



HEMIPLLEGIA-GAIT

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- ▶ For functional purposes walking must be –
- ▶ Safe without fear of falling.
- ▶ Effortless to save energy.
- ▶ Cosmetically good.
- ▶ Possible without aids.
- ▶ To achieve these, components of gait should be understood.
- ▶ Prolonged wheelchair use increases flexion in the body which causes difficulty to extend against gravity.

Important pre-requisites before facilitating walking

- ▶ Ability to stand up and sit down safely.
- ▶ Problems with hemiplegics– If asymmetrical standing without sufficient forward weight transference on upright position will have a poor posture. Hence walking will be adversely affected from the very beginning.

- ▶ Comment–Most hemiplegics walk with their c.g well behind their normal line. Therefore have difficulty in bringing their weight forward over the weight bearing leg due to forces of spastic extensor muscles and loss of selective movements.
- ▶ NORMAL– Gait is symmetrical vis-à-vis time and distance and step lengths of left and right are equal.

- ▶ Hemiplegics – Walk asymmetrically vis-à-vis time and distance.
- ▶ They take a short step with the sound leg to avoid standing and balancing on the affected leg and also to avoid extensor spasticity being provoked by hip extension of the hemiplegic side.

- ▶ **NORMAL– Swing phase is low energy phase.**
- ▶ **Leg swings like a pendulum and controlled by muscles of thigh and leg.**
- ▶ **Hip laterally rotated due to pelvic rotation.**
- ▶ **Active Dorsiflexion due to tibialis anterior and EHL, Which allows clearance of toes.**

- ▶ Hemiplegics have difficulty in swing phase caused by– Spastic pattern of extension.
- ▶ After a step with the sound leg the affected leg behind has marked hyper tonus in all extensor muscle groups.
- ▶ Hip flexion, knee flexion and dorsiflexion difficulty forces the patient to hitch pelvis and circumduct to clear the floor.
- ▶ This causes inability to transfer weight adequately over the sound leg and free the affected leg for swing.

- ▶ Hyper extended or locked knee in hemiplegics.
- ▶ Causes– On weight bearing the whole lower limb extends in a mass pattern including plantar flexion. The foot pushes down against the floor causing a backward thrust of tibia leading to hyperextension.
- ▶ During hemiplegic gait ‘triceps surae’ activity occurs prematurely starting either immediately or shortly after foot– floor contact. This early activation of triceps leads to tension increase to shorten the muscle before the body has passed in front of the foot.

MANAGEMENT OR FACILITATION

- ▶ Use your hands to prevent difficulties and provide suitable cues.
- ▶ Various phases of gait should practiced in standing.
- ▶ For swing phase release spasticity at hip, knee and ankle to enable lifting leg and taking a step.

- ▶ Useful methods to facilitate
- ▶ Assistance to either side of pelvis to facilitate hip extension and weight transference. Use hands on gluteal muscles to facilitate hip extension.
- ▶ Patient to take first step with sound leg, then brings weight on hemiplegic foot. Therapist on affected side uses hands to facilitate hip extension and weight transference.

- ▶ Weight on affected leg then diagonally brought forward over sound leg till affected limb is free to start swing phase.
- ▶ Patient releases hip and knee letting heel fall forwards i.e. external rotation of hip for swing.
- ▶ Therapist to press down and forwards on pelvis as hip and knee flex to prevent hitching of pelvis. As foot reaches forward guide weight over leg to avoid 'push' into pattern of extension.

- ▶ With both arms held behind extended and externally rotated.
- ▶ Once patient can control hip and knee extension adequately , facilitate by holding both arms behind with wrists and fingers extended. This enables patient to extend hips and trunk easily by counteracting pull of flexor spasticity in trunk and shoulders.
- ▶ This also checks associated reactions.

- ▶ With hemiplegic arm on your shoulder.
- ▶ Do not rest both arms as this increases flexion in trunk and hips. This is a normal compensatory mechanism to maintain equilibrium.
- ▶ Therefore place only hemiplegic arm on shoulder and one hand on scapula to maintain protraction.
- ▶ Do not pursue with this for long as patient may become dependent to walk with someone in front.

- ▶ With one hand against thoracic spine and other against sternum.
- ▶ This is suitable for a patient who has difficulty orientating trunk correctly over pelvis.
- ▶ The therapist's hands behind and front serve as points of reference.
- ▶ Progress to backward and sideway walking and stair climbing.

Thank You