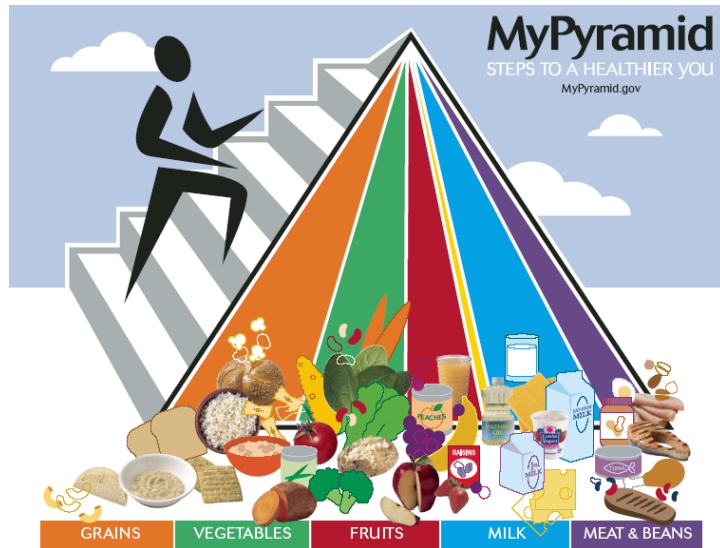


ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ

Μεταπτυχιακό πρόγραμμα “ ΑΣΚΗΣΗ ΚΑΙ ΥΓΕΙΑ”

Άσκηση και Διατροφή στην Πρόληψη και Αντιμετώπιση Ασθενειών



Τίτλος Διάλεξης:

Διατροφικές Αλλαγές στις Χρόνιες Παθήσεις

Γεώργιος Κ. Σακκάς PhD

Κλινικός Εργοφυσιολόγος, Π.Θ. - ΚΕΤΕΑΘ

gsakkas@med.uth.gr

Outline

- Well nourished and Malnourished
- Cachexia and Ascites
- Nutritional Guidelines
- Nutritional Changes in Chronic Diseases
- Chronic Disease and Malnutrition
- Cause of Malnutrition
- Nutritional Assessment and Treatment
- Guidelines and Supplements
- Applied examples in
 - Anemia, diabetes, cancer, chronic renal failure

Well and Mal-nourished

- Well nourished is a patients who eats adequate amount and variety of all foods and has stable body weight and % of body fat for at least 6 months
- Malnourished is a patients who do not eat enough amount and variety of food, loosing more than 5% of body weight with concomitant loss in body fat in less than 6 months
- Insufficient nutrition associated with chronic diseases
- Protein-Calorie Malnutrition (PCM -Πρωτεϊνική υποθρεψία) - a condition of body wasting related to dietary deficiency of calories and protein - is the major characteristic of chronic disease patients

SEVERITY OF WEIGHT LOSS

Significant weight loss

10% in 6 months

7.5% in 3 months

5% in 1 month

2% in 1 week

Severe weight loss

>10% in 6 months

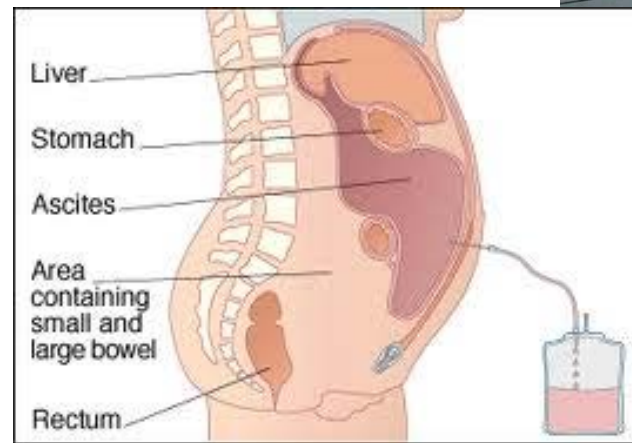
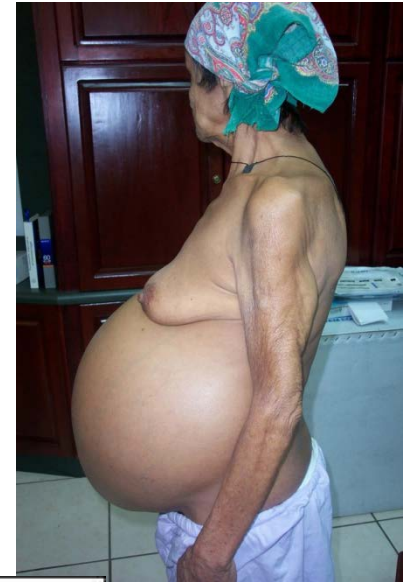
>7.5% in 3 months

>5% in 1 month

>2% in 1 week

Cachexia and Ascites

- Cachexia: Extreme muscle atrophy due to malnutrition or disease causes
 - Partially reversed with anabolic steroid and adequate nutrition
- Ascites: Accumulation of fluid within the peritoneal cavity due to differences in Albumin concentration between plasma and ascites
 - Reverse with correction of malnutrition, diuretics, fluid restriction



Nutritional Guidelines

- Dietary Recommendations (διατροφικές συστάσεις)
 - Nutrient Standards (οδηγίες κατανάλωσης)
 - Nutrient intakes required to prevent deficiency and toxicity associated diseases
 - Dietary Guidelines – (κατευθυντήριες οδηγίες)
 - Provide evidence-based targets dietary messages to encourage adequate nutrient
 - Food Group Plans (ομάδες τροφών)
 - Present food patterns to achieve the recommended nutrient intakes while limiting chronic disease risk
- Physical Activity plays a significant role in adapting dietary habits



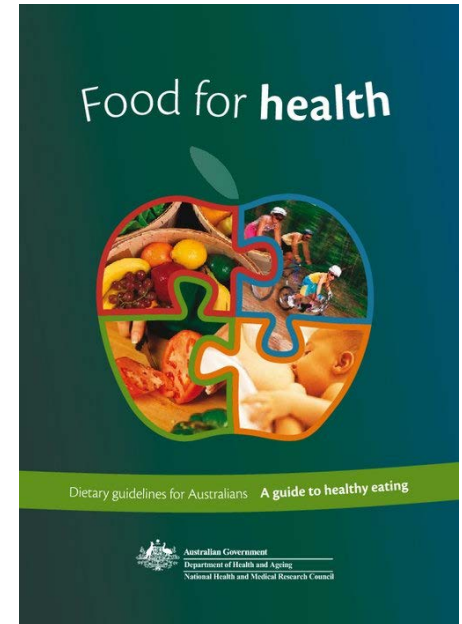
Nutrition Facts	
Per 1 meal	
Amount	% Daily Value
Calories 0	
Fat 0 g	0 %
Carbohydrate 0 g	0 %
Protein 0 g	

Not a significant source of saturated fat, trans fat, cholesterol, sodium, fiber, sugars, vitamin A, vitamin C, calcium or iron.



Nutritional Guidelines

- Nutrient Standards (οδηγίες κατανάλωσης)
 - Adequate Intakes (AIs) (επαρκής κατανάλωση)
 - Tolerable Upper Intake Levels (ULs) – (ανώτερα ανεκτά επίπεδα)
 - Estimated Average Requirements (EARs) (Κατ' εκτίμηση μέσες απαιτήσεις)
- Food Group Plans (ομάδες τροφών)
 - Design to identify individual dietary patterns based on weight, age, sex and physical activity to ensure adequate nutrient intakes within energy allowances



Nutritional Guidelines

- Dietary Guidelines for the prevention of chronic diseases (διατροφικές οδηγίες)
 - Select nutrient dense foods and beverages to achieve adequate nutrient intakes within energy requirements
 - Balance energy intake with activity for weight management
 - Engage in physical activity to reduce chronic disease risk and to manage weight
 - Select a sufficient amount and variety of fruits and vegetables, make $\frac{1}{2}$ of grain selection whole grain (ολικής άλεσης) and choose a sufficient amount of dairy products to ensure adequate nutrient and fiber intake



Nutritional Guidelines

- Restrict saturated fats, total fats and trans fatty acids and select low fat meat and dairy products to reduce the risk of developing obesity and obesity related diseases
- Select high fiber fruits vegetables and whole grain while limiting added sugars to ensure adequate fiber intake and to reduce cancer risk
- Limit sodium intake and consume potassium rich foods to reduce hypertension
- Consume alcoholic beverages responsibly to prevent alcohol related illnesses and accidents
- Practice safe food handling to reduce the risk of developing food-borne illnesses



Anatomy of MyPyramid

One size doesn't fit all

USDA's new MyPyramid symbolizes a personalized approach to healthy eating and physical activity. The symbol has been designed to be simple. It has been developed to remind consumers to make healthy food choices and to be active every day. The different parts of the symbol are described below.

Activity
Activity is represented by the steps and the person climbing them, as a reminder of the importance of daily physical activity.

Moderation
Moderation is represented by the narrowing of each food group from bottom to top. The wider base stands for foods with little or no solid fats or added sugars. These should be selected more often. The narrower top area stands for foods containing more added sugars and solid fats. The more active you are, the more of these foods can fit into your diet.

Personalization
Personalization is shown by the person on the steps, the slogan, and the URL. Find the kinds and amounts of food to eat each day at MyPyramid.gov.



Proportionality
Proportionality is shown by the different widths of the food group bands. The widths suggest how much food a person should choose from each group. The widths are just a general guide, not exact proportions. Check the Web site for how much is right for you.

Variety
Variety is symbolized by the 6 color bands representing the 5 food groups of the Pyramid and oils. This illustrates that foods from all groups are needed each day for good health.

Gradual Improvement
Gradual improvement is encouraged by the slogan. It suggests that individuals can benefit from taking small steps to improve their diet and lifestyle each day.

MyPyramid.gov
STEPS TO A HEALTHIER YOU

GRAINS

VEGETABLES

FRUITS

OILS

MILK

MEAT & BEANS

Caloric range between sedentary and active

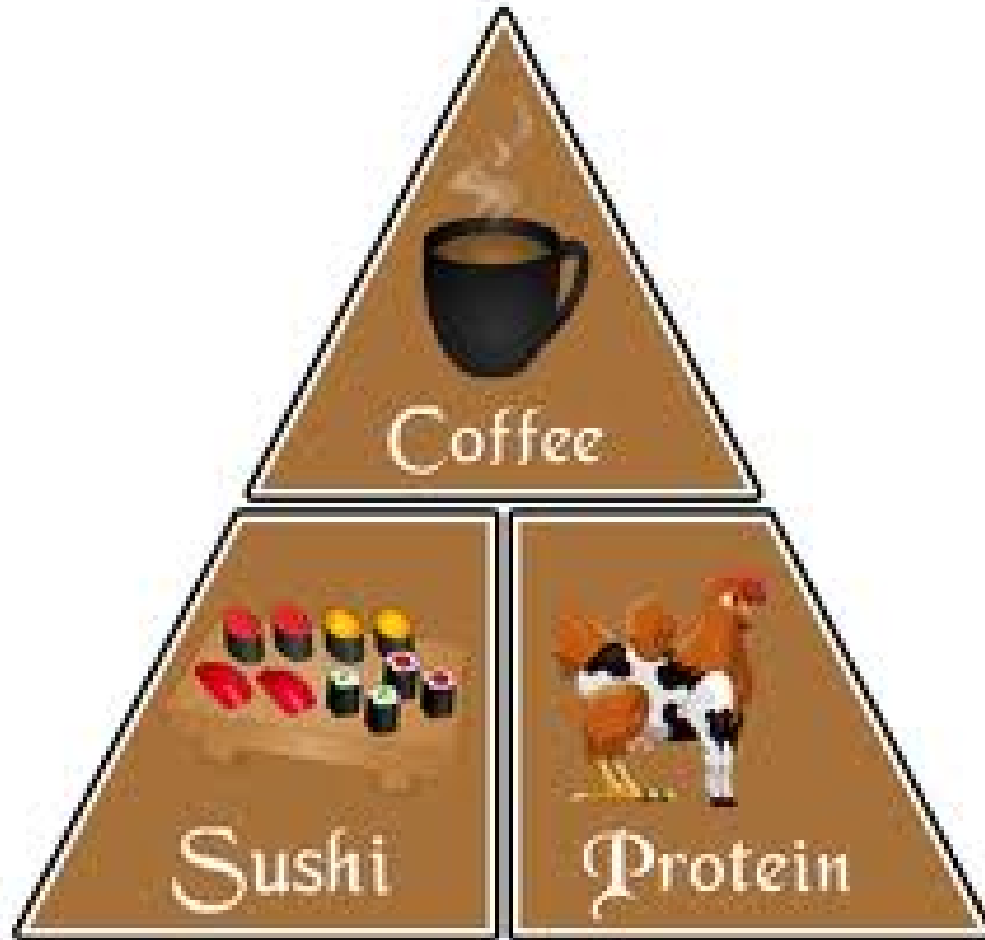
	Calorie Range	
Children	Sedentary →	Active
2-3 years	1,000 →	1,400
Females		
4-8 years	1,200 →	1,800
9-13	1,600 →	2,200
14-18	1,800 →	2,400
19-30	2,000 →	2,400
31-50	1,800 →	2,200
51+	1,600 →	2,200
Males		
4-8 years	1,400 →	2,000
9-13	1,800 →	2,600
14-18	2,200 →	3,200
19-30	2,400 →	3,000
31-50	2,200 →	3,000
51+	2,000 →	2,800

Sedentary means a lifestyle that includes only the light physical activity associated with typical day-to-day life.

Active means a lifestyle that includes physical activity equivalent to walking more than 3 miles per day at 3 to 4 miles per hour, in addition to the light physical activity associated with typical day-to-day life.



The nowadays “Food Pyramid”



Artix Entertainment Food Pyramid

The End of the “Food Pyramid”

- Το υπουργείο Αγροτικής Ανάπτυξης και Τροφίμων των ΗΠΑ (USDA) επένδυσε 2 εκατομμύρια δολάρια για να σχεδιάσει και προωθήσει το πιάτο της διατροφής και τώρα ελπίζει ότι θα δώσει σημαντική ώθηση στην εκπαίδευση και κατανόηση της διατροφής
- Σκοπός του είναι η μείωση της παχυσαρκίας και των παραγόντων που προκαλούν καρδιαγγειακά νοσήματα.



Συμβουλές - Tips

1. Απόλαυσε το φαγητό σου, αλλά κατανάλωσε μικρότερη ποσότητα
2. Απέφυγε υπερμεγέθεις μερίδες
3. Το μισό γεύμα θα πρέπει να είναι τα λαχανικά και τα φρούτα
4. Αντικαταστήστε τα αναψυκτικά ή χυμούς με ζάχαρη με νερό
5. Τα μισά σητιρά από αυτά που καταναλώνεται να είναι ολικής αλέσεως
6. Πίνετε γάλα χωρίς λιπαρά ή 1%
7. Διαβάστε τις οδηγίες στα τρόφιμα (κατεψυγμένα, φρέσκα) και βρείτε το νάτριο (αλάτι) που περιέχουν. Επιλέξτε αυτά με το λιγότερο

Balancing Calories

1. Enjoy your food, but eat less.
2. Avoid oversized portions.

Foods to Increase

1. Make half your plate fruits and vegetables.
2. Make at least half your grains whole grains.
3. Switch to fat-free or low-fat (1%) milk.

Foods to Reduce

1. Compare sodium in foods like soup, bread, and frozen meals — and choose the foods with lower numbers.
2. Drink water instead of sugary drinks.

Nutritional Changes

- Increasing individual fruit and vegetable consumption to 600 g/day reduce the worldwide burden of coronary heart disease by 31% and stroke by 19%
- Reducing consumption of transfat content
- Increasing consumption of whole grain
- Reducing consumption of red meat
- Increasing consumption of fish



Chronic Diseases and Malnutrition

- Protein-Calorie Malnutrition is found in 65-90% of patients with advanced chronic diseases
- There is a direct correlation between the progression of the disease and the severity of malnutrition
- Patients with poor nutritional status before transplant surgery have a decreased survival rate after transplantation and higher rate of graft failure

Causes of Malnutrition Chronic Diseases

- Poor oral intake
- Altered sense of taste
- Dietary restriction (sodium, protein, fluids)
- Malabsorption (fat malabsorption due to reduction in bile salt)
- Hyper-metabolism (infection, ascites)
- Altered fuel consumption (rapid transition from the use of carbs to the use of fat substrate, 58% of energy comes from fat)

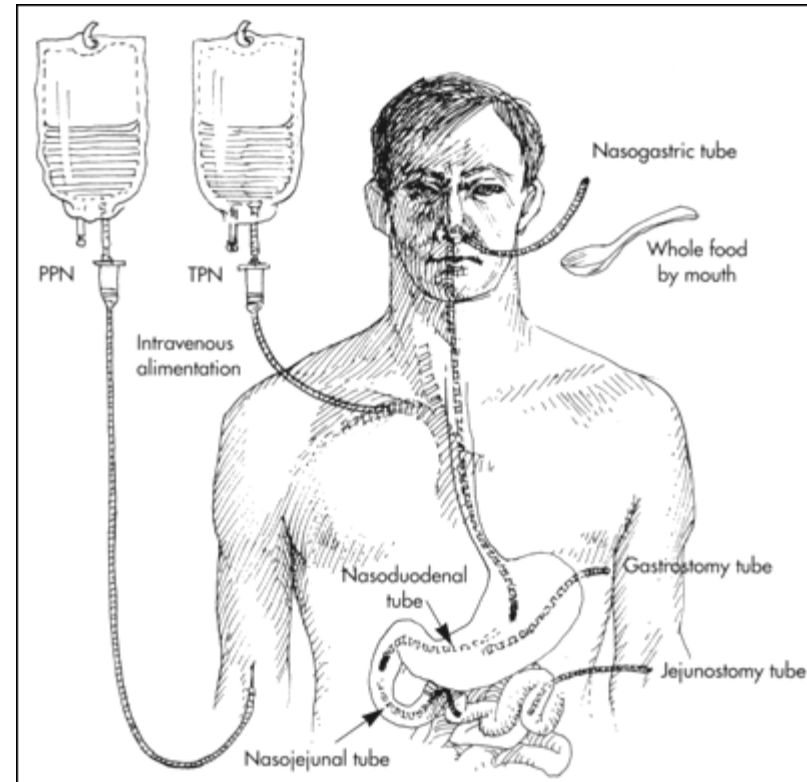
Nutritional Assessment



- Prediction of Malnutrition
 - Detailed history – good approach
 - Weight control – edema and ascites increase weight 😊
 - Albumin and prealbumin – due to low level of synthesis and not due to nutritional status 😊
 - Anthropometry – inter observer variation 😊
 - Subjective Global Assessment (SGA) – good approach 😊
 - Hand Grip strength – good predictor 😊

Nutritional Treatment

- **Goal: to improve Protein-Calorie Malnutrition via**
 - Oral intake
 - Increase to 1000 kcal and to 40g of protein improve mortality by 50%
 - Enteral nutrition (nasogastric tube)
 - Improve albumin levels, decrease in-hospital mortality rate, improve nitrogen balance, fewer infection after transplantation
 - Parenteral nutrition (intravenously)
 - Better option when other modalities have failed
 - Combination of these modalities



Guidelines for meeting nutritional goals

Small variation depending the disease

- Initiation of enteral feeding when oral intake is inadequate
- 25-45 kcal/Kg of body weight per day of non-protein energy (1875 – 3375 Kcal)
- 0.5-1.5 g/kg of body weight per day of protein or amino acids (38 – 112 gr)
- Four to five small meals a day including a late evening snack



Nutritional Supplements

- Branched-chain Amino Acids (BCAA)
- Amino Acids
 - Arginine, Glutamine, Cysteine
- Vitamin A
- Vitamin C
- Vitamin D
- Minerals and micronutrients
 - Zinc, Copper, Calcium, Magnesium, thiamine, folate etc
- Anabolic Steroids
 - Testosterone, Nandrolone, Oxandrolone
- Appetite Stimulant
 - Megestrol Acetate, Dronabinol



Chronic Diseases

some nutritional examples



Anemia

- Iron deficiency and anemia of chronic disease:
 - Multivitamins with Iron or intravenous iron and ferritin
 - Folate added in diet
 - B₁₂ injections or supplement
 - EPO therapy
 - Nutritional adjustments (red meat, dark green vegetables etc)



Chronic Renal Failure

- Caution with...
 - Salt
 - Water-fluids
 - Proteins
 - Phosphorus
 - Potassium

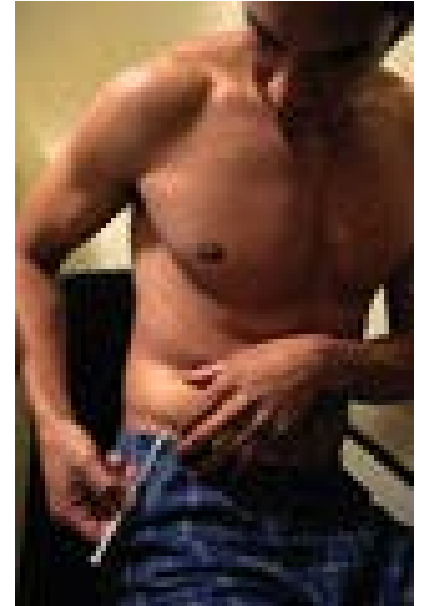


- Dialysis patients need 35 kcal/ kg of body weight (2625 Kcal)
- 0.75 of Protein / Body Weight / Day (56 gr)
- No fruits and very little vegetables
- Complex B vitamins
- EPO & Iron injections
- 500 ml water/ day



Diabetes Mellitus

- Less carbohydrate
- Less fat
- Low cholesterol food
- Low glycemic index foods
 - Whole grain
 - Dark green vegetables
- Adequate amount of proteins
- Multivitamins



Cancer

- Depending the type of cancer and the tissue invaded
 - Increased vegetables
 - Low fat diet
 - High antioxidant vegetables and supplements
 - Moderate consumption of meat
 - Omega 3 FFA



Assessing Tools for Chronic Diseases patients

- Subjective Global Assessment – SGA
- Mini Nutritional Assessment - MNA



Subjective Global Assessment - SGA

Subjective Global Assessment Scoring Sheet

Patient ID _____ Ημερομηνία (ημ/μην/έτος) ____/____/____

Σημερινό Σωματικό Βάρος: _____ Kg

Μέρος Πρώτο: Ιατρικό Ιστορικό

1. Μεταβολές Βάρους

- a. Μεταβολή τους τελευταίους 6 μήνες _____ Kg
- b. Ποσοστό Μεταβολής: _____ Κανένα ή _____ <5% Μείωση
 _____ 5-10% Μείωση
 _____ >10% Μείωση
- c. Μεταβολή βάρους στις 2 τελευταίες εβδομάδες _____ Αύξηση
 _____ Καμία Αλλαγή
 _____ Μείωση

2. Θερμιδική Πρόσληψη

- a. Συνολική Μεταβολή (τελευταίες 2 εβδομάδες) _____ Καμία Μεταβολή
 _____ Μεταβολή
- β. Διάρκεια _____ Εβδομάδες
- γ. Τύπος Μεταβολής σε:
 _____ Υποθερμιδική Στερεά τροφή, _____ Υγρή Τροφή,
 _____ Υποθερμιδική Υγρή τροφή, _____ Πλήρης Στέρηση

SGA Score		
A	B	C

Subjective Global Assessment - SGA

3. Γαστρεντερικά Συμπτώματα (για τουλάχιστον 2 εβδομάδες)

_____ Κανένα,
 _____ Ναυτία, _____ Έμετος, _____ Διάρροια, _____ Ανορεξία

4. Κινητικές Διαταραχές – Αδυναμία (σχετιζόμενες με την διατροφή)

α. Συνολικές Διαταραχές: _____ Καμία

_____ Μέτριες

_____ Σοβαρές

β. Μεταβολές στις δραστηριότητες τις 2 τελευταίες εβδομάδες: _____ Βελτίωση

_____ Καμία Αλλαγή

_____ Υποτροπιασμός

Μέρος Δεύτερο: Κλινική Εξέταση μετά από 2 εβδομάδες.

Ευρήματα σε σχέση με την 1η μέτρηση :

Απώλεια Υπ. Λίπους

Μυϊκός Καταβολισμός

Οίδημα

Ασκήτης (αιμοκαθαρούμενοι μόνο)

Μέρος Τρίτο: Βαθμολόγηση (για επιλογή μόνο)

A. Καλή Θρέψη B. Μειωμένη Θρέψη C. Κακή Θρέψη

<u>Φυσιολ.</u>	Ήπια	Μέτρια	Σοβαρή

Composite Nutritional Index - CNI

Σύνθετος Δείκτης Θρέψης CNI (Composite Nutritional Index)

Παράμετροι Δείκτη	Βαθμός Θρέψης			
	1	2	3	4
1. Βαθμός Θρέψης SGA	A	B	C	
2. Βάρος Αναφοράς %	>90	80-89	70-79	<69
3. α) BMI άνδρες	>21	20-20.9	19-19.9	<19
β) BMI γυναίκες	>20	19-19.9	18-18.9	<18
4. Ξηρό Βάρος εκατοστημορίου	>15	10-15	5-10	<5
5. Δερματοπτυχή Τρικέφαλου, εκτ	>15	10-15	5-10	<5
6. Δερματοπτυχή Υποπλατιαίου εκτ	>15	10-15	5-10	<5
7. Μυϊκή Μοίρα του Βραχίονα εκτ	>15	10-15	5-10	<5
8. Αλβουμίνη ορού g/L	>35	30-34.9	25-29.9	<25

Mini Nutritional Assessment - MNA



Mini Nutritional Assessment MNA®

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

Complete the screen by filling in the boxes with the appropriate numbers. Total the numbers for the final screening score.

Screening		
A	<p>Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?</p> <p>0 = severe decrease in food intake 1 = moderate decrease in food intake 2 = no decrease in food intake</p>	<input type="checkbox"/>
B	<p>Weight loss during the last 3 months</p> <p>0 = weight loss greater than 3 kg (6.6 lbs) 1 = does not know 2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs) 3 = no weight loss</p>	<input type="checkbox"/>
C	<p>Mobility</p> <p>0 = bed or chair bound 1 = able to get out of bed / chair but does not go out 2 = goes out</p>	<input type="checkbox"/>
D	<p>Has suffered psychological stress or acute disease in the past 3 months?</p> <p>0 = yes 2 = no</p>	<input type="checkbox"/>
E	<p>Neuropsychological problems</p> <p>0 = severe dementia or depression 1 = mild dementia 2 = no psychological problems</p>	<input type="checkbox"/>
F1	<p>Body Mass Index (BMI) (weight in kg) / (height in m²)</p> <p>0 = BMI less than 19 1 = BMI 19 to less than 21 2 = BMI 21 to less than 23 3 = BMI 23 or greater</p>	<input type="checkbox"/>
<p>IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2. DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.</p>		
F2	<p>Calf circumference (CC) in cm</p> <p>0 = CC less than 31 3 = CC 31 or greater</p>	<input type="checkbox"/>
<p>Screening score (max. 14 points)</p>		<input type="checkbox"/> <input type="checkbox"/>
12-14 points:	Normal nutritional status	
8-11 points:	At risk of malnutrition	
0-7 points:	Malnourished	

For a more in-depth assessment, complete the full MNA® which is available at www.mna-elderly.com

Ref. Vellas B, Villars H, Abellan G, et al. Overview of the MNA® - its History and Challenges. J Nutr Health Aging 2006;10:456-465.
Rubenstein LZ, Hawker JO, Salva A, Guigoz Y, Vellas B. Screening for Undernutrition in Geriatric Practice: Developing the Short-Form Mini Nutritional Assessment (MNA-SF). J Gerontol 2001;56A: M365-377.
Guigoz Y. The Mini-Nutritional Assessment (MNA): Review of the Literature - What does it tell us? J Nutr Health Aging 2006; 10:466-487.
© Société des Produits Nestlé, S.A., Vevey, Switzerland, Trademark Owners
© Nestlé, 1994, Revision 2009, N67200 12/99 10M
For more information: www.mna-elderly.com

Vitamins - Recommendations

Recommendations	Role
Thiamine (B1) 1.5 mg/day	Helps process food; required for proper functioning of the heart, muscles and nervous system; deficiency signs include weakness, fatigue and nerve damage; needs may be increased in continuous ambulatory peritoneal dialysis (CAPD).
Riboflavin (B2) 1.7 mg/day	Helps the body process food; deficiency signs include sore throat, mouth and/or lip sores, anemia and skin disorders.
Niacin (B3) 20 mg/day	Involved with the digestive system, skin and nerves; helps the body process food; deficiency signs include inflamed skin, digestive problems and mental impairment; may be prescribed as a treatment for lipid disorders but only under the supervision of a doctor due to potential toxicity.
Pantothenic Acid (B5) 10 mg/day	Helps process food; essential for production of hormones and cholesterol.
Pyridoxine (B6) 10 mg/day	Involved in red blood cell development and immune system; helps maintain normal nerve function; required for protein digestion (the higher the protein intake, the higher the need for this vitamin); deficiency signs include mouth and tongue sores, irritability, confusion and depression.
Cobalamin (B12) 6 mcg/day	Involved in formation of red blood cells; maintenance of the central nervous system; deficiency signs include anemia and neurological symptoms (numbness, tingling, weakness, loss of balance).
Folic Acid 800-1000 mcg/day	Helps process and use protein; necessary for production of red blood cells and synthesis of DNA; helps tissue growth and cell function; helps appetite and stimulates formation of digestive acids; doses 5 mg to 30 mg may cause interference of anticonvulsant drugs such as diphenylhydantoin used to treat epilepsy; deficiency signs include tongue inflammation, mouth ulcers, peptic ulcers, diarrhea and anemia.
Biotin 300 mcg/day	Helps process food; involved in synthesis of hormones and cholesterol; may be an option for treatment of uremic neurological disorders including hiccups and restless leg syndrome.
Vitamin C 60 mg/day	Antioxidant; needed for growth and repair of tissues, collagen production, wound healing and repair and maintenance of cartilage, bones and teeth; deficiency signs include dry and splitting hair, gingivitis, bleeding gums, dry or scaly skin, slow wound healing, easy bruising, weakened tooth enamel, swollen and painful joints, anemia, and impaired immune system function; larger doses may contribute to oxalate production which can be deposited in soft tissues and bones.

Summary

- The goal in all intervention is to improve Protein-Calorie Malnutrition
- Caution with nutritional assessment
- Follow the nutritional guidelines for specific chronic diseases
- Supplements aid the correction of low nutritional status
- Always consult a specialist