



GUIDELINES

For

GENERAL PRACTITIONERS

2024

Press record

First Edition

Printed by SARANA PRESS (Dr. Aung Kyaw Min)

249, Theinbyu Road, Mingalartaungnyunt Township, Yangon,
Myanmar

2018

Cover Designer (Tun Zaw)

Inner Designer (Tun Zaw)

Second Edition

Digital Copy Printing (TMO)

249, Theinbyu Road, Mingalartaungnyunt Township, Yangon,
Myanmar.

2024 April

Cover Designer (Tun Zaw & Win Zaw)

Inner Designer (TMO)

FOREWORD

It is a great honor for me to write a foreword to [Guidelines for General Practitioners](#) by General Practitioners' society, Myanmar Medical Association (Central).

General practitioners are the primary health providers in the community looking after the majority of the people of our country. They are being trusted and depend upon by every families in the surrounding area where they practice. The first and foremost care by the General Practitioners are the most important for all the people.

Guidelines based on a critical appraisal of scientific evidence (evidence-based guidelines) clarify which interventions are of proved benefit and document the quality of the supporting data. They alert clinicians to interventions unsupported by good science, reinforce the importance and methods of critical appraisal, and call attention to ineffective, dangerous, and wasteful practices.

Clinical guidelines can improve the quality of clinical decisions. They offer explicit recommendations for clinicians who are uncertain about how to proceed, overturn the beliefs of doctors accustomed to outdated practices, improve the consistency of care, and provide authoritative recommendations that reassure practitioners about the appropriateness of their treatment policies.

The Myanmar Medical Association together with the GP society has been helping out with the CME and CPD program for the Member doctors both inhouse sessions and online courses. This guideline is one of the essential parts of this CPD for the GPs.

I would like to congratulate the GP society for their effort for producing this guideline and also, I would like to encourage them to review and updated regularly.



Professor Aye Aung
President

Myanmar Medical Association

April, 2024

PREFACE

We are writing this letter to express our sincerest gratitude and appreciation for the successful completion of the **second edition** of the **General Practitioners' Guidelines**. This accomplishment is the result of an exceptional collaborative effort, and we would like to extend our thanks to all those involved.

The General Practitioners' Guidelines has been an invaluable resource since its inception with the launch of the first edition in November 2017. As per the initial plan, the guidelines were intended to be updated every three years to ensure the most up-to-date information reaches Myanmar General Practitioners, enhancing their knowledge in primary healthcare and family health.

However, the unforeseen outbreak of the Covid-19 pandemic disrupted our plans and posed numerous challenges for the team. In-person meetings became impossible due to safety concerns, making it necessary for us to find alternative means of communication and collaboration. Despite the adversity faced, the team members demonstrated remarkable resilience and adaptability by utilizing online platforms and technology to continue the update process.

We would like to extend our deepest gratitude to the dedicated team members who persevered and worked tirelessly during these trying times. Their commitment, professionalism, and unwavering dedication to the project enabled us to overcome the obstacles posed by the pandemic and successfully complete the second edition of the guideline.

Furthermore, we would like to express our sincere appreciation to the specialist societies that actively contributed to the development of the guidelines. Their expertise and invaluable insights have ensured that the content remains current, accurate, and relevant, enabling our General Practitioners to provide the highest quality of care to their patients.

We would also like to extend our heartfelt thanks to the esteemed President of the Myanmar Medical Association, for their continuous support and guidance throughout this endeavor. Their leadership and unwavering commitment to advancing medical knowledge in Myanmar have been instrumental in the success of this Guidelines.

Moreover, the decision to distribute the guideline as electronic copies reflects our commitment to ensuring easy access for all Myanmar General Practitioners. By making it available in this format, we aim to facilitate the dissemination of updated knowledge, thus empowering our healthcare professionals to deliver the best possible care to the community.

In conclusion, we would like to express our deepest gratitude to all those who contributed to the development and distribution of the General Practitioners' Guidelines Second Edition. The unwavering supports and collective efforts have made a significant impact on enhancing primary healthcare and family health care in Myanmar.

Once again, thank you for your outstanding dedication, resilience, and invaluable contributions. We look forward to our continued collaboration in advancing medical knowledge and improving healthcare outcomes for all.

Dr Khine Soe Win and Dr Win Zaw
General Practitioners' Society (Central)
Myanmar Medical Association

April, 2024

EDITORIAL

It is my privilege to inform you that our updated and revised edition of “**Guidelines for General Practitioners**” will be published very soon and it is my great pleasure to be the editor-in-chief of this guideline book. There are various reasons for revising and updating the previous edition.

This is the fact that some important topics, for example, malaria and family violence are missing in the first edition and some clinical practice guidelines like Diabetes Management have been changed during the interim period. Of course, this opportunity arises due to the emergence of COVID-19 in the world. As all you know, Medicine is an ever-changing science; we need to consider updating our guidelines at least five- yearly. Hence the time is up now!

Education is achieved by assimilating information from many resources and readers of this book can enhance their learning experience in terms of reflecting in their daily Family/General Practice. We all take immense pride in contributing good educational resource dedicated to Myanmar General Practitioners. The editors and authors anticipate that the readers will both enjoy and profit from their work in preparing this volume.

Happy studying and learning,

Dr Win Lwin Thein
Editor-in chief
Vice President (GP Society)
April, 2024

ACKNOWLEDGEMENT

We would like to thank all our talented and hard-working colleagues who have contributed to the ongoing development of the **Guidelines for General Practitioners**.

Especially, we would like to highlight the significance of the second edition which appears when the family medicine development process in Myanmar is being idle. Many factors are impeding the developing process lately, which has been accelerated previously by the commitment of the MOHS, the medical universities, and the General Practitioners' Society before the COVID-19 pandemic started.

No one can deny that the Myanmar health care system is lacking a strong and effective primary care task force. The best solution to mend this defect is retraining the thousands of general practitioners who are working individually across the country. Here comes the role of family medicine to train these GPs and primary care doctors to be able to use its principles effectively and, in turn, strengthen primary care.

Many GPs are using some family medicine principles consciously or unconsciously in varying degree of competency. Person-centered care, continuity of care, and family-oriented care became the culture of most practices for a long time. But only a few GPs can enjoy the most effective coordinated care and seamless continuity of care with secondary and tertiary care providers. The reasons behind this would be the absence of standardization in general practitioners' service quality and unawareness of the value of family medicine practitioners by other specialties and the public.

To resolve this ambiguity, primary care doctors should be involved in the retraining programs and thereafter CME/CPD and other life-long-learning programs which prescribe family medicine curricula.

We also acknowledge the effort of the contributors to make this new edition more family medicine-oriented, in addition to the Family Medicine chapter at the beginning of the book. We genuinely believe that the new edition will be a better reference for the GP/FP who wants to practice quality primary care and for future family medicine programs in Myanmar.

Finally, we would like to thank all academic writers who contributed to the General Practice Guidelines-first edition. Without their kind support, this second edition could never have happened.

Regards,

Dr. Tin Aye and Dr. Kyaw Thu

General Practitioners' Society (Central), MMA

April, 2024

LIST OF CONTRIBUTORS

1. *Aung Cho Myint, Prof*
2. *Aung Maw, Dr*
3. *Aye Aung, Prof*
4. *Aye Aye Than, Dr*
5. *Aye Aye Thein, Dr*
6. *Chit Soe, Prof*
7. *Hla Myat Nwe, Prof*
8. *Hla Myint Tun, Dr*
9. *Hlaing Mya Win, Prof*
10. *Hlaing Myint, Dr*
11. *Htay Win, Dr*
12. *Htin Aung Saw, Prof*
13. *Htun Lwin Nyein, Prof*
14. *Khin Hla Hla, Prof*
15. *Khin Hta Yi, Prof*
16. *Khin Mi Mi, Dr*
17. *Khin Ohnmar Khine, Prof*
18. *Khin Saw Than, Prof*
19. *Khine Khine Zaw, Prof*
20. *Khine Soe Win, Dr*
21. *Ko Ko, Prof*
22. *Kyaw Myint Naing, Prof*
23. *Kyaw Thu, Dr*
24. *Kyaw Zin Wai, Prof*
25. *Kyi Kyi Nyunt, Prof*
26. *Kyi Kyi Thinn, Prof*
27. *Kyin Htwe, Dr*
28. *Lin Htet, Dr*
29. *Lwin May Oo, Dr*
30. *Mar Mar Kyi, Prof*
31. *Maung Maung Sein, Prof*
32. *May Thandar Oo, Dr*
33. *Min Han, Prof*
34. *Min Yazar, Dr*
35. *Min Zaw Oo, Prof*
36. *Moe Naing, Dr*
37. *Moe Wint Aung, Prof*
38. *Mya Thae Han, Dr*
39. *Mya Win Hnit, Dr*
40. *Myint Thaug, Prof*
41. *Myo Khine, Dr*
42. *Myo Lwin Nyein, Prof*
43. *Myo Nyunt Aung, Dr*
44. *Myo Oo, Prof*
45. *Naing Oo, Prof*
46. *Nang Phyu Phyu Aung, Prof*
47. *Nwe Mar Tun, Prof*
48. *Nwe Nwe Aung, Dr*
49. *Nyein Moe Thaw, Dr*
50. *Phyu Phyu Khaing, Dr*
51. *Rai Mra, Prof*
52. *Samuel Kyaw Hla, Prof*
53. *Saw Win, Prof*
54. *Sein Way Lwin, Dr*
55. *Than Htike, Dr*
56. *Than Than Aung, A Prof*
57. *Than Than Aye, Prof*
58. *Thar Thar Oo, Dr*
59. *Thein Aung, Prof*
60. *Thein Myint, Prof*
61. *Thet Naing Maung, Dr*
62. *Thin Thin Nwe, Dr*
63. *Tin Aye, Dr*
64. *Tin Nyunt, Dr*
65. *Tin Tin Aye, Dr*
66. *Tin Tin Hla, Dr*
67. *Tint Tint Kyi, Prof*
68. *Vijay Kumar, Dr*
69. *Win Lwin Thein, Dr*
70. *Win Zaw, Dr*
71. *Yin Yin Soe, Prof*
72. *Yin Yin Zaw, Prof*
73. *Yu Yu Lwin, Dr*
74. *Zaw Lynn Aung, Prof*

SYMBOLS AND ABBREVIATIONS

AAA abdominal aortic aneurysm	COAD chronic obstructive airways disease
ABC airway, breathing, circulation	COC combined oral contraceptive
ABCD airway, breathing, circulation, dextrose	COCP combined oral contraceptive pill
ABO A, B and O blood groups	COPD chronic obstructive pulmonary disease
ACE angiotensin-converting enzyme	COX cyclooxygenase
ACEI angiotensin-converting enzyme inhibitor	CPA cardiopulmonary arrest
ACTH adrenocorticotrophic hormone	CPAP continuous positive airways pressure
ADHD attention deficit hyperactivity disorder	CPK creatine phosphokinase
ADT adult diphtheria vaccine	CPR cardiopulmonary resuscitation
AFP alpha-fetoprotein	CR controlled release
AI aortic incompetence	CREST calcinosis cutis; Raynaud's phenomenon; oesophageal involvement; sclerodactyly; telangiectasia
AIDS acquired immunodeficiency syndrome	CRF chronic renal failure
AHRA angiotensin II (2) reuptake antagonist	CR(K)F chronic renal (kidney) failure
AKF acute kidney failure	CRP C-reactive protein
ALE average life expectancy	CSF cerebrospinal fluid
ALL acute lymphocytic leukaemia	CT computerised tomography
ALP alkaline phosphatase	CTS carpal tunnel syndrome
ALT alanine aminotransferase	CVA cerebrovascular accident
AMI acute myocardial infarction	CVS cardiovascular system
AML acute myeloid leukaemia	CXR chest X-ray
ANA antinuclear antibody	DBP diastolic blood pressure
ANF antinuclear factor	DC direct current
AP anterior-posterior	DHA docosahexaenoic acid
APH ante-partum haemorrhage	DI diabetes insipidus
ASD atrial septal defect	DIC disseminated intravascular coagulation
ASIS anterior superior iliac spine	dL decilitre
ASOT antistreptolysin O titre	DMARDs disease modifying antirheumatic drugs
AST aspartate aminotransferase	DNA deoxyribose-nucleic acid
AV atrioventricular	DRABC defibrillation, resuscitation, airway, breathing, circulation
AZT azidothymidine	drug dosage bd—twice daily, tid/tds -three times daily, qid/qds -four times daily
BCC basal cell carcinoma	ds double strand
BCG bacille Calmette-Guérin	DS double strength
BMD bone mass density	DSM diagnostic and statistical manual (of mental disorders)
BMI body mass index	DU duodenal ulcer
BP blood pressure	DUB dysfunctional uterine bleeding
BPH benign prostatic hyperplasia	DVT deep venous thrombosis
Ca carcinoma	EBM Epstein-Barr mononucleosis (glandular fever)
CABG coronary artery bypass grafting	EBV Epstein-Barr virus
CAD coronary artery disease	ECG electrocardiogram
CAP community acquired pneumonia	ECT electroconvulsive therapy
CBT cognitive behaviour therapy	EDD expected due date
CCF congestive cardiac failure	EEG electroencephalogram
CCU coronary care unit	ELISA enzyme linked immunosorbent assay
CD4 T helper cell	ESRF end-stage renal failure
CD8 T suppressor cell	ESR(K)F end stage renal (kidney) failure
CDT combined diphtheria/tetanus vaccine	ERCP endoscopic retrograde cholangiopancreatography
CEA carcinoembryonic antigen	esp. especially
CFS chronic fatigue syndrome	ESR erythrocyte sedimentation rate
CHD coronary heart disease	FB foreign body
CHF chronic heart failure	FBE full blood count
CIN cervical intraepithelial neoplasia	
CK creatinine kinase	
CKD chronic kidney disease	
CKF chronic kidney failure	
CML chronic myeloid leukaemia	
CMV cytomegalovirus	
CNS central nervous system	

FEV1 forced expiratory volume in 1 second
fL femtolitre = (1e-15) litre
FSH follicle stimulating hormone
FUO fever of undetermined origin
FVC forced vital capacity
g gram
GA general anaesthetic
GABHS group A beta-haemolytic streptococcus
GBS Guillain-Barré syndrome
GFR glomerular filtration rate
GI glycaemic index
GIT gastrointestinal tract
GLP glucagon-like peptide
GnRH gonadotrophin-releasing hormone
GO gastro-oesophageal
GORD gastro-oesophageal refl ux
GP general practitioner
G-6-PD glucose-6-phosphate
GU gastric ulcer
HAV hepatitis A virus
anti-HAV hepatitis A antibody
Hb haemoglobin
HbA haemoglobin A
anti-HBc hepatitis B core antibody
HBeAg hepatitis B e antigen
anti-HBs hepatitis B surface antibody

HBsAg hepatitis B surface antigen
HBV hepatitis B virus
HCG human chorionic gonadotropin
HCV hepatitis C virus
anti-HCV hepatitis C virus antibody
HDL high-density lipoprotein
HEV hepatitis E virus
HFM hand, foot and mouth
HFV hepatitis F virus
HGV hepatitis G virus
HIV human immunodeficiency virus
HNPCC hereditary nonpolyposis colorectal cancer
HPV human papilloma virus
HRT hormone replacement therapy
HSV herpes simplex viral infection
IBS irritable bowel syndrome
ICE ice, compression, elevation
ICS inhaled corticosteroid
ICS intercondylar separation
ICT immunochromatographic test
IDDM insulin dependent diabetes mellitus
IDU injecting drug user
IgE immunoglobulin E
IgG immunoglobulin G
IgM immunoglobulin M
IHD ischaemic heart disease
IM, IMI intramuscular injection
inc. including
IPPV intermittent positive pressure variation
IR internal rotation
ITP idiopathic (or immune) thrombocytopenia
 purpura
IUCD intrauterine contraceptive device
IUGR intrauterine growth retardation

IV intravenous
IVI intravenous injection
IVP intravenous pyelogram
IVU intravenous urogram
JCA juvenile chronic arthritis
JVP jugular venous pulse
KA keratoacanthoma
kg kilogram
KOH potassium hydroxide
LA local anaesthetic
LABA long acting beta agonist
LBBB left branch bundle block
LBO large bowel obstruction
LBP low back pain
LDH/LH lactic dehydrogenase
LDL low-density lipoprotein
LFTs liver function tests
LH luteinising hormone
LHRH luteinising hormone releasing hormone
LIF left iliac fossa
LMN lower motor neurone
LNG levonorgestrel
LRTI lower respiratory tract infection
LSD lysergic acid
LUQ left upper quadrant
LUTS lower urinary tract symptoms
LV left ventricular
LVH left ventricular hypertrophy
mane in morning
MAOI monoamine oxidase inhibitor
mcg microgram (also µg)
MCV mean corpuscular volume
MDI metered dose inhaler
MDR multi-drug resistant TB
MI myocardial infarction
MRCP magnetic resonance cholangiography
MRI magnetic resonance imaging
MS multiple sclerosis
MSM men who have sex with men
MSU midstream urine
N normal
NAD no abnormality detected
NGU non-gonococcal urethritis
NHL non-Hodgkin's lymphoma
NIDDM non-insulin dependent diabetes mellitus
nocte at night
NSAIDs non-steroidal anti-inflammatory drugs
NSU non-specific urethritis
(o) taken orally
OA osteoarthritis
OCP oral contraceptive pill
OGTT oral glucose tolerance test
OSA obstructive sleep apnoea
OTC over the counter
PA posterior–anterior
PAN polyarteritis nodosa
Pap Papanicolaou
pc after meals
PCA percutaneous continuous analgesia
PCB post coital bleeding

PCL posterior cruciate ligament
PCOS polycystic ovarian syndrome
PCP pneumocystis carinii pneumonia
PCR polymerase chain reaction
PCV packed cell volume
PDA patent ductus arteriosus
PEF peak expiratory flow
PEFR peak expiratory flow rate
PET pre-eclamptic toxemia
PFT pulmonary function test
PH past history
PID pelvic inflammatory disease
PLISSIT permission: limited information: specific suggestion: intensive therapy
PMS premenstrual syndrome
PMT premenstrual tension
POP plaster of Paris
POP progestogen-only pill
PPI proton-pump inhibitor
PPROM preterm premature rupture of membranes
PR per rectum
prn as and when needed
PROM premature rupture of membranes
PSA prostate specific antigen
PSIS posterior superior iliac spine
PSVT paroxysmal supraventricular tachycardia
PT prothrombin time
PTC percutaneous transhepatic cholangiography
PU peptic ulcer
PUO pyrexia of undetermined origin
pv per vagina
qds, qid four times daily
RA rheumatoid arthritis
RBBB right branch bundle block
RBC red blood cell
RCT randomised controlled trial
RF rheumatic fever
Rh rhesus
RIB rest in bed
RICE rest, ice, compression, elevation
RIF right iliac fossa
RPR rapid plasma reagin
RR relative risk
RSV respiratory syncytial virus
RT reverse transcriptase
rtPA recombinant tissue plasminogen activator
SAH subarachnoid haemorrhage
SARS severe acute respiratory distress syndrome
SBE subacute bacterial endocarditis
SBO small bowel obstruction
SBP systolic blood pressure
SC/SCI subcutaneous/subcutaneous injection
SCC squamous cell carcinoma
SCG sodium cromoglycate
SIADH syndrome of secretion of inappropriate antidiuretic hormone
SIDS sudden infant death syndrome
SIJ sacroiliac joint
SL sublingual
SLE systemic lupus erythematosus
SLR straight leg raising
SND sensorineural deafness
SNHL sensorineural hearing loss
SNRI serotonin noradrenaline reuptake inhibitor
SOB shortness of breath
sp species
SR sustained release
SSRI selective serotonin reuptake inhibitor
SSS sick sinus syndrome
stat at once
STI sexually transmitted infection
SVC superior vena cava
SVT supraventricular tachycardia
T3 tri-iodothyronine
T4 thyroxine
TB tuberculosis
tds, tid three times daily
TENS transcutaneous electrical nerve stimulation
TFTs thyroid function tests
TG triglyceride
TIA transient ischaemic attack
TIBC total iron binding capacity
TM tympanic membrane
TMJ temporomandibular joint
TNF tissue necrosis factor
TOF tracheo-oesophageal fistula
TORCH toxoplasmosis, rubella, cytomegalovirus, herpes virus
TPHA Treponema pallidum haemagglutination test
TSE testicular self-examination
TSH thyroid-stimulating hormone
TT thrombin time
TV tidal volume
U units
UC ulcerative colitis
U & E urea and electrolytes
µg microgram
UMN upper motor neurone
URTI upper respiratory tract infection
US ultrasound
UTI urinary tract infection
U ultraviolet
VC vital capacity
VDRL Venereal Disease Reference Laboratory
VF ventricular fibrillation
VMA vanillyl mandelic acid
VSD ventricular septal defect
VT ventricular tachycardia
VUR vesico-ureteric reflux
VWD von Willebrand's disease
WBC white blood cells
WCC white cell count
WHO World Health Organization
WPW Wolff-Parkinson-White
XL sex linked

Printing memo page	1
Foreword	3
Preface	5
Editorial	7
Acknowledgement	9
List of contributors	11
Symbols and abbreviations	13
Content	17

Chapter (12)

747-786

Care of Older Adult

747

- Care of Older Adult 749
- Functional Assessment of an Older Adult 751
- Illness in Older People 753
- Management of Common Geriatric Problem
 - a. Dementia 758
 - b. Depression 764
 - c. Delirium 765
 - d. Falls and Gait Disorders 766
 - e. Urinary incontinence 769
 - f. Undernutrition & Frailty 771
 - g. Pressure ulcers 772
 - h. Pharmacotherapy and Polypharmacy 774
 - i. Vision impairment 775
 - j. Hearing impairment 775
 - k. Elderly Mistreatment & Self Neglect 775
- Chronic Disease Management 777
- Prescribing in Older People 779
- Geriatric Rehabilitation and Pain Management in Elderly 783

CHAPTER (12) CARE OF OLDER ADULT

Care of Older Adult

Functional Assessment of an Older Adult

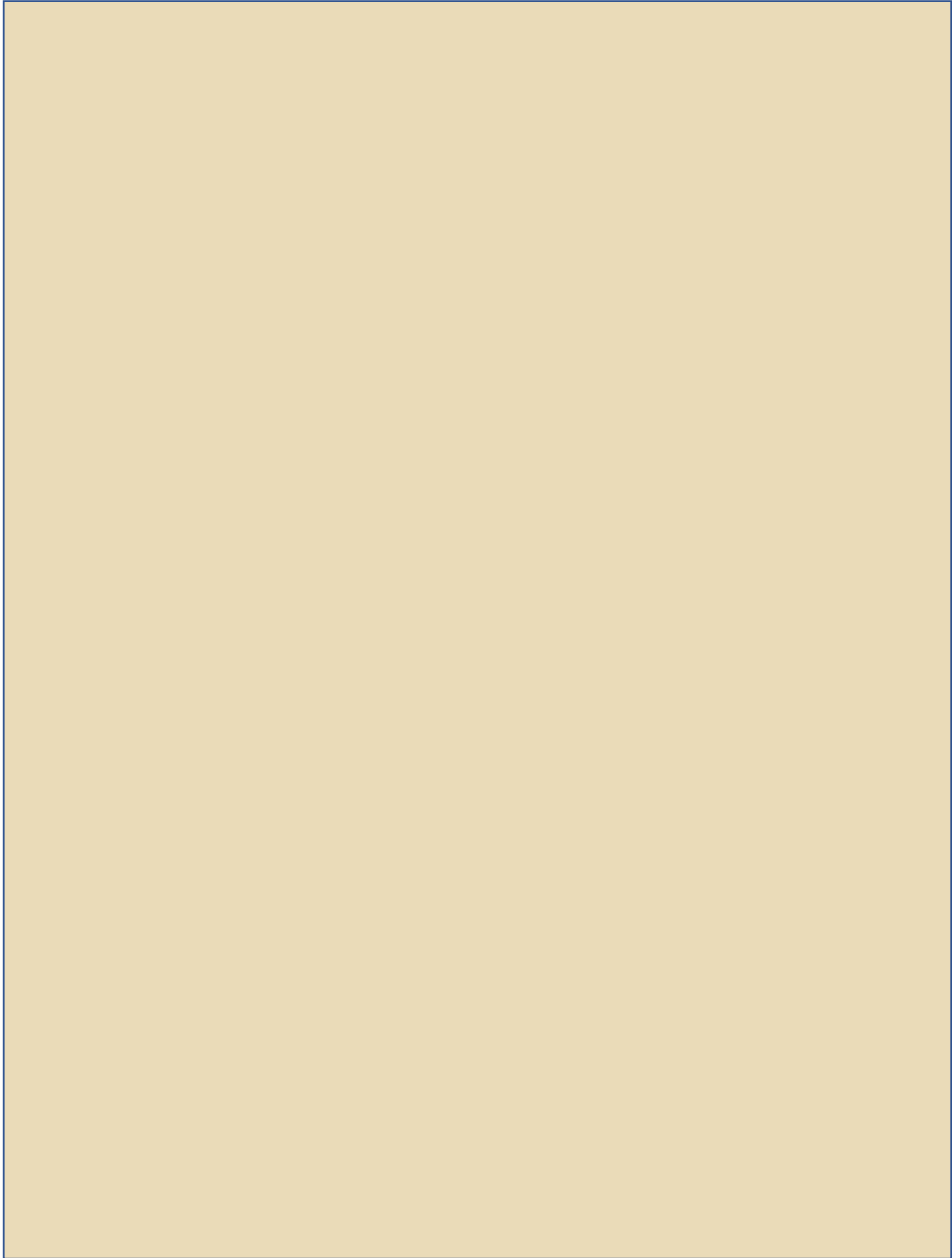
Illness in Older People

Management of Common Geriatric Problem

Chronic Disease Management

Prescribing in Older People

Geriatric Rehabilitation and Pain Management in Elderly



CARE OF OLDER ADULT

General Principle of Geriatric Care

- The following principles help in caring for older adult.
 - Many disorders are multifactorial in origin and are best managed by multifactorial interventions.
 - Diseases often present atypically.
 - Not all abnormalities require evaluation and treatment.
 - Complex medication regimens, adherence problems, and polypharmacy are common challenges.

Assessment of the older adult

- Comprehensive assessment address three topics in addition to conventional assessment of symptoms and diseases: prognosis, values, and preferences, and ability to function independently. Comprehensive assessment is warranted before major clinical decisions (e.g., whether major surgery should be performed, or whether a patient should be admitted to hospital)
 - Assessment of prognosis
 - Assessment of Values and Preferences
 - Assessment of Function

Assessment of prognosis

- When an older patient's clinical situation is dominated by a single disease process (e. g. , lung cancer metastasis to brain) prognosis can be estimated well with a disease specific instrument.
- When an older patient's clinical situation is not dominated by a single disease process prognosis can be estimated initially by considering the patient's age, sex and general health.
- The prognosis of older persons living at home can be estimated by considering age, sex, comorbid conditions and function.

Assessment of Values and Preferences

- Although patients vary in their values and preferences, most frail older patients prioritize maintain their independence over prolonging survival or relieving pain or other symptoms, Values and preferences can be assessed most readily in the context of a specific medical decision. For example, the clinician might ask a patient considering hip replacement, "How would like your hip pain and function to be different? Tell me about the risk and discomfort you are willing to go through to achieve that improvement."

Assessment of Function

- People often lose function in multiple domains as they age, with the results that they may not be able to do some activities as quickly or capably and may need assistance with other activities.
- About one-fourth of patients over 65 have impairments in their IADLs (instrumental activities of daily living) or ADLs (basic activities of daily living)

- In general persons who need help only with IADLs can usually live independently with minimal supports, such as financial services or a chore worker. If institutional care is needed, residential care, board-and-care or assisted living is usually sufficient. While many persons who need help with ADLs may require a nursing home level of care, most live at home with care givers and other community services (day care).

Caregiver issues

- Most elders with functional impairment live in the community with help of an "informal" caregiver, most commonly a spouse or daughter. An older patient's need for nursing home placement is predicted better by the caregiver's ability and stress than the severity of the patient's illness.

Functional Screening Instrument

- Functional screening should include assessment of ADL and IADL and questions to detect weight loss, falls, incontinence, depressed mood, self-neglect, fear for personal safety, and common serious impairments (e.g., hearing, vision, cognition and mobility).

FUNCTIONAL ASSESSMENT OF AN OLDER ADULT

NORMAL AGEING

What is ageing?

- Ageing is a gradual series of changes over time that lead to the loss of function of organs and cells, with the eventual outcome of death. Individuals vary greatly in the rate at which they age. Several factors seem to influence this:
 - Genetic make-up
 - Psychological health
 - Socio-economic factors
 - Environment
 - Lifestyle-diet, physical exercise, smoking

NORMAL CHANGES OF AGEING

System	Clinical/functional effects
<i>Cardiovascular</i>	<ul style="list-style-type: none"> • Cardiac enlargement/left ventricular hypertrophy • Decreased cardiac output -7 decreased exercise capacity • Decreased response of heart rate to exercise • Systolic hypertension • Left ventricular failure
<i>Respiratory</i>	<ul style="list-style-type: none"> • Decreased FEV1/FVC and increased residual volume • Increased susceptibility to infection • Increased susceptibility to aspiration
<i>Endocrine</i>	<ul style="list-style-type: none"> • Decreased insulin sensitivity -7 impaired glucose regulation • Decreased thyroid hormone production
<i>Gastrointestinal</i>	<ul style="list-style-type: none"> • Increased in gastric acid production • Constipation
<i>Genito-urinary</i>	<ul style="list-style-type: none"> • Decreased glomerular filtration rate not reflected by increased creatinine • Benign enlargement of the prostate (25-50% of men >65 yr) -7 prostatism • Slowing of sexual function; erectile dysfunction • Dry vagina and increase susceptibility to urinary infections (♀)
<i>Musculoskeletal</i>	<ul style="list-style-type: none"> • Sarcopenia-decreased muscle strength/power, • Decreased lean body mass (30-40%), increase fat body mass • Decreased mobility • Increased likelihood of falls • Increased osteoporosis /susceptibility to fractures
<i>Nervous</i>	<ul style="list-style-type: none"> • Slower thought processes/reaction times • General decline in performance • Dementia is not a normal change of ageing

<i>Vision</i>	<ul style="list-style-type: none"> • Presbyopia (difficulty focusing on near objects); decrease visual acuity; cataract; impaired dark adaptation
<i>Hearing</i>	<ul style="list-style-type: none"> • High frequency hearing loss/presbycusis-deafness affects 80% of 80 years old • Degenerative changes in the inner ear -7 impairment of balance causing
<i>Immune</i>	<ul style="list-style-type: none"> • Atrophy of the thymus • Reduced immune function resulting in increased infectious disease, reactivation of latent disease (e.g., TB, shingles), increased cancer, and increased autoimmune disease
<i>Skin/hair</i>	<ul style="list-style-type: none"> • Dry skin, wrinkles, tendency to bruise easily, and slower healing • Greying of the hair decreased sweating, heat generation, and heat conservation → heat stroke; • hypothermia decreased sensitivity to touch, pain, and temperature discrimination → burns, pressure sores

- **Primary** ageing-usually due to interactions between genetic (intrinsic 'nature' and environmental (extrinsic, nurture)
- **Secondary ageing** -Adaptation to changes of primary ageing. These are commonly behavioral)

ILLNESS IN OLDER PEOPLE

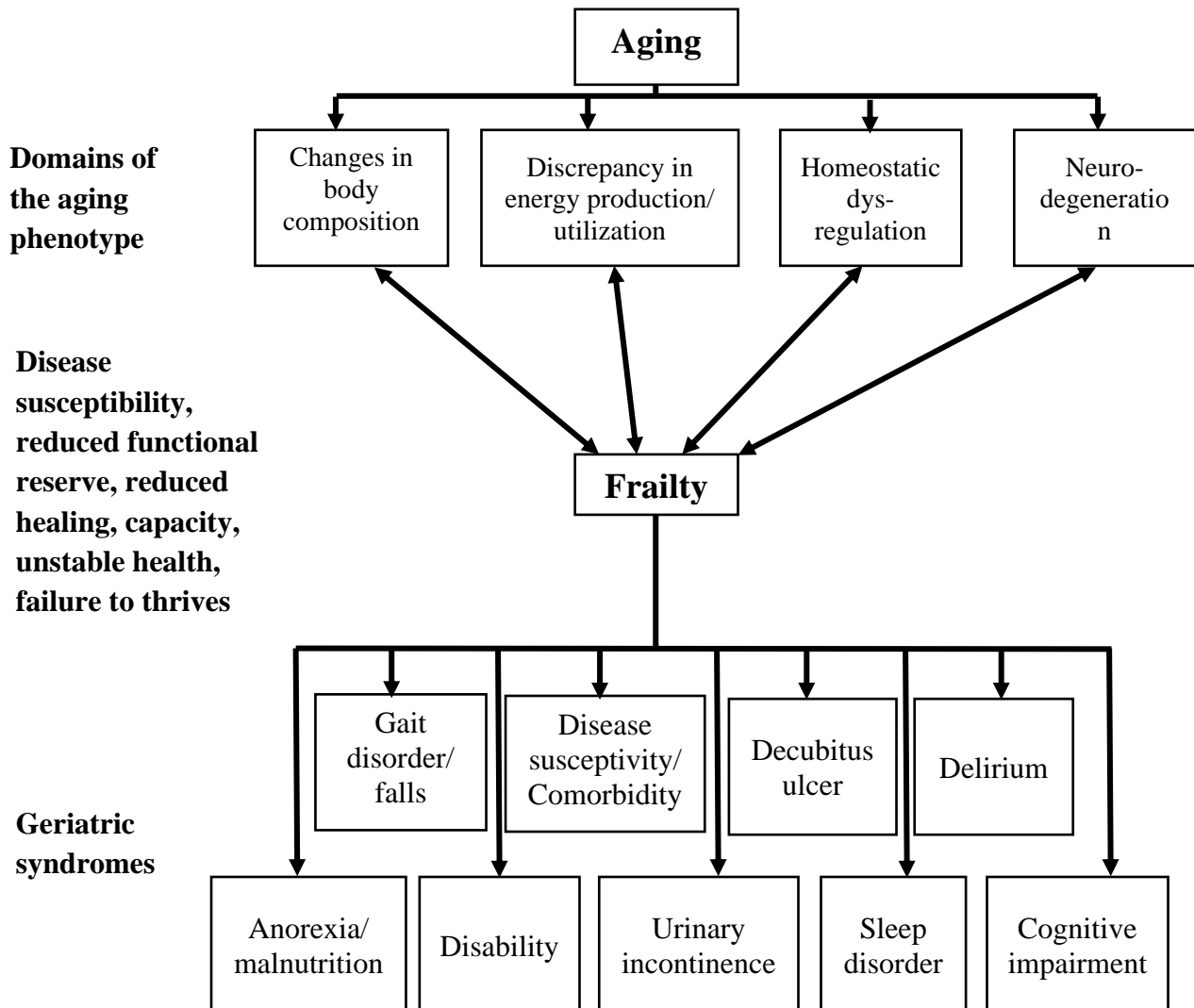
FEATURES OF ILLNESS IN OLDER PEOPLE

Table 1. Examples of assessment of the four domains of the aging phenotype

Approach to assessment	Body Composition	Energetics	Homeostatic Regulation	Neurodegeneration
Self-report		Self-reported questionnaires investigating physical activity, sense of fatigue/exhaustion, exercise tolerance		
Physical examination	Muscle strength testing (isometric and isokinetic) Anthropometrics (weight, height, DMI, waist circumference, arm and leg circumference, skin folds)	Performance-based tests of physical function		Objective assessment of gait balance, reaction time, coordination Standard neurologic examination including assessment of global cognition*
Laboratory value	Biomarkers (24 h creatinuria or 3-methyl histidine)		Nutritional biomarker (e.g., vitamin, anti-oxidants) Baseline level of biomarkers and hormone level Inflammatory marker (e.g., ESR, CRP, IL-6, INF- α)	
Imaging	CT and MRI DEXA	Magnetic resonance spectroscopy		MRI, fMRI, PET, and other dynamic imaging techniques
Others	Hydrostatic weighing	Resting metabolic rate, Treadmill testing of oxygen consumption during walking, Objective measures of physical activities, accelerometer, double-labeled water	Stress response Response to provocative test, such as oral glucose tolerance test, dexamethasone test and others	Evoked potentials Electroneurography and Electromyography

- Mini-Mental State Montreal Cognitive Assessment

- CRP = C-reactive Protein, DEXA = dual energy x-ray absorptiometry, fMRI = functional MRI, IL-6 = Interleukin-6, PET = position emission tomography, TNF- α = tumour necrosis factor- α



- Figure: A unifying model of aging, frailty, and the geriatric syndrome

Illness in older people

- Features of illness in older people
- Present atypically and non-specifically
- Cause greater morbidity and mortality
- May progress much more rapidly
- Health, social, and financial sequelae
- Co-pathology is common
- Lack of physiological reserve
- Difficulties assessing the elderly
- Communication problems-hearing, cognition, speech
- Multiplicity of cause-one symptom may be caused by different, concurrent processes, e.g., breathlessness as a result of COPD + heart failure
- Non-specific symptoms/signs-confusion, falls, or 'off legs' may be the only overt sign of underlying disease, e.g., UTI, MI, stroke
- Symptoms may be absent despite disease, and signs harder to elicit

- Poly-pharmacy may result in side effects and interactions
- Laboratory tests may be unreliable-especially white cell counts and ESR (always check CRP)
- Disease
- The ageing process is compounded by overt disease. This may affect functional capacity, quality of life and independence, cause frailty, decrease well-being and independence, and result in increased care and mobility needs.
- Multiple Morbidity
- Older people are more likely to have several ongoing chronic illnesses that can act in combination to cause disability greater than either illness alone and/or result in:
 - Direction of care at some problems with relative neglect of others
 - Poly-pharmacy
 - Involvement of multiple specialist teams which can cause inconvenience to the patient and family, and result in conflicting advice, and opposing opinions on cause/effect of symptoms
- Frailty
- Many elderly people are described as being 'frail'. This term is used to describe individuals who are physically weak and fragile. It can occur on a background of natural ageing or be precipitated by a disease process. It is not a disease or disability in itself, but a vulnerability or inability to withstand physical/psychological stressors. Common features of frailty include:
 - Unintentional weight loss (>5 kg in a year)
 - Feeling of exhaustion
 - Weakness-measured by grip strength
 - Slow walking speed
 - Low levels of physical activity

Clinical assessment of older people

- The geriatric assessment is a multidimensional, multidisciplinary assessment designed to evaluate an older person's functional ability, physical health, cognition and mental health, and socio environmental circumstances. It is usually initiated when the physician identifies a potential problem. Specific elements of physical health that are evaluated include nutrition, vision, hearing, faecal and urinary continence, and balance.
- Clinical assessment of older people
 - General physical examination
 - Assess gait in an older person
- Common patterns
 - **Leaning back** -common with pseudo-Parkinson's
 - **Leaning forward and grabbing furniture** – common in patients with multiple falls and loss of confidence
 - **Veering to one side** - consider stroke or balance problem
 - **Limping /antalgic** - consider hip or knee or foot problem
 - **Unsteady on turning** – Consider ENT pathology
 - **Difficulty setting off** -consider Parkinson's
 - **Wide based** –Consider cerebellar, subcortical disease and normal pressure hydrocephalus

- **Freezing/halting** - consider anxiety and feeling of falling, Parkinson's disease or frontal brain lesions
- **Foot drop**
- **Difficult rising from chair** - consider proximal muscle weakness

Functional assessment of Older Adult

- Functional assessment gauges a patient's ability to manage tasks of self-care, household management, and mobility. This can be assessed by the ADL and IADL scores activities of daily living (ADL) and instrumental activities of daily living (IADL).
- ADL are self-care activities that a person performs daily (e.g., eating, dressing, bathing, transferring between the bed and a chair, using the toilet, controlling bladder and bowel functions).
- IADL are activities that are needed to live independently (e.g., doing housework, preparing meals, taking medications properly, managing finances, using a telephone).
- Physicians can acquire useful functional information by simply observing older patients as they complete simple tasks, such as unbuttoning and buttoning a shirt, picking up a pen and writing a sentence, taking off and putting on shoes, and climbing up and down from an examination table.
- Deficits in ADL and IADL can signal the need for more in-depth evaluation of the patient's socio-environmental circumstances and the need for additional assistance.
- Loss of IADL predicts mild cognitive impairment from normal cognitive function
- Shopping
- Balancing check book
- To assess cognitive dysfunction Mini-Cognitive assessment instrument is the preferred test.
- Mini-Cog
- Name 3 items to remember
- Clock drawing test: 11:10
- Recall 3 items to remember
- 3 items correct- normal
- 3 items wrong- dementia
- 1 or 2 items recalled correctly: ○ If clock is normal- normal
- If clock is abnormal- dementia

Mini-Cognitive Assessment Instrument

- Step 1. Ask the patient to repeat three unrelated words, such as "ball", "dog", and "window".
- Step 2. Ask the patient to draw a simple clock set to 10 minutes after eleven o'clock (11:10). A correct response is drawing of a circle with the numbers placed in approximately the correct positions, with the hands pointing to the 11 and 2.
- Step 3. Ask the patient to recall the three words from Step 1. One point is given for each item that is recalled correctly.

- Interpretation

<i>Number of items correctly recalled</i>	<i>Clock drawing test result</i>	<i>Interpretation of screening for dementia</i>
0	<i>Normal</i>	<i>Positive</i>
0	<i>Abnormal</i>	<i>Positive</i>
1	<i>Normal</i>	<i>Negative</i>
1	<i>Abnormal</i>	<i>Positive</i>
2	<i>Normal</i>	<i>Negative</i>
2	<i>Abnormal</i>	<i>Positive</i>
3	<i>Normal</i>	<i>Negative</i>
3	<i>Abnormal</i>	<i>Negative</i>

- Adapted with permission from Ebel! MH Brief screening instruments for dementia in primary care. Am FamPhysicia

Investigations

- Simple investigations
- Full blood count, ESR
- Urea, creatinine, and electrolytes
- Glucose
- Liver function tests
- Calcium and phosphate
- CRP
- Thyroid function tests
- CXR
- ECG
- Urinalysis
- Different reference range in older patients
- ESR may be as high as 30mm/hr for men and 35 mm/hr for women
- Haemoglobin reference range should probably
- Abnormal result but common and rarely imply important new disease
- Thyroid stimulating hormone (TSH)
- Low blood sodium
- Alkaline phosphatase
- Normochromic normocytic anaemia
- Bacteriuria
- High creatinine/low estimated glomerular filtration rate
- False negative results
- Creatinine -low muscle mass can mask poor renal function
- Urea - as creatinine

Reference

- Oxford handbook of General Practice, 4th Edition

MANAGEMENT OF COMMON GERIATRIC PROBLEMS

- **Dementia**
- **Depression**
- **Delirium**
- **Immobility**
- **Falls and Gait Disorders**
- **Urinary incontinence**
- **Undernutrition & Frailty**
- **Pressure ulcers**
- **Pharmacotherapy and Polypharmacy**
- **Vision impairment**
- **Hearing impairment**
- **Elderly Mistreatment & Self Neglect**

DEMENTIA

Essentials of Diagnosis

- Progressive decline of intellectual function.
- Loss of short-term memory and at least one other cognitive deficit
- Deficit severe enough to cause impairment of function.
- Not delirious.
- Not due to delirium or psychiatric disease
- Age is the main risk factor, followed by family history and vascular disease risk factors.

General Considerations

- Dementia is an acquired persistent and progressive impairment in intellectual function, with compromise of memory and at least one other cognitive domain, most commonly
 - **aphasia** (typically, word finding difficulty),
 - **apraxia**(inability to perform motor tasks, such as cutting a loaf of bread, despite intact motor function)
 - **agnosia** (inability to recognize objects)
 - **and impaired executive function** (poor abstraction, mental flexibility, planning and judgment).
- The diagnosis of dementia requires a significant decline in function that is severe enough to interfere with work or social life.

Causes are:

- Alzheimer's disease
- Vascular dementia
- Dementia with Lewy Bodies and
- Fronto-temporal dementia
- Some of the risk factors for Alzheimer disease are older age, family history, lower education level, and female sex. Risk factors for vascular dementia are those for stroke, i.e., older age, hypertension, cigarette use, atrial fibrillation, diabetes mellitus and hyperlipidaemia. Depression and delirium are also common in elders, may coexist with dementia. Depression is a common concomitant of early dementia.

Clinical findings

- Screening
- Cognitive impairment
 - Although there is no consensus at present on whether older patients should be screened for dementia, the benefits of early detection include early identification of potentially reversible causes, planning for the future (including discussing values and completing advance care directives), and providing support and counseling for the caregiver.
 - The combination of a clock drawing task with three-item word recall ("mini-cog") is a simple screening test that is fairly quick to administer. Scores are classified as normal, almost normal and abnormal. When patient is able to draw a clock normally and can remember all 3 objects, dementia is unlikely.
- Decision-making capacity—
- While no single test of capacity exists, the following five elements should be considered in a thorough assessment;
- ability to express a choice.
- understanding relevant information about the risk and benefits of planned therapy and the alternatives, in the context of one value, including no treatment.
- comprehension of problem and its consequences
- ability to reason; and
- consistency.
- Sensitivity must be used in applying these five components to people of various cultural backgrounds.

Symptoms and Signs

- The clinician can gather important information about the type of dementia that may be present by asking about the:
- the rate of progression of the deficits as well as their nature (including any personality or behavioral changes.
- the presence of other neurologic symptoms, particularly motor symptoms.
- risk factors for HIV;
- family history of dementia; and
- medications, with particular attention to recent changes

- Work-up is directed at identifying any potentially reversible cause of dementia.
- Symptoms depend on area of the brain affected **short- term memory loss**
 - **Word-finding difficulty**
 - **Visuospatial dysfunction**
 - **Executive dysfunction**
 - **Apathy or Apraxia**

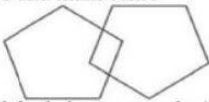
Physical examination

- The neurologic examination emphasizes assessment of mental status but should also include evaluation for sensory deficits, possible previous strokes, parkinsonism or peripheral neuropathy.

Neuropsychological assessment

- The FOLSTEIN Mini Mental State Exam is commonly used and can be administered in approximately 5 minutes.
- **MINI-MENTAL STATE EXAMINATION**

MINI MENTAL STATE EXAMINATION (MMSE)

<p>MINI MENTAL STATE EXAM</p> <p>Please name the: Year? Season? Date? Day of Week? Month?</p> <p style="text-align: right;">Orientation to time /5</p> <p>Where are we? State? City? Suburb? Hospital? Floor/Ward?</p> <p style="text-align: right;">Orientation to place /5</p> <p>"I am now going to test your memory" Name 3 objects. Ask them to repeat all 3. 1 Point for each object remembered. Repeat until learnt all 3 so that recall can be tested.</p> <p style="text-align: right;">Registration /3 # of trials</p> <p>Serial 7s "please count backwards from 100 in sevens" 93, 86, 79, 72, 65 <i>alternatively</i> Spell WORLD backwards D L R O W</p> <p style="text-align: right;">Attention and Calculation /5</p>	<p>"Please repeat the 3 objects I asked you to remember" Recall /3</p> <p>"Please name these objects" Point to a wristwatch and a pencil Naming /2</p> <p>"Please repeat the following phrase" "No ifs, ands or buts" Repetition /1</p> <p>"Please follow this command" "Take this paper in your right hand, fold it in half and place it in your lap" Complex command /3</p> <p>Please read and obey the following command CLOSE YOUR EYES</p> <p>"Please write a sentence" Must have a noun, verb and make sense</p> <p>"Please copy the following drawing"  1 point each for the last 3 commands /3</p> <p>24-30-normal range 18-23-moderate cognitive impairment 0-17 -marked cognitive impairment</p> <p style="text-align: right;">TOTAL /30</p>
---	---

<https://disinherited.com/wp-content/uploads/2018/04/Mental-capacity-exam.jpg>

Interpretation of MMSE scores

- Mini-Mental State Examination (MMSE): good sensitivity but only fair specificity in detecting cognitive impairment and dementia
- 27-30: Normal cognitive, no dementia
- 24-26: Possible cognitive impairment
- 19-23: Mild dementia
- 10-18: Moderate dementia
- 0-9: Severe dementia

- *Note:* In clinical trials, the MMSE for inclusion of mild-to-moderate AD is 14 to 26.

Diagnostic criteria for dementia (DSM-V)

Memory impairment: impaired ability to learn new information or to recall old information
One or more of the following: <i>aphasia</i> (language disturbance) <i>apraxia</i> (impaired ability to carry out motor activities despite intact motor function) <i>disturbance in executive functioning</i> (impaired ability to plan, organize, sequence, abstract)
The cognitive deficits results in functional impairment (social/occupational)
The cognitive deficits do not occur exclusively solely during a delirium
NOT due to other medical or psychiatric conditions

Investigations in dementia

- Full blood count
- Urea and electrolytes
- Glucose
- Liver function tests
- Calcium
- Erythrocyte sedimentation rate (ESR) or plasma viscosity
- Vitamin B12 and folate
- Thyroid function tests
- Laboratory findings
- Laboratory studies include a- serum level of B12, Free T4 and thyroid-stimulating hormone, complete blood count, serum Electrolyte Blood glucose, calcium and creatinine HIV testing.
- Most patients should receive neuroimaging as part of the diagnostic work-up to rule out subdural haematoma, tumor, previous stroke, and hydrocephalus. In older patients with a more classic picture of Alzheimer disease in whom neuroimaging is desired, a non-contrast CT scan is sufficient.

Types of dementia

- Alzheimer's disease (AD)
- Vascular dementia (subtypes: acute onset, multi-infarct, subcortical)
- Dementia with Lewy bodies (DLB)
- Pronto-temporal dementia syndromes (e.g., Pick's disease)
- Other dementias
 - e.g., metabolic 'dementias' like vitamin B12 and thyroid deficiency, Creutzfeldt-Jakob disease, Huntington's disease, Parkinson's disease, AIDS-related dementia

Reversible causes of dementia

- Approximately 13% of cases. The commonest causes of reversible or partially reversible dementia are:
- Drugs

- Depression
- Metabolic: Thyroid disease, vitamin B12 deficiency, Calcium disturbance,
- Liver diseases
- Normal pressure hydrocephalus
- Subdural hematoma
- Neoplasm
- Differential Diagnosis
 - **Mild cognitive impairment**
 - **Delirium**
 - **Many medications** – have been associated with delirium and other types of cognitive impairment in older patients.

Treatment

- Patients and families should be made aware of the Alzheimer's Association as well as the wealth of helpful community.
- Collaborative care models and disease management programs appear to improve the quality of care for patients with dementia.

Cognitive Impairment

- Because demented patients have greatly diminished cognitive reserve, they are a high risk for experiencing acute cognitive or functional decline in the setting of new medical illness.
- Consequently, fragile cognitive status may be best maintained by ensuring that comorbid diseases such as congestive heart failure and infections are detected and treated.

Acetylcholinesterase inhibitors

- Many experts recommend considering a trial of acetylcholine esterase inhibitors (eg. Donepezil, galantamine, rivastigmine) in most patients with mild to moderate Alzheimer disease.
- Starting doses, respectively, of donepezil, galantamine, and rivastigmine, are 5 mg orally once daily (maximum 10 mg once daily), 4 mg orally twice daily (maximum 12 mg twice daily) and 1.5 mg orally twice daily (maximum 6 mg twice daily)
- The doses are increased gradually as tolerated.
- The most bother side effects include diarrhea, nausea, anorexia, weight loss, and syncope.
- In those patients who have had no apparent benefit, experience side effects, or for whom the financial outlay is a burden, the drug should be discontinued.

Memantine –

- In clinical trials, patients with more advanced disease have been shown to have statistical benefit from the use of memantine, an *N-methyl-D-aspartate (NMDA)* antagonist, with or without concomitant use of an acetylcholinesterase inhibitor. Long-term and meaningful functional outcomes have yet to be demonstrated.

Behavioral Problems

- Nonpharmacologic
- Behavioral problems in demented patients are often best managed with a nonpharmacologic approach.

- Initially, it should be established that the problems is not unrecognized delirium, pain, urinary obstruction, or fecal impaction.
- Aerobic exercise (45 minutes most days of the week) and frequent mental stimulation may reduce the rate of functional decline and decrease the demented patient's caregiving needs and these interventions may reduce the risk of dementia in normal individual.

Pharmacologic approaches –

- There is no clear consensus about pharmacological approaches to behavioral problems in patients who have not benefited from nonpharmacological therapies.
- The target symptoms –depression, anxiety, psychosis, mood lability, or pain – may suggest which class of medications might be most helpful in a given patient.
- Patients with Lewy bodies have shown clinically significant improvement in behavioral symptoms when treated with rivastigmine (3- 6 mg orally twice daily)
- For those with Alzheimer disease and agitation, no agents have demonstrated consistent efficacy.
- Despite the lack of strong evidence, antipsychotic medications have remained a mainstay for the treatment of behavioral disturbances.
- The newer atypical antipsychotic agents (risperidone, olanzapine, quetiapine clozapine, ziprasidone) are reported to be better tolerated than older agents but should be avoided in patients with vascular risk factors due to an increased risk of stroke, they can cause weight gain and are also associated with hyperglycaemia in diabetic patient.
- Starting and target dosages should be much lower than those used in schizophrenia (e.g., haloperidol, 0. 5-2 mg orally, risperidone, 0. 25-2mg orally).

Driving

- Experts agree that patients with very moderately severe or more advanced dementia should be counseled to stop driving.
- Caregivers of patients with at least a 30% decline in their IADLs score unable to drive safely than other.

Advance Financial Planning

- Difficulty in managing financial affairs often develop in early in the course of dementia.
- The patient's caregiver may seek advice from the patient's primary care clinician.
- No gold standard test is available to identify when a patient with dementia no longer has financial capacity.
- Patients with dementia are also at increased risk for becoming victims of financial abuse.
- When financial abuse is suspected, clinicians should be aware of the reporting requirements in their local jurisdictions.

Prognosis

- Life expectancy after a diagnosis of Alzheimer disease is typically 3- 15 years; it may be shorter than previous reported.
- Other neurodegenerative dementias, such as dementia with Lewy bodies, show more rapid decline.

When to Refer

- Referral for neuropsychological testing may be helpful in the following circumstances; to distinguish dementia from depression, to diagnose dementia in persons of very poor education or very high premorbid intellect, and to aid diagnosis when impairment is mild.

DEPRESSION

Essentials of Diagnosis

- Depressed elders may not admit to depressed mood
- Depression screening in elders should include a question about anhedonia.

General considerations

- Geriatric patients with depression are more likely to have somatic complaints, less likely to report depressed mood and more likely to experience delusions than younger patients.

Clinical Findings

- A simple two-question screen----- which consists of asking
- ‘During the past 2 weeks, have you felt down, depressed or hopeless?’ and
- “During the past 2 weeks, have you felt little interest or pleasure in doing things?” --- is highly sensitive for detecting major depression in persons over age 65.
- Positive responses can be followed up with more comprehensive, structured interviews, such as the Geriatric Depression Scale or the PHQ-9.
- Elderly patients with depressive symptoms should be questioned about medication use, since many drugs (e.g., Benzodiazepines, corticosteroids) contribute to the clinical picture.
- Similarly, several medical problems can cause fatigue, lethargy, or hypoactive delirium, all of which may be mistaken for depression.

Treatment

- Choice of antidepressant agent in elders is usually based on side effect profile and cost.
- Citalopram and sertraline are often used as first-line agents because of their low side-effect profiles.
- In general, fluoxetine is avoided because of its long duration of action and tricyclic antidepressants are avoided because of their high cholinergic side effects. Mirtazapine is often used for patient with weight loss, anorexia or insomnia. Venlafaxine can be useful in patients who have neuropathic pain.
- Recommend starting elders at a relatively low dose, titrating to full dose slowly, and continuing for a longer trial.

When to refer

- Patients who have not responded to an initial antidepressant drug trial.
- Patients with have symptoms of mania, suicidality, or psychosis.

DELIRIUM

Essentials of diagnosis

- Rapid onset and fluctuating course.
- Primary deficit in attention rather than memory.
- May be hypoactive or hyperactive
- Dementia frequently coexists.

General considerations

- Delirium is an acute, fluctuating disturbance of consciousness, associated with change in cognition or the development of perceptual disturbances.
- It is the pathophysiological consequences of an underlying general medical condition such as infection, coronary ischaemia, hypoxemia, or metabolic derangement.
- Cognitive impairment is an important risk factor for delirium. Other risk factors are male sex, severe illness, hip fracture, fever or hypothermia, hypotension, malnutrition, polypharmacy and use of psychoactive medications, sensory impairment, use of restraints, use of intravenous line, or urinary catheters metabolic disorders, depression, and alcoholism.

Clinical Findings

- The confusion assessment method (CAM), which requires
- acute onset and fluctuating course.
- inattention and either
- Disorganized thinking or
- Altered level of consciousness
- A key component of delirium work-up is review of medications because large number of drugs, the addition of a new drug, or discontinuation of a medication known to cause withdrawal symptoms are all associated with development of delirium.
- Medications that are particularly likely to increase the risk of delirium include opioids, benzodiazepines, dihydropyridines and antihistamines.
- Laboratory evaluation of most patients should include a complete blood count, electrolytes, blood urea nitrogen (BUN), and serum creatinine, glucose, calcium, albumin, liver function studies, urinalysis and electrocardiography.
- In selected cases, serum magnesium, serum drug level, blood gas measurements, blood cultures, chest radiography, urinary toxin screen, head CT-Scan and lumbar puncture may be helpful.

Prevention

- Prevention is best approach in the management of delirium. Measures include improving cognition (frequent reorientation, activities, socialization with family and friends when possible), sleep (massage, noise reduction, minimizing interruption at night). mobility, vision (visual aids and adaptive equipment), hearing and hydration status, (volume repletion).

Treatment

- Management of established episodes of delirium is largely supportive and includes reassurance and reorientation treatment of underlying causes, eliminating unnecessary medications and avoidance of indwelling catheters and restraints.
- Antipsychotic agents (such as haloperidol, 0.5-1mg, or quetiapine, 25mg, at bedtime or twice daily) are considered the medication of choice when drug treatment of delirium is necessary.

When to refer

- If initial evaluation does not reveal the cause of delirium or if entities other than delirium are in the differential diagnosis, referral to a neuropsychologist, neurologist should be considered.
- Immobility
- Although common in older people, reduced mobility is never normal and is often treatable if its causes are identified.
- Bed rest is an important cause of hospital-induced functional decline.
- The hazards of bed rest in older adults are multiple, serious, quick to develop, and slow to reverse. Pressure sores, deep vein thrombosis and pulmonary embolism are additional serious risks.

Prevention & Treatment

- When immobilization cannot be avoided, several measures can be used to minimize its consequences. Skin, particularly areas over pressure points should be inspected at least daily. If the patient is unable to shift position, staff should do so every 2 hours. To minimize the cardiovascular deconditioning, patients should be positioned as close to the upright position as possible, several times daily. To reduce the risk of contracture and weakness, range of motion and strengthening exercises should be started immediately and continue as long as the patient is in bed. Whenever possible, patients should assist with their own positioning, transferring, and self-care. As long as the patient remains immobilized, antithrombotic measures should be used. Advice for a physical therapist is often helpful.

FALLS & GAIT DISORDERS

- About one-third of people over age 65 fall each year and frequency of falls increases markedly with advancing age. About 10% of falls result in serious injuries such as fractures, soft tissue injuries and traumatic brain injuries. Complications of falls are the leading cause of death from injury in persons over age 65. Hip fractures are common precursors to functional impairment, nursing home placement, and death.
- Assessment of patients who fall should include postural blood pressure and pulse, thorough cardiac examination, evaluation of strength, range of motion, cognition proprioception and examination of feet and footwear.
- A thorough gait assessment should be performed in all older people. gait and balance can be readily assessed by the “Up and Go Test”, in which the patient is asked to stand up from a sitting position without use of hands, walk 10 feet, turn around, walk back, and sit down. Patients who take < 10 seconds are usually normal, patients who take longer than 30 seconds tend to need assistance with many mobility tasks and those in between tend to vary widely with respect to

gait, balance and function. The ability to recognize common patterns of gait disorders is an extremely useful clinical skill to develop. Examples of gait abnormalities and their causes are listed---

Causes of Falls

- With age, balance mechanisms can become compromised and postural sway increases. These changes predispose the older person to a fall.
- A fall may be the clinical manifestation of an occult problem, such as pneumonia or myocardial infarction, but much more commonly falls due to the interaction between an impaired patient and an environmental risk factor. Dizziness may be closely related to the deficits associated with falls, gait abnormalities, or dizziness. Sedative/ hypnotics, antidepressants and benzodiazepines were class of drugs most likely to be associated with falling. . The use of multiple medications simultaneously has also been associated with an increased fall risk.

Falls assessment

- The timed get- up- and- go test
- May use usual walking aid.
 - Start with the patient sitting in a straight- backed chair of comfortable height with arms
 - Ask the patient to rise from the chair, walk to a line 10 feet (3m) away, turn around, return to the chair, and sit down again
 - Start timing while the patient is sitting; end timing when the patient has sat down again
 - A time of ≥ 13 sec predicts increase falls risk
- **Falls assessment** If available, refer to a specialist falls service. *Record:*
 - Frequency and history of circumstances around any previous falls
- Drug therapy: polypharmacy, hypnotics, sedatives, diuretics, antihypertensives may all cause falls
 - Assessment of gait and balance, including abnormalities due to foot problems or arthritis, and motor disorders, e.g., stroke, PD
 - Examination of basic neurological function, including vision, mental status (impaired cognition and depression), muscle strength, lower extremity peripheral nerves, proprioception, and reflexes
 - Assessment of basic cardiovascular status including BP (exclude postural hypotension), heart rate, and rhythm
 - Assessment of environmental risk factors, e.g., poor lighting particularly on the stairs, loose carpets or rugs, badly fitting footwear or clothing, lack of safety equipment such as grab rails, steep stairs, slippery floors, or inaccessible lights or windows

Complications of Falls

- The most common fractures resulting from falls are of the wrist, hip, and vertebrae.
- Fear of falling again is a common, serious, but treatable factor.
- Patients who are unable to get up from a fall are at risk for dehydration, electrolyte imbalance, pressure sores, rhabdomyolysis, and hypothermia.

Prevention and Management

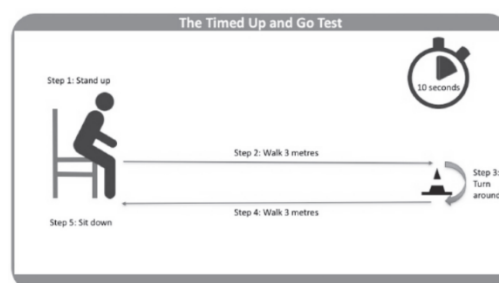
- The risk of falling and consequent injury, disability, and potential institutionalization can be reduced by modifying those factors.
- Emphasis is placed on treating all contributory medical conditions (e.g., cataract) minimizing environmental hazards and eliminating medications.
- Also important are strength, balance, and gait training as well as screening and treatment for osteoporosis, if present.
- Falls and fracture s may be prevented by prescribing vitamin D at a dose of 800 international units daily or higher.
- Assistive devices such as canes and walkers, are useful for many older adults
- Early surgery for patients with cataracts may reduce falls, but eyeglasses, particularly bifocal or graduated lens may increase the risk of falls, particularly the early weeks of use.

- Table: Fall risk factors and targeted interventions and best evidence for fall prevention

• Risk factor	• Targeted intervention
• Postural hypotension (>20 mmHg drop in systolic blood pressure, or systolic pressure <90 mmHg)	• Behavioral recommendation such as hand clenching; elevation of head of bed; discontinuation or substitution of high-risk medications
• Use of benzodiazepine or hypnotic-sedative agent	• Education of sleep hygiene; discontinuation or substitution of medications
• Use of multiple prescription medications	• Review of medications
• Environmental hazards	• Appropriate changes; installation of safety equipment (e.g., grab bar)
• Gait impairment	• Gait training, assistive devices, balance or strengthening exercise
• Impairment of transfer or balance	• Balance exercises, training in transfers, environmental alterations (e.g., grab bars)
• Impairment in leg and arm muscle strength or limbs range of motion	• Exercise with resistance bands or putty, with graduated increase in resistance
• Best Evidence of Fall Prevention ¹	• Numbers of Trials and Risk Ratio
• Exercise of physical therapy	• 16 Randomized controlled trials • Risk ratio for fall 0.87 (confidence interval 0.81-0.94)
• Vitamin D supplementation	• 9 Randomized controlled trials • Risk ratio for fall 0.83 (confidence interval 0.77-0.89)
• Multifactorial intervention	• 19 Randomized controlled trials • Risk ratio for fall 0.97 (confidence interval 0.84-1.02)

- ¹Adapted with permission from Michael YL et.al., Primary care relevant interventions to prevent falling in older adults: systemic evidence review for the U.S Preventive Services Task Force, Ann Intern Med 2010 Dec 21, 153(12):815-25,(PMID: 21173416)

- The timed get-up-and-go test 0 May use usual walking aid.
- Start with the patient sitting in a straight-backed chair of comfortable height with arms
- Ask the patient to rise from the chair, walk to a line 10 feet (3m) away, turn around, return to the chair, and sit down again



- Start timing while the patient is sitting; end timing when the patient has sat down again
- A time of ≥ 13 sec predicts if falls risk

When to Refer

- Patients with a recent history of falls should be referred for physical therapy, eye examination, and home safety evaluation.

URINARY INCONTINENCE

Essentials of Diagnosis

- Involuntary loss of urine
- *Stress incontinence*: leakage of urine upon coughing, sneezing, or standing.
- *Urge incontinence*: urgency and inability to delay urination.
- *Overflow incontinence*: may have variable presentation

General Considerations

- Incontinence in older adults is common, and interventions can improve most patients.
- A simple question about involuntary leakage of urine is a reasonable screen: (Do you have a problem with urine leaks or accidents?)

Classification

- Transient Causes
- Use of the mnemonic (**DIAPPERS**) may be helpful in remembering the categories of transient incontinence. Transient or potentially reversible causes of incontinence.
 - **Delirium**
 - **Infection**
 - **Atrophic urethritis or vaginitis**
 - **Pharmaceuticals** – Drugs are one of the most common causes of transient incontinence. Typical offending agents include potent diuretics, anticholinergics, psychotropics, opioid analgesics, α -blockers (in women), α -agonists (in men) and calcium channel blockers.
 - **Psychological factors** –severe depression with psychomotor retardation may impede the ability to reach a toilet.
 - **Excess urinary output**
 - **Restricted mobility**
 - **Stool impaction**

Established causes

- **Detrusor overactivity (urge incontinence)**
 - Detrusor overactivity refers to uninhibited bladder contractions that cause leakage.
 - The single best question to ask when diagnosing:
 - **urge incontinence** - “Do you have a strong and sudden urge to void that makes you leak before reaching the toilet?”
- **Urethral incompetence (stress incontinence)**

- **Detrusor underactivity (overflow incontinence)**
- Detrusor underactivity is the least common cause of incontinence. It may be idiopathic or due to sacral lower motor nerve dysfunction.

Types of urinary incontinence in older people

- There are five **main** types of urinary incontinence in older people:
- urge incontinence (or over-active/unstable bladder)
- stress incontinence
- mixed incontinence (both urge and stress)
- voiding problems (due to obstruction or a neurogenic bladder)
- functional incontinence (due to an inability to get to the toilet or confusion).

Type of incontinence	Definition	Causes	Symptoms
Urge	The complaint of involuntary leakage of urine accompanied or immediately preceded by urgency	Overactive bladder (OAB)	Frequency, urgency, nocturia. Unable to delay voiding
Stress	Involuntary leakage of urine on effort or exertion, coughing or sneezing	Weak pelvic floor muscles, incompetent urethra. Raised intra- abdominal pressure	Leaks urine on exertion, coughing, laughing, sneezing
Mixed	The complaint of involuntary leakage associated with urgency and also with effort or exertion	OAB and weak pelvic floor	Combination of the above
Voiding problems	The generic term for obstruction during voiding, characterised by increased detrusor pressure and a reduced urinary flow rate	Prostatic hypertrophy, detrusor failure (neurogenic bladder), faecal impaction	Hesitancy, poor stream, post-micturition dribble. May have large residual urine volume. Impaired bladder sensation
Functional incontinence	Inability to toilet independently	Extrinsic factors such as immobility, confusion, inability to access toilet facilities, medications etc.	Incontinent if carer unavailable or unable to communicate needs, or cannot get to toilet

Treatment

Transient causes

- Each identified transient cause should be treated.

Established causes

- **Detrusor overactivity**
 - The cornerstone of treatment is bladder training.
 - Life style modifications including weight loss and caffeine reduction may also improve the incontinence symptoms.
 - Pelvic floor muscle (Kegel) exercises, with or without biofeedback, can reduce the frequency of incontinence episode.
 - If behavioral approaches prove insufficient, drug therapy with antimuscarinic agents may provide additional benefit.
 - The combination of behavioral therapy and antimuscarinics appear to be more effective.
 - Available regimens of antimuscarinics are tolterodine and oxybutynin.
- **Urethral incompetence (stress incompetence)**
 - Life style modifications including limiting caffeine intake and timed voiding, may be helpful for some women.
 - Pelvic floor muscle exercises are effective for women with mild to moderate stress incontinence;
- **Urethral obstruction**
 - Surgical decompression is the most effective treatment for obstruction
- **Detrusor underactivity**
 - For the patients with a poorly contractile bladder, augmented voiding techniques(eg. double voiding, suprapubic pressure) often prove effective.
 - If further emptying is needed, intermittent or indwelling catheterization is the only option.

When to Refer

- Men with urinary obstruction who do not respond to medical therapy should be referred to urologist.
- Women who do not respond to medical and behavioral therapy should be referred to a urogynecologist or urologist.

UNDER-NUTRITION & FRAILITY

General Considerations

- Undernutrition affects substantial numbers of elderly.
- Frailty may be accompanied by physiologic changes in inflammatory and neuroendocrine systems.
- Frailty is not a disease or disability in itself, but a vulnerability or inability to withstand physical/psychological stressors.

Clinical Findings

- Useful laboratory and radiologic studies for the patient with weight loss include complete blood count. serum chemistries (including glucose, TSH, creatinine, calcium) urinalysis and chest radiograph.
- **Frailty** Many elderly people are described as being ‘frail’. This term is used to describe individuals who are physically weak and fragile. It can occur on a background of natural ageing

or be precipitated by a disease process. It is not a disease or disability in itself, but a vulnerability or inability to withstand

- physical/psychological stressors.

Common features of frailty include:

- Unintentional weight loss (>5kg in a year)
- Feeling of exhaustion
- Weakness—measured by grip strength
- Slow walking speed
- Low levels of physical activity
- The most widely recognized definition of frailty requires that the patient exhibit at least three of five following criteria:
 - slow gait speed
 - low hand grip strength.
 - exhaustion
 - weight loss and
 - low energy expenditure

Treatment

- Oral nutritional supplement of 200 to 1000 kcal/d can increase weight and improve outcome in malnourished hospitalized elder.
- For those who have lost the ability to feed themselves, assiduous hand feeding allows maintenance of weight. Although artificial nutrition and hydration (tube feeding) may seem a more convenient alternative.
- The ideal strategies for preventing the frailty syndrome are unknown.
- At present, treatment is largely supportive, multifactorial, and individualized based on patient goals, life expectancy and comorbidities.

PRESSURE ULCERS

Essentials of Diagnosis

- Pressure ulcers should be described by one of six stages:
 - Blanchable hyperemia (stage I)
 - Extension through epidermis. (stage II)
 - Full thickness skin loss (stage III)
 - Full thickness wounds with extension into muscle, bone or supporting structures(stageIV)
 - If eschar or slough overlies the wound, the wound is unstageable
 - Suspected deep tissue injury is an area of discolored or blistered skin

General Considerations

- The primary risk factors for pressure ulcer is immobility. Other contributing factors include reduced sensory perception and moisture (urinary and fecal incontinence) poor nutritional status and friction and shear forces.
- Ulcers in which the base is covered by slough (yellow, tan, gray, green or brown) and /or eschar (tan, brown or black) are considered unstageable.

Prevention

- Using specialized support surfaces (including mattress, beds and cushions), patient repositioning, optimizing nutritional status, moistening sacral skin are strategies that has been shown to reduce pressure ulcer.

Evaluation

- Evaluation of pressure ulcers should include patient risk factors and goals of care, wound stage, size, depth, present or absent of exudate, type of exudate present, appearance of wound bed and whether there appears to be surrounding infection, inus tracking, or cellulitis.
- In poorly healing or atypical pressure ulcers, biopsy should be performed to rule out malignancy or other less common infections such as a pyoderma gangrenosum.

Treatment

- Treatment is aimed toward removing necrotic debris and maintain a moist wound bed that will promote healing and formation of granulation tissue.
- The type of dressing that is recommended depends on the location and depth of the wound, whether necrotic tissue or dead space is present and the amount of exudate
- Pressure reducing devices (e.g., air-fluid beds and low air loss beds) are associated with improved healing rates.
- Although poor nutritional status is a risk factor for the development of pressure ulcer, the results of trials of nutritional supplementation in the treatment of pressure ulcers have been disappointing.
- In patient with end-stage disease who is receiving palliative care, appropriate treatment might toward comfort (including minimizing dressing changes and odour) rather than efforts directed at healing.

Table: Treatment of Pressure Ulcer

Ulcer type	Dressing type and consideration
Stage I and suspected deep injury	Polyurethane film Hydrocolloid wafer Semi-permeable foam dressing
Stage II	Hydrocolloid wafer Semi-permeable foam dressing Polyurethane film

Stage III/IV	For highly exudative wound, use highly absorptive dressing or packing, such as calcium alginate Wound with necrosis must be debrided. Debridement can be autolytic, mechanical (wet to moist) or surgical Shallow clean wound can be dressed with hydrocolloid wafer, semi-permeable foam or polyurethane film Deep wound can be packed with gauze; if the wound is deep and highly exudative, and absorptive packing should be used.
Heel ulcer	Do not remove eschar on heel ulcer because it can help promote healing (eschar in other location should be debrided)
Unstageable	Debride before deciding on further therapy

Complications

- Pressure ulcers are associated with increased mortality rates, although a causal link has not been proven.
- Complications include pain, cellulitis, osteomyelitis, systemic sepsis and prolongation of lengths of stay in the inpatient or nursing home setting.

When to Refer

- Ulcers that are large or nonhealing should be referred to plastic or general surgeon or dermatologist for biopsy, debridement, and possible skin grafting.

PHARMACOTHERAPY & POLYPHARMACY

- There are several reasons for the greater incidence of iatrogenic drugs reactions in elderly population, the most important of which is high number of medications that elder take.
- Drugs metabolism is impaired due to a decrease in glomerular filtration rate as well as reduced hepatic clearance.
- Since older adults have a decrease in total body water and relative increase in body fat, water-soluble drugs become more concentrated and fat-soluble drugs have longer half-lives.

Precautions in Administering Drugs

- Non-pharmacologic interventions can often be a first-line alternative to drugs (e.g., diet for mild hypertension or type 2 diabetes mellitus).
- Therapy is begun with less than the usual adult dosage and the dosage increased slowly, consistent with its pharmacokinetics in older patients.
- A number of single interventions can help improve adherence to the prescribed medical regimen.
- When possible, the provider should keep the dosing schedule simple, the number of pills low, the medication changes as infrequent as possible, and encourage the patient to use a single pharmacy.
- Pillboxes or “medi-sets” helps some patient with adherence.

- Having the patient or care-giver bring all medications at each visit can help the provider perform medication reconciliation and reinforce reasons for drug use, dosage, frequency of administration, and possible side effects.
- The risk of toxicity goes up with the number of medications prescribed.
- Certain combinations of medications are particularly likely to cause drug-drug interactions and should be watch carefully.

When to Refer

- Patients with poor or uncertain adherence may benefit from referral to a pharmacist or a home health nurse.

VISION IMPAIRMENT

- Although visual loss is not severe in many elders, visual impairment is an independent risk factor of falls; it also has a significant impact on quality of life.
- The prevalence of serious and correctable visual disorders in elders is sufficient to warrant a complete eye examination by an ophthalmologist or optometrist annually or biannually for most elders.

HEARING IMPAIRMENT

- Over one-third of persons over age 65 and half of those over age 85 have some hearing loss. . This deficit is correlated with social isolation and depression.
- A reasonable screen is to ask patients if they have hearing impairment. Those who answer “yes” should be referred for audiometry.
- Those who answer “no” may still have hearing impairment and can be screened by a handheld audio-scope or the whispered voice test.
- Caregivers or family members often have important information on the impact of hearing loss on the patient’s social interaction.
- Hearing amplification can improve hearing-related quality of life in patients with hearing loss.
- In general, facing the patient and speaking slowly in a low tone is a more effective communication strategy than yelling for patients with age-related hearing loss.

ELDER MISTREATMENT & SELF NEGLECT

- Elder mistreatment is defined as” actions that cause harm or create a serious risk of harm to an older adult by a caregiver or other person who stands in a trust relationship to the older
- adult or failure by a giver a caregiver to satisfy the elder’s basic needs or to protect the elder from harm”.
- Self-neglect is the most common form of elder mistreatment.
- According to the best available estimates, the prevalence potential neglect and psychological and financial abuse, are each about 5%, with other forms of abuse being less common.
- Clues to possibility of elder abuse include behavioral changes in the present of the caregiver, delays between occurrence of injuries and sought treatment, inconsistencies between an

observed injury and associated explanation, lack of clothing or hygiene, and not filling prescriptions.

- Many elders with cognitive impairment become targets of financial abuse.
- Both elder abuse and self-neglect are associated with an increased rate of mortality.
- It is helpful to observe and talk with every older person alone for at least part of a visit in order to ask questions directly about possible abuse and neglect.

Table: Phrases and actions that may be helpful in situation of suspected abuse or neglects

Question for the Elder
<ul style="list-style-type: none"> • Has anyone hurt you? • Are you afraid of anybody? • Is anyone taking or using your money without your permission?
Question for the caregiver
<ul style="list-style-type: none"> • Are you dad's needs more than you can handle? • Are you worried that you might hit your dad? • Have you hit your dad?
If abuse is suspected
<ul style="list-style-type: none"> • Tell the patient that you are concerned, want to help and will call Adult Protective Services to see if there is anything that they can do to help. • Document any injury • Document the patient's words • Document whether or not the patient is decision making capacity using a tool such as Aid to Capacity Evaluation.

- When self-neglect is suspected, it is crucial to establish whether a patient has decision making capacity in order to determine what course of action needs to be taken.

When to Refer

- The law in most state require health care providers to report suspected abuse or neglect to Adult Protective Agencies.

Reference

- *Current Diagnosis and Treatment LANGE*
- *Oxford handbook of General Practice, 5th Edition*

CHRONIC DISEASE MANAGEMENT

- Long- term conditions frequently managed in general practice include:
- Back pain
- Cancer
- DM
- Dementia
- Renal or liver failure
- Irritable bowel syndrome
- Inflammatory bowel disease
- Cardiovascular disease, e.g., increase BP, heart disease, stroke
- HIV
- Arthritis of all types
- Chronic lung disease
- Chronic neurological conditions, e.g., Parkinson's disease, MS
- Psychiatric illness, e.g., depression, psychosis

Common elements of effective chronic illness management

- **Involvement of the whole family** Chronic diseases do not only affect the patient but everyone in a family
- **Collaboration between service providers, patients, and carers**
- Negotiate and agree a definition of the problem; agree targets and goals for management; develop an individualized self- management plan
- **Personalized written care plan** Take into account patients' / carers' views and experience and the current evidence base
- **Tailored education in self- management** A patient with diabetes spends 3h/ year with a health professional— the other 8757h he or she manages his/ her own condition. Helping patients with chronic disease understand and take responsibility for their conditions is vital
- **Planned follow- up** Proactive follow- up according to the care plan— use of disease registers and call– recall systems is important.

Monitoring of outcome and adherence to treatment

- Use of disease/treatment markers; monitoring of concordance, e.g., prescription frequency; medicine management programmes—
- **Tools and protocols for stepped care**
 - Provide a framework for using limited resources to greatest effect; step professional care in intensity—
 - start with limited professional input and systematic monitoring, then augment care for patients not achieving an acceptable outcome
- **Targeted use of specialist services**
 - For those patients who cannot be managed in primary care alone
- **Monitoring of process**
 - Continually monitor management through clinical governance mechanisms

DEPRESSION AND CHRONIC DISEASE

- Depression is common among people with chronic disease. It is reported to affect 30– 50% of those with epilepsy, CVD, dementia, cancer, type 2 DM, and arthritis.
- Interaction between depression and chronic physical illness
- Depression in those with chronic medical illnesses adversely affects prognosis.
- Conversely, treatment of depression can improve prognosis.
- Depression is associated with:
 - increased mortality, morbidity, disability, and poorer quality of life
 - increase prevalence of smoking and sedentary lifestyles
 - Poorer chronic disease outcome measures, e.g., higher HbA1c levels
 - increase use of services and healthcare costs
 - Poor concordance with medication and management plans

Detection of depression

- Use NICE depression screening questions:
- During the last month, have you often been bothered by feeling down, depressed, or hopeless?
- During the last month, have you often been bothered by having little interest or pleasure in doing things?
- A positive response to either of these questions should prompt further assessment with the following 3 questions: *During the last month have you often been bothered by:*
- Feelings of worthlessness?
- Poor concentration?
- thoughts of death?

Reference

- *Oxford handbook of General Practice, 5th Edition*

PRESCRIBING IN OLDER PEOPLE

- Most of older people are on regular medication
- Pharmacokinetics and pharmacodynamics are **different** in this age group
- Older people are much more likely to suffer from the **side effects** of drugs
- **Polypharmacy** and problems with **concordance** are particular issues in geriatric medicine
- Drug trials **tend not to include** people over the age of 80
- Two-thirds of people over the age of 60 are taking regular medication, and over half of those with repeated prescriptions are taking **more than four drugs**. People in care homes are even more likely to be taking several regular medications. Adverse drug reactions account for up to 17% of hospital admissions.

Pharmacology in older patients

- Administration challenges include:
 - Packing
 - Labels
 - Tablets may be large and difficult to swallow or have an unpleasant taste
 - Liquid formulation
 - Multiple tablets
 - Absorption
 - Increased gastric pH
 - Delayed gastric emptying
 - Reduced intestinal motility and blood flow
 - Absorption of drugs is largely unchanged with age -exceptions include iron and calcium which are absorbed
- Hepatic metabolism
 - Specific hepatic metabolic pathways (e.g., conjugation) are unaffected by age
 - Reducing hepatic mass and blood flow can impact on overall function which slows metabolism of drugs.
 - Many factors interact with liver metabolism (e.g., nutritional state, acute illness, smoking, other medications etc).
- Renal excretion
 - Renal function declines with age
 - Drugs or drugs with active metabolites, that are mainly excreted in the urine include digoxin, gentamycin, lithium, furosemide, and tetracycline
 - Where there is narrow therapeutic index (e.g., digoxin, aminoglycosides)
 - Impair renal function is exacerbated by dehydration and urinary sepsis

PRESCRIBING FOR THE ELDERLY

- Use of medicines increase as people get older. 90% of prescriptions are for repeat medication. Adverse drug events are common reasons for hospital admission in the over-75 age group; many are avoidable. Regular review is essential.

POLYPHARMACY

- Elderly people often have multiple problems.
- Before prescribing a new drug, consider whether it is necessary oBalance the potential risks of the drug against the benefits
- Review medication regularly

Pharmacokinetic differences

- **Age-related changes** lead to differences in absorption, distribution, metabolism and elimination of drugs.
- There is a **reduced volume of distribution** for many drugs because of reduced total body water and an increase in the percentage of body weight as fat. As a result, dose requirements are less than in younger people.
- For example, digoxin is a water-soluble drug, and lower loading doses may be required.
- Diazepam is a lipid-soluble drug and the relative increase in body fat may lead to accumulation, causing toxicity.
- **Liver metabolism is reduced**, leading to slower drug inactivation.
- **Reduced liver blood flow** is made worse by cardiac failure, potentially leading to increased drug concentrations, although this is rarely of clinical significance. However, care should be taken when prescribing drugs that are metabolised in the liver and have a narrow therapeutic index: warfarin, theophylline and phenytoin.
- Plasma levels of these drugs should be monitored.
- Perhaps the most clinically significant difference is that renal blood flow and mass reduce significantly with age, leading to a **reduction in the clearance of many drugs**, especially water-soluble ones.

Pharmacodynamic differences

- Some commonly prescribed drugs should be reduced to account for **reduced renal function** (as measured by GFR). Examples are ciprofloxacin, gentamicin, digoxin and lithium.
- There is an **increased sensitivity to drugs** in general, and lower doses are often required compared to younger adults, for example, a patient started on treatment for hypertension may develop dizziness due to reduced baroreceptor sensitivity causing postural hypotension.

Adverse drug reactions

- More common and complex with increasing age
- Altered drug handling and sensitivity occur with age, worse by poor appetite, nutrition and fluid intake.
- Frailty and multiple diseases make drug-disease interactions more common, for example

- Anticholinergics may precipitate urine retention in a patient with prostatic hypertrophy.
- Benzodiazepine may precipitate delirium in a patient with dementia
- These relationships become even more complex when large numbers of drugs that are prescribed for multiple conditions interact with the disease as well as each other.
- Errors in drug taking make adverse reaction more likely mistakes increase with:
 - Increasing age
 - Increasing number of prescribed drugs
 - Cognitive impairment
 - Living alone
- **Table 1. Illustrates examples of diseases in old age and the disease-drug interactions that can occur with commonly prescribed medications**

Disease in older age	Drugs	Potential effect
Dementia	Benzodiazepines Antimuscarinics, (some) anticonvulsants Levodopa	Worsening confusion
Parkinson's disease	Antimuscarinics Metoclopramide	Worsening symptoms Deteriorating movement disorder
Seizure disorder/epilepsy	Antibiotics Analgesics Antidepressants Antipsychotics Theophyllines Alcohol	Reduced seizure threshold/ seizures

GUIDELINES FOR PRESCRIBING FOR THE ELDERLY

- Think before prescribing
- Is the drug needed?
- Is there another non-pharmacological way of managing the problem?
- Are you treating the underlying condition or the symptoms of it?
- What are the pros and cons of the patient taking this drug?
- What is the evidence base for its use in this age group?
- Will the patient be able to take the drug (formulation; packaging)?
- Will the patient be concordant?
- Will the patient comply with any necessary monitoring?
- Limit the range of drugs you use
- Prescribe from a limited array of drugs that you know well.
- Repeats and disposal
- Tell patients how to get more tablets, and monitor frequency of repeat prescriptions
- Review repeated prescriptions regularly
- Tell patients what to do with any leftover if a drug is stopped
- Decrease the dose
- Start with 50% of the adult dose
- Avoid drugs likely to cause problems (e.g., long-acting antidiabetic agents such as glibenclamide)

- Review regularly
- Consider on each occasion whether each drug could be stopped or the regime simplified
- Consider lowering dosage of drugs if renal function is deteriorating
- Involve carers, community pharmacists, and other PHCT members
- Simplify regimes
- Use OD or BD regimes wherever possible
- Avoid polypharmacy
- Explain clearly
- Put precise instructions on the drug bottle-avoid 'use as directed'
- Give written instructions about how the drug should be taken
- Ensure explanations are given to carers as well as patients where appropriate
- Consider method of administration
- Bottles with childproof tops are often impossible for arthritic hands to open. Suggest the patient asks the chemist for a standard screw cap
- Drug administration boxes, in which the correct tablets are stored in slots marked with the day and time of administration can be helpful. Available from pharmacists and can be filled by the patient, a carer, friend or relative, or the pharmacist
- Medication reminder charts can also be helpful

Reference

- *Oxford handbook of General Practice, 4th Edition*

GERIATRIC REHABILITATION & PAIN MANAGEMENT IN THE ELDERLY

- Ageing, disability, and pain
- Ageing – a progressive physiologic multi-organic decline that promotes the onset of functional limitation and disability.
- Frailty– a condition characterized by a gradual physiologic decline in multiple body systems, by loss of function, loss of physiologic reserve, and increased vulnerability to disease and death.
- Rehabilitation can play an essential role to counteract impairments and to improve abilities.
- The main goal of rehabilitative intervention in the elderly is to maintain independent mobility and activities of daily living (ADL)
- Chronic pain is one of the most common conditions encountered by healthcare professionals, particularly among older (≥ 65 years) patients.
- Pain is associated with substantial disability reduced mobility avoidance of activity falls depression and anxiety sleep impairment, and isolation
- Its negative effects extend beyond the patient, to disrupt both family and social relationships. Chronic pain poses a significant economic burden on society.

Common Pain Conditions in Elderly

- Musculoskeletal condition such as arthritis
- Cancer
- Neuropathies
- Shingles
- Sciatica
- Spinal Stenosis
- Muscle Pain



- Elements of a comprehensive geriatric pain assessment
- Sensory
- Please tell me all of the places you experience pain or discomfort. What does it feel like? What words come to mind?
- Is your pain or discomfort with you all of the time or does it come and go? How long has it been present? What makes it better, what makes it worse?
- Emotional impact (Effective)
- Has pain affected your mood, sense of wellbeing, energy level?
- Are you worried about your pain or what may be causing it?
- Functional impact
- Has pain affected your ability to do every day activities? To do things you enjoy?
- How about relating with others? If so, how?
- Sleep
- Has pain affected your sleep?

- Do you have trouble falling asleep or need to take drugs to help you sleep on account of your pain?
- **Attitudes and beliefs (Cognitive)** Do you have any thoughts or opinions about experiencing pain at this point in your life that you believe would be important for me to know? Do you have any thoughts or opinions about specific pain treatments that you believe would be important for me to know?
- **Coping styles** What things do you do to help you cope with your pain? This could be listening to your favorite music, praying, sitting still, or isolating yourself from others
- **Treatment expectations and goals** What do you think is likely to happen with the treatment I have recommended? What are the most important things you hope will happen as a result of the treatment?
- **Resources** Is there anyone at home or in the community that you can turn to for help and support when your pain is really bad?

Treatment approach

- **To treat the whole patient (Holistic and comprehensive health care) with multidisciplinary team approach**
- not just the specific injury or condition
- in order to improve overall recovery
- prevent recurrence of pain or other source of dysfunction
- needs to focus on Functional, vocational, and socioeconomic and psychological status

Goals of treatment

- to restore the patient's normal function and
- improve quality of life for patients from a physical, emotional, psychosocial and vocational perspective.
- Rehabilitation programs and goals in the elderly
- Prescription of appropriate physical therapy including aerobic exercises focused on balance, gait, mobility, and flexibility.

Prevention of falls

- Prevention of complications of mobility limitation and immobility
- Maintaining functional independence
- Assessment and prescription for equipment and devices

Prevention and treatment of pain

- Patient and family education
- Maintaining social participation
- Improvement of quality of life

Treatment option

- Pharmacological
- Analgesic, NSAIDs, muscle relaxants, anti- epileptics, tranquilizers, etc.
- Non-Pharmacological

- Health education
- Postural care
- Physical Modalities
- Physical activity and therapeutic exercise
- Bio-psychosocial approach
- prevention of recurrence
- Social integration and return back to work
- Cognitive behavioral therapy
- The use of CBT is promising.
- CBT is used to enhance patients' control over pain, based on the premise that an individual's beliefs, attitudes, and behaviors play a central role in the experience of pain.
- Standard CBT protocols instruct patients in the use of specific cognitive and behavioral techniques, teach them how certain thoughts, beliefs, attitudes, and emotions influence pain, and highlight the patient's own role in controlling and adapting to chronic pain.

Reference

- *GERITRIC CONFERENCE MAY 2018 Professor/Head Dr. Khin Myo Hla PRESENTATION*

