

Cerebral Palsy

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Definition

"Cerebral palsy describes a group of *permanent disorders of the development of movement and posture*, causing activity limitations that are attributed to *non-progressive disturbances* that occurred in the developing *fetal or infant brain*. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, perception, cognition, communication, and behaviour, by epilepsy, and by secondary musculoskeletal problems."

Epidemiology

- Prevalence 2-2.5 per 1000 live births globally
- 2-10 per 1000 live births in Africa
 - Paucity of data
 - Effect of high early mortality
 - Differences in postnatal causes

Classification

- Topographical distribution of motor impairment
- Predominant tone abnormality
- Severity

Topographical distribution of motor impairment

- Conventional
 - Hemiplegia
 - Diplegia
 - Quadriplegia
- Proposed (SCPE)
 - Symmetrical vs Asymmetrical
 - Which limbs? Trunk? Face?

Tone abnormality

SCPE Classification of CP Subtypes Based on the predominant neurological findings		All CP subtypes have in common an abnormal pattern of movement and posture. Additional features by subtype:
SPASTIC CP	Bilateral Spastic (BS-CP)	Increased tone Pathological reflexes - increased reflexes, e.g. hyperreflexia - pyramidal signs, e.g. Babinski response resulting in abnormal pattern of movement and posture
	Unilateral Spastic (hemiplegia)	
DYSKINETIC CP	Dystonic	Involuntary, uncontrolled, recurring, occasionally stereotyped movements, primitive reflex patterns predominate, muscle tone is varying
	Choreo-athetotic	
ATAXIC CP		Loss of orderly muscular coordination, so that movements are performed with abnormal force, rhythm and accuracy

Aetiology

1. Brain malformation
2. Brain damage
3. Disorders of brain function without evidence of structural abnormality

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Timing of events

- Prenatal
- Perinatal
- Postnatal (infancy)

Conventional medical therapy

1. Direct muscle relaxants
2. Denervation or neuromuscular blockade
3. Central inhibition
4. Reduction of afferent input from the hypersensitive stretch reflex by selective dorsal rhizotomy
5. Therapies to improve motor control

Conventional medical therapy

	Spasticity	Dystonia	Dyskinetic movements
First line	Barlofen	Trihexiphenidyl Gabapentin Clonidine L-dopa (first line if considering Segawa syndrome)	Levetiracetam
Second line	Gabapentin Diazepam	Barlofen Diazepam	Tetrabenazine Sodium Valproate Carbamazepine
Third line	Dantrolene Tizanidine	Carbamazepine (particularly helpful in PKD) Dantrolene	Gabapentin Clonidine Diazepam

PKD: paroxysmal kinesogenic dystonia.

Other medical therapies

1. Deep brain stimulation
2. Stem cell therapy

Co-morbidities

Associated co-morbidities of cerebral palsy

Neurological	Epilepsy, hydrocephalus, visual and hearing impairment
Behavioural and learning	Sleep disturbance, depression, autistic features, learning difficulties, vulnerability
Gastro-intestinal	Difficulty swallowing, gastro-oesophageal reflux, constipation
Bone	Osteoporosis, scoliosis, hip dislocation, pathological fractures
Respiratory	Susceptibility to chest infections and aspiration
Skin	Drooling, pressure sores
Dental	Poor oral hygiene, susceptibility to dental caries