
			 Tapioca
			 Sweet Potatoes
			 Yam

■ LOW ■ MEDIUM ■ HIGH ■ VERY HIGH

## The Great Potassium Chart

POTASSIUM VALUES OF FRUITS			
LOW K (100mg)	MEDIUM K (100-200mg)	HIGH K (200-300mg)	VERY HIGH K (>300mg)
 Apple	 Cherries	 Custard apple	 Banana
 Jambu	 Grapes (green)	 Fig (fresh)	 Tamarind pulp
 Pear	 Lemon Juice	 Goose berry	 Wood Apple
	 Litchi	 Grapes (black)	 All Dry Fruits
	 Mosambi /sweet lime	 Guava	
	 Mango (Banganpalli)	 Jack fruit	
	 Mango (Totapuri)	 Musk melon	
	 Orange	 Peach	
	 Palm Fruit (nongu/tadgola)	 Pomegranate	
	 Papaya	 Chickoo/Sapota	
	 Pineapple		
	 Plum		
	 Watermelon		
	 Strawberry		

POTASSIUM VALUES OF COMMON FOODS CEREALS / GRAINS			
LOW	MEDIUM	HIGH	
 Raw rice	 Puffed Rice	 Whole Wheat	
 Samai (little millet)	 Rice flakes	 Broken Wheat	
 Varagu (Proso millet)	 Par boiled rice	 Whole wheat flour	
 Kodu Millet	 Sieved Wheat flour	 Millets (foxtail, barnyard etc)	
	 Vermicelli	 Ragi	
		 Brown Rice	
		 Quinoa	
		 Maize	
		 Jowar	
		 Barley	
		 Bajra	

LOW     MEDIUM     HIGH     VERY HIGH



***“Sometimes I crave for my favorites high potassium vegetables”.***

Your favorite High Potassium rich foods can be included in your diet once in a while, by making them undergo a process called leaching. Since, Potassium is water-soluble mineral; it can be reduced to a certain extent by leaching. Leaching can be done in two ways as mentioned below;

1. Soaking: Potassium rich foods can be soaked in large amount of warm water for half hour to one hour. Discard the soaked water and cook in fresh water.
2. Boiling: If boiling is the method of cooking, then boil high Potassium foods with large quantity of water. Discard the boiled water and cook in fresh water.

However, leaching does not remove all potassium and your blood potassium can increase by eating potassium rich foods even after leaching. So amount and frequency of intake has to be checked.

**Remember - Low Potassium diet is essential for CKD patients for healthy muscles and normal heartbeat.**

#### Tip 3: Be a Potassium Watchdog

Look out for low potassium options.

- Balancing a day's potassium and other nutrients is possible---
  - If you had  $\frac{1}{4}$  cup of whole lentils, remember to avoid curd/milk during the other meals in the day.
  - If you ate extra portion of fruit – cut back on potassium with low potassium vegetable at meal times...maybe skip the tea/coffee.  
That's super sensible eating!
- You already know! 1st hour of dialysis – you can enjoy a small portion of high potassium fruit. Treat yourself in the 1st hour.
- Place the Potassium Chart on your refrigerator door
- Distribute egg and lean meat intake through the week

Enjoy small portions. Chew food well. Eat slowly. Fill your plate with your food. Take suggestions from your dietician on ideal portion size.

**Your health is what you make of it.**

#### ENJOY SOME LOW POTASSIUM

Food choices:

Methiparatha + onion chutney

Ridge gourd sambar (using leached dal)

Bottle gourd raitha (using skimmed curds)

Snake gourd thoran

Curry + Sago upma



Green mango & chow chowsambar (using leached dal)  
Paneer peas curry  
Ridge gourd chutney  
Paneer stuffed snake gourd  
Vegetable fried rice – without aginomoto and soy sauce  
Ravadosa  
Vegetable & tofu stir fry  
Raw mango chutney + Dosa  
Ridge gourd chutney+ Idli

**A little planning and you can make a good choice!**

**Suneetha Rao,**  
NU Hospitals, Bengaluru

**Uma Maheshwari**  
Happy Living Diet Clinic

## The Fiber saga

When you are told so much about limiting food, low-high potassium, you are right to wonder why we are talking about ‘Fiber’.

No matter what your kidney condition is, you need dietary fiber in your meal, so here we tell you why, what and which fiber!

Dietary fiber is that part of the plant food that does not get digested. Fiber is found in plant foods such as fruits, vegetables and grains.

*Fiber, the bowel mover*

Fiber is a great enabler for the digestive system to work naturally and saves us from chronic constipation. You face constipation when there's a change in your normal bowel pattern. It happens at times when your dietary intake lacks sufficient fiber and fluids, or there's lack of physical activity and sometimes due to medications.

Your body needs two types of fiber.

First type is a soluble fiber that dissolves in water and absorbs fluid as it passes through the digestive system, creating softer, larger stools. Fruits fall in this category.

The other type is insoluble fiber (roughage). It absorbs water and makes stool bulkier to help bowel movements pass more easily. Roughage is found in fruit peels, bran and many others.

Fiber in food prevents hemorrhoids.

It helps in keeping cholesterol and blood sugar under control.

**Renal diet and fiber’s role**

On dialysis it is tough for you to find enough fiber in your suggested diet.



- With restriction of potassium in your diet, you are unable to eat some fruits and vegetables that could give you fiber, since they fall in the high potassium category. Obviously you will avoid these fruits.
- You may have phosphorus restriction in your diet. That means high fiber found – like whole-wheat bread and bran cereals may not be your source for fibers they are with high phosphorus.
- Fluid is restricted for you. So unlike healthy people who can drink as much fluid as they want, due to dialysis, you can only drink a specified amount of water and other liquids. This limitation also affects the fiber intake. (Remember: Your doctor will determine the fluid intake based on the urine output).
- Your medications like phosphate binder and iron supplements could also affect the bowel movement. Many medications have similar effect.

But, you do have some Fiber choices!

You have a list of fruits and vegetables you can eat.

***Remember to eat all the quantity of fruits that you are allowed as a daily diet plan.  
You must eat low potassium fruits with its peel (if it is possible) - but in recommended portion sizes only.***

Some good snack options that are high fiber and best for renal diet

- are plain popcorn and
- low potassium raw vegetables like cucumber.

### **Find fiber – but be safe by avoiding high potassium options**

*Small, useful tips:*

Increasing your fiber intake can cause gas, bloating and cramps. So plan to gradually increase your intake of fiber. This will help.

For severe constipation – some relief measures

Sometimes fiber is not enough to relieve constipation, as each person may need a different amount of fiber.

Some excellent suggestions you can follow:

- Increase your physical activity.
- Drink warm water.
- Fix meal times and be aware of your need for fiber intake. At every mealtime choose some fruit or salad. That way you will consume all the allotted portions of kidney-friendly fruit/vegetable/water that is required by you. At no cost miss eating any of these.
- Eat peels of fruit and vegetables that can easily be eaten from your Safe fruits/vegetables from the Potassium Chart.
- Snack on unsalted popcorn and raw vegetables.
- Include a breakfast cereal with fiber (one that is approved by your dietitian).
- Eat whole fruit. Avoid fruit juice.



- Talk to your doctor/dietician for kidney-friendly fiber supplements.

*Be free of constipation. That's very important.*

**Suneetha Rao,**  
NU Hospitals, Bengaluru

## Fats: yes, on dialysis you do need them!

To make your diet balanced with all nutrition to face your kidney condition you also need to have 'fats' in your food.

Fats rule your life!

You will be surprised to know it is an extremely essential component in your diet.

- Fats keeps you happy and satisfied
- It helps your body to use the proteins and carbohydrates in your food more efficiently.
- It acts as a transport to carry vitamins like A, D, E and K to your cells.
- Fats are also used to make hormones like estrogen and testosterone.
- Certain dietary fats have essential fatty acids that make your skin glow, it acts as liningsto body's cells and helps with nerve transmission.

But, always remember - too much fat - AND too much of the wrong fats, can cause plenty of health issues like hypertension, heart disease, weight gain and other health problems.

**1gm of fat = 9 kilocalories.**

**Fats – broken into: saturated and unsaturated.**

Saturated fats - found in meat and dairy products (cream, cheese, and whole milk) – is the type that can raise cholesterol, particularly LDL (low density lipoprotein) cholesterol.

This kind of fats could lead to clogged arteries and heart disease. They actually encourage the liver to make more {total cholesterol} and more {LDL cholesterol}.

***Tip: Reduce saturated fats in your diets. Choose your 'fats' wisely.***

Unsaturated fats - found in fish, nuts and certain oils (peanut oil and olive oil) are fats that can actually help to reduce cholesterol. Unsaturated fats – are mostly liquid in form, at room temperature.

*Interesting!* If you choose to use unsaturated fats – it can improve your health.



There are two types of unsaturated fats:

- polyunsaturated(PUFA)
- monounsaturated(MUFA)

Your body cannot produce two types of polyunsaturated fat - omega-3 and omega-6 fatty acids. These are excellent for brain development, skin and hair growth, bone health, maintaining a healthy reproductive system and even in regulating our metabolism.

These fats improve your heart's condition by lowering "bad" LDL cholesterol and raising "good" HDL cholesterol.

*Things to know:* Sometimes food processed making unsaturated fat (like soyabean oil) - becomes hydrogenated or partially hydrogenated. By getting hydrogenated the fat called Trans fatty acids levels rises.

Saturated fats & Trans fats leads to {LDL} and raises{Total Cholesterol Levels}.

**Tip: Please eat food that is low in both saturated fats and Trans fats. That'll keep you safe.**

## Cholesterol

Two sources of cholesterol:

- your liver produces one and
- the otherone comes from fat in the foods we eat.

Dietary cholesterol and saturated fats are found in animal products- such as meat, poultry, seafood, eggs and dairy foods.

· Saturated fats are also found in hydrogenated fats (solid at room temperature).

We cannot control the amount of cholesterol our bodies produce, *but* we can limit the amount of cholesterol and saturated fat we consume in our diets.

Blood cholesterol is divided into several sub-categories. Cholesterol is carried around the bloodstream on molecules called lipoproteins.

There are two main lipoproteins:

- low-density lipoprotein (LDL) – the “bad” cholesterol
- high-density lipoprotein (HDL) is considered “good” cholesterol

↑ High levels of “bad” cholesterol and

↓ low levels of “good” cholesterol can lead to the development of cardiovascular disease (CVD).

(CKD patients are at a higher risk of developing CVD or may already have cardiovascular disease. In addition to causing heart disease, cholesterol plaque can also clog the renal arteries and cut off blood flow to the kidneys, resulting in loss of kidney function.



Triglycerides are the most common type of fat in your blood. They are used for energy and stored as body fat. But ↑ high levels of triglycerides can increase your risk of heart disease.

As a dialysis patient you face a risk of developing coronary artery disease. Some of you often have increase in serum triglycerides and low-density lipoprotein (LDL). It is also common to see some dialysis patients with low levels of high-density lipoprotein (HDL).

As dialysis patient you must eat a relatively high calorie diet as advised under protein section, but you should avoid foods that raise triglycerides and cholesterol concentrations. Your diet should be low in saturated fat, cholesterol and Trans fat.

The recommended dietary allowance for patients on dialysis is 20-25% calories from fat.

***Daily oil allowance of 3-4 tsp refined oil per day if the patient has ideal body weight and 2-3tsp if patient is obese or overweight.***

You can manage your triglyceride level!

Right choices

- Fiber rich
- Less saturated fat

*Choosing right food:*

- Low fat protein sources: Fish, poultry, lean meat and egg whites
- Your food plate must have essential carbohydrates. Try to eat less refined sugars and sweets
- Eat more fiber-rich food
- Consume food rich in omega-3 fatty acids. Oily fish like salmon, mackerel, sardines, herring, tuna, and trout are high in omega-3 fatty acids.
- If you're diabetic – manage your blood sugar so it is within a good range
- Drain all liquid from ground meat after cooking, then place meat into a strainer and rinse under hot water.
- Avoid or limit frying foods. Baking, broiling, steaming and boiling are healthier options.
- Trim fat from all meats and remove skin from poultry.
- Substitute skim milk for whole milk.
- Avoid processed and full fat cheeses.
- Limit alcohol.
- Add physical activity to your daily schedule. Talk to your doctor before you begin a workout routine.
- Quit smoking.
- Keep your weight at a healthy level. If necessary, reduce your calories to lose weight.

***Right choice for fats: in quantity recommended***

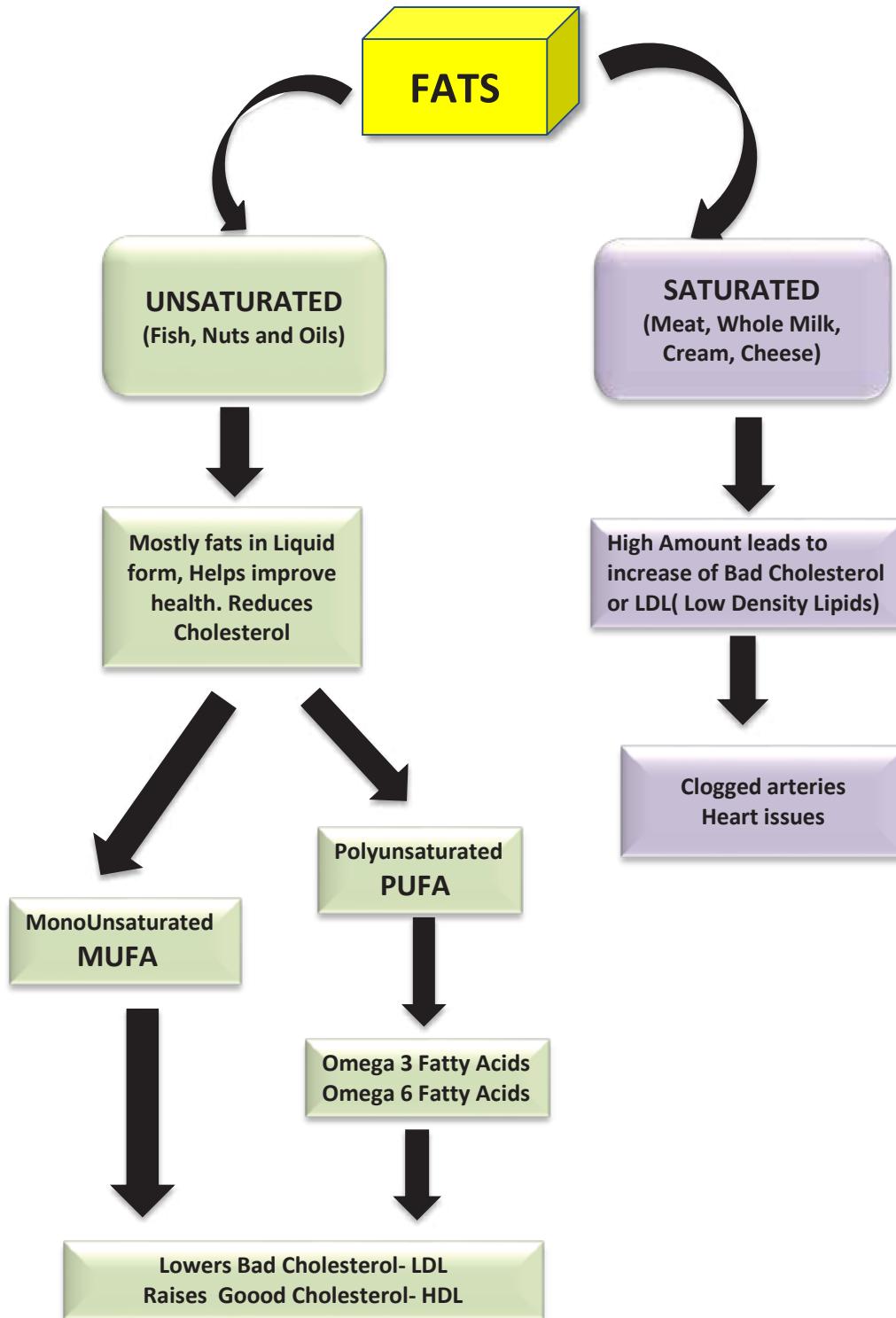
- Use groundnut, sunflower, sesame oil, mustard oil, rice bran oil, coconut oil and olive oil. These can be used in rotation.
- Avoid Vanaspati and margarine. Restrict ghee and butter.

**Swathi Sreekanta,**  
NephroPlus Dialysis Centre  
Bengaluru



## **FATS COMPLETES YOUR BALANCED DIET**

**(Choose more of Good Fats)**



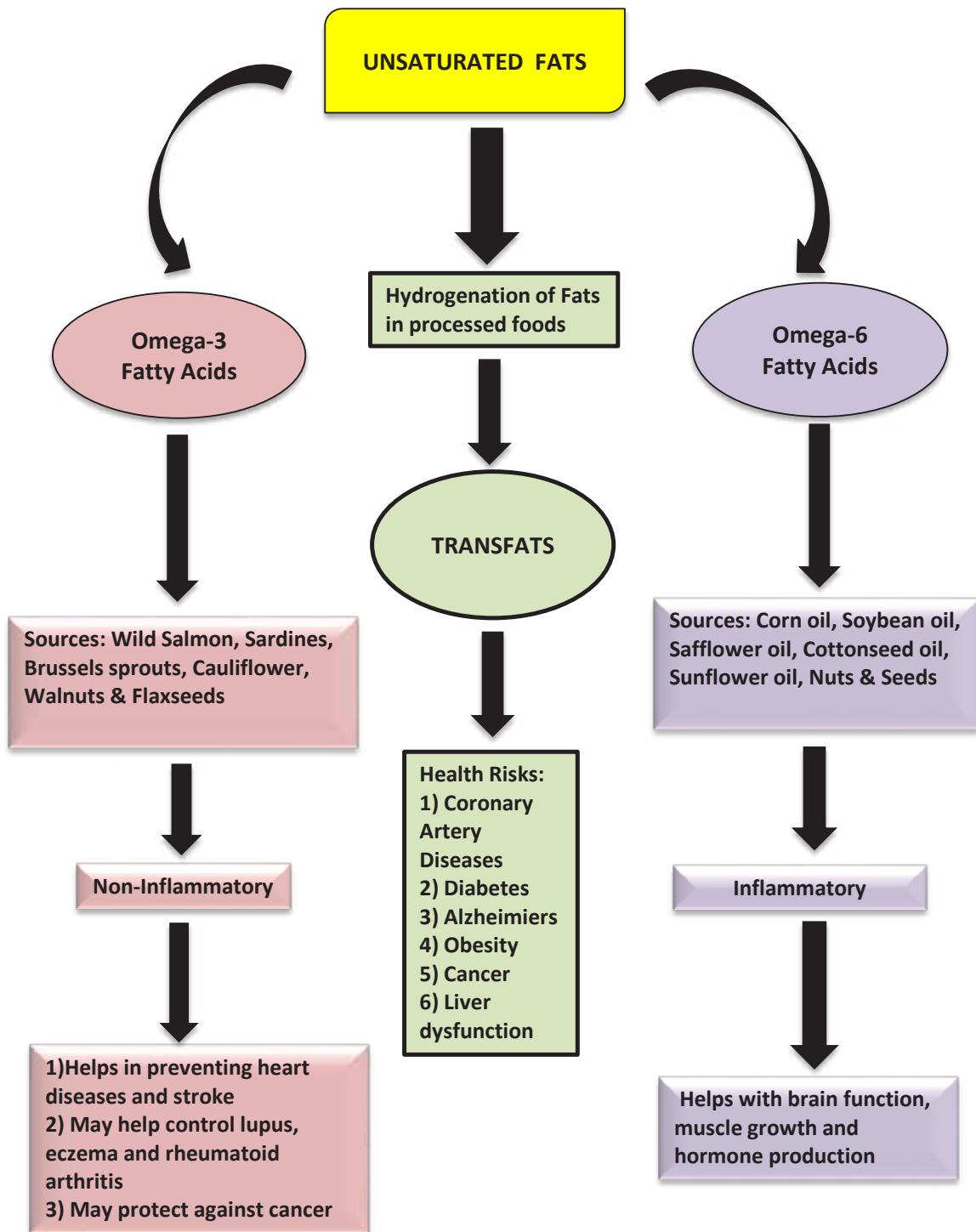
\* Unsaturated Fats are good fats

\* Limited portions of both, more of good fats

© Kidney Warriors Foundation



## INCLUDE UNSATURATED FATS-OMEGA 3 & 6



\* Transfats can be harmful to your health

© Kidney Warriors Foundation



## Fluid control is not only water



Your kidney's primary function is removing fluid from the body. In a kidney that works well, all excess water gets removed through urine. You will be surprised that your kidney is so smart that it keeps the right amount of fluid needed for body's functions.

But, when your kidney function goes down, it cannot remove all the extra fluid and slowly the excess remains in the body creating an overload. This water retained will increase your blood pressure and could lead you to cardiac issues.

When you notice swelling in your ankles, feet, legs, hands, face and parts of your body you must wonder if this is a symptom of fluid accumulation. You must meet a doctor and get it checked and treated. Excess fluid could accumulate in your lungs causing pulmonary oedema – which can be life threatening!

With your kidney slowing down and the body's fluid balance disturbed, you will face a life threatening condition. To maintain your health it is important to follow your doctor's advise on the right amount of fluid intake. Your daily fluid intake will be as needed by your body. It will be different for each patient as it purely depends on the quantity of urine output.

You must:

- Spend time to discuss with your doctor or dietician on your ideal fluid intake.
- Other patients cannot recommend on how much your body needs.
- Also, please understand from the internet you will not get right information

**You need to be careful  
Consume less and you will be dehydrated  
Consume too much and face oedema  
You need the right quantity**

Fluid = all food in **liquid state - at room temperature**. Water, tea, coffee, health drinks, soups, juices, sambar, thin dal, buttermilk, rasam, curd and ice cream. It becomes difficult to maintain fluid restriction, especially during summer.



But we do have some useful **tips**.

*Take 1 day at a time.*

*Follow the tips for a few days, for 10 days, for 20 days and then – you will forget that they were tips.  
Your fluid intake will be as advised by your doctor – to meet your body needs.*



## Our Tips:

- Keep liquids - Pre-measured quantity for mealtime (see that no one drinks from your measured quantity)
- Drink – either very hot or very cold beverages
- Drink in smaller size cups
- Take small sips
- Fill a spray bottle with water. Spray it several times to keep your mouth moist
- Freeze juice in ice cube trays. Suck them like popsicles
- Gargle your mouth with icecold water several times a day. That will keep it moist
- Medicines can be taken along with meals so water can be controlled
- Low salt food will also help



### Most useful *tip*:

- . Keep busy with work, study or any activity. Such activity will distract you.



***Your kidney's function decides how much you may drink!***

**Uma Maheshwari**  
Healthy Living Diet Clinic

#GUIDANCE - GETTING YOUR DIET RIGHT - HEMODIALYSIS							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
EARLY MORNING	coffee/tea/green tea - 100ml or High protein supplement - 100 ml (8g protein)  Marie gold biscuit -3/ wheat khakra -1	coffee/tea/green tea -100ml or High protein supplement - 100 ml (8g protein)  Marie gold biscuit -3/ wheat khakra -1	coffee/tea/green tea -100ml or High protein supplement - 100 ml (8g protein)  Marie gold biscuit -3/ wheat khakra -1	coffee/tea/green tea -100ml or High protein supplement - 100 ml (8g protein)  Marie gold biscuit -3/ wheat khakra -1	coffee/tea/green tea -100ml or High protein supplement - 100 ml (8g protein)  Marie gold biscuit -3/ wheat khakra -1	coffee/tea/green tea -100ml or High protein supplement - 100 ml (8g protein)  Marie gold biscuit -3/ wheat khakra -1	coffee/tea/green tea -100ml or High protein supplement - 100 ml (8g protein)  Marie gold biscuit -3/ wheat khakra -1
BREAKFAST	Egg white panniyaram (8 in nos) (mix 1 egg white into 1/2 cup panniyaram batter and use)  roasted bengal gram chutney (1/4 katori)	Dhokla (4 medium pieces)  tomato-onion chutney (1/4 katori)	Vegetable Pesarattu (moong dal dosa with grated bottle gourd) -3  ridge gourd chutney - 1/2 katori	Tofu paratha -2  onion curd raitha (1katori)	Rava idli -3 (medium sized) roasted bengal gram chutney 1/4 katori) + 1/2 katori sambar	Paneer (50g) paratha -2  cucumber onion raitha - 1 katori	Brad taost (3 slices) with egg white omlette (2 egg Whites)
MID-MORNING	suji/sago/vermicelli kheer (70ml)	cucumber salad - 100g + 1 egg white (boiled)	seasoned rice flakes -1 katori	Apple - 100g	egg white salad -1	masala puffed rice - 1 katori	capsicum, cucumber, onion salad
LUNCH	Soya Nugget/ paneer pulav -3/4 cup (use 50g paneer or soya chunk).  onion tomato raitha- 1 1/2 katori  chapathi - 1with mix  veg curry- 1 katori (carrot, choechow, tinda, tindly mix)	chapathi- 2 + snake gourd curry  dalhadka -1 cup  curd rice - 1/2 cup	Bisibele bath (with chow-chow, capsicum, carrot) - 1 cup  red pumpkin raitha - (1/2 cup)  cucumber salad	roti (2)- cabbage curry, +1 egg white burji  lemon rice - 1/2 cup  butter milk 100 ml	chapathi (2), chicken bhurji (70g de-skinned shredded chicken) or channa masala  curd rice (1 katori)  cucumber salad	egg white (2 whites) fried rice - 1 cup  thin dal curry/onion raitha  tindly subzi	(fish curry -70g) or (egg curry - 2 egg whites) or (70g panner curry)  roti - 2, rice 1/2 cup  mixed veg salad (cucumber, carrot and onion 100g total)

#GUIDANCE - GETTING YOUR DIET RIGHT - HEMODIALYSIS - contd							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Evening Snacks	2 high protein disketts (3g protien)  home made masala puffed rice / rice flakes/ pop corn	2 high protein disketts (3g protien)  home made masala puffed rice / rice flakes/ pop corn	2 high protein disketts (3g protien)  home made masala puffed rice / rice flakes/pop corn	2 high protein disketts (3g protien)  home made masala puffed rice / rice flakes/pop corn	2 high protein disketts (3g protien)  home made masala puffed rice / rice flakes/pop corn	2 high protein disketts (3g protien)  home made masala puffed rice / rice flakes/pop corn	2 high protein disketts (3g protien)  home made masala puffed rice / rice flakes/pop corn
DINNER	Kichidi - 1/2 cup  pulkhas -2  ridge gourd poriyal (thuraisubzi)	lemon rice -1/2 cup  pulkhas -2 beans subzi 1 katori, sauteed paneer (50g)	roti -3 capsicum onion carrot subzi  curd rice - 1/4 cup	kichidi - 1/2 cup  kadi - 1/2 cup  wheat dosa - 2 ridge gourd and tomato chutney	jeera rice - 1/2 cup  dalthadka -1/2 cup  pulkhas- 2 tindasubzi	roti -3 missall (moong/ mott gravy) -1/2 cup  curd rice - 1/4 cup	capsicum rice 1/2 cup  phulkha -2  dalthadka -1/2 cup  mixed veg curry
	THE ABOVE MENU PLAN PER DAY GIVES 1700 TO 1800 Kcal/day, 70g to 80g proteins, 40 to 50 mEq potassium and 1500 mg phosphorus. Sodium content will depend on the individual allowance	Low potassium vegetables have been included in the meal plan to a large extent to bring in the much needed fiber without increasing potassium	Leaching is not recommended for dialysis patients, unless Sr. Potassium is not under control. Only whole lentils (channa, moong, mott, hava to be leached overnight)	Avoid using poppy seeds, coconut milk, fresh coconut, nuts and seeds in gravies.	The protein content of the days meal is inclusive of the protein from supplements	Dialysis patients will have fluid restrictions. Calculate the fluids including the supplement drink, water, thin dal, butter milk, kadi and gravies.	

***Disclaimer: The information given above is meant only for reference purpose, it is recommended to consult your Doctor / Dietician before you make any changes in the doet.***

**GUIDANCE FOR PERITONEAL DIALYSIS:** Talk to your dietitian / nephrologist. You need more protein each day



## 2. Stage 1-4: Maintenance of Kidney Function

**Know about your nutrition – Early stages  
Even now, you need - complete nutrition**

*(Modern day research tells us plant based diet is good to maintain the kidney's condition for a long time. This means you can get better nutrition through the dals, lentils, tofu and nuts. For this stage any and every effort taken to postpone progression will be helpful.)*

Your body needs a full meal with foods that give you all nutrients - carbohydrates, proteins and fats to provide calories that will be used by your body to produce energy. You may say, "But my kidney is not functioning fully!" – But, you still need everything in your diet to keep you healthy.

You need to keep fit in all aspects – mind and body if you wish to postpone the end stage of kidney disease. Every effort by you in the right direction will produce some good result. While not all dreams will come true, you need to remind yourself, "I need to maintain the kidney's condition."

Your body's needs for calories will differ from others. It all depends on your age, size, gender, physical activity level and nutritional status.



## You definitely need carbohydrates!

Every human being needs energy. When your kidney has limited function, you need to start planning how to maintain your health so you are healthy and not malnourished.

To remain healthy while on dialysis, eat sufficient carbohydrates and protein. It is common for many people with kidney disease to feel fatigue and low in energy. Such sluggishness may be due to low energy because of low food intake. You need importantly, adequate carbohydrates to avoid protein sparing effect.

### **What is a good portion or enough for you?**

**Take help from good renal dietitian to give you what portion is needed for your wellbeing.  
After sometime you will understand your body's needs.**

### **Protein and You at early stages:**

You already know that normal kidneys make protein waste products after proteins are digested. Through your urine the waste gets removed. But when your kidneys begin to fail this waste remains in the blood.

You must know that excessive protein intake could put a great strain on your kidneys, causing more damage. You must plan your meal with a reduced portion of protein so you can slow down the progression to kidney disease. Your Doctor and Dietician may show how you can limit protein so you could possibly delay the kidney failure.

***You will be safe if you follow such advice.***

***Limit protein in-take. Small portion! But not "nil"!***

***Stages 1,2 and 3 (of CKD)***

***Your body needs: 0.65 gms - 0.80 gms of protein daily per kilogram of body weight.***

***(If you weigh 60-kilograms- minimum of 40 to 50 gms of protein daily.)***

***Check your body weight; watch your protein intake. In stage 1,2,3 -you can live for more than 10 years with right protein and diet.***

***That means – dialysis can be postponed.***

***• Meet a dietitian • Get good guidance for best renal diet • Love this stage of your health***

### **How to understand protein and malnutrition?**

You know by now that your body's need protein. If you eat less, you will be under nourished. Slowly you will face malnutrition and your health will be at risk. (See the Flow Chart on Protein Sparing)

#### **Safe Zone - measures:**

- Eat your full protein allowance.
- You must choose best sources of protein so you get enough of the essential amino acids. New



research suggests plant based protein is a great way to protect your kidneys.

- Your Dietician will monitor your diet's effect on your health and what changes are needed.
- You must eat required amount of carbohydrates and protein

#### **Unsafe zone - problems:**

- If you study the Protein Sparing Flow-chart you will understand that protein-energy malnutrition can be dangerous.
- 40% patients get under nourished during the early stages of kidney disease and enter chronic dialysis treatment in poor health.
- 20% -60% get into malnutrition when they get into hemodialysis
- Malnutrition could put you into a risk from cardiovascular disease
- Thus, consumption of required amount of calories and protein are equally important.

#### ***Save my kidney Mantra (ideal conditions- but try!)***

Make your goal for slow the progression of CKD and protect against CVD risk for which you need to keep in mind:

- BP - should be less than 130/80 mmHg (<125/75 mmHg if >1 g/day proteinuria). You can reduce proteinuria, slow CKD progression and reduce cardiovascular risk.
- Check on your ACE inhibitors and angiotensin receptor blockers. These will reduce proteinuria and slow CKD progression.
- Non-dihydropyridine calcium channel blockers to reduce proteinuria.
- If you're diabetic your HbA1c must be <6.5% to reduce microvascular complications.
- Keep your total cholesterol <4 mmol/l.

#### ***Lifestyle changes***

- You need to understand that smoking will add to health issues. Better leave the habit by the roadside.
- Improve diet, try to reduce weight, limit alcohol consumption and definitely reduce your salt. You know how much protein you may have. Avoid excess.
- Start an exercise. Dancing, swimming, yoga, walking – make it a serious plan.
- Correct anaemia, acidosis, and disturbances of calcium and phosphate metabolism so you can stay fit.
- Kidney – Water have a partnership. Keep drinking and keep hydrating. But when kidneys cannot remove all the fluid – what can you do? ...
- Check your urine output. Then add 500ml more fluid. Count- water, tea, soups, dals, rasam. So total should be 500ml more than urine. Drink more water – less of soups etc. This is to reduce salt intake in such fluids.

#### ***May you succeed in your goal!***

**Mrinal Pandit**  
NephroPlus Dialysis Center  
Hyderabad

## #Guidance - Pre Dialysis Weekly Diet Plan

*Create a balanced diet plan to postpone ESRD Choosing*

## #Guidance - Pre Dialysis Weekly Diet Plan

*Create a balanced diet plan to postpone ESRD Choosing*

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Dinner 8:00 pm	Plain Rice 1 cup	Plain Rice 1 cup	Plain Rice 1 cup	Plain Rice 1 cup	Masal Khichadi 1 cup	Plain Rice Plain 1 cup	Mix Veg Pulav 1 cup
	Phulka 1 in no	Phulka 1 in no	Phulka 1 in no	Phulka 1 in no	Roasted Flax seed Chutney 1 tsp	Phulka 1 in no	-
	plain curd	Butter milk 100 ml	plain curd	plain curd	Kadhi	Butter milk 100 ml	Onion raita
	Gheeya Curry	Padwal dry	Stuffed Tinda	Lauki curry	Raita	Karela Dry	
Bed Time 10:00 pm	Milk 1/2 cup	Milk 1/2 cup	Milk 1/2 cup	Milk 1/2 cup	Milk 1/2 cup	Milk 1/2 cup	Milk 1/2 cup

# Fats and Oil -3 tsp per day # Table salt ½ tsp per day # Non Diabetic: Sugar 2 tsp per day

- The sample diet menu will provide approximately 1600- 1800 Kcal calories and 40 g protein per day. Half tsp. of table salt is considered while calculating total sodium.
- Nutrient content of menu: 1800 Kcal, 40 g Proteins, 2500 mg sodium, up to 2000 mg potassium and 1200 mg Phosphorous.

Note:

1. Amount of fluids must be managed if you go with your Nephrologists suggestion
2. Monitor potassium and phosphorous values frequently. This will help you understand if further alteration is needed in your menu.
3. Each fruit in the given quantity as serving size & grams will provide approximately 100mg of potassium.

\*\*\*For Diabetics: Please avoid rice with your dinner; you can increase the portion of Phulka/ Chapati/ Bhakri

*Disclaimer : The information given above is meant only for reference purpose, it is recommended to consult your Doctor/Dietician before you make any changes in the diet.*



### 3. Choosing Peritoneal Dialysis



#### Peritoneal Dialysis – needs small dietary changes

Your diet on Peritoneal Dialysis is different from diet for Hemodialysis will need to follow.

Please understand that you need to read these pages carefully to stay healthy.

Peritoneal Dialysis is done daily. Every day toxins accumulated in your body, will be removed. This will give you a better quality of life. For peritoneal dialysis you don't need a fistula. But in the lining in your stomach, the peritoneal cavity will be used for filtering blood.

#### Diet on PD:

- PD diet is designed to help relieve stress on the kidneys and improve the effects of dialysis by providing you good nutrition.
- You have lesser food restriction on PD as on a daily basis all the excess fluids and toxins are removed.
- This is the main reason for many people choosing PD as a treatment option.
- The diet is different for patients based on their health condition and blood reports.
- Also, your nutrition needs may change over time. Follow up with your dietitian so you understand changes needed.

#### Positive points on PD:

- You can do it at home.
- Life is easier, more flexible for going to work.
- Your time for going to a center is saved.
- Doing PD every day means water and toxin removal is continuous.
- You can eat without much restriction

However, be safe, hygienic so you protect yourself against infections.



### Diet specifics:

#### Energy:

On PD you may gain weight as the dialysate brings in 400-700 kilo-calories (Kcal/kg). So you need to be careful with food or you get into very serious problems, even co-morbidity.

Elevation of cholesterol - both LDL and VLDL is very common in renal disease.

So whether you are normal weight or over weight, you will need some restriction of calories as your body will absorb some calories from dialysate

#### Watching Calories:

If your Body Mass Index (BMI) is below normal, you may require calories between 25-30 Kcal/kg of Ideal Body Weight! Your dietician can guide you better on calories required by you.

#### **Health Tip 1:**

To maintain your weight and good health, your dietician will suggest restricted intake of simple sugars and visible fats in the diet.

#### Proteins:

On PD you will face protein loss due to the rigors of dialysis. You will need to replace the loss so higher protein intake will be needed.

Loss of protein varies from 6 -12.5 gram per session. To compensate this protein loss you will need to consume 1.2 -1.5 g proteins per kg per day. This target for protein is difficult to achieve with diet alone, particularly if you have a low appetite and severe nausea.

#### **Health Tip2:**

Your doctor/ dietician will suggest high biological value proteins and nutritional supplement.  
PLEASE take this suggestion seriously to stay fit.



### Potassium:

Many patients may not need to restrict potassium due to continuous clearance, and some may need to deliberately eat high potassium foods due to low potassium count. Try to understand if you need to restrict your potassium through chats with doctor or dietician and also study your blood report. It is advisable to eat low potassium food liberally and keep high potassium food for consuming in moderation.

#### ***Health Tip 3:***

Check the potassium foods in your meal. Learn the game to limit and enjoy all your favorite food in moderation.

### Phosphorus:

Clearance of phosphate is not particularly effective in either PD or conventional HD. Phosphate is too difficult for dialysis to remove it. A combination of diet and medicines are usually needed to control it. Diet alone is rarely enough to control phosphorus; talk to your doctor about phosphate binders is often required.

#### ***Health Tip 4:***

To get best results from the phosphate binders remember to take it with meals! It works well and prevents phosphorous from being absorbed in the blood stream when the food is being digested. The time you take the binders is very important. Remember to keep your binders on your tray, during meal times.

### Sodium:

For both type of dialysis - moderate sodium restriction is needed. The allowance may differ with the type of dialysis. Hypertensive patients will have more sodium restriction.

In PD total dietary sodium allowance can be between 2500 mg-4000 mg per day.  
Sodium level = fluid intake + how much fluid stays in your body

Foods high in sodium you will make you thirsty → so you drink more water.

#### ***Health Tip 5:***

Please avoid food rich in sodium - like table salt, pickle, papad, salted biscuits and all canned foods.



### Fluids:

If you have substantial fluid output, your fluid will not be restricted. They lose water up to 2 L/day by ultrafiltration depending on the dextrose concentration of dialysate.

Fluid restriction is required only if volume of urine goes down.

#### ***Health Tip 6:***

Always check volume of your fluid output.

### Fiber:

Constipation is a main reason for poor dialysis for you on Peritoneal Dialysis (PD). Low dietary fiber intake + decreased level of activity can lead to constipation. Constipation will cause fluid drainage issues. So be careful and avoid constipation.

#### ***HealthTip 7:***

Take laxatives regularly. Add ample fiber in your meals.

Vegetables with skin, fruits, sprouts, salads are rich in fibers.

Include them in your meals in amount suggested by your dietician.

Watch your potassium level, as high fiber foods have a high content of potassium.

### Nutritional parameters according to type of Dialysis

Nutritional Parameter	Stage 5 – Hemodialysis	Stage 5 - Peritoneal Dialysis
Calories (Kcal/kg/day)	30-35	25-30
Protein (g / kg / day)	1.2	1.5
Sodium (mg/day )	2500	2500-4000
Potassium(mg/day )	1500-2000	Restriction only if hyperkalemia
Protein Loss	6-9 g per session	9-12.5 g per 24 hrs.
Calcium (mg/day)	<2000 from diet and medicine	<2000 from diet and medicine
Phosphorous (mg/day)	800-1000	Less than 1200
Fluids (ml / Day)	500 ml +previous day urine output.	500 ml +previous day urine output + Ultra filtration

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## 4. Post Transplant Diet

### a. Introducing NODAT (new-onset diabetes after transplantation)

#### Kidney Transplant *-brings back quality life*

With a kidney transplant you will enjoy a good quality life. You will have an easier diet to follow. You will be able to enjoy most of the food items that were restricted earlier. But even as you move into a normal diet you need to remember a few things about your new life post a kidney transplant.

- Your nutrition care will be the same as for any patient post surgery
- You will have to be aware of blood reports, monitor urine output
- You may need to have some supplements, if needed.

In the first few days, your body must adopt to changes in the body.

- Day 1- You will be “Nil by mouth”
- Day 2- You will start with sips of water and slowly progress to clear liquids.
- Day 3- From clear liquid you will have full liquid diet and gradually semisolid diet.
- Day 4- You will get a full diet with soft food to see how you tolerate food based on your doctor’s advice.
- All the above stages of diet change will depend on the bowel movement, nausea, and general health as monitored by the nurses and doctor.

First few weeks, your body needs special care. Apart from precautions against infections, maintaining hygiene one must understand the importance of a diet to rebuild the body and make it strong.

#### **Protein, key factor:**

During the first weeks after the transplant you need to increase the protein intake:

- to build the muscle tissue that gets broken down due to large doses of steroids.
- to heal faster the post-transplant wound
- to repair the wear and tear of your tissue and muscle

After all levels are under control, discuss with your doctor and reduce the serving size of protein. Everything depends upon your recovery.

#### **Games with Potassium**

- Some post-transplant medicines tend to raise the potassium levels while others may reduce it.
- It will be good to avoid taking high potassium foods immediately after surgery
- It will be ideal to take fluids like Rice kanji, rawa kanji, buttermilk, weak black tea, so

potassium can be maintained. If potassium levels are in normal range – lime juice, moong dal water or dalia kanji can be given.

#### **Watch - your sodium**

You must try to use salt in moderation, as sometimes steroids, may lead to fluid accumulation

- Restricting salt intake to 3 grams per day is reasonable

#### **Phosphorus & Calcium- complement each other**

- You need to keep a watch over your calcium and phosphorus levels
- Balanced diet may help you maintain your calcium levels



- Phosphorus levels should be moderately restricted.
- Depending on your bone mass you may be advised to take some supplements.

### **If I need to diet after a transplant, why should I have a kidney transplant?**

Many people will have this question in their mind.

A kidney transplant will give you some good news – you will enjoy many years of good health for you to meet your goals. You may enjoy many stages of life- finish education, do a regular job, get married and start a family. When on dialysis some of these dreams seemed impossible.

A kidney transplant will bring back your kidney function, it will reduce risks of cardiovascular disease which is very much likely for people on dialysis.

*Some alert:* You could have met with new cardio vascular risk, increased blood glucose level, issues with cholesterol and hypertension due to some post-transplant medications.

### **In-comes a “Special Diet”**

With a transplant you will begin to feel a great sense of liberty. You can eat all that was earlier restricted. Your steroids will boost hunger and suddenly you may gain weight. Moreover, your immunosuppressants and steroids have an increased chance to lead you into diabetes. This is called “New-Onset Diabetes After Transplantation” (NODAT).

**Be your Master:** You can plan, decide and do everything possible to fight NODAT. All your efforts may be wasted, but it is important for you to try to save yourself from diabetes.

### **Keep checking your sugar levels periodically!**



#### **Be assured!**

Research says, between 2% - 53% people are likely to get NODAT after a kidney transplant. It may happen in first 6 months of transplant. So be alert. NODAT may lead to reduced years of kidney's function, bring some infection and your health and life may be in danger.

### **Risk factors of NODAT**

#### **Non Modifiable factors**

**Age-** above 40 years  
**Gender-** Male  
**Ethnicity-** African and Hispanic descent are more sensitive  
**Family H/o of DM-** Increases the risk upto 7 folds

#### **Modifiable factors**

**Weight-** BMI above 30  
**Hyperlipidaemia**  
**Infection-** Cytomegalovirus and Hepatitis C  
**Immunosuppressive**



### **Early steps to prevent NODAT**

- **Maintain your Ideal body weight-** When BMI goes above 30 kg there's a good chance for NOD AT. Try to maintain an ideal weight. Obesity could make it difficult for your body cells to store insulin
- **Keep your lipid in check-** High triglycerides may bring you closer to heart disease.
- **Be Active-** If you increase your physical activity to five times a day, you will be able to maintain ideal body weight and it will help improve insulin sensitivity – (See Flow Chart no: 5, Insulin Resistance).
- **Albumin Levels to be corrected-** Keep albumin above 3.5mg/dl to maintain immunity. Low levels will indicate malnourishment.
- **Balanced Diet-** Diet with balanced macro and micro nutrients can improve the outcomes of surgery
- **Remember: MEDICINES are most important-** Take your medicines at specified time and strictly in dosage prescribed by your doctor. This will reduce health complications.

### **Guidelines to limit the incidence of diabetes Post Transplant**

- Have small meals, 4- 6 meals a day.
- Choose some high protein foods
- Say, NO to simple sugars. Restrict servings of complex carbohydrate to 2-3 per day.
- Add fibre rich food in your meals
- Include 4-5 servings of fruits and green vegetables in your meals (Any salad may be consumed when at home, freshly cut).
- Consume food with less fats and oil; avoid fried food for say 6 months
- Only eat hot food. Avoid all preserved foods and packed food including pickles
- Avoid all open and exposed food. Home made chutneys, freshly made is best for you.
- Follow a balanced and healthy diet.
- Be regular in physical activity

*Enjoy life with your new kidney!*

**Mrinal Pandit**  
NephroPlus Dialysis Center, Hyderabad



Diet Regime in first few months post transplant - NODAT		
Time	Menu	Serving Size
7:00 am Early Morning	Milk (No added Sugar) Supplement	1 cup 1 scoops
8:30am Breakfast	Daliya Upma/ Moong Cheela/ Tomato Omlette/ Ragi Dosa Egg White	1 Bowl 3
11 :00 am Mid-Morning	Fruit (Except Banana, Chickoo/Sapota, Mango, Pineapple, Grapes)	1 cup
1:00 pm Lunch	Millet Roti (Jowar/Bajra) Dal Vegetable (All Soft Gourd Vegetables) Salad	2 n no 1 cup 1 cup 1 Plate
4:00 pm Tea	Tea without sugar	1 cup
5:30 pm Mid Eve Snacks	High Protein Snacks Saute Paneer with Vegetables/ Moong Dal Cheela / Saute Mushroom / Chicken / Soya Chunks / Tofu / Boiled Corn / Jowar Flakes	1 Plate
7:30 pm Dinner	Millet Roti (Jowar/Bajra) Curd / Dal Vegetable (All Soft Gourd Vegetables) Salad	1 cup 1 in no 1 cup 1 Plate
10:00 pm Bed Time	Milk (No added Sugar) Supplement	1 cup 1 scoops
Per Day	Salt	½- ¾ tsp.

- Sodium content in the diet: 3000 mg • Content in the diet: 2500 mg • Phosphorous Content in the diet: 1500 mg • 1800 Kcal 0.80 grams of Protein approximately

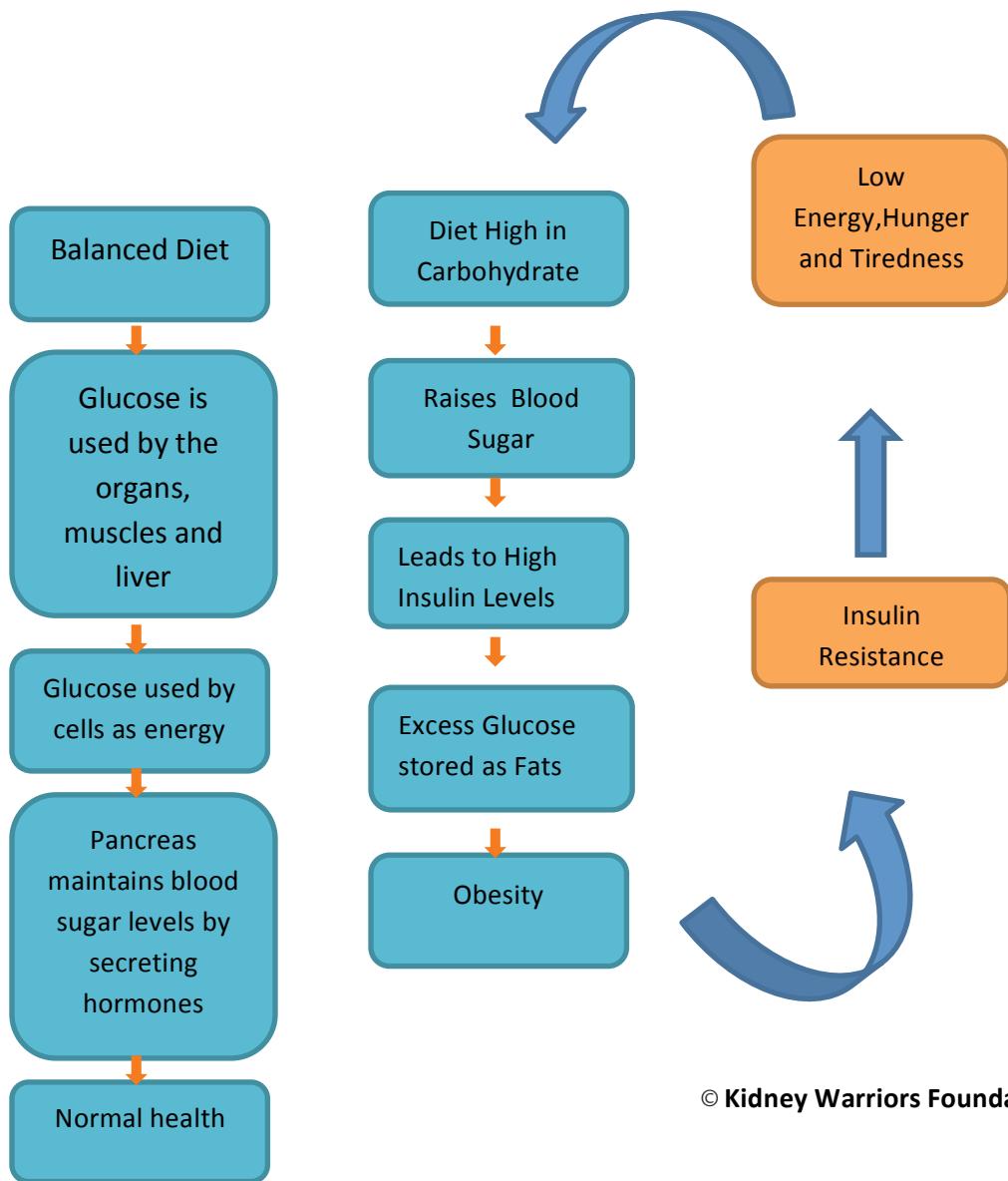
#### Dietary Guidelines:

- Have 4- 6 small frequent meals per day.
- Include high protein foods in the meals.
- Avoid simple sugars and restrict the complex carbohydrate serving to 2-3 per day.
- Encourage food rich in fibre.
- Include 4-5 servings of fruits and green vegetables in the meal.
- Restrict the usage of fats and oil.
- Avoid preserved and packed food.
- Follow balanced and healthy diet.
- Indulge in regular physical activity
- Have a regular follow up with your Nephrologist/ Nutritionist.
- Be aware of good food hygiene practices.
- Monitor biochemistry, especially blood cholesterol, triglycerides, glucose, potassium and blood pressure.
- Plenty of fluids to be encouraged.

**Note:** Kindly do not treat this diet regime as the sole source of information, kindly consult your Nephrologist/ Nutritionist before making any changes in your diet.

**Talk to your doctor about this diet.**

# INSULIN RESISTANT EXPLAINED



© Kidney Warriors Foundation



## Why NODAT Diet is important?

New-onset diabetes after transplantation (NODAT) is a serious and frequent metabolic complication after renal transplantation. Over 2-53 % people have developed diabetes after a kidney transplant. Diabetes after transplant puts the patient into a new risk, as it can affect the renal allograft and increase cardiovascular risk. This is a worldwide phenomenal.

In order to reduce the risk of people from getting into the realm of diabetes, Diabetes Prevention Program has demonstrated that a structured diet and physical activity program that achieves and maintains modest weight loss for overweight adults with impaired glucose tolerance can significantly reduce the development of diabetes.

Pertaining to this guidelines our team of dietician have studied how with a better, healthier diet – directed to reduce consumption of foods with high glycemic index people can improve the post-transplant output, improve quality of life and reduce the risk of NODAT.

The diet recommendation given in the book is considered as good for introduction today, until further researches in India and abroad can help us fine-tune our concept.

*\* Our appeal to all health care providers is to encourage patients to follow balanced low glycemic diet, under supervision, as healthy dietary habits are of paramount importance for renal transplant recipients.*

## 12. The Diabetes with CKD

### Handling your diabetes with kidney failure:

If you have long-standing diabetes, limiting all simple carbohydrates like sugars, honey, jaggery, starchy foods like potatoes, yam, sweet potatoes, sago, refined flour, low glycemic fruits and limiting consumption of cereals with a combination of high fiber will help maintain the blood glucose levels.

However, with failing kidneys high fiber foods like whole wheat, bran, leafy vegetables cannot be included liberally in the meals, as it will negatively affect the blood potassium values. Therefore, with progressive kidney failure, close monitoring of dietary intake is required for maintaining the blood glucose and avoiding extra burden on kidneys.

You will need greater attention to:

- Good value proteins
- Low potassium vegetables and fruits
- Watching water consumption
- Low salt
- Small meals, with healthy snacks between meals

The dextrose concentration in the dialysate can also affect glucose control. Dialysates with lower dextrose concentrations are used and may be associated with hypoglycemia. Conversely, dialysates



with higher dextrose concentrations used in peritoneal dialysis to increase *ultrafiltration*, can lead to *hyperglycemia*.

Carbohydrate modification does become a priority in patients on peritoneal dialysis and can be handled best with individualized diet monitoring with the help of a renal dietitian.

Other factors like uremia, acidosis and dialysis can complicate glycemic control and can contribute to wide fluctuations in glucose levels and thereby, increase the risk of hypoglycemic events.

Consult your Renal Dietician to get a full evaluation of food to be include in the meals

### **Sugar free and such substitutes**

Higher consumption of sugar & sugar products can lead to obesity, diabetes and progressively bring down the kidney's function. So, along with choosing correct food and quantity, life style modification and healthy eating habits need to be inculcated in daily routine to slow down the progression of kidney disease.

As a diabetic it may be better to get used to food without any sweeteners. If you were to use jaggery you may increase the potassium and phosphorus content of your meal. As far as honey is concerned, there are various varieties and one is not certain which one is pure and a natural product. Even though artificial sweeteners are not confirmed to lead to complications any use sugar of substitute will be your individual decision depending on other health conditions.

If you will choose to replacesugar with sugar substitutes as a diabetic, please use it in amounts recommended by your doctor/dieticians. Artificial sweeteners do not add to calories and do not raise blood sugars. In fact, many doctors and healthcare workers recommend artificial sweetener as part of an emergency diet plan. Always consult your Nephrologist for more information.

Even for non-diabetics with CKD it is better to limit simple carbohydrates like sugar, honey, jaggery and palm sugar to avoid any unwanted complications.



## BRAIN TEASER 1

Fill in the blanks with appropriate answer:

1) Normal Blood Pressure (BP) of an adult man is \_\_\_\_\_ mm of Hg.  
(a) 120/80 (b) 130/90 (c) 110/70

2) Dry weight is \_\_\_\_\_  
(a) Weight before dialysis (b) weight after dialysis (c) weight after removing excess water through dialysis

3) If Hemoglobin is 9.3 g/dl it is \_\_\_\_\_  
(a) Normal (b) High (c) Low

4) \_\_\_\_\_ is normal range for potassium.  
(a) 3.5-5.5 Meq/L (b) 3.5-5.5 Meq/dl (c) 3.5-5.5 g/dl

5) Mango is rich in \_\_\_\_\_  
(a) Fats (b) Sodium (c) Vitamin C

6) Patients with CKD stage 4 should have \_\_\_\_\_  
(a) Normal protein (b) Low protein (c) High protein

7) Bajra is rich in Iron, but rich in \_\_\_\_\_ also.  
(a) Vitamin C (b) Vitamin D (c) Potassium

8) If you find your Urine frothy, your Albumin might be \_\_\_\_\_  
(a) Normal (b) High (c) Low

9) If you feel Itchy, your \_\_\_\_\_ might be high.  
(a) Potassium (b) Sodium (c) Phosphorus

10) Serum Uric Acid comes under \_\_\_\_\_ function test.  
(a) Liver (b) Lung (c) Kidney.

## BRAIN TEASER 2

**Rajiv** is on dialysis since past 6 months and **Deepak** is post-transplant since past 3 months. Both attended a marriage event of their common friend. In the buffet dinner served they need to choose the food items wisely

Please help them to choose food items to suit their health status.



Jowar Roti



Naan



Palak Paneer



Dudhi Ke Kofte



Vegetable Salad



Tomato Soup



Rasogulla



Moongdal Sheera



Mango Ice Cream



Vanilla Ice-cream

## ANSWER TO BRAIN TEASERS

### BRAIN TEASER 1:

- 1) (a) 120/80
- 2) (c) weight remaining after removing excess of water through dialysis
- 3) (c) Low
- 4) (a) 3.5-5.5 Meq/L
- 5) (c) Vitamin C
- 6) (b) Low Protein
- 7) (c) Potassium
- 8) (b) Present/ high
- 9) (c) Phosphorus
- 10) (c) Kidney

### BRAIN TEASER 2:

**Rajiv** will take: Jowar roti, Dudhike Kofte, Palak Paneer, Vegetable Salad, Rasogulla and Vanilla ice-cream (in small portions if both sweets are chosen).

**Deepak** will take: Naan, Palak Paneer, Dudhike Kofte Tomato soup and Moong Dal Sheera. (Choice for post transplant is hot food.)

*Prepared by: Vishal Gadhia*

**Kidney disease  
was never  
your choice.**

**It just happened.**

**Love yourself.  
Fight to survive.**



*Our sincere thanks to all the doctors and hospital,  
without whose support this initiative would not be possible*



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## The Bangalore & Sagar Hospitals

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Dr. Umesh Khanna, Mumbai Kidney Foundation, Mumbai

Dr. Rajan Ravichandran, Sapiens Health Foundation

Dr. Sree Bhushan Raju, Nizam's Institute of Medical Science's, Hyderabad

Dr. Manish Mali, Dr Mali's Kidney Care

Dr. Avinash Ignatius, Noble Hospital

Dr. Raju Balasubramaniyam, Kauvery Hospital

Dr. Garima Aggarwal, Max Super Speciality Hospital, Vaishali, Ghaziabad