Aid for Healthy Ageing

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Sri Lanka Association of Geriatric Medicine

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Training Manual for the Community Empowerment

Sri Lanka Association of Geriatric Medicine

2019

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Training Manual on Community Empowerment

ISBN 978-955-7159-01-0

Printed by
Ananda Press
277, Hokandara Road,
Thalawathugoda,
Sri Lanka
T’phone: 011 2774793
E-mail: anandapress65@gmail.com

Cover Page by Mr. Danushka Hasaranga

Conversion of the professional excellence with extended humanity, into service will always be a pleasure and a privilege, when it empowers a community. Hence this team work is an undiminished energy to ensure a healthy life for Sri Lankan elder generation.

"For the unlearned, old age is winter; for the learned it is the season of the harvest"

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Foreword

As a practicing physician, I have frequently experienced situations where many elders visit doctors either with minor ailments that could have been prevented or that does not warrant attention of a specialist medical professional. At the same time, in many occasions, there have been delayed consultations for more serious ailments. The programme, "***Wadihity Deviyata Athwelak***" is an attempt of the Sri Lanka Association of Geriatric Medicine to address both extremes of behavior.

"Wadihity Deviyata Athwelak" or Aid for Healthy Aging is a training programme organized for doctors on Early Detection and Prevention of Common Disorders of Older People. On behalf of the SLAGM, I am delighted that we were able to launch this programme by training 200 doctors on two consecutive sessions in September 2019. I am privileged to write this foreword for the concise manual that provides information on prevention and early detection of common disorders of older people.

The programme consists of a wide array of topics that are relevant for healthy aging of people in the community. They include early detection and prevention of Non-Communicable Diseases, Cancers, Respiratory, Musculoskeletal and Psychiatry Disorders and Disorders of Hearing and Vision. Advice on prevention of falls, Disorders of Nutrition and required medical Check-ups are also included. The final chapter summarizes the advices that should be communicated to older people on Healthy Aging.

Resource personals for the programme were nominated by the respective Medical Professional Colleges. The manual is best understood when used along with power point presentations that is provided in the CD. The concise summary provided could be made used for educating the public by the trainees.

On behalf of the SLAGM, I am grateful to all authors who contributed for the programme for their commitment to make "*Wadihity Deviyata Athwelak*", a great success. I wish to pay my gratitude to editorial board for their diligence in preparing the manual and also to the committee that organized the training programme.

We also wish to express our sincere gratitude to Dr. Razia Pendse, the WHO representative to Sri Lanka for sponsoring the programme that made it a reality. It is the fervent wish of all contributors of this programme that the doctors make use of this training to upgrade their knowledge and implement in practice on prevention and early detection of common disorders among older population in Sri Lanka.

Dr. Padma S Gunaratne
MD(SL), FRCP(Edin, Glasg, Lond), FCCP, Hon FRACP, FAAN, FWSO
President, Sri Lanka Association of Geriatric Medicine

Message from the Secretary, Ministry of Health, Nutrition and Indigenous Medicine

It gives me pleasure in penning a few words for the 'Wedihiti Diviyata Athwelak 2019', a continuous professional development program of the Sri Lanka Association of Geriatric Medicine. Elderly population comprises an important proportion of our population. It is estimated that by year 2041, an approximately 1/4 of the Sri Lankan population will comprise of those above 65 years of age.

Ageing itself is accompanied by a burden to the patient, the carer and the health professional, both in curative and preventative sectors. It is the expectation of all three parties that inevitable ageing should be accompanied by a dignified, better quality of life leading to a good death.

I am sure that the Sri Lanka Association of Geriatric Association will ensure high standards in improving the knowledge, skills and attitudes of the participants of this program to improve the care provided upon the patients and their carers entrusted upon them. I wish the event a success.

Mrs. Wasantha Perera
Secretary
Ministry of Health, Nutrition and Indigenous Medicine

Message from Director General of Health Services

I feel privileged to release this message to the academic Manual of the programme "Aid for Healthy Aging" organized by the Sri Lanka Association of Geriatric Medicine for training doctors on early detection and prevention of common disorders of elders.

In the context of rapidly increasing elderly population in Sri Lanka, I feel it is timely that the SLAGM organized the training for doctors with the primary intention of training them for public education. Many disorders in elderly could be prevented by lifestyle changers and adhering to healthy living. Early detection of some other disorders is important for use of economical and convenient treatment protocols with better outcome. Both these would promote good quality living with longevity.

The Ministry of Health, Nutrition and Indigenous Medicine along with the Government of Sri Lanka has already implemented several measures to promote practice of Geriatric Medicine over last several decades. Recognizing Geriatrics as a sub-speciality and training doctors to treat Geriatric patients are pertinent on this regard. As the Director General of Ministry of Health, I am convinced that training doctors of the Ministry of Health would be beneficial for all patients. Based on these observations, I wish Aid for Healthy Aging programme a great success.

Dr. Anil Jasinghe
Director General
Ministry of Health, Nutrition and Indigenous Medicine

Message from Director, National Secretariat for Elders

It gives me great pleasure to release a message for the training manual of “Wedihity deviyata Athwelak” on early detection and Prevention of Disorders Common among Elders.

There has been a visible improvement in the health, nutritional and education sectors in Sri Lanka which is the result of continuous social and economic development that the country has witnessed during past several decades. The above factors resulted in the drop of birth rates and an improvement in the life expectancy, increasing the percentage of elder population in the country. Accordingly, it is expected that the percentage of elder population will increase from present 12.2% to 20% within the next decade, furthermore to 28% and 40% in year 2050 and 2100 respectively.

It is a necessity that the welfare facilities to improve the living standards of elders should be upgraded along with their rights. The office of the National Secretariat for Elders is functioning with the utmost dedication towards achieving

the above-mentioned goals. Various steps were taken during the past (in year 2015) to empower the elder population including the registration of Elders Committees at various levels, implementation of psychological counselling programmes to improve mental and spiritual development, and also the training of elder caretakers. These were some of the major steps taken towards achieving the afore mentioned goals.

The foremost intention of the National Secretariat for Elders is to prevent the elders leading a solitary life and to improve their participation in the society with dignity and self-fulfilment.

The programme, Aid for Healthy Ageing or “Wedihity deviyata Atwelak” covers all aspects of the health of the Sri Lankan elderly population and is a national endeavour by the Sri Lanka Association of Geriatric Medicine. Therefore, I firmly believe that this programme will provide them with support in many ways.

Mr. Saman Udawatta
Director
National Secretariat for Elders

Message from President, College of Community Physicians

“Aid for Healthy Aging” is a community project focusing on the connectivity with the older generation to empower them with knowledge and how to prepare them for a healthy and extended life through defined life style pattern.

At this juncture it should be said that this is very relevant in the Sri Lankan context as Sri Lanka is an aging nation. With the improvement of life spans from the 1950’s in the range of 50 years to the present outlook of over 70 years as given rise to a projection where Sri Lankan population over 60 component will be more than 20%.

As such this “Aid for Healthy Aging” will serve us a platform in addressing issues relating to both communicable and non-communicable diseases.

In this endeavor the members of the medical profession and other staff have contributed in no uncertain terms to generate this “Aid for Healthy Aging”.

Lord Buddha's preaching have delved in the ventures of a healthy life and "Arogya Parama Labha" from the damma padha epitomizes this factor.

Whilst wishing the aging population of Sri Lanka a healthy life with years of longevity "Ayubowewa".

I would like to take this opportunity to thank the ***Sri Lanka Association of Geriatric Medicine*** for inviting the College of Community Physicians to be part of this important publication and I believe it will be a useful document for medical professionals to develop their skills.

Dr. Janaki Vidanapathirana
MBBS, MD
President, College of Community Physicians of Sri Lanka

Acknowledgement

The ***"Wadihiti Diviyata Athwelak"*** **– Aid for Healthy Ageing** is a Training of Trainers programme designed for doctors to facilitate the empowerment of elders in the community on Early Detection and Prevention of Common Disorders of elderly. While imparting the knowledge during the clinical practice, the trained doctors are capable in carrying out public education programmes for elders in varying fora in community.

All resource persons who contributed for the programme were nominated by the relevant professional colleges. The support and dedication of these intellectuals from different professional colleges to the success of this programme is greatly valued. The guidance of the council of the Sri Lanka Association of Geriatric Medicine in developing this academic module is greatly appreciated.

Dr. Razia Pendse, The WHO Representative in Sri Lanka, Dr. Nalika Gunawardena and Dr. Virginie Mallawarachchi, National Professional Officers and other officials of WHO are acknowledged for funding allocated for success of the programme.

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1. Ageing issues in Sri Lanka

Sri Lanka with a population of 20.4 million, as at the last National Census of 2012, has 9.9 million males and 10.5 million females. When grouped by age, from the population 5.2 million (25.3%) are below 15 years of age; 12.7millon (62.3%) are between 15–59 years; and 2.5 million (12.4%) above 60 years. According to the 1981 statistics, the elderly population (60 years and above) was less than 1 million which was 6.6% of the total population at that time. By 2012, the elderly population doubled for a value of 2.5 million. The elderly population can be grouped as young-old (60-69 years), middle-old (70-79 years) and 'old-old' (80 and above).

Table 1 shows the increase of the elderly population to be mainly in the 'old-old' category (75 years and above). The increase rate of the 'old-old' group is higher than that of the total elderly population which, in turn, is much higher than that of the total population of Sri Lanka.

Table 1: Distribution of the elderly by age group, 1971 to 2041

Year	Percentage		Number ('000) 60+
	60-74	75+	
1971	80.5	19.5	807
1981	78.9	21.1	986
1991	78.8	21.2	1,393
2001	76.3	23.7	1,916
2012	75.9	24.1	2,468
2021	75.8	24.2	**3,997**
2031	70.1	29.9	**5,103**
2041	67.2	32.8	**6,305**

However, it is important to remember that elders are a diverse group and that all elders are not frail, dependent or ill. They can contribute to the economy at national and family level directly or indirectly. It is only a small minority that accounts for a larger use of health services (80/20 Pareto principle).

While there are many policies in place in Sri Lanka which have strengthened the security and rights of the elderly, it is also important to understand that health is a right of older people, similar to everyone else.

1.1 Policies on Elders

- The Protection of the Rights of the Elderly Act No. 9 of 2000 and its amendments.
- The National Charter for Senior Citizens and National Policy for Senior Citizens Sri Lanka – 2006.
- The National Elderly Health Policy (draft).
- The Minutes of Pension and Social Security – 1901 and other pension schemes (the Farmers' Pension and Social Security Benefits Scheme of 1987; the Fishermen's Pension and Social Security Benefits Scheme of 1991; and the Self-employed Persons' Pension and Social Security Benefits Scheme of 1996).

- The Widows and Orphans Act – 1983.
- The Employees' Provident Fund (EPF) and the Employees' Trust Fund (ETF) Acts.
- Public assistance schemes.

The Ministry of Health has ensured the protection and care of the elderly based on these Acts and policies.

1.2 Health services with a specific focus on elders

- The National Elderly Health Policy (draft).
- Special counters giving priority to elders in hospitals.
- Initiation of the Postgraduate Diploma in Elderly Medicine.
- Training of medical specialists in geriatrics to be Consultant Geriatricians (in the pipeline).
- Well Women Clinics.
- Healthy Lifestyle Clinics.
- The Sri Lanka Association of Geriatric Medicine (SLAGM).

Even though some of these services are not directly linked to the Ministry of Health, they have an impact on the health of the elderly. In addition, there are many other services of the Ministry

of Social Services and Empowerment which also focus on the elderly and it is imperative for medical professionals to be familiar with them to direct or refer elderly patients when the need arises.

1.3 Non Health Services for Elderly People

Here are some of the services of the Ministry of Social Services and Empowerment:

- The setting up of **Elders' Committees** at village, divisional, district, provincial and national levels. These committees are supported by the National Secretariat for Elders and doctors may refer elderly patients to them when peer support is needed by these patients.
- Conducting **pre-retirement seminars**.
- Registration of organizations and individuals providing services for elders.
- Provision of **financial assistance through Provincial Councils** for the renovation of Elders' Homes.
- The '**Wedihiti Awarana Kepakaru' Sponsorship Scheme** under which needy elders are provided Rs. 500/- per month from sponsors.
- The issuance of **Elders' Identity Cards**. When elders produce these identity cards, they receive priority at

government and private sector organizations. The National Savings Bank (NSB) gives an additional interest for fixed deposits when this identity card is produced, while 'Osu Sala' , the State Pharmaceutical Corporation (SPC) give a 5% discount when buying medicines.

- The launch of **Home Care Services** for Elders by well-trained, trustworthy workers (The *24-hours Hotline is: 0712087950).*
- The establishment of the **Maintenance Board for Elders**. Low-income elders who are neglected by their children, could make an application to this Board claiming maintenance from their children.
- Provision of a **Senior Citizen's Allowance**. Elders who are over 70 years old whose monthly income is below Rs. 3,000/- are provided a monthly allowance of Rs. 2,000/-
- Support for **Day Care Centres for Elders**, with financial assistance of Rs. 25,000/- being provided for each centre.

When providing health services to the elderly, we need to be aware of……

- Importance of teamwork
- Elder abuse
- Ageism

1.4 Importance of Teamwork in Elderly care

Teamwork is the key when managing illnesses in the elderly. A medical practitioner well versed in patient management may not think about the physiological changes of ageing in the elderly. This can cause unexpected adverse effects and drug interactions due to changed pharmacodynamics and pharmacokinetics. Atypical presentations and poor compliance is common among them due to cognitive and functional issues, financial problems and lack of knowledge. Poly-pharmacy due to multiple morbidities (diseases) may aggravate the situation.

According to the definition, health is '***a state of complete physical, mental, social and spiritual well-being and not merely an absence of disease or infirmity'***. As such, health is not only about the physical fitness but the mental, social and spiritual fitness as well. Therefore, psychiatrists, psychologists, religious leaders, social workers, occupational therapists, physiotherapists, podiatrists, nutritionists, clinical pharmacologists, all may have a role in elderly care.

1.5 Elder abuse

This is an ***intentional act or failure to act*** by a caregiver or another person, ***in a relationship involving an expectation of trust*** that causes or creates a risk of harm to an older adult. Hence it is good to be on the lookout for signs of elder abuse, like with child abuse. Malnutrition can also be a sign of elder abuse, while it includes poor personal care, injuries, depression, suicidal ideation etc.

1.6 Ageism

This is ***stereotyping or acting in a prejudicial or discriminatory manner against people on the basis of their age***. Ageism is widespread and an insidious practice which has harmful effects on the health of older adults. For older people, ageism is an everyday challenge. Overlooked for employment, restricted from social services and stereotyped in the media, ageism marginalizes and excludes older people in their communities. Ageism is everywhere, yet it is the most socially "normalized" of any prejudice and is not widely countered – like racism or sexism. These attitudes lead to the marginalization of older people within our communities and cause a negative impact on their health and well-being. It prevents the elderly from seeking healthcare, leading to delayed

presentations thus escalating health expenditure to the person, his/her family and the country.

Sharing experiences which reveals Ageism in the society

Scenario 1: **"You lose your name. You just become some sick old lady!"**

I am lying in a hospital bed. I can hear and I can see, but I cannot move or answer when they ask me a question. Doctors and nurses shuffle by my bed, my relatives come to visit, but I am sleepy and tired. I know I am a drain on their finances – nappies, medication, bandages, but how can I change this? I don't want them spending their money on me...

The worst comes during meals. The nurse puts the plate on my nightstand. *I feel hungry, but I am too weak to reach for the plate, too weak to move.* If only someone was here to help me eat, that would be great for me.

But the nurse returns and I hear her yell: "Oh, so you won't eat anything? What a spoiled princess you are!" I hear her take the plate with my untouched lunch and she is gone. It doesn't matter I suppose, I was not that hungry anyway. My son will come, visit me later if he can get out of work and he will bring me something to eat. I just hope they will let him off work during the visiting hours. I won't be sleepy

then. I will tell him I am hungry. I just need some Kanji to get my strength back.

I am lying in the bed and I hear them talking about me. "Yes, she's quite old, she will live for few more years," and I think, "Well, don't talk like that in front of me, I can hear everything, step outside, show some discretion".

I lie on my bed and think about how hard it is when you are powerless and weak. You lose your own name. You just become "*some sick old woman*". You used to be much more than a sick old woman.

I lie there thinking, "If only I could wash my hair". It's being 15 days that i washed my hair. I used to work in this hospital. I was a nurse. These are my colleagues. But I am not their colleague any more. I am just an older patient lying here, awaiting my destiny.

Scenario 2: "**Why does this Granny need new clothes for?"**

I love shopping. I love looking at clothes, eyeing up jewelry and make up. You probably think, "She's in her 20s, 30s or 40s". But no, I am in fact 66!

I know the typical person in my country thinks: "Why does this granny need new clothes for?" Yes, I can sense your reaction. Just like how salesgirls in shops glance at me to figure out my age. They usually say something like, "Oh, ma'am, that's not appropriate for your age. That's for girls. How old are you? Here, let me suggest something more appropriate for you!"

What a nerve! Whose decision should it be anyway? Am I not entitled to my own opinion on what I want to wear? I know what I like wearing and what colours I love.

It gets worse. One day, I was walking around with my husband, looking for a place to have a nice cup of tea. Most of the shops were packed, but we managed to spot a free table in one. As we approached, a waiter appeared and said they are full. "What do you mean full? That table there is free!" "No, I said we are full, there are no free tables for you here."

I was confused, surprised and ashamed. No free tables for "you"? Who is "you" here? Older people? Do they not want people over the age of 20 or 30 in their restaurant? As I was standing there, pondering these thoughts, two younger women walked by us and took the seats at the free table.

There – the place is not full for them, just for us. Scandalous! These people are actually afraid that their other clients might think, "What the hell is this old couple doing at this place?"

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2. Healthy Ageing

Active Healthy Ageing is the key to longevity. The elderly probably do not need routine screening for diseases except to learn "Current Health Status" but elderly should be functionally independent as long as possible. The adoption of a healthier lifestyle even in later life can lead to increased life expectancy with reduced disability.

Important facts for Active Healthy Ageing

- Avoid smoking and exposure to air pollutants.
- Avoid alcohol and other toxins.
- Carry out physical exercise regularly.
- Practice healthy eating habits.
- Seek medical advice and control high blood pressure, cholesterol and diabetes.
- Take essential drugs regularly.
- Take care of vision.
- Take care of hearing.
- Avoid wrong postures.
- Arrange living conditions considering safety and convenience.
- Practice basic hygienic habits.
- Keep the mind active.
- Adhere to individual advice given to you

Further reading …….. refer to Chapter 14, Prevention for details on Healthy Aging.

3. Early Detection and Prevention of Common Respiratory Disorders in Older people

Respiratory diseases are a major cause of illness, disability and death among those aged above ≥65 years. As a result of the rapidly ageing world population, the percentage of elderly burdened with multiple pathologies and disabilities continues to grow.

3.1 Special concerns in the elderly with respiratory disorders

An older age can affect the expression of chronic respiratory diseases and, as such, there are many special concerns when considering the elderly. Multidisciplinary care is necessary in the management of respiratory disorders in the elderly as an individual specialist might not possess all the necessary knowledge and skills needed to manage such a patient.

Atypical presentations are more common in the elderly (e.g. neurological/psychiatric symptoms) and the presence of *co-morbidities* may complicate the clinical picture. Further, indoor as well as outdoor air-pollution has a high impact on their respiratory disorders, with elderly patients needing palliative and end-of-life care more.

A good understanding about common respiratory disorders in the elderly will help the clinician in patient management as well as in his/her role as a health educator. Educated community members should be empowered to seek medical advice early, thus helping to minimize adverse outcomes.

3.2. Common respiratory diseases

Common and significant respiratory diseases in the elderly are:

- ➢ Bronchial Asthma
- ➢ Chronic Obstructive Pulmonary Disease (COPD)
- ➢ Pneumonias/Lung infections
- ➢ Sleep disordered breathing disorder (SBD) including Obstructive Sleep Apnoea (OSA)
- ➢ Pulmonary embolism
- ➢ Lung cancer
- ➢ Interstitial Lung Disease (ILD)
- ➢ Aspiration Pneumonia

Investigations

There are limitations in performing and interpreting lung functions and spirometry such as poor quality of reference standards, lack of guidelines as the elderly are not included in trials, shortage of technical skills as tests need longer time to perform with repeated attempts and also limited benefits from sophisticated testing.

Management

The cognitive decline and status of social/family support may affect the presentation and management of respiratory diseases in the elderly. Palliative and end-of-life care needs are more relevant and elderly patients need trained professionals for optimum care.

3.2.1.Bronchial Asthma

Bronchial Asthma is a chronic airway disease with airway hyper reactivity and variable airway obstruction which can be under-diagnosed and under-treated in the elderly.

The ***cardinal features*** in Bronchial Asthma are – episodic cough, wheeze, chest tightness and shortness of breath.

The diagnosis can be complex as co-morbidities such as *congestive cardiac failure, COPD, gastro-oesophageal reflux disorders, sleep*

disorders and *vocal-cord dysfunction* could cause overlapping symptoms.

Some elderly patients may have had asthma from a young age (early onset asthma) and others may have only developed symptoms in middle age or later (late onset asthma).

In the management of Bronchial Asthma, spirometry is crucial for both diagnosis and follow-up especially in older asthmatics. However, the limitations of spirometry in the elderly should be borne in mind when interpreting the results.

Bronchial Asthma in the elderly is treated according to severity (similar to young asthmatics), but response may be sub-optimal due to age-related impairment in bronchodilator responsiveness. Further, elderly patients are more likely to have compliance issues due to poor memory and skills on inhaler technique as it may be difficult to understand and also master.

In asthma management in the elderly, the *lowest possible inhaled steroid doses* should be used due to the risk of osteoporosis and cataract. The adverse effects of theophylline such as arrhythmias should also be considered when prescribing for the elderly.

The annual influenza and *5-yearly pneumococcal vaccines* are recommended, as a preventative measure, for the elderly with chronic respiratory diseases.

3.2.2 Chronic Obstructive Pulmonary Disease (COPD)

Chronic Obstructive Pulmonary Disease (COPD) is a progressive respiratory disorder with fixed airway obstruction and minimal or no reversibility. A majority of COPD sufferers have a history of exposure to inhalation of noxious agents such as tobacco smoke. Indoor air-pollution is increasingly recognized as a significant risk factor for females.

The **main symptoms** of COPD are – persistent and progressive shortness of breath, productive cough and reduced exercise tolerance.

Spirometry is essential to distinguish COPD from asthma which has reversible broncho constriction and to monitor progress of the disease. Underutilization of spirometry, particularly in the very old, frequently contributes to errors in the diagnosis of COPD in the elderly.

The elderly with COPD should be assessed and managed *multi-dimensionally* which should include *medical, rehabilitative and psychosocial interventions.*

The ***medical interventions*** involve the use of drugs and the cornerstone drugs are long-acting anti-muscarinic (LAMA) medications such as Tiotropium and beta agonist *(LABA)* such as salbutamol and inhaled steroids. Oral steroids have little or no value in long term management.

Spirometric severity, degree of dyspnoea and exacerbation frequency will determine the use of individual or combined inhaler therapy.

There are ***non-pharmacological strategies*** such as cessation of smoking which should be reinforced in the management of COPD.

Other non-pharmacological strategies include avoiding exposure to other risk factors such as air pollutants; doing pulmonary rehabilitation; and vaccinating the elders with influenza and pneumococcal vaccine.

Palliative and end-of-life care is also equally important in the management of these patients. Patients with acute or chronic respiratory failure may need non-invasive ventilation and oxygen therapy in long-term management.

3.2.3 Community-Acquired Pneumonia

Pneumonia in the elderly is important as it carries a higher morbidity and mortality.

The **common symptoms** of pneumonia are – cough, high fever and pleuritic chest pain.

But in the elderly, presentation with *atypical symptoms* such as an altered mental state, incontinence, falls, lethargy and weakness are not uncommon.

The clinical diagnosis will be supported by auscultatory evidence on examination. Chest x-ray changes of consolidation would be evident.

The management of Community-Acquired Pneumonia involves complex decision-making regarding the benefits of advanced therapy. It needs proper antibiotics and supportive care particularly in ICUs leading to prolonged hospital stay. Attention during the post-discharge period, when most deaths occur, is much needed.

3.2.4 Tuberculosis (TB)

Tuberculosis (TB) remains one of the world's most lethal infectious diseases. The infection can occur in the lungs (Pulmonary TB) or elsewhere in body (Extra pulmonary TB).

The **common symptoms** of TB are – prolonged cough, loss of weight, loss of appetite, hemoptysis and evening fever.

The clinical features of TB in older patients may be atypical and confused with age-related diseases. In extra pulmonary TB, symptoms specific to the involved organ can occur.

The diagnosis and management of TB in the elderly can be difficult and need a high degree of suspicion and early referral to a specialist. They carry a high level of mortality. TB treatments can be associated with adverse drug reactions.

3.2.5 Sleep Disordered Breathing

Although highly prevalent, this group of disorders are under-recognized in the elderly.

Patients with classical Obstructive Sleep Apnoea will have day time sleepiness, snoring and recurrent arousals from sleep. Co-morbidities such as stroke, heart failure, COPD, Diabetes Mellitus can co-exist and may contribute to the symptoms.

Despite the high prevalence of SDB, the diagnostic criteria, clinical characteristics and treatment options are much less defined world widely, particularly in the elderly, compared with middle-aged patients. Sleep studies are pertinent for a final diagnosis.

3.3 Alarming respiratory symptoms

The presence of the following symptoms are alarming:

- **Cough for more than 2 weeks** with or without sputum
- **Low-grade fever** with or without night sweats
- **Coughing up blood or having rusty coloured sputum**
- **Unintentional weight loss**
- **Loss of appetite**
- **Sudden onset of fever and cough, chest pain increasing with breathing or breathlessness**

If any of these symptoms are present, the patient should seek medical advice immediately.

3.4 Prevention of respiratory diseases

Healthy lungs are important for longevity. Every effort should be taken to prevent infection particularly in the frail elderly who have established respiratory system disorders. A cold or other respiratory infection in the elderly can sometimes take a serious turn.

The burden of chronic respiratory diseases (CRDs) including asthma, COPD and lung cancer will continue to rise because of tobacco use and population ageing. However, there are several measures that can be taken to minimize the risk of infections.

Primary prevention to reduce the level of exposure of individuals and populations to common risk factors and better surveillance are the objectives of the WHO Strategy on CRDs. Surveillance maps the magnitude of CRDs, analyze their determinants with particular reference to poor and underprivileged populations and monitor future trends.

Primary prevention involves reducing the level of exposure of individuals and populations to common risk factors; preventing the use of tobacco, good nutrition, preventing frequent lower respiratory infections during childhood and minimizing environmental air-pollution (indoor, outdoor and occupational).

Secondary and tertiary preventive methods will be strengthening the healthcare of people with CRDs and involves identifying cost-effective interventions and upgrading standards and accessibility of care at different levels of the healthcare system.

- ***Avoidance of smoking and exposure to pollutants***

The impact of indoor and outdoor air-pollution on the health of the elderly is more severe than in the young. The harm caused by smoke and pollutants is relevant in this regard. Second-hand smoking, outdoor air-pollution and chemicals in the home and workplace are harmful to the lungs and need to be avoided.

Houses should be well-ventilated and there should be ventilation in the area where cooking is carried out. The use of firewood for cooking should be minimized and electricity or LP gas which generates much less air pollutants should be used. Outdoor cooking is preferable when firewood is used. On bad air-days, outdoor exercises should be avoided.

- ***Regular exercise***

Regular exercise including breathing exercises are important for healthy lungs. Aerobic exercises help to improve lung capacity. Specific breathing exercises also improve lung function in certain lung disease such as COPD.

- ***Regular medical check-ups***

With ageing, regular medical check-ups are useful, even a healthier elderly might get affected from lung diseases and will not be able to recognize until it gets worse.

- ***Practicing hygienic manners***

Most of the respiratory disorders can be prevented by practicing hygienic manners. The basic hygienic measures are washing hands often with soap and water, brushing the teeth at least twice a day and maintaining good oral hygiene and seeing a dentist at least

once every six months. Practicing cough etiquette will minimize the spread of respiratory infections.

- ***Vaccination***

The yearly vaccination against influenza and also pneumonia when indicated is another important measure.

Recognizing the impact of ageing at a community level is vital to mitigate adverse outcomes.

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4. Early Detection and Prevention of Common Non Communicable Diseases in Older people

Globally forty-one million deaths, which is equivalent to 71% of all deaths in a year are due to Non-Communicable Diseases. *Cardiovascular diseases* account for most NCD deaths or 17.9 million annually, followed by cancer (9 million), respiratory diseases (3.9 million) and diabetes (1.6 million). These four categories of diseases account for over 80% of all 'premature' NCD deaths and over 85% of these premature deaths occur in low and middle-income countries.

In Sri Lanka, NCDs cause more than three quarter of all deaths. Nearly 1 in 5 people dies prematurely from NCDs. According to the United Nations Taskforce on NCDs 2015, the NCD epidemic has now become a serious economical issue as well as public health issue in Sri Lanka. This is fuelled by the high incidence of tobacco use, unhealthy diet, harmful use of alcohol and lack of physical activity. More than one third of adult males in the country are tobacco users and 1 of 3 people has high blood pressure. One third of women in the country suffer from overweight and consumption of salt is two to three times higher than the recommended values.

4.1 Diabetes Mellitus

By 2030, more than half of the diabetes suffers in the world will be in Asia , with 53% being above 60 years and more than 85% above 45 years. Diabetes prevalence in Colombo is 27.1% and the suburbs 20%.

Causes for hyperglycaemia in the Elderly

The leading underlying causes for the development of diabetes in the elderly are *reduced insulin secretion* and *increased adipose tissue*. *Decreased physical activity* and *poor dietary habits* along with certain medications, genetics and co-existing illnesses predispose people for these underlying causes.

Symptoms

A majority of diabetics are *asymptomatic* and when symptoms do occur it is a gradual onset of **classic osmotic symptoms** such as thirst, polyuria or nocturia.

A spectrum of **vague symptoms** such as depressed mood, apathy and mental confusion can occur rarely.

Some of the other **non-specific symptoms** of diabetes seen in the elderly are falls or poor mobility, muscle weakness, poor vision,

unexplained weight loss, memory disorders or cognitive impairment.

A few more associated symptoms include slow recovery from a stroke, increased vulnerability to repeated infections and poor wound healing.

Risk factors

The commonly seen risk factors for diabetes are being overweight or obese (having a BMI >23), a sedentary lifestyle, a family history of diabetes, high blood pressure, low HDL cholesterol, high triglyceride levels, a history of gestational diabetes or giving birth to a baby weighing 9 pounds or more, history of heart diseases or stroke, depression and polycystic ovarian syndrome.

Diagnosis of Diabetes Mellitus

With suggestive symptoms, the diagnostic criteria are:

- Fasting blood glucose $\geqq$7.0 mmol/L (126 mg/dl) or
- Random blood sugar $\geqq$11.1 mmol/L (200 mg/dl)

Without suggestive symptoms, the diagnostic criterion is: fasting blood glucose/random blood glucose should be above the given cut-off values on two occasions.

4.2 Ischaemic Heart Disease (IHD)

Four out of five cardiovascular disease deaths are due to heart attacks and strokes. According to the WHO (2017), 22.52% of the total deaths in Sri Lanka were due to coronary heart disease. Coronary artery disease prevalence increases with age. Approximately 20% of males and 9.7% of females in the age group of 60-79 years are suffering from Ischaemic Heart Disease (IHD). The number increases with advancing age, leading to 32% of males and 19% of females having IHD by the age of 80 years.

Symptoms

The detection of the symptoms of IHD is more difficult in the elderly than in younger patients. The sedentary lifestyle of elderly patients in contrast to the young may hinder the development of exertional symptoms characteristically seen in IHD.

A majority of elderly patients complain of *atypical chest pain*. They may develop typical angina pain as well. These patients may also have non-chest pain presentations such as general fatigue/malaise, dyspnea, abdominal pain, nausea and vomiting or syncope.

Risk factors

Age (getting older increases risk), sex (men are generally at greater risk than women), family history and race are non-modifiable risk factors for IHD. Smoking, lack of physical activity, unhealthy diet and stress are lifestyle-related important modifiable risk factors which, in turn, lead to the development of other modifiable risk factors such as being overweight or obese and having high blood pressure, high blood cholesterol and Diabetes Mellitus.

CVD risk prediction

The WHO/ISH risk prediction chart for the SEAR B region predicts the risks with regard to the development of CVDs over the next 10 years.

Age, gender, total cholesterol levels, smoking habits and presence of diabetes and blood pressure are the factors that are considered when predicting the total risk. There are many instances such as being on treatment and being less than 40 years of age where the risk chart does not assess risk to expected precision rates.

4.3 Stroke

Strokes are a serious threat to the quality of life, particularly of the elderly. In urban Sri Lanka, the prevalence of stroke was found to be 10.4 per 1,000 persons. In the Colombo district, stroke prevalence was 37 per 1,000 adults aged over 65 years.

Symptoms

The *sudden onset of paralysis or numbness of half of the face* with involvement of an arm and/or leg on the same side (hemianesthesia or hemiparesis) and difficulty in speaking and understanding are the most common symptoms of a stroke. Trouble with seeing through one or both eyes, difficulty in walking, with a loss of balance and sudden severe headache are other common symptoms.

Following a stroke, a person may be left with many disabilities such as an impairment of cognitive functions, problems in communication, physical disability, difficulty in swallowing, loss of urinary and bladder control and disturbance in vision.

Risk prediction

The WHO/ISH risk prediction chart predicts the risk of development of all CVDs including stroke over the next 10 years. TIAs predict the immediate risk of a stroke and 20% of TIA

patients end up with an established stroke over the next three months.

Stroke Risk Score card

This score card is available in the Power-point Presentation.

4.4 Preventive strategies for CVDs

Physical activity, healthy diet, avoiding tobacco and alcohol use and maintaining optimum BMI are important preventive strategies for CVDs.

- ***Adequate physical activity***

Physical activity reduces the risk of NCDs, depression and cognitive decline. Some elderly people will not be able to do the recommended levels of physical activities due to their health conditions, but they should be as physically active as their abilities and conditions allow.

At least 150 minutes of moderate-intensity aerobic physical activity throughout the week or 75 minutes of vigorous-intensity aerobic physical activity throughout the week or an equivalent are recommended. The elderly with poor mobility should perform physical activity to enhance balance and prevent falls on 3 or more days each week.

- ***Dietary intake***

The energy intake per individual should be balanced with the energy expenditure to maintain a healthy BMI.

The total fat intake should be less than 30% of the total energy intake, with a shift in fat consumption from saturated fats to unsaturated fats and towards the elimination of industrial trans-fats.

The free sugar intake needs to be limited to less than 10% (or even less than 5%) of the total energy intake. The salt intake needs to be less than 5g per day per individual.
Fruit or vegetable consumption per day needs to be at least 400g (5 portions).

- ***Avoidance of tobacco***

The single greatest preventable cause of NCDs is by avoiding tobacco consumption through any means. Smoking cessation in a year will reduce the risk of coronary heart disease by half to that of a smoker. After 5 years of cessation of smoking, the risk of stroke will be that of a non-smoker. In 15 years, the risk of coronary heart disease will be that of a non-smoker. Second hand smoking is also responsible for death among non-smokers.

- ***Avoidance of alcohol***

A strong link has been found between alcohol and NCDs. Use of alcohol is highly associated with CVDs and diabetes. Other than IHD, chronic/heavy alcohol use is associated with haemorrhagic strokes. The detrimental effects of alcohol in terms of CVDs outweigh the beneficial effects that typically occur with low to moderate consumption.

The control of Diabetes Mellitus, hypertension and hyperlipidemia are important steps in the prevention of CVDs.

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5. Early Detection and Prevention of Common Cancers in Older people

Cancer is a common cause of morbidity (illness) and mortality (death) in the elderly. As such, knowledge about the care of the elderly becomes pertinent when managing cancers in the latter part of life. Most cancers occur after the fifth decade of life (50s) and the type of cancer would be linked to the patient's long-term unhealthy habits and lifestyle.

The National Cancer Control Programme maintains national records on cancers and conducts early detection health camps and awareness programmes. Around 20,000 new cancer cases are detected every year in Sri Lanka. The incidence of cancers gradually increases with ageing, particularly from 45 years upwards. Among females, the rise of the incidence of cancers starts early, above the age of 30.

Demographic data show that breast, lip, tongue, mouth, cervix, uteri, ovary and oesophagus are the leading cancers in Sri Lanka. Earlier, head-and-neck cancers were the most common, but since of late, breast cancers are at the top of the list. While lip, tongue and mouth and trachea, bronchus and lung lead the list of cancers in males from 50-64 years, prostate cancer becomes more prevalent after 65 years of age. Breast cancer followed by cervical and ovarian cancers are the main cancers in females in both these age groups.

5.1 Aetiology

Though cancers have altered genes and DNA (deoxyribonucleic acid), hereditarily determined cancers are not more than 20%.

The adverse effects of lifestyle habits such as smoking, alcohol abuse, occupational hazards, environmental factors etc., change the DNA during a person's lifespan and lead to malignant changes in the tissues. As these factors have to be associated with lifestyle for a considerable period of time to make these changes, the effects and malignancies are seen in the latter part of life.

Most cancers in males are related to tobacco and alcohol, with alcohol-related cancers in males occurring between 50-64 years of age. In females, meanwhile, most cancers are either multi-factorial or have their origins in infections.

5.2 Clinical Features of Cancer

Cancer can present as a change in the usual body functions, growths or changes in parts of the body. Often the symptoms of cancer are either neglected or masked by other co-existing ailments. Co-existence with common co-morbidities, nutrition-related issues and certain medications makes the presentation of cancers more complex and diagnosis more difficult in the elderly.

Psychological and social factors also play a major role in preventing the diagnosis of cancers in the elderly.

Some common symptoms of cancer include a prolonged cough, an alteration in bowel habits, fatigue, a loss of appetite, a loss of weight, non-healing conditions and mood changes.

Recurrent infections, poor attention to health and exercise, continued harmful habits of tobacco and alcohol use or an increase in these habits, use of multiple medications and their unwanted effects are also commonly associated with cancer symptoms. They make the assessment of the health status of the elderly difficult.

5.3 Diagnosis of Cancer

There are **seven early danger signals** of cancers that need to be heeded for the early diagnosis of cancers in the elderly. They are:

1. Newly-detected **lumps** or **growths.**

2. **Bleeding –** abnormal types of bleeding such as rectal, vaginal, urethral and nasal or when coughing or vomiting.

3. Alteration (changes) in **bowel habits** – constipation, spurious diarrhoea or a feeling of inadequate evacuation.

4. Progressive difficulty in **swallowing**.

5. Progressive difficulty in **breathing** and related functions or progressive feeling of **fatigue**.

6. Unintended **loss of weight** – loss of >10% of weight within 3 months.

7. **Colour changes** on areas of the skin or non-healing ulcers.

It is important to keep in mind that in the case of cancer, these symptoms are progressive and do not respond to the usual treatment.

The elderly should know that no time should be wasted if there is pain, as waiting till the pain is unbearable is fatal in many cases. This is why they should be made aware of the danger signals of cancer so that they will seek medical advice which, in turn, will lead to early detection.

When a patient is suspected to be having cancer, biopsies will confirm the malignancy.

In the early stages, the total excision for histology itself would be a form of definitive treatment. In the early stages, surgery or radiotherapy are more bearable, less expensive and has a better outcome.

Once diagnosed, the patient has to go through prolonged, costly and time-consuming forms of treatment protocols. Poor family support along with social and economic factors may hinder the care of the patient.

5.4 Factors that delay in Diagnosis of Cancer

As fatigue, loss of weight and loss of appetite are taken as being a part and parcel ageing, if they are manifestations of a cancer, there could be a delay in diagnosis. People may have mood changes, hormonal changes or behavioural changes but may not volunteer this information or seek medical attention.

If the elderly patient has a co-existing chronic illness, it may mask the symptoms of the cancer. Pain is a late symptom of cancer, while a cognitive impairment may lead to the patient delaying in complaining about the symptoms. An experienced care-giver will make a difference, as he/she will detect these symptoms early.

5.5 Screening and Prevention of Cancer

The identification of the groups at higher risk may make the detection and treatment of cancers easier and more cost-effective. Endoscopy, mammograms, pap tests, tumour marker or blood tests are incorporated in the national screening campaigns and the elderly will benefit immensely by the active participation in such

programmes. Guardians or care-givers should be well informed about these programmes and motivated to get the elderly to participate in them.

In the ***secondary prevention*** of cancers, the primary pathology is detected early, probably at screening, and following treatment, the patient has to undergo lifelong monitoring for a recurrence.

Alcohol and tobacco-related cancers are mostly seen in males of 50-64 years in Sri Lanka and as such screening those who are vulnerable would be cost-effective.

However, breast cancers most prevalent in females in the same age group are multi-factorial in origin and all those in this age group should be screened for early detection. Cervix and uteri cancers are easily detected by pap tests and as the Human Papilloma Virus (HPV) is involved in 80% of cervical cancers, vaccination against HPV before girls become sexually active will prevent cervical cancers.

Cancers of the lip, cheek and mouth are commonly seen in people who chew betel along with areca nut, tobacco and chunam.

Primary prevention is mostly an academic exercise and the knowledge of the causative factors may help the identification of people who are at a higher risk.

Lifestyle changes even at an older age are helpful in preventing non-communicable diseases (NCDs) including cancer. These lifestyle changes include:

- Avoiding harmful habits – alcohol, tobacco and fast food and unnecessary use of medication.
- Reducing mental tension and practicing relaxation.
- Increasing physical exercise.
- Being active by socializing and developing new associates.
- Methodical and timely attention to health needs.
- Proper nutrition.
- Awareness.

Relaxation and mobility are important to lead an enjoyable life and peer associations without obligations or stressful situations are helpful. Proper nutrition and timely attention to one's health needs are also important.

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6. Early Detection and Prevention of Common Psychiatric disorders in Older people

Ageing is a process where psychological, physiological, functional and pathological changes occur and these changes can affect the physical, mental and social well-being of a person. Any part of the body can suffer sickness or illness, with nails, hair and skin being a few examples. The mind is also a part of the body where functions are determined by the levels of neurochemicals in the brain, although many people find it difficult to believe this. As such, by manipulating the levels of neurotransmitters, most of the signs and symptoms of the mind can be treated. What is important to remember is that mental health plays a major role in the general health of the elderly.

Two factors contribute to the presentation and course of mental illness among the elderly people. They are; ***Physical Frailty*** and ***Mental Status***. Influences of impaired renal clearance, changes in body fat distribution and weak circulation on presentation and management are few examples.

6.1 Epidemiology of psychiatric disorders in the elderly

There is a significant rise in the elderly population across the world, more so in less developed than developed countries. When considering the prevalence of psychiatric illnesses among the elderly, there is a significant proportion with cognitive impairment as opposed to decreasing trends in anxiety, substance abuse and affective disorders. But the prevalence of anxiety disorders is almost similar to that of cognitive impairment.

6.2 Common psychiatric disorders in the elderly

6.2.1 Cognitive impairment/dementia

Considering psychiatric illnesses among the elderly, cognitive impairment is one of the commonest illnesses. This will present as personality, intellect or memory impairment. However, although memory impairment is the commonest complaint that patients may present with, changes in personality, behavior and difficulty in language functions. These are also features that may indicate the presence of dementia. With time, not only will cognitive functions deteriorate but the patients may also develop behavioral and psychological symptoms of dementia which may present as sleep and appetite changes, delusions, hallucinations and affective symptoms.

The common types of dementia are Alzheimer's, vascular dementia, lewy body dementia, Parkinson's disease and dementia affecting fronto-temporal functions.

The management of dementia in all three stages of acute, intermediate or long-term will be on *three aspects of care – psychological, pharmacological and social.*

Psychological measures such as reminiscence therapy, music therapy, pet therapy and multi-sensory therapy could be useful.

Pharmacological agents, meanwhile, are mainly used to control the progression of the illness. The commonly-used cognitive enhancers are donepezil, memantine and rivastigmine which are not available in the government sector, only in the private sector.

Socially, these individuals are vulnerable to exploitation, elder abuse and legal issues like impaired testamentary capacity which are some aspects that are commonly overlooked.

The control of risk factors including optimal control of hypertension and diabetes will help prevent dementia, while onset may be delayed by advising people to be cognitively active.

6.2.2 Depression in the elderly

Depression is another common psychiatric condition among the elderly. The typical symptoms of depression are feeling persistently sad, not having the energy to do day-to-day work that he/she used to do (anergy), not enjoy pleasurable activities (anhedonia), poor appetite, reduced attention and somatic symptoms. However, elders could also present with atypical symptoms like agitation, anxiety and somatic symptoms. Suicide and psychomotor retardation are some of the complications of depression.

Depression is managed by using anti-depressants pharma-cologically.

Psychological measures like cognitive behavior therapy may be used depending on the suitability of the patient. The control of underlying metabolic disorders like diabetes and the prevention of social isolation can prevent depressive episodes.

The **prevention of depression** can be done by using biological, social and psychological methods. Adequate treatment of the first episode, changing the person's thinking style through cognitive behavior therapy and correcting social factors like social integration, if possible, are a few examples.

6.2.3 Delirium

Delirium is a major factor contributing to morbidity and mortality among the elderly. Patients with dementia are more prone to delirium. Since delirium is not detected early and not treated promptly, but is mistaken for psychosis, there is an increase in complexity. If the patient is not very well informed and is not aware of where he is or what time of day it is, with clouding of consciousness and fleeting psychotic symptoms, the chances that such presentation is delirium are very high. Delirium should also be suspected if there is an acute or sudden onset of a change in behavior. In a patient with dementia, a sudden change in behavior suggests delirium.

There are effective methods, such as identifying and treating infections early and proper control of non-communicable diseases, to prevent delirium. However, in practicality, this is sometimes difficult.

6.2.4 Psychotic disorders

Delusions, hallucinations, behavioral change and cognitive impairment are features of psychotic disorders. Patients who present with these psychotic symptoms may have a late onset of

schizophrenia or may be psychiatry patients who have already been diagnosed with schizophrenia in young adulthood.

There is a need to exclude organic causes if psychotic symptoms occur for the first time in old age. The mainstay in the management of psychosis is the use of antipsychotics, particularly second-generation antipsychotics.

These are some important symptoms and signs that may occur in the elderly. It is vital to take them to a doctor, preferably a psychiatrist, early as most of these conditions are treatable and can be managed if detected early.

The elderly should be monitored for the emergence of physical and medical conditions, while setting up systems for social integration and cognitive and physical activities to minimize emergence of such symptoms early.

A good healthcare system, with support from social and legal services, is vital in taking care of the elderly. At a time when elder abuse is on the rise and social systems are deteriorating, it is crucial to have vibrant social services to take care of them. Community caregivers should also be in place to support the elderly.

7. Early Detection and Prevention of Musculo-skeletal Disorders in Older people

Musculoskeletal problems will essentially interfere with the Activities of Daily Living (ADL) of any person. Since naturally ageing will reduce muscle bulk and strength, coordination and balance and also the endurance of exertion, musculoskeletal disease will affect the ADL of the elderly more.

ADL are a series of basic activities performed by individuals on a daily basis, necessary for independent living at home or in the community. They include:

- Personal hygiene – bathing/showering, grooming, nail care and oral care
- Dressing – the ability to make appropriate clothing decisions and physically dressing/undressing oneself
- Eating – the ability to feed oneself, though not necessarily the capability to prepare food
- Maintaining continence – both the mental and physical ability to use a toilet, including the ability to get on and off the commode or the squatting pan and clean oneself

- Transferring/mobility – getting up from a seated to standing position, getting in and out of bed and the ability to walk independently from one location to another

7.1 Instrumental Activities of Daily Living (IADL)

These are actions that are important to allow independent living, but are necessarily not required activities on a daily basis. When functional ability declines, independence in IADL is generally lost prior to ADL.

IADL may depend on individual cultural needs such as:

- Basic communication skills – using a regular phone, mobile phone (email or the Internet)
- Transportation – driving or the ability to use public transport
- Meal preparation – meal planning, cooking, cleaning up, storing and the ability to use kitchen equipment and utensils safely
- Shopping – the ability to make appropriate food and clothing purchase decisions
- Housework – doing laundry, washing dishes, dusting, vacuuming and maintaining a hygienic home

- Managing medications – taking accurate dosages at the appropriate times, managing re-fills and avoiding conflicts
- Managing personal finances – operating within a budget, writing cheques, paying bills and avoiding scams.

Our aim should be to identify the problems early and implement the necessary interventions to maintain their mobility and independence in ADL to the maximum level.

Musculoskeletal disorders are common in the elderly and these include:

- Osteoarthritis in the knees, hips and ankles
- Degenerative disease of the spine
- Soft tissue rheumatism – frozen shoulders, tendinopathies
- Rheumatoid arthritis
- Falls and fracture-related problems

7.2 Effects of musculoskeletal disorders on ADL:

- Restricted mobility may affect all ADL
- Difficulty in squatting or standing from **low** seats
- Poor hand grip – increases the risk of falls
- Poor finger movements of the hands
- Washing, dressing and self-care affected due to conditions like frozen shoulder

7.3 Common symptoms of musculoskeletal disorders:

- Joint pains which are activity-related and posture-related are usually due to degenerative disease of weight-bearing joints and the spine
- Painful joints which have localized tenderness – due to tendinitis and other enthesitis
- Persistent joint pain accompanied by swelling and rest pain, early morning worsening, fatigue and febrile feeling, is likely to be due to inflammatory arthritis

There are signs and symptoms that we should be cautious about -

- Arthralgia with associated constitutional symptoms may be due to **paraneoplastic syndrome**
- Difficulty in getting up from seated positions may be due to **inflammatory myopathies**
- Painful or painless weakness of a joint with wasting of the surrounding muscles may be due to a nerveinvolvement
- Unbearable pains in the night time may be due to the bone pain of **malignancies**
- Unbearable pain or effusions in a person with chronic inflammatory arthritis may be due to **septic arthritis**

7.4 Risk factors

- Obesity
- Sedentary lifestyle
- Wrong postures during work
- Osteoporosis
- Falls
- Multiple co-morbidities

7.5 Risk factor Identification

Self-assessment for risk factor identification

ADL/IADL – A simple chart, filled in either by the person or a family member, can be used to assess the individual.

ADL/IADL	Requires no assistance	Requires assistance
Bathing		
Eating		
Grooming		
Dressing		
Oral care		

Toileting		
Transferring/ walking		
Climbing stairs		
Shopping		
Cooking		
Housework		
Driving		
Laundry		
Managing finances		

7.6 Prevention strategies of Falling

- ***Regular exercises***

Walking, Swimming, Balance training exercises, strengthening exercises are some examples for regular exercises.

- ***Prevention of falls***
    - Remove slippery carpets and use sticky rugs instead
    - Remove loose or non-fitting shoes or slippers
    - Avoid wire cords of electrical instruments across the floors of the house
    - Avoid pets obstructing their way

- ***Avoiding wrong postures***

Avoiding wrong postures and overuse of joints and muscles in day-to-day work (Please refer the power point slides)

- ***Modification of the living environment***
    - Adaptation of the living environment:
    - Raising the height of the chair, bed and commode
    - Use of a bedside commode at night
    - Safety bars and handrails in corridors, wash-room and toilet
    - Shower chair in the washroom
    - Walking aids whenever necessary
    - Ramps and handrails along staircases
    - Adaptation of cutlery and other commonly-used tools and functional splints, if hand functions are affected.

- ***Education***

The elderly and their family members need to be aware of:

- The importance of maintaining mobility and independence in ADL
- The disadvantages of being sedentary (muscle weakness, loss of balance and coordination, being at a high risk of musculoskeletal pains, high falls risk, constipation etc.)
- Complications of immobility (deep vein thrombosis – DVT, chest infections, osteoporosis, constipation, indigestion, bedsores, muscle wasting etc.)
- The availability of services (physiotherapy, occupational therapy etc.)

8. Early Detection and Prevention of Falls in Older people

According to World Health Organization (WHO), a fall is an event which results in a person coming to rest inadvertently on the ground, floor or other lower level. Falls are common among the elderly and should not be ignored.

The risk of having at least one fall per year among community dwelling elders who are more than 65 years of age is ≥30%. With increasing age, meanwhile, the risk of falls increases to ≥50% for community dwelling elders who are older than 80 years. However, not even half such falls are reported to a healthcare professional.

8.1 Aetiological factors of falls

Falls are multifactorial. The contributory factors could include physical, psychological, medical, medication use, functional or external.

A multifactorial falls risk assessment should include:

- A detailed falls history
- Assessments of –

- Organ system impairments (CVS/CNS)

- Gait; balance and mobility; and muscle strength/weakness
- Osteoporosis risk
- Falls risk
- Perceived functional ability and 'fear of falling'
- Visual impairment and other sensory impairments
- Cognitive/mood impairments
- Medication review
- Urinary incontinence
- Home hazards

8.2 Locations of falls

Around 50% of all falls occur at *home or in the home surroundings*, while most falls occur on level surfaces such as commonly used rooms – bedrooms, lounge and kitchen. Some falls in the home or home surroundings may involve environmental hazards such as loose rugs, slippery floors, steps etc.

The incidence of falls in *nursing homes and hospitals* is two to three times greater than in the community, with complication rates also being considerably higher.

Falls in *public places* can involve many environmental hazards such as uneven surfaces, gutters, drains, building work, cracks and humps.

8.3 Consequences of falls

Injuries such as bruises, lacerations, bleeding, head injury and fractures are common consequences of falls.

- 22%-60% of those who fall suffer injuries
- 10-15% suffer serious injuries
- 2-6% suffer fractures
- 0.2-1.5% suffer hip fractures
- Falls account for 40% of injury-related deaths and 1% of total deaths in the elderly

The most common injuries that require hospitalization are fractures on the hip; pelvic; leg; the forearm's radius and ulnar; the upper arm's humerus; neck; and trunk.

Following a fall, already existing medical issues may worsen and susceptibility to new major health hazards such as infections, DVT, MI, stroke and delirium are high.

'Long lie', is remaining on the ground/floor for more than one hour immediately following a fall and has been shown to be associated with high mortality.

Some of the other consequences of falls include the fear of falling leading to a loss of confidence which has an impact on independent living, depression and anxiety and repeated hospitalizations.

8.4 Falls risk assessment

A care-giver can perform the assessment

- Gait instability/risk of falls can be assessed by asking: "did you experience any fall during the past year?"

- Timed Up and Go Test: To perform the test, use a standard armchair and place the chair ten feet away from the line. Before doing the test, the following instructions need to be given to the person –
    - Rise from the chair
    - Walk to the line on the floor (10 feet away)
    - Turn and return to the chair and sit down again

The score is the time taken in seconds to complete the task. The person is encouraged to wear regular footwear and use any customary walking aid. No physical assistance is given to him/her. The person can walk through the test once before being timed to become familiar with the test.

People who take 10 seconds or less to complete this sequence of maneuvers are at a low risk of falling. Those who take >20 seconds to complete this sequence are at a high risk of falling.

8.5 Management of falls

History

A fall needs to be thoroughly evaluated by taking a detailed history. This should include the nature of the fall, the circumstances leading to it, the direct cause of it, whether consciousness was lost preceding/following the fall, the injuries sustained/other medical issues as a result, history of previous falls, presence of risk factors, co-morbidities and their contribution/ worsening after the fall, use of medications, incontinence, type of footwear, presence of environmental hazards, osteoporosis risk, pre-morbid functional level and how affected after the fall, social circumstances, housing, social support, family and carer support and ability to engage in rehabilitation programmes are relevant in the evaluation of a fall.

Physical examination

The evaluation should include examination for injuries related to the fall, assessment for postural blood pressure drop for orthostatic hypotension, presence of cardiac arrhythmias, abnormalities in gait or balance and mobility, neuropathies and myopathies, vision impairments (acuity, fields and contrast sensitivity), lower-limb disability and use of mobility aids. The use of mobility aids is associated with an increased risk of falls, both in the community and in institutions.

8.6 Management with multi-component involvement

The victim should be medically optimized. Medications should be reviewed and reduced to a minimum. Exercises, with a focus on balance training, aerobic and/or strengthening, should be recommended. Vitamin D supplementation may be beneficial.

A home assessment should be carried out for hazards and if found should be rectified. The correction of vision, if impaired, is important. A comprehensive geriatric assessment should be carried out. An assessment and input from a physiotherapist and an occupational therapist are pertinent.

8.7 Falls rehabilitation process

Once the doctor has completed the assessment to find out the likely cause of the fall, it is worthwhile to refer the victim to a physiotherapist who will also assess the causes as well as functional, mobility and balance issues. Once the victim has gained the maximum possible function and mobility, an occupational therapist should assess him/her, recommending adaptations as necessary.

8.8 Prevention of falls – target groups

People over the age of 50 who have had a fall or recurrent falls in the past year and/or have abnormalities of gait, balance and/or an underlying condition which can increase the risk of falls (see risk factors) would be in the high-risk category for falls. They will be the best target group for falls-prevention strategies.

It is the duty of doctors to routinely enquire from all those over 50 years with whom they are in contact, whether they have had a fall over the past year. High-risk people should be offered multi-factorial falls risk assessment and all possible contributory factors should be rectified as much as possible.

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9. Early Detection and Prevention of Eye Disorders in Older people

As people get older, they tend to take a reduction in vision as part of "normal ageing". Even doctors, under whose care they are, sometimes consider reduced vision, changes in facial appearance and "pain" to be just age-related.

However, paying attention to eye health in the elderly helps to save vision and sometimes to save lives.

Even in the absence of any symptoms and signs, routine comprehensive eye examinations to exclude age-related eye disease is necessary to prevent future visual loss.

9.1 Clinical Presentations

The clinical presentation of eye disorders in the elderly could take one or more of the following forms:

- Visual defects
- Ocular pain
- Floaters
- Change in appearance

9.1.1 Visual defects

Sudden Loss of Vision

Dense loss of vision of acute onset usually alarms both the patient and the physician. The patient presenting with blurring and distortion of vision, a transient loss of vision and a loss of a definable field of vision should also need urgent attention as those with dense loss of vision.

The sudden loss of vision is usually due to a vascular event where the **central retinal artery** or the **central retinal vein** is involved. Usually, the loss of a field of vision is recognized by patients only when it is acute, which happens when an arterial or venous branch is occluded or when a hemorrhage occurs in the macular area.

Central Retinal Artery Occlusion (CRAO) which presents with a sudden dense loss of vision is an ocular emergency. If attended to urgently (within 6 hours of the onset of vision loss), at least a small field of vision in the affected eye may be saved.

If a direct ophthalmoscope is used, palid retinal edema with a cherry red macula is the typical appearance of CRAO. If this facility is not available, it is best to consider any sudden onset unilateral loss of vision as CRAO Basic “first aid” for CRAO for the patient will help to minimize the damage/ save a part of the

vision. Keep the patient supine, with the head slightly low and massage the eye globe to improve ocular perfusion. 'CO_2 breathing' is thought to cause ocular vascular dilatation to exert the same effect.

Patients with hypertension and abnormal lipids are at a higher risk of CRAO. Episodes of amaurosis fugax may herald CRAO and is an indication for carotid doppler studies in the elderly.

Progressive Vision Loss

The progressive loss of vision happens at different rates in different pathological events. Rapid progression within hours is typically seen in **vitreous haemorrhage** (where the loss of vision gradually becomes denser) or in retinal detachment (where the initial field loss progresses to involve the entire visual field).

The progression of the visual loss in uveitis and some optic neuropathies continues for days, whereas **diabetic maculopathy** progresses for months and **cataract** for months or years before the patient seeks medical advice.

The distortion of vision occurs in both **Age-Related Macular Degeneration (ARMD)** and in **Diabetic Macular Edema (DME)** before irreversible visual loss occurs.

9.1.2 Ocular pain

Chronic mild discomfort due to **blepheritis** and **dry eye** which usually occur together are very common. Warm massaging, lid scrubbing, artificial tears and antibiotic ointment help relieve this chronic nagging symptom.

When an elderly person presents with gradually worsening pain and severe pain which distract the sleep, consider **uveitis** and **scleritis**, which may or may not be associated with red eye or altered vision in the initial stages.

Episodic unilateral eye pain or unilateral headache is **angle closure glaucoma** until proven otherwise.

If pain or irritation follows **trauma** to the eye (however trivial) urgent referral to an eye unit is indicated, as **corneal ulceration** may have occurred and could progress readily in the elderly, more so in the presence of diabetes.

9.1.3 Floaters and flashes

The acute onset appearance of ‘a ring’, ‘a string’, ‘a mosquito’ or ‘a spider’ moving in the center of the visual field, associated with lightning flashes seen in the temporal visual field, is usually an alarming symptom. This occurs due to **age-related vitreous**

degeneration succeeding in to **detachment of the posterior surface of the vitreous from the retina**.

During this event, the adjacent retina may break at the points of attachment of the vitreous and retina. The degenerated vitreous can enter through the retinal break, causing retinal detachment.

Patients who present with floaters and flashes need urgent eye referral – within 24-48 hours. A thorough fundus examination to reveal any retinal breaks which can be treated with laser reduces the risk of retinal detachment.

9.1.4 Change in appearance

Most people stop paying attention to their facial appearance after a certain age. The knowledge of potentially dangerous lesions that change the facial appearance is important.

Colour changes of conjunctiva (especially unilateral) should be noted. Closer examination of a chronic red eye may reveal the slightly elevated '*Salmon patch*' lesion characteristic of **lymphoma**.

Newly-appearing black spots/enlarging '*birth marks*' are of concern as they could be **melanmatous**. Changes of colour or contour

of lid margin could similarly be an indication of a pre-malignant or malignant condition.

Nerve/muscle palsies usually present with *diplopia* or '*acute squints*' and the ability to note specific eye movement defects of the third, fourth and sixth nerves is important. If a patient presents with acute divergent eye with partial ptosis, the examination of the pupils is mandatory. If the pupil is larger on the affected side, surgical third nerve palsy due to an **aneurysm adjacent to the third nerve** should be suspected and urgent neuro-imaging performed.

Although a certain degree of ptosis could occur with **age-related levator weakness**, elderly patients with troublesome ptosis should be checked for fatigability, the clinical diagnostic test for **myasthenia gravis**.

9.2 Routine Screening

As the better eye compensates in cases of slowly progressive visual loss, a self-check at home covering one eye at a time, while reading a calendar or a small-print newspaper should be encouraged in all ages, especially in the elderly.

Comprehensive screening should begin as **early as 35-40 years** to minimize visual impairment due to progressive and irreversible ocular diseases such as glaucoma, diabetic retinopathy and ARMD.

For *diabetics,* **an annual screening** from the date of diagnosis of diabetes is recommended. More frequent examinations need to be done after retinopathy is detected.

For the *non-diabetic elderly*, screening should be done **every three years**.

Routine screening of the vision includes:

- **Checking of distance and near vision** and correction whenever necessary (older people, especially the illiterate, tend to go on without spectacle correction as they can just "manage" with their day-to-day life, but as a result tend to miss detection of early visual loss).
- **Dilated fundus examination**, ideally with a slit-lamp and fundus lens. Fundus photography or direct ophthalmoscopy are also acceptable alternatives.
- **Intra-ocular pressure,** ideally with applanation tonometry (slit-lamp). Air-puff and electronic tonometers are also considered adequate for screening.

9.3 Recommendations for referral to a specialist in ocular emergencies (non-trauma)

- Sudden loss of vision – within 6 hours
- H/O transient loss of vision – within 24-48 hours
- Floaters and flashes – within 24-48 hours
- Unilateral severe episodic or persistent ocular pain – within 24-48 hours
- Surgical third nerve palsy – as early as possible to the neurology or neurosurgical unit.

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10. Early Detection and Prevention of Hearing Disorders in Older people

Hearing is an important special sensation that deteriorates with ageing. More than half of the elderly in Sri Lanka has some hearing disability.

The normal mechanism of hearing starts with the external auditory canal. Sound waves that enter the ear canal travel along it to the tympanic membrane making it vibrate. With this eardrum vibration, the handle of the malleus which is attached to it starts to vibrate followed by the vibration of the adjoining ossicles, incus and stapes. The footplate of the stapes is connected to the oval window and the bony cochlea which has three chambers. The inner-most membranous chamber contains endolymph, while two perilymph chambers are found between the bone bordering the cochlea and the inner membranous chamber. The mechanical vibration of the stapes is transmitted to the perilymph via the oval window at the footplate. The round window, meanwhile, releases the sound and mechanical energy from the perilymph into the middle ear. The oval and the round windows work together to regulate hearing as well as the balance of the body.

Hearing stimulates the brain's nerve pathways and reduces the chances of memory loss. Hence, the maintenance of hearing has a preventive action on dementia.

10.1 Causation of Deafness

The causes of deafness can be classified as those affecting the outer ear, the middle ear and the inner ear. Among the elderly, causes affecting the inner ear are the commonest.

Outer-ear causes of deafness; impacted wax, Otitis externa, foreign bodies and malignancies.

Common middle-ear causes of deafness; Otosclerosis, Chronic Suppurative Otitis Media (CSOM) and Cholesteatoma.

Inner-ear causes of deafness; Presbycusis, Labyrinthitis and Meniere's disease.

10.2 Age-related Hearing Loss (Presbycusis)

As presbycusis comes on gradually as a person gets older, it may not be detected in its early stages. It can be familial.

Presbycusis occurs due to changes in the inner ear and the auditory nerve. Patients with this condition may not be able to hear what others are saying especially when there is background noise. It

may be hard for them to tolerate loud sounds which make them irritated. Usually, presbycusis occurs in both ears, affecting them equally and can cause tinnitus.

10.3 Signs and symptoms of hearing loss

The most common symptom of hearing loss is having trouble hearing over the telephone. It may also become hard to follow conversations when two or more people are talking.

The patients who are short of hearing frequently ask others to repeat what they are saying or they need to turn up the TV volume high to an extent where others may complain about it.

The shortness of hearing becomes more problematic with back-ground noise. Patients are unable to understand the voices of women and children and assume that they are mumbling.

10.4 Early detection of deafness

Deafness can be detected in the early stages through several methods such as checking for impacted wax in the external ear canal or by a whispered voice test or audiometry.

The definite diagnosis of deafness can be done by audiometry and average hearing thresholds at 0.5, 1, 2 and 4 kHz of over 25dB can be considered as deafness.

10.5 The degrees of deafness

1. Normal <25
2. Mild <25-40dB
3. Moderate <40-60dB
4. Severe <60-80dB
5. Profound >80 dB
6. Disabling deafness for an adult >39dB

Audiometry is a subjective test and is performed on those 4 years and above. In this test, the air and bone conduction is measured and pure tones are used.

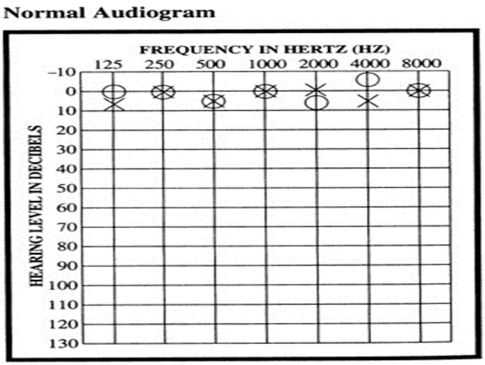


Figure 1: Diagram of a normal audiogram

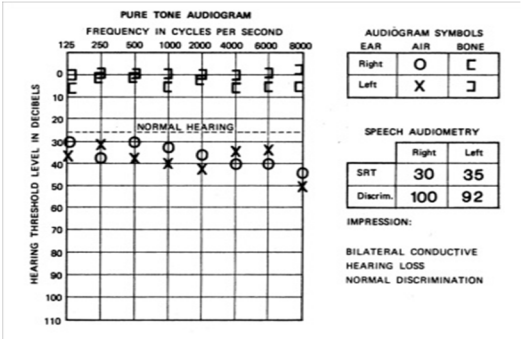


Figure 2: Diagram of an audiogram in conductive deafness

10.6 Coping Strategies for Hearing Loss

Family members and friends of the patient need to know that he/she is having a hearing problem. While speaking, others need to maintain eye contact with the person having hearing loss.

One should speak slowly, clearly and loudly without shouting. The person with the hearing loss needs to pay attention to what is being said as well as to the facial expressions or gestures and view these cues clearly.

It is good to converse standing under a good source of light. The person who is speaking should be asked to repeat a sentence if not heard clearly. The conversation needs to be carried out in a good

location with few disturbances. People need to be patient, positive and relaxed when conversing with deaf people. It is also better to make sure that only one person speaks at a time.

10.7 Problems faced by the elderly with Hearing Impairment

Most people with impaired hearing will avoid conversations and become isolated in the family as well as in society. As they are unable to hear well, there will be communication problems which may lead to frustration. Isolation, frustration and having difficulty expressing their thoughts may lead them to depression and dementia.

10.8 Treatment for Hearing Loss

There are **surgical** as well as non-surgical methods to overcome deafness.

The most common **non-surgical treatment** method is the use of *hearing aids*. These hearing aids can be worn behind the ear, in the ear, in the ear canal or fully within the ear canal.

Hearing aids need to be used and worn all the time, in consultation with an audiologist. As hearing aids amplify background noises, the user must learn to ignore them.

The hearing aids need to be serviced regularly and the batteries changed when necessary. They also need to be protected from moisture.

A tight-fitting ear mould has to be made according to the customer's measurement. The hearing aid mould will differ to patient to patient (Does not seem to fit here please)

Even though most elders prefer to wear in-the-ear hearing aids, a reduction of hand dexterity which comes with ageing may cause using them (placing, tuning and removing which needs fine movements of the hand), difficult. Therefore, a more practical solution may be behind-the-ear hearing aids.

Surgical treatment includes correcting identified abnormalities in the ear, replacing cochlear implants etc.

11. Early Detection and Prevention of Nutrition Disorders in Older people

Diet can make a significant positive contribution in an older person. The primary role of nutrition is to provide adequate energy, protein and essential nutrients.

Medical nutrition therapy plays an important role in achieving the best possible quality of life by the provision of adequate nutrition which, in turn, improves functional status.

The goals of nutrition therapy in elders are: provision of sufficient amounts of energy, protein and micronutrients; maintenance or improvement of nutritional status; maintenance or improvement of function, activity and capacity for rehabilitation; maintenance or improvement of quality of life; and reduction in morbidity and mortality.

11.1 Malnutrition in elderly

Malnutrition is highly prevalent among the elderly. The causes of malnutrition are chronic diseases, dementia, poor oral health, obesity, taking multiple drugs (polypharmacy), sarcopenia/frailty, loss of olfactory and taste sensation, loss of functional capacity (owing to the inability to procure, prepare and consume food) and psychosocial factors including social isolation.

With different nutritional deficiencies, various clinical symptoms and signs can appear. (See Table 1)

As such, clinicians should be alert for signs of nutritional deficiencies when performing routine clinical examinations and treat these patients.

Table 2: Clinical symptoms and signs of nutritional deficiencies

System	**Symptoms/signs**	**Nutritional deficiency**
Skin	Dry, scaly skin	Zinc/essential fatty acids
	Follicular hyperkeratosis	Vitamins A & C
	Petechiae	Vitamins C & K
	Photosensitive dermatitis	Niacin
	Poor wound healing	Zinc & vitamin C
	Scrotal dermatitis	Riboflavin
Hair	Thin/de-pigmented	Protein
	Easy pluck ability	Protein & zinc

Nails	Transverse depigmentation	Albumin
	Spooned nails	Iron
Mouth	Bleeding gums	Vitamin C & riboflavin
	Glossitis	Niacin, pyridoxine & riboflavin
	Atrophic papillae	Iron
	Hypogeusia	Zinc & vitamin A
Eyes	Night blindness	Vitamin A & zinc
	Conjunctival inflammation	Riboflavin
	Keratomalacia	Vitamin A
Neck	Thyroid enlargement	Iodine
	Parotid enlargement	Protein
Abdomen	Diarrhoea	Niacin, folate & vitamin B12
	Hepatomegaly	Protein
Extremities	Bone tenderness	Vitamin D
	Joint pain	Vitamin C
	Muscle tenderness	Thiamine

	Muscle wasting	Protein, selenium & vitamin D
	Oedema	Protein
Neurological	Ataxia	Vitamin B12
	Tetany	Calcium & magnesium
	Parasthesia	Thiamine & vitamin B12
	Dementia	Vitamin B12 & niacin
	Hyporeflexia	Thiamine

Certain physiological changes during ageing demand a higher nutrient intake. This increased requirement should mainly be through a varied diet and not supplements.

Sarcopenia is defined as a decline in skeletal muscle mass, strength and function associated with ageing. It is associated with malnutrition and is the hallmark of frailty.

Older adults have greater protein needs to compensate for anabolic resistance and hypermetabolic disease. They may also have a decreased intake of protein due to age-related appetite loss, medical conditions, economical status etc.

An optimal intake of at least 1.0 to 1.2 g protein/kg BW/day is recommended. This can be increased to 1.5g/kg/day in acute disease conditions. (See protein-rich foods in Annexure II)

A heart-healthy diet would be low in saturated fat, trans-fat and optimum healthy fat with nutrient dense foods to prevent weight gain.

With the ageing process, blood vessels begin to stiffen and blood pressure often increases. Blood becomes more viscous although the number of oxygen-carrying red blood cells declines. Hence, the nutrition recommendation for elders is a low-sodium diet (1,500-2,000 mg/day) with potassium-rich foods (Annexure I) and Omega 3s that are found in fish.

The tendency for blood glucose levels to rise with age makes Type 2 diabetes more prevalent in the elderly. Therefore, it is advisable to prevent excess weight gain through an optimum calorie intake and increased physical activity.

In the ageing process, there is a decrease in the intestinal absorption of calcium and the kidneys are also less able to retain calcium, leading to increased urinary calcium loss which will ultimately lead to a hypocalcaemic situation.

On the other hand, there is a decrease in the capacity of the skin to synthesize vitamin D, with less frequent exposure to sunlight and a decrease in the capacity of the kidneys to convert vitamin D into the most active form, 1,25-dihydroxyvitamin D, leads to a vitamin deficient state.

Both calcium and vitamin D insufficiency can lead to an increased risk of osteomalacia which is very commonly seen in old age. To prevent this condition, it is nutritionally recommended that the calcium and vitamin D intake should be increased along with a good level of physical activity.

With ageing, not only is the GIT motility reduced but there is also a decrease in digestive secretions. In addition to these physiological changes of the body, other changes in old age such as dietary and activity changes and medications can also play a causal role. Hence, it is advisable to increase the fiber-intake to 25-35g/day.

A diet which includes nuts, fruits, vegetables, green leaves and whole grain can provide the required fiber needs.

This is while ensuring that the elderly have adequate hydration and exercise to overcome constipation which is common problem among them.

Having visual problems, meanwhile, is not uncommon in the later stage of life. Carotenoids (lutein, zeaxanthin and beta-carotene) may prevent retinal degeneration and carotenoids with vitamins C and E may prevent macular degeneration. Vitamin C can prevent cataracts which are a common problem among the elderly.

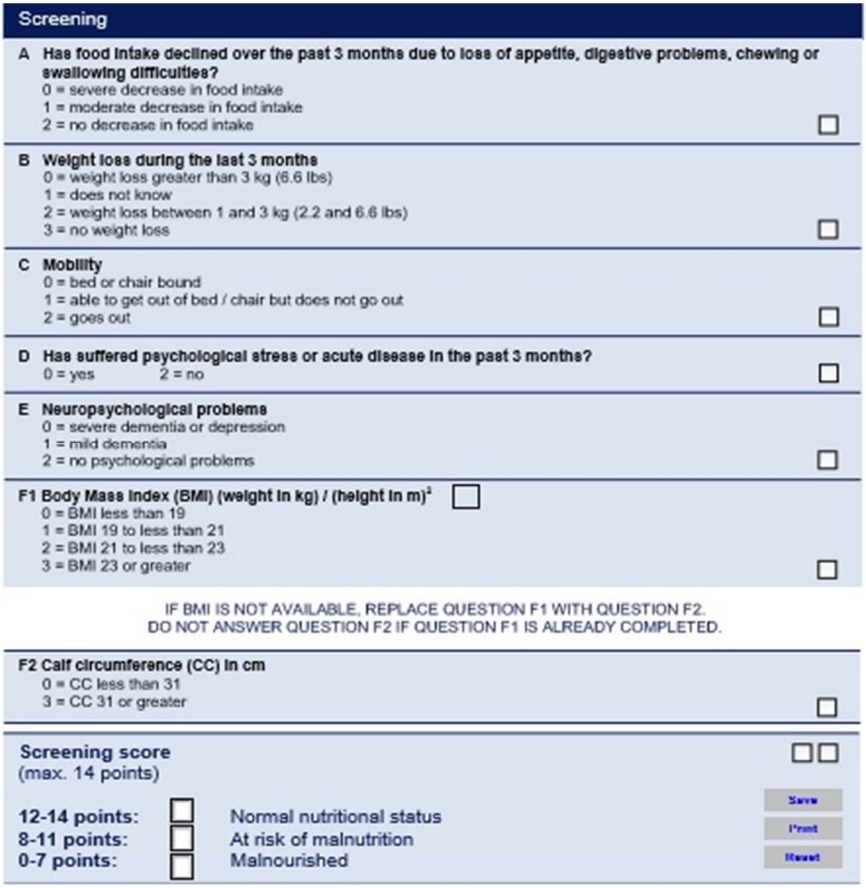
Another issue that the elderly face is a reduction in the number of taste buds leading to reduced taste sensations. There can also be changes in smell, which may lead to a reduced dietary intake. Ensuring an adequate intake of zinc, trying out a variety of new flavors, experimenting with different types of low-sodium seasonings and avoiding overcooking food may help to overcome these problems.

Table 3: The summary of nutrient requirements in the elderly

Nutrient	**Requirement**
Energy	20-30kcal/kg/day
Protein	1-1.2g/kg/day
Fiber	25-35g/day
Vitamin D	600IU/ day (51-70yrs)
	800IU/day (>70yrs)
Calcium	1,000mg/day (males 51-70 yrs)
	1,200mg/day (females >51yrs and males >70yrs)
Vitamin B6	1.5mg/day (females)
	1.7mg/day (males)
Fluid	30ml/kg/day

11.2 Nutrition Assessment Tool:

Mini Nutritional Assessment is a validated tool to assess malnutrition in the elderly (Figure 1).



Screening

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 m)² ☐
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater ☐

IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2.
DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.

F2 Calf circumference (CC) in cm
0 = CC less than 31
3 = CC 31 or greater ☐

Screening score ☐☐
(max. 14 points)

12-14 points: ☐ Normal nutritional status
8-11 points: ☐ At risk of malnutrition
0-7 points: ☐ Malnourished

Save
Print
Reset

Figure 3: Mini Nutrition Assessment Tool

Food Pyramid

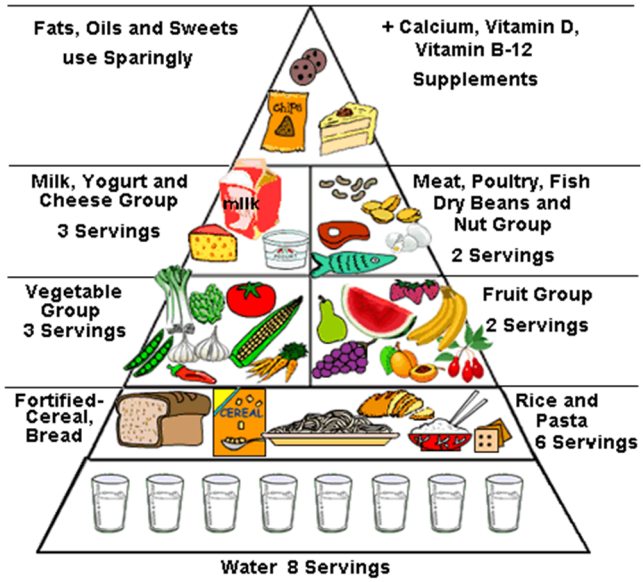


Figure 4: Food Pyramid for the elderly

11.3 Physical Activity for Elders

Physical activity for the elderly is a very important component in maintaining their health. Regular exercise improves skeletal muscle strength and function. Resistant exercises and adequate protein intake (1-1.2g/kg/day) are recommended. Muscle strengthening exercises two or more days per week are also recommended.

11.4 Tips for a healthy diet

- Eat an enjoyable and varied diet with plenty of fruits, vegetables and fiber
- Reduce your salt intake
- Opt for healthier fats
- Eat calcium-rich foods
- Boost B vitamins through a varied diet
- Keep well hydrated
- Look after your teeth
- Don’t consume alcohol
- Don’t smoke
- Get enough sleep
- Watch your weight and stay active
- A little sunshine is good for you
- Keep your brain stimulated

Use it or lose it – keep active!

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12. Medical Check-Ups for Older people

Sri Lanka is facing rapidly changing demographics, family dynamics, socio-economic factors and cultural values. In this setting, healthcare teams led by doctors have a good opportunity to contribute towards improving the quality of life of the elderly by promoting healthy ageing.

The concept of 'Medical Check-ups' is an important tool in this process.

The elderly probably do not require routine medical check-ups except when they have risk factors or symptoms of a disease. This is due to routine medical check-ups bring unnecessary medical examinations which cause uncomfortableness to the patient; such as misinterpreted ECGs which, in turn, may lead to a person undergoing investigations facing exposure to unnecessary radiation or a wrong blood report leading to an unwanted biopsy being taken.

As such, check-ups should be tailored for individuals, while serving as a basis for clinicians to treat acute or chronic ailments.

The objective of providing care for the elderly should be to preserve their functions, thereby improving their quality of life. It is important for the elderly to age in a backdrop of 'Good Health'. While some individuals will demonstrate the natural changes of ageing, others will do so with one or more chronic health conditions. Still others may develop acute illnesses.

Among these people, it is important to differentiate the changes occurring due to the pathological processes in contrast to the inevitable changes of chronological ageing.

Those who age with chronic multiple health conditions will need input from medical professionals to achieve a good quality of life. As their regular family healthcare provider, you will have an ideal platform to advise your patients on the individualized check-ups they need.

The process should begin by obtaining a detailed history, followed by a thorough clinical examination and a series of investigations, all with a holistic approach. While examining and investigating the systems/organs of a particular individual, it should be borne in mind that treatment of these systems/organs in isolation amounts only to treatment as opposed to caring for the individual.

12.1 Assessment of the Elderly

The World Health Organization (WHO) recommends that *'health in the elderly is best measured in terms of function'*. A detailed system/organ based assessment might be required and at times even be mandatory. Nevertheless, the primary objective of a routine medical check-up should be to assess the elderly from a 'functional' perspective.

Functional assessment which can yield valuable information should be a mere adjunct to routine history-taking and examination of the elderly.

Functional assessment using Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) becomes useful in the early detection of problems, early interventions to overcome limitations, prevention of certain problems and monitoring progress or decline.

Functional assessment

This is the systematic, multi-dimensional detailed evaluation of an individual's ability to perform various tasks associated with independent living. Independent living is assessed by the person's ability to perform Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL).

There is a 'rule of thirds' with regard to **functional decline** in the elderly. According to this rule:

- One-third (1/3rd) is from **ageing**
- One-third (1/3rd) is from **illness/disease**
- One-third (1/3rd) is a result of **disuse**

This has important implications. It indicates that functional decline could significantly be reduced by cutting down disease risk and/or early treatment and encouraging active engagement particularly in ADL and IADL.

IADL may be specific to gender, culture or geographical location and thus should be assessed in that context.

12.2 Medical Check-Ups

The medical check-up should ***NOT*** specifically target a diagnosis or even the identification of a precise disease/illness/pathological state. It should aim at arriving at an assessment of the ***Current Health Status*** of the individual and attempt to identify possible aetiological and risk factor/s which could be responsible for his/her current health status.

The check-up should address the mental, physical and social domains of health in the context of the individual, family and community taking into account preventive, curative and rehabilitative aspects of care. It is *sine qua non* (essential) that the medical check-up should be done in an ethical manner respecting the privacy, confidentiality and dignity of the individual (Fig 1)

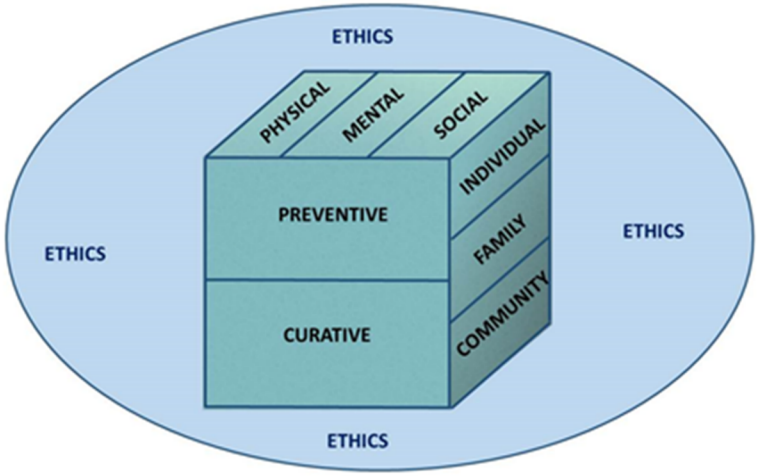


Figure 5: Conceptual Model for Holistic Medical Health Check-up

If an individual presents with non-specific symptoms, unexpected deterioration in health or inability to cope with ADL, it is useful to consider the following checklist in his/her assessment:

- Mental state – *Confusion, dementia, depression, bereavement*
- Eyes – *Visual acuity, cataract, glaucoma*
- Ears – *Deafness, tinnitus, vertigo*
- Mouth – *Dentition, xerostomia, swallowing, malnutrition (under nutrition in particular)*
- Skin/hair/nails – *Wrinkles, elastosis, eczema, pruritis, pressure sores, infections*
- Medication – *Polypharmacy, adverse drug reactions, side-effects of drugs*
- Bladder/bowel – *Incontinence, retention of urine, urinary tract infection, constipation*
- Locomotion – *Gait, movement disorders, arthritis, musculoskeletal disorders, circulation*

The following specific issues **MUST** be assessed in ALL the elderly during a medical check-up:

- **Frailty** – Is a clinically recognizable state of increased vulnerability resulting from ageing-associated decline in reserve and function across multiple physiologic systems such that the ability to cope with day-to-day activities or acute stressors is compromised? In the absence of a gold standard, frailty could be suspected when there are three out

of five phenotypic criteria indicating compromised energetics: low grip strength, low energy, slowed walking speed, low physical activity and/or unintentional weight loss.

- **Pain** – Perception and reaction threshold to pain are decreased in the elderly. The inability to describe and accurately localise pain associated symptoms must be appreciated in the assessment.
- **Breathlessness** – Changes in mental status may mask the sensation of dyspnoea, although tachypnoea is often evident.
- **Falls** – Must be elicited in the history without fail. Many of the elderly do not voluntarily report falls for a myriad of reasons (embarrassment, fear of restrictions being placed on their activities and assumption that falling is 'normal' in old age).
- **Sleep** – Failure to identify sleep disorders may result in preventable deterioration of the quality of life.
- **Loneliness** – Should be elicited and identified as at least one-third of the elderly 'feel' lonely.

12.3 Classification of Investigations

In general, investigations may be classified into one of following groups:

12.3.1 Baseline investigations

Undertaken to help the clinician define and identify the basic functional status of the individual. They would include fasting blood sugar, lipid profile, renal function tests, liver function tests, thyroid function tests, full blood count, ESR and urine full report.

12.3.2 Screening investigations

Undertaken to identify and/or monitor specific risk factors contributing towards morbidity.

12.3.3 Diagnostic investigations

Undertaken for inclusion or exclusion of a problem or a specific diagnosis.

12.3.4 Special investigations

Undertaken under special circumstances to cover all of the above.

In the backdrop of a medical check-up, the investigations that should be done are often pre-identified. However, if the clinician requires more investigations, the individual/caregiver should be informed along with the reasons why they are being requested.

Health promotion and disease prevention in the context of the elderly are very often overlooked during medical check-ups. This is probably due to the notion that the increased risk of illness in older people reflects the inevitability of 'normal' ageing. Such notions have been disproved and some of the most effective interventions available to clinicians for reducing the incidence and severity of the major causes of diseases and disability are mostly those that address personal health practices.

Adoption of a healthier lifestyle even in late life can lead to increased life expectancy with reduced disability and reduced healthcare expenditure. This requires empowering patients to take a more active role in identifying risk factors and encouraging them to take steps to modify disease risk.

The concept of 'opportunistic health promotion' is best practice in the elderly during the process of a medical check-up and should not be missed.

13. Early Identification and Prevention of Common Disorders among the Older people – In Summary

Sri Lanka has a population of 20.4 million; 9.9m males and 10.5m females. Of this population, 12.4% are above 60 years of age. The elderly population has more than doubled over the last 30 years.

Ageing affects the health of elders. However, the early diagnosis and prevention of common conditions will promote active healthy ageing.

This presentation on **'Early Identification and Prevention of Conditions Common among the Elderly'** includes the Early Identification of Cancers, Respiratory Diseases, Cardiovascular Diseases and Psychiatry Diseases; Falls and Musculoskeletal Diseases; and Problems in Vision and Hearing. Finally, routine medical check-ups and prevention of the above mentioned diseases will also be discussed.

It is important to remember that elders are a diverse group when taking into account physical fitness. Active healthy ageing will promote confidence and independent living along with longevity among them.

Early diagnosis of common respiratory disorders

Asthma, Chronic Obstructive Pulmonary Disease (COPD), Pneumonias, TB, Obstructive Sleep Apnoea (OSA), Lung Cancer and Aspiration Pneumonia are common respiratory diseases of the elderly.

Cough, wheezing, shortness of breath, fever, loss of weight and loss of appetite are common symptoms of respiratory diseases.

The following would be alarming respiratory symptoms:

1. Cough for more than 2 weeks with or without sputum.
2. Low-grade fever with or without night sweats.
3. Coughing up blood or having rusty coloured sputum.
4. Unintentional weight loss.
5. Loss of appetite.
6. Sudden onset of fever and cough, chest pain increasing with breathing or breathlessness.

Obstructive Sleep Apnoea is caused by the obstruction of the respiratory tract by the tongue falling backwards while sleeping. Daytime sleepiness, snoring and transient cessation of breathing with recurrent arousal during sleep are symptoms of OSA. Such patients are often overweight and also have associated Diabetes Mellitus, heart disease, stroke and COPD.

Early diagnosis of cardiovascular diseases

Non-Communicable Diseases (NCD) are responsible for 70% of all deaths worldwide every year. Smoking, lack of physical activity, unhealthy diet, alcohol and stress are lifestyle-related important modifiable risk factors for NCDs.

Diabetes Mellitus

A majority of diabetics are not with symptoms and it should be diagnosed by routine blood sugar estimations. When symptoms do occur, thirst, polyuria or nocturia and rapid loss of weight are common. Non-specific symptoms such as falls or muscle weakness, with difficulty in walking, poor vision, impaired memory or poor judgement may occur when diabetes affects the patient long term. Patients who are overweight, lead a sedentary life, have a family history of diabetes and high blood pressure and a history of heart disease or stroke are at a high risk of developing Diabetes Mellitus.

Criteria for diagnosis of Diabetes Mellitus

With suggestive symptoms: Fasting blood glucose >7.0 mmol/L (126 mg/dl) or Random blood sugar >11.1 mmol/L (200 mg/dl).

Without suggestive symptoms: FBS/RBS should be above the given cut-off values on two occasions.

Heart attacks and strokes

Tightening chest pain developed on exertion and relieved with rest is the characteristic symptom of angina. The sedentary lifestyle of the elderly may hinder the development of exertional symptoms characteristically seen in IHD. They may complain of atypical chest pain or have non-chest pain presentations such as general fatigue/malaise, dyspnoea, abdominal pain, nausea and vomiting or syncope.

The sudden onset of paralysis or numbness of half of the face with involvement of an arm and/or leg on the same side and difficulty in speaking and understanding are the most common symptoms of stroke. Trouble with seeing through one or both eyes, difficulty in walking with loss of balance and sudden severe headache are other common symptoms of stroke. Transient symptoms or a mini-stroke predict the immediate risk of a major stroke.

Early diagnosis of cancers

The incidence of cancers gradually increases with ageing, particularly from 45 years upwards and the type of cancer would be linked to the patient's long-term habits and lifestyle.

In Sri Lanka, Breast, Oral (lip, tongue and mouth), Reproductive Organ (cervix, uteri and ovary) and Oesophagus Cancers head the list.

There are seven early danger signals of cancers:

1. Newly-detected **lumps** or **growths**.
2. **Bleeding –** rectal, vaginal, urethral and nasal bleeding or when coughing or vomiting.
3. Recent alteration in **bowel habits** – constipation, diarrhoea or a feeling of inadequate evacuation.
4. Progressive difficulty in **swallowing.**
5. Progressive difficulty in **breathing** or progressive feeling of **fatigue**.
6. **Loss of weight** – loss of >10% of weight within 3 months.
7. **Colour changes** on areas of the skin or non-healing ulcers.

In the case of cancer, these symptoms are progressive and do not respond to the usual treatment. The presence of co-existing chronic illnesses, cognitive impairment and attribution of loss of appetite and loss of weight to ageing, may delay the diagnosis of cancers in the elderly. Pain is a late feature of cancers.

Early diagnosis of common psychiatric disorders

Dementia, depression, delirium and psychotic disorders are common psychiatric conditions of the elderly. There is effective treatment for all these psychiatry conditions.

The following could be the early presenting symptoms of a psychiatric disease:

1. Appearance and behaviour would indicate that the patient is with poor self-care, inappropriate dress and speaking/ smiling to self with changes in facial expression.
2. Speech would be irrelevant and incoherent with changes in volume and rate.
3. Mood could become inappropriate with feeling excessively sad or happy and getting angry.
4. Thoughts would become repetitive and unpleasant with negative thinking and worrisome thoughts. There could be abnormal beliefs and thoughts of harming self. The patient may become anxious about health.
5. Sensations (perceptions) – hearing voices when no one is around and seeing things that are not there. Thinking skills (cognitions) could be impaired. The patient could be confused with lost knowledge on where they are and about

the time of day. There could be poor attention, concentration and forgetfulness. When communicating there may be word finding difficulties. He/she may get lost easily.

6. There could be a change in the way the patient was and changes in sleep and appetite. Poor functioning in the Activities of Daily Living (ADL) will also be evident.

Musculoskeletal disorders and their effect on the Activities of Daily Living (ADL)

Musculoskeletal disorders which include arthritis of hips and knees, degenerative spine, soft tissue rheumatism and old fracture related problems will restrict mobility and affect all ADL. In addition to impairment in ADL such as bathing, grooming, dressing, eating, maintaining bladder and bowel control and mobility, they will have difficulty in squatting or standing from low seats, poor hand grip increasing the risk of falls and impaired finer movements of the hands and climbing steps.

Musculoskeletal disorders will cause joint pains related to activity and posture and also place pressure on joints. The elderly who are overweight and sedentary and have osteoporosis and multiple co-morbidities are more likely to suffer these symptoms. Wrong postures during work exacerbate these symptoms.

Instrumental Activities of Daily Living (IADL) which include activities that are not required on a daily basis such as the ability to use a telephone and public transport; prepare meals and do one's own household work; shopping and managing medications and finances could also be affected.

Falls – target groups

People over the age of 50 who have had a fall or recurrent falls in the past year and/or have abnormalities of gait, balance and/or an underlying condition which can increase the risk of falls (see risk factors) would be in the high-risk category for falls.

It is the duty of doctors to routinely enquire from all those over 50 years with whom they are in contact, whether they have had a fall over the past year. High-risk people should be offered multi-factorial falls risk assessment and all possible contributory factors should be rectified as much as possible.

Impaired vision of the elderly

The elderly with ocular disorders could present with visual defects (gradual or sudden impairment of vision in one eye or both eyes), ocular pain, floaters (the appearance of 'a ring', 'a string', 'a mosquito' or 'a spider' moving in the center of the visual field) or change in appearance of eyes such as red eye, squints or ptosis.

Deafness in the elderly

The most common condition for age related hearing impairment is presbycusis. The most common symptom of hearing loss is having trouble hearing over the telephone. It may also become difficult for them to follow conversations when two or more people are talking particularly when there is background noise. The patients who are short of hearing frequently ask others to repeat what they are saying or they need to turn up the TV volume high to an extent where others may complain about it.

14. Early Identification and Prevention of Common Disorders among the Older people

Active Healthy Ageing is the key to longevity. The family physician should guide all his/her elderly patients on Active Healthy Ageing. He/she should carry out regular check-ups for elders. The best opportunity for such check-ups is when elders with ailments present themselves to the physician. Check-ups have to be individualized.

The elderly probably do not need routine screening for diseases unless they are in a vulnerable category such as being immune compromised.

The objective of the check-up is to learn the "Current Health Status" and not for diagnosis purposes. Routinely, the elderly should be assessed using ADL and IADL for functional independence and for risk factors for the Current Health Status. Our aim should be to identify the problems early and implement the necessary interventions to maintain their mobility and independence in ADL to the maximum level.

Checklist for assessment of the elderly:

- Mental state – Confusion, dementia, depression and bereavement.
- Eyes – Visual acuity, cataract and glaucoma.
- Ears – Deafness, tinnitus and vertigo.
- Mouth – Dentition, xerostomia, swallowing and malnutrition (under-nutrition in particular).
- Skin/hair/nails – Wrinkles, elastosis, eczema, pruritis, pressure sores and infections.
- Medication – Polypharmacy, adverse drug reactions and side-effects of drugs.
- Bladder/bowel – Incontinence, retention of urine, urinary tract infection and constipation.
- Locomotion – Gait, movement disorders, arthritis, musculoskeletal disorders and circulation.

All elderly should be assessed regularly for frailty, pain, breathlessness, falls, insomnia and loneliness.

Baseline investigations should be carried out to identify the basic functional status of the individual (e.g. fasting blood sugar, lipid profile, renal liver and thyroid function tests, full blood count, ESR and urine full report). All other investigations needed would be decided based on the Current Health Status.

The adoption of a healthier lifestyle even in later life can lead to increased life expectancy with reduced disability and reduced healthcare expenditure.

Important facts for Active Healthy Ageing

- ***Avoid smoking and exposure to air pollutants***:
    - Avoid environmental pollution
    - Avoid use of any form of tobacco
    - Be concerned about second-hand smoking
    - Be concerned about occupational air pollution
    - Minimize the use of firewood and try to use LP gas instead
- ***Avoid alcohol and other toxins***:
    - Avoid use of any type of alcohol
    - Avoid chewing betel, areca nut, tobacco and chunam
- ***Carry out physical exercise regularly***:
    - At least 150 minutes of moderate-intensity aerobic physical activity (walking, swimming, balance training exercises and strengthening exercises) throughout the week
    - 75 minutes of vigorous-intensity aerobic physical activity throughout the week

- The elderly with poor mobility should perform physical activity to enhance balance and prevent falls on 3 or more days each week
- Disabled elderly should do physical activity as their abilities and conditions allow
- Breathing exercises are important for healthy lungs
- Seek advice from a physiotherapist with regard to suitable exercises if there are disabilities

- ***Practice healthy eating habits***:
  - The food pyramid provides a basic structure for the diet
  - As older adults have a greater protein need, protein-rich food is recommended (eggs, lean meat, fish, beans, lentils, peas and milk)
  - Take moderate amounts of carbohydrates, based on weight and physical activity (rice, cereals, string hoppers, hoppers and bread)
  - Take less red meat (beef and pork), cheese, bakery items and deep fried food
  - Reduce salt intake to 5gm per day
  - Add calcium, potassium and vit D rich food (small fish and milk)

  - Include plenty of nuts, fresh vegetables, green leaves and fruits in diet
  - Drink adequate water
  - Certain physiological changes may demand a higher nutrient intake. Ensure an increase in the varied diet but not artificial supplements
- Seek medical advice regularly and control high blood pressure, cholesterol and diabetes:
  - Review the list of medications and reduce the number of drugs to a minimum
- ***Take care of vision***:
  - A self-check of vision at home covering one eye at a time, while reading a calendar or small-print by all elderly is recommended
  - Comprehensive routine screening of all elderly to minimise visual impairment due to progressive and irreversible ocular diseases such as glaucoma, diabetic retinopathy and age related macular degeneration
    - Diabetics – Eye screening annually
    - Non-diabetics – Eye screening every three years

- ***Take care of hearing***:
    - Screen for deafness through a whispered voice test or audiometry
    - When communicating with a person with impaired hearing
        - Maintain eye contact
        - Speak slowly, clearly and loudly without shouting
        - There has to be a good source of light and no disturbances at the place of communication
        - Make sure that only one person speaks at a time
    - Using hearing aids is the most common treatment for hearing loss
- ***Avoiding wrong postures***:
    - Avoid wrong postures and overuse of joints in day-to-day work
- ***Arrange living conditions considering safety and convenience***:
    - Remove slippery carpets and use sticky rugs instead
    - Remove loose or non-fitting shoes or slippers

- Avoid wire cords of electrical instruments across the floors of the house
- Avoid pets obstructing the way
- Raise the height of the chair, bed and commode for those who find it difficult to get up from a chair
- Use of a bedside commode at night for those with impaired mobility
- Safety bars and handrails in corridors, washroom and toilet
- Shower chair in the washroom
- Walking aids whenever necessary
- Ramps and handrails along staircases
- Obtain further advice from an occupational therapist

- ***Practice basic hygienic habits***:
  - Keep nails cut and wash hands frequently with soap and water
  - Brush teeth at least twice daily
  - Maintain good oral hygiene and see the dentist at least once in 6 months
  - Practice cough etiquette

- ***Stay active***:
    - Keep the mind active. Word puzzles, memory games and reading are good to keep the mind active
    - Be socially engaged and avoid social isolation

- ***Be aware of available social support***
- Seek medical advice early for infections and other danger signals

- ***Specific advice***:

  Cancers – All women should practice self-examination of breast for cancers. Vulnerable women should undergo a pap smear for cervical cancers

  Respiratory – Frail elderly with respiratory tract disorders should prevent respiratory tract infections. They could get themselves vaccinated against influenza and also pneumonia

15. Annexures

Annexure I:

Table 4: Potassium-rich foods

Food	Standard portion size Medium Size	Potassium (mg) in standard portion
Potato	1 cup	941
Carrot juice	1 cup	689
Passion fruit juice	1 cup	687
Plain yoghurt, non-fat	1 cup	579
Tomato puree	½ cup	549
Sweet potato	1 cup	542
Pomegranate juice	1 cup	134
Orange juice	1 cup	112
Banana	1 medium	105
Avocado	½ cup	120

(Source: USDA National Nutrient Database)

Annexure II*:*

Table 5: Protein content in foods

Food item	Serving size	Amount of protein (g)
Egg	01	7
Lean meat	30g	7
Fish	30g	7
Beans, lentils, peas	½ cup	7
Milk	3 tablespoons	8
Cheese	30g	7
Poultry	30g	7

(Source: USDA National Nutrient Database)

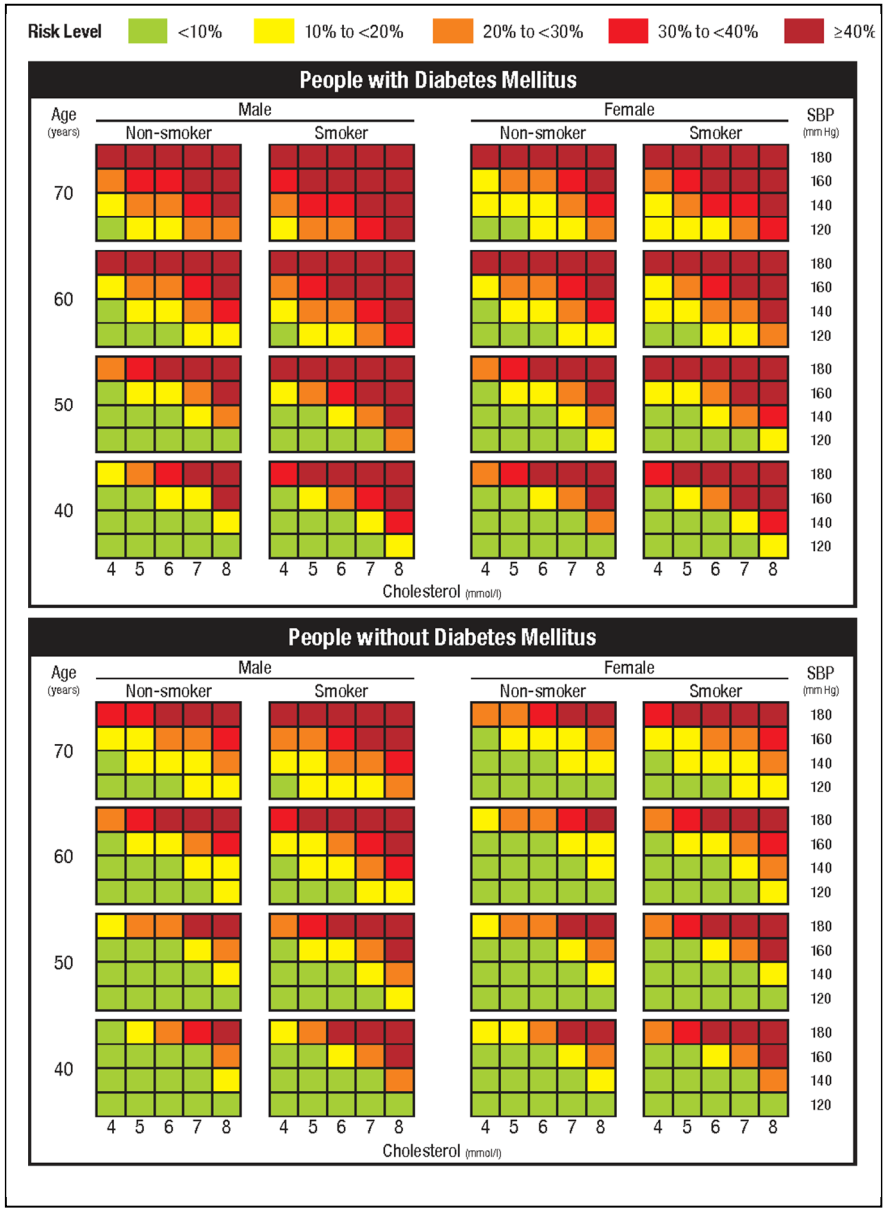
Annexure III:

Table 5: Sample meal plan:

Breakfast		**Serving size**
	Boiled green gram with lunu miris and scraped coconut	1 cup 2 table- spoons
	Kola kenda without rice	1 cup
Snack		
	Vegetable mixed rotti	¼
	Banana (small)	1
	Tea with non-fat milk powder (2 tbs)	1 cup
Lunch		
	Parboiled rice	1½ cups
	Green leaves	3 tbs
	Vegetables	4 tbs
	Chicken	1 piece

	Coconut milk gravy	3 tbs
Snack		
	Gingelly ball 2tbs (with coconut 1 tbs)	1
	Non-fat yoghurt	1
	Guava/beli	½
Dinner		
	Rice	2 cups
	Vegetables	4 tbs
	Fish	1 piece
	Coconut milk gravy	3 tbs
	Veralu	5
Bedtime snack		
	Milk with non-fat milk powder (2 tbs)	1 cup
Energy=1750kcal, CHO=50%, protein= 20% & fat=30%		

Annexure IV: *WHO CVD risk Prediction Module*



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