

Subject: Neurological physical therapy

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Q1. What is difference between Parkinson and Parkinsonism?

Write down primary and secondary clinical feature of Parkinson disease also explain physical therapy management of Parkinson patients.

Answer:

Difference between Parkinson and parkinsonism:

Parkinson is a chronic, progressive, neurological, degenerative disease that occurs due to dopamine depletion in basal ganglia of the brain.

Parkinsonism is a chronic, progressive neurological syndrome due to lesion in basal ganglia.

Parkinson's disease is a neurodegenerative brain disorder that progresses slowly in most people, Whereas Parkinsonism is a general term that refers to a group of neurological disorders that cause movement problems similar to those seen in Parkinson's disease such as resting tremors, rigidity, bradykinesia and postural instabilities

Parkinsonism, also called atypical Parkinson's or Parkinson's plus, is the umbrella term used to describe a group of neurological problems. Parkinson's is caused mainly by the degeneration of nerve cells in the brain, while the causes of parkinsonism are numerous, ranging from the side effects of medications to chronic head traumas to metabolic diseases to toxins to neurological diseases.

Primary and secondary Clinical features of Parkinson:

Primary clinical features	Secondary clinical features
Resting tremors	Psychological problems
Bradykinesia	Personality problems
Rigidity	Autonomic disturbances
Postural abnormalities	Sensory problems
Masked face	Sleep disturbances

Abnormal gait	Speech problems
	Micrographia
	Cough
	Sialorrhea

Physical therapy management of Parkinson patients:

Physical therapy goals for Parkinson's patients are

- Maximize patient's independence
- Regain patient's functional potential
- Minimize deformity chances
- Conserve energy

Modes

1. Exercises

The goals for exercises are to:

- Maintain joint integrity
- Maintain muscle strength, flexibility and endurance

Types of exercises given are

- Strengthening exercises: for all weakened muscles like Core muscles (abdominals), thigh muscles (quadriceps), buttocks (gluteal), back muscles, arm muscles (triceps), hands and wrists
 - Balance exercises: to practice balance and be able to maintain their balance to prevent the risk of falling. Recommended exercises for balance in Parkinson disease Patients are dancing and tai chi
 - Breathing and Relaxation exercises: includes diaphragmatic breathing exercises, yoga and soft music to help release tension from the body and relax.
 - Stretching exercises: stretching exercises are especially given for shortened muscles such as, trunk flexors, hip and knee flexors, neck flexors, shoulder internal rotators and adductors.
 - Hydrotherapy: is water-based therapy which helps in strengthening, relaxation and balance of the patient.
 - Tremors management: tremors is one of the earliest signs of PD and it can be improved with purposeful functions such as putty squeezing, complete relaxation, fist making. proper sleep can also contribute to improvement of tremors
 - Facial mobility exercises: in PD it is common to have masked facies also know as hypomimia (loss of facial expressions). Therefore, the masked facial management for PD

patients would be mirror therapy to practice their facial expressions such as surprise, displeasure, frowning, nose wrinkling, smiling

- Micrographia management: Here patients are given weighted pen for usage, wrapping of tape is also used for additional grip and in later stages the patient also uses typewriter and keyboard typing.
- Gait management: in this the patient performs purposeful targeted movement, walking on cue cards, floor markings and blocks, treadmill walking, walk with longer stepped gait with broad base and walking with arm swing in a marching style.
- Posture management: includes modified wall and corner push ups, bilateral upper limb wall slides, leaning forward with palms towards the wall with arms over head and feet away from the wall, back and head with wall from posterior side while shoulder blades with wall and chin tuck in.
- Aerobic conditioning: these include flexibility exercises like head turns and tilting, ankle circling in air and neck and trunk twisting. It also includes walking, stationary bicycling, recreational activities and dancing.
- AdL's modification: ADL stands for activities of daily living. ADL comprises of basic actions that involve caring for one's self and body, including personal care, mobility and eating. For PD patients there is properly planned short interval important task doing to avoid fatigue, weakness and energy conservation like proper sleeping, transfer techniques, dressing and grooming, eating and writing, bathing and toileting.
- Range of motion exercise: recommended exercises for range of motion is "trunk twist," which is designed to improve range of motion in your neck, trunk, and shoulders, all of which are often compromised in people with Parkinson's disease.
- Coordination exercises: tapping hands on thigh while sitting down, pronation and supination hand tapping on thighs at the same time while sitting down, foot tap, finger to finger, finger to nose, ankle circles, neck rotation left and neck rotation right.

Q.2 All body movements are controlled by brain which is also called control centre, brain have different parts and different lobes, elaborate different lobes in brain and also explain functions of different lobes.

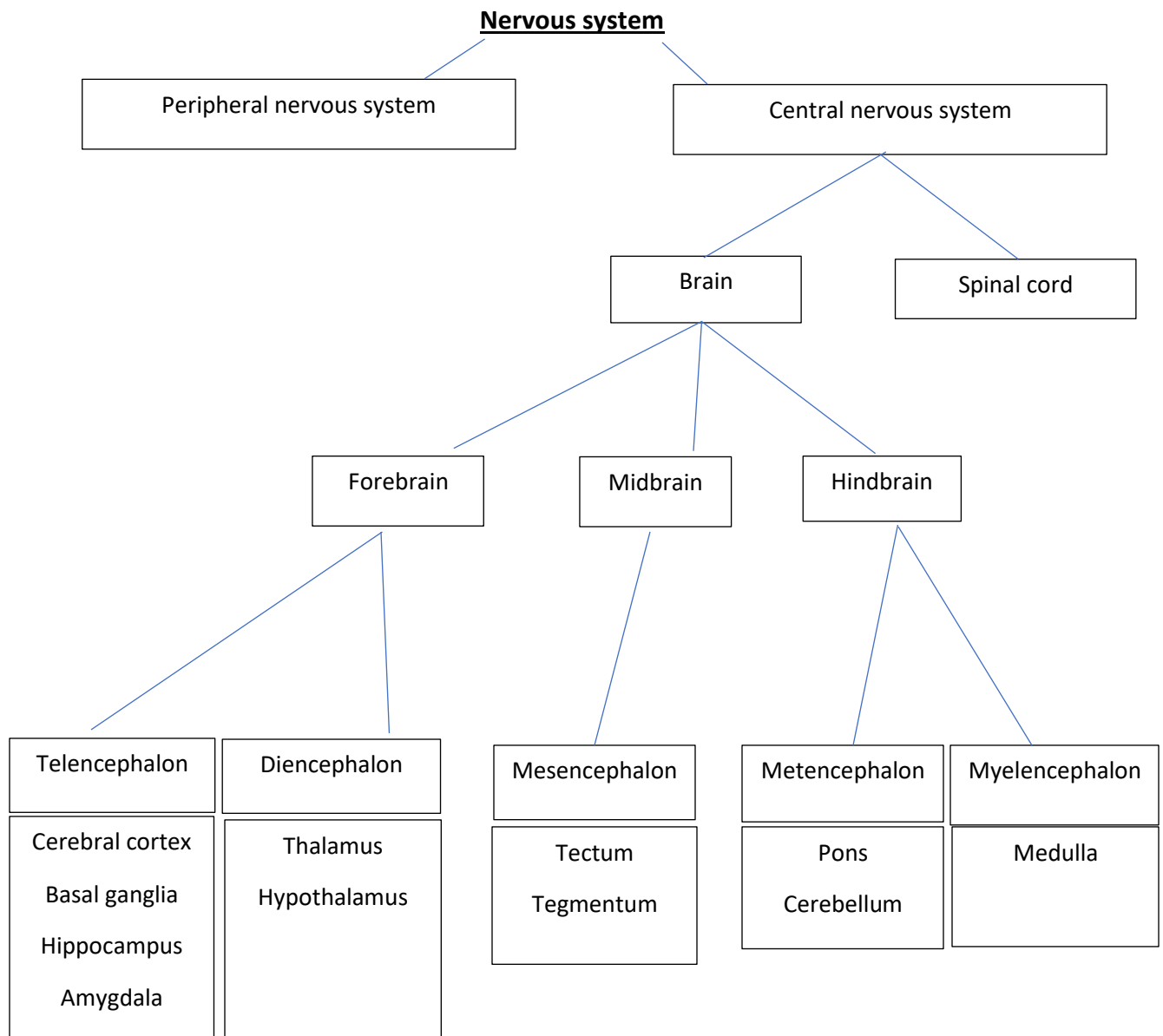
Answer

The human nervous system main organ is the brain and spinal cord. It is one of the most complex and largest organs in human body. Every component of the brain works together to keep the body functioning. In embryos the brain and spinal cord is the neural tube, as the fetus develops the grooves and folds in the neural tube deepens giving rise to different layers of the brain. Brain is split into three major layers hind brain, midbrain and fore brain.

Hindbrain: The hindbrain is the well-protected central core of the brain. It includes the cerebellum, reticular formation, and brain stem

Midbrain: it makes up part of the brain stem. It is located between the hindbrain and forebrain. All sensory and motor information that travels between the forebrain and the spinal cord passes through the midbrain, making it a relay station for the central nervous system.

Forebrain: it is the anterior division of the brain, containing the most complex networks in the central nervous system. It has two major divisions: the diencephalon and the telencephalon. The diencephalon is lower, containing the thalamus and hypothalamus; the telencephalon is on top of the diencephalon and contains the cerebrum.



Each side/ hemispheres of the brain have four lobes these are frontal, parietal, temporal and occipital. These lobes of the brain are divided by gyri (bumps) and sulci (grooves or fissures). Each lobe carries out certain functions.

Frontal lobe: The frontal lobe is separated from the parietal lobe by a space called the central sulcus, and from the temporal lobe by the lateral sulcus. The frontal lobe is generally where higher executive functions including emotional regulation, planning, reasoning and problem solving occur. The frontal lobe also contains the primary motor cortex, the major region responsible for voluntary movement.

Parietal lobe: The parietal lobe is behind the frontal lobe, separated by the central sulcus. Areas in the parietal lobe are responsible for integrating sensory information, including touch, temperature, pressure and pain. Because of parietal lobe we can distinguish between touch of two objects.

Temporal lobe: Separated from the frontal lobe by the lateral fissure, the temporal lobe also contains regions dedicated to processing sensory information, particularly important for hearing, recognising language, and forming memories.

Occipital lobe: The occipital lobe is the major visual processing centre in the brain. The primary visual cortex receives visual information from the eyes. This information is relayed to several secondary visual processing areas, which interpret depth, distance, location and the identity of seen objects.

Q.3 Explain stroke and types of stroke.

- a) What are neurological complications and associated conditions in stroke?
- b) Write down the Physical therapy interventions in stroke patients.

Answer

Stroke and types of stroke

Stroke or cerebrovascular accident (CVA) is the sudden loss of neurological function caused by an interruption of the blood flow to the brain. It causes changes in the level of consciousness and impairments of sensory, motor, cognitive, perceptual and language functions. Brain requires continuous supply of oxygen and glucose for neurons to function. If the blood flow to the brain is obstructed it results in lack of oxygen, the neurological metabolism is altered in 30 seconds, metabolism stops in 2 minutes and cell death occurs in 5 minutes. There are two types of strokes, ischemic stroke and haemorrhagic stroke.

Ischemic stroke is the result of inadequate blood flow to the brain due to partial or complete occlusion of an artery. Ischemic stroke can be divided into two main types these are

thrombotic and embolic. Ischemic stroke occurs due to the narrowing of the arteries in the neck or head. This is mostly caused by atherosclerosis, or gradual cholesterol deposition. If the arteries become too narrow, blood cells may collect and form blood clots.

- A thrombotic stroke occurs when diseased or damaged cerebral arteries become blocked by the formation of a blood clot within the brain. It is clinically referred to as cerebral thrombosis, it is a narrowing of the artery by fatty deposits called plaque. Plaque can cause a dot to form, which blocks the passage of blood through the artery.
- In embolic stroke and embolus (blood clot) or other debris circulates in the blood. When it reaches an artery in the brain that's too narrow to pass through, it lodges there and blocks the flow of blood. Embolic stroke is also caused by a clot within an artery, but unlike in thrombotic stroke the clot (or emboli) forms somewhere other than in the brain itself.

Haemorrhagic stroke results from bleeding into the brain tissue itself or into the subarachnoid space or ventricles. It could happen because of HTN, aneurysm, bleeding disorders, head injury and trauma or weakened vessel that ruptures and bleeds into the surrounding brain. The blood accumulates and compresses the surrounding brain tissue. There are two types of haemorrhagic stroke, subarachnoid haemorrhage and intracerebral haemorrhage.

- Subarachnoid haemorrhage: bleeding into cerebrospinal space between the arachnoid and pia matter. It is commonly caused by rupture of a cerebral aneurysm
- Intracerebral haemorrhage: bleeding is within the brain caused by a rupture of a blood vessels

a) What are neurological complications and associated conditions in stroke?

Neurological complication and associated condition in stroke are the following: Altered consciousness, sensory deficits, motor deficits, dysarthria, dysphagia, cognitive dysfunction, altered emotional status, perceptual dysfunction, seizures, bladder and bowel dysfunction, cardiovascular and pulmonary dysfunction, deep venous thrombosis and pulmonary embolus, osteoporosis and fracture risk.

b) Write down the Physical therapy interventions in stroke patients.

- Look and apply strategies to improve motor learning.
- Interventions to improve sensory functions.
- Intervention to improve unilateral neglect
- Intervention to improve strength
- Interventions to manage spasticity
- Interventions to improve movement control
- Strategies to improve upper extremity functions
- Strategies to improve lower extremity functions
- Interventions to improve functional status

- Interventions to improve postural control and balance
- Intervention to improve gait and locomotion
- Intervention to improve aerobic capacity and endurance