

# MNT OF CORONARY ARTERY DISEASE

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**Therapeutic diets are special diets designed for people with certain medical conditions.**

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**Many health conditions are caused in part by what you eat.**

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**Some of the conditions that can benefit from a therapeutic diet include cardiovascular diseases, diabetes, crohn's disease. ulcerative colitis and celiac disease.**



# Goals of therapeutic diet

To prevent or manage some medical conditions

To maintain or improve health using appropriate & healthy food choices

To achieve & maintain optimal metabolic & physiological outcome.

# DIETARY RECOMMENDATIONS IN HPN



## **DASH eating plan:**

- Dietary approach to stop hypertension (DASH).
- Flexible & balanced eating plan which recommends:





# DASH diet



↑Servings of vegetables & fruits (3-4 servings/d).



↑Foods rich in potassium as: milk, banana, orange & legumes.



Whole grain cereals & bread.



Fat-free or low-fat dairy products (3 servings/d).



Lower saturated fats, cholesterol & total fats.



Limiting lean meat intake.



Two or more vegetarian-style or meatless meals each week.



↓Sweets & added sugars.



Low sodium (salt) intake (<2.3 mg /day.).

# CORONARY HEART DISEASE

- is the modern epidemic facing the developing world.
- Among all the modifiable risk factors ,diet plays an important role in all of them.
- Adequate knowledge is the first step towards behavior change .

# HEART DISEASE

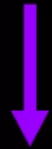
Risk Factors:



# Modifiable risk factors

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## Major



Hypertension

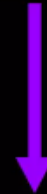
Smoking

Diabetes

Obesity

Elevated Cholesterol

## Minor



Physical Activity

Mental Stress

Oral Contraceptive

Trace Elements

Homocysteinemia



# Non Modifiable Risk Factors



Age

Sex

Family History

Genetic Factors

Personality

*Of these, four factors require  
dietary modifications –*

- Diabetes
- Obesity
- Elevated Cholesterol
- Homocysteinemia

# HYPERCHOLESTEROLEMIA

*Desirable levels of serum cholesterol -  
<150mg/dl.*

*When the levels are more  
than 250mg/dl –  
hypercholesterolemia.*

*(desired levels of LDL cholesterol -  
<100 mg/dl.).*

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# Hypercholesterolemia

Genetic

Dietary

Endocrinal

JJ Medicine  
Lessons

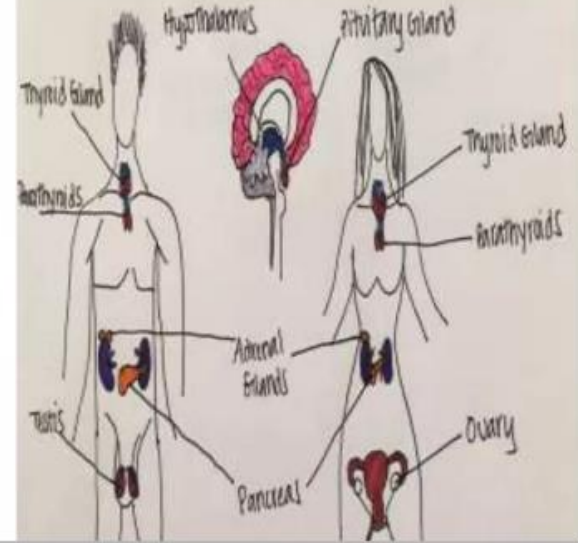
Familial  
Hypercholesterolemia



High Cholesterol



No Cholesterol



# *Hypercholesterolemia*

*Genetic*

*Dietary*

*Metabolic*

*Non – modifiable by  
diet Alone. Need other  
methods like yoga,  
exercise, meditation,  
statins , plasmapheresis*

*Modifiable by  
diet*

8/20/2020

*PCSK9 INHIBITORS*

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## **OBESITY:**

*Defined as an abnormal growth of the adipose tissue due to an enlargement of the fat cell size or an increase in fat cell number or a combination of both.*

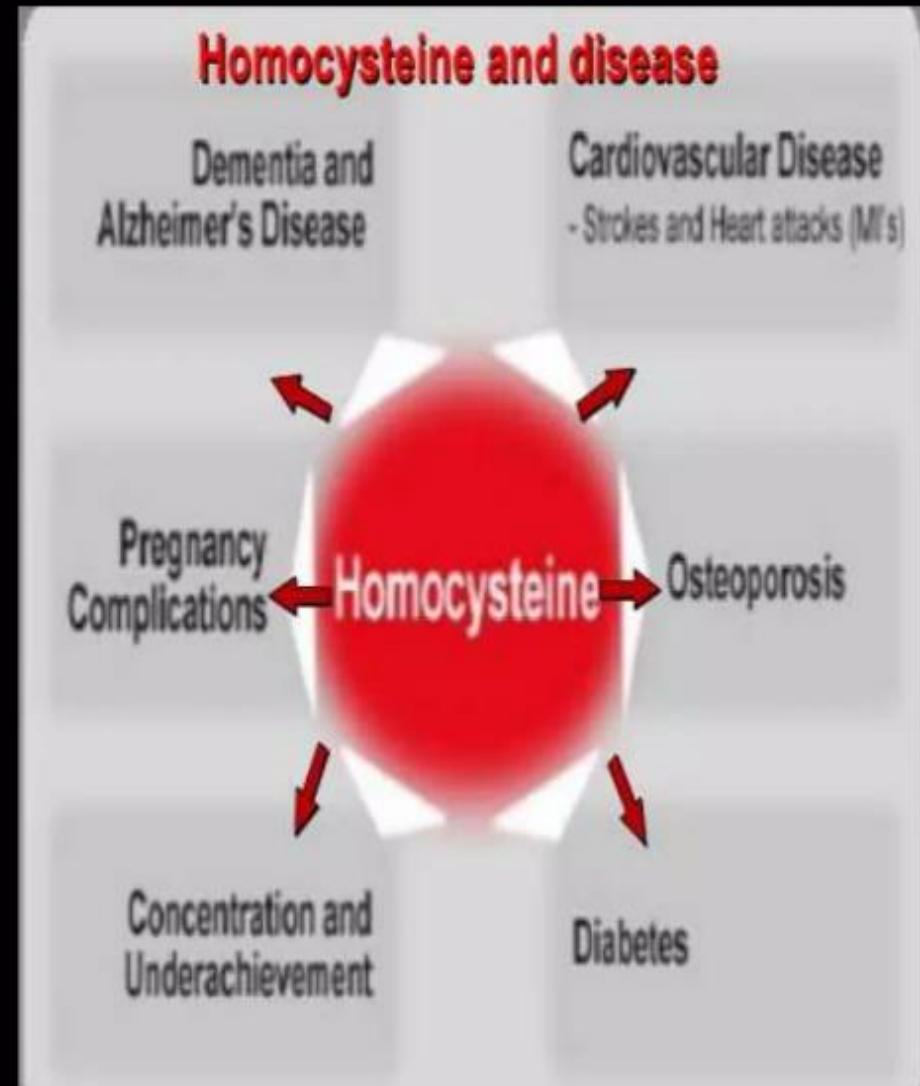


## *According to BMI:*

<i>Underweight</i>	$<18.5$
<i>Normal</i>	$18.5 - 24.9$
<i>Overweight</i>	$\geq 25.0$
<i>Preobese</i>	$25-29.9$
<i>Obese class 1</i>	$30-34.9$
<i>Obese class II</i>	$35-39.9$
<i>Obese class III</i>	$\geq 40.0$

# HOMOCYSTEINEMIA :

*Refers to increased total plasma concentration of homocysteine in the sulfhydryl and disulfide group, free and protein bound.*



# Family history

*Defined as the presence of the health condition under consideration in one's siblings or parents or grand – parents < 60 years old. Usually genetically determined.*

# Energy requirements for various activities

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<i>Sleep</i>	<i>0.6 cal/min.</i>
<i>Reading</i>	<i>1.4 cal/min.</i>
<i>Eating</i>	<i>1.8 cal/min.</i>
<i>Converse</i>	<i>1.8 cal/min.</i>
<i>Writing</i>	<i>1.9 cal/min.</i>
<i>Standing</i>	<i>2.2 cal/min.</i>
<i>Casual walking</i>	<i>4-5 cal/min.</i>
<i>Running</i>	<i>10-12 cal/min.</i>



- This energy requirement for the different activities a person does in a day can be provided by a balanced diet in a normal healthy individual.


# Balanced diet

**This is the recommended diet in a normal healthy individual without any risk factors for Coronary heart disease.**



## *WHAT IS IT ?*


- *15%-20% Proteins*
- *20%-30% Fats*
- *Rest Carbohydrates.*



*Dietary modifications  
in CHD are required  
because of the  
following reasons!*


- **The Seven Countries Study** showed a strong positive relation between saturated fat intake and the 10 year incidence of CHD.



A decorative vertical bar on the left side of the slide, consisting of two parallel lines: a thin light blue line on the left and a slightly thicker dark blue line on the right.

•Body weight changes are strongly related to changes in serum total cholesterol and blood pressure.

•Population subgroups  
consuming diets rich in  
plant foods have lower  
CHD rates than  
the general population.



**•Diet therapy should be  
the first step in the  
treatment of  
Hypercholesterolemia.**

**Lets Take the Various  
Components of Diet  
One by One !**

# **MILK :**

**Whole milk has  
a cholesterol  
lowering effect.**

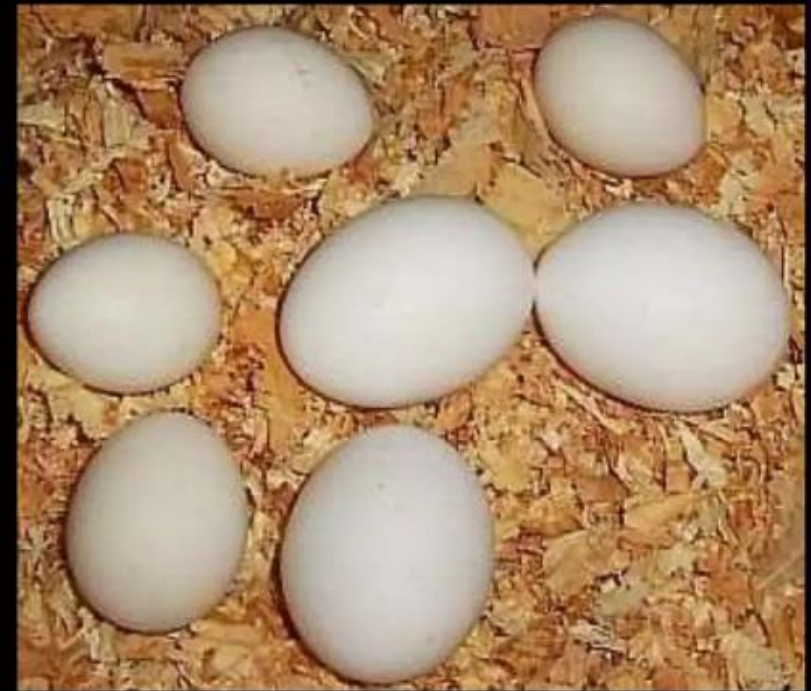
**Thus , a cup or  
two is permitted.**





# Egg

**White of egg has  
no fat and thus does  
not raise cholesterol.  
So, one or two eggs  
per day are safe.**



# Nuts

**28g of walnut with each of the three meals without increasing total dietary fat improves serum lipid profile.**



# Meat

**•No significant change in plasma cholesterol when diet self selected for beef, pork, poultry or fish.**





**•But some studies reveal  
increased plasma total cholesterol  
and systolic blood pressure  
with meat.**





# Soya bean

**In type II hypercholesterolemic patients already on a low lipid, low cholesterol diet, substitution of animal protein by soyabean reduced cholesterol.**



# Garlic and onion

- **Good effect noted with high doses.**
- **Lower blood pressure, prevent coronary thrombosis, heart attacks and strokes.**



## Other vegetables

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- **Capsicum increases fibrinolytic activity in blood – reduced chances of thromboembolism.**



**WHAT ARE  
CAPSICUMS?**

# Fibers

**Two types – soluble & insoluble.**

- **Filling with fewer calories.**
- **Add roughage to the diet.**
- **Aid digestion and elimination.**



## **Soluble fibers in addition-**

- Lower total blood cholesterol.**
- Lower LDL cholesterol.**
- Regulate blood sugar.**
- Favorable effect on blood pressure.**



# Source of soluble fibers

- **Oat bran**
- **Rolled oats**
- **Broccoli**
- **Brussels sprouts**
- **Grapefruit**
- **Apples .**



# Plant foods

**Beneficial factors  
include -**

- relative energy content**
- fiber content**
- unsaturated fatty acids**
- anti oxidant properties.**



# Beverages

**More intake of coffee leads to –**

- Raised serum cholesterol**
- Irregular heart beats**

**Consumers of real boiled coffee face higher risk.**



# **ALCOHOL :(controversial role)**

**Increases HDL cholesterol (HDL3  
but not HDL2) in marathon  
runners and inactive men but not  
in men who run and jog.**



## To Toast or Not To Toast . . .



French Paradox Study: Regular use of red wine = low rate of heart disease

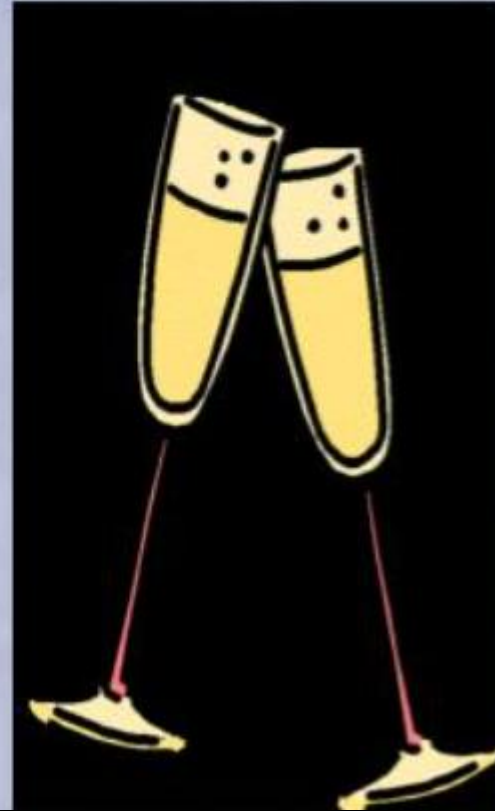




# To Toast or Not To Toast . . .

## Effects

- ♥ May increase HDL
- ♥ May increase blood pressure
- ♥ May increase triglycerides
- ♥ Significant source of calories




# Water (Hard vs Soft)

- **Hard water will contain higher levels of calcium, magnesium, and other minerals, while soft water will contain higher levels of sodium (salt).**

# **WATER :**

- CVS mortality 10% higher  
in areas with very soft water  
as compared to medium  
hard water.**





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- **In areas where water supply changed in the last 30 years favorable effect seen when water became harder and unfavorable when it became softer.**

# **MINERALS :**

- **Silicon deficiency – atherosclerosis**
- **Cadmium – toxic to heart**
- **Low Selenium associated with CHD**



## **ROLE OF FREE RADICALS:**

- By-product of oxidation.**
- Damage cell membranes, disturb chromosomes and genetic material and destroy valuable enzymes.**

- **Cause 50% of CHD, lung diseases certain cancers, cataracts, rheumatoid arthritis, Parkinson's disease etc.**
- **2 ways to reduce them –**
  - 1. Less consumption**
  - 2. Anti-oxidants.**

# Sources of antioxidants



## **Beta-carotene**

- Apricots, carrots, mangoes.



## **Copper**

- Seafood, milk, nuts & lean meat



## **Selenium**

- Onion, garlic, wheat germ, mushrooms.



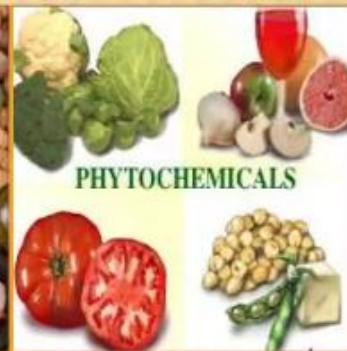
## **Vitamin C**

- Broccoli, cabbage, strawberry.



## **Vitamin E**

- Whole grain cereals, nuts, wheat germ, mangoes.



## **Phytochemicals**

- Green tea, apple, citrus fruits, onion, tomatoes, garlic.



*So, diets suggested when one  
or more risk factors present  
but no history of CHD are -*



## *Presence of Hypertension or Family History:*

<i>Fats</i>	<i>20-30%</i>
<i>Saturated fats</i>	<i>&lt;10%</i>
<i>Dietary cholesterol</i>	<i>&lt;300mg/1000kcal/day</i>
<i>Increased consumption of complex carbohydrates</i>	
<i>Salt intake</i>	<i>&lt;5g/day.</i>



## *Presence of Hypercholesterolemia*

- A two step diet is suggested.
- The goal is to reduce the total cholesterol to less than 150mg% and LDL cholesterol to less than 100mg%.

- If after a trial period of 2-6 months, the Step I diet fails to lower the cholesterol then one should switch to the Step II diet.

# Two steps diet therapy

## **Step one –**

<i>Fats</i>	<i>&lt;30%</i>
<i>Saturated fats</i>	<i>&lt;10%</i>
<i>Dietary cholesterol</i>	<i>&lt;300mg/day.</i>
<i>PUFA</i>	<i>up to 10%</i>
<i>MUFA</i>	<i>10-15%</i>

**Carbohydrates**

**50-60%**

**Proteins**

**10-20%**

**Total Calories - to achieve  
and maintain  
desirable weight**

## Step Two -

<i>Fats</i>	<i>&lt;30%</i>
<i>Saturated fats</i>	<i>&lt;7%</i>
<i>PUFA</i>	<i>upto 10%</i>
<i>MUFA</i>	<i>10-15%</i>
<i>Dietary cholesterol</i>	<i>&lt;200mg/day.</i>



**Carbohydrates**

**50-60%**

**Proteins**

**10-20%**

**Total Calories**

**to achieve  
and maintain  
desirable weight**

# OBESITY:

- *Proportion of energy dense food should be reduced,*
- *Fiber content to be increased,*



# Obesity

- *Adequate levels of essential nutrients in the low energy diets*
- *Food energy intake should not be greater than energy expenditure.*





# Diabetes mellitus

<i>Proteins</i>	<i>10-20%</i>
<i>Saturated fat</i>	<i>&lt;10%</i>
<i>PUFA</i>	<i>≤10%</i>
<i>Carbohydrates</i> <i>+ MUFA</i>	<i>rest calories</i>
<i>Fiber</i>	<i>20-35g/day</i>
<i>Sodium</i>	<i>≤ 3g/day</i>
<i>Cholesterol intake</i>	<i>&lt;300mg/day</i>



# Homocysteinemia

- *Diet rich in folate*  
*or*
- *Consumption of multivitamin supplements recommended.*







# **DIET IN CHD PATIENTS**

A heart-healthy diet is:

- High in omega-3 fats, found in many fishes, especially salmon
- High in fiber
- High in fruits and in green, red and orange vegetables
- Low in saturated fats and trans fats
- Low in sodium
- Low in sugar
- Low in cholesterol
- Low in alcohol or alcohol-free
- Calorie-balanced to support a healthy weight

# Trans fats

- Trans fat, also called trans-unsaturated fatty acids, or trans fatty acids, is a type of unsaturated fat that occurs in foods.
- Trace concentrations of trans fats occur naturally, but large amounts are found in some processed foods.
- Saturated fat increases serum cholesterol. Trans fat does the same thing, but the increase in LDL (bad cholesterol) is greater, while HDL (good cholesterol) may decrease, making the critical LDL/HDL ratio worse. In addition, trans fat may have a greater impact on inflammation.

## Fatty Fish and Flaxseed

- ♥ Contain Omega-3 Fatty Acids
- ♥ Benefits include
  - ♥ Decreased risk of arrhythmias, which can lead to sudden cardiac death
  - ♥ Decreased triglyceride levels (very effective)
  - ♥ Decreased platelet aggregation
  - ♥ May decrease blood pressure

You can achieve this by:

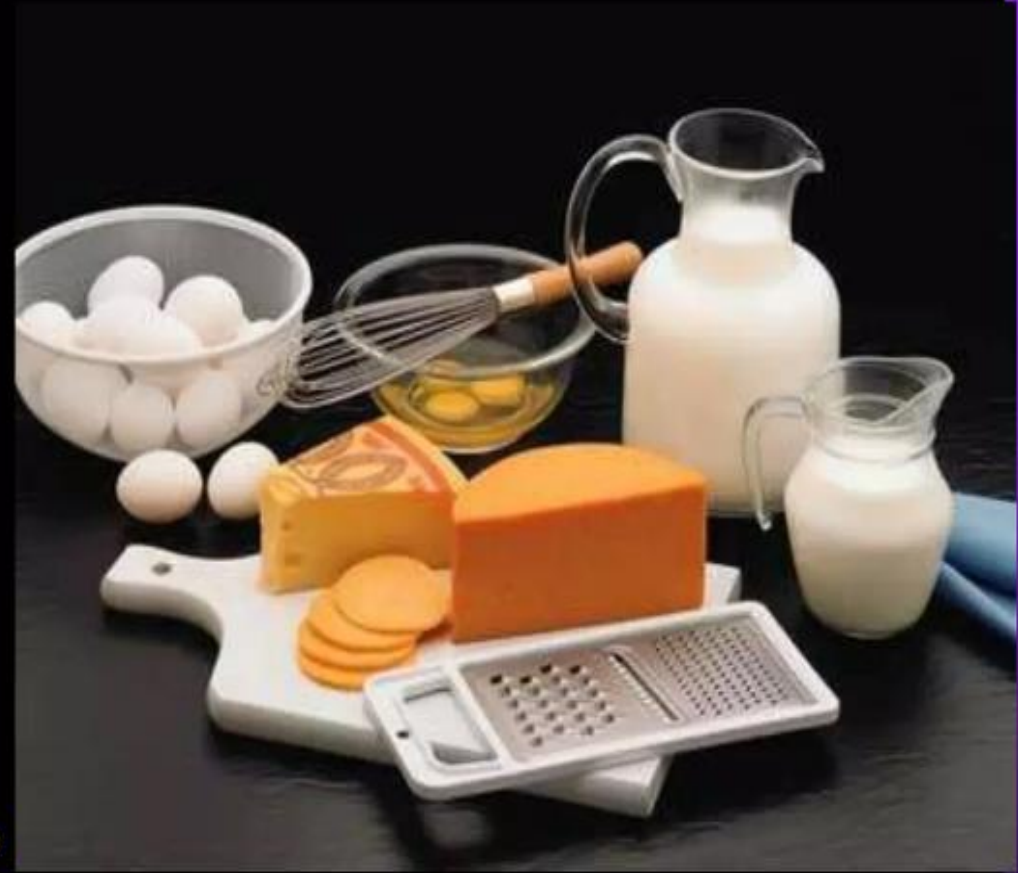
- Reducing overall cholesterol levels and low-density lipoproteins (LDL), which are harmful to the heart
- Increasing high-density lipoproteins (HDL), which are beneficial for the heart
- Reducing other harmful lipids (fatty molecules), such as triglycerides and lipoprotein.

Any diet should also help keep blood pressure and weight under control.



# FOOD ITEMS TO BE AVOIDED

- ❖ **Milk (full cream) and Milk products.**
- ❖ **Skimmed milk beyond 200ml/day.**
- ❖ **Cheese and Butter.**





# FOOD ITEMS MODERATELY RESTRICTED

- Brown bread and white bread.
- Rice.
- Vermicelli.



Peas.

Potato, Sweet potato,

Sugar.

Banana, Mango.

Cold drinks.




# Food items that can be consumed freely

- Cereals: whole grain: oat and barley.
- Pulses.
- Soya bean.
- Leafy vegetables.

# Food items that can be consumed freely

- Roots and tubers: carrot onion, garlic and ginger.
- Other vegetables: cucumber, tomato, lady finger, mushrooms, pumpkins, beans.
- Fruits: apple, pineapple, water melon, lemon, orange.





*Now lets see the type of diet to be taken in CHD patients with one or more risk factors.*

# Reversal diet

- 10% fat (mostly polyunsaturated or monounsaturated).
- 70-75% carbohydrates.
- 15-20% proteins.




- 5 mg cholesterol / day.
- Allows but does not encourage moderate alcohol consumption.



- Excludes all oils and animal products except non fat milk and yogurt.

- Allows egg white.

- 
- Excludes caffeine and other stimulants.
  - Allows moderate use of salt and sugar.



## **CONCLUSION :**

**Modification of diet goes a long way in prevention of CHD especially in those people having multiple risk factors.**

**Dietary management  
will further decrease  
those risk factors and  
the occurrence of  
CHD.**

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**In persons already suffering  
from CHD, right kind of  
dietary management will  
By pass the need for  
interventions and bypass  
surgery.**

# Being healthy is as easy as ABCDE

**Avoid alcohol**

**Be physically active**

**Cut down on salt and sugar**

**Don't use tobacco products**

**Eat plenty of fruits and vegetables**

