

Nutrition

NOTE: You only need to know what Dr. Mayt mentioned during his lecture

First of all:

- If you look at a patient who is malnourished, best interference for such case is either medical or surgical.
- Thirty percent [30%] of admitted patients will not get better because of malnutrition itself! Possibly, they lie dead at several occasions.

So, what is nutrition?

It is the providing of basic nutrition to your body in order to function properly.

Malnutrition is about this concept: if you do not take adequate minerals and macromolecules (Carbohydrates + Proteins + fats) at certain levels it will cause you to function poorly, and here we are talking about ill patients, which makes it more specific.

The body metabolic rate [**BMR**] increases tremendously when you are ill [e.g. infections, malignancies, altered hormonal states, etc.]. In this state, you will burn more energy than you consume [**imbalance**], here you are tending to develop malnutrition. It affects all bodily systems.

[Can you brainstorm the symptomatology?]

(Imbalance = loss is more than gained), the same thing happens in starvation!)

In short, **malnutrition** is the condition that occurs when your body does not get enough **nutrients**.

The most dangerous part of malnutrition is when it involves protein loss. When you have a traumatic accident, for example, or a burnt patient, the body will try to consume protein as the main source of calories. Glycogen stores will last for two days [~48hrs] after that; fat starts to be consumed as the main source of energy.

Malnutrition Diseases :

- Kwashiorkor : adequate calories but not enough protein:
 - Here, you get your calories from macromolecules other than protein [lipids-fat, and carbohydrates]
- Marasmus: a condition of low calorie, and low [not all the time] protein state:
 - Here, you have inadequate calories...
 - Protein intake can be normal or **low**.

Protein malnutrition (Kwashiorkor):

In liver cirrhosis patients, they don't make protein as they should (they have a third space. ascites), also kidney disease[nephrotic syndrome] patients they lose protein, in addition to burnt patients.

Clinical manifestations of protein malnutrition: [Symptomatology]

- Hypoalbuminemia
- peripheral edema
- Muscle atrophy
- Altered Immunity

Marasmus: no protein, no carbs

Usually patients in ICU, post major surgeries, cancer, and burn patients.

Clinical manifestations of Marasmus:

- Very obvious sign in : Weight loss (very low BMI)
- Bradycardia
- Low body Temperature
- Dysphagia
- Anorexia

Mostly: cancer patients, GIT (Crohn's disease : Thickening of the small intestine) , Major surgery , alcoholism (high calories , zero nutrition)

Causes: not imp.

How do we evaluate malnutrition patients?

First, look at weight, BMI, fat, protein storage. Based on that, calculate the losses

Remember anybody loses more than 10% in the past 6 months, that's a very severe sign of malnutrition (3% within a month = severe)

Vitamin deficiency = severe malnutrition (comes after protein malnutrition)

Basic energy expenditure: when you wake up doing nothing, that amount of calories you require is Basic energy... Etc (70% of your entire calorie requirement)

It depends on patient's weight, and height.

Total energy expenditure: basic energy and multiply it by ...

(You do not need to remember these things)

Calorie sources: carbohydrates, fat & protein (1% of cal will be in each comp of nut)

The average person will have about 60 % from carbohydrates [glucose], the fat gets the remaining 20 -40 %. Fifteen percent [15%] can be from protein.

Suppose you're eating meat all day, or Carbohydrates... if you burn 1 gram of Carbs it will give you 3-4 kcal, if you burn protein, it'll give you the same thing. Which would be better to take? Do you prefer getting calories from carbohydrates or protein? Let us see.

Protein is only utilized in the body to build cells, enzymes, and muscle and that is about it. Any extra nutrients [protein in our case] will be converted through **gluconeogenesis** [from amino acids to **glucose**]. Glucose will be stored as glycogen, so no matter how much protein you eat, it will be converted to glucose. So your body (kidney and liver primarily) will work harder. Therefore, it is not a very good idea to take a lot of protein unless you are a body builder. Else, it would be a waste of time and effort.

One bottle of glucose-rich compounds will cost you 10 SR, and one bottle of Amino Acids may reach 100 SR. that is another reason!

Fluid:

If you take 45 ml, it will give you adequate fluid for every calorie you consume. For every 10

A very useful universal formula for patients with healthy kidneys:

- For first 10 kg , every kilogram will need 100 ml
- Second 10 kg , every kilogram will need 500 ml
- Third 10 kg will be around 900 ml

For children, it is very useful!

Route of administration.. How to?

Ask yourself! First, if the GI tract is functioning --> use enteral route. If not (loss of movement happens) you will end up giving him parental (IV).

In IV, there are two sub-routes:

- Peripheral line
- Central line

(The deference is for Calories given)

Enteral : only if GIT is working (5ways)

- Oral
- Naso-gastric tube
- Naso-duodenal

- Naso-jejunal [from the nose to the jejunum, bypassing the esophagus, stomach and duodenum]
- directly into stomach

Why we don't want to use the central line?

The complication, it can cause infection, pneumothorax, and catheter embolism.

Avoid it in severe necrotizing pancreatitis (only), fistula will be formed in the intestine, and whatever you eat is going to leak out of the system.

Also patient with nausea and vomiting issues = causing aspiration pneumonia.

Q: in which cases should we insert these tubes?

A: pt. with dysphagia, stroke pt. (**long term**)

Pt. will need nutrition for more than 6 weeks, that will not be a good idea, cause it'll cause ulceration and irritation..

Q:What is the complication of naso-G tube use?

A: Aspiration pneumonia (because the pt. is not moving. By that time, food will move to the lungs)

Polymeric (intact) it is perfectly right to insert them into the stomach or duodenum

Monomeric is for jejunum and duodenum.

Three types of feeding:

- continuous : put the tube and set up the pump for 24/7 (ICU)
- intermediate (bolus) : by occasional and you infused for only 60 min (general ward)
- **Not given**

The parenteral:

Central (subclavian or jugular vein): the solution given is very high in osmolarity in relation to the plasma (2000) [normally plasma osmolarity is around 300]

IV

The goal is:

...

Who needs parenteral?

- When a patient of more than 5 days with the inability to feed himself.
- Intestinal obstruction
- Major surgery
- Short bowel syndrome

Make sure before that all electrolytes are balanced! Why? (Especially K and phosphate)

If he had low K and phosphate and he's given high Gl = major drop in K and Phosphate and he will die (Re-feeding syndrome) ... that's all