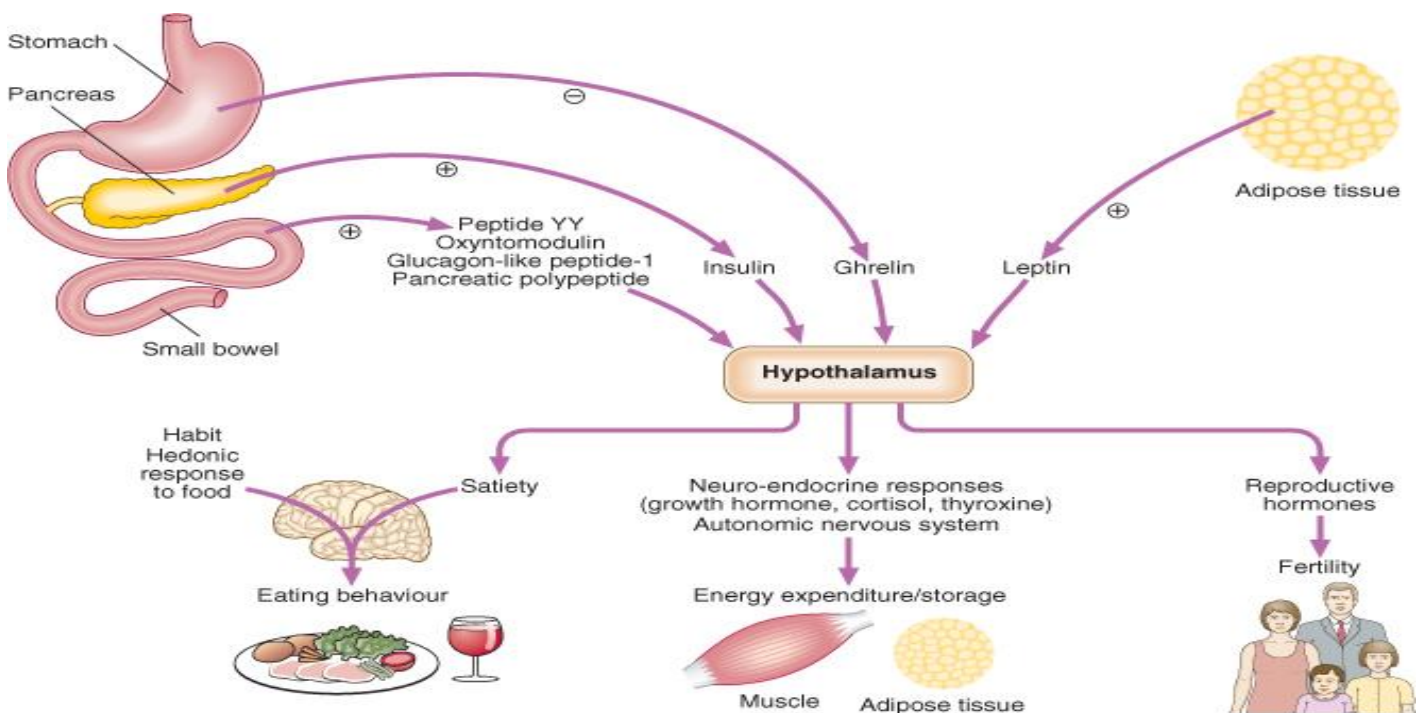


Lecture one

Any food sight , aroma , sounds , thought of food ---- perception of hunger from GIT -----
Hypothalamic signals ----- secretion of hormones , enzymes , substances

- Energy intake is determined by the 'macronutrient' content of food.
- These have different energy densities: carbohydrates (4 kcal/g), fat (9 kcal/g) and protein (4 kcal/g).
- Energy intake and expenditure are highly regulated.



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- Regulation of energy balance is coordinated in the hypothalamus.
- The stomach hormone ghrelin, which falls immediately after eating and rises gradually thereafter to suppress satiety and signal that it is time for the next meal.
- The adipose hormone leptin, which increases with increasing fat mass and stimulates satiety.
- The hypothalamus responds with changes in many local neurotransmitters. These complex regulatory pathways allow adaptation to variations in nutrition.

Sites of digestion :

Mouth: enzyme ---- saliva ; amylase ---- ptyalin secretion --- convert starch to oligosaccharide

Stomach: enzyme --- gastric juice (hydrochloric acid) + pepsin act -----proteolytic
gastric lipase ----- lipolytic

Pancreas : enzyme ---- lipase + (bile salt) act ----- fat ----- monoglyceride

α amylase ----- starch & dextrans

trypsin & chymotrypsin ----- protein & peptides

ribonuclease & deoxyribonuclease act ----- ribonucleic & deoxyribonucleic acid

elastase act---- fibrous

Small Intestine (brush border) : enzyme ---- mono, di , carboxypeptidase act ---- polypeptides

Enterokinase ----- pepsinogen

Sucrose enzyme act ----- Sucrose

Maltose == act ----- Maltose

α dextrans == act ----- dextrans (isomaltose) ,

nucleotidase act ----- nucleic acid

nucleotidase & phosphorylase ----- nucleosides

Nutritional Science; It's the science that deals with the relationship between food & health according to age, sex, physical activity.

Nutrition; The major process deals with intake of food & nutrients for building, metabolism, energy production, and these processes include;

- Food ingestion, Digestion, Absorption, Metabolism, Waste excretion

Calory; The amount of heat that needs to raise (1) gram of water (1) degree°

Classification of food;

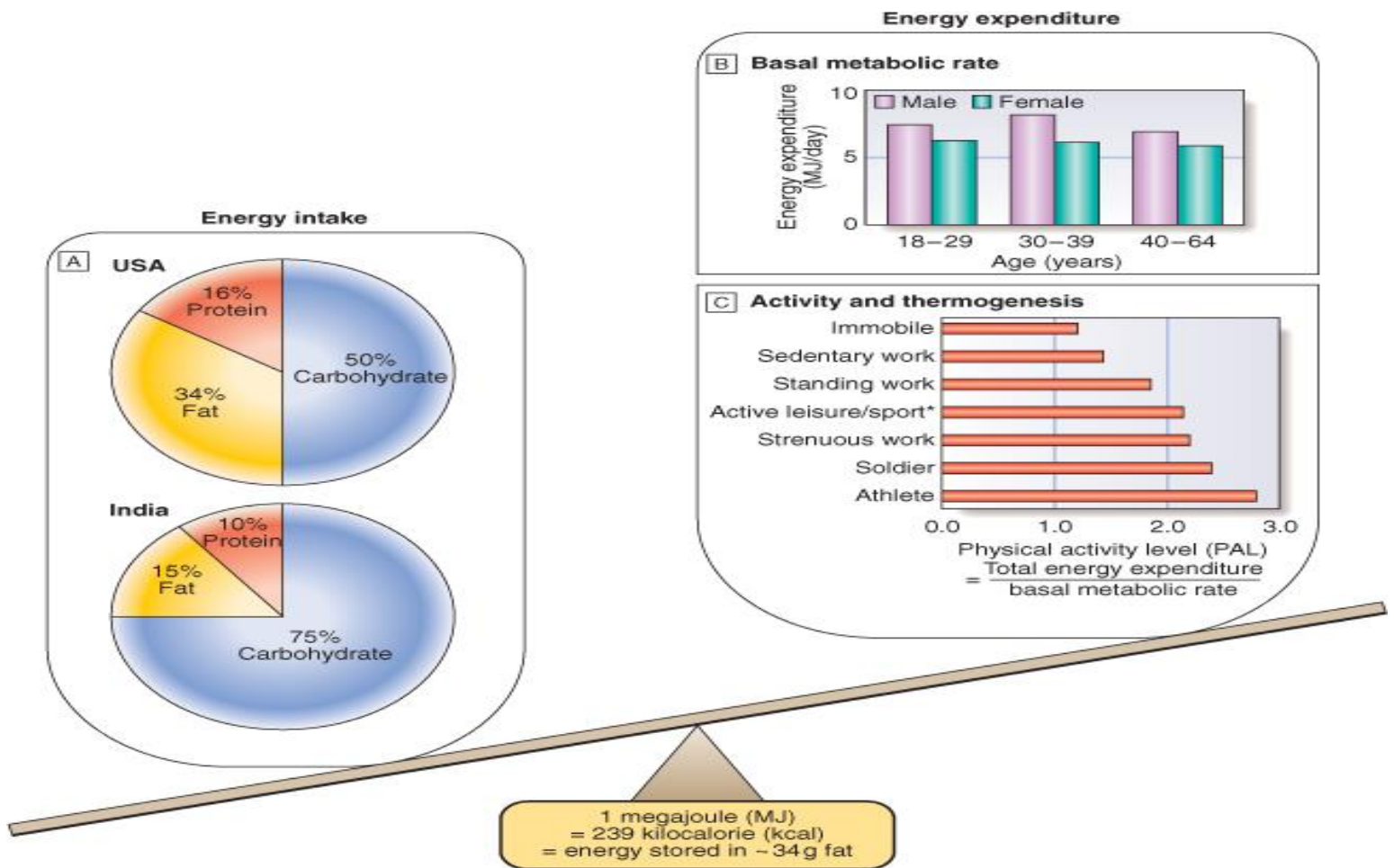
1. Origin
2. Chemical composition
3. Function
4. nutritive values

Nutrients; Any digestible substance can provide necessary dietary needs with good odour, taste & color & may be organic or inorganic, animal or plant origin that supplies body with food. Can be divided to;

Macronutrient; these; –protein, fat, CHO, water

They are big fragments & form bulk of food.

- protein ; form 15 – 20 % of total energy , (1) gram gives (4) k. calorie
- CHO ; form 40 – 50 % of total energy , (1) gram gives (4) k.calory
- Fat ; form 30 % of total energy , (1) gram gives (9) k.calory



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Micronutrient; - Vitamins & Minerals

- Vitamins form 8 % of total energy –Minerals& water form 2 % of total energy

The low-insulin state of sever starvation fuels are liberated from stores initially in glycogen (in liver and muscle), then in triglyceride (lipolysis in adipose tissue, with excess free fatty acid supply to the liver leading to ketosis) and finally in protein (proteolysis in muscle).

- In the high-insulin state of over-nutrition, excess energy is invested in fatty acids and stored as triglycerides; these are deposited principally in:
 - adipose tissue
 - may also spill over and accumulate in liver (non-alcoholic fatty liver disease) or fatty liver

CHO ; Can be classified to :Simple sugar ; that divided to 2 parts

Monosaccharide's ;the simplest structure of CHO & the smallest building unit (one CHO unit) that form 3-7 carbon atoms , that (3) called tri , 4 tetra , (5) pentose , (6) hexose.

Example ; Pentose ; $C_5 H_{10} O_5$ AS : - Xylose - Arabinose - Ribose

Hexose; $C_6 H_{12} O_6$ AS - Grape sugar, simple sugar, corn sugar

Glucose; simple sugar, find in Grape sugar, corn, dates, orange &Lemon.

- Fructose; fruit sugar, find freely as in fruits, honey or with others as in

- Sucrose (glucose + fructose) , starch &glycogen. -

Galactose; Mostly bind with glucose ----- lactose

Bind with other ----- polysaccharide

b. Oligosaccharide ; 2-10 carbon units

- Disacch (2 mono saccharide)

-Trisacch (3 mono)

- Tetrasacch (4 mono)

Example; Sucrose (glucose + fructose)

- Maltose (glucose + glucose)

- Lactose (glucose + Galactose)

2. Polysaccharides; starch, glycogen, cellulose.

Function of CHO;

1. Main source of energy; 1 Gram gives 4 k. calory , most important part of body needs glucose is the brain & when there is decrease ----- decrease of serotonin secretion.

2.Protein sparing action;

When there is decrease in protein intake, CHO can do repairing activity.

3.Regulation of fat metabolism : Need 10-15% of CHO to avoid ketosis, when decrease intake ---- body use of fat for energy production ---- catabolic process & formation of ketone bodies as acetone, acetoacidicacid, butyric acid (ketosis) this is occur with patient with D.M

4.Glycogen – sparing storage action of human muscles; When decrease intake of fat ---- glycogen act as energy (glycogenolysis) .

5. Structural & physiological function;

- Mucoprotein ----- mucus secretion
- Heparin ----- anticoagulant

6. fibers; edible substance that not digest or absorbed in G.I.T

- Water soluble ----- pectin, gum, hemicellulose (dietary fibers)
- Water insoluble----- cellulose, lignin

Function of fibers;

1. prevent constipation
2. Decrease absorption of fatty acids; - enhance bacteria fermentation in colon & analyze fatty acids & avoid there absorption.
3. Regulation of CHO; avoid absorption of sugar & enhance passage through intestine that regulate blood sugar in D.M patient & good for dietary regime.
4. Decrease gall stones that bind with bile salts & excretion in the stool.
5. Decrease chance of colon cancer.
6. Decrease absorption of toxic substances.

Bad effects of fibers;

- Need 20 gram/ day, when intake large amount for long time lead to Vitamins deficiency especially vit B12 -
- Decrease bioviability of minerals as iron, ca^2 , mg^2 , Zink ----- lead to Malnutrition & anemia.

Lecture Two

Protein; it means the first (proteos); it's organic compounds found in all cells, main structure is Amino acids (smallest structure), form 20% of body weight. There are 40 A.A, but only 22 were recommended. essential A.A (not synthesis in body) are (8-9) these are ; Lysine , Tryptophan , Methionine ,Valine , Phynelalanine, Lucien ,Isoleucine , Threonine & in infant Histamine.

COOH (acidic group)

↑ - When (amino group) = (acidic group)---neutral A.A

NH₂ ----- C----- H - When (amino group)> (acidic group)--- basic A.A

(Amino group)↑ - When(amino group) < (acidic group)--- acidic A.A

R

Function

1. Growth & tissue maintenance

Important in tissue building ---- cells, protoplasm, fluid, muscles ---

2. Repairing & replacement of new tissue

--- RBC, new cells, GIT, muscles

--- Repair in ---- wounds, hemorrhage, burns -----

3. Source of energy

Each 1 gram ----- 4 k.cal, when energy intake is not enough (glycogenolysis)

When access amount of protein intake –

--- storage as energy (glycogenesis)

4. Water balance ; regulate fluid between cell & blood especially Albumin , big molecule of protein that stays out side of cell, less protein ----- edema

5. Acid –base balance.

6. Find in body ; Methionine ---- methylation in brain & synthesis of choline (n.t),
Tryptophan --- Niacin & nucleotides formation, Phenylalanine----synthesis of
Tyrosine & epinephrine , Histamine ---- formation of Hydrochloric acid of stomach

Nutritive value; depends on; 1. Amount of protein in food;

- When protein form 30% of food ---good source of protein as in meat, cheese,
Soya bean.

- When protein form 10% of food ---mild source of protein as in legumes, seeds

- When protein form 1-3 % of food -----poor source of protein as in vegetables.

2. Using degree of protein; depends on digestibility of protein that animal

Proteins 97% is digestible with B.V higher than plant protein (60–70%) Digestible.

3. Contents of A.A; biological value of protein differs according to contents of .A.A

a. Complete proteins ; that content all essential A.As as in meat group, milk
Group, eggs (very high biological value)

b. **Less complete proteins** ; have deficiency in 1 or 2 A.As as in plant protein ---
(legumes , seeds) , need to mix 2 groups or more as;

Legumes(loss methionine) + (wheat) (loss lysine)

Legumes(loss methionine) + rice (loss lysine)

Sesame (loss lysine) + beans(loss methionine)

Sesame (loss lysine) + legumes(loss methionine)

c. **incomplete proteins** deficiency in many A.As & with very low B.V as in
Corn, gelatin.

So either ;

* Full A.As ; meat , eggs , milk * One A.A loss; **lysine** loss in rice , sun flower ,
corn , sesame , soya bean **methionine** loss in legumes , **Tryptophan** loss in fish

Micronutrient; - Iron - Iodine - Vitamin A - Zink

- Iron D. An ;

Anemia; A state of Hb less than normal due to deficiency of Iron ,Folate,B12

Male =Hb = 13 g / 100ml, female = 12 g /100ml, pregnant = 11 g /100ml

6 – 12 yrs. = 12 g/100 ml

Causes of I .D .A;

1-Diet poor with iron

2- Increase needs ---- infant, adolescent, pregnancy

3 - Mal absorption, malnutrition, Hemorrhage

5 - Infection as malaria, intestinal worms

4 - Chelating agent; - that decrease absorption of Iron of plant Origin as;

-**Fibers**; find in carrot, broccoli, schwas

- **Phytate**; substance find in tea & coffee so should avoid Intake of tea after meal

Directly (> 2 hrs).

- avoid intake of eggs + tea (egg + milk --- plant origin)

-**ca²⁺**; avoid intake of eggs + milk, while Vitamin C increase absorption of iron , so better to intake It as juices with meal.

D.R;- adult male ; 10 mg - adult female ; 18 mg

Note ; when there is 50% or more Anemia in community need food Fortification , (iron with wheat or rice or sugar).

Sources;

Excellent --- ;meat , organs , legumes ----

Very good ---; sea food (oyster , clams), pea nut , apricot , wheat germ ----

Good--- ; egg , fish ,dates, tomato, broccoli, spinach, green papers ---

Iodine; -Amount of iodine in the body is about 20 – 50 mg that 50% in muscles, 20% In thyroid gland, 10% in GIT& skin. After absorption in intestine, bind with protein to form thyroglobulin that $\frac{1}{3}$ will be absorbed by thyroid gland to form it,s hormones that TSH stimulate Thyroxin to form T₃, T₄.

FUNCTION ;

- Formation of Thyroid hormones that have main role in cell oxidation & balance of basal metabolic rate.

- change carotene to ----- Vit A

- change of F.A s to ----- cholesterol

Deficiency;* Mild form cause ; goiter

*** Sever form cause ; - cretinism & mentally retardation in children**

- Repeated abortion & child cretinism during pregnancy - Infertility in men

D.R.;- infant ; 35 µg - male ; 150µg - female 100µg - pregnancy 125µg - lactation ; 150 µg

Sources ; - Soil& plants rich with iodine (poor in mountains area) - Sea food

- Iodized salt .(1 gram of salt gives 1µg)

Note; should boil goitrogenic substances that find in broccoli, turnip, mustard & avoid intake of yogurt with fish ----- decrease absorption of iodine, avoid intake of still water.

Vit(A);- one of fat soluble vitamins , may be find as Retinol (animal origin) , or B - carotene (plant origin) that (1) Retinol unit gives (6) B – carotene units .

Function;

1.Vision; retinol find in Retina as rod & cone cells that responsible for vision in dark (rod cells) & in light (cone cells).

deficiency: - **early stage** --- night blindness

- **Late stage**—develop of pitot's spots of cornea, dryness &ulceration of cornea that Leads to exophthalmia& blindness

2. Building of epithelial tissue; Form epithelial cells of cornea. GIT. Resp. sys. Skin, Renal system & protect them from cancer (anti- oxidant).

3. Formation of anti-bodies (defense system)

4. Formation of mucou – polysaccharides

5. Takes part in spermatogenesis in male

6. Important in development of bones &skeletal system

7. Formation of hormones; formation of cortisone, corticosteroids which take Part in metabolism of food.

8.Important in metabolism; take role in metabolism of CHO & storage in liver as glycogen & metabolism of cholesterol.

Deficiency; a - night blindness b- blindness c - Keratinization of skin

d- growth retardation e - Defect in spermatogenesis ---- genetic disorder

Over dose> 50,000 IU intake for month --- hyper vitaminosis that lead to nausea

,vomiting & increase intra cranial pressure with irritability.

Sources; animal origin ; organs ,meat & it's product , milk & it's products(full cream) , eggs while Plant origin; carrot, apple, apricot, melon, broccoli, spinach, squash, sweat potato

D.R;2000 - 4000 IU in adult- Note; 1 R. E (retinol equivalent)= 3.33 IU

Zink; - find in skin, nail, sperms, bones& eyes.

- Absorption from jejunum & secret from pancreas& bind with carrier (lignan) that Effects by chelating agents; ca^2 , fibers, copper, casein in cow milk

Function; 1. Formation & as co-factor of enzymes

2. Important for development & growth

3. Maturation of sperms

4. Important for smell & taste

5. Important in formation of insulin

Deficiency; - Effect on growth ---- dwarfism

- Hypogonadism - Hypogeusia &hyposmia

- Acrodermititis enteropathica : genetic disease due to deficiency of zink (skin lesions , loss of hair , diarrhea)

Sources; - Sea food, Meat, eggs, legumes, whole seeds

D. R; Children; 10 mg , Male &female 8 - 11 mg , Pregnancy; 20 mg & lactation; 25 mg

Lecture 3

Nutritional Assessment: A.B.C.D

1. Anthropometric Measurements;

a. Age from 0 – 5 yrs.& 6 – 12 yrs.

- Weight / age (generalized malnutrition)
- Weight / height (acute malnutrition)
- Height / age (chronic malnutrition)
- Head circumference
- Chest& arm measurements
- skin fold thickness (scapula, triceps fold thickness, supra pelvic)

b. Age from 12 – 18yrs.& adult; can use;

- Chest & arm measurements
- skin fold thickness (scapula, triceps fold thickness, supra pelvic)
- Body mass index - $\text{weight} / (\text{height in meter})^2$

that ;- < 18 ---- malnutrition

- 18 – 25 --- normal
- 25 – 30 --- over weight
- >30 – 35 class(I) obesity
- 35 – 40 class(II) obesity
- ≥ 40 class (III) obesity

2. Biochemical examination; study levels of minerals &vits , Hb , protein , sugar in

Blood as albumin level& find hydroxyl purlin in blood mean catabolism of protein (Glycogenolysis) due to malnutrition.

3. Clinical examination; - general appearance (pallor, obesity), examination of eye, skin & nails, Tongue, hair color, goiter, night blindness.

4. Dietary history; take information from person or family about dietary Patterns; - 48 hrs last diet (good for quality & quantity of food).

- frequency dietary table (good for quality), that 4-5 / week - daily intake (good pattern) , 2-3 /week - weekly intake fair (pattern) , less than 2 / week – monthly (poor pattern).

5. Nutritional surveys ; good for food intake of person in the community, type of food , dietary pattern quality & quantity of food need

- can do them by (questionnaire) , can do Anthropometric Measurements.

6. Vital Statistics ; intake of statistics of people especially venerable groups & bind with nutritional status in the community.

- when increase neonatal mortality rate & still birth mean poor nutrition during pregnancy & bad Anti natal cares.

- Age rate; increase age rate in rich countries while decrease in poor.

Total Energy Requirement; T. E. R

***direct calorimetry; by respiratory calorimeter**

***indirect calorimeter; that depends on 3 factors;**

1. Basal Metabolic rate ; the minimal rate of energy needs in total rest condition , after 12-16 hrs of the last meal .

For Male = $1 \times \text{wt} \times 24$ For Female = $0.96 \times \text{wt} \times 24$

2. physical activity ; - mild : 50% (stationary) , home work

- moderate : 75% (sports)

- sever : 100% (lift of heavy things, building workers , boxing---)

3.diet induced thermo genesis;

That energy is required for food digestion & thermal induced from food digestion , it is about 10% .

Example;

male has weight with 70 kg & mild physical activity : find total energy requirement

1. B M R ; $1 \times 70 \times 24 = 1680$

2. Ph .activity ; $50/100 \times 1680 = 840$

3. D .I . th ; $10 /100 \times 1680 = 168$

T. E. R= $1680 + 840 + 168 = 2688$ kcal / day

Ideal Body Wt ; Thump law

152 cm – ht ----- 45 kg wt

For each adding 2.5 cm ----- wt 2.2 kg

Example;

A female with body weight is 70kg & height is 170 cm .

- calculate the Ideal Body Wt

$170 - 152 = 18$ cm

Height	Weight
2.5	2.2
18	?

$2.2 \times 18 / 2.5 = 16$ kg

$16 + 45 = 61$ kg I. B.W

Lecture 4

Nutrition during life cycle;

	Energy k.cal	Prote in G/kg	CHO %	Vit A A IU	Vit D IU	Vit C mg	E /IU	B ₆ Mg	B ₁₂ µg	Folic µg
Infant	1000	1.5	50%	2000	600	30	10	0.5	0.5	80
Children	1000+100/ yr	0.8	50%	2000	600	30	10	0.5	0.5	200
Adolescent	3000- boy2500- girl	1.2	50%	3000	400	60	10	1.5	3	400
Male	3500	1	40-50	3000	400	60	15	2	3	400
Female	<35yrs --- 2500 >35yrs---- 1800	1 1	40-50	3000	400	60	15	2	3	400
Pregnant	300 Added	1.4	50-60	4000	600	80	15	2.5	4	800
Lactating	400-600 added	1.8	50-60	4000	600	100	15	2.5	4	600
	Deficiency		N.B	Rickets O.malacia	Scurvy	Infertility Cell necrosis& atrophy. Hemolytic A	Glositis Convulsion	Pernicious A Neural& Muscular Atrophy	Megaloblastic. A	

Vitamins	Vitamins Precursors	Physiological function
Vitamin A	Retinol, Retinal, Retinoic acid	Visual pigments , cell differentiation , gen Regulation
Vitamin D	Cholecalciferol D ² , Ergocalciferol D ³	Ca- homoestasis& bone metabolism
Vitamin E	A Tocopherol , γ Tocopherol	Membrane antioxidants
Vitamin C	Ascorbic acid	Reduction in biosynthesis of collagen,& metabolism of drugs &steroids
Folic acid	Folic acid	Coenzymes in carbon metabolism

- Deficiency of (VitC) :- generalized weakness – malnutrition – hypochromic microcytic A
- gingivitis , bleeding in organs & bones ---- leg pain --- frog leg .

	Minerals				
	Zink Mg	fe² mg	Iodine µg	Ca² mg	<i>Fluoride</i>
Infant	5	11	50	1400	0.5
Children	10	11	50	1400	1
adolescent	8	18	150	1200	4
Male	11	10	150	1200	4
Female	11	18	100	1200	3
pregnant	20	30	125	1400	3
Lactating	25	30	150	1400	3

Fat Soluble Vits Vitamins; A , K , E ,D

Vitamin K;

Function;

1. take in blood coagulation by maintaining coagulant factors as ;

- Prothrombin – proconvertin VII – Christmas factor IX - Stuart factor X

2. Oxidation of cell & phosphorylation for energy production

Deficiency : Lead to bleeding

Find; - green pepper & leaves , as spinach , squash , - meat

D.R ; 150µg for adult , give 500 µg injection for newborn

Vitamin E ; Find in adrenal gland , muscles , testes

Function;- avoid oxidation of F.A in cell wall & tissues- avoid hemolysis of RBC- avoid oxidation of Vit A & C in tissues & organs as antioxidants **but needs more oxygen** than

Vit A during the oxidation process .- improve sexual performance

Deficiency ; -muscle & skeletal atrophy- Infertility- RBC hemolysis

Vit D ; Function ;

- stimulate Alkaline Phosphatase enzyme to release Ph^2 for bone building
- re absorption of Ph^2 & A.As from kidney
- maintain level of Ca^2 & Ph^2 in blood
- stimulate Adenosine T. Ph enzyme----- collagen formation in bone especially matrix .

(water soluble vits) B complex;

Mostly find ; in milk, eggs , meat & meat products , seafood, legumes whole & germ of seeds , green papers, spinach, share lake , cauliflower , carrot

B1;Thiamin;

Deficiency; may be due to eat raw fish

Dry beriberi; decrease wt , muscular atrophy , polyneuritis & paralysis

Wet beriberi; with the above symptoms there will be – irregular heart beat - edema – aggressiveness –allergy this is occur with drinking alcohol & called Korsakoffs syndrome

Source ; meat , eggs , fish , germ of seeds

B2; Riboflavin :

D.R;1.8 mg , 0.5 mg /1000 kcal during pregnancy & lactation

Deficiency;

- Angular stomatitis & cheilosis – seborrhea dermatitis – geographic tongue – increase vascularization of cornea

Niacin;

Deficiency; Pellagra; neural defect as; muscular & neural atrophy, irritability, delirium, dementia

Dietary Guidelines during life cycle;

There are many differences between breast milk and cow's milk / formula. Cow's milk is not recommended for babies until they are at least 10 to 12 months of age or older (should ask doctor). Cow's milk is much more difficult for an infants digestive system to break down and is not nutritionally equal to breast milk. This goes for all types of cow's milk, regardless of whether it's whole, low fat, skim, powdered or any other form.

Breast Milk :

- Antibodies – Helps baby's immune system gain strength, fighting off bacteria and viruses (mostly VitA) .
- Water –breast milk contains the perfect amount of water to satisfy baby's thirst and adjusts to baby's needs (more dilution during summer).
- Fat – Breast milk contains more fat than cow's milk and is more easily absorbed. This is one of the reasons that breast fed babies have different stools than bottle (formula) fed babies. Since the baby is not excreting any wasted fats the stool will be a yellow mustard color with a mildly sweet smell.
- Protein – Protein that is used to help baby's body grow and develop is in just the right amount and in a form most readily absorbed and easy digest (free from casein) .
- Carbohydrates – Breast milk contains more carbohydrates than cow's milk. These carbohydrates provide a very important source of energy.
- Vitamins and minerals – when mother eats well balanced diet, breast milk will contain all of baby's vitamin and mineral requirements, until about age 6 months. Zink more , Ca² more but less iron .
- Taste - Breast milk changes in taste, depending on the different foods the mother eats. Breastfed babies are more likely to accept new and different foods once they start on solids (not recommended until age 6 months) than their formula-fed peers, because formula tastes the same every single time, while breast milk takes on a taste similar to the different foods a mother eats.

Cow's Milk:

- No antibodies – Antibodies that are in breast milk are not in cow's milk/formula and cannot be artificially produced.
- Water – The amount of water in cow's milk/formula can't change to suit baby's need the way breast milk can.

- Fat – The fat in cow’s milk/formula is very different than the fat in breast milk and can’t absorb it as easily.
- Protein – The amount of protein in cow’s milk/formula is at least double the amount in breast milk but less digestible (casein).
- Carbohydrates – Cow’s milk/formula has smaller amounts of carbohydrates than breast milk.
- Vitamins and minerals – Cow’s milk/formula has more of some vitamins and minerals

Dietary Guidelines during pregnancy & lactation;

- intake of 3-4 cups of milk or milk products.
- intake of frequent small meals ---5 – 6 /days
- increase intake of protein of animal origin, legumes, sea food.
- increase intake of vegetables (3 -5 serving) rich with vitamins & fruits (2-3 serving)
- Should intake folic acid tablet daily (before breakfast) in the beginning of pregnancy & ferrofole tab after 4th months of pregnancy.
- avoid to intake of Vit A capsule (teratogenic effect) better to take it from diet.
- Intake of 6 -8 cups of water to avoid constipation.
- intake of drugs under supervision of doctor.

Dietary Guidelines During lactation;

- intake of 4 - 5 cups of milk or milk products.- increase intake of protein of animal origin , legumes, sea food.
- increase intake of vegetables (4 - 5 serving) rich with vitamins & fruits (2-3 serving)
- continue intake ferrofole tab during 1ST month of lactation
- intake of Vit A capsule (200,000 IU) during 1ST month.
- Intake of 6 -8 cups of water & fluids.

Lecture 5

Health of Adult;

Screening;

a - **Blood pressure** -- should be read periodically

b – **Body mass index (BMI)** ; --- Periodically

c - **C.V.D & Cholesterol level;** --- every 1-2 years

d - **Mammography, Pap's smear;** --- every 1-3 years for women

e - **Prostate specific antigen** --- yearly for men

f - **Dental** --- Periodically

g - **Vision / glaucoma** --- yearly

h - **Osteoporosis;** 50% of female over 45 yrs have risk factor to develop o. p mostly occur with patient of oophorectomy, smoking, low Intake of calcium, sedentary life style, family history— do Routine bone Density test /year

– **screening for cancers;** especially if there is family history or risk factors As ca. Breast ,Colorectal ca., prostate ca, Melanoma, cervical ca. =====

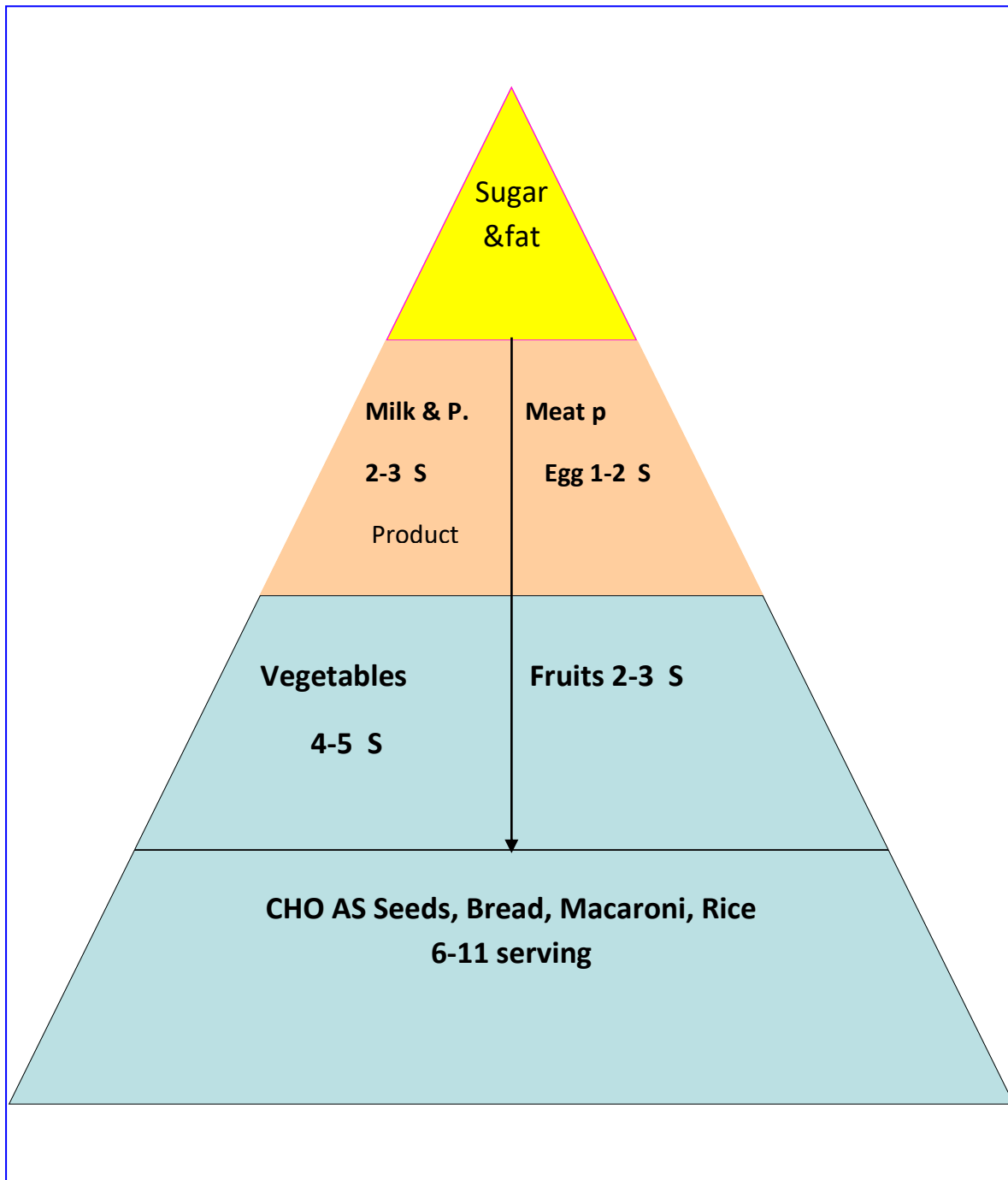
Chemoprophylaxis; Folate --- women child bearing age

Aspirin --- to prevent vascular diseases (over 40 years)

Estrogen --- women over 40 (without uterus)& combination of estrogen+ progesterone with intact uterus to avoid & treat osteoporosis, contraindicated in women with history of breast cancer or DVT.

give calcium tab 1-1.5 g/day especially for females

Diet:

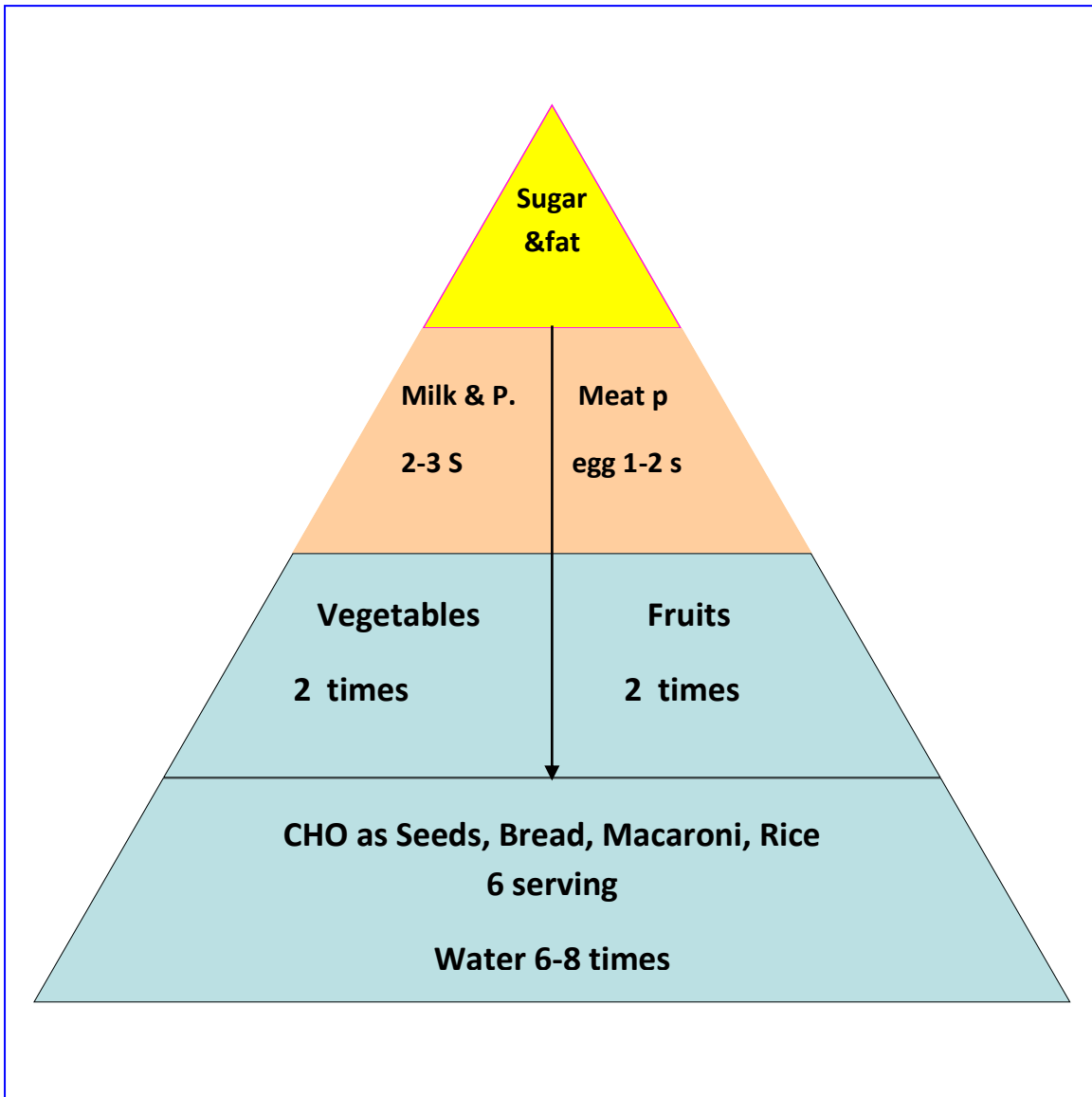


Health of Elderly;

most of them suffer from nutritional problems as;

- Decrease metabolic rate & Decrease physical activity that lead to obesity, that should decrease energy intake to 2000 k.cal for male & 1600 k.cal for female.
- Dental problems & unfitness.
- GIT problems - dysphagia - constipation - lactose intolerance

- A chlorhydria --- decrease absorption of Calcium & vit B₁₂
- Diet should be balanced that provide enough amount of protein, vitamins, minerals as iron & calcium.
- Can intake supplements ----- calcium, iron, vit D , vit B complex with time & another
- Intake 1 g /kg of protein/ day, reduce intake of fat especially saturated F. Acids



Nutrition & Cancer;

Fat; high intake of saturated fatty acids -----breast , lung, colon, prostate cancer

Protein; studies had shown high intake of red meat can cause colon , prostate cancer & deficiency of amino acids ----- decrease tumors

CHO;- high intake of starchy food can cause pancreatic cancer

- high intake of fibers range 20 g /day --- have protect measures against breast, ovaries ,GIT cancers.

Fruits & Vegetables; usefulness;

- a good source of fibers, vits, minerals, low energy

-has antioxidant agent (Vit A,E,C)

-contain phyto chemicals as in (carotenoids, flavanoids----plant sterol), have anti carcinogenic agent

--contain phytoestrogen particles that decrease sex hormone cancers & contain lignin fibers, find in soya bean, peanut

Alcohol; cause cancer of GIT, lung, liver, breast, larynx. - this is may be due to increase endogenous estrogen, reduction of folic acid level &its metabolized in breast.

Tea& Coffee; - green tea intake in regular amount can decrease stomach cancer

-very hot drink increase risk of pharynx, esophageal cancer,

- coffee& tea have no association with cancer.

Artificial sweeteners; - studies had found a significance increase of bladder cancer with intake of cyclamate (food additive) &Sachrine but no association with Aspartum intake

Nitrosamines; -has highly carcinogenic effect that find in tobacco.

- Nitrates find in fruits & vegetables, with sodium &potassium for salting, using in candid food as meat, hot dogs, luncheon that give pink color that can change to rose & nitrosamines in saliva, stomach, colon, bladder, also high intake of processed meat can cause GIT cancer

Food Preparation; - high heat cooking as in grills &meat smoking & broiling can increase GIT cancer (formation of aromatic hydrocarbons) - High salted diet ----- increase of stomach cancer (in case control study)

Programs for Nutritional Deficiency; support by WHO, UNICEF;

Iodine Deficiency program;

- the program had been applied before 3 decades & the goal to reduce prevalence 10% & at year 2000, as in India the prevalence dropped from 41% to 31%.
- there are 71 million have goiter in the world & 167 million are under risk to develop it.

Principles;

1. iodization of salt
2. health education about intake iodized salt, sea food, avoid goitrogenic substances As turnip, broccoli, cabbage.

D.M program;

1. screening for risk group to detect the disease
2. Health education of proper diet, avoid stress.
3. establish centers to control of disease
4. early diagnosis with proper treatment to avoid complications.

Iron control program;

1. give ferrofol tab after 4 months of pregnancy (prophylactic)
2. give iron supplement during first month of lactation
3. give iron syrup for children at 1st year of school
4. IEC about intake diet rich with iron, avoid bad habits, avoid challenging agents
5. give food fortified with iron for children
6. if there is 50% anemia & more ----- community problem --- fortification of food as with wheat, sugar, rice----

Vit A control program

1. health education to intake diet rich with vitamin A
2. give vit A capsule 50,000 IU at age of 9 months & 18 months
3. give vit A capsule 100,000 IU at age of 6 years
4. give lactating mother vit A capsule 200,000 IU at 1st month of lactation

Lecture Six

Diabetes Mellitus;

The major chronic metabolic disease, that affects 25 of the population in the world, 14 million have the disease in U.S.A.

It means honey urination; it occurs in developed countries more --- obesity.

Types; - I D D M form – 5%

N I D M form - 95%

Gestational D M ----- occur during pregnancy

Should maintain blood glucose by; - proper diet

- Physical activity

- Drugs as -- insulin -- oral hypoglycemia

Diet;

CHO; - form 40 -50 % of energy

- Limitation of simple sugar (glucose, fructose, sucrose) & can substitute with complex sugar as starch (potato, rice, bread)

Protein; - form 20% of energy - need 1 g / kg

Fat; - form 30% of energy - Cholesterol less than 10%

Fibers; - reduce glucose absorption & postprandial hyperglycemia

- Find in whole grains, legumes vegetables, oats -----

Vitamins & minerals;

- can give multi vit supplements

- if give vitC 1 g can reduces glycosilation of Hb 20%

Sweeteners;

nutritive sweeteners ----- corn syrup -----sorbitol-----manitol (alcohol sugar)

non nutritive sweeteners ----- aspartum ----- sachrain

- Have no glycemic response & manitol reduces G .response

Recommendations;

Make your calories count with these nutritious foods. Choose healthy carbohydrates, fiber-rich foods, fish and "good" fats.

Healthy carbohydrates

During digestion, sugars (simple carbohydrates) and starches (complex carbohydrates) break down into blood glucose. Focus on healthy carbohydrates, such as:

- Fruits
- Vegetables
- Whole grains
- Legumes, such as beans and peas

- Low-fat dairy products, such as milk and cheese

Avoid less healthy carbohydrates, such as foods or drinks with added fats, sugars and sodium.

Heart-healthy fish

Eat heart-healthy fish at least twice a week. Fish such as salmon, mackerel, tuna and sardines are rich in omega-3 fatty acids, which may prevent heart disease.

Avoid fried fish and fish with high levels of mercury, such as king mackerel.

'Good' fats

Foods containing monounsaturated and polyunsaturated fats can help lower your cholesterol levels. These include:

- Avocados
- Nuts
- Canola, olive and peanut oils but don't overdo it, as all fats are high in calories.

Avoid Saturated fats. Avoid high-fat dairy products and animal proteins such as butter, beef, hot dogs, sausage and bacon. Also limit coconut and palm kernel oils.

- **Avoid Trans fats.** Avoid trans fats found in processed snacks, baked goods, shortening and stick margarines.
- **Cholesterol.** Cholesterol sources include high-fat dairy products and high-fat animal proteins, egg yolks, liver, and other organ meats. Aim for no more than 200 (mg) of cholesterol a day.

Sodium. Aim for less than 2,300 mg of sodium a day, even less if has high blood pressure.

• **Avoid simple sugar** & replace with polysaccharides

• **Should intake mixed food** & can intake food exchange

• Can intake legumes with limitation

• Can intake vegetable freely 4-5 times & 1-2 types of fruits / day

• Intake 3 main meals + 2 snacks (5 meals / day) especially I DDM that give for main meals 75% & 25% for 2 snacks

• Increase intake of fibers by intake of whole grains, vegetables and fruits

• No need for energy restriction for IDDM & for NIDDM need to decrease energy & should keep B.M.I between 18 – 25

Note ;If no response need drug treatment

Example; IDDM patient need 2000 kcal /day , measure CHO needs & other nutrients

For CHO need 50% so --- $50/100 \times 2000 = 1000$ kcal

each 1 gram gives 4 kcal

$1000/4 = 250$ g CHO/ day

$250 / 4 = 60$ g for each meal $60 / 2 = 30$ g for each snack

For protein need 20%

$20/100 \times 2000 = 400$ kcal Each gram gives 4 kcal

$400/4 = 100$ g /day that divide into 3 meals

For fat ; need 30%

$2000 \times 30/100 = 600$ kcal Each g gives 9 kcal

$600/9 = 65$ g That divides into 3 meals

Glycemic Index; -its the degree of response of increase blood sugar after intake different food type.

there are some types of food increase degree to 100% as --- **glucose**, others has week degree as --- **fructose** that with week absorption from intestine & not need insulin for digestion & can metabolized in liver(diabetic patient can tolerate it).

Food	G . I
Glucose	100
Honey	90
Candies	70
Sucrose + pastry	60
Cake + seeds	50
Legumes	25
Fructose	24

Table for food Exchange:

Milk group exchange; gives (11 g) CHO + (7 g) protein + (6 g) fat + 130 k.cal :

- cup of milk 200 ml
- 1/2 cup of liquid milk
- 1/3 cup of powder milk
- 1/2 cup of yogurt

Meat group exchange; gives (7 g) protein + (5 g) fat + 75 k.cal

- 30 g of meat without bones or poultry or 30 g fish
- one egg (50 g) - 30 g of organs - 30 g of cheese

Fat exchange; gives (5 g) fat + 45 k.cal

- spoon cup of butter (5 g)
- spoon cup of olive oil (5 g) or 5 olive beans
- (spoon cup of oil 5 g)
- beans 7-8 - Almond

Bread group exchange; gives (15 g) CHO + (2 g) protein + 70 k.cal

- bread 25 g
- cup of cooked rice
- 1/3 cup of uncooked rice
- 1/2 cup of cooked macaroni
- 1/2 cup of cooked legumes

Vegetables exchange :100 g = 1/2 cup gives (7 g) CHO + (2 g) protein + 36 k cal

As ---broccoli - spinach – green beans – squash – carrot – green kidney

fruit exchange; gives (10 g) CHO + 60 k.cal

- one orange
- 3 pieces of w. m seeds-
- 1/2 banana - grape 12 tab - 12 tab of dates - small apple 70 g

Lecture 7

Hypertension;

It's the most common cause of heart disease that leads to cardiac hypertrophy & failure

- causes;
1. Primary (unknown cause) 95% ---- essential hypertension
 2. secondary; -renal disease – c.c.p --- aortic disease -----
 3. predisposing factors; -- obesity – diet rich with salt& fat – smoking
– Alcohol intake – lack of exercise

Dietary Treatment;

1.chaning dietary pattern;

- a. takes diet low with sodium & exchange with potassium as vasodilator
need 2 g / day that find in apple, banana, orange, legumes, whole seeds
- b. intake diet rich with magnesium as vasodilator
- c. decrease intake of fat especially saturated fatty acids

2. reduce wt & do regular exercise

3.changing habit as stop smoking ,alcohol

4. health education about the disease & its complications & need regular checking of blood pressure

Lipids;

1. simple

a. fat & oils --- ester + Glycerol

b. wax --- palmitic acid

- #### 2.compound ;
- phospholipids (Lecithins ,Cephalins ,Sphingolipids -----)
 - Glycolipids (Cerebrosides ,Gangliosides)
 - Sulpholipids - Lipoprotein

Function of Lipids;

- 1.energy; 1 grams gives 9 k.cal
2. Protective layer of skin, avoid heat & energy loss in cold weather, release of fatty acids for smoothing of skin.
3. Cover of body organs to protect them from external shocks
4. take part in cell structure ,neural & brain tissues
5. produce essential F.A
6. give food palatability & feeling of satiety
7. important in sexual maturation
8. important as neurotransmitters as Myelinated nerve(binding with protein)
9. reduce specific dynamic action of food (reduce energy loss by digestion)

-Fatty Acids ;

Building units of fat, either short chain --- C – (4 - 8)

Long chain --- C – (> 10)

Either saturated or unsaturated F.A

Essential Fatty Acids ;polyunsaturated F.A in plant seed oils that should intake from food as Linoleic acid ,Linolenic acid, Arachidonic acid & mostly Linoleic acid , can not synthesized in the body that need at least 10 g / day (polyunsaturated fatty acids

Omega -3 : series of polyunsaturated fatty acids, e.g. eicosapentaenoic and docosahexaenoic, occur in fish oils and in the lipids of the human brain and retina. They are inhibitors of thrombosis and appear to act by competitively antagonising thromboxane A2 formation

Saturated fats (especially those containing myristic (14:0) and palmitic (16:0) acids.

- **Mainly found in animal fats ; may accelerate vascular disease.**
- **They increase plasma low-density lipoproteins and total cholesterol.**

Cholesterol; one type of fats (sterols) that find in animals, may be exogenous from food absorbed directly in chylomicrons it is not an important source of energy or endogenous that is mostly synthesized in liver, skin, epithelial tissue of intestine. level of cholesterol in blood is 180 – 200 mg/dl

Function; - 80% change to bile acids – as colic acid for fat digestion.

- **take part with ovaries in synthesis of estrogen &with testes to form testosterone**
- **Part of it change to 7 dehydrocholesterol which is the precursor of Vit D3**
- **take role in cell wall structures**
- **take role in building of nerve tissues**
- **an important substrate for steroid and sterol synthesis**

Lipoprotein;

- **LDLP; transport cholesterol from liver to blood(not more than 130 mg/dl).**
- **VLDLP; carry triglyceride more than cholesterol from liver to blood.**
- **H DLP; carry cholesterol from blood to liver (not less than 35mg/dl) .**
- **T. G ; not more than 180 mg/dl**

Note; - cholesterol& T.G level should be checked every 5 yrs for normal person with age over 45 yrs

- for person cholesterol level > 240 mg & T.G > 160 mg should be checked every 6 mths.

Atherosclerosis;

Its a physiological disorder effects coronary arteries due to deposition of fat , CHO, calcium, cholesterol in inner layer of coronary arteries leads to thickening & loss of elasticity ----- Ath. Scl

Causes; uncontrolled ----- controlled

Recommendations;

1. food should be avoided;

- food rich with cholesterol --- find in organs , red meat, egg yolk whole milk & butter.
 - saturated fatty acids find in animal fat , cacao , palm oil , coca nut
- Tea & coffee--- caffeine that increase cholesterol level in blood
 - avoid heavy meal ---- thrombosis & attack of infarction
- = = intake of CHO that change to fat & deposit in the cell

2. food can be taken;

a. unsaturated fatty acids ;

PUFA; - find in fish oil (tuna, sardine, salamon) rich with (omega 3) that avoid thrombosis, arrest & decrease LDLP & T.G.

- corn oil & sun flower oil but decrease both HDLP & LDLP.

MUFA; - find in Olive Oil that is the best because increase HDLP & decrease **LDLP.**

b. intake of poultry instate of red meat, that free from fat & skin

c. intake of legumes & seeds ----- increase HDLP & decrease LDLP.

d. intake of diet rich with fibers (bind with cholesterol)

e. intake of diet rich with vit B6 , B12 (decrease heamocystine formation)

f. intake of diet rich with Anti oxidants (Vit A , E , C) that oxidate LDLP & avoid thrombosis.

g. intake of seafood ----- clame ,marines , oysters (decrease T.G.)

h. intake of garlic & onion daily; decrease cholesterol level by decrease LDLP & increase HDLP .

i. nut& almond; have Unsaturated F.T, that intake small amount 5times/ week

- decrease Ath. Scl 35% .

Lecture Eight

Diet Therapy;

Phenyl Ketonurea ;

In born error of metabolism, due to deficiency of phenyl aniline- dyoxylase enzyme (Genetic disease) that change phenyl aniline to tyrosine, that lead to accumulation of phenyl aniline A.A in body & mostly in the brain ----- mentally retardation

Treatment

1. Give diet limited with phenyl aniline A.A that avoid milk, egg, meat, fish, poultry , legumes, cake & biscuit (contain milk) -----
2. stop breast feeding ,bottle feeding & exchange with medical milk ((Lofenelac)).
3. can intake freely ----- fruits , vegetables , CHO & sugar .

Type of food	Below 1 mth	8 mth	1 – 4 yrs	>4 yrs
Lofenelac milk (tea spoon give 7.5 g)	150 gram	300 gram	300 gram	> 300 gram
Vegetables 1cup =15 g ph. Aniline	----	2 serving	4 serving	5 serving
Fruit	----	1 serving	2 serving	3-4 serving
CHO	-----	2 serving	3- 4 serving	5 serving
FAT	-----	-----	-----	1 time
Calories	550	900	1700	1800

Galactocemia;

Deficiency of galactose enzyme that analysis of milk sugar - D & V, abdominal pain in infants & young children.

Treatment;

1. Intake milk free of Galactose ((ISOMEL)) & avoid intake of milk & milk Products.
2. Can intake of juices, boiled vegetables with meat & rice as semi solid food.
3. Increase intake of protein 150 g / day.
4. Give 4-6 serving of CHO as rice, seeds, and macaroni, biscuit free of galactose.
5. Intake diet rich with vitamin B12 & can give supplements of Calcium & Vitamins

Sucrose & Isomaltose;

Appears as diarrhea & vomiting.

Treatment;

* reduce sucrose intake to less than 20% & even decrease intake of wheat & potato&

can intake of rice & corn.

* can intake fructose sugar as in fruits.

* Some foods are rich with sucrose (>5 g /100 gram)) should be avoided as;

Banana, sugar, dates, chocolate, honey, apricot, sweaty potato, water melon seeds

Gluten Enteropathy :

Genetic disease that in children called (celiac disease) & in adult (tropical sprue) that intolerance to gluten with villus atrophy of intestine leads to diarrhea ,vomiting , mal absorption & nutrition & iron , folate B12 Anemia .

Gluten find in; wheat , malt , shofan, shelem.

Treatment;

1. avoid diet contain gluten

2. give 100 g protein that give meat & meat group , egg but avoid legumes.

3.can give cooked vegetables of low fibers , fruit juices.

4. can give milk & milk products.

5.can make bread from rice ,corn powder, soya bean .

6. Recently oral supplement to digest of **Gliadin** fragment in food that contains gluten & responsible for inflammatory process .

Short Bowel Syndrome;

After surgery of small intestine--- rapid pass of food to large bowel – malabsorption

Treatment;

- Give low fiber diet

- Give 140 g of protein / day (avoid catabolism)

- Give 500 k.cal added of energy as CHO &unsaturated F.A

- Give semi solid & fortified food

- Give minerals &vits supplements

Dumping Syndrome;

After gastric surgery --- after 15 mints of taking of food feeling of drowsiness, sweating, nausea, increase pulse rate (rapid pass of sugar from stomach)

Treatment;

- avoid simple sugar& high concentration of CHO & drinking during meal

- Intake multiple small snakes as 6 times / day with proper chewing of food

- intake of proper amount of protein & can take complex CHO

- intake of milk between meals

- avoid sweets , gas drinking , ice cream , chocolate -----

Peptic ulcer;

Treatment;1.Intake of small meals frequently to avoid stomach acidity

2. Avoid intake of alcohol, smoking, tea, coffee, hot pepper

3. Intake of anti acid

4. Intake of drugs as Cimetidine , omeprazole , pantoprazole (decrease secretion of Gastrin &HCL)

Irritable Bowel Syndrome;

- When Irritable Bowel Syndrome associated with diarrhea ----- avoid intake of diet rich with fibers & legumes
- When associated with constipation better to intake 2-3 cups of water before breakfast, intake of slice of bread with butter or cream with breakfast , increase intake of diet rich with fibers & intake of legumes, dates
- Avoid intake of hot peppers & spices

Liver Diseases;

Acute hepatitis; When can intake by mouth can give;

- Increase intake of protein & energy as CHO .
- Decrease fat intake , can intake of low fat milk
- Intake of soap & semi solid food , fruits & juice . May need vits & supplements
Should avoid intake of alcohol

L. Cirrhosis : same as above : (Increase intake of protein & energy as CHO),but should **avoid fat intake.**

- Decrease sodium & fluid intake (500ml of fluid ----- edema) .
- can intake milk of no fat , fruits & juices .
- Intake of soap & semi solid food , fruits & juice . May need vits & supplements- & anti acids
- should avoid alcohol , spices , tea & coffee

Gall Stones :

same as above : (Increase intake of protein & energy as CHO but decrease energy intake when there is obesity.

- Decrease & avoid fat intake that intake milk of low fat .
- can intake fruits & vegetables of low fibers (gases – abdominal pain) & intake of soap & semi solid food .
- may need vits & supplements

Gout; Disorder of purine metabolism in which high levels of uric acid accumulation blood (hyperuricemia) , normal of purine substance 2-6 mg for female & 2-7 mg for male , for Gout the purine > 7mg.

As a consequence sodium urates are deposited as tophi in small joints & in the ear , renal disease is common , acute onset of pain arthritis in big toe up to the leg & elbow.

Mostly occurs after 35 years age & mostly in men , with increase of obesity & insulin resistance .

Purines : the nitrogenous bases adenine & guanine the constituents of nucleoproteins with end product of uric acid .

Medical & nutritional therapy : Probenecid increase uric acid elimination by kidney

Allopurinol inhibits uric acid formation , colchicine to relieve joint pain during acute state , Indomethacin + phenylbutazone are used as anti-inflammatory drugs .

- decrease protein intake as meat , fish & poultry --- 3 times / week .

- decrease energy & fat intake (urate excretion reduces by fat-Increase of CHO intake(urate excretion increases by CHO) .

- intake milk (2-3)cups & eggs (1-2) / day (low purine).

- intake of fruits 2-3 times & vegetables 3-4 times of low purine

- give fluid & juices 3 liters , coffee & tea (methylate of uric acid) ----- urine

- give anti acids & citrate ----- alkaline of urine .

- avoid intake of legumes

Group 1 100 g gives 5-15 mg purine of as ;rice , seeds, milk , egg , cheese , Fruits & vegetables

Group two ---- 100 g give 50 -150 mg of purine as ;

legumes ,meat ,fish , poultry , sea food, Spanish

Group three ---- >150 mg of purine as ;organs ,mushroom ,serden

Lecture Nine

Esophageal reflux Esophagitis and Hiatal Hernia:

Medical & nutritional therapy:

- avoid Esophageal reflux.
- prevent pain & esophageal irritation.
- decrease of gastric acidity

Nutritional care :

- avoid large meal , high fat , coffee & caffeine beverages .alcohol , smoking
- eating 3-4 hours before resting .
- stay upright & avoid activity, tight – fitting after mea.
- avoid acidic and highly spices. food when inflammation exists.
- using of anti acids after meal

Eating Disorder :

Anorexia Nervosa :appears more in industrial countries. they have body image distortion causing them to feel fat despite their cachectic state and some of them feel of overweight , fear of fatness (with weight loss) , food avoidance , extensive exercise , induce vomiting .There is preoccupation with weight or shape . انهماك

Medical Complication: - Female with amenorrhea , delayed sexual maturation and menarche .

- **GIT involved:** as 2nd to starvation as delayed gastric emptying with prolong sensation of fullness , constipation.

- **CNS involvement:** as brain structural abnormalities. symptoms of depression due to stress of starvation , has obsessive compulsive features .

- **Bone marrow hypoplasia :** leads to leukopenia , anemia , thrombocytopenia and low fibrinogen level and low E.S.R in malnourished liver .

- **Decrease electrolytes - Bradycardia, hypotension**

Nutritional care :- most of them need hospitalization & naso gastric feeding, may be response to oral feeding , in sever cases have hypophosphatemia arrhythmia , delirium that needs immediate ph² checking & supplement with fluid , vitamins & electrolytes replacement

- initial calories are 1000-1600 kcal ,with increasing 40 -100 kcal / kg every 2-3 days that 2-3 lb / week increasing in weight .

- small amount of fat intake till reaches 20 -30% , protein 20% according to daily allowance , CHO ----- 55 -60% .

- iron supplement is recommended.

- gastric delay emptying may be a problem that gives 3 main small meals .

Bulimia Nervosa : Binge eating followed by purging , restriction , excessive exercise , induce vomiting , laxative abuse , diuretic abuse , may cause cardiomyopathy and cardiac arrest . الشراه المرضي العصبي .

Food avoidance disorder : A primary emotional disorder leads to food avoidance but no preoccupation with weight or shape . No body image distortion , may be associated with medical diseases .

Selective eating : food intake is selected to a very small number or amount of food , no body image distortion , no preoccupation with weight or shape , no fear of choking . age appropriate with height and weight .

Functional dysphagia : Food avoidance , particularly with certain type or texture ,fearful of swallowing , vomiting , choking , aversive event may precipitate the disorder No body image distortion , no preoccupation with weight or shape , no fear of choking

Pervasive refusal syndrome متلازمة الرفض المتفشية : May be post traumatic stress disorder that profound and Pervasive to eat refusal to eat , drink , talk , walk or engage in self care , may be under weight , dehydrated , usually life threatening and need hospitalization .

Osteoporosis : a loss of bone tissue and little bone mass to the point that the skeletal site is unable to sustain ordinary strains where a fracture may develop at any stage of life .

- postmenopausal Osteoporosis (Type I) : a loss of bone minerals density after declines of sex hormones ,especially estrogen in women particularly effect trabecular bone tissue as fracture of the distal radius , ulna and crush fractures of vertebrae .

- Type II Osteoporosis : Loss of bone mineral density in both cortical and trabecular bone that occurs in elderly (over 70 years old) in both sexes leads to bone fractures as hip ,vertebrae ,back pain , loss of height and **dowager's hump** .- **2nd Osteoporosis** : a loss of

bone density due to another diseases as liver disease , renal disease , parathyroid gland disease .

Bone markers : serum alkaline phosphatase , bone specific alkaline phosphatase , plasma cross – linked collagen telopeptides .

Nutrition of the bone :Calcium from food : milk & products mostly cheddar cheese , dates , turnip , Spanish , refried beans & fruits ,olive oil

Calcium supplements : giving calcium supplements during life cycle as adolescent , pregnancy and lactation , menopause and elderly is important to avoid osteoporosis .

Bioavailability of Ca² : it is of a good Bioavailability of Ca² in intake of wheat ,broccoli , soya bean ,cheese ,milk and less when intake of Spanish , vegetables. Adult needs 1200 mg . whole milk contains 290 mg Ca² , cheddar cheese contains 200 mg ,turnip 270 mg, refried beans & fruits 150 mg .

Rheumatoid arthritis : **Chronic inflammatory disease involve connective tissue and degenerative , swelling , pain of joints characteristic of changes in synovial membrane ,atrophy of joints & osteopenia that needs anti inflammatory drugs , physical , occupational & nutritional management as**

- reduce weight & avoid obesity.

- balanced diet- diet rich with multi vitamins especially B complex

- vitamin E supplement as 500 IU for 6 months + calcium + vitamin D rich diet or supplement+ herbs as glucosamine , chondroitin sulfate oil & herbs .

Renal Diseases:

G.N ;

* decrease intake of sodium 500 mg (normal needs 3 gram)

* increase intake of CHO that give 250 g sugar & CHO as energy & moderate intake of fat

* decrease intake of protein 40 mg

* decrease intake of fluid 500 ml Over urination

Note: in nephrotic syndrome (chronic inflammation of nephrons with part of fibrosis) give the same Diet Therapy of G.N & KCL in state of NaCl.

Renal Failure :- If glomerular infiltration less than 80 ml / minute ----- need renal transplantation

- If glomerular infiltration more than 80ml/ minute -----give dietary treatment that

Diet Therapy;*avoid intake of sodium (give 20 -40- meq) according to edema , dialysis, U.O.P

* avoid intake of potassium (give 20 -40- meq)

* decrease intake of protein (give 0.5 g /KG) of high biological value

* decrease intake of fluid – 500 ml of fluid added of urination.

* limitation of Ca^{++} , Ph^{++} sources & give vitamin e C & B complex

Food Table of Low Protein , Na^+ , K^+ ;

MILK : 1 CUP gives (7 g) protein ,(350 mg) K^+ + Na (120 mg)

Cheeses: 30 g gives (7 g) protein (65 mg) K^+ + low Na (10 mg) (so better to intake of cheese but not cheder that rich with sodium)

Meat : 30 g gives (7 g) protein + (100 mg) K^+ + low Na (10 mg)

Eggs: 1 egg gives (7 g) protein + (25 mg) K^+ + low Na (10 mg)

Vegetables : $\frac{1}{2}$ cup gives (1 g) protein , (100 mg) K^+ + low Na (10 mg) as tomato onion, broccoli, squash, leaves , cucumber

Fruits : $\frac{1}{2}$ cup gives (1 g) protein

(80 -150 mg) K^+ + 2 mg Na as apple, grapes, Ananias, Orange, Roach, melon, Pears ,banana .

Bread Group: 1 serving gives 30 mg K + 5 mg Na

Renal Stones :*most of Renal Stones are : calcium oxalate, calcium phosphate, cysteine , uric acid

Dietary therapy of calcium oxalate stone :

a. decrease intake of food (Ca^{2+}) content as organs, fish as Robyn & Sardine & milk , milk products , ice cream , chocolate, eggs, dates, Raisins, olive oil , dried fruits , nuts vegetables as Spanish , okra , tomato.

b. can intake of white egg & CHO as (rice, macaroni , white bread), vegetables as (carrot, cucumber, dark plate , Broccoli , squash , onion), protein , tea & coffee .

c. decrease of fat & sodium intake.

d. alkaline of urine with citrate.

e. increase fluid intake (2-3 litter / day) every 2 hours.

Note: - alkaline of urine when there is (Ca^{2+}) oxalate, uric acid, cysteine stones **while** need to acidification of urine when there is (Ca^{2+}) phosphate stones & no need to decrease intake of (Ca^{2+}) from food .

Heart Failure;

* avoid intake of sodium

* Intake of potassium

* decrease intake of (red meat), organs, saturated fatty acids,

*intake of eggs – fish – Poultry (3 times / week)

* decrease intake of fluid* can intake CHO, low fat milk & milk products