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Best Care In Gastric Cancer: From Diagnosis To Nutrition



INTRODUCTION

Malnutrition is a condition characterized by an altered balance between the supply of a particular nutrient and the demand for that nutrient by tissues resulting from inappropriate dietary intake or defective use by the body. Obviously, in malnutrition, the balance between supply and demand for a nutrient may be altered either in excess or in defect. However, in general terms when we speak of malnutrition, we are referring to a nutrient deficiency.

The prevalence of cancer-related malnutrition and its negative consequences are underestimated in most oncology units. The Italian study PreMIO, Prevalence of Malnutrition in Oncology, for the first time focused on the nutritional status of nearly 2000 patients at the first oncology visit and showed incontrovertibly that malnutrition, anorexia, appetite loss and weight loss are common in patients from the earliest stages of the disease, and can be detected at the first visit.

Out of the sample examined, 51.1% showed a variable degree of nutritional impairment, 42.4% of these were at risk of malnutrition and 9% were already frankly malnourished. Unintended weight loss is an indicator, which is the red flag of an altered energy balance, found in 65% of the patients examined: 28.4% had lost more than 10% of their weight. The research revealed the existence of an unsuspected number of subjects at risk of cachexia, a condition that manifests itself in massive loss of weight and muscle tissue. More than 70% of those with stomach or pancreatic cancer, more than 60% of those diagnosed with liver and rectal colon cancer, more than 40% of those with head-neck cancer and genitourinary forms showed body mass index and weight loss compatible with the diagnosis of neoplastic cachexia.

Malnutrition should not be considered as an ineluctable side effect of the disease but as a preventable and reversible phenomenon provided that the intervention is timely and becomes an integral part of cancer treatment.

Malnutrition has a serious impact on the cancer patient:

- increases radio- and chemo-induced toxicity on healthy cells and makes cancer cells more resistant to treatment
- Reduces patient compliance with treatments
- Reduces the patient's quality of life
- weakens the immune system, increasing the frequency of hospitalizations and worsening the prognosis with an increase in mortality. In addition, 20% of cancer patients do not exceed the disease due to the severe consequences of malnutrition.

According to the study "Prevalence and costs of malnutrition in hospitalized patients; the PREDyCES Study" despite the availability of Guidelines a significant proportion of malnourished patients do not receive adequate nutritional support and this has an important impact on health care costs. Patients at risk of malnutrition have a longer hospital stay of 3 days, associated with an increase in patient costs of approximately €2000. According to the study "The economic costs of disease related malnutrition" in the Netherlands, disease-related malnutrition represents an excess of about 2 billion on annual health care expenditure where 1 billion out of 7 (about 300 million total) is attributed to health care expenditure for cancer patients.

Sharing and implementing a clinical path of nutritional support for the cancer patient that represents a strategy to overcome clinical and organizational inappropriateness, is today one of the fascinating new challenges that clinicians need to face in order to ensure the best possible outcomes for the patient.

This challenge should have the following objectives

- Early identification of the patient eligible for nutritional support
- to ensure timely, appropriate and standardized taking charge through shared instruments
- Integrate different hospital/territorial settings (T-H-T) through a simultaneous care model.
- Measuring the level of care provided by means of specific indicators

NUTRITIONAL SCREENING

Nutritional Screening is a simplified system of first guidance for the rapid assessment of risk factors for malnutrition and/or nutritional problems.

Nutritional screening should be performed with validated tools from the diagnosis and systematically repeated at regular intervals in patients with malignancies, which, by type, stage or treatment, may adversely affect the state of nutrition.

The screening tool recommended in this document is taken from the “Pre-Screening” section of Nutritional Risk Screening (NRS) 2002. The Project Group has replaced the fourth question of the instrument “Does the patient have a serious acute disease?” with the question “Is the patient suffering from a tumor in one of the following sites: head-neck, esophagus, stomach or pancreas?” in order to lower the instrument in the context of taking charge of the cancer patient and increase attention to those tumors that predispose the patient to an alteration in nutritional status.

The specific reference person is the oncologist.

PRELIMINARY NUTRITIONAL SCREENING (NRS 2002 PRE-SCREENING)	
1) BMI < 20,5?	<input type="checkbox"/> YES <input type="checkbox"/> NO
2) Has the patient lost weight in the last three months?	<input type="checkbox"/> YES <input type="checkbox"/> NO
3) Has the patient reduced his food intake in the last week?	<input type="checkbox"/> YES <input type="checkbox"/> NO
4) Is the patient suffering from a cancer in one of the following sites: head-neck, esophagus, stomach or pancreas?	<input type="checkbox"/> YES <input type="checkbox"/> NO
If all 4 questions are answered NO the patient is not at risk and should be reassessed at the next oncology follow-up. If even just one answer is YES, the malnourished subject is identified.	

IDENTIFICATION OF THE MALNOURISHED SUBJECT

Following a positive screening the at-risk patient will be sent by the oncologist to the nutritionist/diet practitioner for a specific nutritional consultation. The first objective of the nutritionist’s visit is to identify patients with nutritional problems (already malnourished or at risk of calorie- protein malnutrition or with depletion of specific nutrients) to verify the need for a specific therapeutic intervention.

The tool for the identification of the malnourished subject is the last section of the Nutritional Risk Screening (NRS) 2002 and it is recommended to perform it in all patients identified at risk of malnutrition in order to initiate appropriate nutritional treatment.

The use of this tool will make it feasible to assess the adequacy of any nutritional support, and for this reason it will be repeated periodically (the frequency will be customized on the basis of individual problems and the possible emergence of new situations at nutritional risk).

IDENTIFICATION OF THE MALNOURISHED SUBJECT (NRS 2002 SCREENING)			
Malnutrition		Illness severity (increased needs)	
Normal nutritional status	Absent	0	No acute illnesses in progress (Normal nutritional needs)

Weight loss >5% in 3 months Or score Ingesta 11/15 (food income 50-75% of normal needs in previous weeks)	mild	1	<ul style="list-style-type: none"> - Femur fracture - Chronic diseases with complications (cirrhosis, diabetes, dialysis, COPD) - Neoplasms
Weight loss >5 % in 2 months Or BMI 18.5-20 + altered general conditions Or score Ingesta 10/5 (food revenue 25-50% of normal needs in previous weeks)	moderate	2	<ul style="list-style-type: none"> - Major abdominal surgery - Stroke - Severe pneumonia - Onco-haematology
Weight loss >5 % in 1 month/ >15 % in 3 months Or BMI < 18.5 + altered general conditions Or score Ingesta <5 (food income 0-25% of normal needs in previous weeks)	Severe	3	<ul style="list-style-type: none"> - Head injury - Bone marrow transplantation - Intensive care (APACHE > 10)
Malnutrition score:		Severity of illness score:	
Total score (malnutrition + severity of illness):			
If age ≥ 70 years add 1 score to the total score. Score corrected for age:			
Score ≥ 3: the patient is at nutritional risk and a nutritional program must be drawn up.			
Score < 3: weekly re-evaluation of the patient. If the patient is planning a major surgery, a nutritional programme must be drawn up to prevent a nutritional risk.			

ASSESSMENT AND DEFINITION OF THE NUTRITIONAL STATUS

After detecting a state of malnutrition in the patient through NRS 2002 Screening the nutritionist will provide a complete staging of the patient by evaluating the following aspects:

- Clinical background and anamnesis
- Current weight and weight loss in months 6, 3 and 1
- Revenue assessment
- Height and waist circumference
- Assessment of skin folds (tricipital, bicipital, subscapular and suprailiac) to assess body fat
- Laboratory tests (total lymphocytes, total proteins, albumin, albumin/globulin ratio, prealbumin, RBP, transferrin, creatinine, transthyretin and Prognostic Inflammatory and Nutritional Index (PINI))
- Symptoms affecting nutrition: presence of mucous membranes, xerostomia, dysphagia, chronic nausea, premature satiety, constipation or pain
- Patient Generated-Subjective Global Assessment (PG-SGA) for the global subjective assessment reported by the patient
- Performance status through Karnofsky Index (KI) to evaluate, in a percentage from 0 to 100, the patient's ability to perform daily activities and the possible need for care support
- Bioimpedentiometry to assess body composition, hydration status and basal metabolism.
- Bone mineral density assessment
- Indirect calorimetry to measure energy expenditure at rest
- Hand Grip test to assess muscle function
- Lumbar spine CT scan (in the elderly patient characterized by oncological sarcopenia)

The assessment of nutritional status should be considered an integral part of patient management, as it is crucial in quantifying the risk of complications, assessing the response to therapy and affecting the prognosis.

DRAWING-UP A NUTRITIONAL WORK PLAN

The transition from the assessment of nutritional status to the implementation of the treatment plan involves the following steps:

1. Identification of the objectives that want to be pursued through nutritional intervention
2. Identification of the water, caloric, protein and micronutrient needs of the patient:
 - Total daily calories up to 35 kcal/kg of which: 20-30 Kcal/kg non-protein calories and 1-1.5 g/kg weight/day protein calories
 - Glucose distribution: lipids (%) = 70:30 or 60:40 or 50:50
 - 0.2-0.35 g Nitrogen/kg body weight
3. Definition of the type of nutritional support
 - Nutritional counseling, aimed at increasing the intake of nutrients through a review of the normal diet, favoring foods with high caloric and/or protein content
 - Oral Nutritional Supplements (ONS) that contain macro and micronutrients in concentrated amounts to be added to the normal diet. The intake of ONS must end once an adequate intake of normal food has been re-established: their prescription is therefore necessary as part of a clinical pathway to be re-evaluated frequently.
 - Artificial Nutrition (NA) through Enteral Nutrition (NE) by probe or Intravenous Parenteral Nutrition (NP)
4. Definition of the monitoring programme through the planning of follow-up visits and the sharing of evaluation benchmarks

the nutritionist is the reference professional profile

In order to facilitate the integrated management of the patient among the various stakeholders involved in the process, it would be desirable to envisage the use of a shared platform that allows a rapid exchange of information and the extrapolation of the performance of the service provided.

SPECIFIC INDICATIONS FOR ORAL NUTRITION SUPPLEMENTATION (ONS)

The use of the supplement allows the achievement of nutritional quotas even if not ideal but sufficient to avoid the use of artificial nutrition. The ONS requires a constant intake, however, characterized by a good gradibility and tolerance.

The frequency of visits cannot be standardised, but must be personalised according to clinical conditions and the therapeutic process. For ONS patients, check-ups must be planned on at least a quarterly basis for the re-evaluation of supplies.

The specific reference persons are the nutritionist and the dietician.

ELIGIBILITY

are eligible for ONS:

- Subjects in which, in order to maintain or obtain a satisfactory state of nutrition, the oral diet must be supplemented for prolonged periods with products (in powder or liquid form) with a defined formula, supplementing the meal; the nutritional contribution of the supplement must represent at least 50% of the expected needs.
- Patients with advanced disease where the final prognosis is more dependent on malnutrition than disease progression provided the patient's quality of life is acceptable.

PRESCRIPTION

Once the patient's eligibility for ONS has been verified, proceed with the first prescription:

- 2 ONS per day (range 1-3 per day) in addition to normal nutrition for a maximum of 12 weeks depending on the patient's clinical condition and needs.
- Prescribe 1 "starter pack", check patient compliance through a "step path" and monthly prescribe the patient's preferred ONS (range 1-3 per day).
- Provide the patient with an ONS-related guide/pamphlet
- Communicate objectives and expected results of the nutritional intervention

FOLLOW UP

Controllo di follow up dopo 12 settimane dalla prescrizione del ONS, salvo complicanze o esigenze particolari che richiedano un controllo anticipato:

- Monitor patient compliance, changing the type or taste of the oral support if necessary to maximize intake.
- Evaluate the objectives set before the intervention
- Consider changes in weight, strength, physical appearance, appetite, performance status and ability to perform normal daily activities
- Follow up every 1-3 months depending on clinical need

WHEN TO STOP ONS

- Objectives achieved
- Patient clinically stable or with limited/attenuated acute episodes
- The patient has re-adapted to a correct diet and is no longer at risk of malnutrition
- Inappropriateness of further nutritional intervention

CONTRAINDICATIONS

The use of oral supplementation should not be used as an anti-anorexic.

SPECIFIC INDICATIONS FOR HOME ARTIFICIAL NUTRITION (HAN)

The indications to HAN are represented by all cases in which the patient is in a stable clinical condition that allows him/her to be discharged from the hospital and/or stay at home, but is unable to satisfy his/her nutritional needs naturally.

When, once the acute situation has been overcome, the indication to the AN remains, a multidimensional assessment of suitability for its continuation in the patient's habitual living environment is necessary.

The HAN allows patients who would otherwise need hospitalization to receive only nutritional treatment to be treated at home.

One of the main eligibility criteria for home care is that the nutritional recovery is able to improve the quality of life and clinical condition without involving greater risks; in any case, a periodic reassessment of the indication at HAN is also necessary.

The frequency of visits cannot be standardised, but must be personalised according to clinical conditions and the therapeutic process. For patients in HAN, check-ups must be planned on at least a four-monthly basis for the reassessment of supplies.

The specific referent is the nutritionist.

SPECIFIC INDICATIONS FOR HOME ENTERAL NUTRITION (HEN)

Whenever the HAN indication is placed and the gastrointestinal tract is functional and accessible, the enteral route should be the first choice.

The main reasons for the enteral choice are represented:

- the more physiological nature of such treatment;
- the lower risk of major complications;
- the greater management simplicity;
- lower costs compared to home parenteral nutrition.

Percutaneous Endoscopic Gastrostomy (PEG) should be indicated in patients requiring treatment longer than 4 weeks.

ELEGIBILITY

Are eligible for HEN patients with:

Inability or contraindication to eat orally as a result of:

- Obstructive dysphagia due to therapeutic and non-therapeutic neoplastic diseases (head-neck, oesophagus, stomach, duodenum tumors).
- Functional dysphagia due to neurological pathologies (brain coma, outcomes of acute cerebrovascular events and brain trauma, chronic progressive diseases, etc.) or alterations in the motility of the first digestive tract.

Need for oral integration to nutrition as a result of:

- Anorexia or hyporesis from any cause
- Chronic catabolic diseases
- Aftereffects of serious illnesses

REQUIREMENTS

HEN patients should be assisted by a Multidisciplinary Team including: pharmacists, dieticians, nurses, and other professionals involved in home care (rehabilitation and language therapists). Each professional should have a dedicated job profile with specific skills. The patient must be accompanied by a family member and the family doctor or paediatrician of free choice for the diagnosis and treatment of any potential problems. Patients discharged into HEN or their family members must receive a care protocol that includes the monitoring and training programme.

Patients should also receive appropriate training and an information manual from the Multidisciplinary Team on:

- - management of the enteral nutrition infusion system and administration regime,
- - information about nutrient development procedures,
- - use of the infusion pump and possible risks,
- - methods to solve the most frequent problems by using the instruction manual (complete with appropriate images).
- - telephone numbers (emergency and routine) to contact professionals able to understand the needs and problems of patients undergoing enteral home treatment.
- - organization about the delivery of equipment, materials and nutrients that must be made with appropriate specific contact with the external home care provider possibly involved
- - Patients and/or caregivers should be given the questionnaire "Questionnaire for evaluation of the knowledge of the caregiver and/or caregiver on enteral nutrition management".

HEN CONTRAINDICATIONS

HEN is generally contraindicated in patients with: intestinal subocclusion, intractable vomiting, paralytic ileus and/or severe diarrhea that makes metabolic management of the patient difficult, presence of proximal and/or high-flow enterocutaneous fistulas or chronic intestinal ischemia.

SPECIFIC INDICATIONS FOR HOME PARENTERAL NUTRITION (HPN)

Home parenteral treatment is not free of complications and implies in any case the use of more human and economic resources than HEN.

HPN is indicated in situations of chronic intestinal insufficiency that result in a reduction of the functioning intestinal mass that does not guarantee a sufficient absorption of nutrients.

The prerequisite for considering the HPN indication appropriate is that oral nutrition or HEN has been excluded and that the patient receives less than 60% of the nutritional needs with an inability to maintain weight and satisfactory nutritional condition.

ELEGIBILITY

Short-term HPN candidates are patients with:

1. Neoplastic diseases in the presence of the following conditions:

- when there are severe nutritional/digestive deficiencies, after-effects of aggressive oncological treatments, with no evidence of disease in progress
- in outpatients with ongoing neoplasia in which the precarious nutritional conditions compromise the implementation of appropriate cancer therapy
- patients with advanced disease where the final prognosis is conditioned more by malnutrition/pituitary pituitary by disease progression, provided the patient's quality of life is acceptable

2. Infrequent diseases with short/medium-term Parenteral Nutrition indication:

- transient severe malabsorption
- digestive fistulae.
- hyperemesis gravidarum.
- immune disorders.

Short-term HPD candidates are patients with:

- Short bowel syndrome (results of large intestinal resections following mesenteric infarction, Crohn's disease, actinic enteritis, volvulus, adherence syndrome, etc.).
- Alterations in intestinal motility (pseudo-obstruction, late outcomes of actinic enteritis, toxic and ischemic neuropathies)
- Serious non-treatable malabsorption (non-responder celiac disease...)
- Rare diseases (congenital metabolic errors leading to malabsorption, scleroderma, lymphangiectasia, amyloidosis, VIP syndrome).

Eligibility also requires a treatment requirement of at least a few months and hemodynamic and metabolic stability.

REQUIREMENTS

HPN patients should be assisted by a multidisciplinary team including: pharmacists, dieticians, nurses, and other professionals involved in home care (rehabilitation and language therapists). Each professional should have a dedicated job profile with specific skills. Next to the patient, the presence of a family member and the family doctor is required for the diagnosis and treatment of any potential problems. Patients discharged into parenteral nutrition at home, or their families, should receive a care protocol that includes the monitoring and training program.

Patients should also receive appropriate training and an information manual from the various professionals who have gained relevant expertise in support:

- management of the parenteral nutrition infusion system and administration regime
- information about nutrient development procedures, use of the infusion pump and possible risks, methods for solving the most frequent problems through the use of the instruction manual (complete with appropriate pictures)
- Telephone numbers (emergency and routine) to contact professionals able to understand the needs and problems of patients under parenteral home treatment

- Organisation about the delivery of equipment, materials and nutrients which must be carried out with appropriate specific contact with the external home care provider possibly involved
- Patients and/or caregivers should be given the questionnaire “Questionnaire for assessing the knowledge of the caregiver and/or caregiver on parenteral nutrition management”.

HPN CONTRAINDICATIONS

HPN is contraindicated in all cases where an enteral AN approach can be achieved, however sufficient to fully meet the nutritional needs of the patient. Relative contraindications may be severe coagulopathies or thrombophilic syndromes, in which the risks and benefits of HPN must be assessed on a case-by-case basis.

GASTRIC CANCER PATIENT FOCUS

For the patient with gastric cancer the nutritional aspect is particularly relevant, given the central role that the stomach plays in the general process of nutrition and digestion.

Nutritional problems accompany patients from the earliest stages of the disease: 40% do not finish the pharmacological treatments and are forced to stop chemotherapy because they are too debilitated. In the patient undergoing resection of the stomach for a neoplasm, the causes of malnutrition common to cancer patients are added to the alterations in the digestion process due to the total or partial lack of the organ. A further problem of these patients is the side effects of adjuvant therapies, used after surgery to reduce the risk of recurrence. Although these treatments can significantly reduce cancer mortality in the five years following the start of treatment, they involve a corollary of significant side effects such as nausea, vomiting, anemia, abdominal pain, diarrhoea, stomatitis and taste changes that interfere with proper nutrition.

Early diagnosis of malnutrition or risk of malnutrition and early intervention are crucial to improve the prognosis and treatment of gastric cancer patients.

HAN TREATMENT ELEGIBILITY FOR GASTRIC CANCER PATIENT

Are eligible for nutritional support with HAN:

- Patients with weight loss $\geq 5\%$ in the last 6 months, candidates for major abdominal surgery
- Patients with oral ingestion absent or less than 75% of nutritional needs (AIOM/ SINPE: $<60\%$ for more than 1 or 2 weeks)
- Patients who are candidates for chemo/radiotherapy treatment, where a state of malnutrition or hypophagia precludes proper oncological treatment
- Patients with aphagic or intestinal subocclusion who, despite having exhausted all oncological therapeutic possibilities, have a Karnofsky performance status $\geq 50\%$ and a survival prognosis > 60 days.
- Disease-free patients, but with surgical or chemotherapeutic treatment results in the first digestive tract or gastrointestinal tract that limit nutritional autonomy.
- Patients with clinical, family and environmental home conditions compatible with home nutrition

NUTRITIONAL GUIDELINES FOR GASTRIC CANCER PATIENTS

NON-MALNOURISHED PATIENT

Non malnourished patients (with a weight loss $< 10\%$) are candidates for post-operative artificial nutrition only if a period of fasting or significant hypo-nourishment for more than 10 days is expected.

PRE-SURGICAL STAGE

All patients who are candidates for major surgery undergo nutritional screening: patients with an NRS score ≥ 3 are directly included in a personalized nutritional program for the entire perioperative period, while patients with NRS < 3 are included in a standardized program with monthly monitoring.

In malnourished patients who are candidates for surgery with a high risk of post-operative complications, perioperative nutritional support is indicated. This support should start 15 days before surgery, if there are no contraindications to postpone surgery, and continue for at least 30 days after surgery or until oral feeding is resumed with at least 60% of the energy-protective requirements. Pre-surgical enteral nutrition with immunonutrients (arginine, omega-3 fatty acids and nucleotides) for a duration of at least 5-7 days is recommended for neoplastic patients undergoing surgery greater than the abdomen, regardless of the nutritional status of the subject (grade A recommendation). (reduction of postoperative infectious complications and hospitalisation times).

The introduction of a carbohydrate-rich drink 2 hours before the start of surgery reduces insulin resistance and attenuates post-operative protein catabolism. (reduction of hunger, thirst and anxiety)

POST-SURGICAL STAGE

It is preferable to keep the intestine at rest during the early post-operative phase by practicing parenteral or enteral nutrition through access downstream of the anastomosis. In the post-operative phase, a normal diet without restrictions is recommended, starting with minimum nutritional quotas and increasing the intake according to tolerance every 3/4 days.

MEDIUM AND LONG TERM NUTRITIONAL FOLLOW UP

In the post-surgical setting, nutritional complications can occur: a dietary examination is therefore necessary 1 month after discharge and then subsequent checks every 2-3 months until any complications are normalized (usually within 1-2 years). The most common problems are gastric stasis, dumping syndrome and lipid malabsorption.

NUTRITIONAL APPROACH OF PATIENTS WITH ADVANCED DISEASE

Start-up of the screening and nutritional counselling process with evaluation of the most suitable nutritional supplement according to the patient's condition.

Medium/long-term parenteral nutrition is proposed to those patients in whom the condition of malnutrition and intestinal insufficiency limits survival and quality of life more than the course of the disease.

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