CVA
Cardiovascular Accident

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LEC-14G

INTRODUCTION

- A cerebrovascular accident(CVA),commonly referred to as a stroke, is the interruption of blood flow to brain tissue. The brain tissue that has been deprived of oxygen is damaged or dies.
- Strokes can be ischemic or hemorrhagic. Ischemic stroke is the most common type, accounting for 88% of CVAs.
- Ischemic strokes can be thrombotic, embolic or lacunar.

Ischemic Stroke

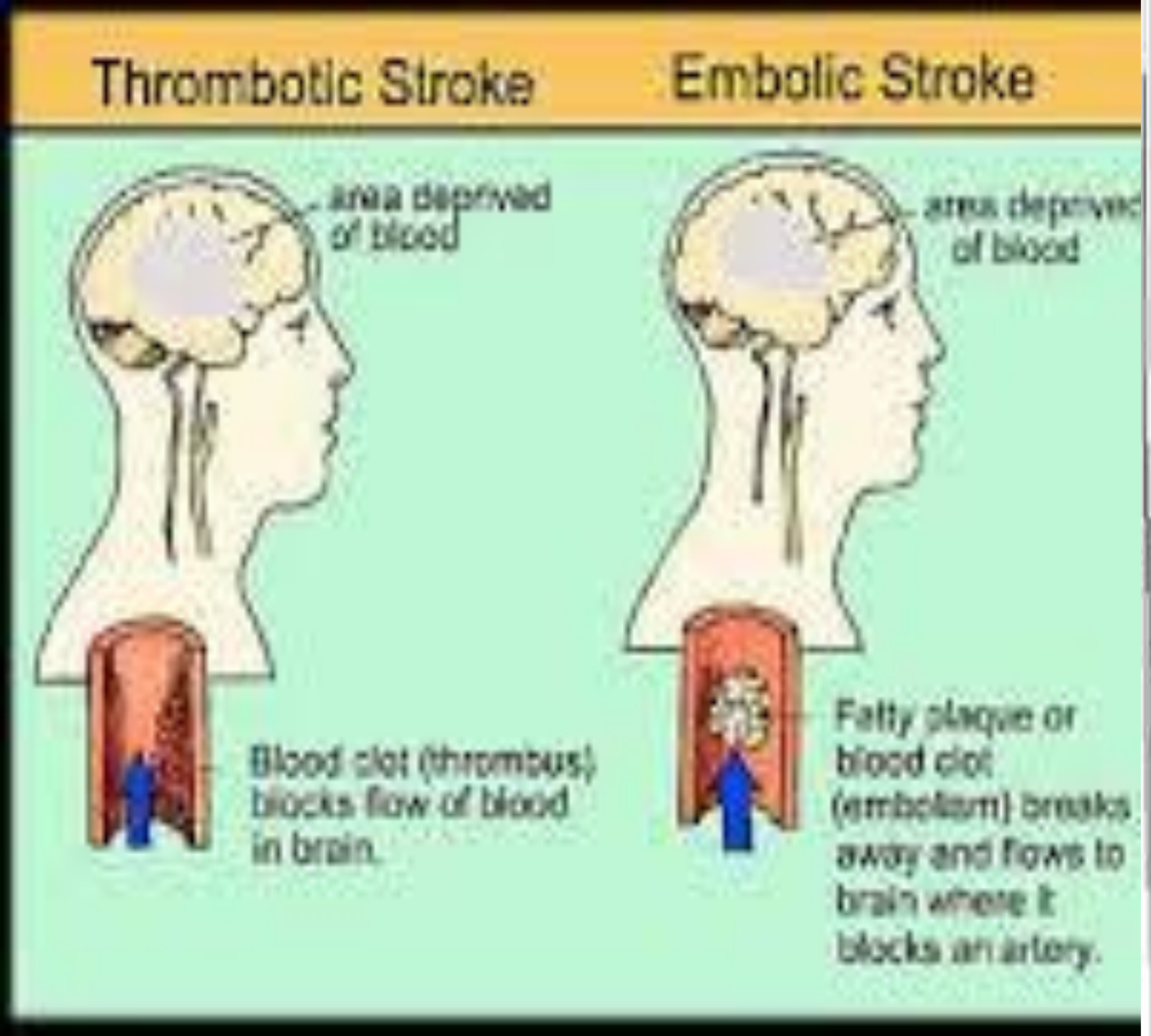
Hemorrhagic Stoke

Obstruction blocks blood flow to part of the brain

Weakened vessel wall ruptures, causing bleeding in the brain

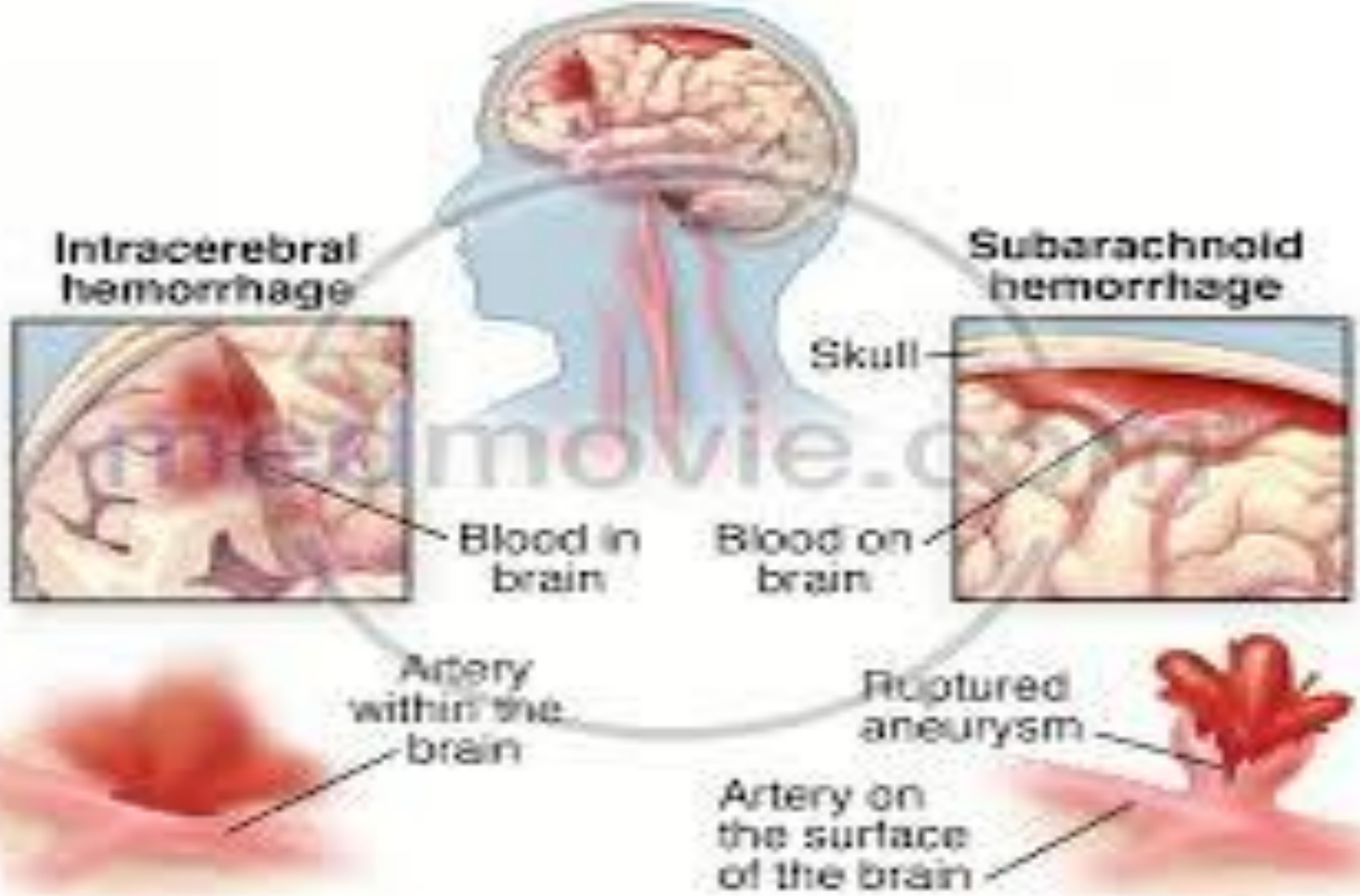
TYPES

- **Thrombotic** CVA is caused by a thrombus that develops in an artery supplying part of the brain.
- **Embolic** CVA is caused by blood clots that form outside the brain and travel through the bloodstream to the brain.
- **Lacunar** infarcts result from disruption of blood flow at the ends of small penetrating vessels found in the basal ganglia, internal capsule and pons.
- **Hemorrhagic** CVA usually results from trauma, vascular abnormality or hypertension (jasmin2004).Hemorrhagic CVA can be either intracerebral or subarachnoid.
- **Intracerebral** hemorrhage is the result of bleeding into brain tissue.
- **Subarachnoid** hemorrhage is the result of bleeding into the space between the arachnoid and pia mater.



Lacunar Infarct:

- Chronic hypertension
- Arteriolosclerosis of deep penetrating arterioles of brain stem.
- Single or multiple cavitary infarcts – lacunes.
- Lenticular nucleus, thalamus
- Slit Haemorrhages.


Intracerebral hemorrhage
Blood in brain
Subarachnoid hemorrhage
Skull
Blood on brain
Artery within the brain
Ruptured aneurysm
Artery on the surface of the brain

RISK FACTORS

- Some risk factors for stroke are non modifiable. These include age, gender, race, family history and history of prior stroke or heart attack.
- The CVA risk doubles for every decade after the age of 55. CVA is more common in men than women. CVA risk increases if an immediate family member has had a CVA.
- Hypertension.
- Patients with atrial fibrillation have a five times greater risk of stroke but treatment with anticoagulants can reduce that risk by two-thirds. Physical inactivity increases stroke risk and even light physical activity can decrease that risk.
- Other modifiable risk factors include diabetes mellitus, hypercholesterolemia, cigarette smoking, drinking more than five alcoholic drinks per day and the combination of smoking and oral contraceptive use .

SIGNS AND SYMPTOMS…DIAGNOSIS

- Signs and symptoms of a possible CVA include headache, vision changes(field cuts, blurriness), confusion, unilateral weakness or altered sensation of the face, arm and/or leg, dizziness and alterations in speech.
- CT and MRI are used as diagnostic imaging.

B E F A S T

Balance Eyes Face Arms Speech Time

STROKE

Rehabilitation Goal

- To restore lost abilities as much as possible
- To prevent stroke-related complications
- To improve the patient's quality of life
- To educate the patient and family about how to prevent recurrent strokes
- Promote re-integration into family, home, work, leisure and community activities

Basic Principles of Rehabilitation

- To begin as possible early (first 24 to 48 hours)
- To assess the patient systematically (first 2-7 day)
- To prepare the therapy plan carefully
- To build up in stages
- To include the type of rehabilitation approach specific to deficits
- To evaluate patient's progress regularly

Multidisciplinary Team

- Rehabilitation specialist
- Physical, occupational and speech therapist
- Social worker
- Dietician
- Recreational therapist
- Psychologist
- Nurses
- Orthotist
- Patient, caregiver

Early Mobilisation

- If patient's condition is stable, however, active mobilisation should begin as soon as possible, within 24 to 48 hours of admission
- Early mobilisation is beneficial to patient outcome by reducing the complication
- It has strong positive psychological benefit for the patient
- Specific tasks (turning from side to side in bed, sitting in bed) and self-care activities (self-feeding, grooming and dressing) can be given for early mobilisation.

Conventional therapies

Therapeutic Exercises
Traditional Functional Retraining

- Range Of Motion (ROM) Exercises
- Muscle Strengthening Exercises
- Mobilization activities
- Fitness training
- Compensatory Techniques

Neurophysiological Approaches

- 1. Muscle Re-education Approach (1920S)
- 2. Neurodevelopmental Approaches (1940-70S)
  - Sensorimotor Approach (Rood, 1940S)
  - Movement Therapy Approach (Brunnstrom, 1950S)
  - NDT Approach (Bobath, 1960-70S)
  - PNF Approach (Knot and Voss,1960-70S)
- 3. Motor Relearning Program for Stroke (1980S)
- 4. Contemporary Task Oriented Approach (1990S)

Neurodevelopmental Therapy

- Targets neuromuscular and central nervous systems
- Focuses on the abilities of the client to carry out efficient postural responses and movement patterns while avoiding abnormal movement patterns (with therapists help)
- Principles of NDT encourage:
  - Use of both sides of body
  - Bearing weight on affected side
  - Decreasing the use of adaptive equipment
  - Managing muscle tone

(Case-smith & O'Brien, 2010)
(Kramer, & Hinojosa, 2010)

STRETCHING TECHNIQUES/PNF STRETCHING

- It is often a combination of passive stretching and isometrics contractions.
- encourage flexibility and coordination throughout the limb's entire range of motion.
- PNF is used to supplement daily stretching and is employed to make quick gains in range of motion to help athletes improve performance.
- Good range of motion makes better biomechanics, reduces fatigue and helps prevent overuse injuries.

Sensorimotor Rehabilitation

- Rhythmic Auditory Stimulation (RAS)
  - used to facilitate rhythmically organized motor patterns needed in gait training
- Patterned Sensory Enhancement (PSE)
  - "the playing of musical instruments in order to exercise and stimulate functional movement patterns"
- Therapeutic Instrument Musical Performance (TIMP)
  - "uses elements of music to provide spatial, temporal and focused cues to movements that are not intrinsically rhythmic."

(Thaut & Hoemberg, 2014)

Aim

- Improve
  - Movement
  - Balance
  - coordination
- Safety

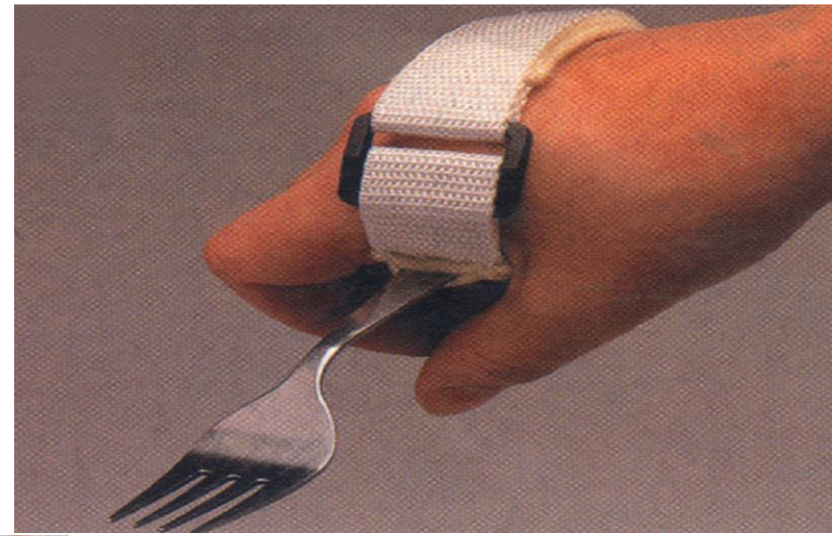
Basic Physical Therapy

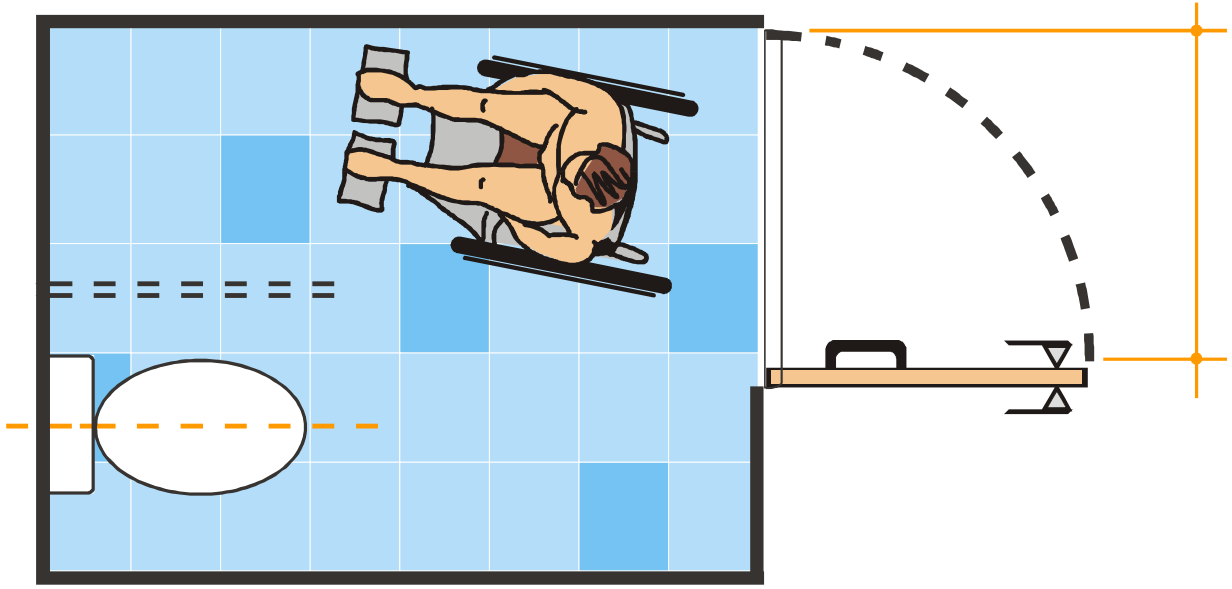
- Bed positioning, mobility
- Range of motion exercises (ROME)
- Sitting/trunk control
- Transfer
- Walking
- Stair climbing

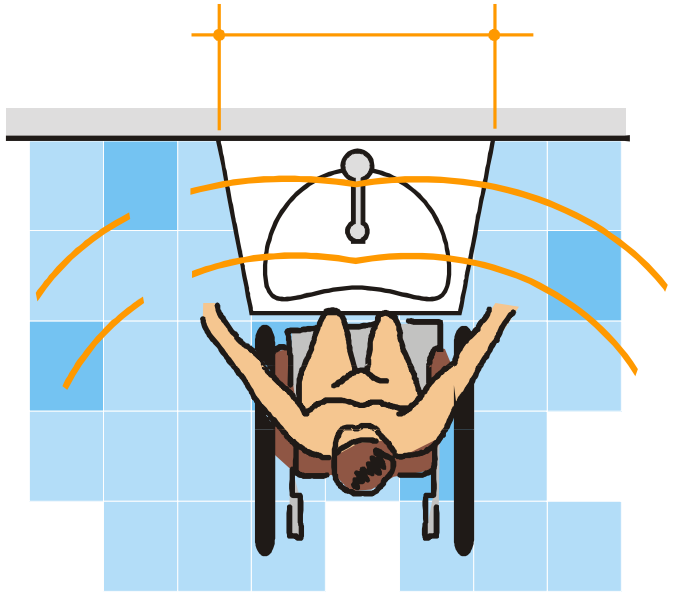
Robotics

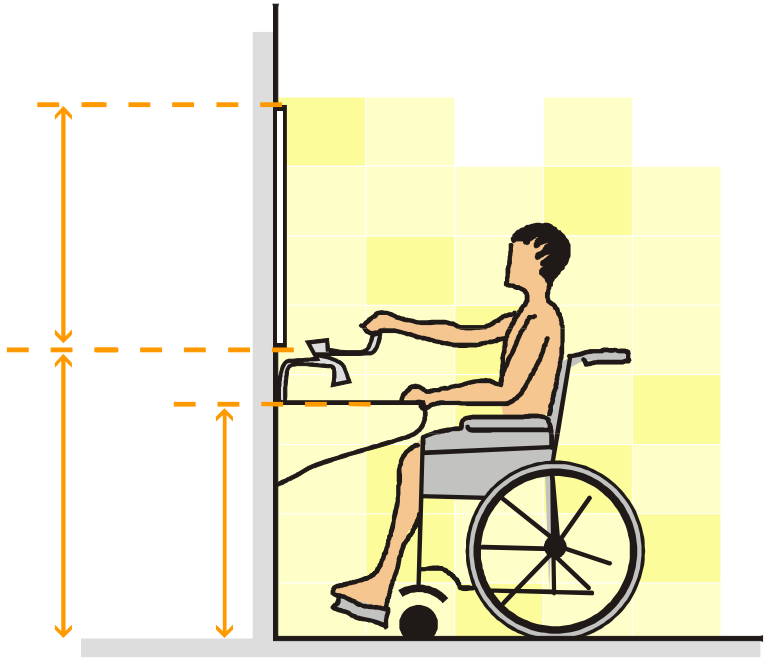
2. Activity of daily living

- Occupational therapy
  - Self care
  - Dressing
  - Grooming
  - Toilet use
  - Bathing
  - Eating
  - Adapt or specially design device







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3. Communication

- Speech and language therapy
- Common communication disorder

4. Swallowing

- Dysphagia : abnormal in swallowing fluids or food
    - Increase risk of pneumonia and malnutrition

5. Orthosis

- Shoulder slings
- Hand splint
- Foot slings
- Ankle foot orthosis

6. Shoulder pain

- Sensorimotor dysfunction of upper extremities
- 72% of stroke patient in first year
- Delay rehabilitation

Treatment

- Electrical stimulation
- Shoulder strapping
- Mobilization (esp. External rotator, abduction) prevent frozen shoulder, shoulder hand pain
- Medical
- Intraarticular injections
- Modalities : ice, heat, massage
- Strengthening

7. Spasticity

- Velocity dependent hyperactivity of tonic streth reflexes

8. Coginitive and perception

- Attention deficits
- Visual neglect
- Unilateral neglect
- Memory deficits
- Problem solving difficulties

Treatment

- Orientation
  - ❑time
  - ❑place
  - ❑person
- Memory
- Repetitive
- Environment
- Problem solving

9. Mood

- 1. Post stroke depression (PSD)
- 2. Anxiety
- 3. Emotionalism (emotional lability)
  - Improve with time

10. Bowel and bladder incontinence

- Urinary incontinence
  - 50% incontinence during acute phase
  - with time, ~ 20% at six months
  - Risk: age, stroke severity, diabetes
  - Indwelling catheter : management of fluids, prevent urinary retention, skin breakdown
  - Use of foley catheter > 48 hours UTI

- Fecal incontinence
  - Improve within 2 weeks
  - Continued fecal incontinence poor prognosis →

- Constipation, fecal impaction
  - More common
  - Immobility, inadequate fluid or food intake, depression or anxiety, cognitive deficit
- Management
  - Adequate intake of fluid
  - Bulk and fiber food
  - Bowel training


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Thank You
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