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Guidelines on Artificial Nutrition Versus Hydration in Terminal Cancer Patients

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ABSTRACT

Whether a terminally ill cancer patient should be actively fed or simply hydrated through subcutaneous or intravenous infusion of isotonic fluids is a matter of ongoing controversy among clinicians involved in the care of these patients.

Under the auspices of the European Association for Palliative Care, a committee of experts developed guidelines to help clinicians make a reasonable decision on what type of nutritional support should be provided on a case-by-case basis. It was acknowledged that part of the controversy related to the definition of the terminal cancer patient, since this is a heterogeneous group of patients with different needs, expectations, and potential for a medical intervention. A major difficulty is the prediction of life expectancy and the patient's likely response to vigorous nutritional support. In an attempt to reach a decision on the type of treatment support (artificial nutrition vs. hydration) which would best meet the needs and expectations of the patient, we propose a three-step process: Step I: define the eight key elements necessary to reach a decision; Step II: make the decision; and Step III: reevaluate the patient and the proposed treatment at specified intervals. Step I involves assessing the patient concerning the following: 1) oncological/clinical condition; 2) symptoms; 3) expected length of survival; 4) hydration and nutritional status; 5) spontaneous or voluntary nutrient intake; 6) psychological profile; 7) gut function and potential route of administration; and 8) need for special services based on type of nutritional support prescribed. Step II involves the overall assessment of pros and cons, based on information determined in Step I, in order to reach an appropriate decision based on a well-defined end point (i.e., improvement of quality of life; maintaining patient survival; attaining rehydration). Step III involves the periodic reevaluation of the decision made in Step II based on the proposed goal and the attained result. *Nutrition* 1996;12:163–167

Key words: parenteral nutrition, hydration, terminal cancer, palliative care

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INTRODUCTION

Anorexia and the continued weight loss of the cancer anorexia/cachexia syndrome are common symptoms in advanced cancer patients and occur in 30–70% of patients who are admitted to hospice programmes.[1–3] The appropriate use of artificial nutrition (AN) or simple hydration (SH) in such patients with advanced and terminal cancer has not been fully assessed.

Patients are considered as terminal cancer patients when their cancer is beyond any available oncological treatment. The patients are often given AN or SH because of the presence of malnutrition or the impairment to eat and presence of dehydration. The main goal of AN, which includes tube feeding, or more frequently parenteral nutrition (PN), is to maintain or restore nutritional status and to correct or prevent malnutrition-related symptoms. The main goal of SH, which includes isotonic fluids usually administered orally or even via a peripheral vein or subcutaneously, is to meet the water/electrolyte baseline requirements and to correct or prevent symptoms related to dehydration.

AN and SH differ in that AN, particularly PN, is more sophisticated and expensive, requires compliance by the patient, family, and health care provider, and often requires a training period which may include hospitalization. AN may prolong survival in those patients with a slow-growing tumor where survival time depends more on nutrient intake than on the progression of the tumor itself.

SH is aimed at avoiding water/electrolyte deprivation symptoms in dying patients, and represents a simple and inexpensive way of keeping patients at home as comfortable as possible without any expectation of prolonging survival. The current controversy as to the indications for using AN or SH in terminal cancer patients is influenced by the heterogeneity of patients potentially suitable for either treatment, the different background knowledge and comfort level of the physicians involved in the care of these terminally ill patients, and different cultural attitudes among physicians and families, which may range from observational nihilism to unnecessary treatment, resulting in either under- or over-treatment.

An indirect estimate of the magnitude of the patient population potentially requiring AN or SH may be obtained from registries in those countries that record the percentage of cancer patients on home parenteral and enteral nutrition (HPN).[4–10] In some centers, cancer patients account for the highest relative or absolute percentage of all patients receiving HPN.[4,6,7,11,12] The periodic reanalysis of the American[13] and Italian[4] HPN experience has shown a progressive upward shift in the percentage of cancer patients from 35–36% before 1990 to 46% and 56% after 1990.

In contrast, we currently lack quantitative estimates of the percentage of patients receiving hydration through the intravenous[14] or subcutaneous[15] routes, although these techniques are used on a routine basis.

The European Association for Palliative Care sponsored an expert committee of clinicians from different specialties involved in the care of terminal cancer patients. Their aim was to determine whether AN or SH is recommended in the terminal phase of the disease. Committee members consisted of physicians, an HPN nurse expert, a relative of a cancer patient treated with HPN, and a young patient presently on HPN who also gave an account of her personal cancer/HPN experience.

Due to the relative paucity of scientific information and the intrinsic difficulty in reaching a consensus on such a difficult topic between the various decision-makers (patients, relatives, and physicians), the Committee decided to present the pivotal elements involved in making such decisions, avoiding rigid treatment guidelines. The Committee felt that any policy on beginning, continuing, or withdrawing AN or SH should include the following three steps necessary for a comprehensive patient-driven decision:

STEP I. Define the eight key elements necessary to reach a decision

Patient assessment is needed in the following areas:

1) Oncological/Clinical Condition;
2) Symptoms;
3) Expected Length of Survival;
4) Hydration and Nutritional Status;
5) Spontaneous or Voluntary Nutrient Intake;
6) Psychological Attitude;
7) Gut Function and Route of Administration;
8) Need for Special Services Based on Type of Nutritional Support Prescribed.

STEP II. Make the decision

STEP III. Reevaluation of the patient and therapy at specified intervals

These elements will now be discussed in detail.

STEP I. DEFINE THE EIGHT KEY ELEMENTS NECESSARY TO REACH A DECISION

1) The Oncological/Clinical Condition

Assessment of patient's age, performance status, other diseases unrelated to cancer (such as renal failure, diabetes, and congestive heart failure, etc.).

Assessment of tumor site, histology, stage and dominant site of disease; slow- versus fast-growing, possibilities of reevaluation for further oncologic therapy.

2) Symptoms

(a) Depending on the level of dehydration, symptoms include: thirst, dry mouth, altered mental status (sometimes secondary to opiod metabolites), constipation, postural hypotension, asthenia.

(b_1) Symptoms resulting from protein-calorie malnutrition include weakness and physical inactivity or fatigability, anorexia, chronic nausea and early satiety, dysgeusia, psychosis/depression, irritability, loss of positive body image, loss of concentration and critical judgment, hypothermia, noise and light hypersensitivity, paresthesia, loss of autonomy, decrease in libido, etc.

(b_2) Symptoms influencing food ingestion include: odynophagia, pain, nausea, vomiting, belching/eructations, etc.

(c) Symptoms independent of nutritional status include pain, chronic nausea or vomiting, dyspnoea, pruritus, depression, etc.

An effort should be made to evaluate the presence/absence of symptoms, their degree of severity, and possible symptom control through a pharmacologic approach. Proper evaluation at this point is of vital importance because at this stage of the disease the realistic goal is symptom palliation. More rarely is the simple prolongation of life achievable and desirable. Identification of symptoms and their relevance makes it easier for the clinician to provide a treatment regimen tailored to the expectations of the patient.

In a recent prospective study, McCann and colleagues[20] showed that less than 50% of terminally ill cancer patients

experienced hunger or thirst. Symptoms of hunger, thirst, and dry mouth can be alleviated through the provision of appropriate amounts of food, fluids, and/or by the application of ice chips, lubrication to the lips and appropriate oral hygiene.[17]

3) Expected Length of Survival

Unfortunately, there is not always sufficient information to accurately predict the length of survival in terminal patients. Note that the definition of "terminal" cancer patient only identifies a patient who has exhausted all available oncologic therapies, irrespective of length of survival, which may range from a few days to several months. Median survival time has been estimated for many advanced stage tumors, but the range around the median value is so wide that it cannot be applied to the individual patient.

Bruera et al.[18] have shown that dysphagia, cognitive failure, and weight loss correlate with a length of survival of $\leq$ or >4 wks, while others have stressed the independent role of both dyspnoea and dry mouth and the Karnofsky performance status scale.[19,20] These data need to be confirmed in further trials with larger numbers of patients. Furthermore, no assessment has been made of whether these markers are simply prognostic indicators of survival or if they have an etiologic role (i.e., dysphagia and weight loss), in which case they could be tentatively reversed or attenuated by AN.[21]

Patients should be classified into three classes with reference to survival: (a) short-term survival (from a few days to a few weeks); (b) medium-term survival, (from a few weeks to a few months); and (c) long-term survival (several months). Such a classification has been accepted on the basis of the following considerations: i) nutritional benefits are limited if AN is delivered only for a very short time; ii) if the expected length of survival is very short, there is not enough time for a proper AN plan since it is usually necessary to train these patients in hospital or under home specialised supervision; such training occurs over a period of 1 to 3 weeks, especially for PN; and iii) if the main endpoint is to keep the patient alive, it must be realised that this goal is unattainable if, due to the malignancy, survival time is less than that allowed by tolerance of starvation, which ranges from 2 to 3 months in healthy subjects and considerably less in patients with advanced cancer (G. Love, personal communication).

It must also be considered that patients can shift spontaneously from one predicted group to another as a consequence of the nutritional support provided.

4) Hydration and Nutritional Status Assessment

(a) Dehydration—Signs observed include the following: poor tissue turgor, dry mucous membranes, enophthalmus, oliguria, constipation, confusion, somnolence, fatigue, and vascular collapse, etc. Laboratory tests reveal an increase in serum electrolytes (sodium), serum osmolality, serum urea and creatinine, and hemoglobin levels.

(b) Protein-calorie malnutrition—Signs observed include the following: emaciation, subcutaneous fat loss, muscle wasting, oedema, hepatomegaly, objective anorexia, bradycardia, hypotension, dyspigmented, sparse, and easily plucked hair, flaky-paint dermatitis, decubitus ulcers, asthenia, generalised weakness. Body composition parameters show a decrease in measurements of the following: body weight, mid-arm fat area, and mid-arm muscle area. Laboratory values also show a decrease in serum albumin, serum transferrin, serum retinol binding protein, nonessential/essential amino acids, and creatinine/height index.

(c) Both protein-calorie malnutrition and dehydration.

(d) No protein-calorie malnutrition or dehydration.

5) Spontaneous or Voluntary Nutrient Intake

(a) Normal nutrient intake (with reference to the Recommended Dietary Allowance [RDA][22] or the Harris-Benedict equation[23]).

(b) Persistent hypophagia. Causes include upper gastrointestinal (GI) obstruction, anorexia, iatrogenic hypophagia. Hypophagia is defined if nutrient intake is $<75\%$ of RDA and/or $<75\%$ of resting energy expenditure by Harris-Benedict equation).

6) Psychological Attitude

(a) The patient is totally unaware of his/her condition and passively relies on the decision of the physician.

(b) The patient is aware of his/her clinical status and actively interacts with the physician in any decision.

Special attention must be paid to the impact of anorexia and/or food intake on the patient's mood and the potential impact of providing nutritional support on the patient's psychological state. Anorexia and/or the impossibility to eat and enjoy a meal may be associated with a sense of hopelessness or the thought of impending death. In some cases providing nutrition alleviates the patient's loneliness and desperation, while in others it can cause anxiety, especially when the organizational effort required by the patient is substantial, working against his or her immediate need to deny illness. Anorexia and weight loss are also perceived by the family as a sign of deteriorating health and may heighten their anxiety.[3] Consequently, the family identifies feeding the patient as a concrete way of helping him/her and of keeping him/her within the family. Family members usually favor the use of AN unless they clearly understand that the artificial nutritional support is only prolonging the patient's suffering. They have been taught that the sequence of loving-feeding-loving is tightly connected. This attitude by family members must be considered because of their importance to the patient in influencing any decisions made and their assistance in management of home care.

Irrespective of ethical concepts of autonomy which champion both informed consent and respect for the desire of those individuals who do not wish to know about their illness, in 33–58% of cases[16,24] alterations in the patient's mental status or level of consciousness or weakness oblige investigators to make decisions without the patient's cooperation.

7) Gut Function and the Potential Route of Administration

Complete nutrition can be administered entirely by mouth, via a tube (nasogastric, pharyngostomy, gastrostomy, or jejunostomy), or intravenously (via peripheral or central vein). There is essentially no difference in the nutritional benefit obtained from the administration of nutrients through the enteral or parenteral route.[21] Although the use of enteral nutrition is more physiological, AN better supports the integrity of the digestive tract and the immune system, most of which is located in the gut mucosa. The choice of approach to the digestive tract, when voluntary nutrition by mouth is precluded, is determined by what is endorsed by the physician and by the preferences of the patient, and obviously depends on the expertise within the institution. The advantage of enteral nutrition is its simplicity, low cost, and lower risk to the patient. There is no doubt that if the gut is working the enteral route is better.

Parenteral nutrition usually requires a central vein, as advanced cancer patients rarely have residual peripheral veins able to tolerate long-term infusions of hyperosmolar mixtures. An infusion pump is suggested for cyclic nocturnal HPN. Iso-

tonic water/electrolyte solutions may also be administered subcutaneously through fine-bore needles, without disturbing the patient.

Patients can be classified as:

(a) A patient with a working gut. Nutrition or hydration may be delivered orally or via fine bore tube through the nose or an external stoma. In cases where oral nutrition/hydration is administered, careful attention must be paid to the preparation and presentation of the food, together with other factors (including place, time and social life) that make a meal more attractive, thus encouraging voluntary alimentation. In these patients, use of progesterone derivatives could have symptomatic effects in addition to inducing weight gain, while corticosteroids affect asthenia, anorexia, and nausea but do not produce any nutritional advantage.

(b) A patient with a nonworking gut. Intravenous (preferably central vein) is mandatory for AN while SH may be delivered via AN intravenous or subcutaneous route.

8) Need for Special Services Based on Type of Nutritional Support Prescribed

Parenteral nutrition is very expensive and its use at home requires specific training of the patient and family and the periodic surveillance by health care providers experienced in the administration and monitoring of nutritional support.

Enteral nutrition and SH are easily managed at home under the care of the family's attending physician, with occasional consultation from a nutrition specialist.

STEP II. MAKING THE DECISION

The final decision on when and whether to provide nutritional support emerges from a comprehensive evaluation of all the points in Step I. Let us suppose we have a patient with a relatively good performance status who is severely hypophagic because of a slow-growing recurrent cancer in the upper GI tract that is refractory to any further treatment. The patient has a localised disease and the main symptoms and signs are related to hypophagia and malnutrition (pain and vomiting while attempting to eat, weakness, and progressive weight loss). This patient is obviously suitable for a trial of AN, preferably by means of tube feeding. This treatment may be effective in preventing further nutritional deterioration, in correcting some manifestations of malnutrition, and in maintaining the patient's quality of life, even if only for a short time.

In contrast is the bedridden patient who has developed mild jaundice from massive liver metastasis, abdominal distension, and vomiting due to intermittent multiple bowel obstructions resulting from peritoneal carcinomatosis and requires intensive pharmacologic therapy to control pain, pruritus and vomiting. Vigorous nutritional support is uncalled for, and the preferred approach is SH to prevent dehydration.

Obviously there are many types of clinical situations in between these two extremes, for example, in patients where the main cause of hypophagia is not determined. In such cases, the patient may stay alive only for a few weeks (or possibly even longer if the hypophagia is corrected); symptoms are multiple and can be partially palliated by drugs, and there is no obstruction in the upper GI tract, yet the patient refuses tube feeding.

Usually, if the majority of patients are in Class a, and are expected to have a short-term survival and include the elements of points 2–4 of Step I, simple hydration is indicated in the form of isotonic fluid replacement. For those patients in Class b who are expected to have a medium-term survival, the probable indication would be PN. If in doubt, AN or SH may be used in a test situation for a limited period. Finally, in some cases, the patient's condition may be such that neither approach is likely to be of benefit.[25]

Once the decision to support the patient with AN or SH has been defined by objective consideration of the points in Step I, the procedure to be undertaken must be explained to the patient and relatives. On analysis of all eight key elements, the patient must be informed of the physician's decision and offered the option to accept or refuse treatment. However, when it is particularly difficult to make the decision between AN or SH on medical grounds, the patient should, if possible, be directly and actively involved in deciding what form of treatment will be provided.

Relatives are usually involved in deciding what type of supplementation will be offered for different reasons:

1. In the case of AN, active family cooperation is necessary;
2. Relatives are often mediators between the patient and the physician. If the patient is not fully aware of his/her condition (a common situation in several European countries), or if adequate information is not possible or desired, relatives become the physician's true interlocutors. Only under these circumstances and if relatives are not available should the decision lie solely with the physician.

STEP III. REEVALUATION OF THE PATIENT AND THERAPY AT SPECIFIED INTERVALS

Upon review of the patient's condition, a definitive decision on type of nutritional support can be reached. It is important to stress that any decision involving active treatment (e.g., PN) or a more simple approach (e.g., SH) should be periodically revised. This may be done at fixed time intervals or as the patient's condition changes.

Returning to our previous example where tube feeding was indicated, it is possible that the onset of an acute episode (e.g., an esophago-bronchial neoplastic fistula) would dictate a reevaluation of the real need for active nutritional support. The therapeutic/palliative potential of AN and SH should be monitored to establish whether the expected goals have been attained. This is particularly important because many palliative measures such as SH and PN can prolong survival, but this nonintentional effect should be balanced by an acceptable quality of life.

CONCLUSION

When faced with advanced cancer patients, the most common goals for the health care provider are: palliation of severe symptoms, discharge from the hospital, and, if possible, the shift to a regimen of home care. Sometimes these goals can include the goal of prolongation of survival if the quality of life is acceptable to the patient or if this is one of the patient's expectations. The determination of whether AN or SH fulfills these goals is difficult. Prospective protocols aimed at evaluating the impact of AN and/or SH on the quality and quantity of life are required.

The role of nutrition and/or simple hydration is an area for future investigation, and one in which well-defined end points should be planned.

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