

## Module 3 Central Nervous system

### Learning objectives:

By the end of the chapter, non-specialist medical officers should be able to:

- Identify cognitive impairment and assess the stage and severity
- Differentiate dementia from delirium and depression.
- Diagnose dementia, Parkinson's Disease, stroke and peripheral neuropathy and develop the care plans for the patient
- Rehabilitation and safe mobility to be taken care of to avoid fall and fracture

## DEMENTIA

### Introduction:

Dementia is a clinical syndrome involving a sustained loss of cognitive functions and memory of sufficient severity to cause dysfunction in daily living. It is emerging as a major public health problem. In the community, among the elderly above 85 years of age, the prevalence is estimated to be 25 – 45%, and > 50% in institutionalized elderly. Loss of functional ability due to impaired cognition is the key feature that distinguishes dementia from mild cognitive impairment.

### Clinical features:

Dementia is classified into two types -

Reversible	Irreversible
<ul style="list-style-type: none"><li>• Infections : CNS tuberculosis, neurosyphilis, HIV</li><li>• Toxins: Alcohol, heavy metals</li><li>• Trauma: Subdural haematoma</li><li>• Nutritional: Vitamin B1, B 12 deficiency</li><li>• Metabolic: Hypothyroidism, uremic &amp; hepatic encephalopathy</li><li>• Drugs: anti cholinergics, anti psychotics</li></ul>	<ul style="list-style-type: none"><li>• Alzheimers disease</li><li>• Vascular dementia -secondary to strokes</li><li>• Lewy body dementia</li><li>• Fronto-temporal dementia</li></ul>

### Symptoms:

The specific symptoms are related to the areas of the brain involved and can be categorized into these cognitive domains:

- Memory (recent & remote) and learning

- Language (word finding difficulty, difficulty expressing self)
- Visuospatial skills (misplacing objects, getting lost)
- Executive functioning (calculations, planning, carrying out multistep tasks)
- Apraxia (not able to do previously learned motor tasks)
- Behavior or personality changes (increased anger, restlessness, obsessiveness)
- Psychiatric symptoms (apathy, hallucinations, delusions, paranoia)
- Urinary and fecal incontinence

It is important to differentiate between delirium, depression and dementia. Depression and delirium can mimic dementia but are more easily treatable. The following points will help in differentiating the three disorders

Table 1 – Difference between dementia from delirium and depression

	<b>Dementia</b>	<b>Delirium</b>	<b>Depression</b>
<b>Onset</b>	Months to years	Hours to days	Weeks to months
<b>Mood</b>	Can fluctuate	Fluctuates	Low/Apathetic
<b>Sensorium</b>	Alert	May be drowsy	Lethargic but alert
<b>Course</b>	Chronic with slowly progressive deterioration over time	Acute -can fluctuate over hours	Chronic and may have good response to treatment
<b>Insight</b>	Insight may be missing- can talk about somatic complaints, usually finds excuses for cognitive deficits or refuses to believe that they are suffering	May have insight into the changes in their deficits	Mostly are concerned about the memory impairment
<b>Activities of daily living (ADLs)</b>	Usually intact early, Impaired as disease progresses	More likely to be impaired	May neglect basic self-care. Usually will have preserved urinary and fecal continence
<b>Instrumental Activities of Daily Living (IADLs)</b>	Usually intact early, Impaired as disease progresses	May be intact or impaired	May be intact or impaired

**Diagnosis:**

Complete evaluation and cognitive tests are necessary for diagnosis and care plan for dementia patients. Tools like Montreal Cognitive Assessment should be used.

## Montreal Cognitive Assessment

It is a free scale of a score of 30 points, can be administered within 10 minutes and is a good screening tool. It is similar to Mini mental state examination although it also includes more tasks of executive functions (frontal lobe functions) as well as construction (parietal lobe functions)

## Investigations

Relevant investigations to rule out treatable causes of dementia need to be done like haemogram, refer the patients for LFT, RFT, electrolytes, thyroid profile, HIV etc. Radiological imaging of the brain with CT scan can rule out conditions like ischemic stroke, SDH, NPH, neoplasms or CNS infections.

## Treatment

### 1. Pharmacological management

Includes treatment for underlying cause

- Removal of offending drugs like anticholinergics - used in Parkinsonism or in urinary problems, sedatives.
- Drugs for improving or slowing the process in moderate Alzheimer's disease – Cholinesterase inhibitors ( donepezil -10 mg -23 mg /day, rivastigmine 3-6 mg/day) and memantine -10 mg/day

Additional drugs may be offered for behavioural problems

Table 2- Drugs used in dementia treatment

Delusion	Risperidone -1mg /day Olanzapine -5 mg/day Quetiapine -400mg/day
Agitation, Aggression	Haloperidol (0.5-3mg /day) Risperidone, Olanzapine, Quetiapine
Depression	Selective serotonin reuptake inhibitors-SSRI Fluoxetine (20mg), Sertraline (50 mg), Citalopam (20 mg), Trazadone ( 50 mg)
Anxiety	SSRI, Lorazepam (1-2mg)
Insomnia	Zolpidem (5-10 mg)
Apathy	Donepezil, Rivastigmine

### 2. Non-Pharmacological management:

- Rule out precipitating factors like delirium or fecal impaction
- Try music therapy, reminiscence therapy, pet exposure, outdoor walks, bright light exposure.

## Care of Demented Elderly

- Protection from harm
- Maintenance of independence in ADL as long as possible
- Improvement in communication
- Prevention and reduction of occurrence of behavior disturbance
- Provision of support to family caregivers
- Making a routine for daily care to improve predictability
- Determining the ideal time of day for doing the necessary things
- Avoiding argument and physical restraints
- Diverting the person's attention
- Engaging them in recreational activities
- Emotional support by the family members

### Key messages:

1. Dementia is common in elderly and its prevalence increases exponentially with age.
2. Alzheimer's disease is the most and vascular dementia is the second common cause.
3. Reversible causes of dementia should be diagnosed and treated.
4. Treatment is aimed at delaying the progression of the disease and thereby maintain the independence in ADL of the person.
5. Behavior problems are troublesome and needs medical management.

#### **A brief note on confusion/delirium (Covered in detail in another module)**

Delirium has an abrupt onset. The beginning of the confusional state starts at a specific point or period of time with regard to distinct change of behavior. It has an underlying cause, and usual duration is < 6 weeks. Features which may help in diagnosis includes change in sleep wake pattern (sleeping in day and reduced sleep in night), hypermotor or hypomotor features (aggression and irritability versus increased dullness and sleepiness) and autonomic features such as increased sweating, tachycardia.

Usual causes are:

- Adverse effect of drugs
- Electrolyte imbalance especially hyponatremia& dehydration
- Infections like urinary tract infection, Pneumonia, sepsis
- Hypoxic states due to hypotension, anaemia
- Hypo & Hyperglycemia
- Hypothermia and hyperthermia

Delirium is corrected by resolving the underlying cause. It is better to avoid sedatives and other psychotropic drugs to treat the delirium as far as possible.

### **Indications for referral:**

1. No facility to diagnose treatable causes like certain blood investigations, MRI Scan etc.
2. When person has a Mild Cognitive Impairment (MCI)
3. Unable to differentiate Dementia, Delirium or depression

Patients with advanced dementia of irreversible etiology should be cared in their homes and counseling of family members should be done. Necessary training and supportive care should be provided to the caregivers.

### **Case Scenario**

A 64-years-old woman is brought to the clinic by her daughter for the complaint that she has been forgetful in the past one year. She has difficulty in cooking and difficulty in managing common household tasks and identification of relatives. The patient's sister had similar problem and was on treatment. The patient was last seen 10 months ago, by her family doctor when she had a routine work-up, which was reported to be unremarkable. Neurological examination revealed no significant abnormalities. Neuropsychological testing demonstrated severe impairment in executive function, deficits in visuo-spatial testing, and delayed speed of processing information. MOCA score is 20/30.

Investigations showed normal B12, thyroid profile and other metabolic parameters. MRI brain showed cortical atrophy involving predominantly medial temporal lobes suggestive of Alzheimers disease. Patient was counselled regarding the disease and started on Tab Donepezil 10 mg/day.

### **Follow up:**

Follow up every 3 months would be beneficial

### **Activity/audiovisual clips/links**

1. [www.alz.org](http://www.alz.org) > Alzheimer's & Dementia
2. <https://www.dementia.org/>
3. <http://www.medicinenet.com/dementia/article.htm>

### **Key messages:**

Dementia is a disease and should not be passed off as an ageing process. It is important to recognize and counsel the patient and relatives as it can significantly affect the quality of life, relationships and cause severe care giver stress.

Information may be given by pamphlets, posters, skits and word of mouth.

### Summary:

Cognitive impairment is secondary to disease of the brain and not an ageing process. However, it is more prevalent in the elderly. Regular screening of all elderly is essential to identify the cognitive impairment at the early stage. It is important to identify the reversible causes and offer appropriate treatment. Progressive neurodegenerative diseases which cannot be cured, have to be treated to delay the progression of the disease and for the person to maintain independence in the ADL as far as possible. The family members and care givers have to be educated about the problem to provide good care for the demented elderly.

### Further reading:

- Text book of Geriatric medicine by The Indian Academy of Geriatrics Editor-in-chief: Dr. Pratap Sanchetee 1st edition(2014):(449-458)
- Dementia: causes, symptoms and treatment by Markus Mac Gill Feb 2016: at [www.medicalnewstoday.com/articles/142214](http://www.medicalnewstoday.com/articles/142214)

## PARKINSON'S DISEASE

### Introduction:

Parkinson's disease (PD) is a neurodegenerative disorder mainly affecting the motor system. Its prevalence is 1% in people above 60 years of age and increases with advancing age with 4% in people above 80 years. Parkinson's disease is the second most common neurodegenerative disorder after Alzheimer's disease.

### Clinical features:

- Age is a strongest risk factor for parkinsonism.
- The clinical features of PD-
  - motor symptoms and
  - non motor symptoms.

Motor symptoms (TRAP)	Non-motor symptoms
<ul style="list-style-type: none"><li>• Tremor (at rest)</li><li>• Rigidity</li><li>• Akinesia &amp;</li><li>• Postural Instability.</li></ul>	<ul style="list-style-type: none"><li>• Speech and swallowing disturbances</li><li>• Pain</li><li>• Fatigue</li><li>• Mask face</li><li>• Micrographia and neuropsychiatric</li></ul>

	symptoms. <ul style="list-style-type: none"> <li>• Cognitive decline and Depression</li> <li>• Insomnia</li> <li>• Constipation &amp; gastric dysmotility</li> <li>• Postural hypotension</li> </ul>
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**Diagnosis:**

It is mainly based on medical history and neurological examination. When bradykinesia (Slow movements) is present with one or more of the other features is diagnostic of PD.

Tremor in Parkinson’s disease usually starts as a rest tremor of 4-6 Hz which can become severe slowly.

It is important to differentiate this disease from Essential tremor wherein the patient has only tremor in both hands in posture and not at rest.

Diagnosis is by clinical assessment along with evidence of good response to levodopa.

No confirmative laboratory test is available. However, CT/ MRI scan is done to rule out other mimicking conditions like tumour, hydrocephalus or vascular pathology.

**Management**

There is no cure for Parkinson's disease, but medications, surgery and multidisciplinary management can provide relief from the symptoms. The care is given by a team of Geriatrician/Physician, Nurse, Physiotherapist, Occupational therapist, social worker, speech therapist and psychiatrist. Advanced cases are to be referred to Neurologist.

Sudden withdrawals from medication should be avoided as it can cause a life threatening condition -Parkinsonism Hyperpyrexia syndrome. As patients tend to develop dopamine dysregulation syndrome with tendency to overdose, regular monitoring should be done. When medications are not enough to control symptoms, surgery - deep brain stimulation (DBS) of can be of use.

**1. Pharmacological management**

- **Levodopa** is the most widely used drug. Dose:100/25 mg tab - 1/2 to 1tab thrice daily initially and increased until good response, maximum dose being 1000 - 1500 mg/day. Adverse effects include hypotension, nausea, disorientation and confusion, insomnia and/or vivid dreams, hallucinations.

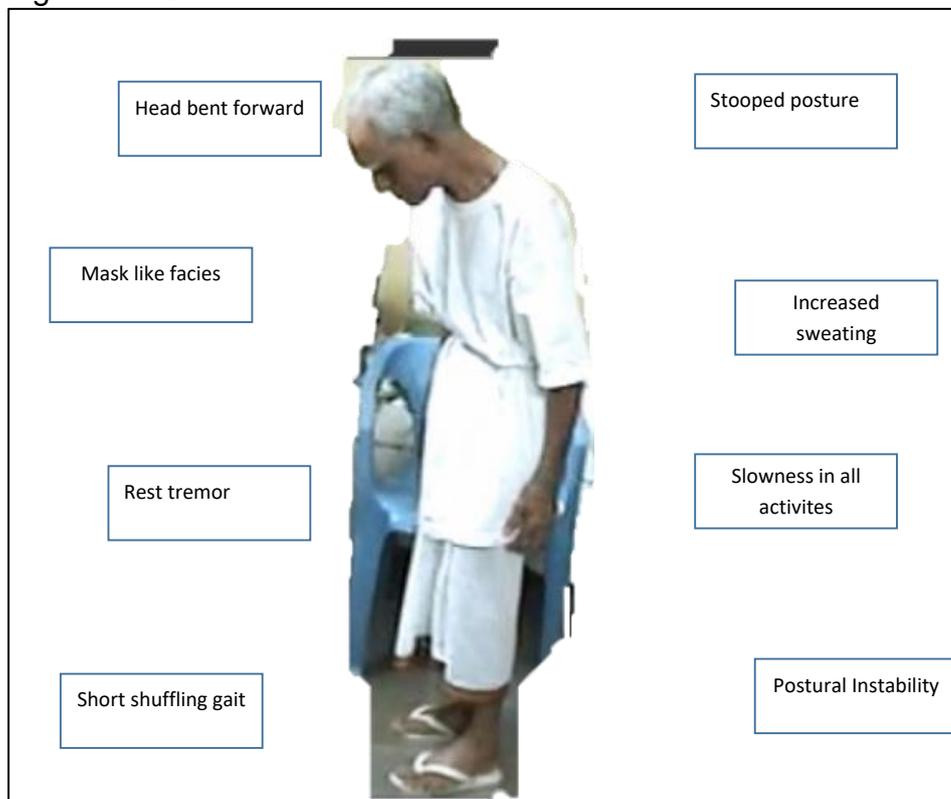
## 2. Non-pharmacological management and Rehabilitation

- Regular exercise programs
- Improve speech and mobility problems.
- Physiotherapy focus on improving gait speed, base of support, stride length, trunk and arm swing movement.
- Strategies include utilizing assistive equipment (pole walking and treadmill walking), verbal cueing (manual, visual and auditory), and exercises.
- Deep diaphragmatic breathing exercises.

### Key messages:

1. Appearance & clinical features are diagnostic

Figure 1 – Common features of Parkinson's Disease



2. The choice of drug depends on the age of onset and duration of symptoms.
3. Non-motor symptoms have to be recognized and adequately treated with appropriate drugs
4. Multi-disciplinary team approach gives better results and improves quality of life.

### Indications for referral:

1. When no adequate response to therapy - to reconsider the diagnosis.  
Troublesome side effects of drugs compelling change of drug regime

2. After 5 years of disease with reduced response duration of medication -when other modalities like DBS / surgery may be required Repeated Falls which require complete evaluation and specialist management
3. Neuropsychiatric manifestations like troublesome psychotic symptoms which require hospitalisation and specialist care.
4. Severe dysphagia: To decide about Nasogastric tube insertion or PEG (Percutaneous Endoscopic Gastrostomy) at higher centres.

### **Case Scenario**

A 70-year-old male farmer has non disabling intermittent resting tremor of the left hand, that later progressed to the right hand in the past one year. On neurological examination the patient had normal cognition. Myerson sign was present. An intermittent mild resting tremor was observed in the left hand, as well as mild signs of asymmetrical cogwheel rigidity and bradykinesia (left > right). Gait and balance were normal as well as postural reflexes. The diagnosis is idiopathic Parkinson's disease.

### **Activity/ Audiovisual Clip/ Links**

1. [www.neura.edu.au/Parkinsons\\_Disease](http://www.neura.edu.au/Parkinsons_Disease)
2. [https://en.wikipedia.org/wiki/Parkinson's\\_disease](https://en.wikipedia.org/wiki/Parkinson's_disease)

### **Follow Up**

Follow up every 3 months would be beneficial

### **Summary:**

Parkinson's disease mainly affects the motor system, the cardinal features being (TRAP) - Tremor, Rigidity, Akinesia& Postural Instability and Gait disturbance. Later, memory and behavioral problems may arise, with dementia commonly occurring in the advanced stages of the disease. Depression is a common association with this disease. Age is a strongest risk factor for parkinsonism. For early onset disease dopamine agonist is the drug of choice and for late onset disease Levadopa is used. COMT inhibitors & MAO- B inhibitors may be added to improve the response to therapy. Rehabilitation is very important to maintain mobility and for good quality of life.

### **Further reading:**

1. Text book of Geriatric Medicine by the Indian Academy of Geriatrics, Editor-in-Chief: Dr. PratapSanchetee, 1st edition, (2014): 459-466
2. Roberts et al. oxford desk reference Geriatric Medicine 1st ed (2012): 292-305

## PERIPHERAL NEUROPATHY

### Introduction

Peripheral neuropathy (PN) is a disease affecting nerves, which may impair sensation, movement, gland or organ function depending on the type of nerve affected. Common causes include systemic diseases (Diabetes, Leprosy) Vitamin deficiency, medication (chemotherapy), trauma, radiation therapy, excessive alcohol consumption, toxins, immune system disease, or viral infection. Compression of nerves results in entrapment neuropathy. It can also be idiopathic.

Neuropathy affecting just one nerve is called "mononeuropathy" and neuropathy involving multiple nerves in roughly the same areas on both sides of the body is called "symmetrical polyneuropathy" or "polyneuropathy". It can be acute in onset or chronic in nature.

### Clinical features:

Symptoms and signs can be motor, sensory, or autonomic. (Animations for each)  
Motor features include weakness and wasting in distal distribution (feet, hands).  
Sensory disturbances include numbness or painful paresthesias in stocking-glove distal distribution. Autonomic features include bladder, sexual, and gastrointestinal dysfunction and skin, hair, and nail changes.

Neuropathies with predominant motor involvement	Neuropathies with predominant sensory involvement
<ul style="list-style-type: none"><li>• GBS</li><li>• CIDP</li><li>• Multifocal motor Neuropathy (MMN)</li><li>• Porphyria</li><li>• Diphtheria</li><li>• Toxic exposure to dapsone, amiodarone and vincristine.</li></ul>	<ul style="list-style-type: none"><li>• Diabetes mellitus</li><li>• Vitamin B12 deficiency</li><li>• HIV</li><li>• Amyloidosis</li><li>• Leprosy</li><li>• Sarcoidosis</li><li>• Uremia</li><li>• Paraneoplastic syndromes</li></ul>

**Neurological Examination** reveals distal sensory or motor and sensory loss, proximal weakness, as in some inflammatory neuropathies, such as Gullain-Barre syndrome or may show focal sensory disturbance or weakness, such as in mononeuropathies. Ankle reflex is absent in peripheral neuropathy, decreased vibration sensation (128 hz tuning fork) & decreased light touch is present. Ulceration may occur.

### Diagnosis:

Diagnosed by the clinical signs and confirmed by the investigations.

Laboratory tests: Vitamin B12 assay, complete Blood count, TSH, screening for Diabetes.

## Treatment

### I. The treatment of the cause:

- Diabetes: Adequate control of Blood sugar
- Immune-mediated diseases: I.V. immunoglobulin or steroids.
- Vitamin deficiencies (B1,B6, B12, vitamin E) correction is required.

### II. Symptomatic treatment:

- **Pain relievers:** Tramadol and opioids are useful.
- **Anti-seizure medications and Antidepressants.**
- **Topical treatments and Physical therapy.** Helps to improve movements. Hand or foot braces, a cane, a walker, or a wheelchair.

### Indications for referral:

1. For investigation like EMG, NCS, biopsy etc.
2. Pain not amenable to medical therapy and requires surgical intervention

### Key messages:

1. Peripheral neuropathy have motor, sensory or autonomic features; sensory type is more common
2. The risk factors are Diabetes mellitus, Alcohol abuse, Vitamin deficiencies, particularly B vitamins, infections, such as Lyme disease, shingles, Epstein-Barr virus, hepatitis C and HIV, Autoimmune diseases (rheumatoid arthritis, lupus), Kidney, liver or thyroid disorders, exposure to toxins, certain medications.
3. Complications include **burns and skin trauma**, infection, falls due to weakness.
4. Treatment is mainly management of underlying cause and pain relief by medications and physical therapy. At times surgery is indicated (entrapment neuropathy)

## Case Scenario

A 67-year-old woman noticed the onset of burning pain in the left great toe two years back. The pain subsequently extended to involve both feet, from the toes to the heels, and was associated with numbness, tingling, and burning. The discomfort has become severe, is present throughout the day, and disrupts sleep. A physical examination reveals normal muscle strength, muscle-stretch reflexes, proprioception,

and vibratory sensation; only pinprick sensation in the toes and feet is diminished. How should this patient be evaluated and treated?

### **Activity/audiovisual clips/links**

1. [https://en.wikipedia.org/wiki/Peripheral\\_neuropathy](https://en.wikipedia.org/wiki/Peripheral_neuropathy)
2. <http://www.webmd.com/brain/understanding-peripheral-neuropathy-treatment>

### **Follow up:**

Follow up every 2 weeks for first 3 months and then every 3 months would be beneficial

### **Summary:**

Disorders of peripheral nerves (neuropathy) can cause motor, sensory, and autonomic symptoms. Motor features include weakness and wasting in distal distribution (feet, hands). Sensory disturbances include numbness or painful paresthesias in stocking-glove distal distribution. Autonomic features include bladder, sexual, and gastrointestinal dysfunction and skin, hair, and nail changes. Stretch reflexes are decreased early in most neuropathies. The diagnosis of neuropathy is confirmed by nerve conduction studies. The neuropathy can be generalized (polyneuropathy) or focal as occurs with compressive (entrapment) neuropathies. Treatment is management of underlying cause and pain relief by medications and physical therapy. Surgery is indicated in entrapment neuropathy

### **Further reading:**

- Latov, Norman (2007). *Peripheral Neuropathy: When the Numbness, Weakness, and Pain Won't Stop*. New York: American Academy of Neurology Press Demos Medical ISBN-1-932603-59-X.
- Harrison's textbook of Principles of Internal Medicine; 17th edition vol II.pg:2651 - 2666.

## **STROKE IN ELDERLY**

### **Introduction:**

Stroke (Cerebrovascular Accident) is one of the top three causes of death worldwide. Two thirds of stroke cases occur in people above 65 years. It is the leading cause of long-term disability and is a major cause of dementia, depression, seizures, etc. Cerebro-vascular Accident, (brain attack) refers to a spectrum from Transient Ischemic attack (TIA) to fatal stroke.

**Definition:**

Stroke is defined by the World Health Organization (WHO) as ‘a clinical syndrome characterized by rapidly developing clinical symptoms and/or signs of focal, and at times global (applied to patients in deep coma and those with subarachnoid haemorrhage), loss of cerebral function, with symptoms lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular origin’.

The classical definition of a transient ischaemic attack (TIA) is of ‘a sudden, focal neurological deficit lasting for less than 24 hours, of presumed vascular origin, and confined to an area of the brain perfused by a specific artery’.

Stroke can be of 3 types

- Infarct – There is a clot in the blood vessel with ischemia of the brain
- Intracerebral Bleed – There is rupture of blood vessel with bleeding in the brain
- Subarachnoid Haemorrhage – There is bleeding around the brain

		
<p>Figure 2 CT brain -Infarct in the brain</p>	<p>Figure 3 CT brain of Intracerebral bleed</p>	<p>Figure 4 CT scan of Subarachnoid Haemorrhage</p>

**Clinical Features**

Stroke symptoms presents as sudden onset of weakness of the part of the body supplied by the affected cerebral vessel. The symptoms depend on the area of the brain affected. It presents as hemiplegia and muscle weakness of face, speech disturbance (Dysarthria or Dysphasia), numbness of the affected limbs and initial flaccidity followed by spasticity. Associated symptoms include loss of consciousness, headache, vomiting due to raised intracranial pressure (haemorrhage) from blood compressing the brain.

Stroke association proposed FAST (face, arm, speech, and time), for early recognition of stroke and hospitalization.

### Predisposing Risk Factors:

<b>Non modifiable:</b>	<b>Modifiable :</b>
<ul style="list-style-type: none"><li>• <i>Age</i>: Stroke risk increases with increasing age (strongest risk factor).</li><li>• <i>Sex</i>: Males &gt; females</li><li>• <i>Family history</i></li><li>• <i>Previous stroke or TIA</i>: Risk of recurrence is about 10%–16% in the first year</li><li>• <i>Other vascular disease</i></li></ul>	<ul style="list-style-type: none"><li>• Smoking</li><li>• Alcohol intake</li><li>• Obesity</li><li>• Physical inactivity</li><li>• Diet</li><li>• Hypertension</li><li>• Diabetes</li><li>• High cholesterol</li><li>• Atrial fibrillation</li><li>• Carotid stenosis</li></ul>

### Evaluation:

- Level of arousal and orientation, inattention
- Vital signs: Airway, breathing, circulation (ABC)- (Emergency referral)
- Speech: dysarthria (articulation defect) or aphasia (cortical disruption of speech—may be receptive and/or expressive)
- Cranial nerves: Especially 2, 5, 7, 9&10th nerve examination
- Motor strength and Coordination: to identify the parts affected
- Sensation: There are easy bedside tests for fine touch and proprioception.
- Gait: Assessment done in a less severe stroke
- Reflexes may initially be absent, and then become brisker with time. Plantar reflex is extensor on affected side.
- Cardiovascular: (pulse rate and rhythm, blood pressure, Respiratory examination (aspiration pneumonia or pre-existing respiratory conditions))

## **Investigations:**

Other relevant investigations: complete blood counts, platelet counts, electrolytes, blood sugar, LFT, RFT, lipid profile and ECG.

## **Management**

### **TIME IS BRAIN**

Brain neurons cannot be regenerated and in case of infarct, thrombolysis should be initiated within 4.5 hours for recovery of brain tissue.

Patients with strokes should be shifted immediately to a specialised centre if the onset is less than 6 hours after just looking at airway, oxygenation

### **Specific treatment:**

Thrombolysis for thrombotic stroke – Tissue plasminogen activator -alteplase, tenecteplase within 4.5 hours of stroke

Mechanical thrombectomy by clot retrieval devices can be used in specialised centres upto 6 hours.

### **Beyond this period the management is only palliative and to prevent future events and they include**

- Aspirin, Clopidogrel (Thrombotic stroke)
- Heparin ( Embolic stroke)
- Control of Blood pressure (Haemorrhagic stroke)
- Airway, O2, Fluids, Nutrition, BP, Glycemic control
- prevent DVT, pressure sore management, infection

### **Rehabilitation:**

- ▶ Speech therapy
- ▶ Physical therapy - to help a person relearn movement and co-ordination.
- ▶ Occupational therapy - to help a person to improve their ability to carry out routine daily activities, such as bathing, cooking, dressing, eating, reading and writing
- ▶ Avoid depression by proper counseling and antidepressants if needed.

- ▶ Support from friends and family.

#### Indications for referral:

- **URGENT REFERRAL FOR Thrombolysis <4.5 hours after ischemic stroke.**
- Unconscious / Drowsy stroke patient or features of raised ICT
- Uncontrolled hyperglycemia not responding adequately to oral antidiabetics and/or who require Insulin therapy on close supervision.
- If facilities for CT scan/ MRI is not available for differentiating ischemic and hemorrhagic stroke.

#### Key messages:

- stroke types: ischemic strokes, hemorrhagic strokes and transient ischemic attacks.
- Strokes need to be diagnosed and treated at the earliest in order to minimize brain damage.
- Remembering the F.A.S.T. acronym can help with recognizing the onset of stroke (Face, Arms, Speed, Time).
- Ischemic strokes can be treated with 'clot-busting' drugs.
- Hemorrhagic strokes can be treated with surgery to repair or block blood vessel weaknesses.
- The most effective way to prevent strokes is through maintaining a healthy lifestyle.

#### Case Scenario

An 83-year-old woman with a history of hypertension and dyslipidemia developed acute onset of impaired speech and comprehension, and right-sided weakness. Her previous medical history was notable for one episode of slurred speech, associated with tingling sensation of right limb which lasted for 5 minutes, 3 days ago. The patient was on two antihypertensive medications and often non compliant. Physical examination revealed global aphasia, right homonymous hemianopia, right hemiplegia, and hemisensory loss. The risk factors include Age, TIA, Hypertension. CT scan brain shows an infarct in the left anterior hemisphere. Treatment started with Aspirin 325 mg initially followed by maintenance dose of 75 mg/day. Statins also added. Rehabilitation started once the general condition stabilized.

#### Activity/audiovisual clips/links

1. <https://en.wikipedia.org/wiki/Stroke>
2. [www.strokeassociation.org/STROKEORG/AboutStroke/About-Stroke\\_UCM\\_308529](http://www.strokeassociation.org/STROKEORG/AboutStroke/About-Stroke_UCM_308529).

## **Follow up and Progression**

Stroke improves to some extent over 3 months period and to a little extent over the next 2 years.

Follow up every 2 weeks for first 3 months and then every 3 months would be beneficial

## **Summary:**

Stroke, occurs when poor blood flow to the brain results in cell death. Ischemic stroke is due to lack of blood flow, and haemorrhagic stroke due to bleeding. Signs and symptoms of a stroke include an inability to move or feel on one side of the body, problems in understanding or speaking, or unioocular blindness, vertigo or instability. If symptoms last less than one or two hours it is known as a Transient Ischemic Attack (TIA). The main risk factors include high BP, Diabetes, cardiac arrhythmia, dyslipidemia, smoking and alcohol consumption. Diagnosis is by clinical examination complemented by brain imaging by CT brain or MRI scan. Long term complications may include pressure sores, pneumonia, urinary tract infection, aspiration, contractures of the limbs, restricted mobility and dependency. Hence early ambulation with intense physiotherapy along with medical management is essential for good functional recovery.

1. Stroke: Pathophysiology, Diagnosis, and Management. New York: Churchill Livingstone. ISBN 0-443-06600-0. OCLC 50477349
2. Stroke: Practical Management (3rd edition) Wiley - Blackwell. ISBN 1-4051-2766-X