Gait disorders

Normal

Swing phase - Raise one foot and accellerate it forward

Stance phase - Swing leg contacts ground heel first and weight is transferred forward as rest of foot touches down

Walking is pendulous motion. Everyone has a "natural frequency" and to go outside of the natural frequency in any manor costs energy in the form of slowing the pendulum down or accellerating it. Thus it costs as much for a shorter person to walk faster as it does for a taller person to walk slower. People who walk "gracefully" usually expend more energy to do so.

Hemiparetic gait

"mummy walk" - leg extended, arm flexed, swing phase is not pendulous motion but circumduction; body rocks to opposite side instead of forward and backward: arm does not swing; loss of arm swing and uneven wear of shoe can be early and subtle signs of hemiparesis

Spastic paraparetic gait

Slow stiff movements of knees and hips – much energy expenditure

Scissor gait – legs may cross with each step

Feet may scrape floor and toes of shoes wear early

Parkinsonian gait

Slooped posture of flexion at elbows, legs and waist with masked like facies

When walking body leans even farther forward

Marche a petis pas – small shuffling steps with feet scraping floor

Speed of walk may increase and patients may fall – increasingly rapid walking – festination

Freezing – abrupt cessation of walking when attempting to pass through a doorway

A subtle disturbance (a gentle shove) may knock them off balance and produce a retropulsive or propulsive series of steps

Cerebellar disease

Wide based stance

Titubation – coarse to and fro tremor of the trunk

Fear walking without support

Lose balance when feet moved closer together *with eyes open or closed*

Subtle disturbances brought to light with tandem walk

Alcoholic cerebeller degeneration – affects vermis of cerebellum more so than hemispheres. Result is stance and gait abnormalities in the absence of limb ataxia and nystagmus

Unilateral cerebellar hemispheric lesion – stance is with ipsilateral shoulder lower and slight scoliosis. Limbs on affected side show hypotonia. Patients deviate to affected side when walking.

Bilateral cerebellar hemispheric lesions – gait is like vermal lesion but limb ataxia manifested by dysmetria, abnormal heel to shin testing etc. is also present

Sensory ataxia gait

Lesion of peripheral nerve, roots, dorsal columns, medial lemnisci; Stand with feet far apart

Stable with feet close together, but fall when eyes closed (**Rom**berg)

Foot slaps ground when walking – pick feet up very high; Gait worsens markedly in the dark

Hysterical gait disorders

Easily recognized usually, sometimes not

Patients may lurch wildly but may perform incredible feats of balance to keep from falling

Hysterical hemiplegia – affected limb drags ground instead of being circumducted, arm is not flexed, babinski absent DTR normal

Hysterical paraplegia – pts walk with crutches ro lie in bed with legs rigid at times and at others completely limp

Atasia-abasia- patients cannot stand or walk but can carry out normal movements in bed

Cerebral Palsey

Wide variety of severity and thus gait abnormalities

Bilateral hemiparetic gait – legs adducted and internally rotated at hip, plantar flexed at ankles so they walk on toes with knees rubbing and crossing producing scissor gait – arms are adducted and flexed at elbows and wrists

Athetotic gait – bilateral hemiparetic gait with involuntary limb movements and facial griamacing. Partially fixed asymetric limb postures (flexion of one arm with extension and pronation of the other, with chin rotation toward side of extended arm)

Chorea

Sydenham or Huntington's disease – walking accentuates movements and resembles dance steps

Dystonia Musculorum Deformans

Inversion of one foot at the ankle early on – pts walk on lateral aspect of foot – later – elevation of one shoulder, of on ehip and twisted trunk

Muscular dystrophy

Gowers sign

Lumbar lordosis, protuberant abdomen

Pelvic waddle from weak gluteal muscles

Shoulders slope forward, scapulae wing

Senile gait disorders

Cautious gait – wide based, short steps, turning en bloc, no hesitency, no shuffling, no freezing

Subcortical dysequilibrium – PSP, MID – absent postural adjustments to perterbations – occular palsies, dysarthria, and EPS

Frontal dysequilibrium – cannot rise, stand, walk or even sit without support – cannot rise from a chair – frequently lean backwards rather than forwards: dementia, suck, snout, grasp, motor perservation, urinary incontinence, pseudobubar passey, increased dtr, upgoing toes

Isolated gait ignition failure – difficulty initiating and maintaining locomotion – start with short steps, but eventually normalizes when they continue to walk: if distracted gait will freeze again and start over; postural responses preserved, falls rare- aka magnetic gait and apraxia of gait

Frontal gait disorder – MID, NPH- vp shunt may restore gait-short shuffling steps, hesitation in starting and turning; cognitive impairment, pseudobulbar palsy, dysarthria, frontal release, urinary incontinence

Lower motor neuron disorder – bilateral foot drop (CMT); unilateral (perineal neuropathy); high steping waddling gait