STROKE: ASSESSMENT & MANAGEMENT

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ASSESSMENT

1. **Demographic details**

   (date , name , age , sex , address , occupation etc)

2. **History taking**

   (present history , past history , medical history , family history , personal history)

3. **Observation**

- **Body built**
- **Posture and attitude of limbs**
- **Facial symmetry**
- **Tropical changes of skins**
- **Swelling , scars**
- **Contractures or deformities**

- **Abnormal movements like tremors**
- **Muscle wasting**

4. **Palpation**

Palpate and compare with unaffected side

- **Oedema: localized or generalised , indurated or non-indurated, pitting or non pitting**
- **Tender points**

5. Examination

- **Higher functions (memory , intelligence , level of consciousness , orientation , speech, behaviour)**
- **Cranial nerves abnormalities**

>SENSORY EXAMINATION:

To identify the level of lesion and type of lesion

- **Loss of cortical sensation indicates the lesion in the sensory cortex**
- **Loss of other sensations indicates an extensive subcortical lesion**
- **Loss of all senses indicates thalamic lesions**
- **Intact sensory system indicates the lesion in the motor cortex only**

>REFLEX EXAMINATION:

- **Superficial reflexes**
- **Deep tendon reflexes**
- **Babinski response**
- **Presence of abnormal primitive reflexes**

>MOTOR EXAMINATION:

- **Tone-**

Assessed by repeated passive movements of the limbs.

Different scales can be used for tone assessment like Modified Ashworth , Tardieu ,

Pendulum test

Table 2: The Modified Ashworth Scale (Bohannon and Smith, 1987)

Grade	Description
0	No increase in muscle tone
1	Slight increase in muscle tone, manifested by a catch and release or by minimal resistance at the end of the ROM when the affected part(s) is moved in flexion or in extension
1+	Slight increase in muscle tone, manifested by a catch, followed by minimal resistance throughout the reminder (less than half) of the ROM
2	More marked increase in muscle tone throughout most of the ROM, but affected part(s) easily moved
3	Considerable increase in muscle tone, passive movement is difficult
4	Affected part(s) rigid in flexion or extension

Table 3
Tardieu scale

Velocities	
V1	As slow as possible, slower than the natural drop of the limb segment under gravity
V2	Speed of limb segment falling under gravity
V3	As fast as possible, faster than the rate of the natural drop of the limb segment under gravity
Scoring	
0	No resistance throughout the course of the passive movement
1	Slight resistance throughout the course of passive movement, no clear catch at a precise angle
2	Clear catch at a precise angle, interrupting the passive movement, followed by release
3	Fatigable clonus with less than 10 s when maintaining the pressure and appearing at the precise angle
4	Unfatigable clonus with more than 10 s when maintaining the pressure and appearing at a precise angle
5	Joint is immovable

- **Muscle girth**
- **Muscle power**
- **Voluntary muscle control**
- **Presence of abnormal associated movements-**

Souque ' s phenomenon

When a hemiplegic upper limb is raised above 90 degrees of flexion or abduction , there will be fan-shaped finger extension

Ramiste ' s phenomenon

When resistance is applied to abduction/ adduction of the unaffected lower limb , there will be similar reaction in the affected limb

Homolateral limb synkinesis

When there is flexion of hemiplegic upper limb there will be flexion of hemiplegic lower limb

- **Range of motion**
- **Coordination –**

along with coordination the synergy is also checked

- **Perception and cognitive functions**

6. Gait assessment-

observe the symmetry of gait, ability to walk with a narrow base,

stride length , tandem walking

GAIT ASSESSMENT SCALE **can be used to assess the gait**

7. Assessment of ADL

determines the level & the type of assistance a person requires to live an independent life.

ADLs can be assessed by *BARTHEL INDEX* & *KATZ INDEX*

Proposed guidelines for interpreting Barthel scores are that scores of 0-20 indicate "total" dependency, 21-60 indicate "severe" dependency, 61-90 indicate "moderate" dependency, and 91-99 indicates "slight" dependency.2 Most studies apply the 60/61 cutting point.

BARTHEL INDEX

Table 1. Original scoring for the Barthel Index [6]

Items	Unable to perform task	Needs assistance	Fully independent
Personal hygiene	0	0	5
Bathing self	0	0	5
Feeding	0	5	10
Toilet	0	5	10
Stair climbing	0	5	10
Dressing	0	5	10
Bowel control	0	5	10
Bladder control	0	5	10
Ambulation	0	5–10	15
Wheelchair*	0	0	5
Chair/bed transfers	0	5–10	15
Range	0	.....	100

*Score only if unable to walk.

KATZ INDEX

KATZ INDEX OF INDEPENDENCE IN ACTIVITIES OF DAILY LIVING*

Activities *POINTS (1 OR 0)*	*Independence* *(1 POINT)* *NO supervision, direction, or personal assistance*	*Dependence* *(0 POINT)* *WITH supervision, direction, personal assistance, or total care*
BATHING Points: ____	(1 point) Bathes self completely or needs help in bathing only a single part of the body such as the back, genital area, or disabled extremity.	(0 points) Needs help with bathing more than one part of the body, getting in or out of bathtub or shower. Requires total bathing.
DRESSING Points: ____	(1 point) Gets clothes from closets and drawers and puts on clothes and outer garments complete with fasteners. May have help tying shoes.	(0 points) Needs help with dressing self or needs to be completely dressed.
TOILETING Points: ____	(1 point) Goes to toilet, gets on and off, arranges clothes, and cleans genital area without help.	(0 points) Needs help transferring to the toilet, cleaning self, or uses bedpan or commode.
TRANSFERRING Points: ____	(1 point) Moves in and out of bed or chair unassisted. Mechanical transferring aides are acceptable.	(0 points) Needs help in moving from bed to chair or requires a complete transfer.
CONTINENCE Points: ____	(1 point) Exercises complete self-control over urination and defecation.	(0 points) Is partially or totally incontinent of bowel or bladder.
FEEDING Points: ____	(1 point) Gets food from plate into mouth without help. Preparation of food may be done by another person.	(0 points) Needs partial or total help with feeding or requires parenteral feeding.
TOTAL POINTS: ____	*6 = High (client independent)*	*0 = Low (client very dependent)*

* *Slightly adapted with permission from Gerontological Society of America. Katz, S., Down, T.D., Cash, H.R., et al. (1970). Progress in the development of the index of ADL. The Gerontologist, 10, 20-30.*

8. Psychological Assessment

The stroke patient often experience anxiety and depression.

It is the major secondary complication

It is assessed by *HADS (Hospital Anxiety and Depression Scale)*

9. NIHSS (National institutes of health stroke scale)

- **Stroke assessment tool to evaluate neurological status in acute stroke patients**
- **15 item neurological examination**
- **Used to evaluate the effect of acute cerebral infarction**
- **Patient's ability to answer the questions and perform activities are rated**
- **Ratings for each item are scored on a 3 to 5 point scale**
- **Higher scores indicate greater severity**

- ✓ **1-5 = Mild**
- ✓ **5-14 = Moderate**
- ✓ **15-24 = Severe**
- ✓ **>25 = Very severe**

MANAGEMENT

An integrated approach involving all the methods is found beneficial in all stroke patients .

These approaches are:-

1. **Bobath concept**

- **Neurological developmental approach**
- **Main principle is to promote motor learning for efficient motor control**
- **Bobath approach mainly concentrate to prevent the synergistic patterns**

2. Brunnstrom approach

- Reflexes should be used to elicit movement
- Proprioceptive and exteroceptive stimuli can be used to evoke desired movement

3.Peto approach

- The patient is encouraged to verbalize the activities as they perform them and focus on the function

4. Johnstone approach

- **Based on reflex inhibition with special attention to inhibiting the tonic neck reflexes through use of air splints and positioning.**

5. Motor relearning program

- **Aimed at gaining functional independence through learning a specific task oriented movement.**
- **Major factors in the learning or relearning process:-**

a. **Identification of a goal**
b. **Inhibition of unnecessary activity**

c. Ability to cope with the effects of gravity

d. Appropriate body alignment

e. Practice

f. Motivation

g. Feedback

6. Proprioceptive neuromuscular facilitation

Patterns of developing motor behaviour, spiral and diagonal patterns of movements , voluntary movement with postural and righting reflexes, sensory and verbal cues, maximal resistance for maximum excitation & inhibition & repetitive activity for conditioning &training

7. Rood ‘s approach

- **Treatment concerned with the interaction of somatic, autonomic , psychological factors & their interaction with motor activities.**

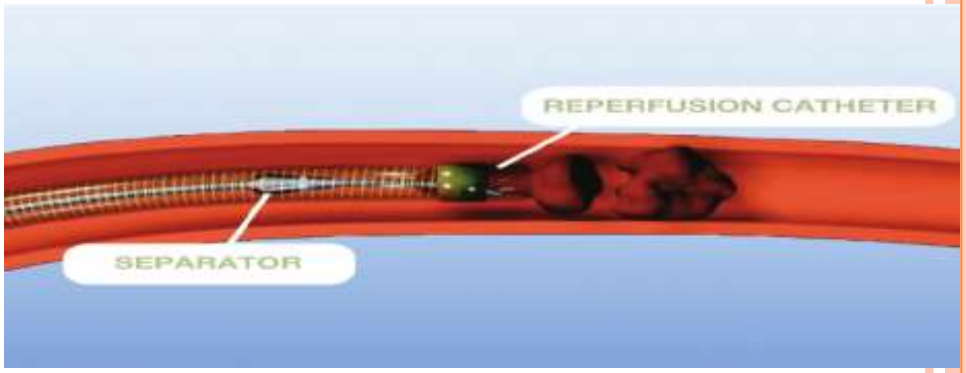
MEDICAL MANAGEMENT

- To re-establish circulation and oxygenation.
- Maintain blood pressure.
- Maintain sufficient cardiac output.
- Control seizures and infections.
- Control oedema and intracranial pressure.
- Maintain skin integrity and joint integrity.
- Decrease the risk of complications like DVT and Bed sores.

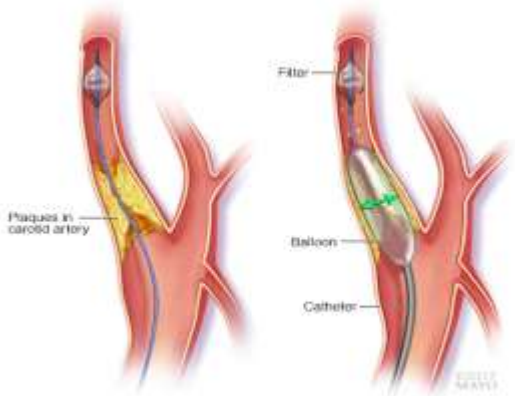
- Thrombolytic
- Anti-hypertensive agents
- Anti-coagulants
- Anti-convulsants
- Anticholestrol agents
- Antispastic
- Antidepressants
- Anti-platelet therapy

SURGICAL MANAGEMENT

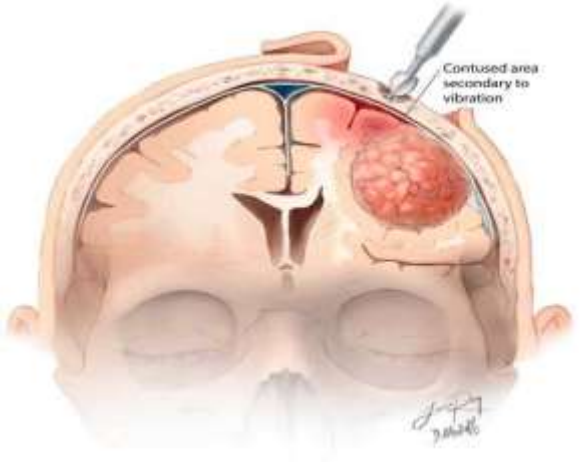
- The penumbra system



- Carotid endartectomv



- Craniotomy



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3. Susan B. O'Sullivan.et.al; physical rehabilitation; th edition.
4. A.k.agarwal.et.al; recent concepts in stroke; indian college of physicians.
5. James F. toole.et.al; cerebrovascular disorders; 5th edition.

GOALS FOR PHYSIOTHERAPY

- SHORT TERM GOALS:

1) To provide psychological support and develop good rapport with patient.
2) To decrease the tendency of developing abnormal movement pattern.
3) To prevent complications of prolonged bed rest.
4) To prevent joint contractures and deformities.
5) To encourage early weight bearing.

- Long term goals:

- To continue counselling of the patient.
- To motivate patients to work and cope with their condition as well as encouraging them for regular exercises.
- To normalize the tone.
- To maintain the cardiovascular respiratory proficiency.
- Improve the functional capabilities.
- Vocational training.

PHYSIOTHERAPY MANAGEMENT

- Depends upon the examination of existing impairments and activity limitations.
- Functional, task specific training is the mainstay of therapy and is designed to assist patients in regaining control of functional movement patterns.
- Protocol includes:

1. To improve motor learning
2. To improve sensory function
3. To improve flexibility and joint integrity
4. To improve strength
5. To manage spasticity
6. To improve static and dynamic balance
7. To improve gait
8. Improve aerobic capacity and endurance

IMPROVING MOTOR RELEARNING

- Explicit verbal instructions are used to detect patient's attention to task.
- Active participation is necessary for the learning process.
- Mental rehearsal of imagery technique for improving performance.
- In a study mental practise with the help of audio tapes have been proven to enhance upper limb and lower limb motor recovery.
- Mirror therapy
- Transcranial direct current stimulation

IMPROVING SENSORY FUNCTION

- Mirror therapy
- Repetitive sensory discrimination activities.
- Compression techniques
- Intermittent pneumatic compression
- Scanning movements
- Brush stroking
- Robot assisted therapy
- Virtual reality
- Standardised Kinaesthetic Illusion Procedure for muscle tendon vibration.

IMPROVING FLEXIBILTY AND JOINT INTEGRITY

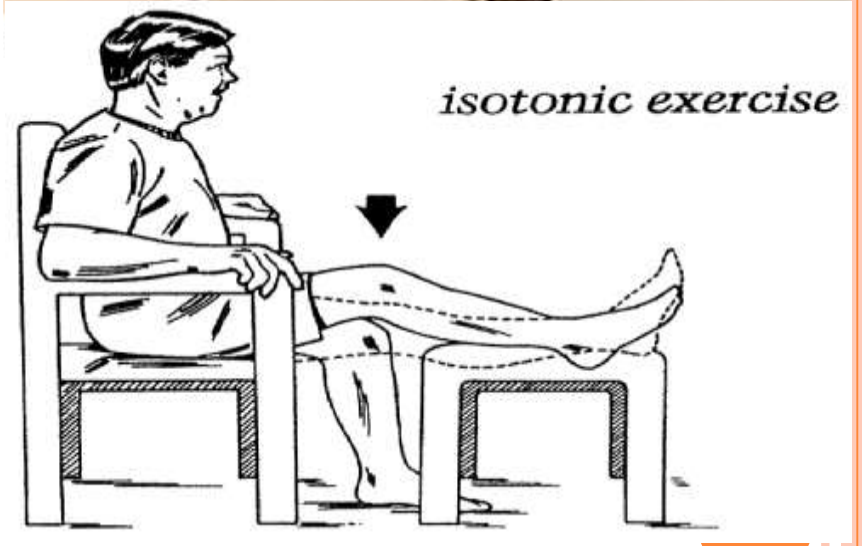
- Passive and active range of motion exercises.
- Stretching of terminal muscles
- Effective positioning
- Use of resting splints
- Soft tissue/ joint mobilization
- Arm cradling
- Table top polishing
- Weight transfer activities
- Ambulation if possible.
- Constraint induced movement therapy

MANAGEMENT OF SPASTICITY

- Early mobilization
- Vigorous and sustained stretching
- Optimal positioning
- Rhythmic rotation
- Weight bearing in kneeling
- Proprioceptive neuromuscular facilitation
- Local facilitation technique
- Ice therapy
- Functional electrical stimulation
- Air splints
- Neuromuscular electrical stimulation

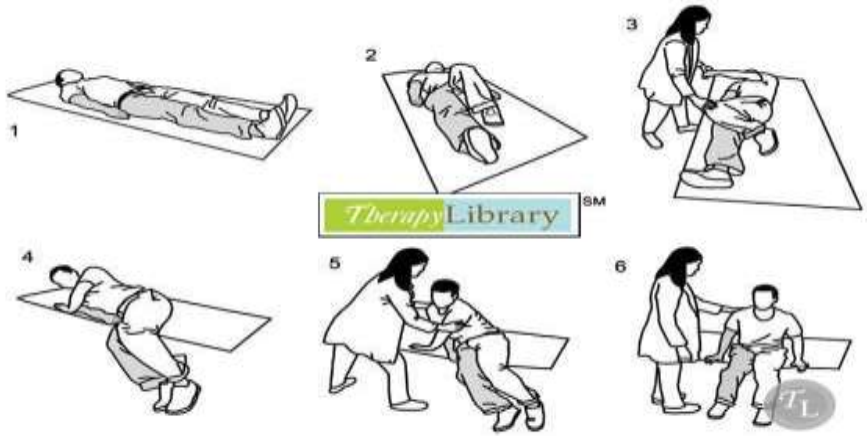
IMPROVING STRENGTH

- Progressive resisted strength training through free weights, elastic therabands and isokinetic exercises
- Aquatic exercises
- Sling suspension exercises
- Combination of resistance training with task oriented functional activities enhances muscle functioning
- Partial wall sqauts
- Adequate warm ups and cool down periods.
- Upper limb weight bearing exercises
- Task oriented reaching and manipulation



IMPROVING STATIC AND DYNAMIC BALANCE

- Upper limb weight bearing
- Task oriented reaching and manipulation
- Robot assisted therapy
- In bed mobility exercises
- Sit-to-stand and sit-down transfers
- Transfers
- Dual task training
- Single leg support exercises
- MAT exercises



IMPROVING GAIT

- Task-specific over-ground locomotor training.
- Body weight supported motorized treadmill training
- Robotic assisted locomotor training
- Aquatic therapy
- Functional electrical stimulation with movement
- Orthotics and assistive devices
- Force platform biofeedback

IMPROVING AEROBIC CAPACITY

- Adequate supervision and monitoring
- Deep breathing techniques
- Bilateral segmental expansion
- Diaphragmatic breathing techniques
- Treadmill walking
- Endurance training

THANK YOU