Basics of nutrition on dysphagia condition

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Goals of the lesson

The aim of this lesson is to provide knowledge on nutrition in the dysphagia condition.

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Learning outcomes

- Understanding the importance of nutrition in the dysphagia condition.
- Knowing the specific nutritional requirements in patients with dysphagia.
- Identifying malnutrition in patients with dysphagia.

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Ice Breaker

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Nutritional status and dysphagia

Optimal nutritional status means providing all the nutrients in the right proportions to meet the individual's requirements to achieve the best performance and the longest possible lifetime in good health.

Improving nutritional status is a powerful factor in **preventing and treating diseases** and **maintaining a good quality of life.**

In view of the regular consumption of modified and/or less nutrient-dense meals, combined with difficulties in tolerating large volumes of fluids, dysphagic patients are at particularly **high risk of inadequate macro- and micronutrient intakes.**

Consequently, adults can suffer a **negative energy balance,** resulting in **sustained weight loss,** and their risk of **sarcopenia**, **inadequate fluid intake** and **micronutrient deficiencies** is increased. Referring to children, this situation can cause permanent, widespread **damage to their growth**, **development** and **well-being**.

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Nutritional status and dysphagia

- The psychological implications of dysphagia should also be observed. Patients find increased dependence on caregiver at mealtimes and new feeding patterns, as degrading and upsetting, which may further lead to loss of appetite, depression and anxiety or fear at mealtimes – contributing to **weight loss** and **exacerbation of malnutrition**.

- In fact, it is well-documented that **dehydration** and **malnutrition**, mainly undernutrition, are linked to undiagnosed or untreated dysphagia.

- Malnutrition leads to systemic muscle mass loss and atrophy of the muscles used to swallow, and this ultimately leads to **worsening of dysphagia.**

- **Effective nutritional management** is crucial to to maintain good nutritional status or to reverse malnutrition. The first step to establish appropriate nutrition care plans is the **nutrition assessment**.

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Goals of Nutritional Management

- Maintain and ensure **adequate nutrition and hydration** status;
- Implement the **correct and safe texture modified diet** upon speech and language therapist recommendations;
- **Maximize nutritional intake** while maintaining safe eating, i.e. to prevent aspiration and choking.
- Establish the need for **dietary supplementation** and/or **fortification**.

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Nutritional requirements in patients with dysphagia

- Correct energy balance;
- Adequate macronutrient intake;
- Dietary Reference Intake for vitamins and minerals;
- Optimal supply of bioactive compounds – phytochemicals.

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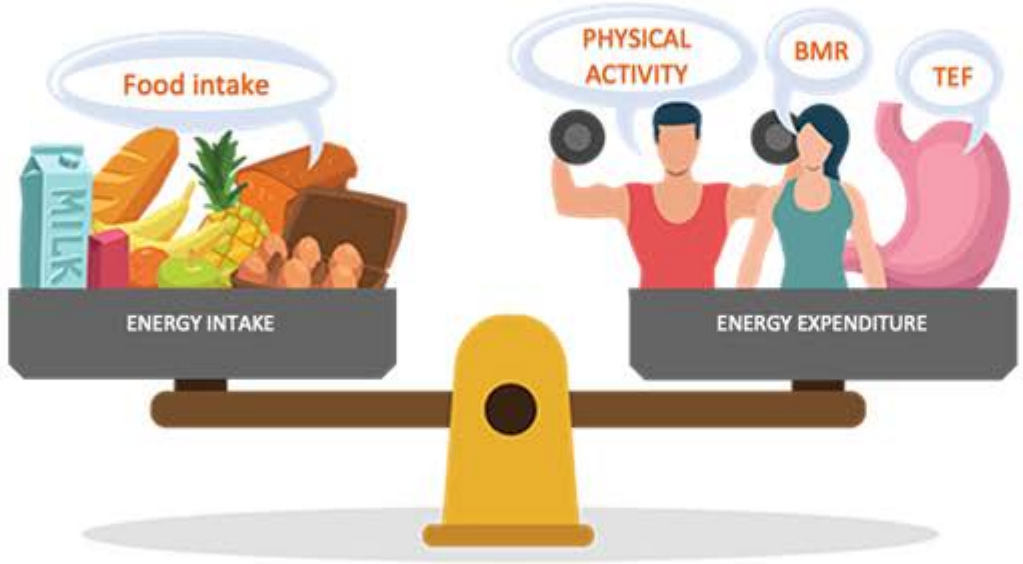
Energy balance

The number of calories in a food refers to the amount of **energy stored in that food.**



Source: Modified image obtained from https://www.activehealth.sg/eat-better/resources/energy-balance

Your body **uses calories**:

- **Physical activity:** walking, thinking, working, sports and so on.
- **Basal Metabolic Rate (BMR):** vital physiological functions such as breathing, working of heart, etc.
- **Thermic Effect of Food (TEF):** food digestion and absorption.

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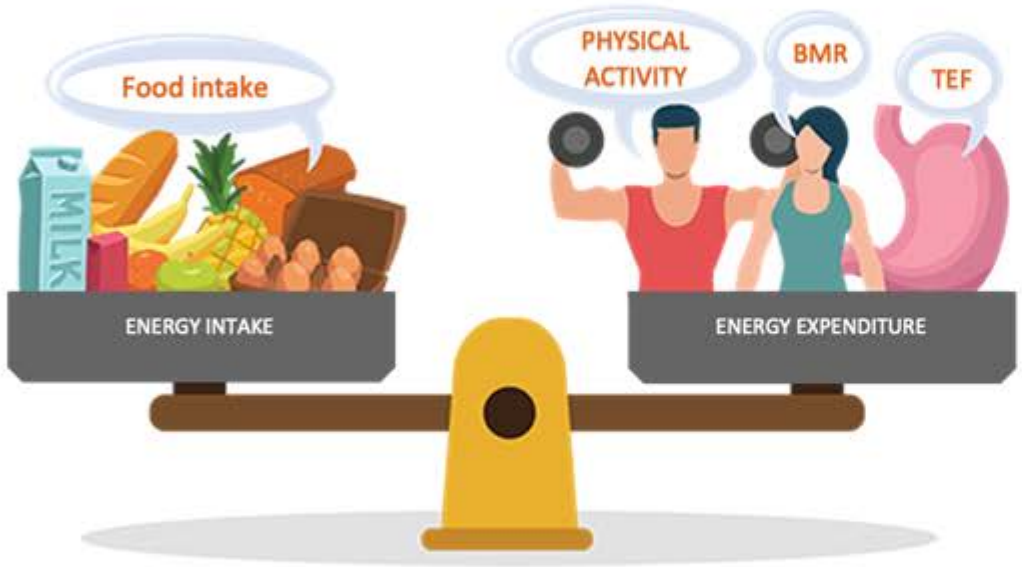
Energy balance



Source: Modified image obtained from https://www.activehealth.sg/eat-better/resources/energy-balance

- **Adults:** The average adult person needs about 2,000 calories every day to maintain their weight, but the amount will depend on their age, sex, and physical activity level.
- **Children:** The energy they need includes that used for their proper growth and development.
- **Specific situations:** Some diseases require higher energy intake for better recovery.

Do you want to know energy intake recommendations for EU? Visit: https://multimedia.efsa.europa.eu/drvs/index.htm

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Energy balance

Body weight gain

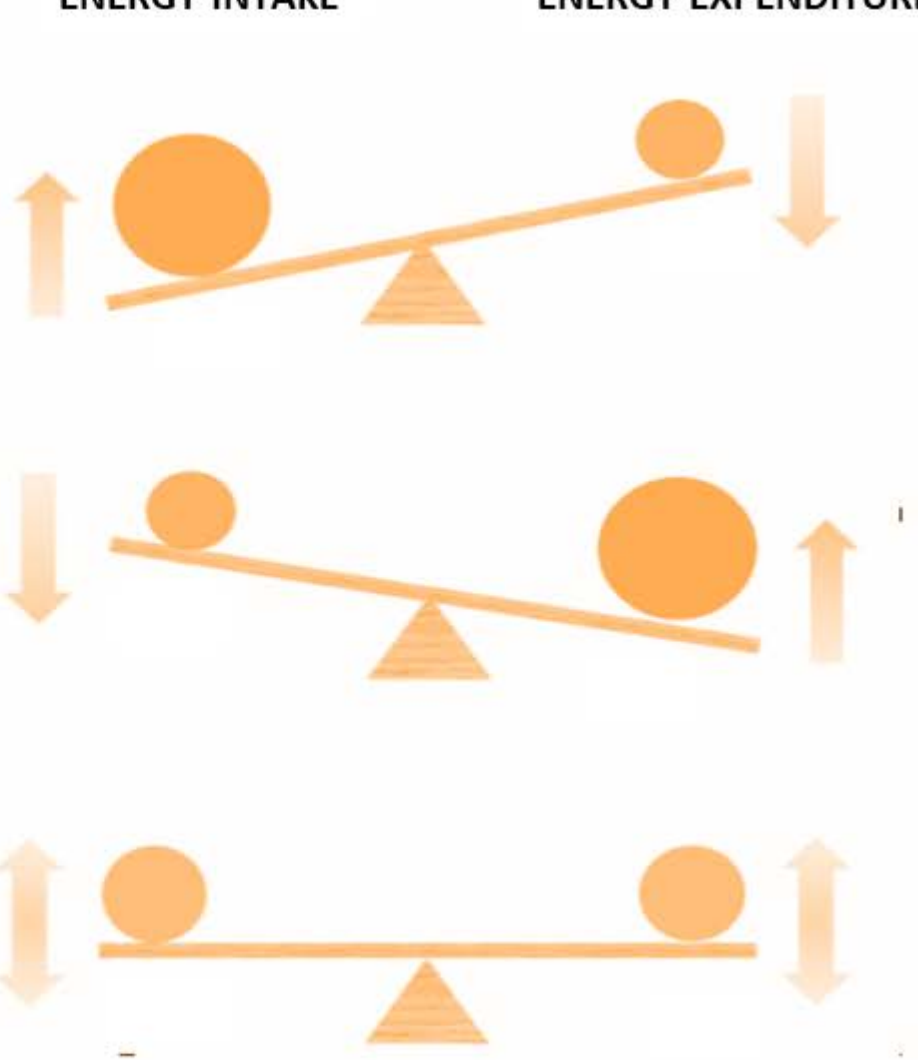
\+ Energy for growth and/or fat deposition

Body weight loss

– Depletion of body mass (catabolism)

Body weight maintenance

= Body energy balance



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Nutritional requirements in patients with dysphagia

- Correct energy balance;
- **Adequate macronutrients intake;**
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- Optimal supply of bioactive compounds – phytochemicals.

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Adequate macronutrients intake

- Proteins
- Glycaemic carbohydrates
- Dietary fibre
- Fats
- Water

Macronutrients:

They predominate in the composition of foodstuffs and, therefore, are daily ingested in **quantities** of grams.

Their main **functions** within the organism of proteins, fats and glycaemic carbohydrates are energetic and structural. Dietary fibre and water are considered regulatory nutrients.

Visit https://multimedia.efsa.europa.eu/drvs/index.htm to consult the **Dietary Reference Values for the EU**.

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Adequate macronutrients intake

Proteins:

- Dietary proteins **are the source of** nitrogen and essential aminoacids which the body requires for tissue growth and maintenance.
- Main sources of protein could be plant and animal based.
- **Animal protein** is a complete protein, containing all essential aminoacids, and is considered a high biological value protein (HBV).
- **Plant proteins** are incomplete proteins, providing only several essential aminoacids to the diet, and are considered low biological value (LBV) proteins.
- **Protein complementation** is when LBV proteins are combined: By eating two LBV proteins you can make up for the lacking amino acids in each, therefore giving an intake with a HBV i.e. legumes with cereals. There could also be protein complementation by eating adequate amounts of HBV and LBV proteins i.e. milk with bread.

Source: obtained from Canva Pro

Do you want to know more about proteins? Visit: https://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/protein/

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Adequate macronutrients intake

Glycaemic carbohydrates:

- They are the **main source of energy**, which they provide to body cells in the form of glucose.
- Simple carbohydrates – **Sugars:** They are rapidly digested and absorbed in the human small intestine. Food containing sugars is prone to have a higher glycemic index. The amounts of dietary sugars should be low, and should preferably be sourced from nutritionally dense foods – i.e. fruits and fruit smoothies.
- Complex carbohydrates – **Starch**: They are slower digested and absorbed in the human small intestine and a better choice as source of energy, mainly when these foods also contain **dietary fibre**. Main sources of carbohydrates and fibres should be form grits, porridges, mashed root and legumes.

Do you want to know more about added sugars? Visit:
https://www.hsph.harvard.edu/nutritionsource/carbohydrates/added-sugar-in-the-diet/
https://www.heart.org/en/healthy-living/healthy-eating/eat-smart/sugar

Source: designed by Canva Pro

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Adequate macronutrients intake

Dietary fibre:

- Carbohydrates which **cannot be digested** in the human small intestine and includes non-starch polysaccharides (cellulose, hemicellulose and pectins), resistant starch, resistant oligosaccharides, and lignin.
- Dietary fibre has an established role in **bowel function** (e.g. laxation). Some types of dietary fibre also **reduce absorption** of dietary fat and glycaemic carbohydrates.
- It is one of **the most complicated nutrients**, because naturally fibres present in nuts or grains can be difficult to consume by dysphagic patients. However, fruit and vegetables are also sources of dietary fibre.

Source: https://pixabay.com/

Do you want to know more about dietary fibre? Visit: https://www.hsph.harvard.edu/nutritionsource/carbohydrates/fiber/

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Adequate macronutrients intake

Fat:

- Fat is the **most caloric-dense** macronutrient
- **Saturated and *trans* fat** are usually solid at room temperature. Naturally-occurring in foodstuffs of animal origin, they are also very popular in (ultra-) processed foods. Butter, tallow, lard, coconut and palm oil are rich sources of saturated fat. Their intake, as well as that of **cholesterol**, should be limited.

Do you want to know more about "bad" fats? Visit: https://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/fats-and-cholesterol/

Source: https://pixabay.com/

- **Unsaturated fat,** which are liquid at room temperature, are considered the "good" fats because they play a high number of beneficial roles, mainly at cardiovascular level.
  - **Monounsaturated fat** should be the main type of fat to be ingested. Nuts, avocado, olive oil are sources of oleic acid, the most abundant monounsaturated fatty acid in foods.

Source: https://pixabay.com/

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Adequate macronutrients intake

Fat:

- **Unsaturated fat:**
  - **Polyunsaturated fat.** The most important polyunsaturated fatty acids are nutritionally essential, so it is compulsory in the diet:
    - ✓ Omega 3 fatty acids: alpha-linolenic acid (ALA), eicosapentaenoic acid and docosahexaenoic acid (EPA and DHA)
    - ✓ Omega 6 fatty acids: linoleic acid (LA)

    Besides sources of energy, polyunsaturated fatty acids are considered regulators due to their role as precursors of important immunomodulatory compounds.

Source: https://pixabay.com/

Do you want to know more about fats? Visit:
https://www.heart.org/en/healthy-living/healthy-eating/eat-smart/fats

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Adequate macronutrients intake

Did you know ...?

- In addition to those present as components of foodstuffs, fats can be served as sauces or consumed by adding in smashed food, not only to increase energy intake, but also improve the taste.

Source: https://pixabay.com/

Source: https://www.pexels.com/

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Adequate macronutrients intake

Water:

- Almost every cell in human body contains water: body water makes up 79% of muscles, 73% of brain, and even 31% of bones. Overall body weight can be 45-65% water.
- Water is essential for practically all functions of the body. It helps to restore fluids lost through metabolism, breathing, sweating, and the removal of waste. Besides, it is particularly important for thermoregulation. Finally, it lubricates the joints and tissues, maintains healthy skin, and is necessary for proper digestion.
- A human can go without food for about three weeks but would typically only last three to four days without water.
- Keep in mind that about 20% of our total water intake comes not from beverages but from water-rich foods such as fruits and vegetables.

Source: designed by Canva Pro

Source: https://pixabay.com/

Do you want to know which foods are the richest in water? Visit: https://www.medicalnewstoday.com/articles/325958

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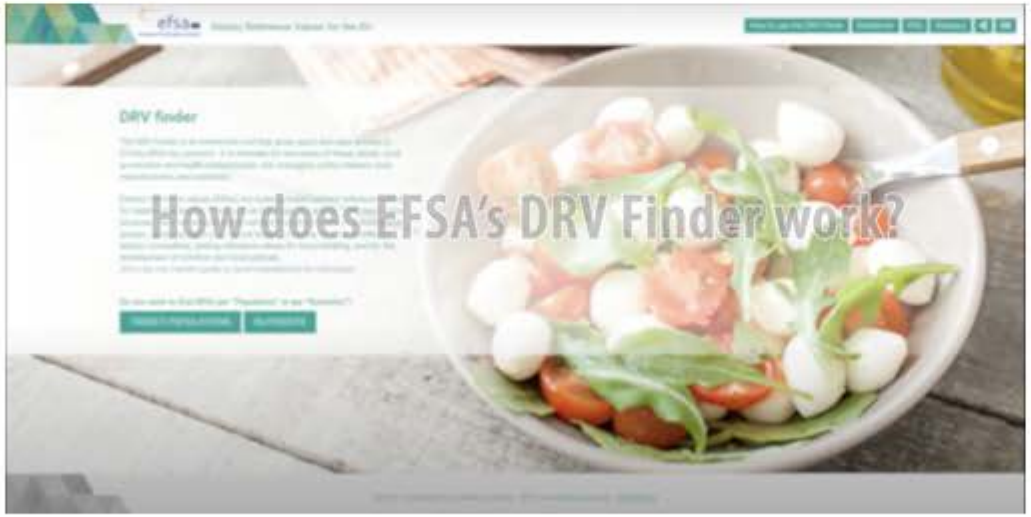
Try to use the *Dietary Reference Value Finder* and answer this question:

What are the adequate macronutrients intake for a woman of 20 years-old?



Follow the instructions of this video: https://www.youtube.com/watch?v=-0ww-QI9GO8

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Adequate micronutrients intake

- **Vitamins**:
  - Water-soluble vitamins
  - Fat-soluble vitamins
- **Minerals**
  - Macrominerals
  - Microminerals or trace elements

Micronutrients:

Micronutrients are **non-energetic nutrients** but they are essential for healthy development, disease prevention, and wellbeing due to their functions as, mainly, **regulatory** compounds.

The organism needs micronutrients in **small quantities** (milligrams or, even, micrograms), but it is **essential** to provide them in the diet because the human organism is not able to synthesise them (or only in insufficient quantities).

There is **no single food** that contains all the essential vitamins and minerals for human beings.

Visit https://multimedia.efsa.europa.eu/drvs/index.htm to consult the **Dietary Reference Values for the EU**.

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Adequate micronutrients intake

Vitamins:

- 13 organic substances, with lots of different regulatory functions, are considered vitamins. Vitamins play a vital role in many biochemical functions in the human body and are essential components for maintaining optimal health.

  - **Water-soluble vitamins**: They are characterised by their ability to dissolve in water. Therefore, in general, their absorption in the small intestine is easier, their storage in the body is very limited and unused amounts and/or their metabolites are eliminated in the urine.

    There are 9 water-soluble vitamins: the B-complex vitamins, thiamine, riboflavin, niacin, pantothenic acid, biotin, vitamin B6, folate, and vitamin B12, and vitamin C.

BE CAREFUL

Although the body keeps a small reserve of water-soluble vitamins, they have to be taken regularly to prevent a shortage in the body.

Do you want to know more about water-soluble vitamins? Visit:
https://www.ncbi.nlm.nih.gov/books/NBK538510/
https://ods.od.nih.gov/factsheets/list-VitaminsMinerals/

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Adequate micronutrients intake

Vitamins:

Fat-soluble vitamins: They dissolve in fat. Due to their low solubility in hydrophilic media, the body absorbs them into newly forming micelles ir the small intestine. Besides, they need specific ways of transport in the body and tend to accumulate in the tissues.

There are 4 fat-soluble vitamins: vitamins A - retinol, D - cholecalciferol, E - tocopherol, and K.

- Retinol is present in animal-based food, but carotenoids from plant-based food can be converted by the body into retinol.
- Cholecalciferol can be synthesised in the skin by the action of ultraviolet rays.
- Vitamin K synthesised by intestinal bacteria can be used by the organism.

BE CAREFUL

As they are stored in the tissues, they do not need to be taken regularly, but excessive intake may carry a risk of toxicity.

Do you want to know more about fat-soluble vitamins? Visit:
https://www.ncbi.nlm.nih.gov/books/NBK534869/
https://ods.od.nih.gov/factsheets/list-VitaminsMinerals/

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Adequate micronutrients intake

Minerals:

- They are inorganic substances that are responsible for structural functions involving the skeleton and soft tissues and for regulatory functions including neuromuscular transmission, blood clotting, oxygen transport, and enzymatic activity.
  - **Macrominerals**: Calcium, magnesium, phosphorus and the electrolytes, sodium, potassium and chloride, are considered essential macrominerals.
  - **Microminerals or trace elements**: Iron, zinc, copper, iodine, selenium are considered essential the most important trace elements.

BE CAREFUL

All minerals are essential which means it is mandatory its intake with the diet in order to mantain adequate levels in the organism.

Do you want to know more about minerals? Visit:
https://www.ncbi.nlm.nih.gov/books/NBK554545/
https://www.ncbi.nlm.nih.gov/books/NBK218735/
https://ods.od.nih.gov/factsheets/list-VitaminsMinerals/

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Adequate micronutrients intake

Did you know ...?

- Eating a wide variety of foods is the best way to get the necessary amounts of vitamins and minerals.
- Some micronutrients are present in a small number of foods i.e. foods from animals, but not plants, naturally have vitamin B12.

Do you want to know more about micronutrients sources?
Visit: https://ods.od.nih.gov/factsheets/list-VitaminsMinerals/

Source: https://www.clinicabaviera.com/

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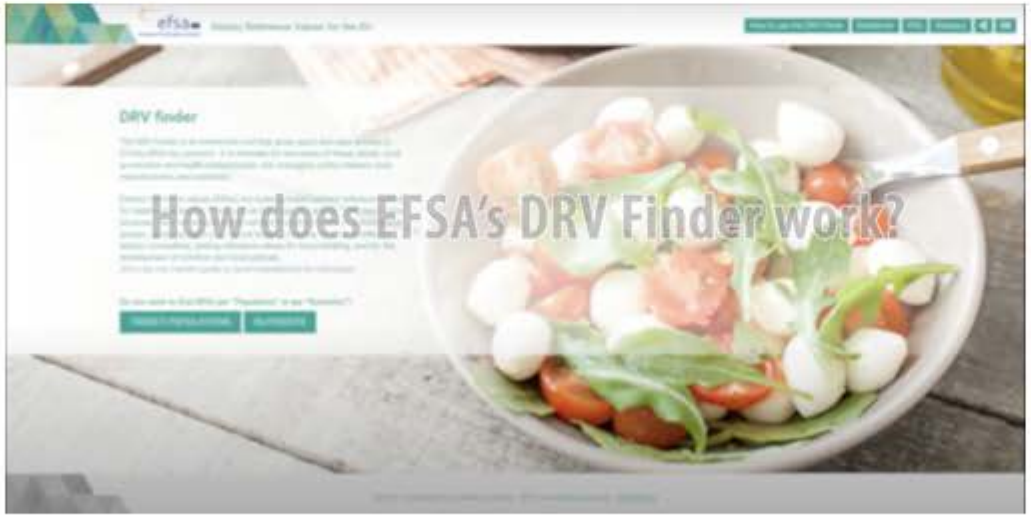
Try to use the Dietary Reference Value Finder and answer this question:

What are the adequate micronutrient intake for a man of 70 years-old?



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Bioactive compounds

- They are interesting naturally occurring compounds, mainly in plant-based food (that is why they are known as **phytochemicals**), that are not considered nutrients.
- Bioactive compounds are thought to be largely responsible for the **protective health benefits** of these plant-based foods and beverages, beyond those conferred by their nutritional value.
- These phytochemicals, which are part of a large and varied group of chemical compounds, also are **responsible for the color, flavor, and odor of plant foods**, such as blueberries' dark hue, broccoli's bitter taste, and garlic's pungent odor.
- **Research strongly suggests that consuming foods rich in phytochemicals provides health benefits**, but not enough information exists to make specific recommendations for phytochemical intake.

Major Food Bioactive Compounds (FBCs) sources and classification

Câmara JS, Albuquerque BR, Aguiar J, Corrêa RCG, Gonçalves JL, Granato D, et al. Food Bioactive Compounds and Emerging Techniques for Their Extraction: Polyphenols as a Case Study. Foods 2021, 10, 37. https://doi.org/10.3390/foods10010037

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Time for discussion

Which recommendation do you think is the most difficult to comply with in a patient with dysphagia?

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Relevance of the diagnosis of malnutrition in dysphagia

- Malnutrition in patients with dysphagia;
- Identifying malnutrition in patients with dysphagia;
- Managing malnutrition in patients with dysphagia.

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Malnutrition in patients with dysphagia

Malnutrition refers to deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients:

- **Undernutrition**, which includes wasting (low weight-for-height), stunting (low height-for-age) and underweight (low weight-for-age);
- **Micronutrient-related malnutrition**, which includes micronutrient deficiencies (a lack of important vitamins and minerals) or micronutrient excess; and
- **Overweight** and **obesity**.

It is known that various pathological conditions may cause malnutrition, but many, even healthy, dysphagic people may **fail to adequately consume food** and experience any type of malnutrition.

Dysphagia and malnutrition are apparently associated. Several studies have focused on **dysphagia as a prevalent risk factor for malnutrition** during recent years.

Untreated dysphagia patients who are malnourished sustain a **longer hospital stay**, higher risk of **complications**, and higher **mortality** rate than those who are properly nourished.

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Malnutrition in patients with dysphagia

Did you know ...?

- The prevalence of concurrent malnutrition and dysphagia has been estimated between 3% and 29% in the elderly. Vitamin B12, C, D, folate, zinc and iron are the micronutrients to pay most attention to.

- The prevalence of oropharyngeal dysphagia in children with cerebral palsy is estimated to be between 19% and 99%. A recent review found a high rate of malnutrition in children with cerebral palsy and several nutrient deficiencies were detected such as hypocalcemia and reduced serum concentrations of zinc, copper, and vitamin D.

- The presence of dysphagia is a major risk factor for developing malnutrition in stroke patients.

- It is difficult to accurately ascertain the prevalence of malnutrition in dysphagic people due to discrepancies in the measurement methods used.

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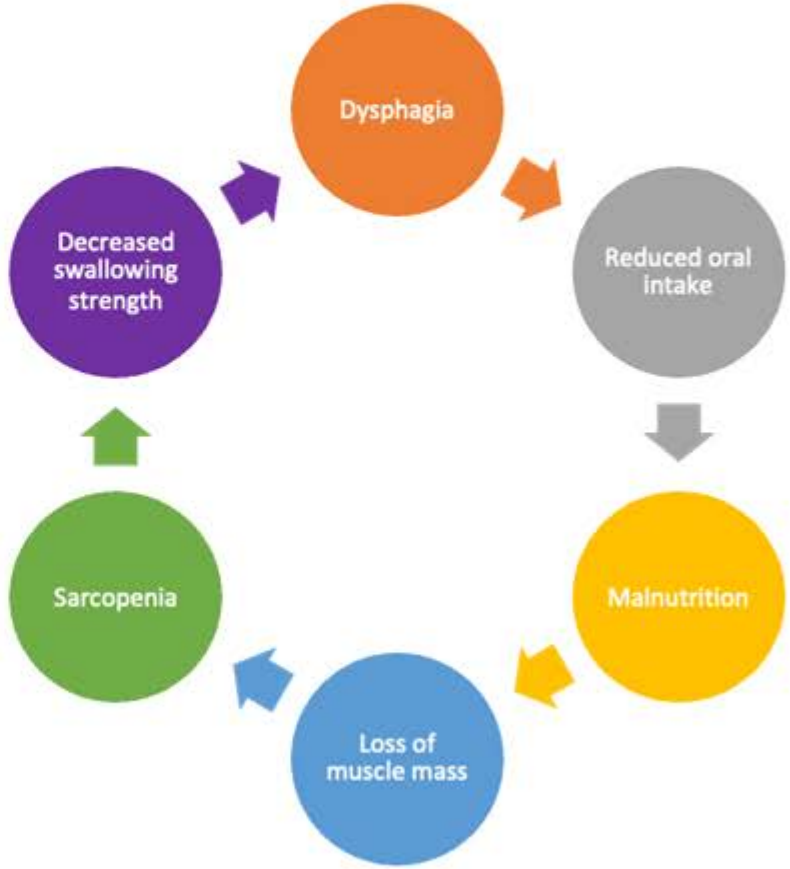
Malnutrition in patients with dysphagia

Did you know ...?

Reduced oral intake due to dysphagia leads to weight loss and disrupted synthesis of skeletal muscles, which consequently result in further development of sarcopenia.

Therefore, a vicious cycle between dysphagia, malnutrition, and sarcopenia eventually becomes inevitable.



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Identifying malnutrition in patients with dysphagia

- Early referral to the clinical nutritionist has a pivotal importance in **halting the progressive nature of malnutrition** and allowing close monitoring of patients' weight and oral intake and the tolerability of the prescribed diet.
- Health professionals must do **nutrition screening** to detect patients at risk of malnutrition.
- The clinical nutritionist carries out a **full nutritional status assessment** and the results determine the dietary counselling and/or treatment.

Source: obtained from Canva Pro

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Nutritional status screening

Nutritional status screening …

- is a process to identify an individual who may be malnourished or at risk of being malnourished.
- is used to determine whether a full nutrition assessment is indicated.
- is generally completed by someone other than the nutrition provider.

Malnutrition risk screening (MNRS) tools …

- should be quick, simple, and easy to use
- a certain degree of validity, agreement, and inter-rater reability in identifying malnutrition risk is necessary

MNRS for ADULTS:

- MST – Malnutrition Screening Tool
- MUST – Malnutrition Universal Screening Tool

Source: https://www.shutterstock.com/

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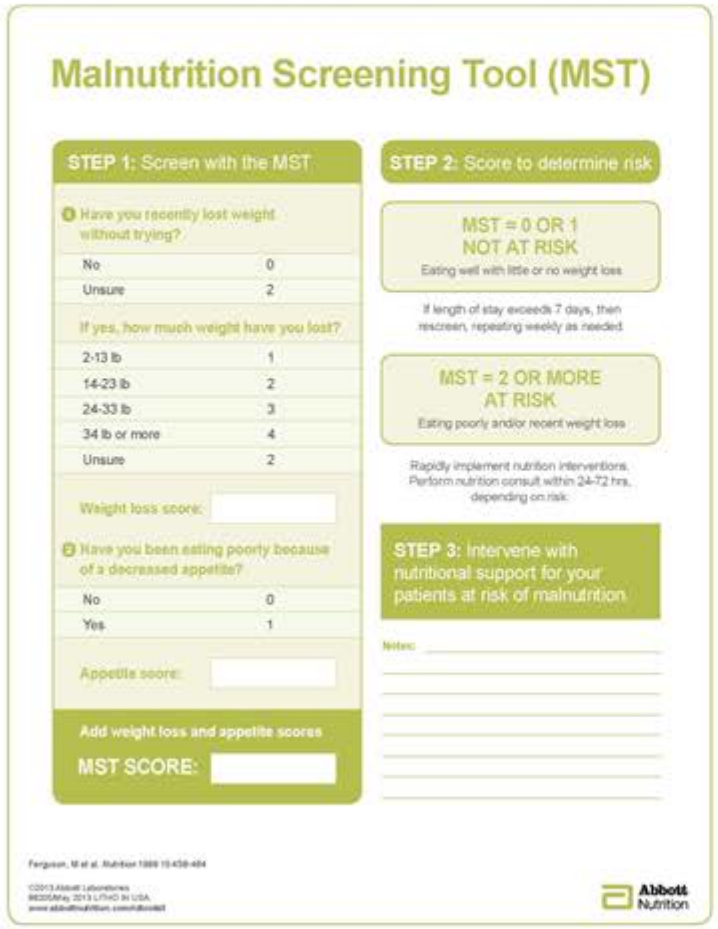
Nutritional status screening

MNRS for ADULTS:



Malnutrition Screening Tool (MST)

STEP 1: Screen with the MST

1. Have you recently lost weight without trying?

No	0
Unsure	2

If yes, how much weight have you lost?

2-13 lb	1
14-23 lb	2
24-33 lb	3
34 lb or more	4
Unsure	2

Weight loss score:

2. Have you been eating poorly because of a decreased appetite?

No	0
Yes	1

Appetite score:

Add weight loss and appetite scores

MST SCORE:

STEP 2: Score to determine risk

MST = 0 OR 1
NOT AT RISK
Eating well with little or no weight loss

If length of stay exceeds 7 days, then rescreen, repeating weekly as needed

MST = 2 OR MORE
AT RISK
Eating poorly and/or recent weight loss

Rapidly implement nutrition interventions. Perform nutrition consult within 24-72 hrs, depending on risk.

STEP 3: Intervene with nutritional support for your patients at risk of malnutrition

Notes:

Ferguson, M et al. Nutrition 1999;15:458-464

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Malnutrition Universal Screening Tool (MUST) ☆

Identifies patients who are malnourished or at risk of malnutrition.

INSTRUCTIONS
Use in patients ≥18 years old. May be applied in either a hospital or community setting.

BMI, kg/m²	>20		0
	18.5-20		+1
	<18.5		+2
Unplanned weight loss in past 3-6 months	<5% 0	5-10% +1	>10% +2
Patient is acutely ill and there has been or is likely to be no nutritional intake for >5 days	No 0	Yes +2	

MUST SCORE:	MALNUTRITION RISK:
0 points	Low risk
1 point	Medium risk
2 points	High risk

Do you want to know how to complete the MUST? Visit:
https://www.bapen.org.uk/pdfs/must/must_full.pdf
https://www.youtube.com/watch?v=oOT7GHfieMQ

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Nutritional status screening

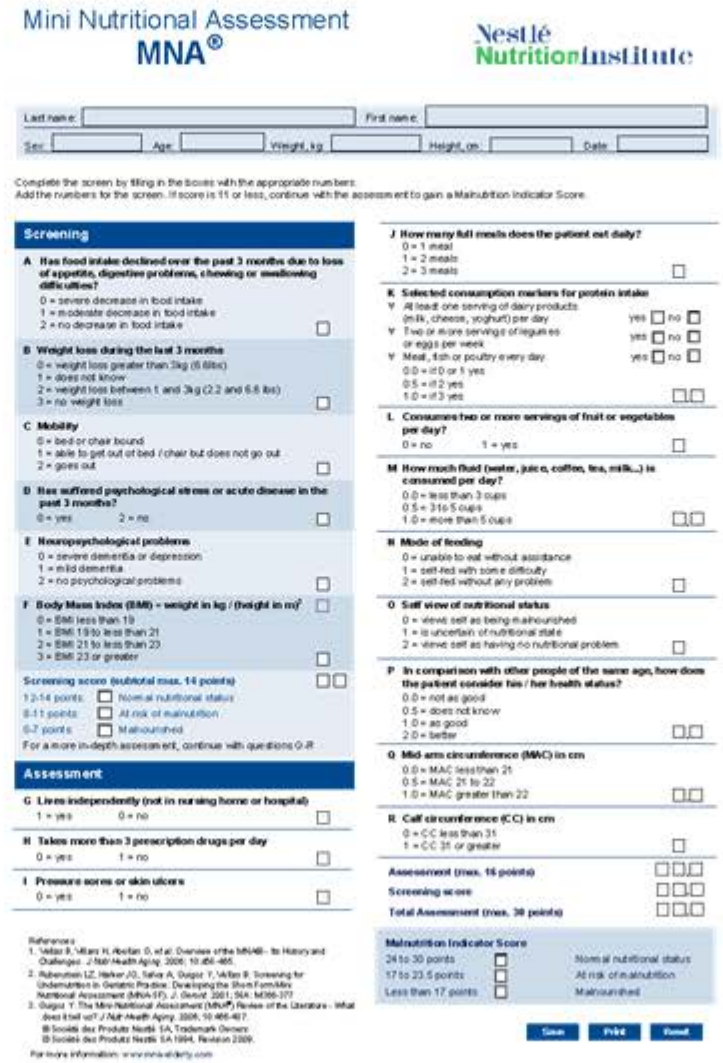
MNRS for ELDERLY:

- MNA – Mini Nutritional Assessment

Source: https://pixabay.com/

Do you want to know how to complete the MNA? Visit: https://www.mna-elderly.com/sites/default/files/2021-10/mna-guide-english-sf.pdf

Questionnaires available here: https://www.mna-elderly.com/mna-forms



Mini Nutritional Assessment
MNA®

Nestlé Nutrition Institute

Last name: First name:
Sex: Age: Weight, kg: Height, cm: Date:

Complete the screen by filling in the boxes with the appropriate numbers.
Add the numbers for the screen. If score is 11 or less, continue with the assessment to gain a Malnutrition Indicator Score.

Screening

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake

B Weight loss during the last 3 months
0 = weight loss greater than 3kg (6.6lbs)
1 = does not know
2 = weight loss between 1 and 3kg (2.2 and 6.6 lbs)
3 = no weight loss

C Mobility
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out

D Has suffered psychological stress or acute disease in the past 3 months?
0 = yes 2 = no

E Neuropsychological problems
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems

F Body Mass Index (BMI) = weight in kg / (height in m)²
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater

Screening score (subtotal max. 14 points)
12-14 points: Normal nutritional status
8-11 points: At risk of malnutrition
0-7 points: Malnourished
For a more in-depth assessment, continue with questions G-R

Assessment

G Lives independently (not in nursing home or hospital)
1 = yes 0 = no

H Takes more than 3 prescription drugs per day
0 = yes 1 = no

I Pressure sores or skin ulcers
0 = yes 1 = no

J How many full meals does the patient eat daily?
0 = 1 meal
1 = 2 meals
2 = 3 meals

K Selected consumption markers for protein intake
Y At least one serving of dairy products (milk, cheese, yoghurt) per day: yes no
Y Two or more servings of legumes or eggs per week: yes no
Y Meat, fish or poultry every day: yes no
0.0 = if 0 or 1 yes
0.5 = if 2 yes
1.0 = if 3 yes

L Consumes two or more servings of fruit or vegetables per day?
0 = no 1 = yes

M How much fluid (water, juice, coffee, tea, milk...) is consumed per day?
0.0 = less than 3 cups
0.5 = 3 to 5 cups
1.0 = more than 5 cups

N Mode of feeding
0 = unable to eat without assistance
1 = self-fed with some difficulty
2 = self-fed without any problem

O Self view of nutritional status
0 = views self as being malnourished
1 = is uncertain of nutritional state
2 = views self as having no nutritional problem

P In comparison with other people of the same age, how does the patient consider his / her health status?
0.0 = not as good
0.5 = does not know
1.0 = as good
2.0 = better

Q Mid-arm circumference (MAC) in cm
0.0 = MAC less than 21
0.5 = MAC 21 to 22
1.0 = MAC greater than 22

R Calf circumference (CC) in cm
0 = CC less than 31
1 = CC 31 or greater

Assessment (max. 16 points)
Screening score
Total Assessment (max. 30 points)

Malnutrition Indicator Score
24 to 30 points: Normal nutritional status
17 to 23.5 points: At risk of malnutrition
Less than 17 points: Malnourished

Save Print Reset

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For more information: www.mna-elderly.com

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Nutritional status screening

Pediatric MNRS:

- STAMP – Screening Tool for Assessment of Malnutrition in Paediatrics.
- PNST – Paediatric Nutrition Screening Tool.

Source: https://www.pngegg.com/

Do you want to know more about STAMP? Visit: https://www.stampscreeningtool.org/what-is-stamp-training

Paediatric Nutrition Screening Tool

Nutrition screening questions			
1	Has the child unintentionally lost weight lately?	Yes	No
2	Has the child had poor weight gain over the last few months?	Yes	No
3	Has the child been eating/feeding less in the last few weeks?	Yes	No
4	Is the child obviously underweight?	Yes	No

If 'yes' to two or more of the above:
- refer the child for further nutrition assessment (see contact details)
- check if child is known to a dietitian
- measure weight and length/height
- commence food and fluid intake record.

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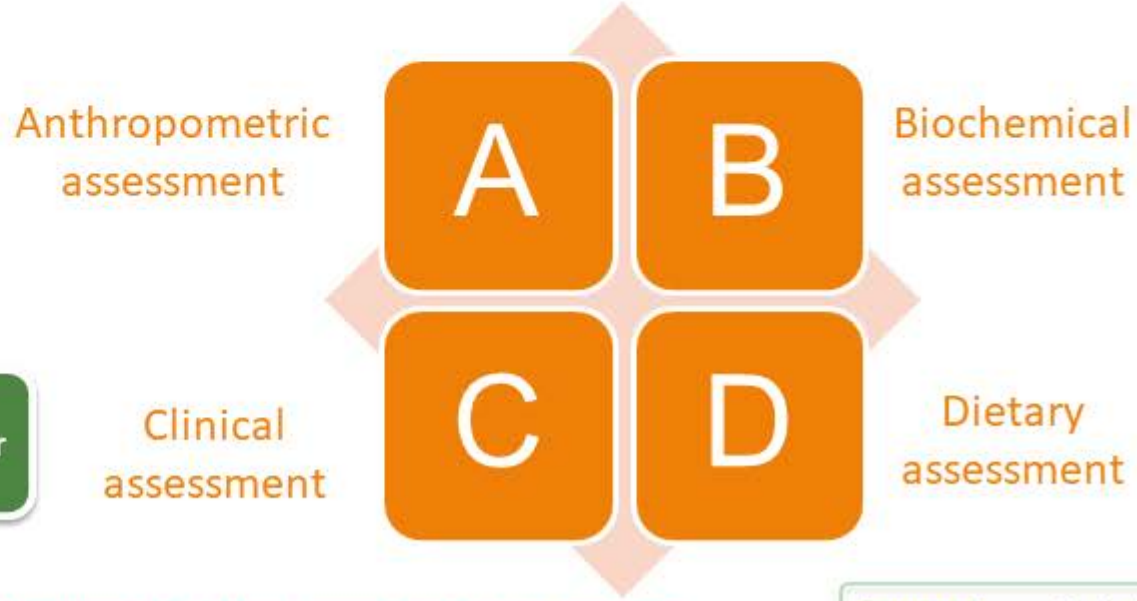
Nutritional status assessment

Nutritional status assessment ...

- is used to determine the nutritional status of individual or population groups as influenced by the intake and utilization of nutrients
- can be defined as the interpretation from dietary, laboratory, anthropometric, and clinical studies.

An easy way to remember the components of the nutritional status assessment is: **ABCD**



Do you want to know more about ABCD? Visit: https://www.fantaproject.org/sites/default/files/resources/NACS-Users-Guide-Module2-May2016.pdf

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Nutritional status assessment

ANTHROPOMETRIC ASSESSMENT:

Consists in the measurement of the **size, weight and proportions of the body.**

The most common measurements are weight, height, perimeters and skin folds.

What is BMI calculated?
Visit: https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmicalc.htm

Source: https://medicaltrain.es/

BIOCHEMICAL ASSESSMENT:

Uses **laboratory measurements** of serum protein, serum micronutrient levels, serum lipids, and immunological parameters to assess general nutritional status and to identify specific nutritional deficiencies. Urine and stools samples may also be analysed.

Source: https://pixabay.com/

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Nutritional status assessment

CLINICAL ASSESSMENT:

The estimation of nutritional status on the basis of recording a **medical history** and conducting a **physical examination** to detect signs (observations made by a qualified observer) and symptoms (manifestations reported by the patient) associated with malnutrition. Several **sociodemographic** and **psychological factors** related to nutritional status are also collected.

Source: https://pixabay.com/

DIETARY ASSESSMENT:

It provides information on **dietary quantity and quality** and the results are compared with recommended intake.

Several common methods to assess dietary intake exist: 24h-recall, food-frequency questionnaires and food weighted records.

Do you want to know more about the methods to assess dietary intake?
Visit: https://epi.grants.cancer.gov/dietary-assessment/Chapter%201_Coulston.pdf

Source: https://pixabay.com/

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Managing malnutrition in patients with dysphagia

In order to overcome the problem of malnutrition, a team approach including medical doctors, dentists, nurses, public health nurses, nutritionists, and therapists is mandatory.

Source: https://www.pngegg.com/

Source: https://pixabay.com/

Source: https://www.shutterstock.com/

Actions:

- Remove or substantially modify dietary restrictions;
- Encourage use of flavor enhancers and frequent small meals;
- Improve protein and energy intake by enrichment meals;
- Treat depression, and remove or replace medicines that can cause loss of appetite as a side-effect,
- Offer liquid nutritional supplements for use between (not with) meals;
- Evaluate swallowing as well as functional ability to manage eating;
- If the patient must be fed, allow adequate time for chewing, swallowing, and clearing throat before offering another bite.

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Time for discussion

Any questions?

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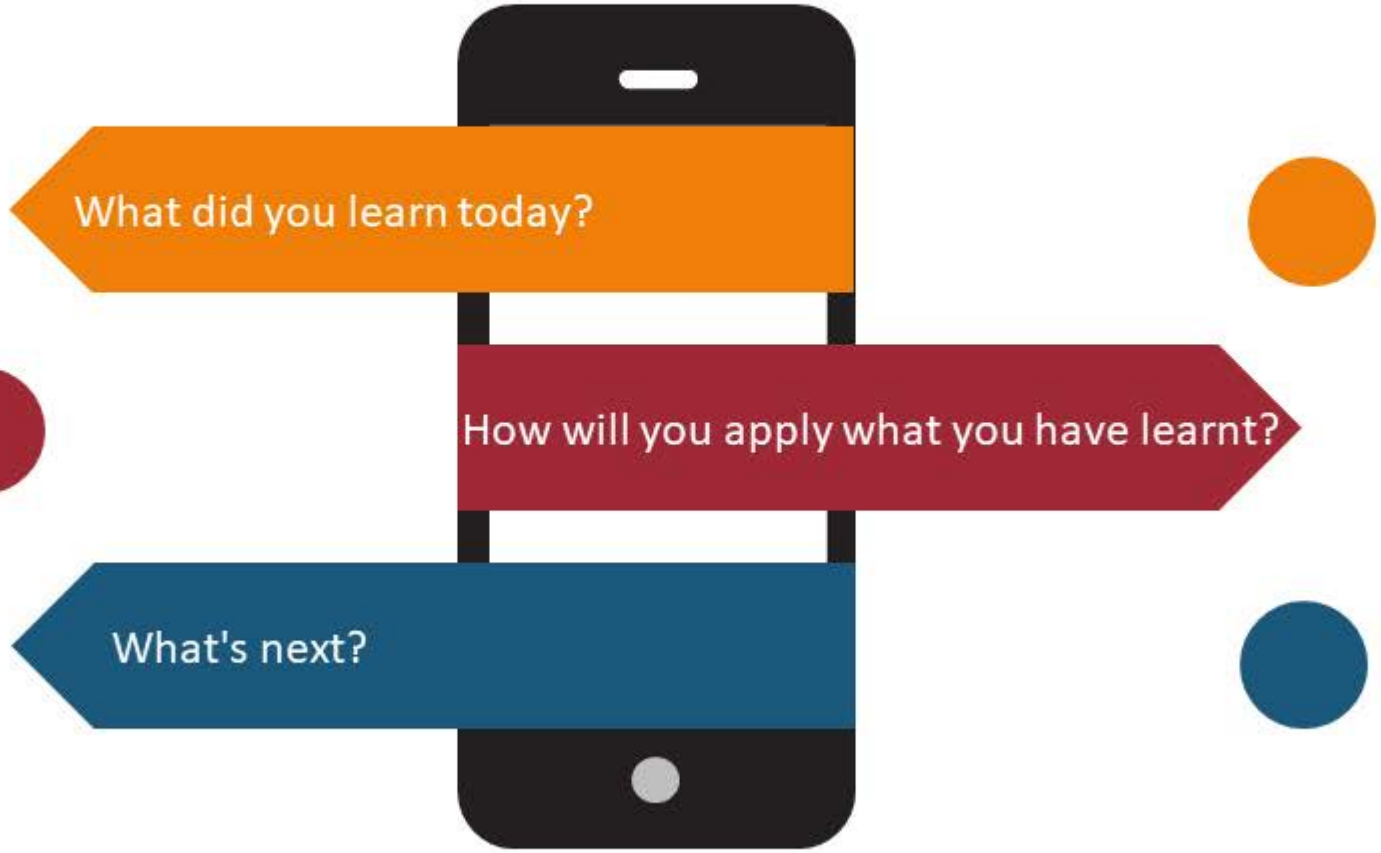
Reflect on the session



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Feedback

How many stars would you give this workshop (1 to 5)?

What did you like the MOST?

What changes would you recommend?

What did you like the LEAST?

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