UNIT I

Nutrition Throughout Life Cycle I

- Principles of Menu Planning
- Nutritional requirements of pregnancy
- Nutrition during lactation

NUTRIENTS

- **Two classification**

  Macro and Micro Nutrients

Macro Nutrients – carbohydrate, protein, fat

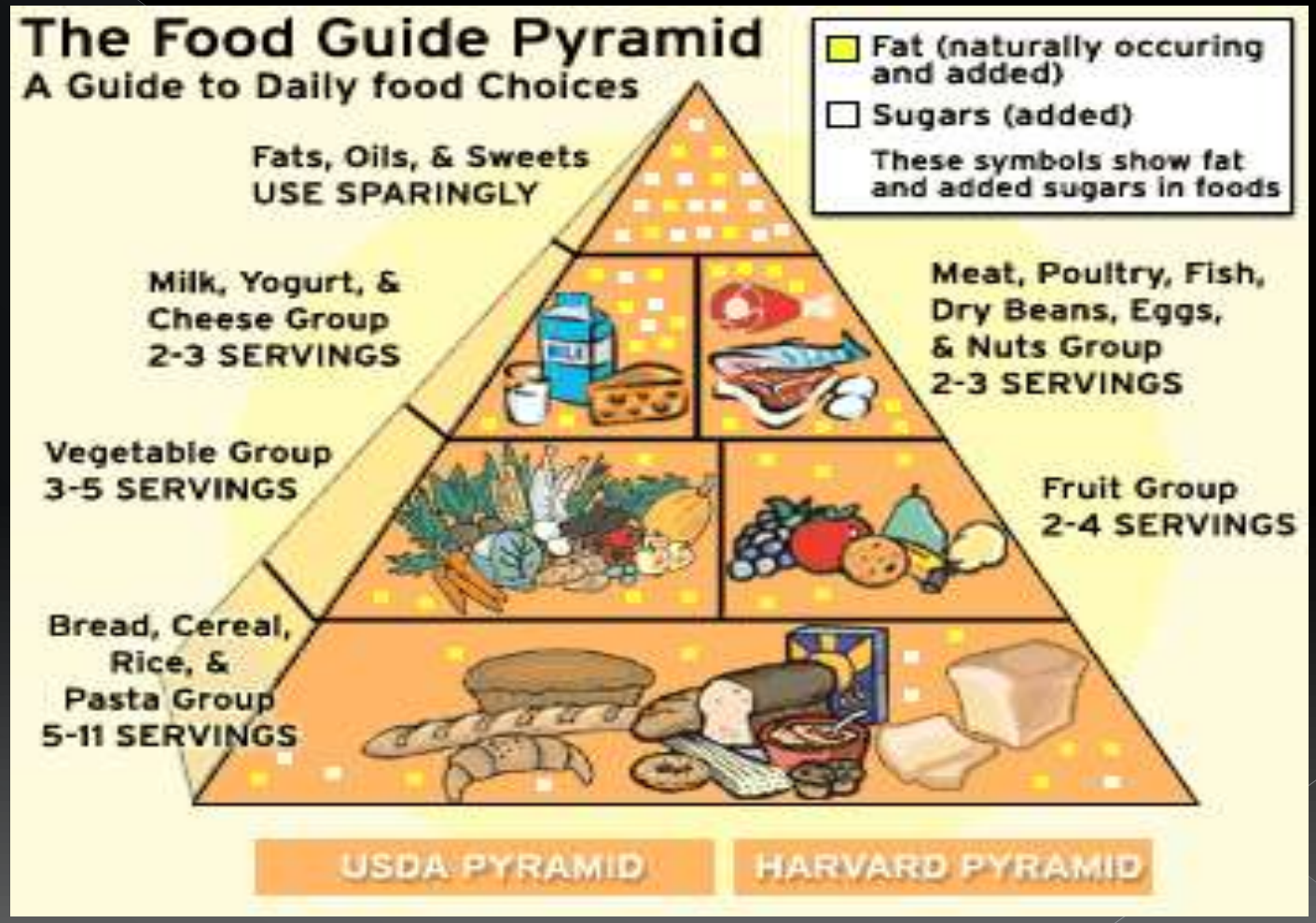
- 1gm of carbohydrate gives 4 kcal
- 1gm of protein gives 4kcal
- 1gm of fat gives 9kcal

Micro Nutrients - Vitamins (A,B,C,D,E,K), Minerals(calcium, iron, phosphorous, sodium, zinc, iodine, selenium, copper)

Basic Food Group by ICMR

- Cereals, millets and pulses
- Milk and Animal products
- Vegetables and Fruits
- Oils , Fats and Nuts

FOOD GROUP IMAGE



Principles of Menu Planning

- Meeting nutritional requirement
- Menu should fulfill family needs
- Meal planning depends upon everyone likes and dislikes
- Meal plan should give maximum nutrients
- Meal plan should provide variety

- Meal planning should save time and energy
- Meal planning should be economical
- Meal plan should include locally available foods
- Menu should have healthy foods
- Meal plan should have regular intervals

NUTRITIONAL REQUIREMENTS OF PREGNANCY

Nutrition During Pregnancy

Nutrient	Pregnant sedentary women
Energy (kcal)	2250
Protein (gm)	82.2
Fat (gm)	30
Calcium (mg)	1200
Iron (mg)	35
Zinc (mg)	12
Thiamine(mg) or vitamin B1 (mg)	1.2
Riboflavin (mg) or vitamin B2(mg)	1.4
Niacin (mg) or vitamin B3(mg)	14
Pyridoxine (mg) or vitamin B6 (mg)	2.5
Ascorbic acid(mg) or vitamin C(mg)	60
Dietary folate(mg)or folic acid (mg)	500
Vitamin A (mcg)	800

Nutritional Requirements of Pregnancy

Energy : ICMR recommended energy requirement for pregnant women

- **Sedentary worker** : 1900 + 350 = 2250 kcal
- **Moderate worker** : 2230+ 350 = 2580 kcal
- **Heavy worker** : 2850 + 350 = 3200 kcal

BMR increases during 1st and 2nd trimester and 12% during 3rd trimester

- Total weight gain during pregnancy may range from 10 – 14 kg

Protein :

- the normal protein requirement for pregnant women 82.2 gm/day

Protein rich foods : milk, fish, egg, meat, pulses, legumes, whole grains

Fat :

- ICMR recommends fat for pregnant women 30gm/day

EFA rich foods: corn, cotton seed, safflower, soyabean oils, green leaf vegetables, flax seeds, walnuts

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Calcium :

- requirement of calcium during pregnancy is 1200mg/day

calcium rich foods: milk and milk products, agathi leaves, gingelly seeds

Iron:

- requirement of iron during pregnancy is 35mg/day

Iron rich foods: rice flakes, egg yolk, green leaf vegetables, jaggery, liver, dried beans, dried fruits, ragi, jowar, bajra

Sodium:

- helps to maintain blood pressure
- when sodium level reduces kidney produces rennin harmone to maintain sodium level

Iodine :

- iodine deficiency leads to abortion, still births, cretinism, psychomotor defects

Zinc:

- low zinc during pregnancy results in low birth weight infants

Vitamin A:

- requirement of vitamin A during pregnancy is 800mcg/day
- vitamin A is needed for proper vision
- deficiency of vitamin A leads to night blindness

Vitamin A rich foods: liver, egg yolk, butter, green leaf vegetables, yellow and orange vegetables

Vitamin D:

- vitamin D increases the calcium absorption
- deficiency of vitamin D leads to neonatal hypocalcaemia

Vitamin E:

- it plays an important role in reproductive process and reduces abortion and still births

Vitamin K:

- it is essential for synthesis of prothrombin

Vitamin B:

- vitamin B1 prevent nausea in pregnancy
- vitamin B2 increase maternal body size and growth of foetus

Folic Acid:

- requirement of folic acid during pregnancy is 400mcg/day

Folic acid rich foods: green leaf vegetables, legumes, orange juice, soya, almonds and peanuts

Vitamin C :

- Requirement of vitamin C during pregnancy is 60 mg/day
- It helps in iron absorption

General Dietary Problems during Pregnancy

- Nausea and vomiting
- Leg cramps
- Heart burn
- Weight gain during pregnancy

Complications during pregnancy

- Anaemia
- Constipation
- Oedema
- Hypertension
- Gestational diabetes mellitus

NUTRITION DURING LACTATION

Nutritional requirements of lactating mother

- Lactating mother's nutritional requirement should meet
- -her daily needs
- -provide enough nutrients in milk for growing infant
- -for the mechanism of milk production .

Nutrients	0-6 months	7-12 months
Energy (kcal)	2500	2420
Protein (gm)	77.9	70.2
Fat (gm)	30	30
Calcium (mg)	1200	1200
Iron (mg)	25	25
Zinc (mg)	12	12
Thiamine(mg) or vitamin B1 (mg)	1.3	1.2
Riboflavin (mg) or vitamin B2(mg)	1.5	1.4
Niacin (mg) or vitamin B3(mg)	16	15
Pyridoxine (mg) or vitamin B6 (mg)	2.5	2.5
Ascorbic acid(mg) or vitamin C(mg)	80	80
Dietary folate(mg)or folic acid (mg)	300	300
Vitamin A (mcg)	950	950

- **Energy**: ICMR recommends 2500 calorie for lactating mother for first 6 months and 2420 kilo calories for lactating mother for the next remaining months.
- Energy is needed for the mechanism of milk production.
- **Protein**: ICMR recommends 77.9 gm for 0 to 6 months and 70.2 gm for 6 to 12 months lactating mother.
- If energy and protein is lacking, there will be reduction in milk volume.
- **Protein rich food** –milk, fish, egg, meat, pulses, legumes, whole grains.

Fat : ICMR recommends 30 gm for lactating mother. Lactating mother should consume 200 mgs per day DHA for infant development.

Fat in diet provide adequate energy for their needs.

Calcium : ICMR recommends 1200 mg for lactating mother. Calcium is needed for mothers skeleton and foetal bone development.

Calcium rich foods: milk and Milk products, agathi leaves, gingelly seeds, Ragi.

Iron : the iron requirement during lactation is 25 mg per day and requirements during lactation is to make up the iron lost during breast milk.

Iron rich foods- rice flakes,, egg yolk green leafy vegetables, jaggery, liver, dried beans, dried fruits, Ragi, Jowar, Bajra.

Vitamin A : ICMR recommends 950 microgm for lactating mother.

Vitamin A requirement is fulfilled by including liver, fish liver oil, egg yolk, and green leafy vegetables in diet

Vitamin B : ICMR recommends thiamin or Vitamin B1 is 1.3 mgs riboflavin 1.5 mgs niacin 16 mg Folic acid 30 microgm. Vitamin B deficiency leads to low milk output.

Vitamin C vitamin ICMR recommends 80 mg of Vitamin C for lactating mother

Fluids: Increased intake of food is needed for adequate milk production. A lactating mother should take 2 to 3 litres per day. Water, Juices, soups buttermilk, milk should be included in their diet.

NUTRITION THROUGHOUTLIFE CYCLE -II

Presented by

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NUTRITION THROUGHOUTLIFE CYCLE-II

a.nutrition during infancy

nutrition during preschoolers

c.nutrition during school going children

GROWTH AND DEVELOPMENT DURING INFANCY

- According to WHO, the average weight of healthy newborn baby is 3.2 kg and normal length is 50- 55 cm at birth.
- The child has 75% water and 12 to 15 percent fat by the end of one year. Water decreases to 60% and fat increases by 24%. Infants have Rapid heart rate 120-140 bpm and hemoglobin level 17 to 20 gm per 100 ml of blood.

Energy

- Infants require 92 kilo calorie per kg body weight. 50% energy intake is used for basal energy, 25% for physical activity and 25% for growth.
- After 6 months infant should feed with supplement food like (milk, cooked vegetables and fruits).
- To meet the energy requirements excess intake of calorie may leads to infantile child obesity.

PROTEIN

- ✓ Protein intake for infant is about 1.16 gm per kg body weight.
- ✓ It need for skeletal muscle growth. Mother's milk provides all amino acids for proper growth. Deficiency of calories and protein leads to protein energy malnutrition that is marasmus and kwashiorkor.

FAT

- Fat intake for infant is about 19 gm. Deficiency of fats develops skin lesions, diarrhea and poor growth.

CALCIUM AND PHOSPHORUS

- Infants requires 500 mg of calcium and 750 mg of phosphorus.
- Calcium and phosphorus is needed for proper bone development.
- calcium: Phosphorus ratio in mothers milk is 2 :1 and in Cow's milk 1 : 2

Zinc :

- Mother's milk contains high level of zinc.

It promotes normal growth and needs for normal brain development.

Sodium :

- Mother’s milk contains good level of sodium.

Iodine:

- if mother is deficient in Iodine it will make the infants mentally retarded.

Vitamin A:

- Vitamin A needed for proper vision. Infants requires 400 microgram as daily requirement.

Vitamin D:

- Vitamin D needed for calcium absorption it prevents rickets.

Vitamin K:

- Deficiency of Vitamin K lead to hemorrhage

Vitamin C :

- Infants requires 25 mg as daily requirements.

If Vitamin C is less in mother's milk the infants may develop Scurvy.

Folic acid:

- Infant requires 25 microgram as daily requirement.

  Folic acid is needed for synthesis of RNA and DNA.

  Also Folic acid is essential for the development of

  RBC.

ADVANTAGES OF BREASTFEEDING

- The advantages of breastfeeding can be considered under nutritional, immunological, psychological, economical and physiological and other factors.

Nutritional benefits

- It contains high amount of lactose .
- It contains salivary amylase that helps in digesting starch.

It contains 20% beta casein and 80% whey protein.
It contains binding proteins it contains EPA and D H A.
It contains 2 : 1 ratio of calcium and phosphorus.
It contains 1: 5 ratio of Copper and zinc.
It contains more amount of Vitamin A and B

HORMONES AND GROWTH FACTOR BENEFITS

- It contains hormones like TSH, thyroxin, parathyroid hormone, calcitonin, oxytoxin, growth hormone, insulin, prolactin.
- It contains growth regulating factor growth promoting factor growth modulators.

IMMUNOLOGICAL BENEFITS

- ✓ Macrophages destroys bacteria.
- ✓ Lymphocytes -these for WBC responsible for immune system.
- ✓ Immunoglobin- These are defensive proteins contains all type of antibodies.
- ✓ Ig Aprotect infants from microorganisms like virus bacteria and other pathogens.
- ✓ Lactoferrin and Vitamin B12 binding protein .
- ✓ Lactoferrin that is Iron with proteins control the growth of microorganisms Staphylococcus and E coli Enzymes .
- ✓ mother's milk contains amylase lipase lysozyme peroxidase Lipases kills bacteria.
- ✓ Lysozyme promotes cell growth. Paramino benzoic acid (PABA) in mother's milk inhibits Malaria

Psychological benefits:

- It develops a good relationship between the mother and child.

Economic benefits:

- when compared to artificial feeding it is economical.

Infant and child mortality:

- Breastfeeding reduces the risk of childhood diseases like Asthma childhood leukemia childhood obesity.

TYPES OF SUPPLEMENTARY FOOD

- ✓ Milk - after 6 months three to four times /day .
- ✓ Juices of fresh fruits like oranges tomato grapes can be given in small quantities.
- ✓ Soup from green leafy vegetables Cereals and starchy gruels- Gruels, rice, rice flakes, Ragi flour mixed with milk and sugar can be given.
- ✓ To prepare amylase rich foods (ARF) the cereal soaked in water for whole night.
- ✓ Next day water is removed and cereal is tied in moist cloth and kept in a warm place.
- ✓ After 48 hours sprouts come out.
- ✓ It should be dried in the sun and roasted.
- ✓ The malted cereal is powdered.
- ✓ During the process, starch is converted into maltose due to amylase enzyme this is called amylase rich food.

- ✓Vegetables - cooked mashed vegetables like potatoes carrots can be given .
- ✓Fruits- all fruit except banana can be given .
- ✓Pulses -well cooked pulses along with cereals can be given .
- ✓Non- vegetarian foods -boiled egg can be given after 8 months.

SCHOOL GOING CHILDREN

INTRODUCTION

- The school age period has been called the latent time of growth.
- The rate of growth slows and body changes occur gradually.
- It belongs to age group 6 to 12 years. Up to 9 years, the nutritional requirements for both girls and boys are same.

ENERGY

- The calorie intake of 7 - 9 years children is 1670 K.cal and 10 - 12 years is 2010 kilo calories.
- Energy needs varies in child physical activity growth rate and body size.
- Protein ICMR recommends protein intake of 7-9 years is 30 gm and 10 - 12 years is 40 gm.
- Girls requiring more protein than boys due to pubertal changes.
- Protein rich food - milk fish egg meat pulses legumes and whole grains.

FAT

- ICMR recommends 35 gm of Fat for school children.
- Fat provides additional energy.

Minerals

- School going children diet should provide good amount of calcium.

- Requirement of calcium between 10- 12 years is 800 mg and phosphorus is 800 mg.
- elemental calcium : Phosphorus ratio is 1:1 should be maintained.
- need to take two to three glasses of milk everyday.
- Calcium rich foods -milk and Milk products agathi leaves gingelly seeds .

IRON

- Iron requirement for women is 4 mg greater than men because iron loss through mensuration and reproduction.
- Iron rich foods: Rice flakes, green leafy vegetables, jaggery, dried beans, dried fruits, Ragi, Jowar, Bajra, egg yolk, liver

VITAMINS

- We should plan a diet with more in vitamin D foods to increase calcium absorption and Vitamin C foods for iron absorption.

FIBER

- We should include more green leafy vegetables in their diet.

PACKED LUNCH

- The packed lunch is a lunch that is packed in a tiffin box to be eaten by the child while away from home. Packed lunch must fulfill the quality of nutrients and quantity of portion. Things to be considered while planning a packed lunch.

- Packed lunch must fulfill their one third daily requirement of calcium protein and other nutrients .
- Packed lunch should consist of all five food groups.
- We should include green leafy vegetables in daily diet Variety of food should be included Packed lunch must be colorful and nutritious one.
- Packed lunch should contain fruits or buttermilk.
- Milk and Milk products like curd, paneer and addition of egg improve protein quality

Suggested Packed Lunch

- Vegetable pulao boiled egg tomato raita and orange.
- fruit Chapati and carrot salad Idli and Kurma.
- Sambar rice keerai poriyal and lemon pickle.
- Green leafy chapati and thick Dal Cheese sandwich and paneer sandwich, Guava.

NUTRITION THROUGH LIFE CYCLE-III

PRESENTED BY

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Unit -III

- **Nutrition during adolescence**
- **Nutrition during adulthood**
- **Nutrition during old age**

- The age group of adolescence is between 13 - 19 years.
- The period of transition from childhood to adulthood is called adolescence.
- Growth velocity for boys between 12 -13 years and for girls 10 - 13 years.
- There are many physical and mental changes which results due to the influence of hormones.

Energy

- The calorie intake for both boys and girls remains same up to 9 years.
- After 10 years boys need more calories than girls.
- Calorie needs increase the metabolic demands of growth and activity.

Protein

- ICMR recommends 55gm protein for girls and 53 gm protein for boys.
- Protein meets growth and pubertal changes in both sex and developing muscle mass in boys.
- Girls need more protein than boys.
- Protein rich foods milk meat fish egg pulses and legumes whole grains

Fat

- ICMR recommends 35 gm fat for girls and 45 gm fat for boys.
- Essential fatty acids helps in relaxing muscles and blood vessels in uterus and reduces menstrual pain
- EFA rich foods :corn cotton seed safflower soybean oil green leafy vegetables flax seeds.

Minerals

Calcium

- During adolescence, 800 mg of calcium and 800 mg of phosphorus is needed.
- Bone growth demands calcium. Elemental ca: p ratio is 1:1 should be maintained.
- Calcium rich foods -milk and Milk products agathi leaves gingelly seeds Ragi

Iron

- ICMR recommends 28 mg of iron per day.
- Iron is needed for hemoglobin synthesis.
- Girls need more and than boys to compensate menstrual blood loss.
- Iron rich foods: rice flakes egg yolk green leafy vegetables jaggery liver dried beans dried fruits Ragi Jowar Bajra

Zinc

- ICMR recommends 12 mg of zinc per day.
- It increases pubertal growth and deficiency leads to pubertal delay.

Vitamins

- ICMR recommends 400 microgm of Vitamin A and 400 microgm of vitamin D.
- Folic acid and Vitamin B12 are essential for DNA synthesis.

Nutritional problems in adolescence

- Obesity
- More calorie intake and poor physical activity leads to obesity.
- Other causes are
- Skipping meals
- Eating junk food (very salty High sugar, fat foods)
- Consume more sweet beverages like soft drinks
- More calorie intake
- Lack of exercise
- Due to family habits hormonal imbalance emotional stress
- Eating disorder

- There are three types of eating disorder -anorexia nervosa, bulimia nervosa and binge eating disorder.

Anorexia nervosa

- It occurs in middle adolescence (15 to 17 years).
- They will be extremely thin and rapid loss in weight.
- They rigidly avoid one particular food like milk non vegetarian foods. Refuse to eat and eat only tiny portion.

Bulimia nervosa

- It occurs in late adolescence (18 to 20 years).
- Usually near the ideal body weight, sometimes loss in weight.
- Eat large meals but no gain in weight.

Binge eating disorder

- It occurs at any age until adulthood.
- Usually overweight or obese.
- They may have obesity-related diseases such as type 2 diabetes high blood pressure high cholesterol.
- They frequently eat when not hungry.

- **Osteoporosis** Excess exercise high fibre consumption of soft drinks reduces the muscle mass and bone density.
- Reduce calcium intake leads to osteoporosis.

Anaemia

- Anaemia is common during adolescence due to lack of iron in diet and due to loss of iron in mensuration.

Undernutrition

- Undernutrition during adolescence due to lack of nutrient in diet, childhood marriage, Peer influence, eating outside home with poor selection of food, emotional disturbance.

NUTRITION DURING ADULTHOOD

- Human needs a wide range of nutrients which performs various actions of body.
- During adulthood nutrients are required for energy, replacement of tissues and maintenance of body functions.

Energy

- Reference man weight is about 60 kg and reference men women weight is about 55 kg (this is only for non pregnant and non lactating).
- The energy intake of adults depends on their activity.
- Based on the activities adults are classified into sedentary worker (teacher tailor housewife) moderate worker (fisherman Farmer industrial worker) heavy worker (stonecutter mine worker woodcutter)

Protein

- ICMR recommends protein for men 60 gm and for women 55 gm protein is mainly needed for the cell impairments and growth.
- Protein rich foods -egg fish meat milk pulses and legumes whole grains

Fat

- ICMR requirement fat for men 25 gm and for women 20 gm.
- Fat provide more calories in their diet.

Minerals

Calcium

- The requirement of calcium for both men and women are same as 600 mg.
- The Ca:P is 1: 1 is to be maintained in the diet.
- Calcium is mainly needed for bone development.
- Calcium rich foods- milk and Milk products, agathi leaves, gingelly seeds.

Iron

- Iron requirement for women is 4 mg greater than men because iron loss through mensuration and reproduction.
- Iron rich foods: Rice flakes, green leafy vegetables, jaggery, dried beans, dried fruits, Ragi, Jowar, Bajra, egg yolk, liver

Vitamins

- The requirement of Vitamin A is same for both men and women.
- The requirement of B vitamins is based on calorie requirement.
- We should concentrate on Vitamin C and Vitamin E foods in diet.
- **Antioxidants:** it helps to neutralize free radicals which leads to cell damage and cause cancer.
- Some of the antioxidants of foods are carrots, green leafy vegetables, Orange, lemon, papaya, mango.

NUTRITION DURING OLD AGE

- Old age is best at the age of retirement that is, 60 years and above.
- Aging is not a disease that a biological process.
- It is a normal process begins at conception and ends only with death.

Energy

- After 35 years, BMR decreases due to reduce muscle mass and metabolic activity.
- So calorie intake depends on the work they do.
- ICMR recommends energy for sedentary work old men 1900 K.cal and for sedentary old women 1800 K.cal.

Protein

- The daily requirement of protein is 1 gm per kg body weight.
- For men 60 gm per day.
- Protein is needed for skeletal muscle mass and for cell growth and maintenance.
- Protein rich food Milk, fish meat eggs pulses legumes whole grains.

Fats

- ICMR requirement fat for old men 25 gm and old women 20 gm.
- EFA in diet helps to reduce hair loss, vision loss, improper digestion, poor kidney function, painful joints and mental depression.
- EFA rich foods corn, cotton seeds sunflower soya bean oils, green leafy vegetables flax seeds

Minerals

Calcium

- There will be heavy loss of calcium in bones after 40 years leads to osteoporosis so calcium intake is high in old age 800 mg.
- Deficiency of calcium leads to poor bone density, dental decay and pain in joints.
- Calcium rich foods: milk and Milk products, agathi leaves, gingelly food

Iron

- Iron deficiency anaemia is common in old age.
- So iron rich food should be taken in diet regularly.
- Iron rich foods- rice flakes, green leafy vegetables, jaggery, dried beans, dried fruits, Ragi, Jowar, Bajra, egg yolk, liver.

Vitamins

- Vitamin D is needed for calcium absorption otherwise calcium deficiency leads to osteoporosis.
- Vitamin C is needed for iron absorption which prevents anaemia.
- Vitamin B is helpful in functioning immune system. Vitamin A & E act as good antioxidants and prevent free radical formation that leads to cancer.

Water

- For proper kidney function an adequate amount of water is needed to eliminate waste products.
- Water can be in the form of juices, buttermilk and soups.

Fibre

- Fibre helps to reduce cholesterol and heart diseases so fibre should include in diet.
- Ex: Whole vegetables and fruits.


THANK YOU

CONCEPT OFDIET THERAPY -11

Presented By

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Unit IV

- Principles of therapeutic diet
- Pre-operative and post-operative diet

Unit IV
PRINCIPLES OF THERAPEUTIC DIET

Routine hospital diet

- **Clear fluid diet**
- Whenever an acute illness or surgery, the patient could not tolerate the food clear fluid diet is followed. The conditions such as
- In acute infections
- Problem in intestinal tract
- After surgery in colon
- To relieve the thirst
- To supply water to the tissue
- In removal of gas

- This diet is made up of clear fluid without any residue. It should not follow 48 hours. This diet provides 300-kilo calorie and no protein
- Examples: barley water, tender coconut water, dhal water, glucose, tea without milk and coffee without milk

- **Full fluid diet**
- This diet is followed after clear fluid diet. This diet is followed after clear fluid diet.
- This diet contains only liquid foods and given at two to four hour interval. This diet gives 1200 calorie and 35 gram of protein.
- Examples: kanji, ragi malt, dal soup, milk, tea, fruit juices

- **Soft diet**
- This diet is followed after full fluid diet.
- The soft diet should be simple easily digestible without any harsh fibre and low fat.
- This diet gives 1500 calorie and 35 - 40 grams of protein.
- Example: idli, idiappam, aapam, all dhals, cooked and mashed vegetables, banana, custard

- **Regular normal diet**
- This diet is followed after soft diet.
- It is protein normal routine diet.
- The diet should well balance with all nutrients.
- The diet provides 1800- 2000 calories and 42 to 45 grams of protein.

- **SPECIAL FEEDING METHOD**
- Enteral nutrition
- It can be provided only orally or by tube feeding. The patient who are unable to chew or eat. The conditions are
- Paralysis
- Semi-conscious
- Coma patients

- Baby with low weight
- Severe diarrhoea
- Severe malabsorption
- Post-surgery
- Patients who cannot chew
- Renal disorders
- Oral cancer

Tube feeding

- **Nasogastric feeding**
- This is done by passing a tube into a stomach through nose.
- Gastrostomy directly connected to gastric through surgical operations it is a short-term process.
- Jejunostomy directly connected to jejunum through surgical operation it is a long-term process Tube feeding provides good nutrition, easily digested and well acceptable by patients. this provides 1500 calorie and 50 grams of protein.
- Examples: Natural liquid foods Fluids curd milk cooked cereals can be given.

- Parenteral feeding: A sterile nutrient-dense solution is infused intravenously. It is short-term process. It provides 1000- 2500 calories.
- Total parenteral feeding :it is defined as provision of all nutrients needed for normal growth in required amounts through vein. it provides nearly 30 to 50% of daily nutrients.

PRE-OPERATIVE AND POST-OPERATIVE DIET

- **Pre-operative diet**
- This diet is followed before the operation.
- This diet may be liquid solid or regular diet with no harsh fibre.
- Foods and fluids are generally allowed until the midnight preceding the day of operation.
- It is essential to keep the stomach empty in order to avoid the functioning of gastrointestinal tract.

Post-operative diet

- Following a minor operation.
- Liquids can be given within few hours and normal diet is followed.
- After major surgery, the intake may delay for days.
- Tube feeding is given (enteral nutrition or parenteral nutrition) if the patient is able to chew the food, routine hospital diet is applied (clear fluid diet to normal diet).

Enteral Nutrition	Parenteral Nutrition
Oral feeding directly or through Nasogastric / Gastrostomy/Jejunostomy	Feeding through Central vein
If oral feeding is not possible to feeding is given	If enteral feeding is not possible parenteral feeding is given
Food is given in modified form	Nutrients are in dense solution
Biochemical monitoring is required	Frequent biochemical monitoring is needed
Less technical skills is required	More technical skills are required
Chances of complications are less	Chances of complications are more
Less expensive	More expensive
Satisfaction of taking food	No satisfaction
Intestinal mucosa is maintained	intestinal mucosa not maintained
Calculation of food intake is less	correct amount of food is taken

Modification of normal diet

- Diet therapy is applied with the modification of the normal diet to meet the requirements of the sick individual. Its purposes are:

To maintain good nutritional status	To metabolize the nutrients
To correct deficiencies	To bring out the changes in body weight
To keep the body rest	To maintain the intestinal flora
To keep the affected part rest	To improve the immunity
To maintain the body's ability	

DEFICIENCY DISORDER

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VITAMIN A DEFICIENCY

Deficiency of Vitamin A

- Preschool children are at greater risk of Vitamin A deficiency.

Causes

- Poor nutritional status
- Due to poor nutritional status of Mother
- Late supplementary feeding
- Not proper diet
- Common childhood infections

Clinical signs

- Night blindness: Inability to see in night or in dim (poor) light. Rhodopsin is a biological pigment found in retina that enables vision in dim light. Vitamin A is essential for rhodopsin synthesis. Deficiency of vitamin A deficiency leads to night blindness.
- Conjunctival Xerosis: Dry patches in conjunctiva
- Corneal Xerosis: Cornea becomes dry and loses its clarity
- Bitot's spot: Dry triangular patches in eye.
- Keratomalacia: Lesions in cornea affects the lens and whole eyeball leads to total blindness.

Nutritional requirements

- Ensure adequate amount of Vitamin A rich foods in diet. Vitamin A rich foods- egg yolk liver butter green leafy vegetables yellow and orange vegetables

Anaemia

- Nutritional anaemia is caused by the absence of nutrients like (Iron Folic acid and Vitamin B12) that is involved in hemoglobin formation or by poor absorption of these nutrients like Iron, Folic acid and vitamin B12. Anaemia is common in all age group mainly in adolescents and adults.

Causes

- Deficient in nutrients like Iron, Folic acid, vitamin B12, vitamin B, C, protein
- Poor environment
- Poor Healthcare
- Increased blood loss
- Poverty
- Infectious illness
- Inadequate diet in quantity and quality

- Low absorption
- Lack of awareness

Symptoms

- Fatigue (tiredness)
- Paleness of conjunctiva
- Spoon shaped nails
- Oedema
- Weakness

Types of anaemia

- **Hypochromic microcytic**: This is due to the deficiency of iron for the formation of haemoglobin. The RBC are pale and small.
- **Megaloblastic:** Vitamin B12 and Folic acid are essential for DNA synthesis. Deficiency of the vitamins may damage to DNA and block mitotic division. This results in irregular shape of RBC.
- **Dimorphic :** This is due to both Iron and Folic acid or vitamin B12 deficiency. It is called as hypochromic microcytic or dimorphic anaemia.

- **Nutritional requirements** : Balanced diet rich in proteins, vitamins and minerals should be consumed.
- Iron rich foods: Roice flakes, egg yolk, green leafy vegetables, jaggery, liver, dried beans, dried fruits, Ragi, Jowar, Bajra, egg yolk, liver.
- Protein rich foods: Meat, fish, egg, milk, pulses and legumes, whole grains.
- Vitamin C rich foods: Amla, Orange, lemon and other citrus fruits
- Folic acid rich foods: vegetables, legumes, orange juice, soya, wheat germ, almonds and peanuts
- Vitamin B12 rich foods: Meat, curd, egg, rice products.


Thank
you