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APPROACH TO A PATIENT WITH UNSTEADY GAIT
Outline

- Physiology of locomotion
- Causes of unsteady gait
- History taking
- Physical examination with focus on different gaits
- Investigations & Managements
- Video Quiz
Physiology of locomotion

- 4 fundamental requirements for successful locomotion:
  1. Maintenance of balance and upright posture
  2. Gait initiation
  3. Generation of rhythmic locomotion
  4. Adaptation of movements to meet the environmental demands and the goals of the individual

- Delicate balance between various interacting systems: 3 major afferent sensory systems, a locomotor efferent system and the strict surveillance by several structures of the CNS (brainstem, cerebellum, subcortex and frontal cortex)

- Cardiovascular system also participates
Causes of unsteady gait

- Can be multifactorial
- Acute/subacute vs chronic
- Neurological and non-neurological
Causes of acute/subacute gait disorders

- Trauma
- Stroke
- Subdural hematoma
- SOLs of brain and spinal cord
- Guillain-Barre syndrome
- Acute encephalopathy
- Intoxication/drugs
<table>
<thead>
<tr>
<th>Drug class</th>
<th>Sedation</th>
<th>Orthostasis</th>
<th>Hallucinations/psychosis</th>
<th>Extrapyramidal syndrome</th>
<th>Ataxia/dizziness</th>
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<td>Anticholinergics</td>
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<td>Antidepressants</td>
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### Disorders affecting the afferent nervous system
- Sensory peripheral neuropathies
- Multiple sensory deficits
- Vestibular dysfunction

### Disorders affecting the integrative nervous system
- CVAs
- Binswanger disease
- Chronic subdural hematoma
- Neoplasms
- Normal pressure hydrocephalus
- Cerebral palsy
- Multiple sclerosis
- Metabolic encephalopathies
- Drugs and toxins
- Parkinson disease
- Atypical Parkinsonism eg MSA, PSP
- Secondary Parkinsonism
- Other hyperkinetic movement disorders
- Spinocerebellar degenerations
- Paraneoplastic cerebellar degeneration

**Common causes of chronic gait disorders**
### Disorders affecting the efferent nervous system

- Cervical myelopathy
- Myopathies
- Peripheral motor neuropathies
- Other neuromuscular diseases

### Non Neurological causes

- Arthritis
- Musculoskeletal deformities
- Depression
- Psychogenic disorders
History Taking

- Clarification of unsteady gait
- Temporal nature, onset, progression, precipitating factors, relieving factors
- Associated symptoms like giddiness, weakness, pain, numbness and etc
- Falls history (previous falls, injuries, circumstances of fall)
- Careful medical history, surgical history and systemic review
- Family hx
- Medications (recently added, changes of dosing, adverse effects)
- Premorbid activity, mobility status and level of function
- Use of walking aids
Physical Examination

- Affective/cognitive
- Musculoskeletal
- Neurological examination (tone, reflexes, power, pinprick sensation, proprioception, Romberg’s sign, cerebellar signs, vestibular functions, hypokinesia, ?dyskinesia, ?tremor)
- Gait (speed, initiation, arm swing, turning, cadence, ?freezing, tandem, pull test)
- Vision
- Vitals eg postural BP
- Cardiovascular examination
Examination of Gait and Balance

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<thead>
<tr>
<th><strong>Musculoskeletal assessment</strong></th>
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<tr>
<td>Range of motion in spine, pelvis, hips, knees, and ankles</td>
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<td>Muscle bulk, strength and tone</td>
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<th><strong>Postural control and balance</strong></th>
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<td>Stability and posture while sitting and standing</td>
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<td>Romberg test</td>
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<td>Rescue response (pull test)</td>
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<td>Tandem walking</td>
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<td>Hallpike maneuver in patients with positional or episodic vertigo</td>
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<th><strong>Locomotion</strong></th>
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<td>Rising from a chair</td>
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<td>Gait initiation</td>
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<td>Walking (stride, arm swing, base, symmetry of limb movement)</td>
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<td>Turning and negotiating obstacles</td>
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<td>Sitting</td>
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Investigations

- Blood investigations, neurophysiological studies, brain or spine imaging, LP if indicated
- Hearing and ophthalmologic evaluation if indicated
Management

- Correcting the reversible causes
- If not possible, the goals will be to curb further progression of disability and to avoid recurrence of known causes
- Other aims:
  - Improve ambulation
  - Promote independence
  - Prevent falls
Video quiz- Question 1
Question 2
THANK YOU 😊