

# A Review on Oral Health and Nutritional Intervention in Elderly Adults

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**Abstract:** *Proper nutrition is essential to the maintenance of overall health and condition of oral tissues. Management requires a holistic approach, and underlying causes such as chronic illness, depression, medication and social isolation must be treated. Patients with physical or cognitive impairment require special care and attention. Oral supplements or internal feeding should be considered in patients at high risk or in patients unable to meet daily requirements. Geriatric medicine and dentistry have the responsibility of enabling the older patient try contribution to our world by appreciating their problems and providing adequate treatment. This article summarises the various treatment modalities for improvement in nutritional status of patients and discusses the possible modifications in dietary pattern.*

## 1. Introduction

Nutrition is the process of providing proper food elements for maintenance of health and growth. <sup>[1]</sup> Proper nutrition is essential for maintenance of health and comfort of body in general and oral health in particular. Geriatric patients need partial or complete correction of oral health and masticatory apparatus. Age related medical problems compounded with inability to eat, render the old aged patients to nutritional deficiency. <sup>[2]</sup> A referral to a dietician should be made as soon as malnutrition is diagnosed or identified as a possibility. A pharmacist may review the patient's medications to determine the presence of drug-nutrient interactions (many medications can cause anorexia or alter taste or appetite), and a multidisciplinary team specializing in nutrition should be consulted. <sup>[3]</sup>

### Nutritional Objectives<sup>[4]</sup>

- 1) To establish a balanced diet which is consistent with the physical, social, psychological and economical background of the patient.
- 2) To provide temporary dietary supportive treatment directed towards specific goals such as caries control, postoperative healing, or soft - tissue conditioning.
- 3) To interpret factors peculiar to the denture - age group of patients which may relate to or complicate nutritional therapy.

### Treatment<sup>[4]</sup>

A fivefold plan of treatment that may be used in nutritionally oriented tissue conditioning consists of:

- 1) Examination by physician,
- 2) Use of physical tissue conditioning agents,
- 3) Dietary advice,
- 4) Motivation, and
- 5) Dietary supplementation.

**Medical examination:** An examination by the patient's physician is advisable and is always indicated if an extensive dietary change is anticipated or if frank systemic or nutritional disease is apparent. Such an examination may benefit the dentist in two ways:

- 1) It may reveal concurrent medical problems which interfere with dental and general health or utilization of nutrients.
- 2) It may reveal specific medical problems such as diabetes or anaemia which may be masked by any dietary treatment other than massive, concerted nutritional therapy.

**Physical tissue - conditioning agents:** When existing dentures are retained during a program of tissue conditioning, the dentures should be restored to an acceptable occlusal vertical dimension and occlusal relation. The basal seat area of the dentures should be generously reduced and an ethyl methacrylate lining material applied periodically (twice a week), relieving areas of tissue impingement as they occur.

The use of soft liners is a substitute for the more effective procedure of leaving dentures out of the mouth during the period of tissue recovery. If monilial infection is present, the latter procedure is recommended because denture sterilization is difficult unless ethylene gas sterilization is available. Massage of the oral tissues, including the tongue, with an antifungal agent and regular use of mouth wash that has antifungal properties are also helpful in correcting monilial infection of the oral cavity.<sup>[5]</sup>

#### **Provide oral supplements:**

High - calorie, nutrient rich supplements are a good intervention for people who are unable or unwilling to eat. It has been shown that improvements in body weight and survival have been shown in patients receiving oral supplements.<sup>[6]</sup> For example, one study of illness related to malnutrition in older adults concluded that "oral nutritional supplements have a greater role than dietary advice in the improvement of body weight and energy intake."<sup>[7]</sup> There are a variety of supplements, including those created for patients with diabetes, chronic obstructive pulmonary disease, renal disease, and liver disease.

Some of these products are enriched with fibre; supplements are also available as pudding, soups, coffee, and clear liquids. Supplements are not designed to replace meals but should be provided between meals (not within the hour preceding a meal) and at bedtime. Instruct patients and caregivers in how to take in additional calories and protein.

#### **Alleviate dry mouth:**

Instruct patients with dry mouth to avoid caffeine; alcohol and tobacco; and dry, bulky, spicy, salty, or highly acidic foods. Actions that can be taken by the patient include eating sugarless hard candy or chewing gum to stimulate saliva (not appropriate for patients with dementia or dysphagia), applying petroleum jelly to the lips and dentures, and taking frequent small mouthfuls of water.<sup>[3]</sup>

#### **Dietary advice and motivation**

Advice and motivation must be considered concurrently since one reinforces the other. Because we are primarily concerned with the mouth, our discussion of nutrition should be oriented toward oral tissue preservation and healing, with emphasis being placed upon the abnormal stress imposed upon a denture foundation by appliances; the necessity of maintaining maximum tissue health; the relation of tissue health to nutrient supply; and the consequences of tissue abuse. A booklet published by the Detroit Dental Clinic Club, Nutrition for the Dental Patient,<sup>[8]</sup> is an excellent educational aid which presents basic nutritional information to the patient in a readily "digestible" form.

Dietary advice to complete denture patients, unlike that designed for dietary control of caries, need not involve an extensive survey of existing eating habits. Indeed, such a survey tends to create patient resistance.

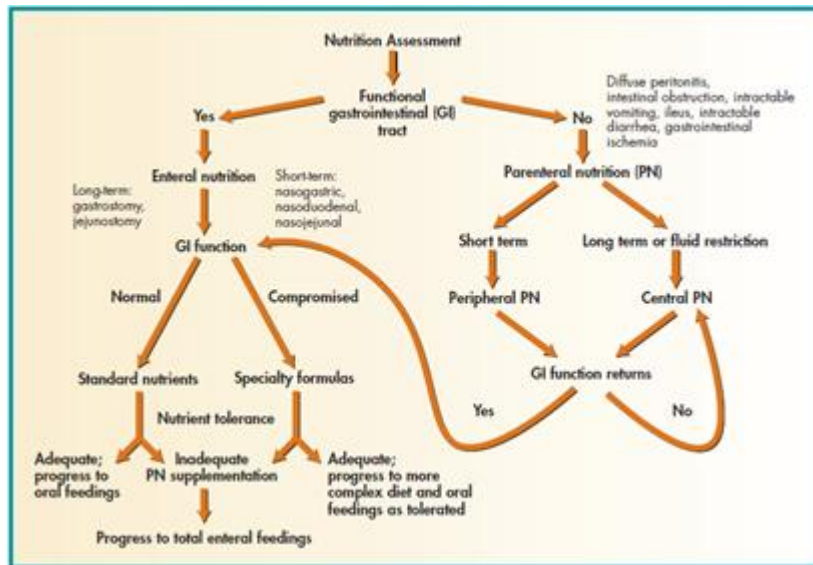
A far better approach, in the absence of specific health problems, is a discussion of shortcomings in the average diet of the denture - age patient, emphasizing the common problems of carbohydrate excess with deficiency of animal protein, calcium, thiamin, vitamin A, and ascorbic acid. It should be emphasized that regulation of these and other nutritional elements requires neither specialized fad diets nor drastic change in daily routine. Rather, it should be pointed out that all nutritional elements are readily available from normal foods and that these nutritional elements of the diet are interrelated and often interdependent in their function. Ascorbic acid (vitamin C) furnishes an interesting example for the patient. Although the primary function of this vitamin is the regulation of collagen formation (antiscorbutic action), it is indirectly responsible for prevention of iron deficiency anemias by enhancing the intestinal absorption of iron<sup>[9]</sup> and also is indirectly responsible for preventing macrocytic anemias because of its involvement in the transformation of folic acid into the biologically active folinic acid.<sup>[10]</sup>

#### **Improve oral intake**

We can implement several strategies in the hospital setting to encourage eating at mealtimes.<sup>[11]</sup>

- Walk around at mealtimes to determine how much food is being consumed and whether assistance is needed.
- Take your breaks before or after mealtimes, whenever possible, to ensure that adequate staff are available to help patients with meals.
- Encourage family members to visit at mealtimes. Ask them to bring favourite foods from home, as long as they are in keeping with the patient's diet. Ask about the patient's food preferences.
- Suggest small, frequent meals with adequate nutrients to help patients regain or maintain weight. Ask dietary services to provide nutritious snacks.
- Remove bedpans, urinals, and emesis basins from rooms before mealtimes.
- Administer analgesics and antiemetics on a schedule that will diminish the likelihood of pain or nausea during mealtimes.
- Serve meals to patients in a chair if they can comfortably get out of bed and remain seated.
- Create a more relaxed atmosphere by sitting at the patient's eye level and making eye contact when feeding her.<sup>[12]</sup>
- Order a late food tray or keep food warm if patients are not in their rooms during mealtimes.<sup>[13]</sup>
- Help patients with mouth care and placement of dentures before food is served.

**Provide specialized nutrition support:** Older adults should be started on specialized nutrition support if they can't eat adequately and if the benefits of improved nutrition outweigh the associated risks.<sup>[14]</sup> (Figure 1)



**Figure 1:** Nutrition support algorithm

Among the risks of parenteral nutrition are catheter - related infection, hyperglycaemia, metabolic bone disease, fluid and electrolyte disturbances, and elevations in liver enzyme levels. <sup>[15]</sup> Among the risks of enteral tube feeding are aspiration pneumonia, fluid and electrolyte imbalances, feeding intolerance, and gastrointestinal disturbances.

While older adults receiving home parenteral nutrition are routinely monitored in the home setting, there may be a gap in the delivery of professional care to older patients sent home receiving tube feedings.

In a recent study of older adults receiving home enteral nutrition, complications led to unscheduled health care visits and readmissions; an interdisciplinary approach to monitoring these patients in the home is clearly needed. <sup>[16]</sup>

#### Use volunteers:

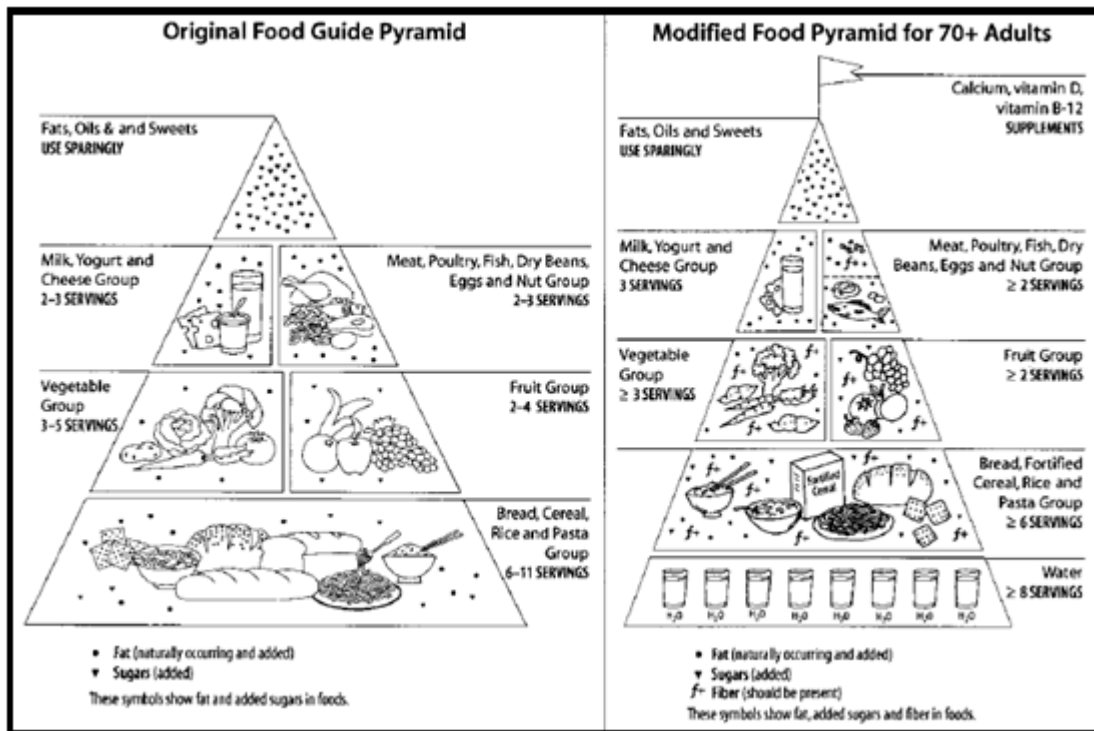
Eating is the most time - intensive activity of daily living, but trained volunteers can help set up meal trays, assist with feeding, and keep patients company during meals. It's especially important to ensure adequate staffing at

mealtimes; the failure to do so has been linked to poor care, such as spending too little time assisting people with meals (which can lead to dehydration). <sup>[17]</sup>

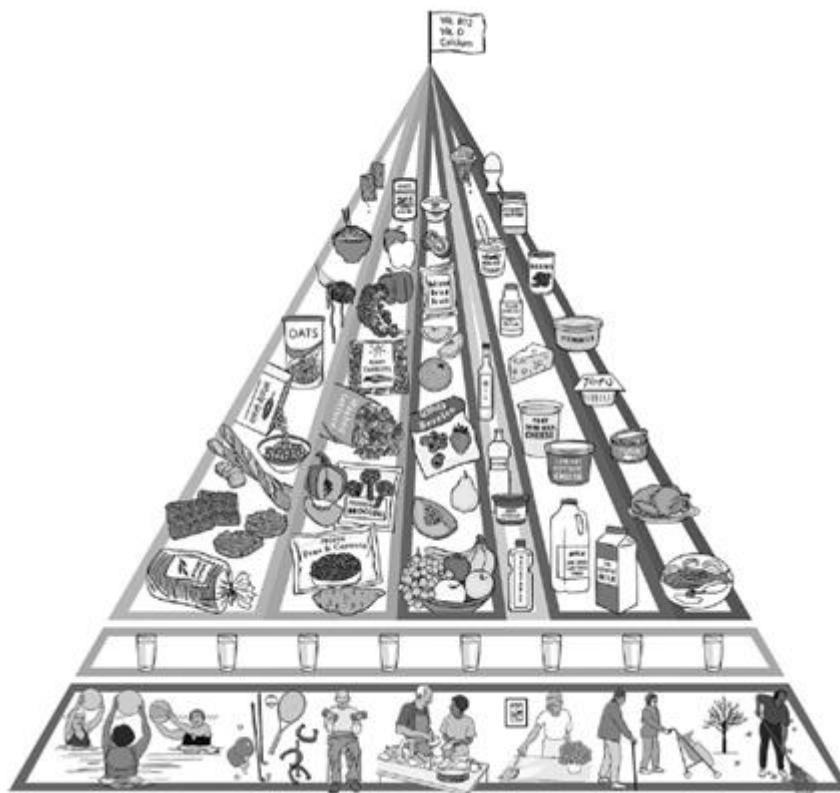
Russell *et al* in 1999 suggested Food Guide Pyramid and the modified Food Guide Pyramid [Figure 2] for adults more than 70 years of age. This was recommended for dietary needs of older adults. <sup>[18]</sup>

In modified food guide pyramid water was placed at bottom as elderly people do not drink enough water to stay hydrated. A flag was also placed at top of the pyramid which denotes need of calcium, Vitamin B12 and D because many older adults do not get enough of these nutrients in a regular diet.

Later in 2008, Lichtenstein *et al* suggested MyPyramid [Figure 3] which recommended the placement of physical activities at the bottom of pyramid. <sup>[19]</sup> More physical work will lead to more consumption of food which means better intake of nutritional supplements. Physical activity also helps maintaining muscle mass with increasing age.



**Figure 2:** The modified food guide pyramid for the elderly has a narrower base (to reflect a decrease in energy needs), while emphasizing nutrient dense foods, fiber and water. In addition, nutrient-specific supplements may be appropriate for many older people



**Figure 3:** The major features of the modified MyPyramid for older adults graphic that are different from MyPyramid are the expanded presentation of food icons throughout the pyramid highlighting good choices within each category, a foundation depicting a row of water glasses and physical activities emphasizing the increased importance of both fluid intake and regular physical activity in older adults, and a flag on the top to suggest that some older adults, due to biological changes, may need supplemental vitamins B-12 and D, and calcium.

**Foods recommended for the elderly** <sup>[20]</sup>**The five food groups**

All the nutrients necessary for optimal health in the desirable amounts, can be obtained by eating a variety of foods in adequate amounts from the following five food groups:

- 1) Four servings of vegetables and fruits, subdivided into 3 categories:
  - Servings of good sources of vitamin C, such as citrus fruits, salad greens and raw cabbage.
  - Serving of a good source of provitamin - A such as deep green and yellow vegetables or fruits.
  - Serving of potatoes and other vegetables and fruits.
- 2) Four servings of enriched breads, cereals and flour products.
- 3) Two servings of milk and milk - based foods, such as cheese.
- 4) Two servings of meats, fish, poultry, eggs, dried beans, peas, and nuts.
- 5) 5. Additional miscellaneous foods including fats, oils and sugars, as well as alcohol; the only serving recommendation is for about 2 - 4 tablespoons of polyunsaturated fats, which supply essential fatty acids.

**Diet Recommended for new Denture Wearer** <sup>[20]</sup>

The logical sequence of eating food is biting, chewing and swallowing and it is much easier for the new denture wearer to master this complex of masticatory movements in the reverse order. Consequently, food of a consistency that will require only swallowing, such as liquids, should be prescribed for the first few days after insertion of the denture. The use of soft foods is advocated for the next few days and a firm or regular diet can be eaten by the end of the week.

First post - insertion day

Vegetable - Fruit group: Juices

Bread - Cereal group: Gruels cooked in either milk or water.

Milk group: Fluid milk may be taken in any form.

Meat group: Eggs in egg-nogs, pureed meats, meat broths, or soups.

The sample menu should contain a glass of milk at least once a day.

Second and third post - insertion day

Vegetable - Fruit group: Juices, tender cooked fruits and vegetables (seedless and skinless)

Bread - cereal group: Cooked cereals, softened breads boiled, rice, noodles and macaroni.

Milk group: Fluid milk and cottage cheese.

Meat group: Chopped beef, ground liver, tender chicken/fish in a cream sauce, scrambled eggs, thick soups, etc.

The sample menu must include butter or margarine, a glass of milk at least once a day.

Fourth day and after

By the fourth day, or as soon as the sore spots have healed, firmer foods can be eaten in addition to the soft foods. These should ideally be cut into small pieces before eating. The sample menu must contain butter or margarine and a glass of milk.

**Nutrition counseling and dietary guidance for the elderly**

- Since denture construction requires a series of appointments, dietary analysis and counselling can be easily incorporated into the treatment sequence.
- The patient should be urged to see their physician for more detailed diagnostic procedures and treatment, when severe deficiency disease of any kind is present. On the other hand, advice can be given properly by the dentist, when there is obvious excessive use of cariogenic foods, evidence of imbalanced diets likely to lead to difficulty, or minimal suggestive clinical signs coupled with compatibly poor dietary habits.

**2. Conclusion**

One of the most important factors of a satisfactory prosthetic service is the nutrition of the patient. Dietary supplements and specific diets should be suggested to maintain the nutritional health of edentulous patients throughout the course of their treatment for prosthetic restorations.

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