NUTRITION AND AGING

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Definition of malnutrition

Malnutrition is a condition in which a deficiency, excess or imbalance of food and/or food components causes measurable adverse effects on tissue, body form (shape, size and composition), function, clinical outcome and quality of life.

Malnutrition seen as under nutrition is the most frequent form of malnutrition that occurs in older persons.

Protein-energy malnutrition is present when insufficient energy and/or protein is available to meet metabolic demands. Protein-energy malnutrition may develop because of poor dietary protein or calorie intake, increased metabolic demands as a result of illness or trauma, or increased nutrient losses (2).

Epidemiology

All studies are indicating a high prevalence of malnutrition in the older population. 40 to 50% of non-institutionalised older persons are at a moderate to high risk for nutritional problems

In more selected populations groups its possible to estimate that 9 to 15% of older persons seen in the out-patient clinic, 12 to 50% of hospitalised older persons and 25 to 60% of older persons residing in institutional settings have one or more nutritional inadequacies. Some reports however are more pessimistic and found a prevalence of 60 to 100% in Nursing Homes. (Stratton et al. 2003, King et al. 2004, Abbasi et al. 1991).

With increasing age energy intakes declines significantly, and more than the diminished needs by decrements in the lean body mass and physical activity. In the National Health and Nutrition Examination Surveys the mean daily energy intake was approximately 1600 kcal for men and 1200 kcal for women, and more than 15 percent of older persons consumed less than 1000 kcal/d. In this context of diminished food intake its probable that many of these persons have an imbalanced diet, and have thus a lack of many nutritional components.

Malnutrition: an unknown problem

Older persons themselves, their families, the professionals who cares for hem are not aware of this problem.

For older people living at home in the community, the local family doctor is the first port-of-call. Yet awareness among family doctors of the symptoms and the risk of malnutrition is often alarmingly low. In a survey of UK family doctors about their awareness of malnutrition and use of nutritional support services, there was found that:

- 88% of respondents were not aware of any nutritional screening tool designed to identify patients at risk of malnutrition,
- only 13% always referred a patient at risk, or suffering from, malnutrition to an NHS Dietician,
- 40% never provided dietary advice to patients at risk of malnutrition prior to an elective admission to hospital (3).

According C.Pichard (4) 77% of all patients above 80 years are malnourished.

For most professional and non-professional carers, a dietician is a specialist for special diets, for obesity treatment or treatment of other specified diseases, but is not associated with fight against malnutrition!

Pathophysiology

Protein-energy malnutrition may occur as a consequence of inadequate intake alone (i.e. starvation) or in association with disease-activated physiologic mechanisms that affect body metabolism, composition, and appetite (i.e. cachexia). In the former (primary caloric deficiency state) the body adapts by using fat stores, while conserving protein and muscle, and the resulting physiologic changes are often reversible with resumption of usual intake and activity. Cachexia is marked by an acute phase response that is associated with elevated inflammatory mediators (e.g. tumor necrosis factor-_ and interleukin-1) and increased protein and muscle degradation that may not be readily reversed by refeeding. Although cachexia is usually associated with specific chronic disease conditions (.g. cancer, infection, inflammatory arthritis) this state my develop in older persons without obvious disease (5).

Older persons may be at greater risk of not being able to recover from malnutrition once installed. (Pirlich et al.) (6)

Who is at risk for malnutrition?

Are at risk for malnutrition all (older) persons with a physical handicap or a cognitive deficit, living alone, or in institutions or in a hospital. All these persons are really at risk because they are not able to get and prepare the foods (they prefer).

All older persons staying for longer time in a

hospital are at risk, because generally the first aim of a hospital is not to give the excellent food of a first class restaurant, but deliver excellent technical medical care.

The poverty of many very old persons is also a treat to the nutritional state. In some situations people have to make a choice between food, paying their house rent, or the expenses of social contacts, etc.

Causes of malnutrition in the older persons

The causes of malnutrition can be divided in three categories: Social, economical and health related.

The social causes are numerous. Living alone is a common cause of malnutrition. Living alone means there is less stimulation to prepare good meals. For one person its' indeed a lot of work, and they eat only some foods not requiring a lot of preparation, and many times with the same content. A meal is more enjoyable when taken with other persons too. Living alone with a handicap or with cognitive deficit can make difficult to get the necessary ingredients to prepare the meal. The cooking process is also more difficult in these cases.

The economical aspects are also very important. Its' well known that in many countries the incomes of the very old are not correlated with the increase of the expenses of the daily life. Poverty and long-standing retirement situation are situations to e aware of potentially malnutrition on economical grounds.

The health related aspects are better known, but some are generally forgotten as the poor oral and dental situation, or situation of depression and cognitive disorders that are both frequent in the very old. The diminution of the taste and smell is also in important factor in developing malnutrition. Some drugs are also important factors in the development of malnutrition (SSRI, digoxine, etc.).

In hospitals many patients have not their estimated nutritional provided for, despite sufficient food provision (Dupertuis et al.) (7). Since insufficient food intake was often attributed to causes other than disease, ther should be potential to improve the hospital meal service. More than 40% of hospital food is wasted (Barton AD et al.) (8).

The situation is not better in Nursing Homes: It may be possible to get enough energy and most nutrients from the served food, but many elderly nursing homes residents did not eat enough (Suominem M et al.) (9).

Detection of malnutrition

Many easy to perform test are now available to detect malnutrition:

- MNA, (Mini Nutrition Risk Index) - attach 1*
- MUST, (Malnutrition Universal Screening Tool)**
- GNRI (Geriatric Nutritional Risk Index)

The Geriatric Nutritional Risk Index (GNRI) = (1.489 x albumin, g/l) + (41.7 x present/ideal body weight).

Ideal body weight (Broca):

Men = Standing height in cm - 100

Female = (Standing height in cm - 100) - 5%

Measurement of Standing height by knee height (10):

Men = 96,50 + (1,38 x knee height) - (0,08 x age) cm

Female = 89,68 + (1,53 x knee height) - (0,17 x age) cm

Recommendations from the inaugural Conference of the European Nutrition fir Health Alliance (London, 14th September 2005).

Detection

- Adopt measuring tools for nutritional/oral intake/clinical signs of malnutrition.

The absence of a universally-preferred screening tool for malnutrition has frustrated attempts to develop policy solutions. Ideally, such a screening tool should be adopted across Europe, so as to better enable cross-border comparison and learning.

- Universal mandatory malnutrition screening for older people must be adopted.

Screening should target older people where they are most vulnerable, in secondary care, residential care and in the community. Screening tools such as the "Malnutrition Universal Screening Tool" should be used with older people. Nutritional assessment should be incorporated into all geriatric assessment.

- Define and identify at risk groups.

Certain groups among the older persons are at particular risk of malnutrition. Research to identify these groups should be undertaken, and the results distributed among health and social care professionals.

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Awareness

- Malnutrition should be recognised as a primary disease.

Malnutrition, currently, is not on anyone's radar. It is not recognised as a significant problem of public health, nor as a preventable social phenomenon nor as a significant health risk in ageing populations. To receive the attention it needs, malnutrition must be recognised as a primary disease which warrants proactive detection, dedicated heath promotion, and comprehensive treatment guidelines. Building it within this framework would prevent it from being "forgotten" as is currently the case. It would also stimulate professional awareness and scientific research.

Nestlé Nutrition INSTITUTE

Mini Nutritional Assessment MNA®

Last name: First name: Sex: Date:

Age: Weight, kg: Height, cm: I.D. Number:

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 loss of appetite
1 = moderate loss of appetite
2 = no loss of appetite ☐

B Weight loss during the last 3 months
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 ☐

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 m²)
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 points or greater Normal – not at risk – no need to complete assessment
11 points or below Possible malnutrition – continue assessment

Assessment

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

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
- At least one serving of dairy products (milk, cheese, yogurt) per day yes ☐ no ☐
- Two or more servings of legumes or eggs per week yes ☐ no ☐
- 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 fruits 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 22 or greater ☐.☐

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
17 to 23.5 points at risk of malnutrition ☐
Less than 17 points malnourished ☐

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, Harker 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: M366-377.
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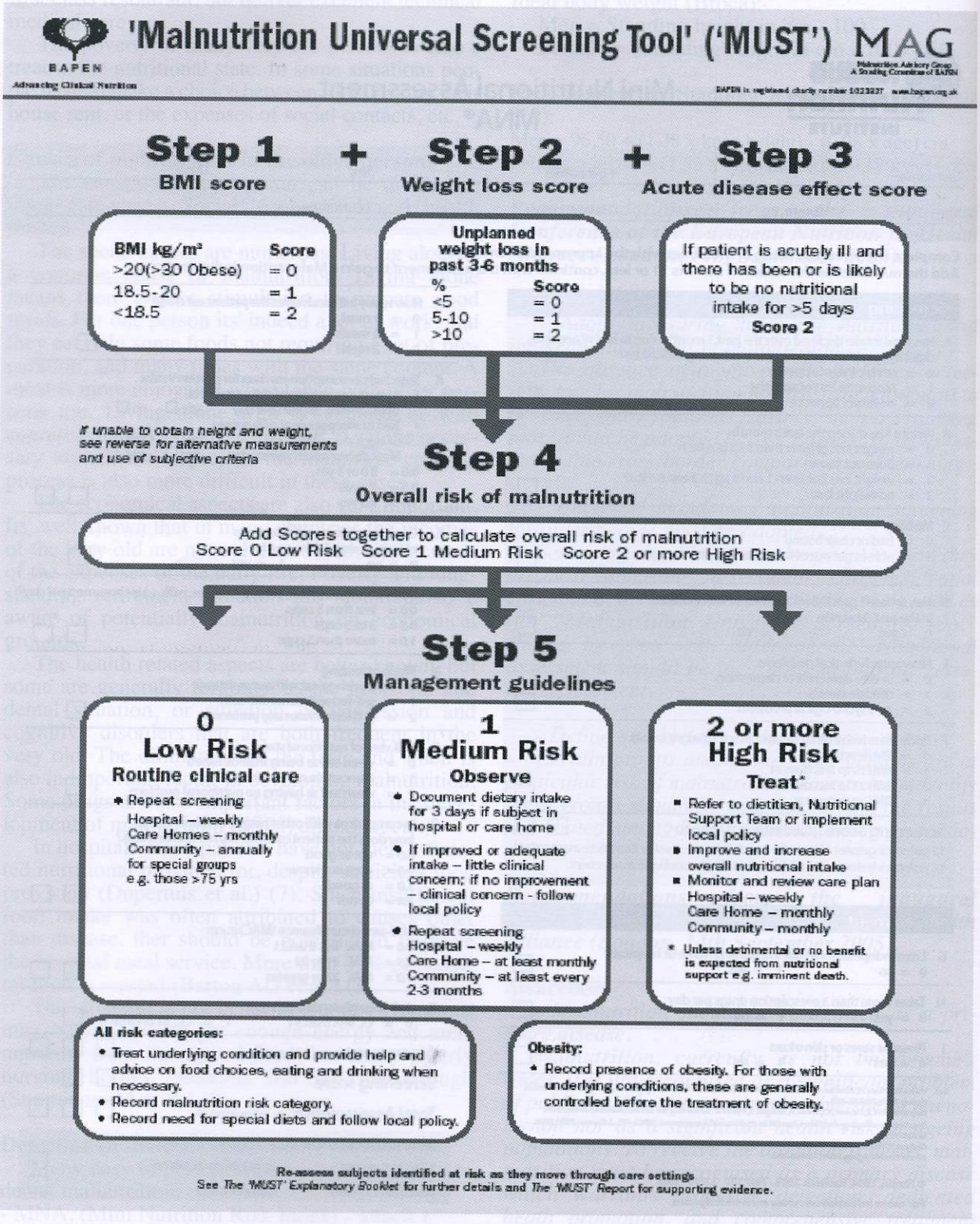
For more information : www.mna-elderly.com

*MNA (Mini Nutrition Risk Index) - attach 1.



***MUST, (Malnutrition Universal Screening Tool).*

- Professional education and training.

Improving professional education is the key to the treatment of malnutrition. It is hugely important that health and social care professionals, and those working in the residential care, become aware of the prevalence of malnutrition, and are educated about detection and prevention. Governments must make this a key priority. Health professionals need more training in dealing with malnutrition, and expert nutrition organisations need to have a greater role in evaluating and determining the training of health professionals. Professional bodies should influence curriculum development in nutrition training for health professionals.

- Awareness building among the public.

Many of the interventions for preventing and treating malnutrition can be undertaken by friends and relatives. Greater public awareness of the problem is vital to beating malnutrition. Governments need to implement major public awareness-building campaigns to enlist the public in fighting malnutrition among the older persons.

Friends and relative can help to detect malnutrition, by identifying: weight loss, signs of apathy or depression, checking the fridge, "tell me what you had to eat yesterday" (Potocka).

- Benchmarking

Conference delegates recommended the use of benchmarking for malnutrition. Delegates identified the need to coordinate efforts to collect prevalence data in a standardised way, and the need for a uniform practice to compare burden of malnutrition across settings.

Nutritional interventions are effective

The Belgian College of geriatricians performed an interventional nutritional study in the geriatric departments of Belgium with a zero-measurement, followed by an intervention and finished by a new measurement. The effect was significant with an improvement of the nutritional status and a shorter length of stay in the hospital (Th.Pepersack) (11).

The use of nutritional supplements with older malnourished patients in the community resulted in reduced medical costs (hospital, nursing and other medical care) of 723 euro lower on average (Arnaud-Battandier et al.) (12).

A systematic review of evidence on the use of immunonutrition in hospital patients found that it was associated with lower infectious complications, and compared to immune-enhancing diets, a lower mortality rate (Heyland et al.) (13)

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Interventions

Community settings

- Promote nutrition as a social activity.

It is easy to forget eating is a social activity, and that malnutrition is often associated with social isolation. Promoting the social aspect of eating is a cheap and highly effective way of preventing malnutrition among older people.

- Recognise the role of social care agencies in promoting good nutrition.

It is not just in secondary care that good nutrition should be promoted for older people. It si often forgotten that a key setting for preventing malnutrition among the older persons is the community. Social care agencies can promote nutrition and prevent many of the problems of malnutrition that later require the involvement of health professionals.

- Promote self-assessment.

Some of the simplest tests for detecting malnutrition can actually be self-administred. Educating older persons in self-assessment would be a very useful step in tackling malnutrition.

Hospital Care

- Governance: create accountability at board level.

Despite the importance of good nutrition many organisations across health and social care do not give the issue sufficient importance. It is to recommend that a formal accountability for nutrition should be created at the highest level of organisations, particularly hospitals.

Residential care

- Residential care inspectors should be trained in nutrition, to enable the regular inspection of residential care providers for standards of nutrition.

Health promotion and public health.

- Make public health campaigns more effective

- Identify patients preferences; promote service user involvement.

Malnutrition is a cost and a burden to individuals and to society

To individuals:

Somatic:

- Higher vulnerability to illness and other conditions;
- Increased mortality for a number of diseases;
- Reduced effectiveness of drugs;
- Impaired thermoregulation;
- Increases in falls;
- Leads to inactivity, pressure sores and thromboembolism.

Social and psychological:

- Depression, apathy and self-neglect;

- lack of self-esteem;
- possible confusion with slow recovery;
- low interest in food, leading to decreased interest in social interactions;
- mood behaviour shifts and changes in attitude (adapted from NICE 2005).

To individuals in hospital settings:
- Complication rates 2-3 times higher in malnourished surgical patients;
- Predisposition to infections and impaired recovery when infected
- Impaired wound healing, with prolonged length of stay in hospital;
- Reduced respiratory muscle strength (with long-term dependency on ventilators);
- Pneumonia and pulmonary failure (adapted from NICE 2005).

The cost of malnutrition among older persons for society:
- More frequently visiting their GP;
- Increased need and use of social and health care;
- Prolongation length of stay in hospital.

Recent data suggest that malnutrition in the UK costs in excess of £7.3 billion each year, the bulk of the which arises from the treatment of malnourished patients in hospital (£3.8 billion) and in long-term facilities (2.6 billion). (Elia, BAPEN, 2005) (14).

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Diminish cost and burden to society

- Communicate the real costs of malnutrition to public and professionals;
- Present the economic opportunity for malnutrition interventions - awareness building;
- Make good nutrition a viable and attractive option;
- Further research to define the economic benefits of interventions on malnutrition;
- Who pays for nutritional solutions?

Conclusion

Malnutrition must be recognised as a disease;

Malnutrition must be recognised as a social issue.

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