What is a Movement disorder?

- “A disorder which impairs the regulation of voluntary motor activity without directly affecting strength, sensation or cerebellar function”
- Sometimes also known as “extrapyramidal disorders”
- It is a disorder of basal ganglia which are group of the nuclei located subcortically which take part in motor movements of body.
- Abnormal increment or decrement in its parts causes various movements disorders.

### Basal Ganglia

<table>
<thead>
<tr>
<th>Corpus striatum</th>
<th>Other subcortical nuclei</th>
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<tbody>
<tr>
<td>Caudate N</td>
<td>Lenticular N</td>
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<tr>
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<td>Putamen</td>
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<td></td>
<td>Globus pallidus</td>
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<td>STN</td>
<td>SN</td>
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### Classification of Movement Disorders

- Pyramidal Syndromes → Spasticity
- Cerebellar Disorders → Ataxia
- Basal Ganglia Disorders:
  - Hypokinesias
    - Akinesia
    - Rigidity
  - Hyperkinesias
    - Tremor
    - Dystonia
    - Myoclonus
    - Chorea, Athetosis
    - Tics, Stereotypies
  - Miscellaneous (Moto-Sensory-Behavioral)
    - Compulsions
    - Mannerism
    - Akathisia, Restless Legs

### Hyperkinetic Movements

- Tremor (ET- most common)
- Chorea/ Athetosis
- Dystonia
- Ballism
- Myoclonus
- Tics

### Hypokinetic Movements

- Parkinsonism (2nd most common)
- Apraxia
- Hypothyroid slowness
- Rigidity
Tremor

- Rhythmic
- Involuntary movements of fingers, hand, arms, legs, tongue, or head
- Due to alternate contraction and relaxation of agonist and antagonist muscle groups
- Sometimes they can be so fine that they can’t be easily recognized
- Put a paper on dorsum of an outstretched hand
- May be coarse

Common Causes of Tremor

Rest Tremor

- Parkinson disease
- Drug-induced parkinsonism
- Vascular parkinsonism

Postural Tremor

- Enhanced physiologic tremor
- Essential tremor
- Drugs (coffee, salbutamol)
- Thyrotoxicosis

Kinetic Tremor

- Cerebellar disease
- Wilson disease
- Psychogenic (functional)

Ballismus, Chorea, Athetosis & Dystonia

- These should NOT be thought of as separate entities amenable to specific definition but rather as a SPECTRUM of movements that blend into one-another. Why?
- Because...
  - They often co-exist
  - They often (with some notable exceptions) have the same significance in terms of aetiology.
- The spectrum:
  - Movements become
    - Less violent / explosive / jerky
    - Smoother and more flowing
    - More sustained
  - They differ from tics in that they cannot be suppressed by voluntary control
Ballismus

- Violent “flinging” movement of entire limb
- Almost always unilateral and therefore use term “HEMIBALLISMUS”
- Involves proximal musculature and is sometimes thought of as a “proximal unilateral chorea”
- Usually due to a stroke in contralateral subthalamic nucleus

Chorea (“dance” in Greek)

- Rapid irregular muscle jerks
- May affect limbs, head, face and tongue
- In the limbs chorea refers more to distal movements (as proximal movements usually called ballismus)
- Patients often attempt to conceal involuntary movements by superimposing voluntary movements onto them e.g. an involuntary movement of arm towards face may be adapted to look-like an attempt to look at watch

Athetosis “changeable” in Greek

- Slow, flowing, often twisting movements
- Occurs mainly distally (hands, fingers)
- Can also affect face and tongue
- Often use term “choreoathetosis” due to overlap between syndromes (chorea referring to less smooth, more jerky movements)

Dystonia

- “condition in which the patient assumes a sustained, abnormal posture or limb position”
- Due to co-contraction of agonist and antagonist muscles in part of body
- The part of the movement when the limb was held, unmoving, in an abnormal position would be considered a dystonia (may occur alone).
- Classification:
  - Focal (single body part)
    - Affect one part of the body such as eyes, neck, arm or vocal cords.
    - Usually idiopathic
    - Most common type
    - Examples: Blepharospasm, Torticollis, Writer’s cramp, Musician’s cramp
  - Hemidystonia affects an arm and a leg on one side of the body.
  - Generalized dystonia affects most of the body, frequently involving the legs and back.

Causes of Chorea, Dystonia and Athetosis

- Hereditary
- Static Encephalopathy (Cerebral Palsy)
- Drugs
- Stroke
- Secondary to medical disorders
- Miscellaneous
  - Sydenham’s chorea
  - Chorea Gravidarum
  - Sporadic idiopathic torsion dystonia
• Secondary to medical disorders (A SHEEP)
  o Anoxic brain damage (post – CPR)
  o Systemic lupus erythematosis
  o Hepatic failure
  o Endocrine - Thyrotoxicosis - Addisons
  o Electrolyte - Low Ca, Mg - High Na
  o Polycythemia rubra vera

**Myoclonus**

• Brief, isolated, random, non-purposeful jerks of muscle groups in the limbs, may occur normally at the onset of sleep (hypnic jerks).
• May be caused by active muscle contraction (positive myoclonus)
• May be caused by inhibition of ongoing muscle activity (negative myoclonus, eg. Asterixis)
• Generalised - widespread throughout body
• Focal / segmental – restricted to particular part of body

**Causes**

• Physiologic - Nocturnal (usually on falling asleep) - Hiccups
• Epileptic - Demonstrable cortical source
• Symptomatic:
  o hypoglycemia
  o hepatic failure ("asterixis")
  o renal failure
  o hyponatremia

**Tics**

• Recurrent, stereotyped abnormal movements
• May be suppressed voluntarily or with distraction
• Voluntary suppression leads to anxiety and a build-up of internal unrest.
• Worsen under stress