

Elderly Food and Nutrition

Gaurav Popli

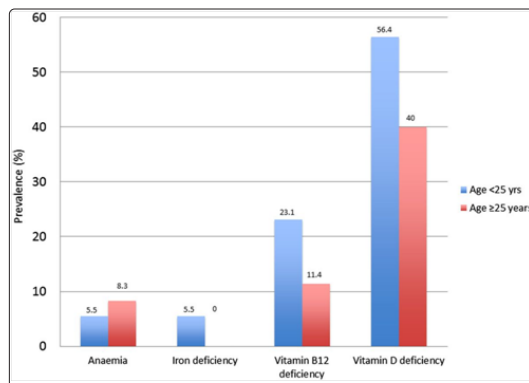
Bharti Vidyapeeth (Deemed) Dental College and Hospital, India

Corresponding author

Dr. Gaurav Popli, Bharti Vidyapeeth (Deemed) Dental College and Hospital, Pune, India. E-mail: gpfieb@rediffmail.com

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Ageing (and related diseases) may be described as a process which results from impaired immunological, genetic, neurological or endocrinological functions. Oxidative mechanisms may play an important role in the ageing process. It is important, therefore, to emphasize the relationship between health and nutrition in the elderly [1].



According to WHO, nutrition is the intake of food considered in relation to the body's dietary needs [2]. It is especially important to give attention to it in the elderly as the nutritional needs of the body alters because of physiological, medical, social, psychological changes in the old age which makes food and nutrition and its intake and acceptance in elderly as challenge because their nutritional requirements are not well defined and both lean body mass and metabolic rate decline with age, an older person's energy requirement per kilogram of body weight is also reduced.

Physiological changes

- Loss of teeth
- Decreased Neuromuscular coordination
- Impaired hearing and failing vision.
- Anorexia.
- Change in body composition.
- Change in gastro-intestinal tract.
- Change in cardiovascular system.
- Change in respiratory function.
- Change in renal function.
- Change in skeletal tissue.

Globally seen the nutrition found in elderly is of concern. The prevalence of malnutrition in north American, European, Asian, Australian and Latin American hospitals range from 20 to >50%. Many countries in asia are dealing with rapidly aging populations and some are in a nutrition transition as people shift from rural to urban settings [3]. As a result of the rapid demographic and environmental change, many are experiencing rising health care costs as a consequence of increased rate of non-communicable disease such as diabetes, cardiovascular diseases and COPD. Malnutrition refers to both under nutrition and over nutrition though the latter is commonly associated solely in developed nations. Today both form of malnutrition side by side are infiltrating countries around the world, a growing issue that is putting health experts around the globe on their toes [4].

In old age even a rich to rich of a diet filled with healthy nutrient and tasty diet will not be accepted or relished by a human body because of alterations in body system. Diet and nutrition play important roles in maintaining health and preventing disease. This is especially important for elderly adults, for whom proper nutrition plays a crucial role in helping them maintain good health and body function. Many older adults are at increased risk of inadequate nutritional intakes due to lower intakes of energy and other nutrients. Other risk factors for poor nutrition include disease, physical limitations and chewing difficulties, polypharmacy, living alone, lack of transportation and limited income. Although many seniors use dietary supplements.

Older people at high risk

Consultations for the World Humanitarian Summit found that many older people:



are separated from their families



have physical disabilities



are cut off from services



suffer physical and psychological distress



have specific health and nutritional needs



risk abuse and neglect, especially older women

Alarmed by millions of children dying or falling prey to diseases due to **malnutrition** in Asia and the Pacific, the World Health Organization (WHO) has warned that failure to address the issue is having an impact beyond health and is causing dire social and economic consequences as well. WHO emphasized that malnutrition undermines economic growth and perpetuates poverty—affecting productivity by reducing capacity to perform physical work and lessening earning ability. WHO said the double burden of malnutrition—**undernutrition and overweight**, with undernutrition more prominent in Asia—weakens people's immune systems and heightens the risk of non-communicable diseases [5].



On average, people become less hungry and eat less as they get older. Older adults experience less hunger and more fullness before meals, consume smaller meals more slowly, eat fewer snacks between meals and become satiated more rapidly after eating a normal meal than younger adults. Aging is associated with consumption of less varied, more monotonous diet. Average daily energy intake decrease by up to 30% between 20 and 80 yrs. of age. This physiologic, age-related reduction in appetite and energy intake has been termed anorexia of aging [6]. There has to be constant monitoring of the requirement of the type of nutrients on the need of the body and lifestyle with the progressing age. More attention has to give socializing meeting people, eating in restaurants in weekends, regular medical checkups of heart, kidney, bones. Even small dietary changes can make a big difference in an older adult's health and well-being. For example:

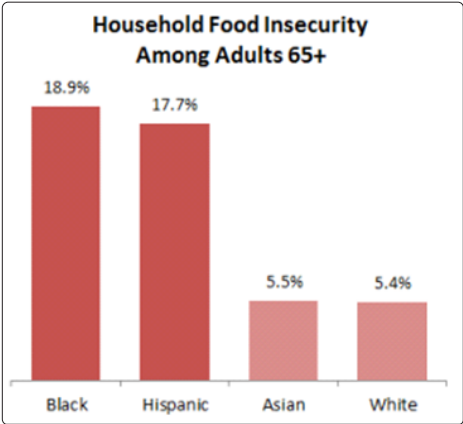
- **Engage doctors.** If your loved one is losing weight, work with his or her doctors to identify — and address — any contributing factors. This might include changing medications that affect appetite, suspending any diet restrictions until eating more effectively, and working with a dentist to treat oral pain or chewing problems.
- **Encourage your loved one to eat foods packed with nutrients.** Spread peanut or other nut butters on toast and crackers, ripe fruits, and cooked vegetables. Sprinkle finely chopped nuts or wheat germ on yogurt, fruit and cereal. Add extra egg whites to scrambled eggs and omelets and encourage use of whole milk. Add cheese to sandwiches, vegetables, soups, rice and noodles.
- **Restore life to bland food.** Make a restricted diet more appealing by using lemon juice, herbs and spices.
- **Plan between-meal snacks.** A piece of fruit or cheese, a spoonful of peanut butter, or a fruit smoothie can provide nutrients and calories.
- **Consider a supplement.** A nutritional supplement can supply extra nutrients. Discuss which type is best with doctor or dietitian.

- **Make meals social events.** Drop by during mealtime or invite your loved one to your home for occasional meals. Encourage to join programs where he or she can eat with others.
- **Encourage regular physical activity.** Daily exercise — even if it's light — can stimulate appetite and strengthen bones and muscles.
- **Provide food-savings tips.** If your loved one shops for groceries, encourage him or her to bring a shopping list, check store flyers for sales and choose less expensive brands. Suggest splitting the cost of bulk goods or meals with a friend or neighbour, and frequenting restaurants that offer discounts for older adults.
- **Consider outside help.** If necessary, hire a home health aide to shop for groceries or prepare meals. Also consider Meals on Wheels and other community services, including home visits from nurses and registered dietitians. Your local Area Agency on Aging or a county social worker also might be helpful [7].

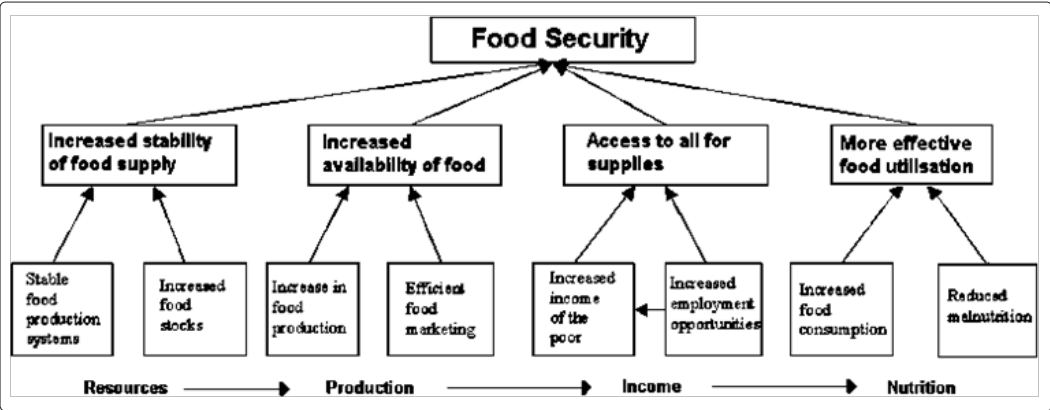
Of the subjects reported that they estimated that almost a half of people over the age of 65 years suffer from arthritis, having difficulties in either getting to the shops or in shopping. Physical conditions like arthritis results in pain and disability to perform function like shopping essential food and cooking [8]. Older people are more prone to caries, dental infections, presence of missing teeth, receding gums causes eating a painful and unpleasant experience. To overcome it food needs to be softened, creamed or made into soups to be accepted by body. Depression is quite frequently seen in old age because of which they are unmotivated to perform basic tasks like cooking and eating resulting in a change in appetite. Depression is associated with loss of social networks. A person's nutritional status is affected by refusal or forgetting of meals. Sharing of meals can cause an increase in frequency of eating and increase in dietary variety than eating alone. Eating out in restaurants has also been shown to increase the dietary intake during weekends then comparatively in weekdays, showing more energy intake. Nutrition related health is economically related as less financial status cause less chance in making good choice of choosing healthy and energy rich food. Another factor is the price of foods rich in micronutrients, which further discourages their consumption. Compounding this situation is the fact that the older people often suffer from decreased immune function, which contributes to this group's increased morbidity and mortality. Other significant age-related changes include the loss of cognitive function and deteriorating vision, all of which hinder good health and dietary habits in old age. Less availability of transport means causes limited access to shopping malls and shops to buy eating products so less food and more abnormal aging. Prevalence of Unhealthy adults are found in hospitalized patients, who are not having adequate nutritious food then those who are not hospitalized [9].

The survey in relation to economical background has shown that low income adults consume 562 less kJ of calories with respect to middle income and more the 1000 kJ of calories with respect to high income group. In old age, small, high energy intake of food should be frequently taken. There is a problem of malnutrition which is seen more in elderly because of poor appetite, inability to eat, non presence or lack of food, impaired digestion/absorption, excess nutrient loss in impaired renal function. The reduction in physical activity that generally accompanies aging decreases energy requirements. To reduce caloric intake in the elderly, consumption of "empty" calories (i.e. fats) must be reduced and consumption of nutrient-dense foods (i.e. carbohydrates and proteins) must be increased. During aging process diet has to be nutrient dense and less

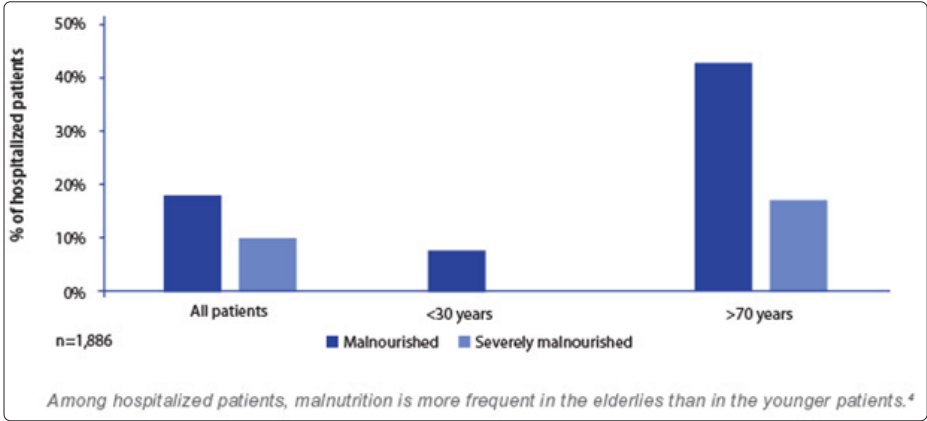
in calorie i.e., there should be more vegetables and fruits, more fibres as found in fruits and vegetables and whole grains. Additionally, as one study reported, people living alone have been identified as being at greater risk of developing nutritional deficiency. Location of supermarkets limits the access many elderly people. It is also necessary to consider the adequacy of shops, resulting in an increased requirement for adequate long-term food storage facilities. Although home helps are only one area of care for the elderly capacity to store food for longer. From the results of this study, the physical population, the inadequacy of this service has nutritional implications through inadequate disabilities in the elderly remain a predominant influence on the preparation or assistance with food shopping and food preparation.



It is necessary to ensure the nutritional well-being of all elderly persons who are at nutritional and health risk, including those who are food insecure and have even poorer nutritional and health status than those who are food secure [7]. Because of food insecurity status, older people consume less than the recommended dietary allowance. Most food insecurity programs over the last decades focused on malnutrition have overlooked the growing issue of overnutrition, particularly among the poor; consequently, obesity has epidemically increased despite a decrease in food insecurity. Food-insecure elderly persons had significantly lower intakes of energy, protein, carbohydrate, saturated fat, niacin, riboflavin, vitamins B-6 and B-12, magnesium, iron and zinc [10]. In addition, food-insecure elderly persons are 2.33 times more likely to report fair/poor health status and had higher nutritional risk.

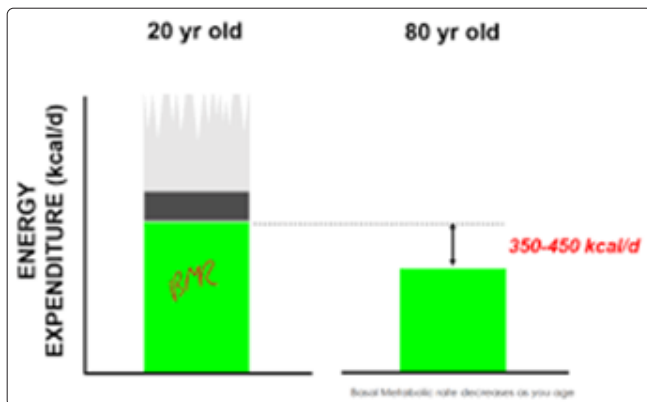


Malnutrition is prevalent among hospitalized older adults and is associated with increased morbidity, reduced quality of life and impairment in mobility and functional capacity. Malnutrition impacts older adults across the health care continuum, from independent living older adults to those in the hospital, affecting up to 60% of hospitalized older adult.



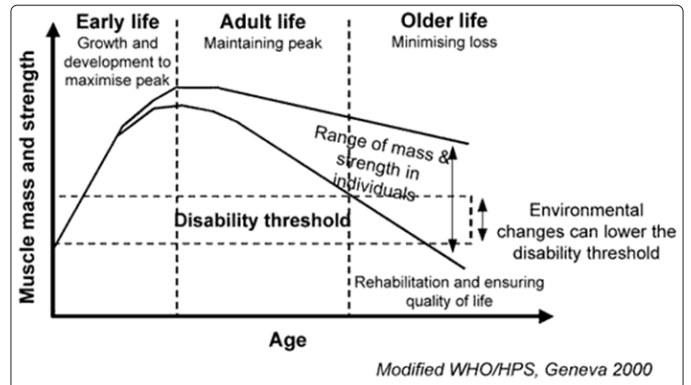
The cause of malnutrition is often multifactorial, including aging, inadequate food intake, and acute and chronic medical conditions [11]. Often, older adults do not suffer from malnutrition alone, many also struggle with sarcopenia or the loss of lean body mass (LBM) and strength or functionality. Moreover, older adults are more likely to be hospitalized for illness, injuries and surgeries, further increasing the risk for malnutrition. Up to 60% of **hospitalized** older adults are malnourished but many patients go unrecognized and undertreated. Moreover, malnutrition is associated with increased health care costs, longer hospital lengths of stay and hospital readmission rates. These results indicate that food-insecure elderly persons have poorer dietary intake, nutritional status and health status than do food-secure elderly persons. In one of the studies, researchers at the University of Iowa evaluated close to six million adult hospitalizations at 105 institutions during 2014-2015 using a large collaborative multi-institutional database to assess the rate of malnutrition diagnoses and institutional variables associated with higher rates of malnutrition diagnosis. They determined that only 5% of hospitalized adult patients had medical diagnoses of malnutrition during their hospital stay. This rate was consistently low across different hospitals. The researchers found that institutional culture influences missing malnutrition diagnoses. Hospitals with higher rates of malnutrition identification had a higher volume of patients, higher hospital ranking. A 2012 consensus statement from the Academy of Nutrition and Dietetics and the American Society of Parenteral and Enteral Nutrition (ASPEN) has led efforts to improve the recognition, diagnosis, and treatment of malnutrition in hospital settings. The consensus statement defined the current standard of care for assessing malnutrition based on the presence of at least two of the following clinical characteristics: insufficient energy intake, weight loss, loss of muscle mass, loss of subcutaneous fat, localized or general fluid accumulation, and diminished grip strength [12].

The result of **overconsumption** is overweight, impaired body functions, chronic diseases and obesity due to consumption of excess energy or excess intake of a specific nutrient. The excess energy or nutrient intake lacks the required dietary quality to adequately nurture the body and prevent chronic disease partly due to inadequate micronutrient content. In other words, diets that lead to overnutrition contain energy-dense foods that have high contents of fat and carbohydrates but lack nutrient-density.



In old age there is a reduction in the energy or calorie requirement because of decreased **BMR (Basal Metabolic Rate)** which is because of atrophied decrease in the muscle mass as skeletal musculature is a fundamental organ that consumes the large part of the energy in the normal human body, which lead to less intake of food consumption

and decrease in intake of micro and macronutrients which are essentials for the well being of the person. Oxidative stress has been implicated both in the aging process and in the pathological changes associated with Alzheimer's disease. Antioxidants, which have been shown to reduce oxidative stress in vitro, may represent a set of potentially modifiable protective factors for poor memory, which is a major component of the dementing disorders. The high rates of abnormal fasting and post challenge glucose found together with the increasing frequency of obesity and sedentary lifestyles in the population, make it likely that diabetes will continue to be a major health problem [13].



The incidence of medical and neurological complications during alcohol withdrawal syndrome in elderly alcoholics is higher than in younger **alcoholics**. Chronic alcohol abuse is associated with tissue damage to several organs. Namely, an increased level of blood pressure is more frequent in the elderly than in younger adults, and a greater vulnerability to the onset of alcoholic liver disease, and an increasing risk of breast cancer in menopausal women. A properly balanced intake of proteins, vitamins and minerals, a reduction in the number of functioning cells and the resultant slowing of metabolic processes results in a decrease in caloric requirements among the elderly [14].

Also, the reduction in physical activity that generally accompanies aging further decreases energy requirements. To reduce caloric intake in the elderly, consumption of "empty" calories (i.e. fats) must be reduced and consumption of nutrient-dense foods (i.e. carbohydrates and proteins) must be increased. The elderly are prone to developing nutritional deficiencies of vitamins, minerals, and proteins as well as energy. The addition of **Spirulina** biomass to food is of interest because of the microalga's nutritional content. Products with added microalgal biomass can provide energy and protein and can contribute to the elderly population's nutritional requirements [15].

Food in elderly has to be taken with respect to the **vitamins and minerals** present in the diet with special attention as said above of the physiological changes that occur during the aging process. The body does not respond to the nutrients given to the body during food in the same way as in the young or in the infant age. The **nutrients** that are required normally macronutrients and micronutrients.

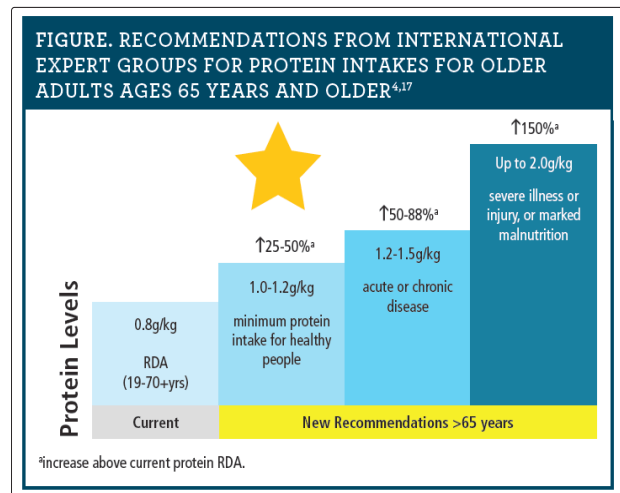
Various **macronutrients** are protein, carbohydrates and fats. It is well accepted that daily **protein** intake is an important dietary consideration to limit and treat age-related declines in muscle mass, strength, and function. Furthermore, there is a growing appreciation for the need to consider protein intake on a per-meal basis rather than

simply focusing on the total daily protein intake [16]. The existence of a saturable dose-response relationship between muscle protein synthesis (MPS) and the quantity of protein consumed in a single meal/bolus provides the rationale for promoting an even/balanced pattern of daily protein intake. A balanced/even protein intake pattern with the ingestion a quantity of protein shown to optimally stimulate MPS at each meal may be an effective strategy to alleviate sarcopenic muscle loss. In this review we examine the available evidence supporting the influence of dietary protein intake pattern on muscle protein turnover, muscle mass, and muscle function.

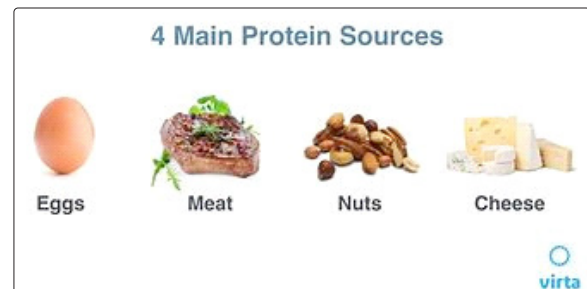
There are several practical considerations that, it is proposed, should be taken into account when translating a per-meal protein recommendation into dietary advice for older adults. Protein requirement in older people 25 percent more in younger adults. Deficiency in protein lead to a diminished system response and frequent infections is also likely to be compromised if the diet lacks sufficient protein. Protein deficiency and malnutrition can occur at any age especially during age due to illness or poor diet that may have devastating consequence in the health. Many of the body proteins have a short life, which means they are quickly used and degraded. This rapid turnover rate necessitates continuous protein production and an ongoing supply of new protein building blocks, amino acids from the diet. So there has to be a continuous supply of protein whether in young or in old age [17].

The current recommendation for protein intake in healthy subjects is 0.8g/kg body weight/day, the same as for younger adults [18]. The contribution of muscle protein to whole body protein metabolism was significantly reduced in the elderly and explained by their reduced muscle mass and lower rates of myofibrillar protein turnover. Consequently the contribution on non muscle protein especially that of visceral tissue whose rates of protein turnover are known to be more rapid was proportionally greater with aging. It is conceivable that higher protein consumption rates could compensate for the decrease in availability of muscle amino acids and spare the muscle mass, however because skeletal muscle mass plays an important role in the response to body protein and amino acid metabolism to stress such as infection or trauma. This decline in the contribution of muscle to total body protein metabolism might be a factor responsible for the reduced ability of older people to withstand such unfavourable circumstances.

Carbohydrate provides energy in the form of sugar, polysaccharides and dietary fibre. Older people consume more sugar as a way of making food more palatable to compensate the diminish in the sense of taste and smell resulting in more caries prone teeth, more dental infection. There is improper chewing and less acceptance of food. More consumption of sugar also leads to excess energy which leads to increase in body mass. The presence of polysaccharides in the diet which is present in cereals, potatoes, green bananas and legumes leads to delay in the absorption of sugar free food and improve the metabolic control of glucose which is good in diabetic people [19]. Intake of dietary fibre is for proper functioning of gut, decreases type 2 diabetes and heart diseases. Disposal of a glucose load is progressively impaired during aging. The mechanism(s) for this alteration remains unclear. Five possibilities have been raised: (1) poor diet, (2) physical inactivity, (3) decreased lean body mass in which to store the carbohydrate load, (4) decreased insulin secretion, and (5) insulin antagonism [20].



Sources of proteins in diet are bread, milk, fish and pork.



Mostly Older people mostly consume a greater proportion of their total intake of **fat** from butter which is a saturated fat and should be avoided. A diet high in saturated fat might increase total cholesterol. This can increase the risk of cardiovascular disease. It is advisable to decrease the intake of saturated fats like red meat, cheese. Unsaturated fats are derived mostly from plant and some animal sources. Examples of unsaturated fats are black beans, cauliflower, soybean oil, avocado, cold-water fish, tofu.

Various micronutrients are vitamins and minerals-micro minerals and trace elements. Micronutrients required are smaller but necessary part of diet in comparison to macronutrients. Vitamins and minerals acts as antioxidants they protect against cell damage that has been associated with old age diseases like alzheimer and heart diseases reducing the disease to about 12-24%. Some researches has linked minerals like selenium if found in low dose increases the risk of heart diseases. Anemia is generally recognized as a common clinical problem in elderly individuals [21]. According to the World Health Organization (WHO) criteria, anemia is consistent with a haemoglobin concentration of <13 in men and <12 g/dl in women. Data indicate a high prevalence of anemia among hospitalized seniors; patients associated with geriatric clinics, and institutionalized seniors. The most prevalent anemia's in elderly populations are those associated with blood loss, inflammation and chronic disease, and protein-energy malnutrition. In elderly patients with ineffective erythropoiesis (formation of erythrocytes), it is important for pharmacists to note that microcytosis (low mean corpuscle volume [MCV]) should suggest sideroblastic anemia, while macrocytosis (high MCV) strongly suggests **vitamin B12** or folic acid deficiency. Pernicious anemia (megaloblastic anemia due to failure of the gastric mucosa to secrete adequate and potent intrinsic factor, resulting in

malabsorption of vitamin B12) has been reported with increasing frequency, particularly in seniors. Physiological modifications occurring during the lifetime and environmental influences are significant factors contributing to the impairment of micronutrient status, and these factors have to be considered when defining the specific requirements of the elderly [22]. The Physiological changes that take place are decrease in gastric acid secretion prevents vitamin B12 absorption causing decreased presence of it in the body. Because of decrease in pancreatic enzyme secretions a large intake of fat or protein will lead to its less absorption. The **Vitamin D** Council recommends that healthy adults take 2,000 IU of vitamin D daily -- more if they get little or no sun exposure. Essential for strong bones, vitamin D is produced by the body in response to sunlight. It helps the body absorb calcium, which is critical to bone health and strength. National institute of health has found less incidence of heart diseases, infection with higher 25(OH) D level. Vit d main source is sunlight but due to exposure to UV-B rays it is a primary determinant of vit d status. use of sunscreen also is not effective. individuals with low vitamin D levels have lower bone density and are at risk for fractures as t seniors, in particular, may have lower blood levels of vitamin D compared to younger counter' especially those who have minimal exposure to sunlight. Vitamin D deficiency causes osteomalacia in adults (producing bone pain in some and possibly contributing to osteoporosis) Drug-induced osteomalacia is associated with anticonvulsant therapy (e.g., phenytoin, phenol prim done, carbamazepine), rifampin, and some hypnotic agents. Institutionalized patients individuals receiving multiple concomitant anticonvulsant therapy are usually the only patient anticonvulsant-associated osteomalacia is present [23]. Kidney failure and primary biliary cirrhosis examples of conditions that alter vitamin D metabolism. **Vitamin E** deficiency may cause disorientation and vision problems. Low levels of vitamin E can lead to muscle weakness: Vitamin E is essential to the central nervous system. It is among the body's main antioxidants, and a deficiency results in oxidative stress, which can lead to muscle weakness. Sources of Vitamin A are eggs, milk, butter, liver fish such as sardines and tuna. Beef is a poor source of **vitamin A** but they also contain beta-carotene and other carotenoids. Night blindness is the first symptom of vitamin A deficiency. Prolonged and severe vitamin A deficiency can produce total and irreversible blindness. **Vitamin C** aids in the production of collagen, which helps the skin retain its elasticity. Taking vitamin C daily also helps the body produce more collagen, which can enhance the appearance of skin. Seniors with insufficient vitamin C intake may experience an array of health issues, making it difficult to care for them. Vitamin C (ascorbic acid) is an essential nutrient involved in several biologic and biochemical functions. It is the most readily available antioxidant in the diet and it may also help prevent cardiovascular disease by protecting low-density lipoproteins against oxidation by free radicals, as well as by its effect on vascular remodelling in response to injury [24]. In large population studies, people who eat lots of fruits and vegetables high in vitamin C appear to have a reduced risk for various types of cancer, including cancers of the mouth, oesophagus, stomach, colon, and lung. But it's not clear that these benefits come specifically from vitamin C. The Age-Related Eye Disease Study found that a daily supplement containing 500 milligrams (mg) of vitamin C, 400 international units (IU) of vitamin E, 15 mg of beta carotene, 80 mg of zinc, and 2 mg of copper can help slow the progression of macular degeneration, an age-related eye disease that causes vision loss. But benefits are not known if any by vitamin C in particular. Many people take vitamin C supplements in unnecessarily high doses

to prevent or treat various conditions for which its effectiveness is unproved. The vitamin C supplements have variously been touted for preventing cardiovascular disease and osteoarthritis, staving off sunburn, and improving the appearance. He aged suggest that intake above currently recommended levels of vitamin E may improve immune and inflammatory responses and be associated with a reduced risk of infectious disease [25].

Alpha (α)-tocopherol is the most bioavailable form of vitamin E. This natural antioxidant is lipid-soluble, and due to this property, it exerts preferentially its antioxidant activity in lipid-rich membranes, which concerns immune cells. This natural antioxidant is lipid-soluble, and due to this property, it exerts preferentially its antioxidant activity in lipid-rich membranes, which concerns immune cells. In terms of immunomodulatory properties, α -tocopherol was shown to exert anti-inflammatory actions

Minerals like calcium, iron are good in old age .In old age overconsumption of alcohol or intake of pheytoin, trimethoprim cause decrease of the body system. **Folic acid** can supplemented through bread, raw vegetables. Almost all of the calcium in the body is stored in the bones and teeth. Bones are living at calcified connective tissues that form the major part of your skeleton. **Calcium** is an import the "bone mineralization" process, which helps to give the skeleton its structure. The bones and teeth begin to slowly deteriorate because using its calcium stores to perform other functions, such as muscle contraction and forming membranes. Adolescents throughout the world are growing in risk due to dietary pattern changes. Many adolescents decrease calcium intake by substituting dairy products particularly beverages or by decreasing total intake of calcium. The elderly are at risk for multiple reasons including low over time, medication interactions that may decrease dietary calcium absorption, and the underlying chronic disease osteoporosis which changes bone formation and strength. The minimum requirement is 700 mg per day for calcium. Source for calcium are milk, green leafy vegetables, fish.

Healthy foods, including fruits and vegetables can cause unintended and possibly dangerous interactions with certain medications. Vitamin supplements can also disrupt a carefully balanced dosage of medication. Antibiotics and common pain relievers also can cause the blood to Thicken. On the flip side, some over-the-counter medications used to treat cold and allergy symptoms can cause the blood to thin. Other consumables, such as alcohol, can also have an impact on medications due to the way it can change the liver's ability to filter medication from the body. And even simple things like salt, which is widespread in the food supply can take a toll because it increases the amount of fluid retained in the body, rendering the medication dose inadequate it's just the way the body processes nutrients and elements, Foods and drugs are just different elements with different purposes, but it's all handled by the same process. If we overwhelm the system in one way, then it can be affected in other ways [26]. The key for cardiovascular disease patients is to be aware of the risks and maintain regular communication with healthcare providers in the case of statin-based cholesterol medications, including those marketed under brands such as Lipitor, Mevacor and Zocor, grapefruit and pomegranate can be a dangerous mix. There is avoidance of grapefruit if taking warfarin. In taking supplements in the form of medicine precaution has to be taken to avoid overdose like intake of vitamin A and iron.

Due to frequent occurrence of diabetes in old age attention has to be paid to the use of type of sugar. With the occurrence of high cholesterol heart problem and BP problems the body has to be treated with the right amount of salt and potassium in food and use of type fats. The diets has to be less caloric but nutrient dense which can be found in fruit and vegetables and whole grains. Due to physical and medical condition in old age the vit b12 has to be supplemented through use of medicines, inj IM. It can be found in egg, cheese, and fish. Dehydration in older age is common because of various reasons. Medications taken at the elderly age is common, some of them may be diuretic, while some may cause patient to sweat more. A persons sense of thirst becomes less acute as they age. In addition, frail seniors may have harder time getting up to drink when they're thirsty or they may rely on caregivers who can't sense that they **fluids**. As we age our bodies lose kidney function and are less able to conserve fluid. Vomiting/diarrhoea can quickly cause dehydration in elderly. Water can be supplemented through juice, tea, soup unlike young age where there is more capacity for retention and better renal system relatively. In old age there is decrease in pancreatic enzyme secretion so on consumption of large amount of fat or protein it will not be absorbed in the body [27].

In old age there is decrease in pancreatic enzyme secretion so on consumption of large amount of fat or protein it will not be absorbed in the body. Oxidative stress has been implicated both in the aging process and in the pathological changes associated with Alzheimer's disease. Antioxidants, which have been shown to reduce oxidative stress in vitro, may represent a set of potentially modifiable protective factors for poor memory, which is a major component of the dementing disorders. The high rates of abnormal fasting and post challenge glucose found together with the increasing frequency of obesity and sedentary lifestyles in the population, make it likely that diabetes will continue to be a major health problem.

In aging there is a decrease in **heme** synthesis, an increase in heme degradation, and maintenance of heme concentration and heme-containing proteins. This raises the possibility that alternate sources of heme are utilized by synthesis. The mechanisms to balance heme and protein synthesis, and cytoplasmic and mitochondrial protein synthesis remain intact with advanced age. Iron remains available to the healthy organism in abundant amounts throughout the life span. The decrease in cellular iron utilization seen with age might conceivably result from availability of heme independent of heme synthesis, as intracellular heme controls the cellular uptake of iron from transferring [28]. Heme levels in aged cells seem to be maintained via an alternate heme source. The bone marrow in aged animals appears to function adequately as long as there is no stress. Anemia, therefore, should always be considered as a serious sign in illness.

Inadequate nutritional intake is an important modifiable risk factor for **frailty**. Existing evidence supports the importance of adequate dietary quantity and especially quality to ensure sufficient intakes of energy, protein and micronutrients. However, to date no nutritional intervention or supplementation concept has emerged as being effective for the prevention or treatment of frailty [29]. Further research, including specifically the group of frail older persons and those at risk of frailty, and focussing on functional benefits as an outcome, is needed to allow definite recommendations for optimal diet, i.e. food and nutrient intakes.

sarcopenia is the loss of muscle mass that occurs with aging. Lean muscle mass is lost at the rate of approximately 1% per year after 30 years of age. Aging-related sarcopenia means that muscle mass, strength, and physical performance tend to decline with age, and malnutrition is associated with sarcopenia. Therefore, nutritional interventions may make an important contribution to prevent the development of sarcopenia. Exercise (both resistance and aerobic) in combination with adequate protein and energy intake is the key component of the prevention and management of sarcopenia [30]. Adequate protein supplementation alone only slows loss of muscle mass. Adequate protein intake (leucine-enriched balanced amino acids and possibly creatine) may enhance muscle strength. Skeletal mass declines in adults over the age span which accumulates after the gap of 80 and a relative increase in fat over time. It is because of genetic and environmental factors. There is no weight loss seen as there is a doubling and redistribution of fat, which is seen more in abdominal areas and less in subcutaneous areas. It is important for the elderly to maintain their skeletal muscle mass, which in turn helps to maintain physical functions. Dentists specializing in dysphagia rehabilitation evaluated skeletal muscle mass, occlusal status and swallowing function. In one of the analysis it was revealed that skeletal muscle mass was significantly related to nutritional status in both men and women.

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