

Nutritional Management of

Renal Disease

In Children



The Art of Smart Choices

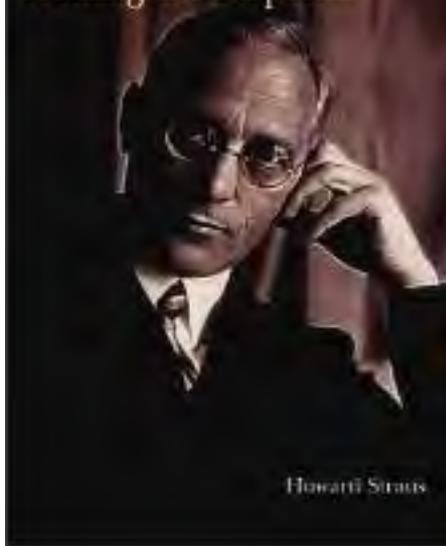
By

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President of the Egyptian Society of
Pediatric Nephrology &
Transplantation

(ESPNT)

DR MAX GERSON
Healing the Hopeless



Howard Straus

"In the hand of the physician,
nutrition can be the highest &
best remedy."
-Dr. Max Gerson

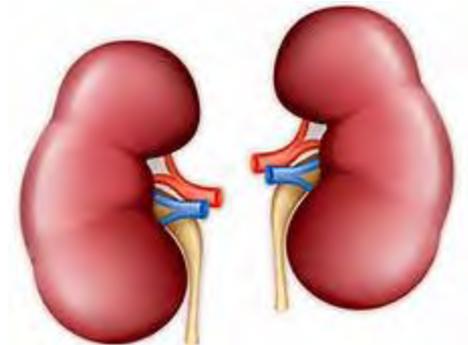
We eat and drink whatever we dare,



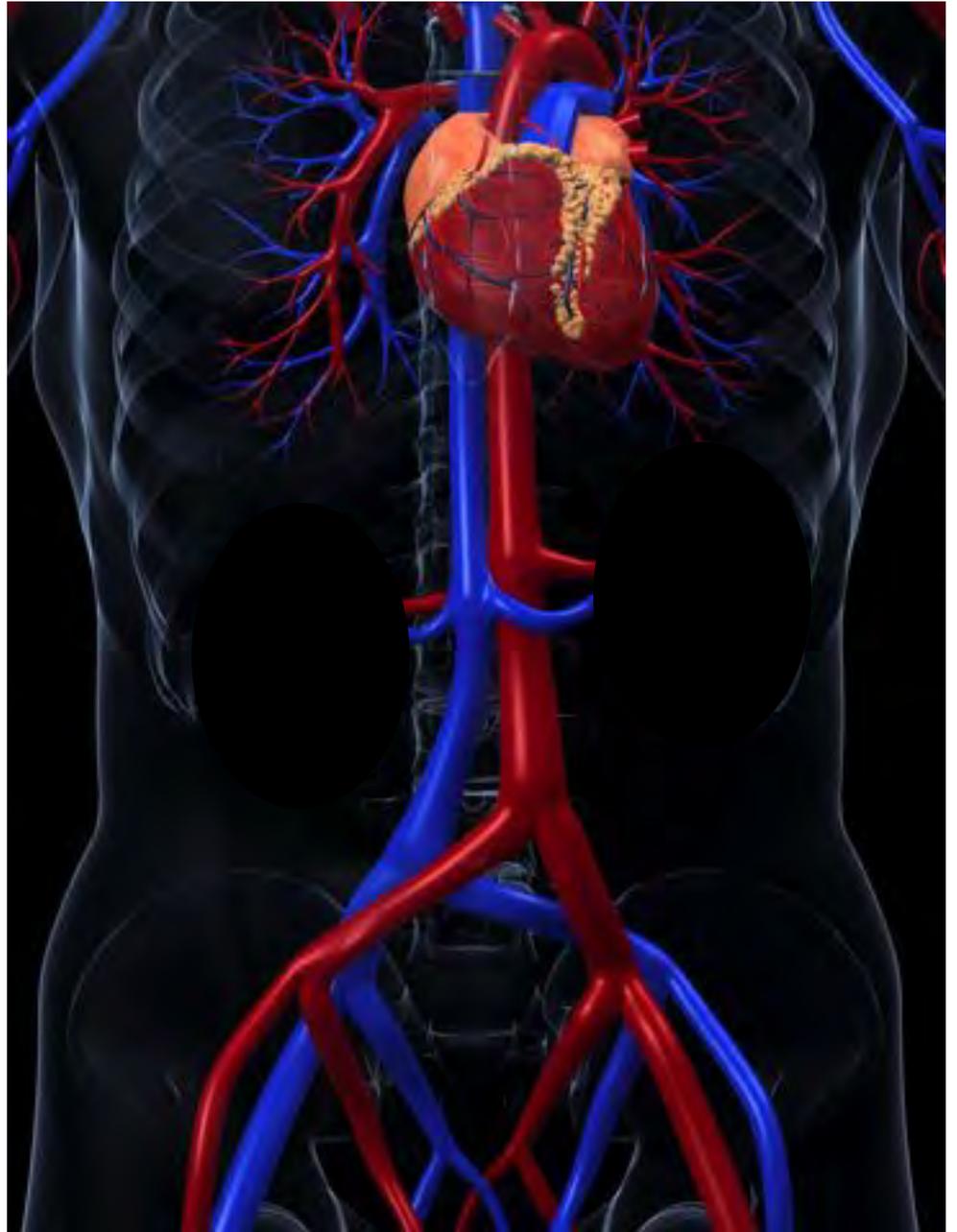
We are not, by any means, aware,



As long as the kidneys are there



**But if the kidneys are
not there,.....**





Then, eating and drinking should be with extreme care.

Feeding the kidney patient





Satisfy the patient's needs



to

**Optimize growth and
development**



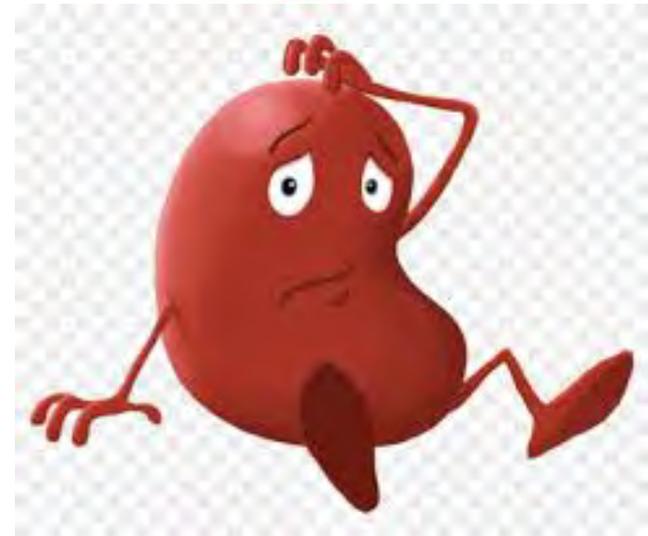
without

Overloading the tired kidney



or

Causing further damage to it



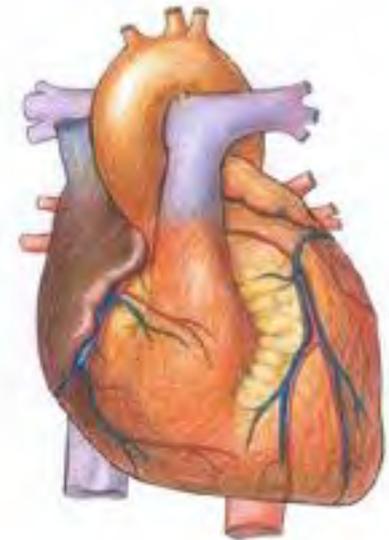
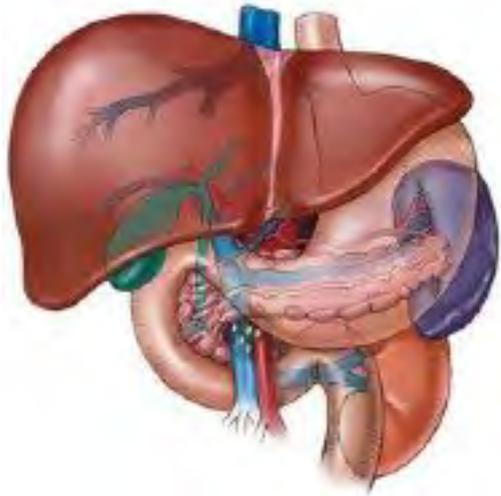
with



to achieve adherence of the patient to these dietary changes.

REMEMBER





Continuous monitoring of nutrition status is an integral part, *not only of pediatric renal care*, but it also extends to the so many other chronic diseases of infancy and childhood.

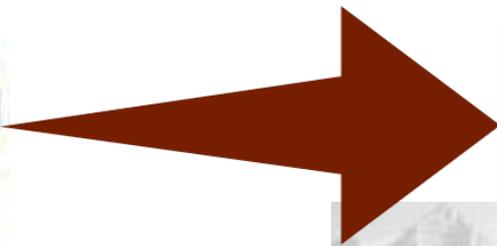


**Renal conditions that require
specific nutritional attention**

Acute Kidney Injury

- Water and salt retention with edema & HTN
- Hyperkalemia with heart problems
- Elevation of S. creatinine and other nitrogenous wastes
- Hyperphosphatemia
- Hypocalcemia
- Acidosis



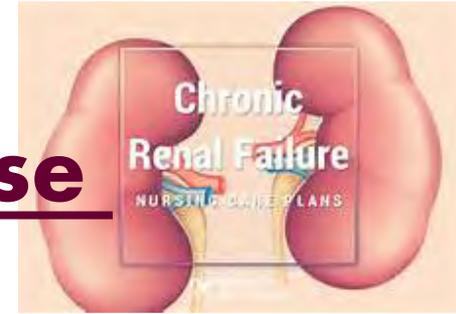


further

health - wealth - wisdom



Chronic Kidney Disease (CKD)



- ▶ Water, electrolytes, and acid-base disturbances, with Hyperphosphatemia, Hypocalcemia, and Hyperkalemia.
- ▶ Elevated nitrogenous wastes with declining GFR
- ▶ Malnutrition due to anorexia, vomiting, and impaired taste sensation
- ▶ Bone disease due to Hypocalcemia, impaired calcitriol synthesis, and 2ry hyperparathyroidism
- ▶ Anemia of erythropoietin deficiency and malnutrition

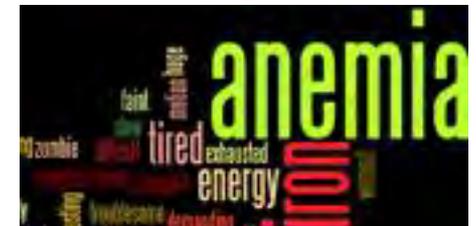
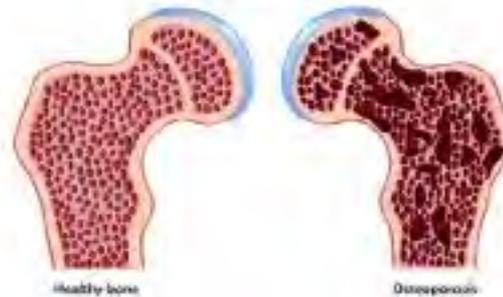


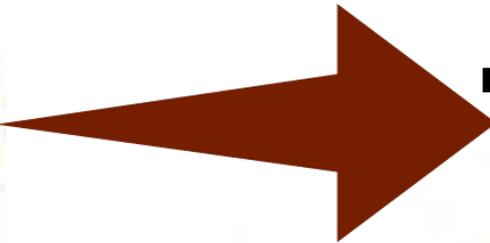
It's a matter of corrupted internal environment

Water, electrolytes, acid-base disturbances, and elevated nitrogenous wastes with declining GFR, along with :



Bone disease

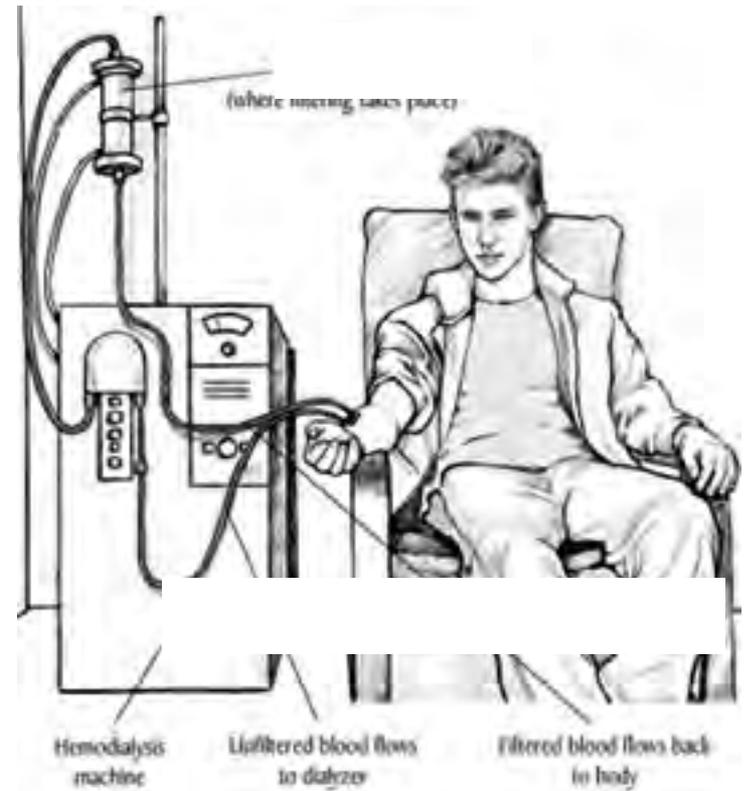




Try to

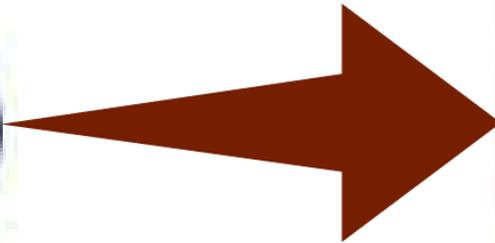


Hemodialysis



The same disturbances as CKD with a regular correction by dialysis.

Therefore . . .



OPTIMAL
LIVING
DAILY

- ▶ Allow for optimal nutrient intake.
- ▶ Limit restrictions and focus on the favorite foods.



However, never allow excessive

HAZARDOUS WASTE

*to build up in-between
the dialysis settings.*

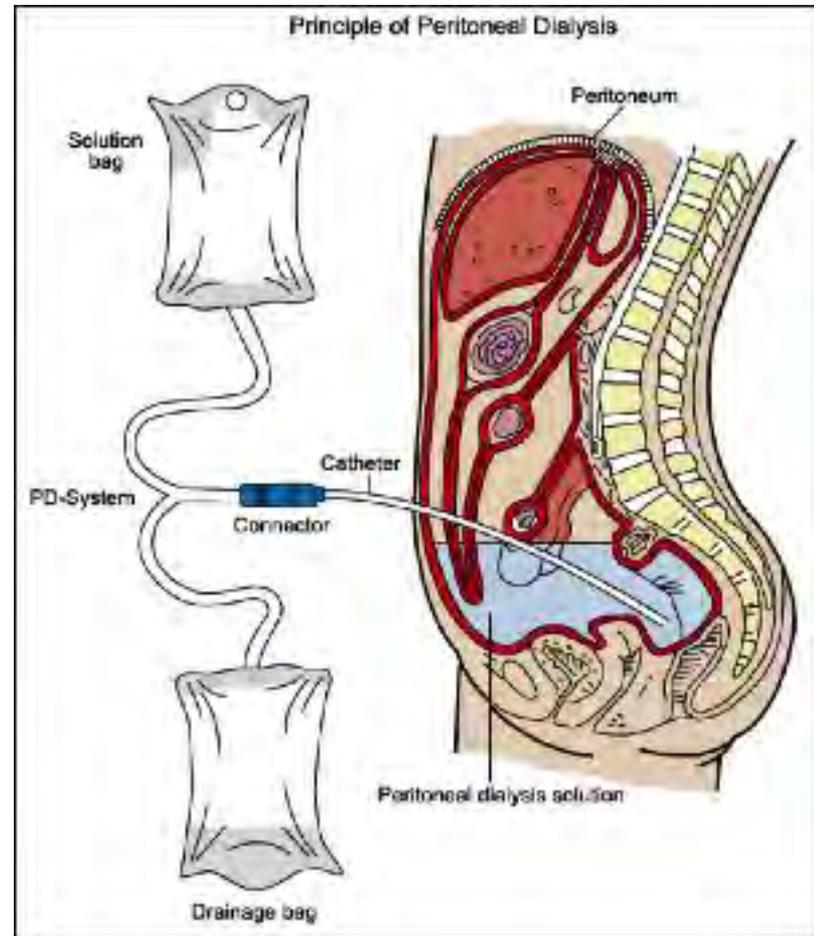
Always

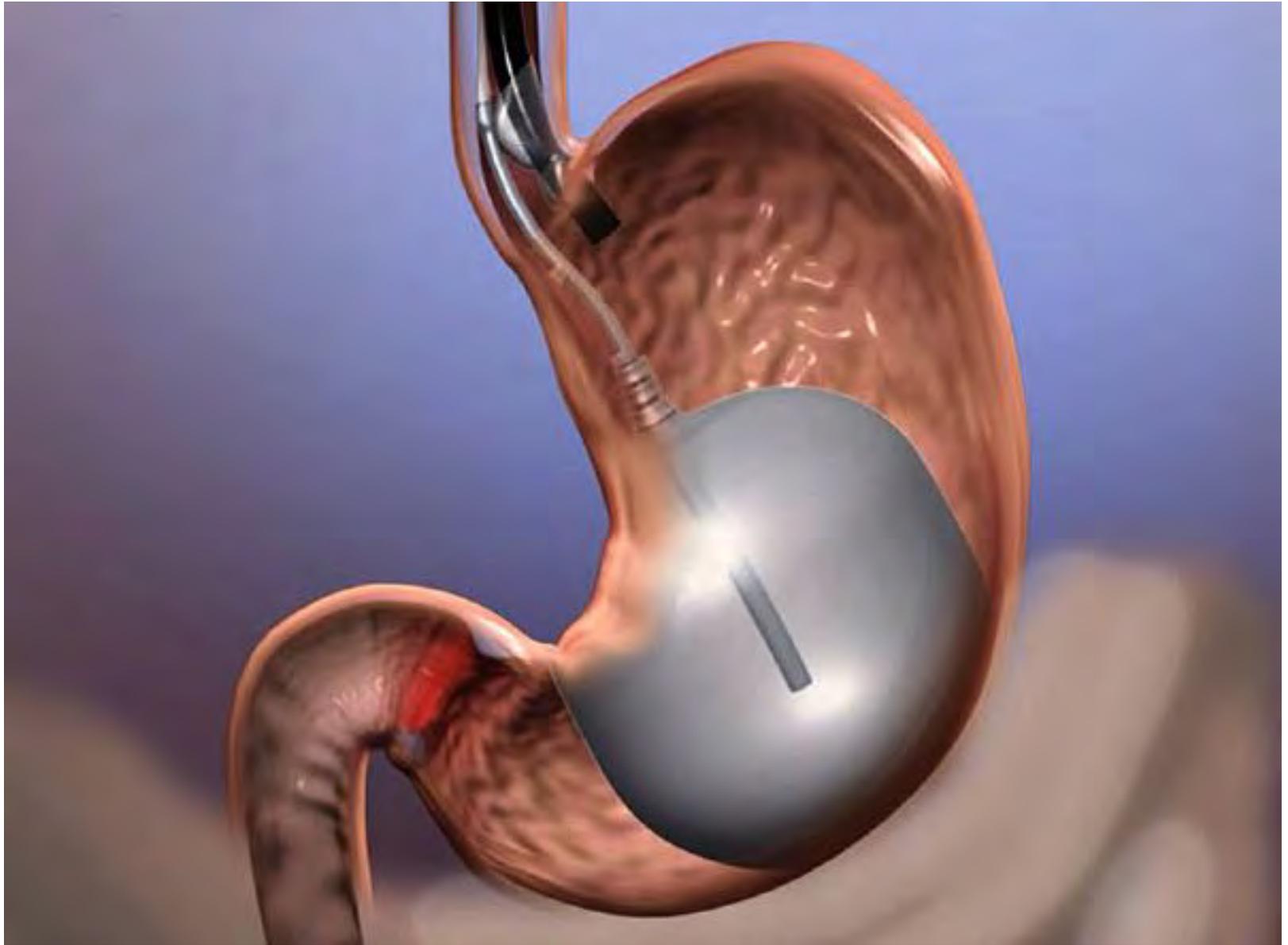
- ▶ Take into account the sodium load.
- ▶ Keep an eye on the potassium intake.
- ▶ Limit the intake of phosphorus.

Peritoneal Dialysis

Situation

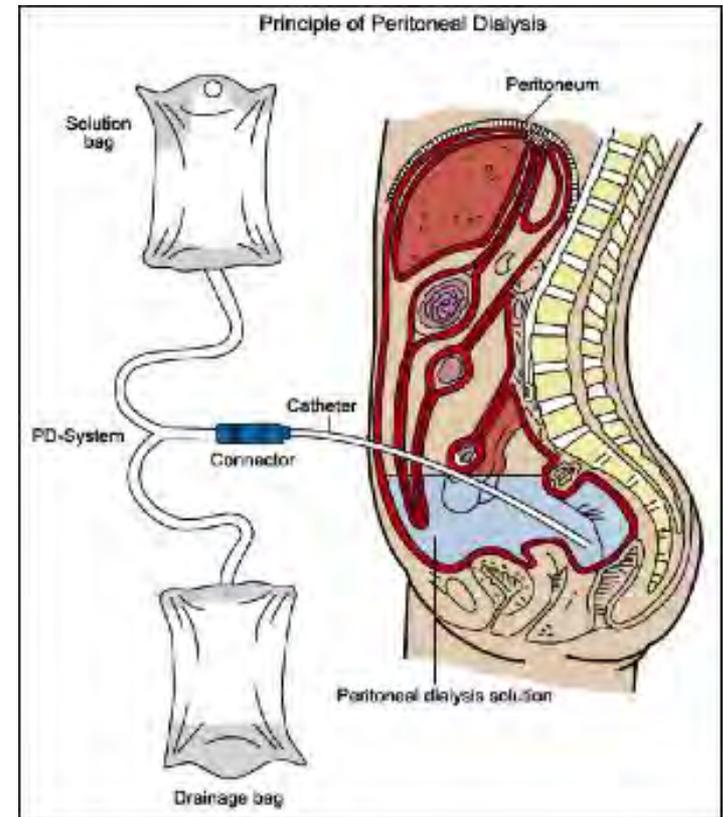
*reduced nutrient intake
from the sense of fullness
due to IP fluid.







- ▶ more liberal intake of fluid, potassium, and sodium than HD.
- ▶ caloric supplement is essential
- ▶ more protein to face the losses through the peritoneal membrane





Clinical Pearl

Because dialysis removes protein from the blood, a child on dialysis needs to eat more protein.

Peritoneal dialysis removes more protein than hemodialysis .



Clinical Pearl

The most appropriate protein for kidney patients on dialysis to avoid undue elevations in serum triglycerides and cholesterol which are already high would be

poultry and fish, but not red meat,



Nephrotic Syndrome



We are faced with

- ▶ Sodium and water overload
- ▶ Hypoproteinemia
- ▶ Hyperlipidemia



SO WHAT?



- ▶ Sodium intake is restricted to < 2 gm/day.
- ▶ Protein intake is supplemented just to the RDA with replacement of ongoing losses, but excessive protein intake should be avoided since it may worsen the situation.
- ▶ Hyperlipidemia is treated with a low-saturated fat diet, and ACEi.

Post-Transplantation

- ▶ If the allograft is functioning well, no restrictions are required



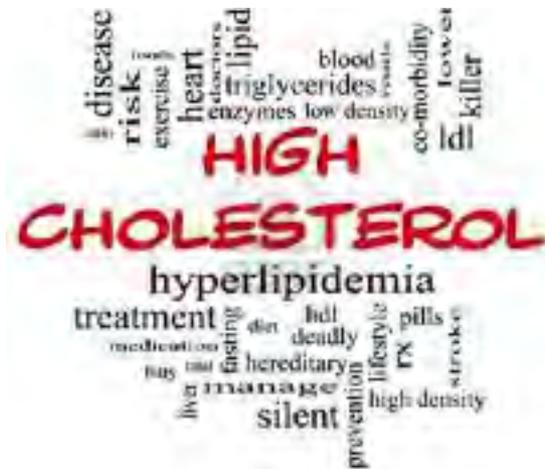
However,

- ▶ If the GFR is reduced, we have to follow the same recommendations as for CKD





Important long-term nutritional problems after a successful kidney transplantation are increased appetite, weight gain, obesity, hypercholesterolemia, and hyperlipidemia.





Now I have a kidney





After having this quick idea about the different situations, proceed as follows :

1. Define the child's needs

2. Plan the Menu

3. Serve the child to his meals

1



Let's start defining our
child's needs



First, and most important, You
have to work through a **TEAM**.

*The patient should be handled by a “variety”
of health care specialists e.g.
nephrologists, orthopedists,
endocrinologists, psychiatrist,.. etc*





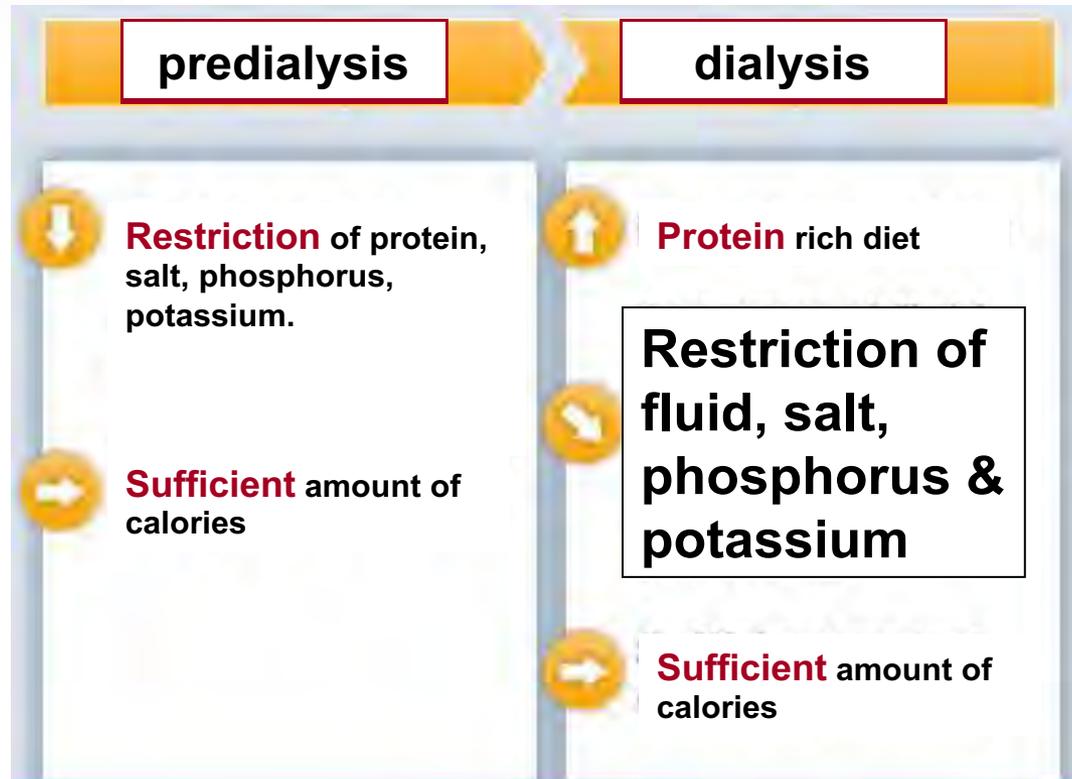
*And a **dietician** is one integral member of this team.*



Just put the diet prescription



For example in CKD





Dietitian
the power of total control



Deliver this prescription to the dietitian who will **tailor** it to **fit** the individual needs of each patient.

**And it should run exactly this
way,**



Designer

Christian Dior
PARIS

And,



Tailor



Planner

And,



Executives

Physician



Dietitian



**Handling the nutrition of the
kidney patient is a mutual task
with the dietitian**



أفطر ايه ؟

أتغدى ايه ؟

أتعشى ايه ؟

أشرب ايه ؟



مالكش دعوة.....



**IT'S
REALLY
NONE
OF MY
BUSINESS.**



What's
Next?

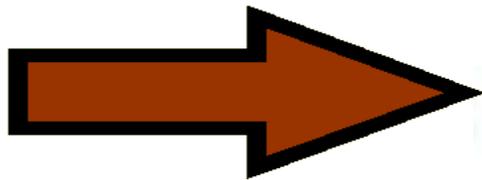
2



Forwards towards planning the
MENU

How Much ?

- How much Calories does the patient need ?
- How much and what kind of protein is he allowed ?
- How much fat to be used for energy supply ?
- How much of vitamins and minerals needed ?
- How much water and other fluids to allow ?



Ask the
Dietitian[®]



**Last but not
least, what are,**



**the healthy ingredients to prepare
the diet from ?**

Calories



Kids come in all sizes and each person's body burns energy (**calories**) at different rates, so there is **no one perfect number of calories** that every **kid** should eat.

Recommended *range* for
most **kids** between 6 and 12 years old:
1,600 to 2,200 per day.

Estimated needs for younger children range
from
1,000 to 2,000 calories per day.

Top 10 Foods Highest in Calories

Fats & oils

Nuts & seeds

Dark chocolate

Nut & seed butter

Avocados

Fruits & fruit juices

Milk, Dairy & eggs

Whole grains

Oily fish

Meat



Proteins

Kids require 1 gram protein per kg per day.

SOURCES OF PROTEIN

High biological value

- Meat, Fish, Eggs Cheese



Low biological value

- Peas, Beans, Nuts, Pasta





Although Low-protein diets may be helpful in preventing further damage to the kidney, yet, enough protein is needed to support growth.

**Protein intake should not be
less than the RDA for the
child's age.**



Clinical Pearl

Proteins allowed should be of the lean or extra lean quality, high biological value with all the essential amino acids.



Lean :

Each 100 gm must contain less than **10** grams of total fat, less than **4.5** grams of saturated fat, and less than **95** milligrams of cholesterol.

Extra lean:

Each 100 gm should contain less than **5** grams of total fat, less than **2** grams of saturated fat, and less than **95** milligrams of cholesterol.



Lean Meats, Poultry And Fish

Fats

Keep total **fat intake** around 30% of total calories.



Which fat ?



Choose foods with “good” unsaturated fats, limit foods high in “bad” saturated fat.



GOOD

Unsaturated Fats VS



BAD

Saturated Fats



Vegetables and Fruits

Water and other fluids

**Do you
know?**



**The exact
amount of
water**

**that you
should be
drinking
every day?**



In the early stages of kidney failure, no need to limit the fluid intake.

But, as it gets worse, or when on dialysis, the need to watch the amount of liquid taken in is mandatory.

In-between dialysis sessions, fluid can build up in the body.

Too much fluid will lead to shortness of breath, a medical emergency that needs immediate attention.



DO NOT allow too much of foods that contain a lot of water, such as soups, grapes, melons, lettuce, and tomatoes.



Those who are vomiting, have diarrhea, are sweating excessively, or who are exposed to extremely high temperatures,
Require much more fluids



Liquids

(Be sure to include these liquids when adding up the amount of liquids allowed for a day.)



But what is this drink ?

Coca Cola and Pepsi are such products that have been labeled by the environment and human rights department for being of the worst and unhealthy food products.



They are symbolic of all soft drinks that are nothing but sugar or artificially sweetened sodas with color.

5 Reasons

to

NEVER

Let Your Kid

Drink



1. Caffeine, Sugar and Aspartame :

Aspartame causes several diseases.
Caffeine and sugar are very addictive.



2. Kidney Failures :

Consuming Diet versions of Coca Cola or Pepsi have proved to produce more impairment of kidney function than the sweet versions.



3. Obesity and Diabetes :

are major problems with these products.

4. Teeth and Bone Damage :

These beverages are acidic in nature and can dissolve bones and enamels very quickly .



5. Reproduction problems :

Cans of Coke or Pepsi are coated with such chemicals that may lead to reproduction problems with regular consumption .

The possibility of spermicidal effects of Coca-Cola was first reported in 1985 in the *New England Journal of Medicine* .





sodium



AVOID



Roast beef, turkey,
canned salmon and sardines
These meats are high in sodium.



Cheap processed meat, with high salt content, eaten in excess can be disastrous for a person's health.





World Cancer Research Fund
recommends people avoid all processed
meats.



Avoid cheese as well

Salty foods:
barbecue sauce.
ketchup.
chili sauce.
mustard.
pickles.





Crackers, fries, and restaurant foods.





X
WRONG!





Look for these words on food labels:

Low-sodium

No salt added

Sodium-free

Sodium-reduced

Unsalted

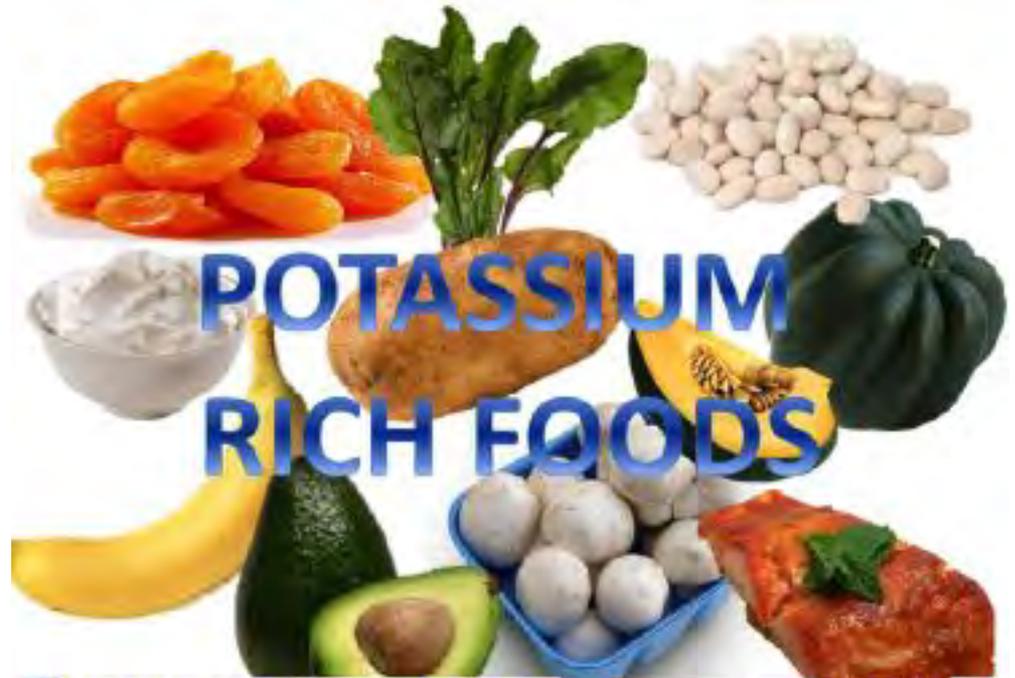
Potassium

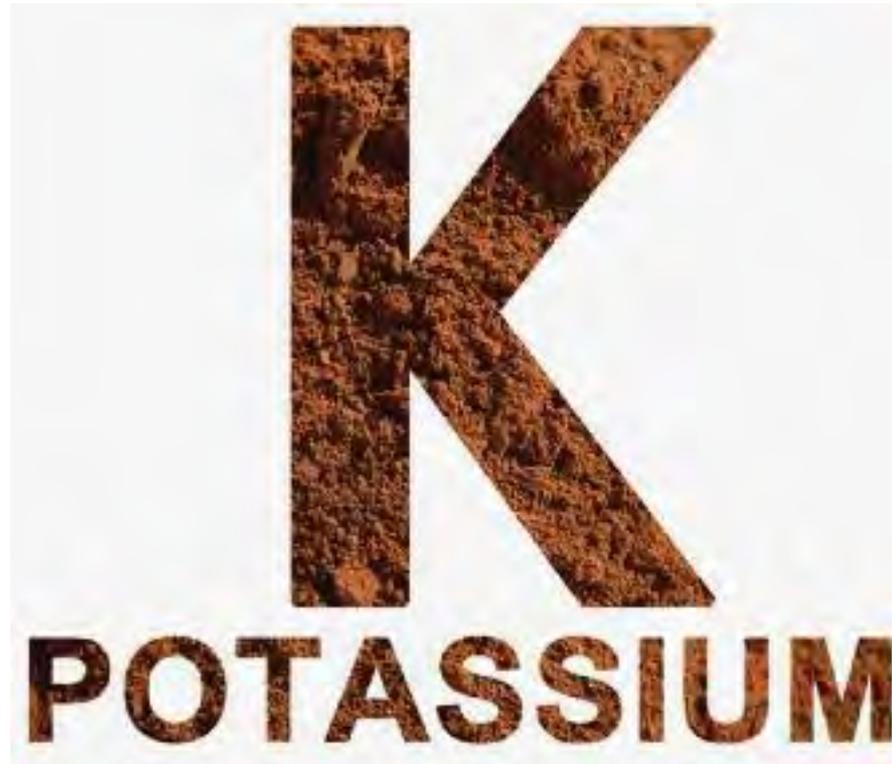
POTASSIUM

Normal blood levels of potassium help keep your heart beating steadily.

However, too much potassium can build up when the kidneys no longer function well.

Dangerous heart rhythms may result, which can lead to death.





What matters most in vegetables and fruits in our kidney patient is their POTASSIUM content

Low potassium vegetables

cabbage.

cucumber.

Lettuce.

sweet pepper



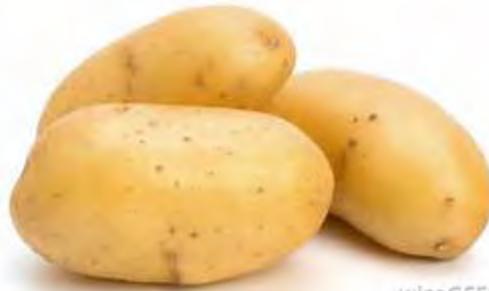
Medium potassium vegetables

Broccoli, cauliflower, eggplant, onions,
carrot, corn,
mushrooms, spinach, and squash.



High potassium vegetables

Brussels sprouts, Potato, tomato paste, mushrooms, and squash.



wiseGEEK



wiseGEEK



Fruits





Measure it right



Low potassium fruits

Applesauce.
Blueberries.
Canned pears.
Grape juice.



Medium potassium fruits

One small **apple** (two inches across)
One fresh **peach** (two inches across).
cherries.
pineapple.
Grapes, strawberries, mango.
1/2 small grapefruit.



High potassium fruits (201-350 mg):

One cup of canned or fresh **apricots**.

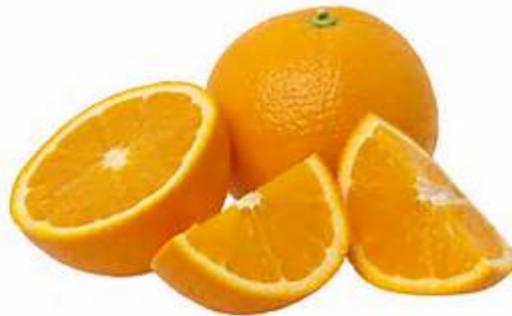
1/2 cup of **orange** juice, or one small orange.

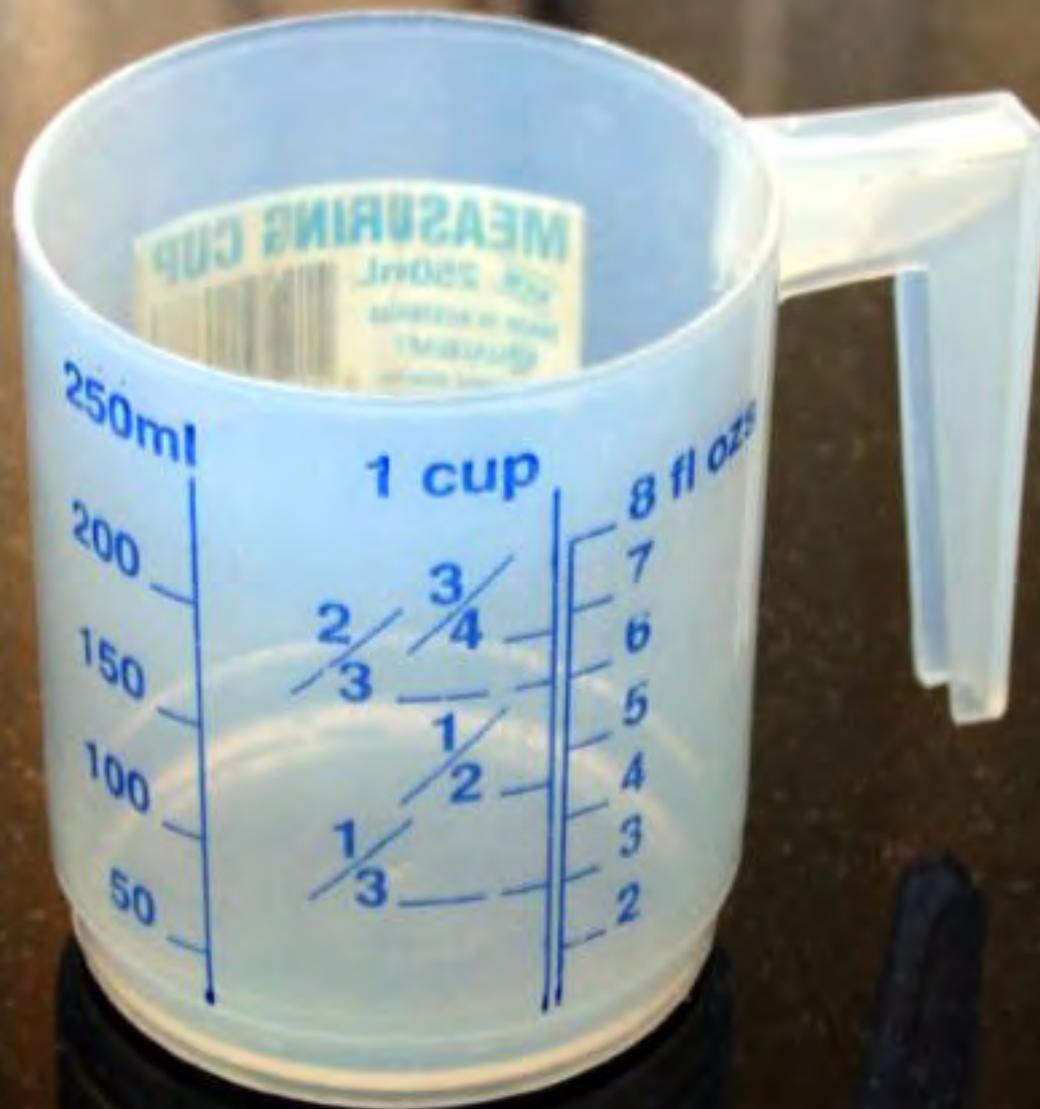
1/8 small **cantaloupe**.

1/4 cup of **dates** or two whole dried **figs**.

One medium fresh **pear**.

1/8 small honeydew **melon**.

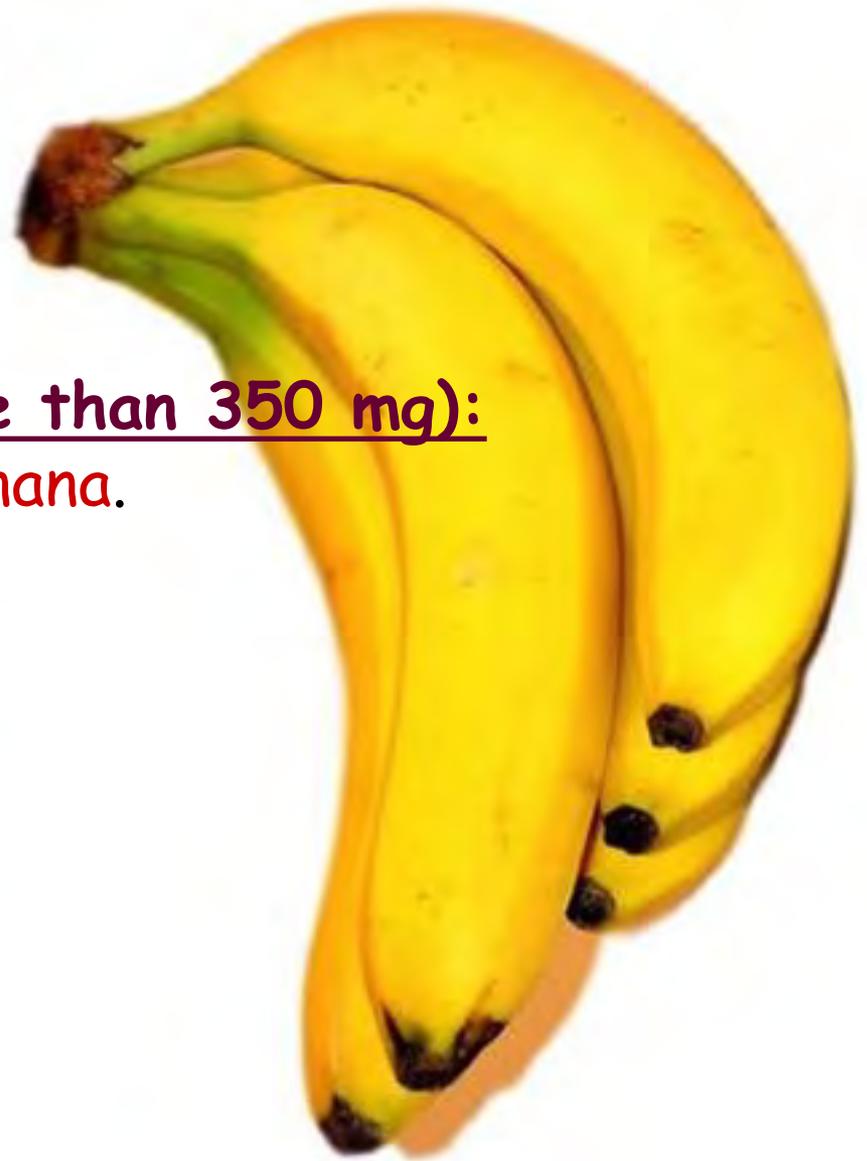




A cup is about 237 mL.

Very high potassium (more than 350 mg):
1/2 medium banana.

I ♥
BANANAS



Calcium



TOP CALCIUM RICH FOODS



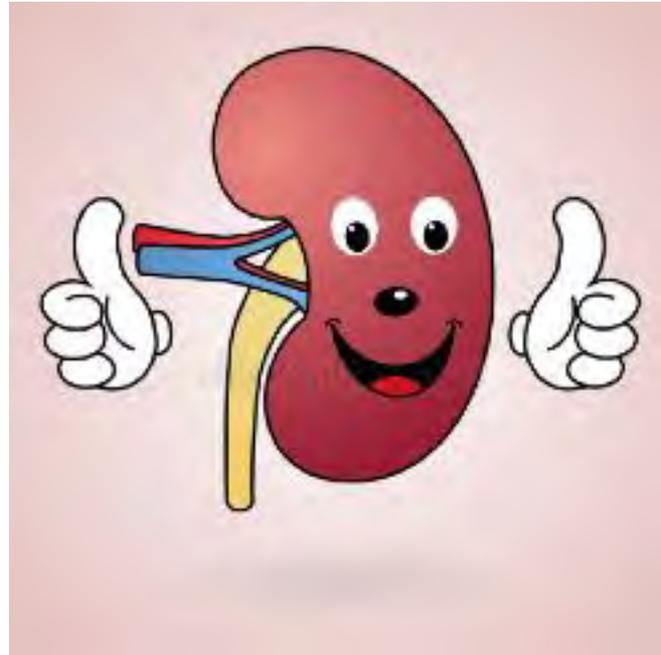
As well, calcium may be obtained from





Why might I need to control protein, sodium, phosphorus, calcium, or potassium ?

Eating the right amount of protein, sodium, potassium or phosphorus may help control the buildup of waste and fluid in your blood.



This means your kidneys *do not have* to work as hard to remove the extra waste and fluid .



What's
Next?

3

Now, please, serve our patient to his meals





Bon Appétit

fruit & vegetables

Suit your K+ needs

bread, other cereals & potatoes

100% whole grain

meat, fish & alternatives

Pick up the lean, HBV proteins

fats & sugars

Choose the mono- & poly-unsaturated

milk & dairy products

Watch your PO++



Soup



Significant nutrient value

soup

lentil, chicken and sweet corn, and pea.



Soup of moderate energy
Pumpkin, tomato, and potato



Main dishes - Meat / poultry / fish

Wet dish with high meat content
(120g)



Salads



At least 5 vegetables/ 90g total weight

Sandwiches



The lean meat, 50g/sandwich;
cheese 21g/sandwich.

1 Egg , lettuce, and cucumber may be added.

Desserts



little amount of dairy.
moderate energy, high protein and
calcium.

**DON'T
FORGET TO**



**REMEMBER
!**



There is not one eating plan that is right for everyone with kidney disease.



What can or cannot be eaten may change over time, depending on how much kidney function is there and other factors.



Also, if a special diet for diabetes or heart conditions is followed, it should be **respected**.

Do I **need to know** All this ?

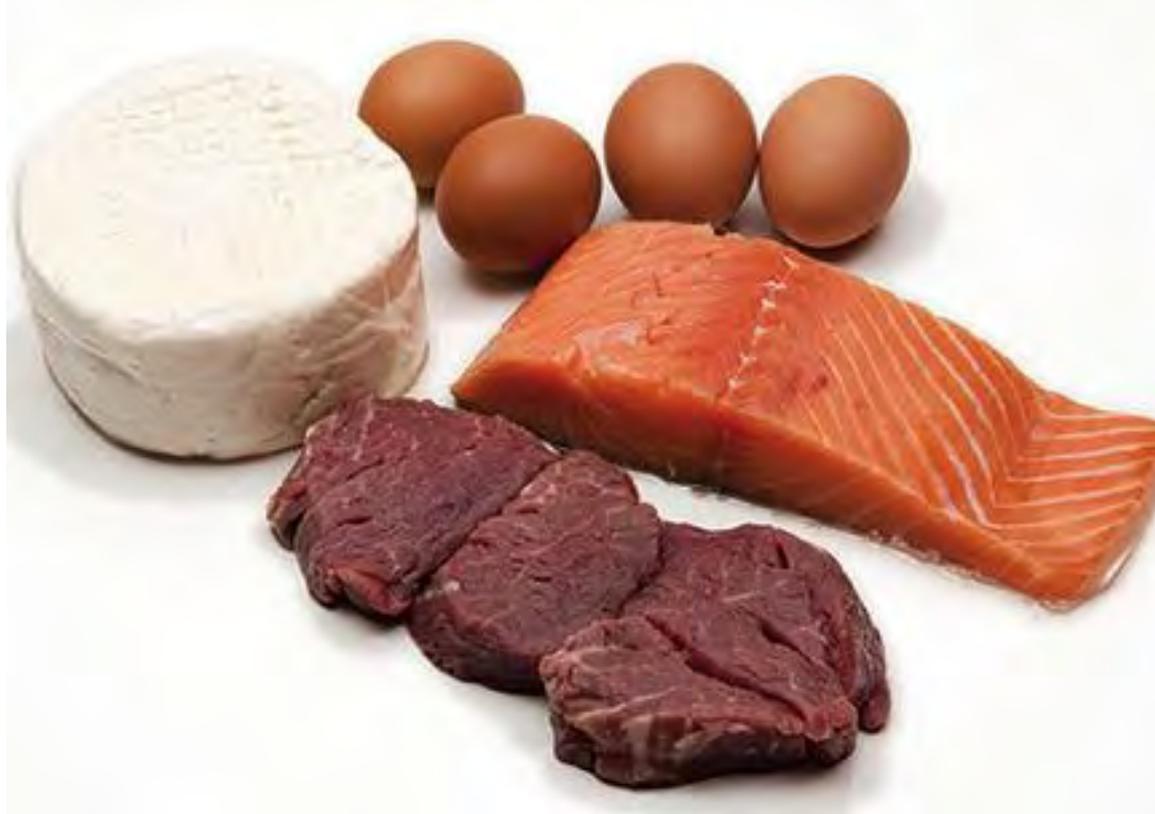


Yes!

A dietitian is not always available

Summ
get Up!

- ▶ Protein supply is essential for the growth of the child.
You have to respect the RDA.



- ▶ Fish is the best source of lean protein, vitamin D, calcium, and omega 3



And take this
RIGHT FROM THE HEART





Eat fish,



To live longer,



To make more money,

To buy more fish





And for all who want to
refrain from eating red
meat for all the risks it
carries, and become
“VEGETERIAN”

Vegetarian
for Life 



Take my advice and turn
“**FISHETERIANS**”



- ▶ Fats can be a good source of calories.





Make sure to use monounsaturated and polyunsaturated fats (olive oil).

▶ You may serve " Dairy " as a source of Calcium to prevent bone disease and promote growth



- ▶ Fruits and vegetables can be a rich source of calcium too.



However,

▶ Carbohydrate foods are a good source of energy.



▶ However, excessive intake of sugars may push your patient to "sugar addiction"

ACCORDING TO BRAIN SCANS.

Sugar



IS AS
ADDICTIVE
AS

Cocaine



- ▶ Protein supply is essential.



- ▶ However, too much proteins may result in further damage to the kidneys.



And beware, too much restriction may interfere with the growth of the child.

- ▶ Fish is a very good source of lean protein, vitamin D, calcium, and omega 3





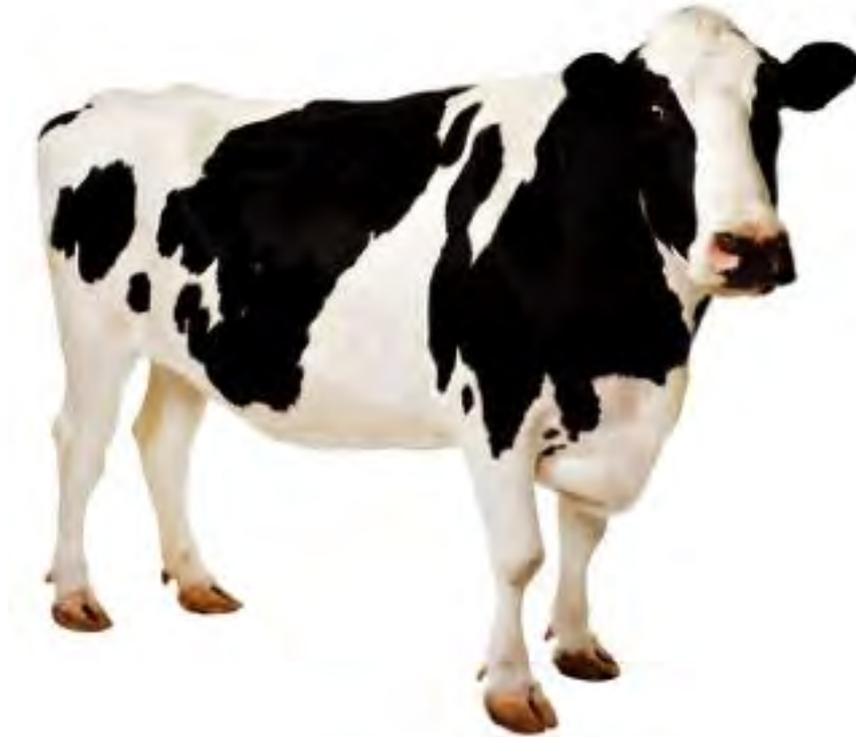
- ▶ However, the high phosphorus and salt content, especially in canned varieties may be hazardous.

- ▶ Fats can be a good source of calories.



- ▶ However, the use of wrong fats will markedly hurt the heart health.

▶ You may think of " Dairy " as a source of Calcium to prevent bone disease and promote growth.

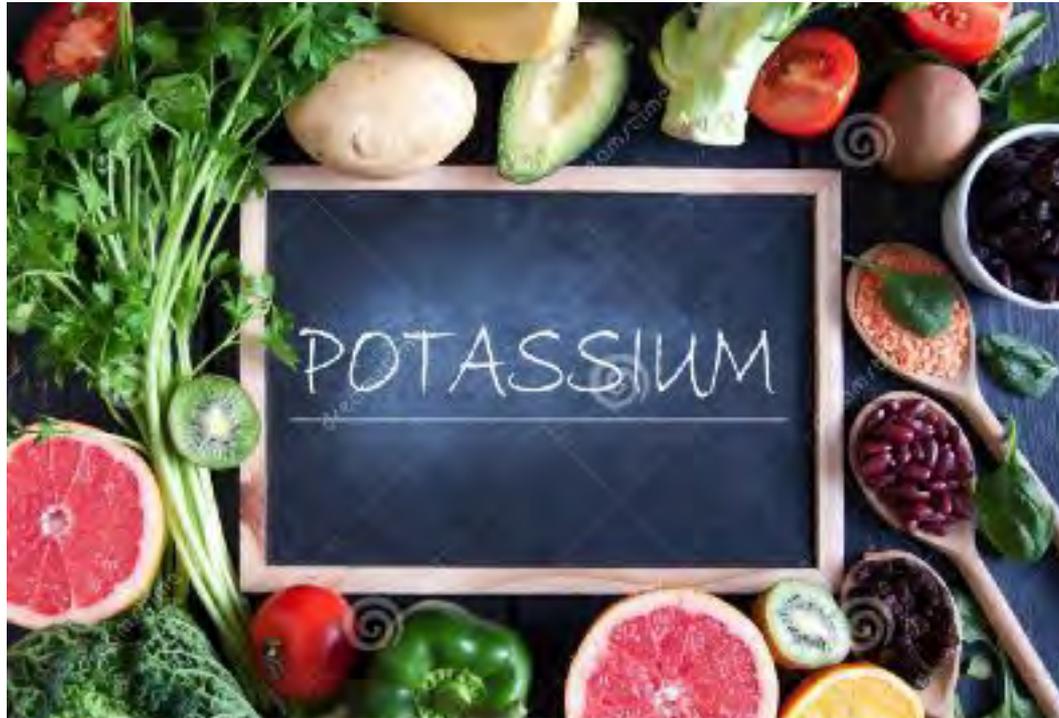




However, Beware, they contain large amounts of phosphorous .

▶ you may go, then, to fruits and vegetables for calcium, they contain only small amounts of phosphorous





▶ However, they may be a dangerous source of potassium.



It's a “slack line-crossing”



Either you keep a good balance,



OR



Falling is eventual

The Art of

SMART
CHOICES

is the key



And,



The "five rights" to provide patient safety.



Am I giving the right food?



To the right patient?



In the right amount?



At the right time?



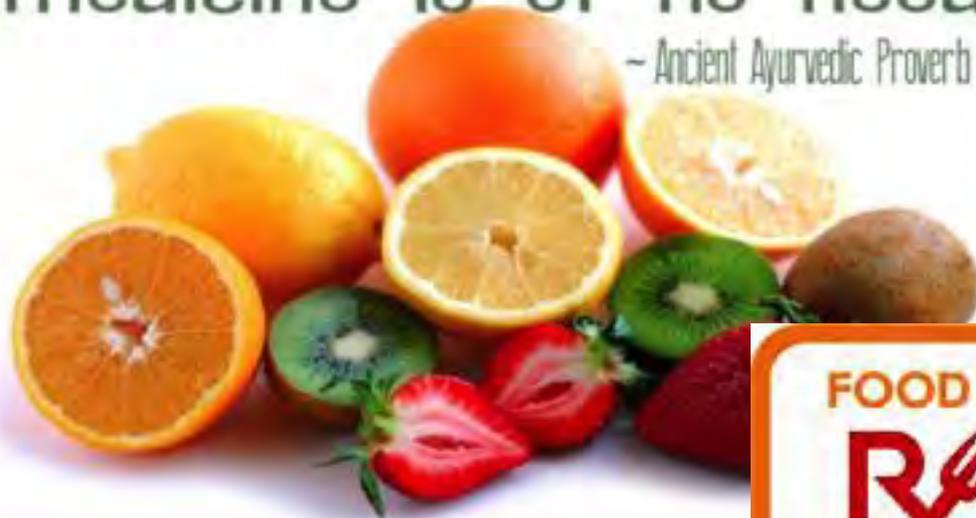
Through the right route?

BECAUSE



When diet is wrong
medicine is of no use.
when diet is correct
medicine is of no need.

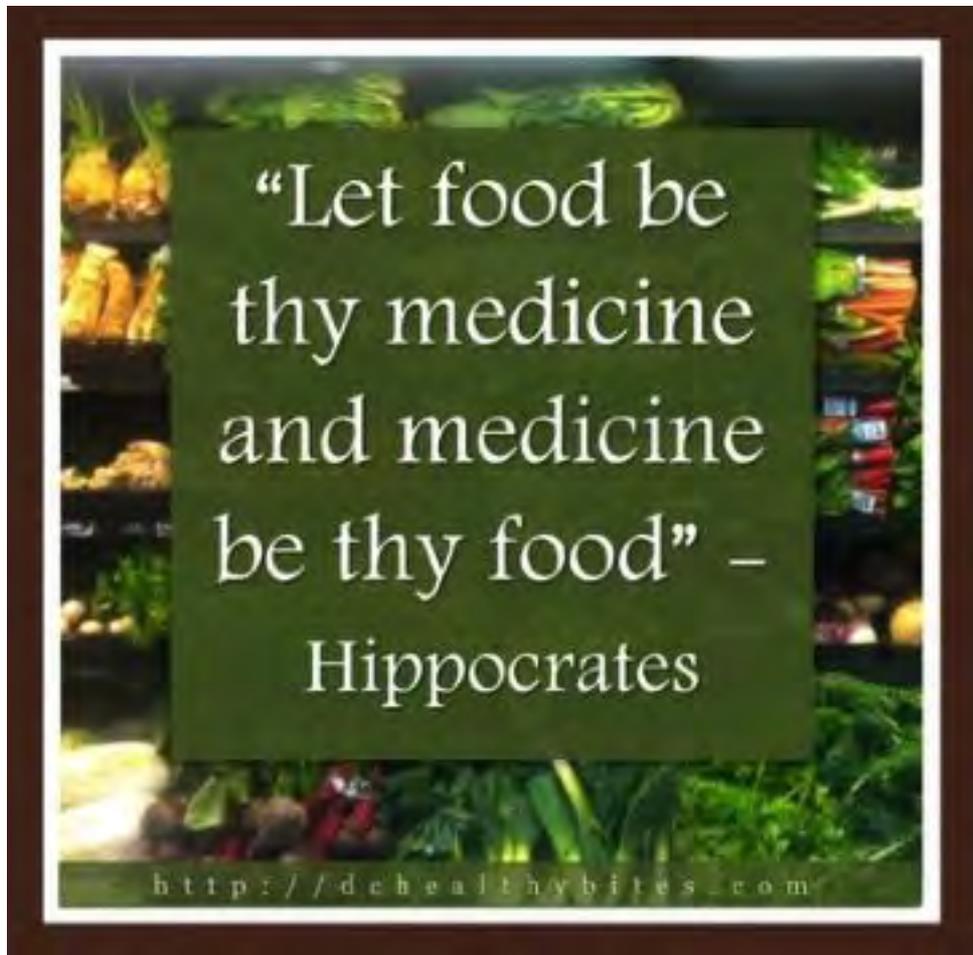
- Ancient Ayurvedic Proverb



FOOD IS



MEDICINE



(HIPPOCRATES 460 - 359 BC)

من طعامك فليكن دواؤك ، وانشد دوائك في طعامك



Ramzi el-Baroudy

MCQ

Multiple Choice Questions

1. What is the most potent anti - proteinuric therapy?

A. Captopril

B. Beta-Blocker Therapy

C. Low protein diet

D. Low salt diet

2. What is the richest fruit in potassium ?

A. orange

B. Grapes

C. Bananas

D. Avocado

3. Select the one that is the best answer :

Most of the glucose that is filtered through the glomerulus undergoes reabsorption in the :

- A) proximal tubule
- B) descending limb of the loop of Henle
- C) ascending limb of the loop of Henle
- D) distal tubule