GUIDELINES

For

GENERAL PRACTITIONERS

2024

Press record

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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recommendations for clinicians who are uncertain about how to proceed, overturn the beliefs of doctors accustomed to outdated practices, improve the consistency of care, and provide authoritative recommendations that reassure practitioners about the appropriateness of their treatment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 April, 2024
General Practitioners' Society (Central)
Myanmar Medical Association

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 immerse 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**

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SYMBOLS AND ABBREVIATIONS

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

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 toxaemia
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 haemoglutination 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

CHAPTER (10)
NEUROLOGICAL PROBLEMS

1. Epilepsy
2. Facial Nerve (Bell) Palsy
3. Headache
4. Parkinsonism
5. Stroke
6. Trigeminal Neuralgia (Tic Douloureux)

7 Peripheral Neuropathy

EPILEPSY

Definition

- A seizure is defined by transient (***paroxysmal event***) due to abnormal excessive or synchronous neuronal activity in the brain.

Provoked seizure

- It is a seizure associated with a clear precipitant or triggering factor (such as: drugs, fever, acute head injury, acute cerebra-vascular,acute metabolic imbalance)

Unprovoked seizure

- Itis a seizure not associated with a clear precipitant or triggering factor.

Epilepsy

- Epilepsy is defined as recurrence of at least 2 unprovoked seizures occurring more than 24 hours apart.
- It is a clinical phenomenon rather than a single disease entity, since there are many forms and causes of epilepsy.

Status Epilepticus

- *Status epilepticus refers to continuous seizures or repetitive, discrete seizures with impaired consciousness in the interictal period.*
- *More practical definition is a situation in which the duration of seizures (for generalized tonic-clonic epilepsy usually last more than 5 minutes) prompts the acute use of anticonvulsant therapy.*

Causes of Epilepsy

1. Unknown cause (Idiopathic epilepsy) - 60-75%
   - Genetic (hereditary) factors may play a role in some cases.
2. Symptomatic epilepsy - 25-40% Some causes include:
   - Congenital disorders
     - Inborn error of metabolism
     - Neuro-Phakomatoses (e.g. neurofibromatosis)
     - Cortical dysgenesis
   - Cerebral anoxia of any cause
   - Head trauma
   - CNS Infection (meningitis, AIDS and viral encephalitis)
   - Vascular Disease (e.g. post-stroke, AV malformation,Aneurysm)
   - Brain tumor
   - Drugs and alcohol

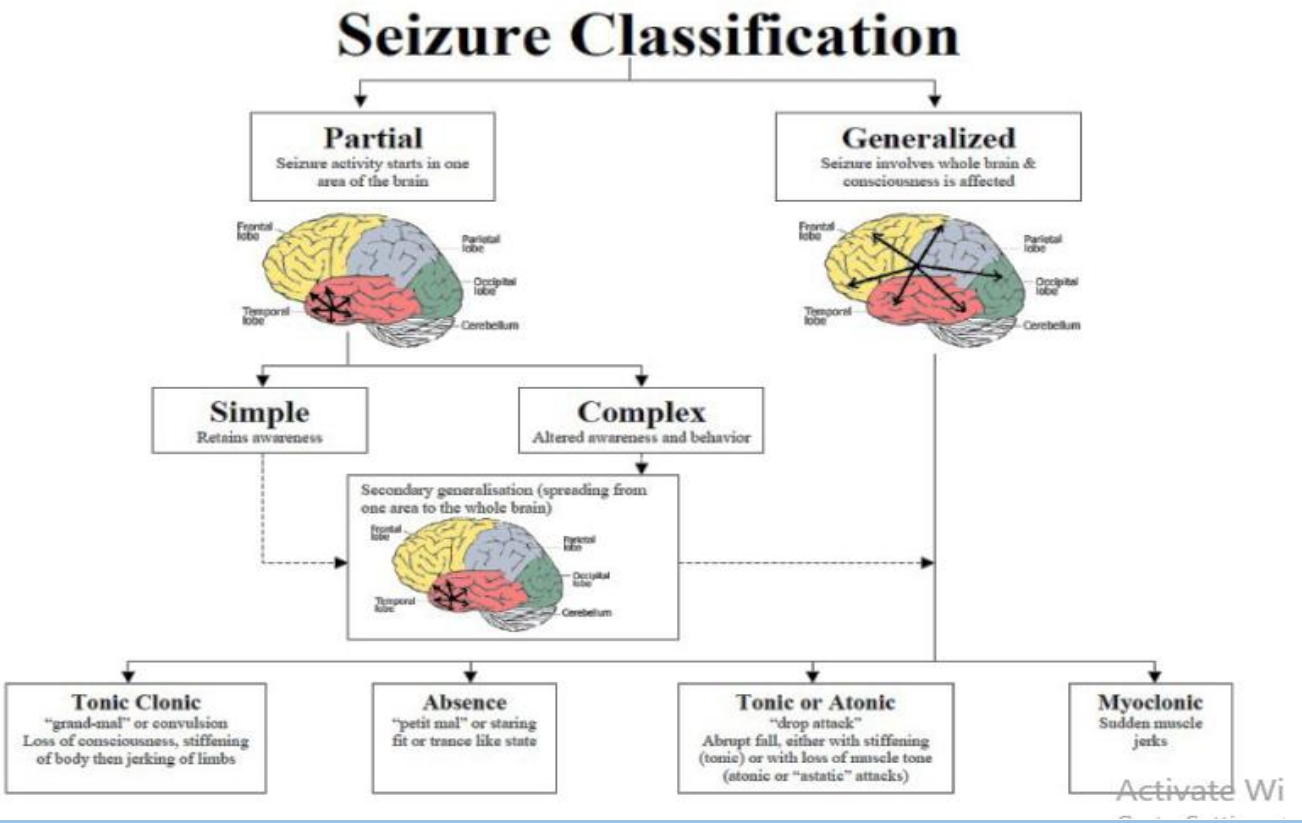
Triggering factors for seizures

- Sleep deprivation
- Missed doses of anti-epileptic drugs in treated patients
- Alcohol (particularly withdrawal)
- Recreational drug misuse
- Physical and mental exhaustion
- Flickering lights, including TV and computer screens (generalized epilepsy syndromes only)
- Intercurrent infections and metabolic disturbances
- Uncommon:
  - loud noises, music, reading, hot baths

Phases of seizure in Generalized Epilepsy

- ***Prodromal Phase-*** lasting hours or days, may rarely precede the seizure. It is not part of the seizure itself: the patient or others notice a change in mood or behaviour.
- ***Aura Phase-*** is part of the seizure of which the patient is *aware*, and may precede its other manifestations. The aura may be a strange feeling in the gut, or an experience such as ***dejavu*** (disturbing sense of familiarity), or strange smells or flashing lights. It implies a partial (focal) seizure, often, but not necessarily, from the temporal lobe.
- ***Post-ictal Phase-*** there may be headache, confusion, myalgia, and a sore *tongue;* or temporary weakness after a focal seizure in motor cortex (Todd's *palsy)*, or dysphasia following a focal seizure in the temporal lobe.

Classification of seizures

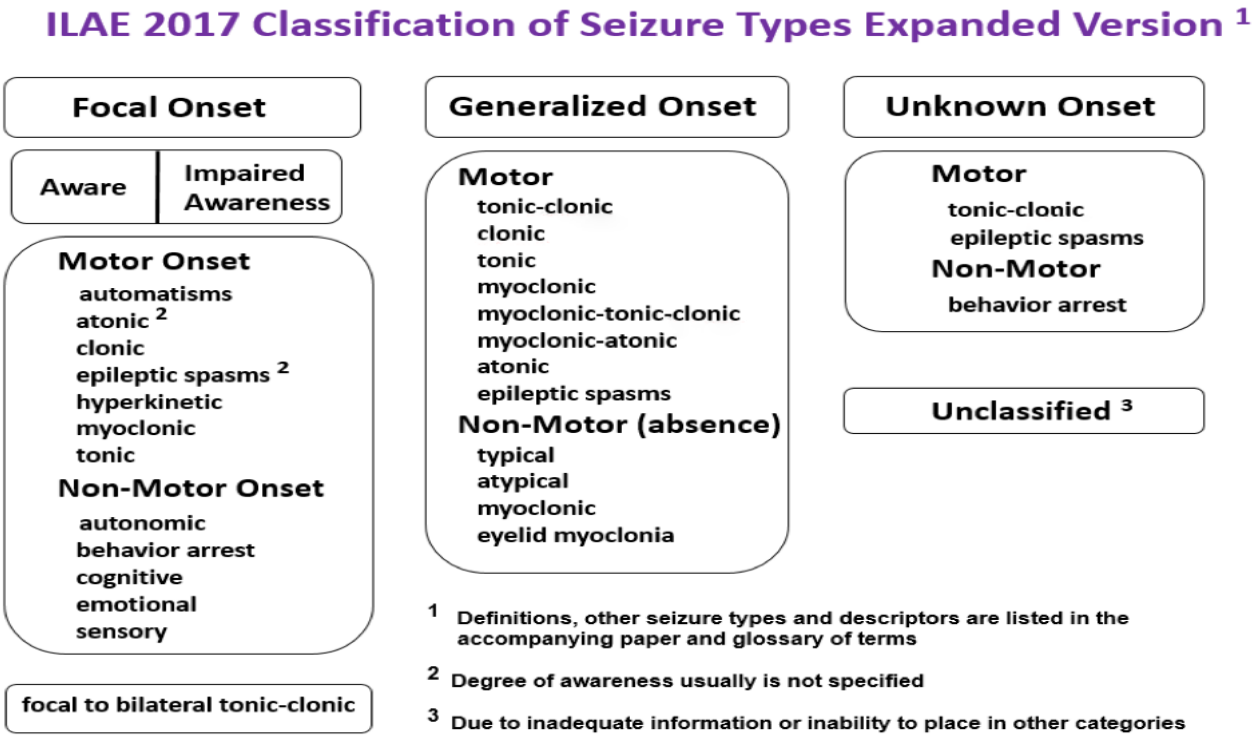


Generalised Seizures

- *Generalized seizures are thought to arise at some point in the brain but immediately and rapidly engage neuronal networks in both cerebral hemispheres.*
- *Several types of generalized seizures have features that place them in distinctive categories and facilitate clinical diagnosis.*

Typical absence seizures

- *characterized by sudden, brief lapses of consciousness without loss of postural control.*
- *The seizure typically lasts for only seconds, consciousness returns as suddenly as it was lost, and there is no postictal confusion.*
- *It always starts in childhood. Occur so frequently (20-30 times a day) that they are mistaken for daydreaming or poor concentration in school.*
- *Triggers: hyperventilation and flashing lights*



Atypical absence seizures

- *Different from typical absence seizure.*
- *The lapse of consciousness is usually of longer duration and less abrupt in onset and cessation, and the seizure is accompanied by more obvious motor signs that may include focal or lateralizing features.*
- *They are usually associated with diffuse or multifocal structural abnormalities of the brain and less responsive to antiseizure medications.*

Tonic-clonic seizures

- *The most common seizure type. Initial 'aura' then becomes rigid (tonic) and unconscious. During this phase, breathing stops and central cyanosis may occur.*
- *The limbs produce jerking (clonic) movements for a variable time. Afterwards, there is a flaccid state of unresponsiveness, which can persist for some minutes.*
- *After regaining consciousness, the patients may be confused, disorientated and/or amnesic.*
- *Urinary incontinence and tongue-biting may occur.*

Atonic seizures

- *It is characterized by sudden loss of postural muscle tone lasting 1–2 s Consciousness is briefly impaired, but there is usually no postictal confusion.*
- *A very brief seizure may cause only a quick head drop or nodding movement, while a longer seizure will cause the patient to collapse or fall.*
- *Atonic seizures are usually seen in association with known epilepsy syndromes.*

Myoclonus seizures

- *A sudden and brief muscle contraction that may involve one part of the body (usually in the arms) or the entire body.*
- *They are more marked in the morning or on awakening from sleep, and tend to be provoked by fatigue, alcohol or sleep deprivation.*
- *Myoclonic seizures usually coexist with other forms of generalized seizures but are the predominant feature of juvenile myoclonic epilepsy (JME).*

Focal seizures

- *Focal seizures arise from a neuronal network either discretely localized within one cerebral hemisphere or more broadly distributed but still within the hemisphere.*

Focal seizures without dyscognitive features (previously known as Simple partial)

- *Focal motor seizures usually are clonic type.*
- *It can also manifest as changes in somatic sensation (e.g., paresthesias), vision (flashing lights or formed hallucinations), equilibrium (sensation of falling or vertigo), or autonomic function (flushing, sweating, piloerection).*
- *Focal seizures arising from the temporal or frontal cortex may also cause alterations in hearing, olfaction, or higher cortical function (psychic symptoms).*

Focal seizures with dyscognitive features (previously known as Complex partial)

- *It is accompanied by a transient impairment of the patient's ability to maintain normal contact with the environment.*
- *The patient is unable to respond appropriately to visual or verbal commands during the seizure and has impaired recollection or awareness of the ictal phase.*
- *The seizures frequently begin with an aura, that is stereotypic for the patient. A sudden behavioral arrest (automatism) or motionless stare are common aura.*

Evolution of focal seizures to generalized seizures (previously known as secondary generalization)

- *Focal seizures can spread to involve both cerebral hemispheres and produce a generalized seizure, usually of the tonic-clonic variety.*
- *This is observed frequently following focal seizures arising from a focus in the frontal lobe.*
- *A focal seizure that evolves into a generalized seizure is often difficult to distinguish from a primary generalized-onset tonic-clonic seizure*

Currently Unclassifiable Seizures

Epileptic spasms:

- These are characterized by a very brief sustained flexion or extension of predominantly proximal muscles, including truncal muscles, *but recurring in clusters of 5-50, often on awakening.*
- *Occur mainly in infancy.*

Disorders That May Mimic Epilepsy

Cardiovascular events (syncope)

- Vasovagal attacks (vasodepressor syncope),
- Arrhythmias (Stokes-Adams attacks)

Movement disorders

- Paroxysmal choreoathetosis
- Myoclonus, *tics,* habit spasms

Migraine –

- *Brainstem migraine*

Sleep disorders

- *Parasomnias*

Metabolic disorders

- Hypoglycemia,

Psychological disorders

- *Functional seizures*

Diagnosis

History Taking

- Should be obtained from ***both patients and witnesses*** including;
- The clinical ***context,*** including medical and family history, and circumstances under which the episode occurred

Specific triggers or provoking factors

A detailed clinical description that entails four components:

- What is the first ***symptom or sign*** (presence and type of aura, evidence of focal seizure at onset)?
- How does it ***evolve after onset*** (what happens during the seizure proper, what are the signs or symptoms, how long does it last)?
- How does ***it end*** (gradually or abruptly)?
- Are there ***any neurologic deficits*** after the seizure ends?
- What type of seizure is it-partial or generalized?
- ***Physical and neurological examination***
- Routine examination of all the systems.
- Scars, *bruises*, skin pigmentation, adenoma *sebaceum*, haemangioma, congenital anomalies
- Signs of drug *toxicity*, e.g., ataxia, drowsiness, sleepiness, nystagmus

Differential diagnosis

- Vasovagal syncope
- *Functional seizures*
- Tics
- Panic attack
- Hypoglycaemic attack
- Normal phenomenon (e.g. deja vu)
- Cardiac arrhythmias
- Other cardiac disorders (e.g. Aortic stenosis)
- HOCM
- TIA
- Migranous aura

Investigation

- ***Blood tests*** - Blood sugar, full blood count, ESR, urea & electrolytes, creatinine, *calcium*, ***magnesium***, liver function *test*, pregnancy test
- *EEG*

Refer to neurologist for further management. Drug choice is a specialist decision

Pharmacological treatment

Initiation of Antiseizure Medication Treatment

- should be ***individualized*** according to the seizure *type*, epilepsy *syndrome*, concurrent ***medications*** and ***co-morbidity, lifestyle,*** and the preferences of the person and their ***family and/or carers.***
- generally recommended after a second epileptic seizure.
- should be considered even after a first unprovoked seizure

1) *abnormal neurological examination*
2) *the EEG shows unequivocal epileptic activity*

3) *the risk of having a further seizure is high*
4) *status epilepticus as the first seizure presentation*
5) *brain imaging shows a structural abnormality*

Principle Of AED

How to start first drug

- Start with ***one of the first-line drug:***
- Start at a ***low dose:*** increase gradually ***until*** effective control is achieved
- If seizure is ***not controlled with monotherapy,*** check *compliance*, dose frequency, timing and drug interactions

When to use second drug

- If seizure control is ***not achieved*** with maximum tolerant dose of first drug
- ***Optimise*** second drug, then try ***to withdraw first drug*** (alternative monotherapy)
- *Monotherapy should be the goal whenever possible.*

When to use combination therapy

- *After trying 2 drugs as monotherapy*
- *In multiple seizure types*
- *In poor prognosis epilepsy syndromes*

When to withdraw AED

- *Complete medical control of the seizure for 1-5 years*
- *Single seizure type, either focal or generalized*
- *Normal neurologic examination including intelligence*
- *Normal EEFG*
- *With patient's informed agreement*
- *One drug at a time in cases of polytherapy*
- *Withdraw slowly over 3-6 months*
- *Most recurrences occur in the first 3 months after discontinuing therapy, and patients should be warned*

Choice of ASMs according to Seizure Type

GENERALISED ONSET TONIC CLONIC	FOCAL	TYPICAL ABSENCE	ATYPICAL ABSENCE MYOCLONIC, ATONIC
First-Line			
Valproic acid Lamotrigine Topiramate	Lamotrigine Carbamazepine Oxcarbazepine Phenytoin Levetiracetam	Valproic acid Ethosuximide	Valproic acid Lamotrigine Topiramate
Alternatives			
Zonisamide* Phenytoin Carbamazepine Oxcarbazepine Phenobarbital Primidone Felbamate	Topiramate Zonisamide* Valproic acid Tiagabine* Gabapentin* Lacosamide* Phenobarbital Primidone Felbamate	Lamotrigine Clonazepam	Clonazepam Felbamate

*As adjunctive therapy

- *Sodium valproate is first-line treatment in-patients with newly diagnosed GTC seizures.*
- *Carbamazepine or lamotrigine is first-line treatment in patients with newly diagnosed focal seizures.*
- *Do not offer lamotrigine in myoclonic seizures, and carbamazepine and oxcarbazepine in myoclonic or absence seizures. (may beworsen seizures)*

Dosage guidelines for established ASMs in adolescent and adult

Drug	Starting dose (per day)	Standard Maintenance Dose (per day)	Dosage interval	Common side effects
Sodium valporate	200 mg	500-2000mg	od - qid	Weight gain, Tremor, Hair Loss, Teratogenesis
Carbamazepine	200 mg	400-1800mg	od - bid	Rash, Diplopia, Dizziness, Headache, Nausea, Teratogenesis,
Phenobaribitone	60 mg	60-180mg	od - bid	Fatigue, Listlessness, Depression
Phenytoin	200 mg	100 - 400 mg	od - bid	Ataxia, Drowsiness, Hirsutism, Gum hypertrophy, Teratogenesis
Lamotrigine	25 mg	100 - 500 mg	od - bid	Rash, Nausea, Headache, Insomnia
Topiramate	25 mg	100 - 400 mg	od - bid	Nausea, vomiting, Diarrhoea, Constipation, Dyspepsia, Dry mouth, Abdominal pain, Dizziness, Cognitive impairment
Levetiracetam	250 mg	250 -3000 mg	od - bid	Anorexia, Weight change, Abdominal pain, Dyspepsia, Diarrhoea, Dizziness
Oxycarbazepine	300 mg	900-2400 mg	od - bid	Rash, Diplopia, Dizziness, Headache, Nausea, Teratogenesis,
Lacosamide	100 mg	200-400 mg	od - bid	GI irritation Cardiac conduction (PR interval prolongation)

- Serious skin reaction including Stevens-Johnson's syndrome and toxic epidermal necrolysis is rare but potentially fatal. Warn the patients to see doctor immediately if rash or signs and symptoms of hypersensitivity develop

Referral to the Tertiary Centre

Referral should be considered when one or more of the following criteria are present:

- management is unsuccessful after two drugs
- unacceptable side effects from medication
- suspected of structural brain lesion
- psychological and/or psychiatric co-morbidity
- diagnostic doubt as to the nature of the seizures and/or seizure syndrome

Considerations in women

Menstruation

- Some women experience a marked increase in seizure frequency around the time of menses (catamenial epilepsy)
- This is believed to be mediated by either the effects of estrogen and progesterone on neuronal excitability
- or changes in antiepileptic drug levels due to altered protein binding or metabolism.
- Some patients may benefit from increases in antiseizure drug dosages during menses

Contraception

- Enzyme-inducing antiepileptic drugs (e.g. carbamazepine, phenytoin, phenobarbital, oxcarbazepine, topiramate) that reduce estrogen levels by enhancing its metabolism require patients to be treated with higher doses of pill (containing 50- 100 µg ethinyloestradiol) or alternative methods of contraception.

Pregnancy

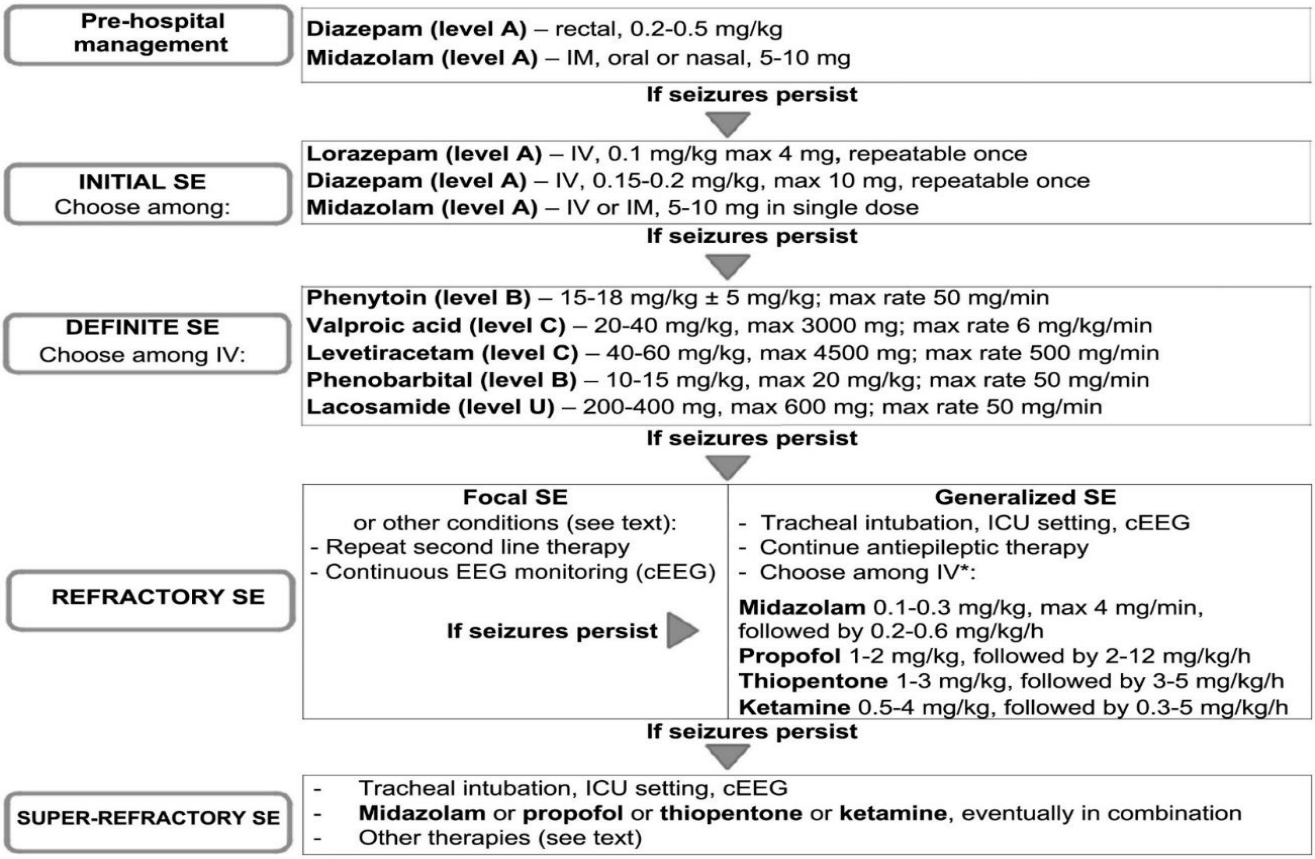
- *Most women with epilepsy who become pregnant will have an uncomplicated gestation and*

deliver a normal baby

- *Epilepsy poses some important risks to a pregnancy.*
- *Seizure frequency during pregnancy will remain unchanged in ~50% of women, increase in 30%, and decrease in 20%*
- *Changes in seizure frequency are due to endocrine effects on the CNS, variations in antiepileptic drug pharmacokinetics (such as acceleration of hepatic drug metabolism or effects on plasma protein binding), and changes in medication compliance.*
- Risk of fetal malformation is minimized if a single first-line AED with folic acid (5mg/day) supplementation is used.
- Antiepileptic drugs should not be discontinued
- Valproate should be *avoided*, if possible. It is Valproic acid is strongly associated with an
- *increased risk of adverse fetal outcomes (7–20%).*
- Carbamazepine and *Lamotrigine* have the lowest incidence of major fetal malformations.
- *Enzyme-inducing drugs such as phenytoin, carbamazepine, oxcarbazepine, topiramate, phenobarbital, and primidone cause a transient and reversible deficiency of vitamin K–dependent clotting factors in ~50% of newborn infants*
- *Neonatal hemorrhage is uncommon, the mother should be treated with oral vitamin K (20 mg/d, phylloquinone) in the last 2 weeks of pregnancy, and the infant should receive intramuscular vitamin K (1 mg) at birth.*

Breast Feeding

- *Given the overall benefits of breast-feeding and the lack of evidence for long-term harm to the infant by being exposed to antiepileptic drugs, mothers with epilepsy can be encouraged to breast-feed.*
- *This should be reconsidered, if there is any evidence of drug effects on the infant such as lethargy or poor feeding.*



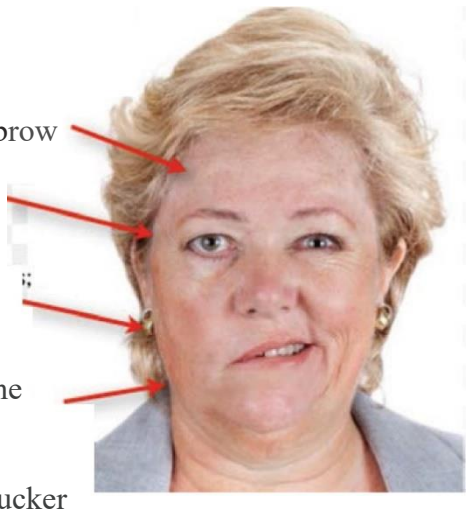
FACIAL NERVE (BELL) PALSY

- ***Bell Palsy is an acute unilateral lower motor neuron paresis or paralysis of the facial nerve (cranial nerve 7). It is the most common cranial neuropathy.***
- ***The annual incidence of this idiopathic disorder is ~25 per 100,000 annually, or about 1 in 60 persons in a lifetime and common in age group between 10 and 40.***
- The classic type is Bell palsy, which is usually idiopathic although attributed to an inflammatory swelling involving the facial nerve in the bony facial canal.
- In Ramsay-Hunt syndrome, which is due to infection with herpes zoster causing facial nerve palsy, vesicles may be seen on the ipsilateral ear.
- *Herpes simplex virus (HSV) type 1 DNA was frequently detected in endoneurial fluid and*
- *posterior auricular muscle, suggesting that a reactivation of this virus in the geniculate ganglion may be responsible for most cases.*
- *Reactivation of varicella zoster virus is associated with Bell's palsy in up to one-third of cases, and may represent the second most frequent cause*

Clinical features

- Abrupt onset (can worsen over 2-5 days)
- ***Pain behind the ear may precede the paralysis for a day or two.***
- *Weakness in the face (complete or incomplete)*
- Impaired blinking
- *Bell phenomenon - when closing the eye, it turns up under the half-closed lid*

Bell's Palsy



- Less common:
  - difficulty eating
  - loss of taste-anterior two-thirds of tongue
  - *hyperacusis*

Prognosis

- *70% of patient have a complete recovery, 13% have had insignificant sequelae, the remainder have permanent deficit*
- *Approximately 80% of patients recover within a few weeks or months.*
- *The presence of incomplete paralysis in the first week is the most favorable prognostic sign.*

Management

- ***Prednisolone*** 1mg/kg/day in divided doses for 3 days within 72 hrs of onset, then taper to zero over next 14 days (start within 3 days of onset)
- *Prednisolone therapy modestly shortens the recovery period and improves the functional outcome.*
- *For Ramsey-Hunt syndrome, antiviral agent is added.*
    - Although two larges recently published randomized trials found no added benefit of antiviral agents ***valacyclovir*** (1000 mg daily for 5–7 days) or ***acyclovir*** (400 mg five times daily for 10 days) compared to prednisolone alone, the overall weight of evidence suggests that the combination therapy with prednisone plus valacyclovir/acyclovir may be marginally better than prednisone alone, especially in patients with severe clinical presentations.
- ***Patient education andreassurance***
- ***Adhesive patch*** or paper tape to cover over eye if corneal exposure (e.g. windy or dusty conditions, during sleep)
- ***Artificial tears*** if eye is dry and at bedtime
- Massage and facial exercises during recovery
- ***Note:*** At least 70-80% achieves full spontaneous *recovery*, higher if mild.
- *Electromyography and nerve excitability or conduction studies are a prognostic guide only.*
- *No evidence that surgical procedures to decompress the nerve are beneficial*
- *Refer to physiotherapy for better outcome*

Refer

- If recovery is not starting after 3 weeks
- For tarsorrhaphy if complete or long-standing palsy
- If unacceptable cosmetic result may benefit from plastic surgery

HEADACHE

Introduction

- *Everyday* many patients visit to the doctors with the complaint of headache.
- *Chief skill is interpreting the history to get to the diagnosis.*

Causes

COMMON CAUSES OF HEADACHE

PRIMARY HEADACHE		SECONDARY HEADACHE	
TYPE	**%**	**TYPE**	**%**
Tension-type	69	Systemic infection	63
Migraine	16	Head injury	4
Idiopathic stabbing	2	Vascular disorders	1
Exertional	1	Subarachnoid hemorrhage	<1
Cluster	0.1	Brain tumor	0.1

Source: After J Olesen et al: *The Headaches*. Philadelphia, Lippincott, Williams & Wilkins, 2005.

Acute Single Episode

- ***Meningitis:*** *Acute, severe headache with stiff neck and fever suggests meningitis. Lumbar puncture is mandatory.*
- *Often there is striking accentuation of pain with eye movement.*
- ***Encephalitis:*** Fever, odd behaviour, *seizure,* or reduced consciousness
- ***Tropical illness:*** *Malaria,* flu like illness
- ***Intracranial Hemorrhage:*** Acute, severe headache with stiff neck but without fever suggests subarachnoid hemorrhage. A ruptured aneurysm, arteriovenous malformation, or intraparenchymal hemorrhage may also present with headache alone.
- ***Sinusitis:*** Dull constant aching pain over the affected frontal or maxillary sinus, with tender overlying skin with or without post nasal drip, often accompanied by coryza
- ***Head injury:*** Cuts, *bruises,* reduced consciousness and lucid interval

Acute Recurrent Attack

- ***Migraine:*** if aura present, usually, seeing spots, *zigzag* lines, Vomiting, Nausea, Throbbing type and usually last up to 72 hours
- ***Cluster headache:*** Strictly unilateral, and typically associated with severe pain and congestion of eye, tearing, nasal congestion on the affected side, tearing, lasts for about 4-8 weeks then feels resolve for next several months then reoccur intermittently. Usually last for 90 to 120 minutes and majority occur at last in night.
- ***Glaucoma:*** Glaucoma may present with a prostrating headache associated with nausea and vomiting. The headache often starts with severe eye pain. On physical examination, the eye is often red with a fixed, moderately dilated pupil.

Subacute Headache

- ***Temporal (Giant) cell arteritis:*** *Temporal (giant cell) arteritis is an inflammatory disorder of arteries that frequently involves the extracranial carotid circulation.*
  - *It is a common disorder of the elderly*
  - *The average age of onset is 70 years, and women account for 65% of cases.*
  - *About half of patients with untreated temporal arteritis develop blindness due to*

involvement of the ophthalmic artery and its branches.
  - *Typical presenting symptoms include headache, polymyalgia rheumatica, jaw claudication, fever, and weight loss.*
  - *Headache is the dominant symptom and often appears in association with malaise and muscle aches.*
  - *Scalp tenderness is often present, The ESR is often, though not always, elevated; a normal ESR does not exclude giant cell arteritis*
- ***Venous sinus thrombosis:*** cavernous sinus thrombosis due to
  - spread of facial pustules or
  - folliculitis causing *headache*,
  - chemosis,
  - *proptosis*,
  - painful ophthalmoplegia
- ***Saggittal sinus thrombosis:***
  - *Headache*,
  - *vomiting*,
  - seizures,
  - *papilloedema*
- ***Brain tumor:***
  - *Approximately 30% of patients with brain tumors consider headache to be their chief complaint.*
  - *The head pain is usually nondescript—an intermittent deep, dull aching of moderate intensity, which may worsen with exertion or change in position and may be associated with nausea and vomiting*

Chronic Headache

- ***Chronic daily headache:*** The presence of a headache on 15 days or more per month for at least 3 months.
- ***Tension Headache:*** *tension-type headache (TTH) is commonly used to describe a chronic head-pain syndrome characterized by bilateral tight, bandlike discomfort.*
  - *The pain typically builds slowly, fluctuates in severity, and may persist more or less continuously for many days. The headache may be episodic or chronic (present >15 days per month).*
  - *A useful clinical approach is to diagnose TTH in patients whose headaches are completely without accompanying features such as nausea, vomiting, photophobia, phonophobia, osmophobia, throbbing, and aggravation with movement.*

CLASSIFICATION OF CHRONIC DAILY HEADACHE

PRIMARY		
>4 h DAILY	**<4 h DAILY**	**SECONDARY**
Chronic migraine[a]	Chronic cluster headache[b]	Posttraumatic Head injury Iatrogenic Postinfectious
Chronic tension-type headache[a]	Chronic paroxysmal hemicrania	Inflammatory, such as Giant cell arteritis Sarcoidosis Behçet's syndrome
Hemicrania continua[a]	SUNCT/SUNA	Chronic CNS infection
New daily persistent headache[a]	Hypnic headache	Medication-overuse headache[a]

[a]May be complicated by analgesic overuse.
[b]Some patients may have headache >4 h/d.
Abbreviations: SUNA, short-lasting *u*nilateral *n*euralgiform headache *a*ttacks with cranial autonomic symptoms; SUNCT, short-lasting *u*nilateral *n*euralgiform headache attacks with conjunctival injection and *t*earing.

1.

Other chronic headache

- ***Chronically increased ICP:*** e.g. brain *tumour*, worse in the morning *waking*, projectile vomiting
- Analgesic induced headache: rebound headache on stopping taking analgesics
- ***Paget's disease:*** most commonly presents with bone pain but can come with headache
- ***Depression***
- ***Dental and occular disease***
- ***Temporomandibular joint dysfunction***
- ***Trigeminal neuralgia***

How to get diagnosis of headache

Thorough history taking is essential

- ***onset:*** *acute*, subacute, *chronic*, recurrent
- ***duration:*** hours or days, episodic
- ***severity:*** severe at *onset*, first and worse headache ever, thunderclap headache is SAH
- ***site and radiation:*** commonly bi-temporal in tension *headache*, unilateral in *migraine*, frontal in raised intracranial pressure,
- ***associated features:***
  - neck stiffness, photophobia m meningitis, disorientation m encephalitis
  - *nausea*, lacrimation, seeing spots in migraine
  - *vomiting*, headache worse on waking up, diplopia in brain tumor
  - periorbital oedema, chemosis, ophthalmoplegia in cavernous sinus thrombosis

Diagnostic workup

History

- Complete systemic examination (need to emphasize on CNS examination)
- Fundoscopic and retinal examination (may need eye referral for glaucoma cases)

Basic laboratory exam

- Full blood count (neutrophil leucocytosis in pyogenic *meningitis*, lymphocytosis in viral and tuberculous meningitis)
- ESR raised in Giant Cell Arteritis
- Urea and electrolytes, liver function test for metabolic causes of encephalopathy
- Skull X-ray and Sinus X-ray if there is evidence of head injury, sinusitis
- Lumbar puncture if there is no papilloedema on fundoscopy
- Essential for diagnosis of meningitis, encephalitis and subarachnoid haemorrhage
- CT head scan: to exclude space occupying lesion

Management

Depends on the underlying cause

- If there is suspicious signs of increase intracranial pressure and meningitis, should refer to hospital immediately.
- If no emergency symptoms like severe headache, *vomiting*, neurological *deficit*, can do investigation and can be treated atoutside clinic.

Symptomatic Management

- *Simple pain killers (paracetamol or **simple analgesics)** first, then step up to **potent NSAIDs** if symptom not controlled.*
- ***Antiemetics** like metoclopramide should be added in cases of Migraine.*
- *If headache tends to be **chronic and long term NSAID usage is needed,** should consider to add **proton pump inhibitor** to prevent gastritis or erosion*
- *If pain still continues, can use narcotic-based compounds (co-codamol) or tramadol.*

Specific Management

Migraine acute treatment

- ***Oral triptan** combined with either NSAID or paracetamol (NICE)*
- ***High dose Aspirin** 900mg 6 hrly after food or paracetamol 1 gram 6 hourly after metoclopramide therapy*
- ***Alternatives:** Sumatriptan, Zolmitriptan, Ergotamine*
- *Breathing into paper bag may abort some attacks*
- *Some people find warm or cold packs to the head helps ease the pain*

Migraine prophylaxis treatment

- ***Stop Oral Contraceptive pills** if the migraine produces focal neurology, such as hemiplegia*
- *Patients with an increasing frequency of migraine attacks, or with attacks that are either unresponsive or poorly responsive to abortive treatments, are good candidates for preventive agents.*
- *A preventive medication should be for patients with five or more attacks a month*
- *Drugs must be taken daily, and there is usually a lag of at least 2–12 weeks before an effect is seen.*
- *If one drug **doesn't work** after 2-3 months **try another***
- *60% ofpatients can expect some benefits*
- *Drugs:*
    - *Propranolol 40-80 mg 8 hrly,*
    - *Topiramate 25-50 mg 12 hrly (teratogenic in pregnancy),*
    - *Pizotifen 500 µg 8 hrly PO, or 1.5 mg PO at night,*
    - *Amitryptyline 10-50 mg at night (contraindicated if IHD, coronary spasm, uncontrolled hypertension and recent lithium SSRI or Ergotamine use)*
    - *Second line drugs: **sodium valproate,** verapamil, **gabapentin** and clonidine*

Referral

- *Should refer to emergency if any fever, signs of increase intracranial pressure, neck stiffness, sensorium changes present, unilateral headache with eye pain, recent head injury (<3 month)*
- *Seek specialist opinion if headache recurrent, not responding to maximal dose of pain killers and neurological involvement*
- *New onset in patient with a history of HIV or cancer*
- *Headache with atypical aura (>1 hr ± motor weakness)*
- *Aura for first time and using COC*

TREATMENT OF ACUTE MIGRAINE

Drug	Dosage
Simple analgesics	
Paracetamol, aspirin, caffeine combination	Two tablets or caplets q6h (max 8 per day)
NSAIDs	
Naproxen	220-550 mg BD
Ibuprofen	400 mg TDS-QID
5-HT1 Agonists	
Avamigran	One or two tablets at onset, then one tablet q1/2h (max 6 per day, 10 per week)
Sumatriptan	50–100 mg tablet at onset; may repeat after 2 h (max 200 mg/d)
Zolmitriptan	2.5 mg tablet at onset; may repeat after 2 h (max 10 mg/d)
Dopamine Antagonists	
Metoclopramide	Oral 5–10 mg/d, or IV 10 mg
Prochlorperazine	Oral 1–25 mg/d, or IV 10 mg

Preventive Treatments in Migraine

Drug	Dose	Selected side effects
Propranolol	40-120 mg BD	Reduced energy Tiredness Postural symptoms Contraindicated in asthma
Amitriptyline	10-75 mg HS	Drowsiness
Topiramate	25-200 mg/day	Paresthesias Cognitive symptoms Weight loss Glaucoma Caution with nephrolithiasis
Valproate	400-600 mg BD	Drowsiness Weight gain Tremor Hair loss Fetal abnormalities Hematologic or liver abnormalities
Gabapentin	900-3600 mg/day	Dizziness Sedation
Flunarizine	5-15 mg/day	Drowsiness Weight gain Depression Parkinsonism

PARKINSONISM

SYNDROME OF PARKINSONISM

- *a general term that is used to define a symptom complex manifest by bradykinesia with rigidity and/or tremor.*
- *Among the different forms of parkinsonism, PD is the most common (approximately 75% of cases).*

Atypical parkinsonism:

- *a group of neurodegenerative conditions present with a parkinsonism (rigidity and bradykinesia) but typically have a slightly different clinical picture than PD, reflecting differences in underlying pathology.*
- *They are often characterized by early speech and gait impairment, absence of rest tremor, no asymmetry, poor or no response to levodopa, and an aggressive clinical course.*
- *In the early stages, they may show some modest benefit from levodopa and be difficult to distinguish from PD.*
- *Common forms of atypical parkinsonism are (1) multisystem atrophy, (2) progressive supranuclear palsy and (3) corticobasal degeneration.*

Secondary parkinsonism:

- *It can be associated with drugs, stroke, tumor, infection, or exposure to toxins such as carbon monoxide or manganese.*
- *Dopamine-blocking agents such as the neuroleptics are the commonest cause of secondary parkinsonism. These drugs are most widely used in psychiatry, but be aware that drugs such as metoclopramide and chloropyrazine, which are primarily used to treat gastrointestinal problems, are also neuroleptic agents and common causes of secondary parkinsonism and tardive dyskinesia*

DIFFERENTIAL DIAGNOSIS OF PARKINSONISM

Parkinson's Disease	Atypical Parkinsonisms	Secondary Parkinsonism	Other Neurodegenerative Disorders
Genetic	Multiple-system atrophy	Drug-induced	Wilson's disease
Sporadic	Cerebellar type (MSA-c)	Tumor	Huntington's disease
Dementia with Lewy bodies	Parkinson type (MSA-p)	Infection	Neurodegeneration with brain iron accumulation
	Progressive supranuclear palsy	Vascular	SCA 3 (spinocerebellar ataxia)
	Corticobasal ganglionic degeneration	Normal-pressure hydrocephalus	Fragile X–associated ataxia-tremor-parkinsonism
	Frontotemporal dementia	Trauma	Prion disease
		Liver failure	Dystonia-parkinsonism (DYT3)
		Toxins (e.g., carbon monoxide, manganese, MPTP, cyanide, hexane, methanol, carbon disulfide)	Alzheimer's disease with parkinsonism

Treatment of Drug-induced Parkinsonism

- If *possible*, stop the implicated drug. If on an antipsychotic for schizophrenia, do not stop *treatment*, but add an anticholinergic drug (e.g. Trihexyphenidyl 2 mg tds).
- Consider switching to an atypical antipsychotic drug -take specialist advice.

PARKINSON DISEASE

Definition

- *Incurable, progressive,* degenerative disease affecting the dopaminergic neurons of the substantia nigra in the brainstem, resulting in ***deficiency of dopamine*** and relative excess of acetylcholine transmitters

Clinical Features

Symptoms

- *PD is a most common and disabling chronic neurological disorder.*
- *The mean age of onset is between 58 and 62 years.*
- The incidence rises sharply over 70 years of *age*.
- The diagnosis is based on the history and examination.
- Always think of PD in an older person presenting with falls.
- Non-motor automatic dysfunctions: cognition, behavior, *mood*. Hemi-Parkinsonism can occur; all the signs are confined to one side and thus must be differentiated from hemiparesis. In fact, most cases of PD start *unilaterally*.
- Always consider drug-induced Parkinsonism. The usual drugs are phenothiazines, butyrophenones and reserpine. Tremor is uncommon but rigidity and bradykinesia may be severe.

THREE MAJOR TRAPS IN MISSING EARLY DIAGNOSIS:

- *Age:* 10-15% are <50 years at onset
- Belief that it is a disease of men:
- Absence of resting tremor (only 50% have it at onset).

Signs

- *Power,* reflexes, and sensation are usually normal.
- The earliest abnormal physical signs to appear are loss of dexterity of rapid alternating movements and absence of arm swing, in addition to increased tone with distraction.
- Positive frontal lobe signs, such as grasp and glabellar taps (only allow three blinks), *are* more common with Parkinsonism.

The Classic Tetrad of PD

- tremor (at rest)
- *rigidity*
- bradykinesia (poverty of movement)
- *postural instability*

CLINICAL FEATURES OF PARKINSON'S DISEASE

CARDINAL FEATURES	OTHER MOTOR FEATURES	NONMOTOR FEATURES
Bradykinesia	Micrographia	Anosmia
Rest tremor	Masked facies (hypomimia) equalize	Sensory disturbances (e.g., pain)
Rigidity	Reduced eye blink	Mood disorders (e.g., depression)
Gait disturbance/postural instability	Soft voice (hypophonia)	Sleep disturbances
	Dysphagia	Autonomic disturbances
	Freezing	Orthostatic hypotension
		Gastrointestinal disturbances
		Genitourinal disturbances
		Sexual dysfunction
		Cognitive impairment/dementia

PARKINSON DISEASE: SYMPTOMS AND SIGNS (CHECK-LIST)

General	Tiredness Lethargy Restlessness Trouble getting out of chair or car and turning over in bed
Tremor	Present at rest
Rigidity	Slow rate--4 to 6 cycles per second Alternating, especially arms Pill-rolling (severe cases) *Note:* may be absent or unilateral 'Cogwheel' - 'juddering' on passive extension of the forearm-feels like going through c o g s Lead pipe-limbs resist passive extension through movement (constant resistance)
Bradykinesia/hypokinesia	Slowness of initiating a movement Masked facies Relative lack of blinking Impaired convergence of eyes Excessive salivation (late) Difficulty turning over in bed and rising from a chair Slow, monotonous s p e e c h /dysarthria
Gait disorder	No arm swing on one or both sides Start hesitation Slow and shuffling Short steps *(petit pas)* Slow turning circle ('tum by numbers') 'Freezing' when approaching an obstacle Festination
Disequilibrium	Poor balance Impaired righting reflexes Falls-may be first thing that leads to presentation
Posture	Progressive forward flexion of trunk (stooped) Flexion of elbow at affected side
Autonomic symptoms	Constipation (common) Postural hypotension-may be induced by treatment Depression (early) Progressive dementia in 30-40% usually after 10 years
Psychiatric	Hallucination – either with Lewy body dementia or treatment

PRINCIPLES OF MANAGEMENT

1. Provide appropriate explanation and education.
Explain that PD is slowly progressive disease, and it may improve some but not cured by treatment.
Support systems are necessary for advanced PD.
Walking sticks (which spread the centre of gravity) with appropriate education into their use may be necessary to help prevent falls, and constant care is required, so that admission to a nursing home for end-stage disease may be appropriate.
Reduce symptoms and increase quality of life
Reduce rate of disease progression
Limit side effects of treatment

SCREENING FOR DEPRESSION

REFERRAL

- Refer all patients to Neuro-Physician for confirmation of diagnosis, advise on management and to access a multidiscipline specialist rehabilitation team.

REHABILITATION

- Liaise closely with specialistrehabilitation team

DRUG TREATMENT

- *The medical treatment of early PD should be started when functional disability appears, which is a different threshold for each patient.*
- *For patients below 65 years old, or above 65 years old but with preserved mental function and with no severe comorbidity, initial monotherapy with a dopamine agonist is advisable.*
- *Non–levodopa medications eventually will be insufficient to effectively ameliorate motor symptoms, and patients will need to be treated with levodopa (levodopa rescue).*

Dopamine Receptor Agonist

- *Dopamine agonists directly stimulate dopamine receptors, bypassing degenerating dopaminergic neurons in the brain.*
- *Non–ergot dopamine agonists are used as both monotherapy and adjunctive therapy in the treatment of Parkinson disease. They have longer half-lives (greater than 6 hours) than levodopa*
- *They also have a higher incidence of psychiatric side effects, including hallucinations and impulse control disorders as well as potential "sleep attacks" (i.e., episodes of sudden onset of sleep).*
- *Dopamine agonists include pramipexole, ropinirole rotigotine (transdermal formulation), and apomorphine, which is for subcutaneous use as a rescue medication for acute off periods.*

Levodopa (L-dopa)

- *Levodopa is the gold standard for dopamine replacement therapy in Parkinson disease.*
- *It is administered with a dopa decarboxylase inhibitor (carbidopa) to reduce its peripheral breakdown and lessen nausea.*
- *Levodopa is particularly effective in treating akinesia and rigidity, with more variable effects on tremor.*
- *Clinical research suggests that levodopa treatment does not worsen disease*
- *Progression*

COMT Inhibitors

- *COMT inhibitors reduce the breakdown of levodopa to 3-O-methyldopa and increase the plasma half-life of levodopa.*
- *COMT inhibitors are used in conjunction with levodopa to improve end-of-dose wearing-off time*
- *They may increase dyskinesia.*
- *Currently available COMT inhibitors include* ***entacapone and tolcapone.***

MAO-B (Monoamine Oxidase B) inhibitors

- *MAO-B inhibitors prevent levodopa degradation in the brain and limit its reuptake.*
- *Selegiline is a selective and irreversible MAO-B inhibitor approved as adjunctive medication to levodopa in patients with motor fluctuations.*
- *Rasagiline, a second-generation MAO-B inhibitor, lacks the amphetamine metabolites of selegiline and may be used as monotherapy and adjunct therapy.*
- *Safinamide is another potent, reversible MAO-B inhibitor as adjunct therapy in patients with Parkinson disease with motor fluctuations*

Amantadine

- *Amantadine is an N-methyl-D-aspartate (NMDA) receptor antagonist and has antidyskinetic*

properties.

- *It also improves bradykinesia, tremor, and rigidity.*

Anti-cholinergic drugs

- *Anticholinergic medications such as trihexyphenidyl and benztropine are used to treat tremor in younger patients with Parkinson disease*
- *Useful for drug-induced parkinsonism.*

NON-MOTOR FEATURES OF PARKINSON'S DISEASE

DEPRESSION

- Management of depression in people with PD should be tailored to the individual to their co-existing therapy.
- SSRI e.g.,
  - Escitalopram (5-20 mg/D)
  - Fluoxetine 20-60 mg/D
  - Sertraline 25-200 mg/D
  - Venlafaxine 37.5-187.5 mg/D

PSYCHOTIC SYMPTOMS

- Rule out secondary cause
- *Mild psychotic symptoms may not need to be actively treated if well tolerated by the patient and carers.*
- Eliminate PD medication in order of anticholinergic, *amantadine,* dopamine agonists and MAOI.
- Atypical *antipsychotics*
  - Quetiapine immediate release (50 mg tablet) 12.5-200 mg HS.
  - Clozapine (25 mg tablet) 6.25-50 mg HS can be used.

COGNITIVE IMPAIRMENT

- Compensatory strategies (e.g. *Cueing,* simplifying complex tasks)
- Cholinesterase inhibitors: Rivastigmine 1.5 mg bd (3 mg/day) titrate every 4 weeks to 6 mg bd as tolerated or Donepezil 5 mg/day after 4 weeks to 10 mg/D

SLEEP DISTURBANCES

- Good sleep hygiene should be advised such *as*
  - avoidance of stimulants (for *example,* coffee, *tea,* caffeine) in the evening
  - establishment of a regular pattern of sleep
  - comfortable bedding and temperature
  - provision of assistive devices, such as a bed lever or rails to aid with moving and *turning,* allowing the person to get more comfortable
  - restriction of daytime nap
  - advice about taking regular and appropriate exercise to induce better sleep
  - *a review of all medication and avoidance of any drugs that may affect sleep or alertness, or may interact with other medication (e.g. selegiline, antihistamines, H2 antagonists, antipsychotics and sedatives).*

Drug treatment for sleep disturbances

- *Tricyclic antidepressants*
  - *Amitriptyline 12.5-25 mg HS*
- *Non benzodiazepine hypnotic-*
  - *Zolpidem 5-10 mg HS*
- *Benzodiazepine –*
  - *Lorazepam 0.5-1 mg HS*
- *Atypical antipsychotic-*
  - *Quetiapine 12.5-50 mg HS*

RAPID EYE MOVEMENT BEHAVIOR DISORDER (RBD)

- *Mild-not need medication, ensure safety of sleeping environment.*
- *Moderate or severe-Clonazepam 0.25 mg HS and titrate according to response and tolerability up to 4 mg/day*
- *Consider melatonin (3 mg HS titrate 3 mg every week as necessary and tolerated up to 12 mg).*

CONSTIPATION

- *Dietary fiber and fluid intake*
- *Laxatives - lactulose 15-30 ml daily or bd,*
- *Stimulant laxative - Bisacodyl (Dulcolax) 5-15mg HS*

PD related pain

- *Amitriptyline*
- *Gabapentin*

TABLE. PHARMACEUTICAL TREATMENTS FOR MOTOR SYMPTOMS OF PARKINSON'S DISEASE

ACTION	DRUGS	AVAILABLE FORMULATIONS	COMMON SIDE EFFECTS
Dopamine precursor with metabolic inhibitor	Levodopa/carbidopa	Tablets (IR, ER) Dissolving tablets	Nausea, vomiting, orthostatic hypotension, vivid dreams, hallucinations, delusions
MAO inhibitors reduce levodopa and dopamine degradation	Rasagiline	Tablets	Hypertension, orthostatic hypotension, potentiation of levodopa-related side effects
	Selegiline	Tablets, capsules, orally disintegrating tablets	
	Safinamide	Tablets	
COMT inhibtors reduce levodopa and dopamine degradation	Entacapone	Tablets	Potentiaiton of levodopa-related side effects, diarrhea, orange color of urine
	Tolcapone	Tablets	Potentiation of levodopa-related side effects, hepatotoxicity,
Dopamine receptor agonists	Pramipexole	Tablets, ER tablets	Nausea, vomiting, orthostatic hypotension, hallucinations, psychosis, impulse control disorders, peripheral edema
	Ropinirole	Tablets, ER tablets	
	Rotigotine	Transdermal patches	
	Apomorphine	Subcutaneous injection	
Other/Unknown	Anticholinergics (trihexyphenidyl, benztropine)	Tablets	Dry mouth, dry eyes, confusion, hallucinations, constipation, urinary retention
	Amantadine	Tablets, capsules, ER tablets	Dry mouth, dry eyes, livedo reticularis, confusion, hallucinations, constipation, urinary retension, peripheral edema

Abbreviations: COMT, catechol-*o*-methyltransferase; ER, extended release; IR, immediate release; MAO, monoamine oxidase.

Symptoms	Treatment
Depression	• Norepinephrine antidepressants such as: Amitriptyline, imipramine, nortriptyline, and desipramine • SSRI's such as fluoxetine and nefazodone • Second generation non-ergot agonists, for example, Pramipexole and ropinirole • Psychotherapy
Anxiety	• Buspirone and SSRI • Cognitive Behavioral Therapy
Apathy	• Piribedil • Dopamine enhancing medication, for example, Pramipexole and ropinirole
Dementia	• Rivastigmine
Front Executive Dysfunction	• Cholinesterase inhibitors
EDS	• Correct timing of medication • CNS stimulants: Modafinil, Ritalin • Avoid benzodiazepine
MCI	• Cholinesterase inhibitors
RBD	• Clonazepam • Donepezil • Melatonin • Pramipexole
Incontinence	• Anticholinergic drugs • α-Blockers • Pelvic floor muscle therapy • Lifestyle changes
Hyperhidrosis	• Dopamine agonist therapy • Apomorphine
Drooling	• Anti-Parkinson's drug therapy • Speech and language therapy • Chewing gum • Trihexyphenidyl • Amitriptyline
Sexual dysfunction	• ED: Phosphodiesterase inhibitors, for example, Sildenafil • Hypersexuality: Pergolide mesylate with L-DOPA • Counseling
Postural hypotension	• Fludrocortisone
Non-motor symptom fluctuation	• COMT inhibitors • IMAOB • Apomorphine infusion • Subthalamic deep brain stimulation • Amatine • Free salt intake • Increased fluid intake
Pain	• Musculoskeletal pain: NSAIDS, physical therapy and exercise program • Dystonic pain: deep brain stimulation, trihexyphenidyl • Pain from akathisia: managed with dopaminergic treatments • Central pain: analgesics, opiates, and atypical neuroleptics
Speech dysfunction	• Behavioral speech therapy • LSVT LOUD
Constipation	• Diet of high fiber foods and fluids • Exercise • Reduction of anticholinergic medication

EDS: Excessive day time sleepiness; MCI: Mild cognitive impairment; PLMS: Periodic limb movements of sleep; RBD: REM behavioral disorder; RLS: Restless leg syndrome.

Symptoms	Treatment
	• Macrogol • Milk of magnesia • Psyllium • Polyethylene glycol • Laxatives and enemas as a last resort
Dysphagia	• Softening solid food and thickening liquids before consumption • Gastrostomy
Ocular dysfunction	• Artificial tears • Bifocal and progressive lenses
RLS	• Pramipexole, ropinirole • Pregabalin • Simplify psychoactive medications with atypical neuroleptics, for example, clozapine • Gabapentin enacarbil to treat PLMS • Oxycodone with naloxone

EDS: Excessive day time sleepiness; MCI: Mild cognitive impairment; PLMS: Periodic limb movements of sleep; RBD: REM behavioral disorder; RLS: Restless leg syndrome.

STROKE

Definition

A focal neurological deficit lasting longer than 24 hours caused by intracerebral hemorrhage or infarction.

Completed stroke: The deficit has become fixed and maximal, usually within 6 hrs.
Stroke in evolution: An enlarging neurological deficit, presumably due to infarction, which increases over 24-48 hours.
Transient cerebral ischaemic attack (TIA): A transient focal neurological deficit due to cerebral ischemia, lasting not more than 24 hr. of initial symptoms, but most TIAs last <1 h. The causes of TIA are similar to the causes of ischemic stroke, but because TIAs may herald stroke they are an important risk factor that should be considered separately.
Patients with a history of TIA have a 20% risk of stroke in the following month with higher risk in the first 72 hr. Risk can be predicted using the ABCD2 scoring system.
Amaurosis fugax: Amaurosis fugax, or transient monocular blindness, is a form of TI occurs from emboli to the central retinal artery of one eye. This may indicate carotid stenosis as the cause or local ophthalmic artery disease.

ACUTE STROKE

Definition of CNS infarction:

CNS infarction is brain, spinal cord, or retinal cell death attributable to ischemia, based on

1. *pathological, imaging, or other objective evidence of cerebral, spinal cord, or retinal focal ischemic injury in a defined vascular distribution; or*
2. *clinical evidence of cerebral, spinal cord, or retinal focal ischemic injury based on symptoms persisting ≥24 hours or until death, and other etiologies excluded.*

Definition of ischemic stroke:

- *An episode of neurological dysfunction caused by focal cerebral, spinal, or retinal infarction.*

Definition of silent CNS infarction:

- *Imaging or neuropathological evidence of CNS infarction, without a history of acute neurological dysfunction attributable to the lesion.*

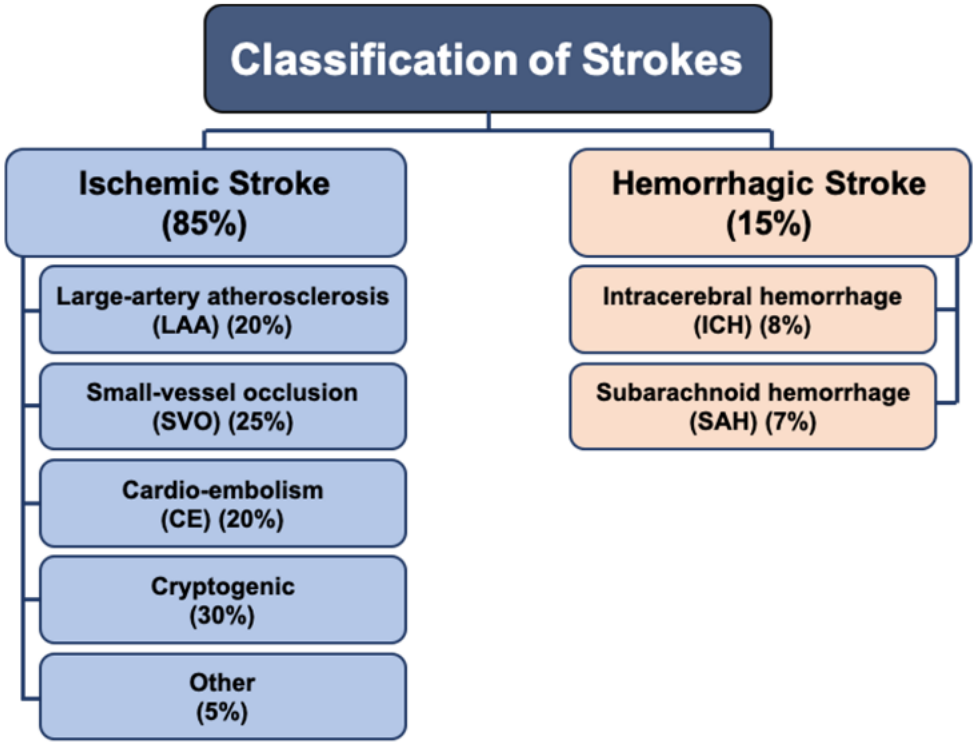
Definition of intracerebral hemorrhage:

- *A focal collection of blood within the brain parenchyma or ventricular system that is not caused by trauma.*

Definition of stroke caused by intracerebral hemorrhage:

- *Rapidly developing clinical signs of neurological dysfunction attributable to a focal collection of blood within the brain parenchyma or ventricular system that is not caused by trauma.*

Classification of stroke



RISK FACTORS FOR STROKE

Modifiable risk factors	Non-modifiable risk factors
Hypertension	Age
Cardiac disease	Gender
Diabetes	Race
Hyperlipidaemia	Ethnicity
Cigarette smoking	Family history of stroke
Alcohol consumption	
Illicit drug use	
Lifestyle factors: obesity, lack of physical activity and poor diet	
Oral contraceptive	
Migraine	
Atrial fibrillation	
Transient ischaemic attack	

PRESENTATION:

Symptoms strongly associated with stroke are sudden onset of:

- Change in speech
- Visual loss or diplopia

- Paralysis or weakness
- Numbness or tingling
- Non-orthostatic d i z z i n e s s

History: Sudden onset of CNS symptoms or stepwise progression of symptoms over hours or days

Examination: Conscious level may be reduced or normal: Neurological signs (including dysphagia and incontinence): BP, heart rate and rhythm, heart murmurs; carotid bruits; Systemic signs of infection or neoplasm.

MANAGEMENT OF ACUTE STROKE

- Admit all patients to an acute stroke unit unless there is a reason why that would be inappropriate, for *instance*, the patient is already in the terminal stage of another illness.

Assessment of patient by using BEFAST (Balance Eye Face Arm Speech Time)

To look for:

- A new symptom of trouble with balance and/or coordination
- A new symptom of suddenly blurred or double vision or a sudden loss of vision in one or both eyes without pain
- A new symptom of asymmetry of mouth; (acute facial paresis)
- A new symptom of inability to hold one arm out for 5 seconds compared to the other arm: (arm drift)
- A new symptom of slurred speech or new inability to understand or say words. (abnormal speech)

Patients who are candidates for brain imaging within hour of the onset of symptoms are:

- Those who are candidates for thrombolysis
- Patients on anticoagulants or with a bleeding tendency;
- Those with depressed level of consciousness (Glasgow Coma Score< 13);
- Those with progressive or fluctuating symptoms
- Those with signs of alternative pathology: neck stiffness, papilledema, fever

Those whose stroke begins with severe headache of sudden onset.

Assess the urgency or referral using ABCD2 (TIA)

Score the patient' risk of stroke in the next 30 days as follows:

- *score is a risk assessment tool designed to improve the prediction of short-term stroke risk after a transient ischemic attack (TIA).*
- The score is optimized to predict the risk of stroke within 2 days after a TIA, but also predicts stroke risk within 90 days.
- *The ABCD2 score is calculated by summing up points for five independent factors.*

Risk factor	Points	Score
Age • ≥ 60 years	1	
Blood Pressure • Systolic BP ≥ 140 mmHg or Diastolic BP ≥ 90 mmHg	1	
Clinical features of TIA (choose one) • Unilateral weakness with or without speech impairment OR • Speech impairment without unilateral weakness	2 1	
Duration • TIA duration ≥ 60 minute • TIA duration 10-59 minutes	2 1	
Diabetes	1	
Total		

High risk (6-7 points) Median risk (4-5 points) Low risk (0-3 points)
Admit if score is >l in <l week
Between 2-4 (median & high-risk group) must be assessed by a specialist within 24 hours

PREVENTION OF STROKE

SECONDARY PREVENTION

The risk of recurrence is 8% per year with the additional risk of other manifestation of cardiovascular disease.

Set up a cardiovascular disease register.

- *Lifestyle changes:* Assist smokers to stop and urge weight reduction, dietary *change,* reduction of alcohol intake to within sensible limits and exercise where appropriate.
- *Antiplatelet drugs:* Aspirin 75 mg daily or clopidogrel 75 mg daily *or* cilostazol 50 to 100 mg BD unless the stroke is likely to have been hemorrhage.
- *Blood pressure:* Once the initial phase of stroke is over (usually about 2 weeks), control any hypertension to < 140/85 or 130/80 in patients ***Atrial fibrillation:***
- Arrange anticoagulation with warfarin whether valvular heart disease is present or not.
- *Co- incidental cardiac disease: either;*
  - arranges *echocardiography*
  - anticoagulated
- *Raised cholesterol:* Use a statin and diet to lower cholesterol as recommended in the prevention of coronary heart *disease*
- *Carotid artery surgery for symptomatic extracranial carotid artery severe stenosis (70-99%).* Check that patient has been considered for carotid endarterectomy or angioplasty *if* the stroke was in the appropriate carotid artery territory.
- *With diabetes:* Treatment with Perindopril 4mg *daily+/-* a thiazide reduces the risk of further stroke by 28%.
- *ACE inhibitor:* Give an ACE inhibitor (e. g. ramipril 2.5mg daily increasing to ***10*** mg daily)

PRIMARY PREVENTION OF STROKE

Prevention should be targeted towards patients with one or more of these factors.

- *Hypertension:* Control BP to< 140/85 mmHg.
- *Atrial fibrillation:* Advise the patient about anticoagulation or antiplatelet treatment according

to risk.

- *Aspirin:* Recommend aspirin in primary prevention only high- risk patients.
- *Cholesterol:* Assess the patient's risk from all occlusive artery disease Treatment with atorvastatin 20 mg daily prevents stroke in patients at high risk. In this case high risk was defined as having occlusive cardiovascular disease other than stroke, or diabetes or hypertension in men aged at least 65.
- *ACE inhibitor:* Ramipril decreases the risk of stroke by 32% despite lowering the BP by only 4/3 mmHg
- *Alcohol* -Advise the patient to keep alcohol consumption of < 14 units per week. Regular light to moderate consumption of alcohol seems to decrease the risk of ischaemic stroke by reducing atherothrombotic events.
- *Smoking:* Encourage smokers to stop.
- Encourage *lifestyle and behavior modification:* (including moderate exercises for 30 mins on 5 days a week) that are effective in the prevention of cardiovascular disease and stroke. Weight (a BMI >28 and a large girth (waist circumference>99cm) are independent risk factors for stroke, at least in older men.

SPECIFIC MANAGEMENT

For Cerebral Infarct

- Thrombolytic therapy IV rtPA (IV tissue plasminogen activator)
- *Antiplatelet*
- Anticoagulant heparin, warfarin

For Intracerebral Heamorrhage

- Control hypertension
- Reduce the cerebral edema by mannitol infusion and dexamethasone injection
- ***REFER for*** urgent neurosurgical clot evacuation
- Antiplatelet drugs and anticoagulants are contraindicated.

Neurological Rehabilitation Problems

Principle of rehabilitation & elderly case

Use of Assessments/measures

Central to the management of frailty disability use validated measures by all team members (e.g. disability scores, PHQ-9). Reassess regularly

Team Works

Good outcomes are associated with clinicians working as a team towards a common goal with patients and their families (or carers) included as team members

Goal Setting

Goal must be meaningful, challenging but achievable. Use short and long term goals involve the patient ± carer(s). Regularly renew, review, and adapt

Underlying approach to therapy

All approaches focus on modification of impairment with everyday activities & improvement in function

Intensity/duration of therapy

How much therapy is needed? Is there minimum threshold below which there is no benefit at all?

BOWEL PROBLEMS

Dysphagia:

- Common. Fluids are more difficult to swallow than semisolids.
- Formal assessment by trained staff is essential. Feeding through NG tube or percutaneous endoscopic gastrostomy (PEG) may be needed long or short term in terminal disease (e.g., MND). Weigh provision of nutrition against prolongation of poor-quality life.

Constipation

- Difficulty with defecation or bowel open <2 times/wk.
- Increase fluid intake and increased fiber in diet, if no *improvement,* use laxative po ± regular suppositories/enema.

Incontinence

- Exclude overflow due to constipation.

BLADDER PROBLEM

UTI

- *If suspected, check urine dipstick ± send MSU for microscopic examination, C&S and start antibiotics. If >3 proven UTI in* ***1*** *year,* ***REFER*** *to urology).*

Urgency

- *Modify environment, e.g., provide commode, try anticholinergic e.g., tolterodine 2mg bd. If not better, REFER to urology.*

SKIN BREAKDOWN

- *Prevented by positioning, mobilization, good skin care, management of incontinence, pressure relieving aids (e.g., special mattress/cushion).*

FATIGUE

- *Consider & treat factors that might be responsible depression, disturbed sleep, chronic pain. poor nutrition*

Action

- *Review support, diet and medication, encourage graded aerobic exercise.*

DEPRESSION AND ANXIETY

- *Common. Diagnosis can be difficult. Standard questionnaires e.g.* ***(PHQ9)*** *are helpful for screening.*

2. ***Action***
   - *Give opportunities to talk about the impact of the illness on lifestyle. Jointly identify areas where positive changes could be made e.g. referral to day care to widen social contact. Consider antidepressant medication or REFER.*

RESPIRATORY INFECTION

- *Common. Treat with antibiotics unless in terminal stages of disease. Advice pneumococcal and influenza vaccination.*

MOTOR IMPAIRMENT

- *Aim to maintain physical independence, involve physiotherapy. Often only 2-3 visits are needed.*
- *Involve OT (occupational therapy)*
- *A task-oriented approach is used (e.g., learning how to dress). Can also supply/advice on aids and appliances, e.g., wheelchairs.*
- *REFER for social services OT assessment for aids, equipment or adaptations are needed for the home.*
- *Give information about driving/employment where appropriate. Spasticity ± muscle & joint contractures*

- *Treat with physiotherapy (usually involving exercise ± splintage) ± drugs. Antispasticity drug include baclofen 5 mg bd, or tizanidine 2 mg od.*

PATIENT HEALTH QUESTIONNAIRE-9
(P H Q - 9)

Over the last 2 weeks, how often have you been bothered by any of the following problems? (Use ✔ to indicate your answer)	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. *Little interest or pleasure in doing things*	0	1	2	3
2. *Feeling down, depressed, or hopeless*	0	1	2	3
3. *Trouble falling or staying asleep, or sleeping too much*	0	1	2	3
4. *Feeling tired or having little energy*	0	1	2	3
5. *Poor appetite or overeating*	0	1	2	3
6. *Feeling bad about yourself – or that you are a failure or have let yourself or your family down?*	0	1	2	3
7. *Trouble concentrating things, such as reading the newspaper or watching television*	0	1	2	3
8. *Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual*	0	1	2	3
9. *Thoughts that you would be better off dead or of hurting yourself in some way*	0	1	2	3
FOR OFFICE CODING	0	+	+	+
			= Total Score	

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	**Somewhat difficult**	**Very difficult**	**Extremely difficult**
☐	☐	☐	☐

TRIGEMINAL NEURALGIA (TIC DOULOUREUX)

- Trigeminal neuralgia is among the most excruciating of pain syndromes seen in office practice. Most patients are middle-aged or elderly. Some have found the pain so intolerable that they consider suicide. The primary physician needs to know how to use available medical therapies and when to send the patient for a neurosurgical consultation.

Clinical Presentation and Natural History

- The illness is characterized by paroxysms of unilateral lancinating facial pain involving the jaw, gums, lips, or maxillary region (areas corresponding to branches of the trigeminal nerve).
- The pain seldom lasts more than a few seconds or a minute or two.
- The paroxysms, experienced as single jabs or clusters, tend to recur frequently, both day and night, for several weeks at a time.
- They may occur spontaneously or with movements of affected areas evoked by speaking, chewing, or smiling.
- The maxillary and mandibular divisions are affected more frequently than the ophthalmic division. Minor, repeated contact with a **trigger zone** often precipitates an attack, setting off fierce pain that usually lasts up to a few minutes.
- Repeated paroxysms pain may continue for several weeks. The disease is strictly unilateral and there is demonstrable sensory or motor deficits, features that distinguish it from trigeminal pain with other causes, such as tumor.
- The condition can be chronic, although spontaneous remissions are not uncommon. Women (60%) are more often affected than men, and the incidence rises with age.
- The etiology of the condition is unknown. Despite much speculation, no definitive evidence links it to herpes simplex virus. The pathologic lesion found in some electron micrographs appears to be a breakdown of myelin.
- Compression of the trigeminal nerve root by a blood vessel, most often the superior
- cerebellar artery or on occasion a tortuous vein, is the source of trigeminal neuralgia in a substantial proportion of patients.
- In cases of vascular compression, age-related brain sagging and increased vascular thickness and tortuosity may explain the prevalence of trigeminal neuralgia in later life.
- Trigeminal neuralgia may be a symptom of multiple sclerosis, which should be considered in a young adult with bilateral trigeminal neuralgia, BUT it is infrequent as the initial or sole manifestation of this disease. Similarly, trigeminal neuralgia is uncommonly the isolated symptom of a cerebellopontine angle tumor.
- Both diseases can be demonstrated by magnetic resonance imaging (MRI).

Differential Diagnosis

- Although few conditions absolutely mimic the lancinating pain of trigeminal neuralgia, pain referable to structures of the face may be similar.
- Conditions that should be excluded include dental disease, temporomandibular joint dysfunction, temporal arteritis, sphenoid sinusitis, and cluster headache.
- The preemption pain of herpes zoster, which occurs in the distribution of the ophthalmic division of the trigeminal more frequently than in the distribution of the other two divisions, and postherpetic neuralgia, which follows the skin eruption by a few weeks, are two other entities to be considered.
- Physical examination should be normal without evidence of sensory loss in the distribution of the trigeminal nerve.

Principles Of Management

- **Treatment is symptomatic**.
- Because drug therapy may provide adequate control of symptoms, surgical intervention should be reserved for refractory cases.
- Pharmacologic agents found particularly useful in the condition include carbamazepine, oxcarbazepine, and baclofen.

Pharmacologic Therapy

Carbamazepine

Drug therapy with carbamazepine is effective in ~50– 75% of patients.

- Carbamazepine should be started as a single daily dose of 100 mg taken with food and increased gradually (by 100 mg daily in divided doses every 3–4 days) until substantial (>50%) pain relief is achieved.
- Most patients require a maintenance dose of 200 mg qid. Doses >1200 mg daily provide no additional benefit.
- Dizziness, nausea, diarrhea, imbalance, sedation, and rare cases of agranulocytosis are the most important side effects of carbamazepine.
- Skin rash often precedes other serious side effects; it may be erythematous and pruritic. The onset of a skin rash is an early indication to halt therapy
- If treatment is effective, it is usually continued for several months and then tapered as tolerated.
- Unfortunately, by 3 years, 30% of patients no longer obtain relief by taking carbamazepine.

Oxcarbazepine

- Oxcarbazepine (300–1200 mg bid) is an alternative to carbamazepine, has less bone marrow toxicity, and probably is equally efficacious.
- Serum sodium must be followed carefully because this is a common metabolic derangement with oxcarbazepine.
- The starting dose is 300 mg in the evening and the daily dose can be titrated upward to a target daily dose of 900 to 1800 mg in three divided doses.
- If these agents are not well tolerated or are ineffective, lamotrigine 400 mg daily or phenytoin, 300–400 mg daily, are other options

Baclofen

- Baclofen, an agent that enhances synaptic transmission of GABA and, has been used with success in a high percentage of cases.
- It can be administered, either alone or in combination with an anticonvulsant.
- Some now consider it the drug of choice for trigeminal neuralgia. The initial dose of 10 mg twice daily is increased slowly.
- The usual maintenance dose is 60 to 80 mg/day (divided into TDS or QID).
- Sedation and nausea are the most common limiting side effects.
- Abrupt cessation of therapy can lead to hallucinations and seizur*es; therefore, discontinuation must be gradual.*

Combination Therapy and Use of Other Agents

- Combination therapy may be necessary because trigeminal neuralgia tends to increase in severity.
- Carbamazepine and Baclofen or Either with Phenytoin
- *These agents in combination or either in conjunction with phenytoin can provide additional relief*
- The usual daily dose of phenytoin that achieves therapeutic serum levels is 300 to 400 mg. Although phenytoin is not as effective as carbamazepine as monotherapy, it may be a useful add-

on *treatment*, and parenteral phenytoin is sometimes used emergently for patients who are having a flurry of severe attacks and cannot take medicine orally.

Gabapentin

- This drug may be prescribed if other medicines are failed, but sedation can be a limiting side effect if high doses are needed.
- If need to use, gabapentin may be started at a dose of 300 mg at bedtime and then increased by 300 mg every 4 days until a total of 1,800 mg is being taken divided into three doses daily.

Narcotics

- Narcotics should be avoided because they are unlikely to be helpful for long-term control of pain and may lead to drug dependency.

Tricyclics

- Amitriptyline, although useful for postherpetic neuralgia and other forms of neuropathic *pain,* is not helpful for trigeminal *neuralgia*.

Surgical Approaches (If available)

- Surgical approaches can be considered when drug therapy proves inadequate and pain is incapacitating.

Percutaneous Radiofrequency Rhizotomy

- This is the least invasive procedure that produces the greatest relief of symptoms and the least loss of sensation.
- The small pain fibers are destroyed, whereas the more heavily myelinated touch fibers that supply the relevant zone are spared.
- The procedure has produced short-term relief in 80% of those treated *once;* only 5% have experienced an undesirable loss of sensation.
- Late recurrences occur in up to 50% at 5 *years,* but pain relief is achieved with a repeated procedure in these patients.
- *It is used less often now than in the past.*

Microvascular Decompression

- *The most widely used method currently and is to relieve pressure on the trigeminal nerve as it exits the pons*
- This procedure affords the best chance of long-term pain relief without sensory deficit, but entails much more complicated surgery, reserving it for younger patients.
- *It requires general anesthesia and a suboccipital craniotomy.*
- *More than 90% of operated patients have compression of the trigeminal nerve by an artery or vein.*
- Muscle tissue or synthetic material is used to decompress the nerve with 85% I -year success rate.

Gamma knife radiosurgery

- *It is also utilized for treatment and results in complete pain relief in more than two-thirds of patients and a low risk of persistent facial numbness; the response is sometimes long-lasting.*
- *Recurrent pain develops over 2–3 years in half of patients.*
- *Compared with surgical decompression, gamma knife surgery appears to be somewhat less effective but has few serious complications.*

Patient Education

- The patient needs to be told that the condition can be controlled and is often self-limited. This knowledge can prevent a distraught sufferer from attempting suicide. The physician must keep in mind the anguish these patients may experience; they require close support. Obvious ways to prevent attacks, such as avoiding repetitive contact with the trigger *zone*, have usually been discovered by the *patient*, but they are worth mentioning. Patients treated with carbamazepine must be informed of the risk for marrow suppression and the importance of regular monitoring of the complete blood cell count.

PERIPHERAL NEUROPATHY: DIFFERENTIAL DIAGNOSIS AND MANAGEMENT

Definition

- Peripheral nerves serve different motor, sensory, and autonomic functions.
- The term peripheral neuropathy is usually used to describe symmetric and universal damage to adjacent nerves. The damage and clinical manifestations are usually located distally with a proximal *progression*.

Relevance to general practice

- One study estimated that the prevalence of peripheral neuropathy in the family medicine setting is 8% in persons 55 years and older. The prevalence in the general population may be as high as 2.4%. A community-based study estimated the prevalence of peripheral neuropathy in patients with type 2 diabetes mellitus to be 26.4 percent.

Diagnosis workup

- Peripheral neuropathy can be caused by a variety of systemic *diseases*, toxic exposures, medications, infections, and hereditary disorders. Several disorders can damage peripheral nerves and cause peripheral *neuropathy;* it is important to differentiate actual neuropathy from other disorders that can have a similar clinical presentation.

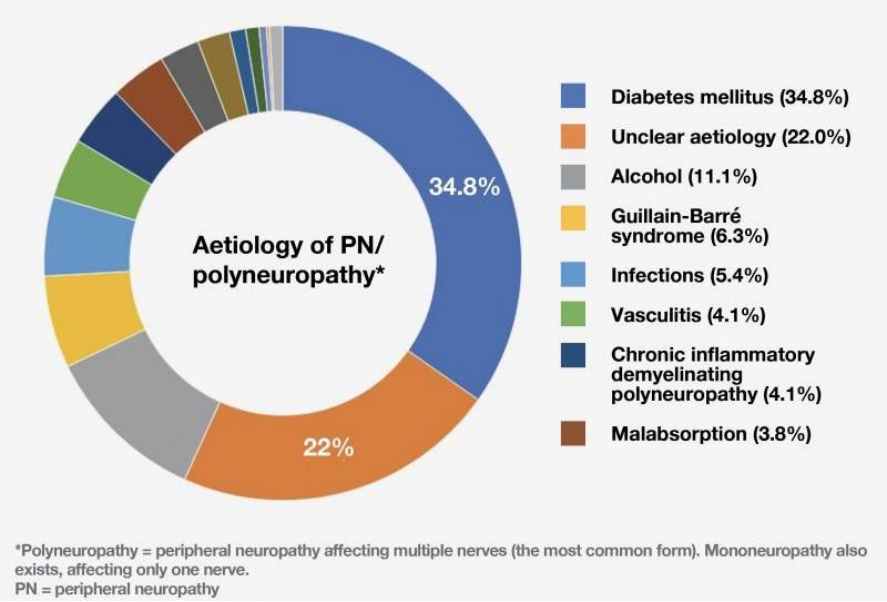
Causes

Table 1. Causes of Peripheral Neuropathy Based on Clinical Presentation

Conditions causing mononeuropathy • Acute (trauma-related) • Chronic (nerve entrapment)	**Conditions causing neuropathy with autonomic Features** • Alcoholism • Amyloidosis • Chemotherapy-related neuropathy • Diabetes • Heavy metal toxicity • Paraneoplastic syndrome • Porphyria • Primary *dysautonomia* • Vitamin B12 deficiency
Disorders causing mononeuropathy *Acute* • Diabetes mellitus* • Multifocal motor neuropathy • Vasculitic syndromes *Chronic* • Acquired immunodeficiency syndrome • Leprosy* • Sarcoidosis	**Conditions causing painful neuropathy** • Alcoholism • Amyloidosis • Chemotherapy (heavy metal toxicity) • Diabetes • Idiopathic polyneuropathy • Porphyria

May cause symmetric peripheral neuropathy.

The most common treatable causes are diabetes, hypothyroidism and nutritional deficiencies



General Approach

In approaching a patient with a neuropathy, the clinician has three main goals:
(1) identify where the lesion is,
(2) identify the cause, and
(3) determine the proper treatment.
The first goal is accomplished by obtaining a thorough history, neurologic examination, and electrodiagnostic and other laboratory studies

APPROACH TO NEUROPATHIC DISORDERS: SEVEN KEY QUESTIONS	
1.	**What systems are involved?**
	Motor, sensory, autonomic, or combinations
2.	**What is the distribution of weakness?**
	Only distal versus proximal and distal
	Focal/asymmetric versus symmetric
3.	**What is the nature of the sensory involvement?**
	Temperature loss or burning or stabbing pain (e.g., small fibre)
	Vibratory or proprioceptive loss (e.g., large fibre)
4.	**Is there evidence of upper motor neuron involvement?**
	Without sensory loss
	With sensory loss
5.	**What is the temporal evolution?**
	Acute (days to 4 weeks)
	Subacute (4-6 weeks)
	Chronic (>6 weeks)
6.	**Is there evidence for a hereditary neuropathy?**
	Family history of neuropathy
	Lack of sensory symptoms despite sensory signs
7.	**Are there any associated medical conditions?**
	Cancer, diabetes mellitus, connective tissue disease or other autoimmune diseases, infection (e.g., HIV, Lyme disease, leprosy)
	Medications including over-the-counter drugs that may cause a toxic neuropathy
	Preceding events, drugs, toxins

Information from History and Physical examination
Pattern Recognition Approach To Neuropathic Disorders

Pattern 1: Symmetric proximal and distal weakness with sensory loss
Consider: inflammatory demyelinating polyneuropathy (GBS and CIDP)
Pattern 2: Symmetric distal sensory loss with or without distal weakness
Consider: cryptogenic or idiopathic sensory polyneuropathy (CSPN), diabetes mellitus and other metabolic disorders, drugs, toxins, hereditary (Charcot-Marie-Tooth, amyloidosis, and others)
Pattern 3: Asymmetric distal weakness with sensory loss
With involvement of multiple nerves
Consider: multifocal CIDP, vasculitis, cryoglobulinemia, amyloidosis, sarcoid, infectious (leprosy, Lyme, hepatitis B or C, HIV, CMV), hereditary neuropathy with liability to pressure palsies (HNPP), tumor infiltration
With involvement of single nerves/regions
Consider: may be any of the above but also could be compressive mononeuropathy, plexopathy, or radiculopathy
Pattern 4: Asymmetric proximal and distal weakness with sensory loss
Consider: polyradiculopathy or plexopathy due to diabetes mellitus, meningeal carcinomatosis or lymphomatosis, hereditary plexopathy (HNPP, HNA), idiopathic
Pattern 5: Asymmetric distal weakness without sensory loss
With upper motor neuron findings
Consider: motor neuron disease
Without upper motor neuron findings
Consider: progressive muscular atrophy, juvenile monomelic amyotrophy (Hirayama disease), multifocal motor neuropathy, multifocal acquired motor axonopathy
Pattern 6: Symmetric sensory loss and distal areflexia with upper motor neuron findings
Consider: Vitamin B_{12}, vitamin E, and copper deficiency with combined system degeneration with peripheral neuropathy, hereditary leukodystrophies (e.g., adrenomyeloneuropathy)
Pattern 7: Symmetric weakness without sensory loss
With proximal and distal weakness
Consider: spinal muscular atrophy
With distal weakness
Consider: hereditary motor neuropathy ("distal" SMA) or atypical CMT
Pattern 8: Asymmetric proprioceptive sensory loss without weakness
Consider causes of a sensory neuronopathy (ganglionopathy):
Cancer (paraneoplastic)
Sjögren's syndrome
Idiopathic sensory neuronopathy (possible GBS variant)
Cisplatin and other chemotherapeutic agents
Vitamin B_6 toxicity
HIV-related sensory neuronopathy
Pattern 9: Autonomic symptoms and signs
Consider neuropathies associated with prominent autonomic dysfunction:
Hereditary sensory and autonomic neuropathy
Amyloidosis (familial and acquired)
Diabetes mellitus
Idiopathic pandysautonomia (may be a variant of Guillain-Barré syndrome)
Porphyria
HIV-related autonomic neuropathy
Vincristine and other chemotherapeutic agents

Abbreviations: CIDP, chronic inflammatory demyelinating polyneuropathy; CMT, Charcot-Marie-Tooth disease; CMV, cytomegalovirus; GBS, Guillain-Barré syndrome; HIV, human immunodeficiency virus; HNA, hereditary neuralgic amyotrophy; SMA, spinal muscular atrophy.

Clinical Pearls

- When a patient presents with symptoms of distal numbness, tingling and pain, or weakness, the first step is to d**etermine whether the symptoms are the result of peripheral neuropathy or of a lesion in the CNS,** and whether a **single nerve root, multiple nerve roots, or a peripheral nerve plexus** is involved.
- **CNS lesions** may be associated with other features, such as speech difficulty, double vision, ataxia, cranial nerve involvement, or, in cases of **myelopathy**, impairment of bowel and bladder functions. Deep tendon reflexes are usually brisk, and muscle tone is spastic.
- Lesions of the peripheral nerve **roots** are typically **asymmetric**, follow a **dermatomal pattern** of sensory symptoms, and may have associated neck and low back pain.
- Lesions of the **plexus** are **asymmetric** with sensorimotor involvement of **multiple nerves in one extremity**.
- The neuropathies must be further characterized by **onset and chronicity** of symptoms, the pattern and extent of involvement, and the type of nerve fibers involved (i.e., sensory, motor, or autonomic).
- In the early stages of peripheral neuropathy, patients typically present with progressive symptoms, including sensory loss, numbness, and pain or burning sensations in distal limbs in a "stocking and glove" distribution. Over time, the numbness may extend proximally, and mild distal muscle weakness and atrophy may occur.
- In disorders that cause acute peripheral neuropathy, such as those produced by toxic exposures, patients may present with similar but more fulminant symptoms, and **pain predominates; symptoms also typically have a faster progression.**
- In other disorders, such as acute inflammatory demyelinating disorder (i.e. Guillain- Barre syndrome) and chronic inflammatory demyelinating polyneuropathy, weakness rather than sensory loss typically predominates and may be the earliest sign of the disease.
- The presence of neuropathic symptoms, decreased ankle reflexes, and decreased distal sensations, regardless of distal muscle weakness and atrophy, makes the diagnosis of peripheral neuropathy likely.
- Some causes of peripheral neuropathy are characterized by mononeuropathy, some involve multiple *nerves,* and others have ***autonomic dysfunction*** or pain prominence.
- Risk factors and medical comorbidities associated with peripheral neuropathy

Diagnostic Testing

The evaluation of a patient with peripheral neuropathy starts with simple blood tests, including

- a complete blood *count,*
- *comprehensive metabolic profile,*
- *erythrocyte sedimentation rate and*
- fasting blood glucose,
- vitamin B12, and
- *thyroid stimulating hormone levels.*

Additional tests, if clinically indicated, may include a paraneoplastic panel to evaluate for occult malignancy;

- anti-myelin-associated glycoprotein antibodies to evaluate for sensorimotor *neuropathies;*
- antiganglioside antibodies;

- cryoglobulins;
- cerebrospinal fluid analysis to evaluate for chronic inflammatory demyelinating neuropathy;
- anti-sulfatide antibodies to evaluate for autoimmune polyneuropathy; and
- genetic testing if hereditary peripheral neuropathy is suspected
- lumbar puncture and CSF analysis may be helpful in diagnosing Guillain-Barre syndrome and chronic inflammatory demyelinating *neuropathy;* CSF protein levels may be elevated in patients with these conditions *(albumin cytologic dissociation)*

Tests Indicated in Patients with Peripheral Neuropathy in complete resource setting

Tests	*Clinical disorders*
Routine	
*Complete blood count	
*Comprehensive metabolic panel -	
*Erythrocyte sedimentation rate –	
*Fasting blood glucose level	
*Thyroid-stimulating hormone level	
*Vitamin Bl2 level	
If indicated by clinical suspicion	
*Glucose tolerance test, Al C level	Diabetes mellitus
* HIV antibodies	HIV
*Hepatic panel	Liver disorders
Lyme antibodies	Lyme disease
*Rapid plasma regains, VDRL	Syphilis
*Urinalysis (including 24-hour urine collection)	Heavy metal toxicity, porphyria
For multiple myeloma	
*Urine and serum protein electrophoresis with Immunofixation	Demyelinating neuropathy
Angiotensin-converting enzyme levels	Sarcoidosis
*Antinuclear antibodies, P-ANCA, C-ANCA	Vasculitis
Tests for uncommon conditions	
*Paraneoplastic panel	Underlying malignancy
Anti-myelin-associated glycoprotein and antiganglioside antibodies	Sensorimotor neuropathy
Anti-sulfatide antibodies	Autoimmune polyneuropathy
Cryoglobulins	Cryoglobulinemia
Salivary flow rate, Schirmer test, rose Bengal test, labial gland biopsy	Sjogren syndrome
*Cerebrospinal fluid analysis	Acute or chronic inflammatory demyelinating neuropathy
Genetic testing	Hereditary neuropathy

C-ANCA = cytoplasmic antineutrophil cytoplasmic antibodies; HIV = human immunodeficiency virus; P-ANCA = perinuclear antineutrophil cytoplasmic antibodies. VDRL = Venereal Disease Research Laboratory.

Principles of Treatment

Treatment of peripheral neuropathy has two goals:

1. controlling the underlying disease process
2. treating troublesome symptoms.

1. Controlling the underlying disease process

- Eliminating offending agents, such as toxins or medications; correcting a nutritional deficiency; or treating the underlying disease *(e.g.,* corticosteroid therapy for immune- mediated

neuropathy). These steps are important to halt the progression of neuropathy, and they may improve symptoms.

- Acute inflammatory neuropathies require more urgent and aggressive management with intravenous immunoglobulin or plasmapheresis.

Treating troublesome symptoms

- It is important to help patients control troublesome symptoms of peripheral neuropathy, such as severe numbness and pain, as well as to alleviate disability resulting from weakness.
- Several pharmacologic options exist to treat neuropathic pain, including some antiseizure medications (e.g., gabapentin, topiramate, carbamazepine, pregabalin) and antidepressants (e.g., amitriptyline).
- Topical patches and sprays containing lidocaine (Lidoderm patch or capsaicin (also may relieve pain in some *patients*.
- Other supportive measures, such as foot care, weight reduction, and shoe selection, may also be helpful.
- Narcotics may have a role in the treatment of chronic neuropathic pain in selected patients; candidates initially should be evaluated for their risk of substance abuse and addiction, and several nonnarcotic regimens should be tried *first*.
- A second opinion regarding the patient's diagnosis and management also should be considered before initiating long-term opioid therapy.

TREATMENT OF PAINFUL SENSORY NEUROPATHIES

THERAPY	ROUTE	DOSE	SIDE EFFECTS
First-Line			
Lidoderm 5% patch	Apply to painful area	Up to 3 patches qd	Skin irritation
Tricyclic antidepressants (e.g., amitriptylin, nortriptyline)	p.o.	10–100 mg qhs	Cognitive changes, sedation, dry eyes and mouth, urinary retention, constipation
Gabapentin	p.o.	300–1200 mg TID	Cognitive changes, sedation, peripheral edema
Pregabalin	p.o.	50–100 mg TID	Cognitive changes, sedation, peripheral edema
Duloxetine	p.o.	30–60 mg qd	Cognitive changes, sedation, dry eyes, diaphoresis, nausea, diarrhea, constipation
Second-Line			
Carbamazepine	p.o.	200–400 mg q 6–8 h	Cognitive changes, dizziness, leukopenia, liver dysfunction
Phenytoin	p.o.	200–400 mg qhs	Cognitive changes, dizziness, liver dysfunction
Venlafaxine	po	37.5–150 mg/d	Asthenia, sweating, nausea, constipation, anorexia, vomiting, somnolence, dry mouth, dizziness, nervousness, anxiety, tremor, and blurred vision as well as abnormal ejaculation/orgasm and impotence
Tramadol	p.o.	50 mg qid	Cognitive changes, GI upset
Third-Line			
Mexiletine	p.o.	200–300 mg tid	Arrhythmias
Other Agents			
EMLA cream 2.5% lidocaine 2.5% prilocaine	Apply cutaneously	q.i.d.	Local erythema
Capsaicin 0.025%–0.075% cream	Apply cutaneously	q.i.d.	Painful burning skin