LIVING ENVIRONMENTS AND HEALTH ISSUES OF THE ELDERLY: Aging And Long-Term Care Part I

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Abstract

In the United States the population is aging and, in the coming decades, this trend is anticipated to increase. Between 2010 and 2050, it is expected that there will be a rapid growth in the older age groups. By 2050, the total national population aged 65 and older is predicted to rise rapidly and to reach 88.5 million, which is more than two-fold its population in 2010. This growth in the elderly population will far exceed the growth in younger age groups. Aging And Long Term Care is a 3-part series discussing important topics related to aging factors, special disability populations, end-of-life care issues and trends in long-term care.
Continuing Nursing Education Course Planners

William A. Cook, PhD, Director, Douglas Lawrence, MA, Webmaster, Susan DePasquale, MSN, FPMHNP-BC, Lead Nurse Planner

Policy Statement

This activity has been planned and implemented in accordance with the policies of NurseCe4Less.com and the continuing nursing education requirements of the American Nurses Credentialing Center's Commission on Accreditation for registered nurses. It is the policy of NurseCe4Less.com to ensure objectivity, transparency, and best practice in clinical education for all continuing nursing education (CNE) activities.

Continuing Education Credit Designation

This educational activity is credited for 3 hours. Nurses may only claim credit commensurate with the credit awarded for completion of this course activity.

Statement of Learning Need

Nursing professionals are increasingly caring for elderly and disabled individuals requiring placement or residing in long-term care facilities. Long-term care involves making complex decisions influencing care outcomes that require nurses to have specialized knowledge related to unique issues affecting quality of life as well as end-of-life issues.
Course Purpose
To provide nursing professionals with knowledge of long-term care for the elderly and disabled individuals.

Target Audience
Advanced Practice Registered Nurses and Registered Nurses
(Interdisciplinary Health Team Members, including Vocational Nurses and Medical Assistants may obtain a Certificate of Completion)

Course Author & Planning Team Conflict of Interest Disclosures
Jassin M. Jouria, MD, William S. Cook, PhD, Douglas Lawrence, MA
Susan DePasquale, MSN, FPMHNP-BC – all have no disclosures

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There is no commercial support for this course.

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Please take time to complete a self-assessment of knowledge, on page 4, sample questions before reading the article.

Opportunity to complete a self-assessment of knowledge learned will be provided at the end of the course.
1. In the U.S., most elderly long-term care is provided by:
   a. Medicare.
   b. Medicaid.
   c. Family, relatives and friends.
   d. None of the above

2. Currently, more than 6 million elderly in the U.S. require some kind of ____________, with about a third of these requiring more substantial care.
   a. long-term care
   b. emergency care
   c. palliative care
   d. hospice care

3. Older age is associated with an increased prevalence of:
   a. chronic diseases and sensory dysfunction.
   b. changes in cognition.
   c. poor balance and increased rate of falls and injuries.
   d. All of the above

4. True or False: Impaired cognition in the elderly has no correlation to the ability or desire to eat.
   a. True
   b. False

5. Elderly individuals with pneumonia frequently experience:
   a. more symptoms than young adults.
   b. aspiration pneumonia detected late, and under-diagnosed.
   c. tachypnea or increased respiratory rate as an early sign.
   d. answers b and c above.
Introduction

The number of people over 65 years of age is growing and expected to expand significantly over the coming decades in the United States. A larger number of older people will be requiring and looking for health care from a variety of sources. This creates an environment in which specialists in geriatric health are highly sought after to deal with the specific and various issues that affect an aging population. Older individuals are highly likely to have chronic health issues that require long-term care, either in a specialized facility or in the home. A proactive approach to managing older individuals’ health is necessary to ensure the highest quality of health care is available.

The Aging Population In The United States

The number of people over 65 years of age represented 12.4% of the population in the year 2000 but is expected to grow to be 19% by 2030. That means that 72.1 million older people will be seeking health care from a variety of sources in the next 20 years. The U.S. is the third most populous country and constitutes approximately 4.5% of the total world population. According to the 2010 Census, the U.S. population was about 308.7 million persons. The U.S. population is over 300 million and has increased two-fold since 1950. In addition, the population is now qualitatively different from what it was previously. The Population Reference Bureau reports that the U.S. population is growing, and becoming older and more diverse. In the coming decades, specifically between 2010 and 2050, the U.S. is expected to see a rapid growth in its older population.
In 2050, it is expected that the total population of U.S. citizens aged 65 and older will reach 88.5 million, which is more than two-fold its population in 2010. Between 2010 and 2050, the 65+ population is expected to roughly double. Approximately one in five individuals will belong to this age group in 2050; currently, this rate hovers around 1 in 7.7 individuals. The anticipated growth in the elderly population will far exceed the growth in younger age groups or categories. In the same period, the total number of people in the 85+ age group (oldest adults) will witness a far more rapid growth than the growth of older adults 65+ years of age. The 85+ population will increase three-fold from 5.8 million in 2010 to approximately 19 million in 2050. This surge in the elderly population will have far reaching implications. As the U.S. population ages, the demand for long-term care for the elderly will increase dramatically and their need for health services is expected to also grow.

Currently, more than 6 million elderly in the U.S. require some kind of long-term care, with about a third of these requiring more substantial care. Medicare finances medical care for almost all the elderly in the total population. However, support for long-term care is often beyond the scope of Medicare. Medicaid is a state program supported by the federal government and provides long-term care financing for low-income families. However, long-term care for the elderly continues to be a major challenge for the country. Elderly who require long-term care often do not receive the quality or amount of care they may wish, need or prefer. In addition, the financial burdens on the society and the family are often quite heavy. It is families, relatives and friends who end up providing most long-term care for the elderly.
Society and healthcare providers face a huge problem and dissatisfaction in terms of quality, scope, and financing of long-term care services. Despite a consistent growth in home-care services, nursing homes continue to dominate the long-term care services system, and the government is still struggling to manage its social and financial resources. Changing demographics in the U.S. pose a further challenge. It is estimated that the demand for long-term care among the elderly will increase to more than double in the next three decades.\(^1\) This exponential growth further exacerbates concerns about long-term care for elderly. The key variables required to address this problem are institutional and non-institutional elderly care, quality of care, integration of acute and long-term care, and the adoption of sustainable financing strategies for those who require long-term care. As the population of elderly individuals increases, questions surrounding long-term care will increasingly shape the quality of life for aging community members.

**Future Projections**

Approximately 10 million out of the county’s 26.2 million older households have at least one family member with a disability. It has been observed that the rates of disability increase with age. In 2007, approximately 4% of the 65+ Medicare population utilized long-term care facilities such as nursing homes. Another two percent lived in community housing. However, the picture changes drastically among the oldest adults. In 2007, among people in the 85 and older aged category, approximately 7% lived in community housing and about 15% resided in long-term care facilities.
Older age is also associated with an increased prevalence of chronic diseases and sensory dysfunction, changes in cognition, poor balance, increased rate of falls, fall-related injuries, and death. In addition, physical activity and community engagement declines in the elderly. This also leads to overall declines in health. These age-related changes may substantially impact the healthcare and long-term care in the coming decades because the use of health-related services and long term care is strongly correlated to increasing age, as outlined below.²,³

### FUTURE PROJECTIONS FOR THE ELDERLY POPULATION IN THE U.S.

- The number of U.S. citizens who require long-term care will jump from approximately 12 million (currently) to 27 million in 2050.
- Baby boomers will start turning 65 between 2011 and 2029. During this period, 10,000 Americans will turn 65 every day.
- By 2030, the number of Americans in the age group of 65 and older will be approximately 72 million, or approximately 19% of the total U.S. population (up from over 40 million or 13% in 2010).
- By 2050, the number of elderly in the U.S. will jump to almost 89 million, which constitutes approximately 20% of the total U.S. population.
- The percentage of the U.S. population that is age 85 and older will increase by more than 25% by 2030 and by 126% by 2050.
- From 2010 to 2030, Alaska (+217%), Nevada (+147%), Arizona (+119%) will witness the highest population growth of those age 85 and older.
- Life expectancy in the U.S. has increased significantly over the last century and will continue to increase. An individual born in 2010 has an average life expectancy of 79 years, compared to almost 52 years in 1910.
- Life expectancy is higher for women than men. For those born in 2010, projected life expectancy for women is about 81 years, compared to 76 years for men.
- Between 2000 and 2030 the number of Americans with chronic disease or conditions will increase by approximately 37%, an addition of 46 million people. Twenty-seven million individuals with chronic diseases or conditions in the U.S. population will also experience functional impairment.
- As of 2012, there are 5.2 million people age 65 and older who have been diagnosed with Alzheimer’s disease. By 2025, the number of people age 65 and older with Alzheimer’s disease is estimated to increase by 30% to 6.7 million. By 2050, this number may witness a three-fold increase to approximately 11 million to 16 million.
By 2020, approximately 12 million elderly will need long-term care. The majority of these people, about 70%, will be provided care at home by their family and friends. A recent study reported that elderly people have 40% chance of entering a nursing home. Roughly 10% of nursing home residents will stay there for five years or more. The cost of long-term care may vary depending on the type of care, location of the provider, and location of the elderly. The table below compares varied long-term care services.

<table>
<thead>
<tr>
<th>Service</th>
<th>Help with activities of daily living</th>
<th>Help with additional services</th>
<th>Help with care needs</th>
<th>Range of costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community-Based Services</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Low to medium</td>
</tr>
<tr>
<td>Home Health Care</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Low to high</td>
</tr>
<tr>
<td>In-Law Apartments</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Low to high</td>
</tr>
<tr>
<td>Housing for Aging and Disabled Individuals</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Low to high</td>
</tr>
<tr>
<td>Board and Care Homes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Low to high</td>
</tr>
<tr>
<td>Assisted Living</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Medium to high</td>
</tr>
<tr>
<td>Continuing Care Retirement Communities</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
</tr>
<tr>
<td>Nursing Homes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
</tr>
</tbody>
</table>
Living Environments And Long-Term Care

Long-term care (LTC) for the elderly or the younger disabled individual is an essential component of health and social systems and encompasses a wide variety of medical and non-medical services. This includes the personal needs and the activities of daily living (ADL) of the elderly. Long-term care can be provided at home, and in the community, nursing homes, or an assisted living care facility. Increasingly, LTC also encompasses a higher level of medical care that requires the expertise of skilled health providers to address the complexities of multiple chronic conditions associated with aging, as discussed in this section.7-9

The need for LTC is impacted by changes in the physical, mental, and/or cognitive functional capacities of the elderly, which in turn are greatly influenced by the environment. The type and duration of LTC involve complex issues and decision-making, and are usually difficult to predict. The goal of LTC is to make sure that an elder who is not fully capable of longer term self-care can maintain the highest possible quality of life, with the high degree of independence, participation, autonomy, individual fulfillment, and dignity.

Appropriate and adequate LTC includes respect for individual’s values, wishes, needs and preferences. Elderly who need home-based LTC may also require other services, such as physical or mental health care and rehabilitation, together with social financial and legal support. LTC may be provided formally or informally. Facilities that provide formal LTC services usually make provisions for living accommodation for those elderly who need round-the-clock supervised care, which may include professional healthcare services, personal care and services
such as housekeeping, meals and laundry. Such formal LTC services are provided by such facilities as a nursing home, residential continuing care facility, and personal care facility.

Home health care is LTC provided formally in the home, and may encompass several clinical services such as nursing, physical therapy and other activities such as installation of hydraulic lifts or the renovation of kitchens and bathrooms. These services are generally directed and ordered by a physician or other professional. Family members, close friends and volunteers, all together support the provision of LTC at home. It is estimated that approximately 90% of all home care is provided informally without any monetary compensation. The table below outlines typical conditions for both temporary and ongoing LTC, which is explained in more detail in the following sections.

<table>
<thead>
<tr>
<th>Temporary long term care (Required for short term care over few weeks or months)</th>
<th>Ongoing long term care (Required for care over several months or years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Rehabilitation from a hospital stay</td>
<td>• Chronic medical conditions</td>
</tr>
<tr>
<td>• Recovery from illness</td>
<td>• Chronic severe pain</td>
</tr>
<tr>
<td>• Recovery from injury</td>
<td>• Permanent disabilities</td>
</tr>
<tr>
<td>• Recovery from surgery</td>
<td>• Dementia</td>
</tr>
<tr>
<td>• Terminal medical condition</td>
<td>• Ongoing need for help with activities of daily living</td>
</tr>
<tr>
<td></td>
<td>• Need for supervision</td>
</tr>
</tbody>
</table>
**Services from Unpaid Caregivers**

Home-based LTC encompasses health, personal, and other types of support services to help the elderly stay at home and live as independently as possible. This type of care is usually provided either in their own home or at a family member’s home. In-home services can be short-term or long-term depending on the condition of an individual. For example, an individual may need these services postoperatively for a few days (short-term) to adequately recover from an operation. On the other hand, an individual may require ongoing in-home services for a longer term. The majority of home-based services provide personal care, such as help with activities of daily living, *i.e.*, bathing, dressing, *etc.* These services are often also provided free of cost by immediate family members, friends, partners, and neighbors. Such informal care is the dominant form of care for elderly in the U.S. as well as throughout the world, despite the immense burdens that it places on the provider.

**Services from Paid Caregivers**

Trained paid caregivers are also available for home-based LTC services. Health care professionals including nurses, home health care aides, and therapists may provide these services. These paid services may also be provided by:

- Home health care workers
- Friendly visitor or companion services
- Homemaker services
- Emergency response systems
**Home Health Care**

These services may include nursing care to help an individual recover from surgery, an injury, or illness. It usually involves part-time medical services advised by a physician for a particular event or condition. Home health care may also provide different types of therapies including physical, occupational, or speech therapy. If required, provisions can also be made for temporary home health aide services.

**Homemaker Services**

Homemaker services can be utilized without a physician's recommendation. Personal care includes help with activities of daily living such as bathing, grooming and dressing. These services also provide help for meal preparation and simple household chores. These agencies do not need to be approved by Medicare to provide services.

**Friendly Visitor or Companion Services**

Volunteers usually offer friendly visitor or companion services from the community. These include regularly (paying) short visits to elderly people who live alone and are too weak to take care of themselves.

**Emergency Response Systems**

These advanced systems automatically respond to medical and other emergencies with the help of electronic monitors and other resources. This type of service is particularly helpful for those who live alone or who are at risk for falls. This is a paid service. The table below summarizes criteria for care generally needed leading to the implementation of home-based LTC.
ELEMENTS OF HOME-BASED LONG-TERM CARE

- Assessment, monitoring, and reassessment
- Health promotion, health protection, disease prevention, postponement of disability
- Facilitation of self-care, self-help, mutual aid, and advocacy
- Health care, including medical and nursing care
- Personal care, *i.e.*, grooming, bathing, meals
- Household assistance, *i.e.*, cleaning, laundry, shopping
- Physical adaptation of the home to meet the needs of disabled individuals
- Referral and linkage to community resources
- Community-based rehabilitation
- Provision of supplies (basic and specialized), assistive devices and equipment (*i.e.*, hearing aids, walking frames), and drugs
- Alternative therapies and traditional healing
- Specialized support (*i.e.*, for incontinence, dementia and other mental problems, substance abuse)
- Respite care (at home or in a group setting)
- Palliative care, *i.e.*, management of pain and other symptoms
- Provision of information to patient, family, and social networks
- Counseling and emotional support
- Facilitation of social interaction and development of informal networks
- Development of voluntary work and provision of volunteer opportunities to clients
- Productive activities and recreation
- Opportunities for physical activities
- Education and training of clients and of informal and formal caregivers
- Support for caregivers before, during, and after periods of caregiving
- Preparation and mobilization of society and the community for caring roles
Nursing Home Care

Nursing homes provide a comprehensive range of medical services, which includes 24-hour supervision and nursing care. More than 1.5 million elderly have spent time in a nursing home, and around one of two nursing home residents need assistance with all activities of daily living. By 2050, the total number of U.S. citizens requiring LTC is expected to increase two-fold. Nursing homes may vary in size and scope of services. They may offer short-term care, post hospitalization rehabilitation and hospice care.

The majority of nursing homes employ community physicians to provide care. The principal goal of nursing home care is to maximize resident autonomy, function, dignity, and comfort. Nursing homes also provide a sense of community where elderly can do social activities and make social bonds with other people. Care in a nursing home includes several different levels of care. These are further explained below.

Skilled Nursing Care

Skilled nursing care is provided on a physician’s recommendation and requires the professional skills of a registered nurse or a licensed practical nurse. It is offered either directly by or under the supervision of a registered nurse.

Intermediate Nursing Care

Intermediate nursing care is provided under periodic medical supervision and encompasses physical, psychological, social, and other restorative services. This nursing care is provided by a skilled
registered nurse and includes the observation and the recording of signs and symptoms.

*Personal or Custodial Care*

Individuals without medical training can offer personal or custodial type of care. The main goal of this type of care is to meet the personal needs of the elderly, including feeding and personal hygiene.

*Palliative Care*

The planning elements and stages (early, middle, late, bereavement) of palliative or end of life care are best addressed in the table below.

### Elements of Palliative Care for Nursing Home Residents

<table>
<thead>
<tr>
<th>Element</th>
<th>Stage of Disease or Frailty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Early</td>
</tr>
<tr>
<td>Goals of care</td>
<td>Discuss diagnosis, prognosis, likely course of disease, disease-modifying therapies, goals, hopes; and the resident’s desires for treatment.</td>
</tr>
<tr>
<td></td>
<td>Provide education material to the resident on the diagnosis and on palliative care.</td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>Element</th>
<th>Early</th>
<th>Middle</th>
<th>Late</th>
<th>Bereavement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program support</td>
<td>Recommend initiation of visiting nurse, home care, case management, and applicable home modifications.</td>
<td>Recommend initiation of visiting nurse, home care.</td>
<td>Recommend palliative care (home or hospital), case management, hospice, PACE* initial services.</td>
<td>Discuss hospice post bereavement services, mental health referral, support groups.</td>
</tr>
<tr>
<td></td>
<td>Review prognostic factors for conditions of residents relevant clinical practice guidelines.</td>
<td>Consider palliative care (home or hospital), hospice, subacute rehabilitation, case management and PACE.</td>
<td>Consider nursing home with hospice/palliative care services for substantial caregiver burden.</td>
<td></td>
</tr>
<tr>
<td>Financial and legal planning</td>
<td>Recommend professional assistance with financial planning, long-term care, future insurance needs.</td>
<td>Reassess adequacy of financial, medical, home care, and family support; long-term care planning.</td>
<td>Review financial resources and needs, financial options for personal and long-term care (including hospice and Medicaid if lacking resources to meet goals).</td>
<td>Complete necessary documents, including death certificate.</td>
</tr>
<tr>
<td></td>
<td>Legal counsel with expertise in health care issues; protection or transfer of financial assets.</td>
<td>Consider hospice referral, Medicaid eligibility assessment.</td>
<td>Explicitly recommend hospice.</td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>Early</td>
<td>Middle</td>
<td>Late</td>
<td>Bereavement</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
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<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Family support</td>
<td>Inform resident and family about support groups; ask about practical support needs; listen to concerns; encourage home modifications to reduce caregiver burden; provide education related to diagnosis as well as general caregiver tasks and support.</td>
<td>Recommend support or counseling for caregivers, respite care; caregiver visit with personal provider; help from family and friends.</td>
<td>Advise remote family and friends to visit the resident.</td>
<td>Send bereavement card, contact family, attend funeral. Listen to concerns, maintain contact.</td>
</tr>
<tr>
<td>Cultural support</td>
<td>Understand acculturation, traditions, health beliefs.</td>
<td>Understand approaches to medical decision-making, issues of disclosure and consent.</td>
<td>Address caregiver need for support groups, counseling, personal health care, respite services.</td>
<td>Address advance directives, end-of-life care planning, care intensity. Recognize specific cultural practices of surviving family members and caregivers.</td>
</tr>
<tr>
<td>Spiritual support</td>
<td>Observe for spiritual themes or life stories that are sources of distress or support.</td>
<td>Explore spiritual issues to develop a deeper sense of healing.</td>
<td>Assist resident with resolving conflicts, grieving and receiving forgiveness.</td>
<td>Assist surviving loved ones with finding meaning, hope, comfort, and inner peace.</td>
</tr>
</tbody>
</table>

*PACE = Program of All-Inclusive Care for the Elderly.*
Community-Based Long-Term Care

Community-based long-term care can be offered in many types of settings and by many kinds of care providers. Services are varied and individualized to meet the needs of the individual requiring services as well as those of their family or social support system. Some of the specific kinds of services that offer community-based long-term care are discussed below.

Home Health Care

Home health care includes the following services for elderly:

- Skilled nursing services
- Personal care
- Health aide services
- Physical, occupational, or speech therapy

Assisted Living Facility

Assisted living facilities provide care to individuals in a residential facility and can include supportive services, personal care, or nursing services. Supportive services usually include housekeeping, laundry, assistance with meals, and arranging for transportation. Personal services offer the elderly a direct, hands-on help with activities of daily living.

Assisted living forms a bridge between nursing homes and home care. These facilities offer a homelike environment for elderly requiring or anticipating assistance with activities of daily living but for which 24-hour nursing care is not a necessity.
These facilities provide an environment that resembles more of a home than a hospital. The facilities have suites or private rooms and locked doors. There may be provision for fireplaces, gathering areas with couches, gardens, atriums, etc. Frequent outings are also planned. Many assisted living facilities also allow home health agencies to provide services for residents. Some assisted living facilities provide specialized care for Alzheimer's patients. Medicare does not cover the costs of assisted living.

**Adult Day Care**

Adult day care is provided in a nonresidential, community-based group program that caters to the needs of functionally impaired elderly. These facilities provide a number of health care, social, and support services during the day. According to a recent survey, there are more than 4,600 adult day care centers nationwide; however, more than 9,000 such centers are needed. Adult day care services provide an alternative to caregivers by providing a daytime care environment outside of the home.

**Respite Care**

Respite care offers personal care, supervision, or other services to an individual to provide, temporarily, relief to that individual’s care provider and/or family member. These services are generally provided at the individual’s home or in another home or homelike setting. In some cases, it can also be provided in a nursing home.
Hospice Care

Hospice care primarily offers symptom and pain management, and supportive services to terminally ill individuals and their families. Hospice is a form of palliative care for terminally ill individuals. Hospice care provides compassion, support and dignity to the patients during the process of dying. Below is an outline of the care providers involved with hospice care, criteria or goals of care as well as health coverage.

<table>
<thead>
<tr>
<th>Providers Involved In Hospice Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Family caregivers</td>
</tr>
<tr>
<td>• The patient’ s personal physician</td>
</tr>
<tr>
<td>• Hospice physician (or medical director) and Nurse</td>
</tr>
<tr>
<td>• Home health workers</td>
</tr>
<tr>
<td>• Social workers and trained volunteers</td>
</tr>
<tr>
<td>• Clergy or other counselors</td>
</tr>
<tr>
<td>• Speech, physical, and occupational therapists, if needed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Principal Aims of Hospice Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Manages the patient’s pain and symptoms</td>
</tr>
<tr>
<td>• Helps the patient with the emotional, psychosocial and spiritual aspects of dying</td>
</tr>
<tr>
<td>• Provides needed medications, medical supplies, and equipment</td>
</tr>
<tr>
<td>• Coaches the family on how to care for the patient</td>
</tr>
<tr>
<td>• Delivers special services like speech and physical therapy when needed</td>
</tr>
<tr>
<td>• Makes short-term inpatient care available when pain or symptoms become too difficult to manage at home, or the caregiver needs respite time</td>
</tr>
<tr>
<td>• Provides bereavement care and counseling to surviving family and friends</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hospice Eligibility from Medicare</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Eligible for Medicare Part A (Hospital Insurance)</td>
</tr>
<tr>
<td>• The provider and the hospice medical director certify that the person is terminally ill and potentially has less than six months to live</td>
</tr>
<tr>
<td>• The person or a family member signs a statement choosing hospice care instead of routine Medicare covered benefits for the terminal illness</td>
</tr>
<tr>
<td>• Care is received from a Medicare-approved hospice program</td>
</tr>
</tbody>
</table>
**Eligibility for Hospice**

Common terminal conditions and the medical criteria are indicative of advanced illness. Patients are eligible for hospice only if:

- An attending physician certifies that patient has a terminal condition with an expected life span of 6 months or less.
- The patient decides to forego life-prolonging therapies.
- The patient does not have to be a Do Not Resuscitate (DNR) order to be eligible for hospice. No home hospice can refuse to admit a patient just because he/she opts to remain a “full code” (fully resuscitated in a life threatening event).

However, this could potentially represent a red flag with regard to a full understanding of the focus of hospice care on symptom management as opposed to curative disease modifying treatment. This should be fully explained to the patient and documented. For example, patients with advanced congestive heart failure (CHF) should remain on ACE inhibitor or diuretics as tolerated because these treatments are considered palliative and help control symptoms. These treatments may be life prolonging, but in a hospice setting they are understood to be primarily palliative. Hospice care diagnoses can include:

- Advanced End Stage Senescence or Debility
- Cancer
- Amyotrophic Lateral Sclerosis (ALS)
- Liver Disease
- Pulmonary Disease
- Dementia
- Human Immunodeficiency Virus
- Stroke and Coma
### Home-based Long-term Care Services and Stages of Economic Development

<table>
<thead>
<tr>
<th>Lowest-income Economies</th>
<th>Low-income Economies</th>
<th>Middle-income Economies</th>
<th>High-income Economies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Almost all care is informal</td>
<td>• Almost all care is informal</td>
<td>• More limited informal care</td>
<td>• More pressure on availability of informal care</td>
</tr>
<tr>
<td>• Direct care is informal</td>
<td>• Paid local community workers</td>
<td>• Paid local community workers</td>
<td>• Few community health workers</td>
</tr>
<tr>
<td>• Largely voluntary community workers (payment in kind), with some training</td>
<td>• More training of these workers</td>
<td>• Some personal care and home-making and less clinical care</td>
<td>• Specialized personal care and home-making workers with no clinical or community development roles</td>
</tr>
<tr>
<td>• No personal care, or home-making</td>
<td>• No personal care or home-making</td>
<td>• Professional staff involved in more direct home care</td>
<td>• Varying professional training for workers and concern for over-professionalization</td>
</tr>
<tr>
<td>• Counseling, simple clinical responsibilities, and dispensing of supplies</td>
<td>• Counseling, simple clinical responsibilities and dispensing of supplies</td>
<td>• Emergence of some social-system-based home care</td>
<td>• Professional home care highly developed</td>
</tr>
<tr>
<td>• Community development role</td>
<td>• Community development role</td>
<td>• Growing institutional care</td>
<td>• Institutional care of major importance</td>
</tr>
<tr>
<td>• Professional staff in a supervisory role</td>
<td>• Professional staff in a supervisory role</td>
<td></td>
<td>• Segregated social and health-based home care system</td>
</tr>
</tbody>
</table>
The table above shows that patterns of development of home-based long-term care services at different stages of economic development range from lowest, low, middle and high-income categories.

**Long-Term Care Hospitals**

Long-term care hospitals (LTCHs) account for a small percentage of total Medicare spending, but have been growing for the last few years. These are acute care hospitals, which also focus on providing care to patients who stay in the facility for more than 25 days. These hospitals offer specialized treatment to patients who may have several comorbidities, but with a relatively good prognosis assuming adequate medical treatment and supervised care. Some patients are transferred from the intensive or critical care units of the hospital. LTCHs offer a comprehensive rehabilitation program, respiratory therapy, pain relief and management and head trauma management.

**Health Issues In An Aging Population**

An aging population is one of the biggest social changes that have occurred in the last few decades and is primarily due to improved standards of living. By 2050, it is estimated that the elderly will outnumber children under the age of 14 years. Globally and in the U.S., the elderly population is very diverse, ranging from very healthy, active and fit independent individuals, to very weak, frail and dependent older people with chronic disease and varying degrees of disabilities.

Currently, approximately 13% of the U.S. population is over 65 years old. This is expected to increase to about 20% by 2050. Globally, the
elderly population will also increase dramatically in the next 30 years. Today, it is estimated that approximately two-thirds of general and acute hospital beds are occupied by individuals over 65 years of age, and those over 75 years occupy the beds for longer times.

**Malnutrition in the Elderly**

The elderly bear an increased burden of disease that also affects their nutritional status. In addition, as people age, they experience changes in body composition and metabolism that also affect nutritional status. The following discussion highlights the physical changes and nutritional needs of elderly people.\(^{10-18}\)

**Body Composition of Elderly People**

Fat mass increases till about 75 years of age, and then remains stable or decreases. In addition, it is believed that central fat accumulation increases with aging, while appendicular fat mass decreases. Several studies have linked this pattern of fat distribution to an increased risk of diabetes, stroke, hyperlipidemia, cardiac disease, and hypertension, and all of these conditions are commonly seen in the elderly population.

Fat free mass (FFM) decreases with age, and generally starts declining around 40–50 years of age. This loss accelerates further due to a reduction in skeletal muscle, and bone mineral density, particularly in older women. Several studies have shown that even a 10% loss of lean tissue in previously healthy people can lead to poor immunity, increased susceptibility to infections, and subsequently increased mortality. Therefore, elderly with greater FFM loss are prone to various types of disease and infections.
Etiology of Weight Loss

Weight loss in elderly can be categorized into three distinct types:

- Wasting:
  Wasting is an involuntary weight loss predominantly caused by inadequate dietary intake. Chronic disease and psychosocial factors play an important role. Wasting in elderly may be seen with a background of cachexia, sarcopenia or both.

- Cachexia:
  Cachexia is an involuntary loss of free fat mass (FFM) or body cell mass (BCM), which is caused by increased catabolism, and increased protein degradation leading to changes in the body composition. However, weight loss may not be present in the beginning.

  Cachexia is observed in several chronic diseases such as congestive heart failure, rheumatoid arthritis, human immunodeficiency virus (HIV) infection, cancer, and also in conditions associated with metabolic stress such as trauma, decubitus ulcers and infections. Concentrations of certain cytokines, *i.e.*, interleukin 1 (IL1), tumor necrosis factor a (TNFa) and IL6 are higher than normal in patients with cachexia and weight loss.

- Sarcopenia:
  Sarcopenia is an involuntary loss of muscle mass, which is primarily due to aging and not the effect of age-associated
chronic or comorbid diseases. Hormonal, neural, and cytokine activity with lack of physical activity play an important role in the development of sarcopenia.

Comparison of the characteristics of undernutrition due to anorexia, cachexia and sarcopenia are shown in the table below.

<table>
<thead>
<tr>
<th></th>
<th>Anorexia</th>
<th>Cachexia</th>
<th>Sarcopenia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anorexia</strong></td>
<td>+</td>
<td>++</td>
<td>–</td>
</tr>
<tr>
<td><strong>Weight loss</strong></td>
<td>+</td>
<td>++</td>
<td>+/-</td>
</tr>
<tr>
<td><strong>Fat loss</strong></td>
<td>++</td>
<td>++</td>
<td>0</td>
</tr>
<tr>
<td><strong>Muscle loss</strong></td>
<td>+</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td><strong>Proteolysis</strong></td>
<td>−</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td><strong>Hypertriglyceridemia</strong></td>
<td>−</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td><strong>Anemia</strong></td>
<td>+</td>
<td>++</td>
<td>–</td>
</tr>
<tr>
<td><strong>Insulin resistance</strong></td>
<td>−</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td><strong>Elevated cytokines</strong></td>
<td>+/-</td>
<td>++</td>
<td>+/-</td>
</tr>
<tr>
<td><strong>Increased C-reactive protein</strong></td>
<td>–</td>
<td>++</td>
<td>–</td>
</tr>
</tbody>
</table>

(+) = present; (−) = absent.

*Malnutrition in the Older Population*

Malnutrition is the state of being poorly nourished due to either the lack of one or more nutrients (undernutrition), or the excess of nutrients (overnutrition). The elderly usually suffer from undernutrition. In the older population, malnutrition is an important issue that has been observed in hospitals, residential care, and in the community.
The prevalence of malnutrition in the general hospital population hovers around 11% - 44%, but can rise in the elderly to 29% - 61%. Aging is not the sole factor for malnutrition in the elderly; many other changes linked to the aging process can cause malnutrition. For example, the elderly may have loss of smell and taste acuity, poor dental and oral health, and decreased physical activity, all of which may adversely impact food intake. Any change in food or nutrient intake may cause malnutrition with its potentially life threatening and serious consequences.

Many research studies have observed a close relationship between the severity of malnutrition and increased duration of hospital stay, treatment costs, return to normal life, and readmission rates. Therefore, the treatment as well as prevention of malnutrition among the elderly population represents a major challenge for the health care system.

*Causes of Malnutrition*

The causes of malnutrition among older people are varied, but can be categorized into three main types: *medical, social, and psychological*. The risk factors for malnutrition in the elderly are outlined in the table below, which also includes a category of *additional risk factors in a hospital setting*. 
### RISK FACTORS FOR MALNUTRITION IN THE ELDERLY

#### Medical Factors
- Poor appetite
- Poor dentition, other oral problems and dysphagia
- Loss of taste and smell
- Respiratory disorders: emphysema
- Gastrointestinal disorder: malabsorption
- Endocrine disorders: diabetes, thyrotoxicosis
- Neurological disorders: cerebrovascular accident, Parkinson’s disease
- Infections: urinary tract infection, chest infection
- Physical disability: arthritis, poor mobility
- Drug interactions: digoxin, metformin, antibiotics
- Other disease states: cancer

#### Lifestyle and Social Factors
- Lack of knowledge about food, cooking, and nutrition
- Isolation/loneliness
- Poverty
- Inability to shop or prepare food

#### Psychological
- Confusion
- Dementia
- Depression
- Bereavement
- Anxiety

#### Additional Risk Factors in a Hospital Setting
- Food service — sole nutritional supply is hospital food, limited choice, presentation may be poor
- Slow eating and limited time for meals
- Missing dentures
- Needs feeding/supervision
- Inability to reach food, use cutlery, or open packages
- Unpleasant sights, sounds, and smells
- Increased nutrient requirement, for example, because of infections, catabolic state, wound healing, etc.
- Limited provision for religious or cultural dietary needs
- Nil by mouth or miss meals while having tests

### Appetite

It is clear that several factors play a role in appetite regulation. Poor appetite or anorexia is one of the most common causes of malnutrition
and is mediated by a number of factors. Energy intake decreases with age, and the elderly are susceptible to micronutrient deficiencies with poor energy intake. The exact mechanism behind this reduction is still unknown but several possible hypotheses have been developed. It is believed that aging is often linked with poor food intake regulation. It has been suggested that elderly fail to reduce their energy expenditure during these periods of negative energy balance. The elderly take longer to regain their lost weight, and are susceptible to risks associated with malnutrition during this period.

Researchers have also shown satiety is determined by a complex process involving the hormone cholecystokinin (CCK) and the relaxation of the stomach wall. CCK levels are higher in older people with slow gastric emptying, which both play an important role in early satiety. In addition, the elderly have a reduced stomach capacity. Therefore, the stomach wall stretches earlier thus causing early satiety. Compared to young adults, the elderly are also less responsive to the volume of the stomach contents, as measured by hunger ratings.

It is suspected that ghrelin (hunger hormone) level is reduced with aging, trauma or illness. Aging also causes the dysregulation of peptide hormones such as CCK, peptide-YY, oxyntomodulin, glucagon-like peptide 1, and pancreatic polypeptide. These hormones play an important role in the regulation of appetite.

Older people usually have reduced levels of growth and sex hormones, but have increased levels of catecholamines and glucocorticoids. This hormonal imbalance leads to elevated levels of cytokines such as
TNFα, IL1, IL6, and serotonin, which increase catabolism and can cause anorexia. These cytokines are also elevated in chronic inflammatory diseases, trauma, and various infections. Furthermore, the brain and neurotransmitters play an important role in the regulation of food intake. It is believed that aging leads to low levels of endogenous opioids in the brain as well as loss of opioid receptors. The elderly have reduced levels of nitric oxide and endogenous opioids, which play an important role in food intake regulation.

**Taste and Smell**

A poor sense of taste and smell are also held responsible for the loss of appetite, as they are associated with decline in the pleasantness of food. Taste also plays a crucial role in the cephalic phase response that prepares the body for food digestion. Taste is also an important factor for the modulation of food selection and meal size by increasing the pleasure of eating and satiety.

Aging is associated with loss of taste and smell that and can also be exacerbated by certain medications and diseases. The exact cause of taste loss is still not known. It is believed that aging leads to reduction in the number of taste buds, and a decrease in the functioning of taste receptors, which play a key role in taste sensation.

Many drugs such as antihistamines, lipid lowering agents and others can alter the sensation of taste and smell. The exact mechanism by which these medications alter taste or smell is still unknown. Some research studies have observed that improving the food flavor can enhance nutritional intake and cause weight gain in nursing home and hospital patients, as well as in the healthy elderly.
Oral Health, Dental Status and Dysphagia

Poor oral health and dentition can significantly impact food intake in the elderly; it can cause difficulty in chewing, speaking, dryness of mouth, and can impact relationships with others. In these studies, it was shown that energy intake was lower in edentate elderly people with poor energy intake and concomitant deficiencies of micronutrients (calcium, iron, vitamins A, C and E, and some B vitamins), fiber, and protein. Dysphagia from various causes in the elderly, presbyesophagus or disease, can lead to malnutrition due to poor food intake.

Disease and Disability

In the elderly, disease may increase the risk of malnutrition. It has been observed that rates of hospital malnutrition, and worsening malnutrition increase during illness. Additionally, some drugs can adversely affect food intake. Compared to other age groups, the elderly take more medications and are therefore more likely to have these adverse side effects.

Lifestyle and Social Factors

It has been observed that burden of disease, stress, poor appetite, and vision, comprise independent determinants of food intake in elderly. Lifestyle factors may also contribute in the development of malnutrition. Other determinants of food intake are:

- Knowledge of cooking
- Social isolation and loneliness
- Food attitudes and beliefs
• Certain psychological factors such as stress, depression, and bereavement
• Availability of services and assistance
• Oral health and dentition
• Food expenditure
• Food availability
• Degree of functional disability
• Appetite status
• Disease status

_Dementia and Confusion_

Several studies have observed a close relationship between cognitive impairments and malnutrition in elderly. It has been observed that there is an inverse relationship between food intake and cognition, indicating that impaired cognition may adversely impact the ability or desire to eat. Progressive dementia process is characterized by frequent weight loss and an altered eating pattern.

Uncontrolled weight loss is a distinctive feature in the latter stages. Approximately 50% of the elderly with Alzheimer’s disease lose the ability to feed themselves eight years after diagnosis. Furthermore, it has been observed that even in early stages of Alzheimer’s disease, some patients may experience slower oral manipulation of food and a slower swallow response.

A recent study conducted on nursing home patients with dementia done to investigate the cause of unintentional weight loss, found a close association between weight loss in demented elderly and the process of choosing food, bringing the selected food to the mouth, and
chewing. Several studies have also observed that major changes in feeding ability develop during dementia and subsequently lead to weight loss and malnutrition.

*Depression and Other Psychological Factors*

Several studies have observed that depression leads to malnutrition and weight loss in the elderly. Bereavement can also adversely impact eating behaviors and food intake. Stress and anxiety can impact and pattern food intake. For example, it has been found that low or depressed moods may push people to eat more, particularly comfort food. On the other hand, some people may resort to a fasting state instead.

**Common Single Nutrient Deficiency Diseases**

The tables below outline the more common nutrient deficiencies experienced by aged individuals, and the effects of protein malnutrition.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Deficient Nutrient</th>
<th>Clinical presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pellagra</td>
<td>Niacin (Vit B3)</td>
<td>Dermatitis, diarrhea or constipation and dementia</td>
</tr>
<tr>
<td>Beriberi</td>
<td>Thiamine (Vit B1)</td>
<td>Dry: Parasthenia, footdrop, loss of reflexes Wet: Edema, dyspnea, heart failure</td>
</tr>
<tr>
<td>Wernicke's Syndrome</td>
<td>Thiamine (Vit B1)</td>
<td>Confusion, sixth nerve palsy, coma</td>
</tr>
<tr>
<td>Scurvy</td>
<td>Vitamin C</td>
<td>Petechiae, bleeding</td>
</tr>
<tr>
<td>Xerophthalmia</td>
<td>Vitamin A</td>
<td>Keratitis, blindness</td>
</tr>
</tbody>
</table>
### Effects of Protein Energy Malnutrition

<table>
<thead>
<tr>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
</tr>
<tr>
<td>Pressure ulcers</td>
</tr>
<tr>
<td>Hip fracture</td>
</tr>
<tr>
<td>Falls</td>
</tr>
<tr>
<td>Weakness</td>
</tr>
<tr>
<td>Fatigue</td>
</tr>
<tr>
<td>Anemia</td>
</tr>
<tr>
<td>Edema</td>
</tr>
<tr>
<td>Cognitive abnormalities</td>
</tr>
<tr>
<td>Infections</td>
</tr>
<tr>
<td>Immune dysfunction</td>
</tr>
<tr>
<td>Thymic atrophy</td>
</tr>
<tr>
<td>Decreased delayed hypersensitivity</td>
</tr>
<tr>
<td>Decreased helper T cells (CD4⁺)</td>
</tr>
<tr>
<td>Decreased lymphocyte response to mitogens</td>
</tr>
<tr>
<td>Decreased response to immunizations</td>
</tr>
</tbody>
</table>

### Assessing Malnutrition

Initial screening for malnutrition in the elderly includes an accurate measurement of weight and height and assessment with a screening tool such as the Mini Nutritional Assessment (MNA). Clinical judgment plays an important role in the identification of patients at risk for malnutrition. Proper assessment of function is important because functional decline may lead to malnutrition or result from it.
Weight and Body Mass Index (BMI)

Weight loss is an important indicator of malnutrition. Parameters for the assessment of elderly in long-term care settings are as follows:

- Severe weight loss is defined as greater than 5% weight loss in 1 month, 7.5% weight loss in 3 months or 10% weight loss in 6 months.
- Failure to thrive can be defined as a 25% weight loss with no identifiable cause.
- Measurement of weight and height are necessary to determine body mass index. A BMI of 21 or less is often consistent with malnutrition in older adults and has been linked to higher mortality. It should trigger intervention.

Even in overweight individuals, weight loss is associated with a greater incidence of morbidity and mortality. The table below lists BMI classifications and value trends.

<table>
<thead>
<tr>
<th>Classification</th>
<th>BMI(kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
</tr>
<tr>
<td>Normal</td>
<td>18.5–24.9</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0–29.9</td>
</tr>
<tr>
<td>Obesity Class I</td>
<td>30.0–34.9</td>
</tr>
<tr>
<td>Obesity Class II</td>
<td>35.0–39.9</td>
</tr>
<tr>
<td>Obesity Class III</td>
<td>&gt;40</td>
</tr>
</tbody>
</table>
Height

It is important to measure height accurately. The best way to measure the height of an elderly person is to use height at the knee to determine overall height. The chart below provides guidance on estimating stature based on knee height.

<table>
<thead>
<tr>
<th>AGE (years)</th>
<th>6–18</th>
<th>19–60</th>
<th>&gt;60</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MEN</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>( S = 40.54 + (2.22 \text{ KH}) )</td>
<td>( S = 71.85 + (1.88 \text{ KH}) )</td>
<td>( S = 59.01 + (2.08 \text{ KH}) )</td>
</tr>
<tr>
<td>Black</td>
<td>( S = 39.60 + (2.18 \text{ KH}) )</td>
<td>( X = 73.42 + (1.79 \text{ KH}) )</td>
<td>( S = 95.79 + (1.37 \text{ KH}) )</td>
</tr>
<tr>
<td><strong>WOMEN</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>( S = 43.21 + (2.14 \text{ KH}) )</td>
<td>( S = 70.25 + (1.87 \text{ KH}) - (0.06 A) )</td>
<td>( S = 75.00 + (1.91 \text{ KH}) - (0.17 A) )</td>
</tr>
<tr>
<td>Black</td>
<td>( S = 46.59 + (2.02 \text{ KH}) )</td>
<td>( S = 68.10 + (1.86 \text{ KH}) - (0.06 A) )</td>
<td>( S = 58.72 + (1.96 \text{ KH}) )</td>
</tr>
</tbody>
</table>

Undernutrition in Older Adults

The simplified nutrition assessment questionnaire (SNAQ) is a helpful tool for clinicians to assess dietary needs. It is outlined below.

**SNAQ**

1. My appetite is
   A. very poor
   B. poor
   C. average
   D. good
   E. very good
2. When I eat
A. I feel full after eating only a few mouthfuls
B. I feel full after eating about a third of a meal
C. I feel full after eating over half a meal
D. I feel full after eating most of the meal
E. I hardly ever feel full

3. Food tastes
A. very bad
B. bad
C. good
D. very good

4. Normally I eat
A. less than one meal a day
B. one meal a day
C. two meals a day
D. three meals a day
E. more than three meals a day

The clinician should follow the instructions for completing the screening scale as explained below.

Complete the questionnaire by circling the correct answers and then tally the results based upon the following numerical scale: A = 1, B = 2, C = 3, D = 4 and E = 5. Scoring: if the mini-SNAQ is <14, there is a significant risk of weight loss.

An additional tool clinicians may use for nutritional screening is the Mini Nutritional Assessment Short Form (MNA®-SF), which is shown in the following table.
<table>
<thead>
<tr>
<th></th>
<th>Mini Nutritional Assessment – Short Form</th>
</tr>
</thead>
</table>
| A. | Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?  
0 = severe decrease in food intake  
1 = moderate decrease in food intake  
2 = no decrease in food intake  |
| B. | Weight loss during the last 3 months  
0 = weight loss greater than 3 kg (6.6 lbs.)  
1 = does not know  
2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs.)  
3 = no weight loss  |
| C. | Mobility  
0 = bed or chair bound  
1 = able to get out of bed / chair but does not go out  
2 = goes out  |
| D. | Has suffered psychological stress or acute disease in the past 3 months?  
0 = yes  
2 = no  |
| E. | Neuropsychological problems  
0 = severe dementia or depression  
1 = mild dementia  
2 = no psychological problems  |
| F1. | Body Mass Index (BMI) (weight in kg) / (height in m2)  
0 = BMI less than 19  
1 = BMI 19 to less than 21  
2 = BMI 21 to less than 23  
3 = BMI 23 or greater  |
| F2. | Calf circumference (CC) in cm  
0 = CC less than 31  
3 = CC 31 or greater  |

12-14 points: Normal nutritional status; 8-11 points: At risk of malnutrition; 0-7 points: Malnourished
The Full MNA® is a screening tool to help identify elderly patients who are malnourished or at risk of malnutrition. It is a more thorough version of the MNA®-SF. The following table explains each question and how to assign and interpret the score.

| A. Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties? | Ask patient or caregiver or check the medical record  
- “Have you eaten less than normal over the past three months?”  
- If so, “Is this because of lack of appetite, chewing, or swallowing difficulties?”  
- If yes, “have you eaten much less than before, or only a little less?” |
|---|---|
| 0 = severe decrease in food intake  
1 = moderate decrease in food intake  
2 = no decrease in food intake |  |

| B. Weight loss during the last 3 months | Ask patient / Review medical record (if long term or residential care)  
- “Have you lost any weight without trying over the last 3 months?”  
- “Has your waistband gotten looser?”  
- “How much weight do you think you have lost? More or less than 3 kg (or 6 pounds)?” |
|---|---|
| 0 = weight loss greater than 3 kg (6.6 lbs)  
1 = does not know  
2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)  
3 = no weight loss |  |

Though weight loss in the overweight elderly may be appropriate, it may also be due to malnutrition. When the weight loss question is removed, the MNA® loses its sensitivity, so it is important to ask about weight loss even in the overweight.
| C. Mobility | Ask patient/Patient’s medical record/ Information from caregiver  
0 = bed or chair bound  
1 = able to get out of bed / chair but does not go out  
2 = goes out  
- “How would you describe your current mobility?”  
- “Are you able to get out of a bed, a chair, or a wheelchair without the assistance of another person?” – if not, would score 0  
- “Are you able to get out of a bed or a chair, but unable to go out of your home?” – if yes, would score 1  
- “Are you able to leave your home?” – if yes, would score 2 |
| --- | --- |
| D. Has suffered psychological stress or acute disease in the past 3 months? | Ask patient / Review medical record / Use professional judgment  
0 = yes  
2 = no  
- “Have you been stressed recently?”  
- “Have you been severely ill recently?” |
| E. Neuropsychological problems | Review patient medical record / Use professional judgment / Ask patient, nursing staff or caregiver  
0 = severe dementia or depression  
1 = mild dementia  
2 = no psychological problems  
- “Do you have dementia?”  
- “Have you had prolonged or severe sadness?”  
The patient’s caregiver, nursing staff or medical record can provide information about the severity of the patient’s neuropsychological problems (dementia). |
**F1 Body Mass Index (BMI)**
*(weight in kg) / (height in m²)*

<table>
<thead>
<tr>
<th>BMI</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>BMI less than 19</td>
</tr>
<tr>
<td>1</td>
<td>BMI 19 to less than 21</td>
</tr>
<tr>
<td>2</td>
<td>BMI 21 to less than 23</td>
</tr>
<tr>
<td>3</td>
<td>BMI 23 or greater</td>
</tr>
</tbody>
</table>

**Determining BMI:**

BMI is used as an indicator of appropriate weight for height.

**BMI Formula – US Units**

- BMI = (Weight in Pounds / [Height in inches x Height in inches]) x 703

**BMI Formula – Metric Units**

- BMI = (Weight in Kilograms / [Height in Meters x Height in Meters])

1 Pound = 0.45 Kilograms

1 Inch = 2.54 Centimeters

Before determining BMI, record the patient’s weight and height on the MNA® form.

1. If height has not been measured, please measure using a stadiometer or height gauge.

2. If the patient is unable to stand, measure height using indirect methods such as measuring demi-span, arm span, or knee height.

3. Using the BMI chart, locate the patient’s height and weight and determine the BMI.

4. Fill in the appropriate box on the MNA® form to represent the BMI of the patient.

5. To determine BMI for a patient with an amputation.

Note: If the BMI cannot be obtained, discontinue use of the full MNA® and use the MNA®-SF instead. Substitute calf circumference for BMI on the MNA®-SF.
| **F2 Calf circumference (CC) in cm** | 0 = CC less than 31  
3 = CC 31 or greater |
|-------------------------------------|-------------------------------|

**Additional Information:**

**G. Lives independently (not in a nursing home)?**
Score 1 = Yes  
0 = No

Ask patient

This question refers to the normal living conditions of the individual. Its purpose is to determine if the person is usually dependent on others for care.

For example, if the patient is in the hospital because of an accident or acute illness, where does the patient normally live?

- “Do you normally live in your own home, or in an assisted living, residential setting, or nursing home?”

**H. Takes more than 3 prescription drugs per day?**
Score 0 = Yes  
1 = No

Ask patient / Review patient’s medical record

Check the patient’s medication record / ask nursing staff / ask doctor / ask patient

**I. Pressure sores or skin ulcers?**
Score 0 = Yes  
1 = No

Ask patient / Review patient’s medical record

- “Do you have bed sores?”

Check the patient’s medical record for documentation of pressure wounds or skin ulcers, or ask the caregiver / nursing staff / doctor for details; or examine the patient if information is not available in the medical record.
### J. How many full meals does the patient eat daily?

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>One meal</td>
</tr>
<tr>
<td>1</td>
<td>Two meals</td>
</tr>
<tr>
<td>2</td>
<td>Three meals</td>
</tr>
</tbody>
</table>

Ask patient / Check food intake record if necessary

- “Do you normally eat breakfast, lunch and dinner?”
- “How many meals a day do you eat?”

A full meal is defined as eating more than 2 items or dishes when the patient sits down to eat. For example, eating potatoes, vegetable, and meat is considered a full meal; or eating an egg, bread, and fruit is considered a full meal.

### K. Selected consumption markers for protein intake Select all that apply.

- **At least one serving of dairy products (milk, cheese, yogurt) per day?**
  - Yes
  - No

- **Two or more servings of legumes or eggs per week?**
  - Yes
  - No

- **Meat, fish or poultry every day?**
  - Yes
  - No

Score 0.0 = if 0 or 1 Yes answer

Score 0.5 = if 2 Yes answers

Score 1.0 = if 3 Yes answers

Ask the patient or nursing staff, or check the completed food intake record

- “Do you consume any dairy products (a glass of milk / cheese in a sandwich / cup of yogurt / can of high protein supplement) every day?”
- “Do you eat beans / eggs? How often do you eat them?”
- “Do you eat meat, fish or chicken every day?”
<table>
<thead>
<tr>
<th>Question</th>
<th>Instructions/Ask</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>L. Consumes two or more servings of fruits or vegetables per day?</strong></td>
<td>Ask the patient / check the completed food intake record if necessary</td>
</tr>
<tr>
<td>Score 0 = No</td>
<td>• “Do you eat fruits and vegetables?”</td>
</tr>
<tr>
<td>1 = Yes</td>
<td>• “How many portions do you have each day?”</td>
</tr>
<tr>
<td></td>
<td>A portion can be classified as:</td>
</tr>
<tr>
<td></td>
<td>• One piece of fruit (apple, banana, orange, etc.)</td>
</tr>
<tr>
<td></td>
<td>• One medium cup of fruit or vegetable juice</td>
</tr>
<tr>
<td></td>
<td>• One cup of raw or cooked vegetables</td>
</tr>
<tr>
<td><strong>M. How much fluid (water, juice, coffee, tea, milk) is consumed per day?</strong></td>
<td>Ask patient</td>
</tr>
<tr>
<td>Score 0.0 = Less than 3 cups</td>
<td>• “How many cups of tea or coffee do you normally drink during the day?”</td>
</tr>
<tr>
<td>0.5 = 3 to 5 cups</td>
<td>• “Do you drink any water, milk or fruit juice?”</td>
</tr>
<tr>
<td>1.0 = More than 5 cups</td>
<td>“What size cup do you usually use?”</td>
</tr>
<tr>
<td></td>
<td>A cup is considered 200 – 240ml or 7-8oz.</td>
</tr>
<tr>
<td><strong>N. Mode of Feeding?</strong></td>
<td>Ask patient / Review patient medical record/Ask caregiver</td>
</tr>
<tr>
<td>Score 0 = Unable to eat without assistance</td>
<td>• “Are you able to feed yourself?” / “Can the patient feed himself/herself?”</td>
</tr>
<tr>
<td>1 = Feeds self with some difficulty</td>
<td>• “Do you need help to eat?” / “Do you help the patient to eat?”</td>
</tr>
<tr>
<td>2 = Feeds self without any problems</td>
<td>• “Do you need help setting up your meals (opening containers, buttering bread, or cutting meats)?”</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Patients who must be fed or need help holding the fork would score 0.</td>
</tr>
</tbody>
</table>
**Patients who need help setting up meals (opening containers, buttering bread, or cutting meats), but are able to feed themselves would score 1 point. (Pay particular attention to potential causes of malnutrition that need to be addressed to avoid malnutrition, *i.e.*, dental problems, need for adaptive feeding devices to support eating).**

<table>
<thead>
<tr>
<th>O. Self-View of Nutritional Status</th>
<th>Ask the patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score 0 = Views self as being malnourished</td>
<td>• “How would you describe your nutritional state?”</td>
</tr>
<tr>
<td>1 = Is uncertain of nutritional state</td>
<td>Then prompt “Poorly nourished?” “Uncertain?” “No problems?”</td>
</tr>
<tr>
<td>2 = Views self as having no nutritional problems</td>
<td>The answer to this question depends upon the patient’s state of mind. If you think the patient is not capable of answering the question, ask the caregiver / nursing staff for their opinion.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P. In comparison with other people of the same age, how does the patient consider his/her health status?</th>
<th>Ask patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score 0.0 = Not as good</td>
<td>• “How would you describe your state of health compared to others your age?”</td>
</tr>
<tr>
<td>0.5 = Does not know</td>
<td>Then prompt “Not as good as others of your age?” “Not sure?” “As good as others of your age?” “Better?”</td>
</tr>
<tr>
<td>1.0 = As good</td>
<td>Again, the answer will depend upon the state of mind of the person answering the question. Mid-arm circumference (MAC) in cm</td>
</tr>
<tr>
<td>2.0 = Better</td>
<td>Score 0.0 = MAC less than 21</td>
</tr>
</tbody>
</table>
**Q. Mid-arm circumference (MAC) in cm**
Score 0.0 = MAC less than 21
0.5 = MAC 21 to 22
1.0 = MAC 22 or greater

**R. Calf circumference (CC) in cm**
Score 0 = CC less than 31
1 = CC 31 or greater

Measure the mid-arm circumference in cm
Calf circumference should be measured in cm

24-30 points-Normal nutritional status; 17-23.5 points-At Risk of Malnutrition <17 points-Malnourished

**Undernutrition in Older Adults**

The 'Meals on Wheels' mnemonic for treatable causes of weight loss is a helpful way to organize evaluation of the older adult. It is outlined below as:

- **Medications**
- **Emotional** (depression)
- **Alcoholism**, anorexia tardive dyskinesia, abuse (elder)
- **Late life paranoia**
- **Swallowing problems**
- **Oral problems**
- **Nosocomial infections, no money** (poverty)
- **Wandering/dementia**
- **Hyperthyroidism**, hypercalcemia, hypoadrenalism
- **Enteric problems** (malabsorption)
- **Eating problems** (*i.e.*, Tremor)
- **Low salt, low cholesterol diet**
- **Shopping and meal preparation problems**, stones (cholecystitis)
**Laboratory Studies**

Laboratory analysis for an elderly patient suspected of malnutrition should assess the presence of disease and conditions that cause weight loss or loss of appetite. A complete blood count screens for infection and anemia, particularly megaloblastic anemia due to B\(_{12}\) or folate deficiency. A complete thyroid profile to detect hypothyroidism and hyperthyroidism is also required. A comprehensive metabolic panel including total protein and albumin, serum electrolytes and liver function tests should also be conducted. Urinalysis and stool analysis should also be conducted to detect infection and bleeding. Some of the important markers of malnutrition in elderly include albumin, transferrin, retinol-binding protein and thyroxine-binding prealbumin.

Among all these markers of nutrition, serum albumin is considered to be more accurate as it is predictive of mortality and other outcomes in older people. However, these proteins are also affected by inflammation and infection; therefore, they have limited usefulness. Transferrin is a more sensitive indicator of early protein-energy malnutrition, but it is not reliable in conditions such as iron deficiency, chronic infection, hypoxemia, and liver disease. A low total lymphocyte count indicates a poor prognosis and is independent of low serum albumin.

Malnutrition is also associated with age-related immune impairments, including decreased lymphocyte proliferation. No biochemical marker or screening test can clearly indicate malnourishment.
Management of Malnutrition

Only 1% of elderly individuals who are independent and healthy are malnourished; however, approximately, 16% of community-dwelling elderly in the U.S. consumed fewer than 1,000 calories per day. Management of malnutrition in the elderly focuses early on offering ample food choices with high nutrient density and high caloric value after which additional caloric supplements can be considered. It also focuses on the early diagnosis and treatment of treatable causes of malnutrition. Provision of adequate food forms the basis of the management of malnutrition.

A recent study has observed that caloric supplementation is associated with decreased length of hospitalization and mortality. Amino acid supplementation rich in leucine has been found to increase production of muscle protein and muscle function. Oral calorie supplements should ideally be taken between meals. Improving food taste, enhancing flavors, good ambience and time spent feeding impaired elderly also help in treating malnutrition.

There are two major orexigenic or appetite stimulant drugs (megestrol acetate and dronabinol), which may be used for the management of malnutrition. Megestrol acetate causes increased food intake and leads to weight gain. It is more effective in women than in men. Megestrol acetate should be given with food for better absorption. A nanoparticle form of this drug is better absorbed during starvation. The major adverse effect of this drug is increased risk of deep vein thrombosis. Megestrol acetate should not be prescribed to elderly confined to bed. Its efficacy increases in combination with olanzapine (a mood altering drug).
Dronabinol is also an effective medication that leads to a small increase in appetite as well as weight gain. It is also used as a palliative care drug because it decreases nausea, increases enjoyment of food and life. Testosterone in combination with a caloric supplement can also lead to weight gain and decreases hospitalization in the frail elderly.

Gastrointestinal tube feeding can be a life saving option for those elderly who are unable to swallow. However, tube feeding should be used selectively.

Aging is associated with decreased vitamin D level. Vitamin D at a low level in the body is associated with fractures, muscle atrophy, falls and an increased rate of mortality. Adequate supplementation with 800 – 1000 IU vitamin D daily may help the elderly manage low levels of vitamin D.

Anemia due to malnutrition is common in the elderly. Iron deficiency anemia is the most common, but vitamin B12 and folate deficiency are also seen in the elderly. Iron deficiency anemia is observed in individuals having a low iron and ferritin level. Transferrin receptors should be measured to differentiate from the anemia of chronic disease. Methylmalonic acid levels should be assessed in people with borderline low levels of vitamin B12. Treatment of vitamin B12 deficiency includes either 1000 IU of vitamin B12 orally daily or injections of 1000 IU of vitamin B12 weekly for 4 weeks.

Iron deficiency anemia is treated with oral iron once a day for 6 weeks. Reticulocyte count should be measured after 1 week of treatment. If
the reticulocyte count doesn’t increase, malabsorption may be a possibility and parenteral iron may be required in such cases.

Zinc deficiency may be seen in elderly with diabetes mellitus and cancer or on diuretics. The role of zinc supplementation remains uncertain.

Interventions that may be necessary for the management of undernutrition, malnutrition and nutritional deficiencies may include one or more of the following actions:

- Liberalize diet by removing or changing dietary restrictions
- Encourage use of flavor enhancers
- Increase frequency of small meals
- Add liquid food supplements between meals
- Addition of meat, peanut butter, or protein powder to increase protein intake
- Diagnose and treat depression with medications that antidepressants that do not exacerbate malnutrition
- Replace or discontinue drugs that may lead to anorexia
- Evaluate dysphagia, swallowing impairment and the ability to manage eating
- Obtain social services assessment of living situation of community-dwelling adults

The hospital and skilled nursing facilities present additional factors that impact nutrition. Interventions that may be carried in the institutional setting for the management of malnutrition in the elderly include:
• Ensure that patients have all the necessary sensory aids such as dentures, glasses, hearing aids, etc.
• Make sure that the elderly patient is seated upright close to 90 degrees.
• The elderly in a long-term care facility should preferably take their meals in the dining room.
• While taking meals, food and utensils should be kept unwrapped or in open containers and should be within the patient's reach.
• The elderly should be given ample time to eat, facilitating their potentially slower pace of eating.
• Consider the ethnic food preferences of the elderly and allow families to bring foods that the patient loves to eat.
• If an elderly person must be fed or requires assistance, give adequate time for chewing, swallowing, and clearing the throat before another bite. The person assisting the patient should develop a good rapport with that patient.
• Those with dementia may need to be reminded to chew and swallow and may benefit from finger foods.
• The patient’s family should be encouraged to be present at mealtime and to assist in feeding.

Clinical Signs and Nutritional Deficiencies

The following table outlines the common systemic signs and symptoms of nutrient deficits in the elderly.
<table>
<thead>
<tr>
<th>System</th>
<th>Sign or symptom</th>
<th>Nutrient deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td>Dry scaly skin</td>
<td>Zinc/essential fatty acids</td>
</tr>
<tr>
<td></td>
<td>Follicular hyperkeratosis</td>
<td>Vitamins A, C</td>
</tr>
<tr>
<td></td>
<td>Petechiae</td>
<td>Vitamins C, K</td>
</tr>
<tr>
<td></td>
<td>Photosensitive dermatitis</td>
<td>Niacin</td>
</tr>
<tr>
<td></td>
<td>Poor wound healing</td>
<td>Zinc, vitamin C</td>
</tr>
<tr>
<td></td>
<td>Scrotal dermatitis</td>
<td>Riboflavin</td>
</tr>
<tr>
<td>Hair</td>
<td>Thin/depigmented</td>
<td>Protein</td>
</tr>
<tr>
<td></td>
<td>Easily plucked, hair loss</td>
<td>Protein, zinc</td>
</tr>
<tr>
<td>Nail</td>
<td>Transverse depigmentation</td>
<td>Albumin</td>
</tr>
<tr>
<td></td>
<td>Spooning</td>
<td>Iron</td>
</tr>
<tr>
<td>Eyes</td>
<td>Night blindness</td>
<td>Vitamin A, zinc</td>
</tr>
<tr>
<td></td>
<td>Conjunctival inflammation</td>
<td>Riboflavin</td>
</tr>
<tr>
<td></td>
<td>Keratomalacia</td>
<td>Vitamin A</td>
</tr>
<tr>
<td>Mouth</td>
<td>Bleeding gums</td>
<td>Vitamin C, riboflavin</td>
</tr>
<tr>
<td></td>
<td>Glositis</td>
<td>Niacin, pyridoxine, riboflavin</td>
</tr>
<tr>
<td></td>
<td>Atrophic papillae</td>
<td>Iron</td>
</tr>
<tr>
<td></td>
<td>Hypoguesia</td>
<td>Zinc, vitamin A</td>
</tr>
<tr>
<td>Neck</td>
<td>Thyroid gland enlargement</td>
<td>Iodine</td>
</tr>
<tr>
<td></td>
<td>Parotid gland enlargement</td>
<td>Protein</td>
</tr>
<tr>
<td>Abdomen</td>
<td>Diarrhea</td>
<td>Niacin, folate, vitamin B12</td>
</tr>
<tr>
<td></td>
<td>Hepatomegaly</td>
<td>Protein</td>
</tr>
<tr>
<td>Extremities</td>
<td>Bone tenderness</td>
<td>Vitamin D</td>
</tr>
<tr>
<td></td>
<td>Joint pain</td>
<td>Vitamin C</td>
</tr>
<tr>
<td></td>
<td>Muscle tenderness</td>
<td>Thiamine</td>
</tr>
<tr>
<td></td>
<td>Muscle wasting</td>
<td>Protein, selenium vitamin D</td>
</tr>
<tr>
<td></td>
<td>Edema</td>
<td>Protein</td>
</tr>
<tr>
<td>System</td>
<td>Sign or symptom</td>
<td>Nutrient deficiency</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Neurological</td>
<td>Ataxia</td>
<td>Vitamin B12</td>
</tr>
<tr>
<td></td>
<td>Tetany</td>
<td>Calcium, magnesium</td>
</tr>
<tr>
<td></td>
<td>Parasthesia</td>
<td>Thiamine, vitamin B12</td>
</tr>
<tr>
<td></td>
<td>Ataxia</td>
<td>Vitamin B12</td>
</tr>
<tr>
<td></td>
<td>Dementia</td>
<td>Vitamin B12, niacin</td>
</tr>
<tr>
<td></td>
<td>Hyporeflexia</td>
<td>Thiamine</td>
</tr>
</tbody>
</table>

**Dysphagia**

Dysphagia can be defined as any impairment in the swallowing process and is a frequent health concern in the aging population. Individuals with physiological or anatomical impairments in the mouth, pharynx, larynx, and esophagus may experience dysphagia. Dysphagia also increases the risk of malnutrition and pneumonia. Dysphagia is observed in 68% of elderly nursing home residents, around 30% of elderly admitted to the hospital, approximately 64% of patients after stroke, and up to 13%–38% of elderly who live independently.

Predisposing factors for dysphagia in the elderly include alterations in swallowing physiology and chronic diseases. In the U.S., approximately 300,000–600,000 individuals suffer dysphagia every year. It is believed that around 15% of the elderly population experience dysphagia. According to a recent study, from 2002–2007, dysphagia referral rates among the elderly in a single tertiary teaching hospital increased by 20%; and, 70% of the referrals were for individuals above the age of 60. In 2010, it is suggested that approximately 6 million elderly were at risk for dysphagia.
Aging Effects on Swallowing Function

Aging leads to reductions in muscle mass and connective tissue elasticity, which results in poor range of motion and a loss of strength. These changes may adversely affect the process of swallowing. Most commonly, a subtle and progressive slowing of the swallowing processes occurs in the elderly. Over time, these subtle but cumulative changes may cause dysphagia and affect the upper airway.

Low moisture in the oral cavity, poor taste, and smell acuity can also lead to poor swallowing in the elderly. However, the predominant factor responsible for dysphagia in the elderly is the presence of age-related disease.

Dysphagia and its Sequelae

The swallowing process is complex and many diseases and conditions can affect this vital function. Neurological diseases such as dementia, carcinoma of the esophagus and head/neck, and metabolic impairments also may play an important role in the development of dysphagia. Dysphagia in the elderly is also linked with increased mortality and morbidity.

Common complications of dysphagia in the elderly include pneumonia and malnutrition. Below is a table of the common conditions that contribute to dysphagia in the elderly.
Conditions That May Contribute To Dysphagia

<table>
<thead>
<tr>
<th>Neurologic disease</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>Any tumor involving the digestive or</td>
</tr>
<tr>
<td>Dementia</td>
<td>respiratory tract</td>
</tr>
<tr>
<td>Traumatic brain injury</td>
<td>Iatrogenic diagnoses</td>
</tr>
<tr>
<td>Myasthenia gravis</td>
<td>Chemotherapy</td>
</tr>
<tr>
<td>Cerebral palsy</td>
<td>Radiation therapy</td>
</tr>
<tr>
<td>Guillain–Barré syndrome</td>
<td>Medication related</td>
</tr>
<tr>
<td>Poliomyelitis</td>
<td>Other, related diagnoses</td>
</tr>
<tr>
<td>Myopathy</td>
<td>Severe respiratory compromise</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Progressive or neurologic disease</th>
<th>Rheumatoid disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parkinson’s disease</td>
<td>Polydermatomyositis</td>
</tr>
<tr>
<td>Huntington disease</td>
<td>Progressive systemic sclerosis</td>
</tr>
<tr>
<td>Age-related changes</td>
<td>Sjögren’s disease</td>
</tr>
</tbody>
</table>

**Dysphagia and Nutrition in Stroke**

Dysphagia is commonly seen after a stroke with estimates ranging from 30%–65%. Approximately 300,000–600,000 individuals experience dysphagia because of stroke or other neurological disorders. Many individuals regain functional swallowing within the first month following an episode of stroke; however, some individuals experience difficulty in swallowing even beyond 6 months. Common complications associated with dysphagia following stroke include malnutrition, pneumonia, dehydration, poorer long-term outcome, increased rehabilitation time and the need for long-term care assistance, increased length of hospital stay, increased mortality and increased health care costs. These complications adversely impact the social and physical wellbeing of the elderly, the quality of life of both
elderly and caregivers, and the proper utilization of health care resources.

During the acute phase of stroke, around 40%–60% of elderly patients report swallowing impairments. These impairments also accentuate malnutrition. Although the risk of malnutrition is increased in the presence of dysphagia, post-stroke and pre-stroke factors must be taken into account when assessing nutritional status and predicting stroke outcome. Around 16% of stroke patients present with malnutrition. The risk and prevalence of malnutrition is 22%–26% at the time of discharge from acute care.

Although, nutritional deficiencies and dysphagia often coexist, malnutrition is usually not associated with dysphagia in the acute phase of stroke. In fact, the prevalence rate of malnutrition has increased up to 45% in the post acute rehabilitation phase. Poor food intake during acute hospitalization associated with dysphagia may lead to malnutrition during subsequent rehabilitation.

Dysphagia and Pneumonia in Stroke

Post-stroke pneumonia affects up to one-third of acute stroke patients. Pneumonia accounts for approximately 35% of post-stroke mortality. The majority of stroke-related pneumonias are generally considered to be due to dysphagia and the subsequent aspiration of food. Aspiration can be defined as entry of liquid or food into the airway below the level of the true vocal cords. Aspiration pneumonia is the entry of swallowed materials (gastric or oral) into the airway that causes a lung infection. A recent study has observed stroke patients with dysphagia have a
three-fold increase in pneumonia risk, while the risk of pneumonia increases up to eleven-fold among patients after aspiration.

*Dysphagia and Dementia*

Dysphagia is a common feature of dementia. Approximately 45% of elderly patients with dementia experience some degree of swallowing impairment. Different presentations of dementia lead to varying degree of swallowing or feeding difficulties. These patients usually have a slowing of the swallowing process. Additionally, elderly patients with dementia usually face problems with self-feeding. Dementia, dysphagia, and other related feeding dysfunctions may cause malnutrition and nutritional deficits, which combined with other factors, can lead to pneumonia and even death. The presence of dementia in elderly is closely associated with higher hospital admission rates and overall higher mortality.

*Dysphagia and Nutrition in Community Dwelling Older Adults*

Dysphagia contributes to poor nutritional status due to the reduced or altered oral intake of food or liquid. Dysphagia plays a role in the development of malnutrition, and malnutrition in turn can lead to poor functional capacity. Therefore, dysphagia plays an important role in the process of frailty among older patients. A study conducted on elderly individuals residing in community dwellings showed that approximately 37.6% of those reported dysphagia; and, approximately 5.2% of these elderly reported the use of a feeding tube at some point in life, and around 12.9% took nutritional supplements to achieve an adequate daily caloric intake. Several studies have observed that
elderly patients with dysphagia living in the community are also susceptible to malnutrition.

*Dysphagia and Pneumonia in Older Adults*

Recent findings indicate the potential association between dysphagia, pneumonia, and nutritional status in *community dwelling* elderly. The risk is increased for community-acquired pneumonia in elderly, particularly in those older than 75 years. Furthermore, deaths from pneumonitis due to aspiration are increasing. Dysphagia in the elderly also greatly increases the susceptibility to pneumonia.

*Assessment and Prevention of Dysphagia*

Video fluoroscopy is considered to be the gold standard to study dysphagia. Fiberoptic endoscopic evaluation may also be considered if video fluoroscopy is not available. Some providers recommend these tests only for patients who fail a reliable clinical swallowing assessment.

Clinical Symptoms of Aspiration:

- Abrupt manifestations of certain respiratory symptoms (severe coughing and cyanosis) associated with drinking, eating, or the regurgitation of gastric contents.
- A change in voice (hoarseness or a gurgling noise) after swallowing.
- Small-volume aspirations that lead to minimal or no symptom are frequently seen in elderly and are usually not detected until these progresses to aspiration pneumonia.
Aspiration Pneumonia:

- Elderly individuals with pneumonia frequently usually experience fewer symptoms than young adults; aspiration pneumonia is usually detected late and under-diagnosed in the elderly.
- Delirium is frequently observed in elderly with aspiration pneumonias.
- Tachypnea or increased respiratory rate is an early sign indicating pneumonia in elderly patients; other important symptoms of aspiration pneumonia include fever, chills, pleuritic chest pain and findings of crackles on auscultation of lungs.
- High-risk elderly patients should be monitored closely for aspiration pneumonia.

Management of Dysphagia

The presence of a strong relationship between swallowing process, nutritional status, and pneumonia among older patients indicates a role for dysphagia management in the elderly population. Successful and optimal swallowing interventions/techniques also help in the management of malnutrition and pneumonia. A number of dysphagia management techniques can be used for the treatment of dysphagia.

Swallowing Management

Dysphagia management requires multi-pronged strategies; no single strategy is appropriate for all older patients with dysphagia. Alternate sources of nutrition may be required for optimal nutrition. Compensatory strategies are also helpful for the continued safe oral intake of food. Compensatory strategies also include postural adjustments, swallow techniques or maneuvers, and diet
modifications. Finally, speech therapists can play a key role in the management of patients with dysphagia.

*Postural Adjustments*

Changes in body and/or head posture are common compensatory techniques that may help in reducing the risk of aspiration or residue. Postural changes can help alter the speed and flow direction of a food, which leads to a safe swallow. However, some research studies suggest that active rehabilitation efforts are better than these strategies for the prevention of pneumonia and malnutrition.

<table>
<thead>
<tr>
<th>Examples of Postural Adjustments</th>
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<tbody>
<tr>
<td><strong>Technique</strong></td>
</tr>
<tr>
<td><strong>Body posture changes</strong></td>
</tr>
<tr>
<td>Lying down</td>
</tr>
<tr>
<td>Side lying</td>
</tr>
<tr>
<td><strong>Head posture changes</strong></td>
</tr>
<tr>
<td>Head extension or chin up</td>
</tr>
<tr>
<td>Head flexion or chin tuck</td>
</tr>
<tr>
<td>Head rotation or head turn</td>
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</tbody>
</table>
**Swallow Maneuvers**

Swallow maneuvers are different variations of the normal swallowing process in order to facilitate increased safety or efficiency of the swallow function. For instance, the supraglottic and the super supraglottic swallow techniques involve a voluntary breath hold and associated laryngeal closure to facilitate better swallowing and protect the airway during this process.

Another technique called Mendelssohn maneuver facilitates relaxation of the upper esophageal sphincter (UES). Another popular maneuver is the ‘hard’ swallow that increases swallow forces leading to less residue or airway compromise. Unfortunately, there are limited and inconclusive data on the efficacy of these techniques; therefore, verification of the impact of these maneuvers using swallowing imaging studies should be conducted to ascertain the potential effect of these maneuvers before initiation of these compensatory strategies.

<table>
<thead>
<tr>
<th>TYPES OF SWALLOW MANEUVERS</th>
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</thead>
<tbody>
<tr>
<td>Swallow Maneuver</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Supraglottic swallow</td>
</tr>
<tr>
<td>Super supraglottic swallow</td>
</tr>
<tr>
<td>Effortful swallow; called ‘hard’ or ‘forceful’ swallow</td>
</tr>
<tr>
<td>Mendelssohn maneuver</td>
</tr>
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</table>
Diet Modifications

Modifying the consistency of food is the cornerstone of compensatory intervention for elderly with dysphagia. Thickened liquids are a common compensatory technique that is offered to elderly in hospitals and long-term care facilities. It is believed that thickened liquids aid in controlling the direction, speed, duration, and clearance of the food. Solid foods can be modified to promote safe swallowing and proper nutrition. Levels of the modified diet are highlighted in the table below.

<table>
<thead>
<tr>
<th>LEVELS OF MODIFIED DIET</th>
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<tbody>
<tr>
<td>Level</td>
</tr>
<tr>
<td>Four Levels in the National dysphagia diet</td>
</tr>
<tr>
<td>Level 1: dysphagia pureed</td>
</tr>
<tr>
<td>Level 2: dysphagia mechanically altered</td>
</tr>
<tr>
<td>Level 3: dysphagia advanced</td>
</tr>
<tr>
<td>Level 4: regular</td>
</tr>
</tbody>
</table>
Feeding Dependence and Targeted Feeding

Those elderly patients with stroke and dementia may become dependent upon others for feeding because of cognitive dysfunction and/or certain physical limitations. Feeding dependence may lead to an increased aspiration risk and associated complications in elderly patients with dysphagia. Such patients may require specific training on feeding. Other techniques may be required to monitor the intake of food in order to provide increased safety, decreased fatigue, and improved feedback on swallowing during the course of the meal.

Eating in environments without external stimuli and distractions is also helpful, particularly in skilled nursing or long-term care health care facilities. Introduction of angled utensils, cups without rims, etc., may also be beneficial for elderly patients with dysphagia.

Provision of Alternate Nutrition

Alternate nutrition strategies can be the best form of compensation. Optimal and adequate non-oral feeding can benefit elderly with malnutrition and nutritional deficiencies. Malnutrition in the elderly together with other factors may lead to cardiovascular disease, poor cognitive function, impaired immunity, and poor healing or non-healing pressure ulcers and wounds.

Swallow Rehabilitation

The principal aim of swallow rehabilitation is overall improvement in process of swallowing. Exercise-based swallowing techniques may be employed to facilitate better functional swallowing, prevent or minimize dysphagia-related complications or morbidities, and improve
swallowing physiology. Some of the exercise-based approaches for swallow rehabilitation are discussed in the following table.

<table>
<thead>
<tr>
<th>Exercise-based swallow rehabilitation approaches</th>
<th>Program</th>
<th>Focus</th>
<th>Intended outcome</th>
<th>Reported benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise-based swallow rehabilitation approaches</td>
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<td></td>
</tr>
<tr>
<td>Program</td>
<td>Focus</td>
<td>Intended outcome</td>
<td>Reported benefit</td>
<td></td>
</tr>
<tr>
<td>Lingual resistance</td>
<td>• Strengthening</td>
<td>• Increased tongue</td>
<td>• Increased</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tongue with</td>
<td>strength</td>
<td>tongue muscle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>progressively</td>
<td>• Improved swallow function</td>
<td>mass</td>
<td></td>
</tr>
<tr>
<td></td>
<td>increasing intensity</td>
<td></td>
<td>pressure</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reduced aspiration</td>
<td></td>
</tr>
<tr>
<td>Shaker/head-lift</td>
<td>• Strengthening</td>
<td>• Improve strength</td>
<td>• Increased</td>
<td></td>
</tr>
<tr>
<td></td>
<td>supralingual muscles</td>
<td>of muscles for</td>
<td>larynx elevation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Improve</td>
<td>greater upper</td>
<td>• Increased upper</td>
<td></td>
</tr>
<tr>
<td></td>
<td>elevation of larynx</td>
<td>esophageal sphincter opening</td>
<td>esophageal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Increasing upper</td>
<td></td>
<td>sphincter opening</td>
<td></td>
</tr>
<tr>
<td></td>
<td>esophageal</td>
<td></td>
<td>• Less post-swallow</td>
<td></td>
</tr>
<tr>
<td></td>
<td>sphincter opening</td>
<td></td>
<td>aspiration</td>
<td></td>
</tr>
<tr>
<td>EMST (expiratory muscle strength training)</td>
<td>• Strengthening</td>
<td>• Improve expiratory</td>
<td>• Better</td>
<td></td>
</tr>
<tr>
<td></td>
<td>submental muscle</td>
<td>pressures for better</td>
<td>penetration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improve expiratory</td>
<td>airway protection</td>
<td>aspiration scores</td>
<td></td>
</tr>
<tr>
<td></td>
<td>pressures for</td>
<td></td>
<td>in Parkinson's</td>
<td></td>
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<tr>
<td></td>
<td>better airway</td>
<td></td>
<td>disease</td>
<td></td>
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<td></td>
<td>protection</td>
<td></td>
<td>increased</td>
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<td></td>
<td>maximum</td>
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<td>expiratory</td>
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<td>pressure</td>
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<td>increased</td>
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<td></td>
<td>submental muscle</td>
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<td>electromyography</td>
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<td>activity during</td>
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<td></td>
<td></td>
<td></td>
<td>swallowing</td>
<td></td>
</tr>
<tr>
<td>MDTP (McNeill dysphagia therapy program)</td>
<td>• Swallow as</td>
<td>• Improve swallowing including strength</td>
<td>• Improved</td>
<td></td>
</tr>
<tr>
<td></td>
<td>exercise with</td>
<td>and timing</td>
<td>swallowed strength</td>
<td></td>
</tr>
<tr>
<td></td>
<td>progressive</td>
<td></td>
<td>• Improved</td>
<td></td>
</tr>
<tr>
<td></td>
<td>resistance</td>
<td></td>
<td>movement of</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>swallow structures</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Improved</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>timing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Weight gain</td>
<td></td>
</tr>
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</table>
Falls In The Elderly

Falls may be defined as a sudden, unintentional change in position of an elderly leading to a position at a lower level, on an object, the floor, or the ground, other than as a consequence of seizure, sudden onset of paralysis, or an external force. There are a number of factors that contribute to increased incidence of falls in elderly. Falls can be life threatening and can severely impact the quality of life, general health, and the independence of elderly persons, such as are reviewed in this section.19-24

Falls in the elderly are caused by complex interactions among the various risk factors, which may be characterized as intrinsic (patient related) or extrinsic (external to the patient). It is estimated that approximately 30-40% of community-dwelling elderly fall at least once per year. In the elderly, falls are among the leading causes of fatal and nonfatal injuries. The mortality rate due to falls is around 10 per 100,000 persons for elderly individuals in the 65-74 years age group and 147 per 100,000 persons for elderly individuals in the 85 years or older age group.

The economic burden for fall-related injuries among community-dwelling elderly in 2000 was estimated to be approximately $19.2 billion. Another study has projected that by 2020 this cost could shoot up to $43.8 billion. It is important to note that majority of falls among elderly are preventable. Unintentional injuries are one of the leading causes of death in elderly, with falls accounting for two-thirds of such deaths. In nursing homes, fall rates increase by two-fold when compared with the non-institutionalized population. Falls in the elderly are associated with poorer survival and great financial burden.
Falls are the main cause of traumatic spinal cord injury in elderly. Additionally, even non-injurious falls adversely impact the individual’s quality of life, lead to an increased fear of falling, and limit mobility and activity. The prevalence of risk factors associated with falls in elderly is greater in the nursing home setting and the majority of elderly residents have multiple risk factors.

Some of the well-established risk factors in the long-term care setting include muscular weakness, poor balance and gait, poor vision, cognitive and functional dysfunction, delirium, orthostatic hypotension, certain medications, urinary incontinence and comorbidities such as depression, stroke, arthritis, etc. In 2010, the overall rate of reported nonfatal fall injury episodes was 43 per 1,000 and elderly who were more than 75 years of age had the highest rate. The risk factors, screening and assessment, and interventions for older adults related to fall risk are listed in the tables below.

### Risk Factors for Falls in Older Persons

<table>
<thead>
<tr>
<th>Non-modifiable Risk Factors</th>
<th>Modifiable Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age older than 80 years</td>
<td>Environmental hazards</td>
</tr>
<tr>
<td>Arthritis</td>
<td>Medications (especially psychoactive)</td>
</tr>
<tr>
<td>Cognitive impairment/dementia</td>
<td>Polypharmacy (four or more prescription medications)</td>
</tr>
<tr>
<td>Female sex</td>
<td>Metabolic factors</td>
</tr>
<tr>
<td>History of cerebrovascular accident or transient ischemic attack</td>
<td>• Dehydration</td>
</tr>
<tr>
<td>History of falls</td>
<td>• Diabetes mellitus</td>
</tr>
<tr>
<td>History of fractures</td>
<td>• Low body mass index</td>
</tr>
<tr>
<td>Recently discharged from hospital (within one month)</td>
<td>• Vitamin D deficiency</td>
</tr>
<tr>
<td>Musculoskeletal factors</td>
<td></td>
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<tr>
<td>------------------------</td>
<td></td>
</tr>
<tr>
<td>• Balance impairment</td>
<td></td>
</tr>
<tr>
<td>• Foot problems</td>
<td></td>
</tr>
<tr>
<td>• Gait impairment</td>
<td></td>
</tr>
<tr>
<td>• Impaired activities of daily living</td>
<td></td>
</tr>
<tr>
<td>• Lower extremity muscle weakness</td>
<td></td>
</tr>
<tr>
<td>• Musculoskeletal pain</td>
<td></td>
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<tr>
<td>• Use of assistive device</td>
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<table>
<thead>
<tr>
<th>Neuropsychologic factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Delirium</td>
</tr>
<tr>
<td>• Depression</td>
</tr>
<tr>
<td>• Dizziness or vertigo</td>
</tr>
<tr>
<td>• Fear of falling</td>
</tr>
<tr>
<td>• Parkinson disease</td>
</tr>
<tr>
<td>• Peripheral neuropathy</td>
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</table>

<table>
<thead>
<tr>
<th>Sensory impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Auditory impairment</td>
</tr>
<tr>
<td>• Multifocal lens use</td>
</tr>
<tr>
<td>• Visual impairment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Acute illness</td>
</tr>
<tr>
<td>• Alcohol intoxication</td>
</tr>
<tr>
<td>• Anemia</td>
</tr>
<tr>
<td>• Cardiac arrhythmia</td>
</tr>
<tr>
<td>• Inappropriate footwear</td>
</tr>
<tr>
<td>• Obstructive sleep apnea</td>
</tr>
<tr>
<td>• Orthostatic hypotension</td>
</tr>
<tr>
<td>• Urinary incontinence</td>
</tr>
</tbody>
</table>
## Screening and Assessment

1. The elderly patient should be asked about his or her history of falls during the past year.
2. An elderly person who reports a fall should be asked about the frequency and circumstances of the fall(s).
3. The elderly should be asked about their difficulties with walking or balance.
4. The elderly who present for medical attention due to a fall, report a history of recurrent falls in the past one-year, or report problems in walking or balance should undergo a multifactorial fall risk assessment.
5. Older persons presenting with a single fall should be evaluated for gait and balance.
6. The elderly who have fallen must be assessed for gait and balance.
7. The elderly who are unable to perform or perform poorly on a standardized gait and balance test should be provided a multifactorial fall risk assessment.
8. A multifactorial fall risk assessment is also needed for elderly who exhibit unsteadiness.
9. A fall risk assessment is not required for an elderly person who has only had a single fall and has no significant difficulties with balance, gait or unsteadiness.
10. Only a clinician (or clinicians) with appropriate skills and training should assess the elderly.
11. The multifactorial fall risk assessment must encompass the following:

### Focused History
- a. History of falls in detail
- b. Medication review
- c. History of relevant risk factors

### Physical Examinations
- a. Comprehensive assessment of gait, balance, and mobility levels and lower extremity joint function
- b. Neurological function including assessment of cognition, proprioception, lower extremity peripheral nerves, reflexes, assessment of extrapyramidal, cortical, and cerebellar function
c. Muscle strength (lower extremities)
d. Cardiovascular status
e. Assessment of visual acuity
f. Examination of the feet and footwear

**Functional Assessment**

a. Assessment of activities of daily living (ADL) skills
b. Assessment of the individual's perceived functional ability and fear related to falling

**Environmental Assessment**

a. Environmental assessment including home safety

**Interventions: Elderly Living In the Community**

1. After a thorough multifactorial fall risk assessment, direct interventions should be initiated tailored to the identified risk factors, together with an optimal exercise program.

2. A strategy to reduce the risk of falls should include multifactorial assessment of known fall risk factors and management of the risk factors identified.

3. The components most commonly included in efficacious interventions were:
   - Adaptation or modification of home environment
   - Withdrawal or minimization of psychoactive medications
   - Withdrawal or minimization of other medications
   - Management of postural hypotension
   - Management of foot problems and footwear
   - Exercise, particularly balance, strength, and gait training

4. All elderly individuals who are at risk of falling should be provided an exercise program that encompasses balance, gait, and strength training. Flexibility and endurance training should also be preferably included, but not as sole components of the program.

5. Intervention should include an educational component complementing and addressing issues specifically pertaining to the intervention being provided, tailored to individual cognitive function and language.
6. All such interventions should be carried out by healthcare professionals and other qualified healthcare professionals.

7. If indicated, psychoactive drugs/medications and should either be minimized or withdrawn, with appropriate tapering.

8. The aim should be to reduce either the total number of medications or dose of the medication medications. All medications should be reviewed, and if required minimized or withdrawn.

9. Exercise should be included for fall prevention in community-residing elderly.

10. An exercise program such as Tai Chi or physical therapy that targets strength, gait and balance, is an effective intervention for the reduction of falls.

11. Exercise programs should be individualized according to the physical abilities and health profile of the elderly. Qualified health professionals or fitness instructors should recommend programs.

12. An older person should not wear multifocal lenses when walking, especially on stairs.

13. Postural hypotension in the elderly should be adequately treated.

14. Dual chamber cardiac pacing should be considered for elderly with cardioinhibitory carotid sinus hypersensitivity that experience unexplained recurrent falls.

15. Those elderly who have proven vitamin D deficiency should be supplemented with vitamin D supplements with at least 800 IU per day; and, least 800 IU per day should be offered to elderly with suspected vitamin D deficiency or who are otherwise at an increased risk for falls.

16. Foot problems should be investigated and optimal treatment should be provided to those elderly living in the community.

17. The elderly should be advised that walking with shoes of low heel height and high surface contact area may reduce the risk of falls.

18. Health care professionals should carry out home environment assessment. Intervention should also encompass a multifactorial assessment and intervention for those elderly who have fallen or who are prone to falls.

19. The intervention should encompass removal of recognized hazards in the home, and evaluation and interventions to promote the safe performance of daily activities.

20. Educational and informational programs are an important component of a multifactorial intervention for the elderly.
OLDER PERSONS IN LONG-TERM CARE FACILITIES

1. Multifactorial interventions to reduce the risk of falls should be contemplated for those elderly in long-term care settings.
2. Exercise programs should also be contemplated to reduce the risk of falls in those elderly living in long-term care settings. Special care is needed to reduce the risk of injury in frail individuals.
3. Vitamin D supplements (minimum of 800 IU per day) should be given to those elderly living in long-term care settings with suspected or proven vitamin D deficiency.
4. Vitamin D supplements (minimum of 800 IU per day) should be considered in those elderly residing in long-term care settings who have impaired gait or balance or who are otherwise susceptible to falls.

Summary

In the United States the demand for long-term care for elderly will increase dramatically and the need for health services to help the elderly will grow exponentially. It is the families, relatives and friends of the elderly that provide most of the long-term care required. Medicaid provides long-term care financing for low-income families. However, long-term care continues to be a major challenge for the country and especially the elderly.

It is estimated that the demand for long-term care among the elderly will increase to more than double in the next three decades. LTC for the elderly encompasses a wide variety of services that includes non-medical as well as medical care. It also caters to the health or personal needs of the elderly.

Long-term care assists the elderly with various types of support services such as activities of daily living. It can also be provided at
home, in the community, in nursing homes, or in assisted living. The need for LTC is impacted by changes in the physical, mental, and/or cognitive functional capacities of the elderly, which in turn are greatly influenced by the environment. The type and duration of LTC are a complex issue and usually difficult to predict. The goal of LTC is to make sure that an elderly individual who is not fully capable of long-term self-care can maintain the highest possible quality of life, with a high degree of independence, participation, autonomy, individual fulfillment, and dignity.

Home-based LTC encompasses health, personal, and other types of support services to help the elderly stay at home and live independently as much as possible. This type of care is usually provided either in the home of the elderly person or at a family member’s home. Trained caregivers that receive compensation are also available for home-based LTC services. Home healthcare may include nursing care to help an individual recover from surgery, an injury, or illness. Homemaker services can be availed even without a provider's recommendation.

Nursing homes provide a comprehensive range of medical services, which includes 24-hour supervision and nursing care. Skilled nursing care is provided on a physician’s recommendation and requires the professional skills of a registered nurse or a licensed practical nurse. Intermediate nursing care is provided under periodic medical supervision and encompasses physical, psychological, social, and other restorative services. Individuals without medical training can offer personal or custodial care.
Community-based LTC such as home health care, assisted living facility, adult day care, respite care, and hospice care can be offered in many types of settings and by many kinds of care providers. Assisted living facilities provide care to individuals in a residential facility and include supportive services, personal care, and/or nursing services. Adult day care is care provided in a nonresidential, community-based group program that caters to the needs of functionally impaired elderly. Respite care offers personal care, supervision, or other services to a debilitated individual to provide temporary relief to a patient’s care provider and family member. Hospice care primarily offers symptom and pain management, and supportive services to terminally ill individuals and their families. Hospice is a form of palliative care for terminally ill individuals. LTC hospitals are acute care hospitals, but also focus on providing care to patients who stay in the facility for more than 25 days.

In the older population, malnutrition is an important issue. Malnutrition is the state of being poorly nourished due to under-nutrition, for example the lack of one or more nutrients; or, over nutrition, such as an excess of nutrients. The causes of malnutrition among older people are varied, and they can be categorized into three main types: medical, social, and psychological. Management of malnutrition in the elderly focuses early on offering ample food choices and high calorie food after which additional caloric supplements can be considered.

Dysphagia is a frequent health concern in our aging population. Video fluoroscopy is considered to be the gold standard used to study dysphagia. Successful and optimal swallowing interventions or techniques can help in the management of complication related to
dysphagia malnutrition and pneumonia. A number of dysphagia management techniques and tools can be used for the treatment of dysphagia.

Comorbid conditions complicate the care of the elderly. Often these conditions contribute to falls. Fall risk in the older population is caused by complex interactions among various multiple risk factors, which may be characterized as intrinsic or extrinsic. Elderly patients and their families need to be adequately educated about health risk factors and prevention, such as fall risk, to avoid complications and further loss of health.

Please take time to help NurseCe4Less.com course planners evaluate the nursing knowledge needs met by completing the self-assessment of Knowledge Questions after reading the article, and providing feedback in the online course evaluation.

Completing the study questions is optional and is NOT a course requirement.
1. In the U.S., most elderly long-term care is provided by:
   a. Medicare.
   b. Medicaid.
   c. Family, relatives and friends.
   d. None of the above

2. Currently, more than 6 million elderly in the U.S. require some kind of ____________, with about a third of these requiring more substantial care.
   a. long-term care
   b. emergency care
   c. palliative care
   d. hospice care

3. Older age is associated with an increased prevalence of:
   a. chronic diseases and sensory dysfunction.
   b. changes in cognition.
   c. poor balance and increased rate of falls and injuries.
   d. All of the above

4. True or False: Impaired cognition in the elderly has no correlation to the ability or desire to eat.
   a. True
   b. False

5. Elderly individuals with pneumonia frequently experience:
   a. more symptoms than young adults.
   b. aspiration pneumonia detected late, and under-diagnosed.
   c. tachypnea or increased respiratory rate as an early sign.
   d. answers b and c above.

6. To evaluate the older adult for malnutrition, a helpful mnemonic is:
   c. D-I-E-T-F-O-R-L-I-F-E
   d. E-L-D-E-R-W-E-L-N-E-S-S
7. Basic laboratory work-up for the elderly includes:
   a. CMP, sedimentation rate and CRP.
   b. complete blood count, CMP, thyroid panel.
   c. thyroid profile, liver function test, cardiac enzymes.
   d. Genetic testing to determine medication efficacy.

8. Most common conditions associated with anemia in the elderly include:
   a. Iron deficiency anemia
   b. Vitamin B12 and folate deficiency
   c. Hypercalcemia
   d. Answers a and b above

9. Treatment of vitamin B12 deficiency includes:
   a. 1000 IU of vitamin B12 orally daily.
   b. 500 IU of vitamin B12 orally/injections every other day.
   c. 1000 IU of vitamin B12 injections weekly for 4 weeks.
   d. Answers a and c above

10. True or False: Dysphagia management in the elderly also help in the management of malnutrition and pneumonia.
    a. True
    b. False

11. Currently, one in seven individuals in the U.S., are 65 years of age or more. By 2050, ____________ individuals will belong to this age group.
    a. one in ten
    b. one in seven
    c. one in five
    d. one in eight
12. ________________ form(s) a bridge between nursing homes and home care.
   a. Palliative care
   b. Assisted living
   c. Hospice care
   d. Emergency response systems

13. Medicare does not cover
   a. assisted living care.
   b. palliative care.
   c. adult day care.
   d. hospice care.

14. True or False: Falls in the elderly include factors related to seizure, sudden onset of paralysis, or an external force.
   a. True
   b. False

15. Which of the following programs specifically provides temporary relief to an elderly person’s care provider?
   a. Short-term care
   b. Palliative care
   c. Adult day care
   d. Respite care

16. One of the conditions a patient must satisfy in order to be eligible for hospice care is the patient must
   a. have a DNR (Do Not Resuscitate) order.
   b. agree to life-prolonging therapies.
   c. have a life expectancy of 6 months or less.
   d. agree to a curative disease treatment program.

17. It is believed that ___________ accumulation increases with aging.
   a. appendicular fat
   b. central fat
   c. trans fat
   d. None of the above
18. Several studies have shown that even a _____ loss of lean tissue in previously healthy people can lead to poor immunity, increased susceptibility to infections, and subsequently increased mortality.

   a. 15%
   b. 20%
   c. 10%
   d. 5%

19. Involuntary weight loss predominantly caused by inadequate dietary intake is known as

   a. cachexia.
   b. catabolism.
   c. wasting.
   d. anorexia.

20. _____________ is an involuntary loss of muscle mass, which is primarily due to aging and not the effect of age associated chronic or co-morbid diseases.

   a. Proteolysis
   b. Sarcopenia
   c. Cachexia
   d. Malnutrition

21. A lack of physical activity plays an important role in the development of

   a. sarcopenia.
   b. anorexia.
   c. cachexia.
   d. malnutrition.

22. Inflammatory cytokines TNFa and IL1b prevent the development of

   a. fat cells.
   b. hypertriglyceridemia.
   c. anemia.
   d. functional muscle fibers.
23. Malnutrition is the state of being poorly nourished due to
   a. the lack of one or more nutrients.
   b. the excess of nutrients.
   c. a., and b.
   d. loss of muscle mass.

24. Malnutrition may be due to
   a. have loss of smell and taste acuity.
   b. poor dental and oral health.
   c. decreased physical activity.
   d. All of the above.

25. True or False: The hormone cholecystokinin (CCK) levels are lower in older people with slow gastric emptying, both of which play an important role in early satiety.
   a. True
   b. False

26. _______________, also known as the “hunger hormone,” reduces with aging, trauma or illness.
   a. Cholecystokinin
   b. Ghrelin
   c. Oxyntomodulin
   d. Pancreatic polypeptide

27. Among the markers of malnutrition, ______________ is considered to be more accurate as it is predictive of mortality and other outcomes in older people.
   a. transferrin
   b. ghrelin
   c. serum albumin
   d. thyroxine-binding prealbumin
28. Appetite stimulant drugs such as ______________ may be used to increase food intake and lead to weight gain for elderly patients.

   a. megestrol acetate  
   b. cholecystokinin  
   c. ghrelin  
   d. methylmalonic acid

29. ______________ deficiencies in the body is associated with fractures, muscle atrophy, falls and an increased rate of mortality.

   a. Riboflavin  
   b. Zinc  
   c. Vitamin D  
   d. Polypeptide

30. True or False: Progressive dementia process is characterized by frequent weight loss and an altered eating pattern.

   a. True  
   b. False

31. Poor wound healing is a symptom of a deficiency in

   a. riboflavin.  
   b. zinc or vitamin C.  
   c. albumin.  
   d. iron.

32. A deficiency in vitamin A and zinc can result in

   a. dry, scaly skin.  
   b. hepatomegaly  
   c. thyroid gland enlargement.  
   d. night blindness.
33. **Modifying the consistency of food is the cornerstone of compensatory intervention for elderly with**

   a. dysphagia.
   b. stroke.
   c. dementia.
   d. malnutrition.

34. **The predominant factor responsible for dysphagia in the elderly is**

   a. poor taste and smell acuity.
   b. the presence of age-related disease (e.g., stroke).
   c. low moisture in the oral cavity.
   d. subtle but cumulative changes of swallowing processes.

35. **True or False: The majority of stroke-related pneumonias are generally considered to be due to dysphagia and the subsequent aspiration of food.**

   a. True
   b. false

**Correct Answers:**

1. **In the U.S., most elderly long-term care is provided by:**

   c. Family, relatives and friends.

2. **Currently, more than 6 million elderly in the U.S. require some kind of ____________, with about a third of these requiring more substantial care.**

   a. long-term care

3. **Older age is associated with an increased prevalence of:**

   d. All of the above
4. True or False: Impaired cognition in the elderly has no correlation to the ability or desire to eat.
   b. False

5. Elderly individuals with pneumonia frequently experience:
   d. answers b and c above.

6. To evaluate the older adult for malnutrition, a helpful mnemonic is:

7. Basic laboratory work-up for the elderly includes:
   b. complete blood count, CMP, thyroid panel.

8. Most common conditions associated with anemia in the elderly include:
   d. Answers a and b above

9. Treatment of vitamin B12 deficiency includes:
   d. Answers a and c above

10. True or False: Dysphagia management in the elderly also help in the management of malnutrition and pneumonia.
    a. True

11. Currently, one in seven individuals in the U.S., are 65 years of age or more. By 2050, ___________ individuals will belong to this age group.
    c. one in five

12. _________________ form(s) a bridge between nursing homes and home care.
    b. Assisted living
13. Medicare does not cover
   a. assisted living care.

14. True or False: Falls in the elderly include factors related to seizure, sudden onset of paralysis, or an external force.
   a. True

15. Which of the following programs specifically provides temporary relief to an elderly person’s care provider?
   d. Respite care

16. One of the conditions a patient must satisfy in order to be eligible for hospice care is the patient must
   c. have a life expectancy of 6 months or less.

17. It is believed that ___________ accumulation increases with aging.
   b. central fat

18. Several studies have shown that even a _____ loss of lean tissue in previously healthy people can lead to poor immunity, increased susceptibility to infections, and subsequently increased mortality.
   c. 10%

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   c. wasting.

20. _______________ is an involuntary loss of muscle mass, which is primarily due to aging and not the effect of age associated chronic or co-morbid diseases.
   b. Sarcopenia
21. A lack of physical activity plays an important role in the development of
   a. sarcopenia.

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   d. functional muscle fibers.

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   c. a., and b.

24. Malnutrition may be due to
   d. All of the above.

25. True or False: The hormone cholecystokinin (CCK) levels are lower in older people with slow gastric emptying, both of which play an important role in early satiety.
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28. Appetite stimulant drugs such as ______________ may be used to increase food intake and lead to weight gain for elderly patients.
   a. megestrol acetate
29. ____________ deficiencies in the body is associated with fractures, muscle atrophy, falls and an increased rate of mortality.
   c. Vitamin D

30. True or False: Progressive dementia process is characterized by frequent weight loss and an altered eating pattern.
   a. True

31. Poor wound healing is a symptom of a deficiency in
   b. zinc or vitamin C.

32. A deficiency in vitamin A and zinc can result in
   d. night blindness.

33. Modifying the consistency of food is the cornerstone of compensatory intervention for elderly with
   a. dysphagia.

34. The predominant factor responsible for dysphagia in the elderly is
   b. the presence of age-related disease (i.e., stroke).

35. True or False: The majority of stroke-related pneumonias are generally considered to be due to dysphagia and the subsequent aspiration of food.
   a. True
References Section

The reference section of in-text citations include published works intended as helpful material for further reading. Unpublished works and personal communications are not included in this section, although may appear within the study text.


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