

FRANKLIN MEDICAL COLLEGE

Excerpted from:

MEDICAL TERMINOLOGY
COURSE CURRICULUM



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The Nervous System

Chapter 13 Unit 2

1.0 Amyotrophic Lateral Sclerosis (ALS; Lou Gehregs disease)

A common motor neuron disease causing degeneration of the upper motor nerves in the medulla oblongata and the lower nerves in the spinal cord. This results in atrophy of the muscles. Onset occurs between the ages of 40-70 and is usually fatal within 3-10 years due to aspiration pneumonia or respiratory failure.

CAUSES:

- Inherited autosomal trait
- Vitamin E deficiency (damages cell membranes)
- Metabolic interference in the production of nucleic acid by the nerves; autoimmune disorders and nutritional deficiency of the motor neurons.

SYMPTOMS:

- Muscular atrophy
- Weakness - especially of hands and forearms, plus problems with speech, chewing and swallowing.
- If brain stem is involved - respirations will be affected (i.e., choking and excessive drooling).

TREATMENT:

No effective treatment is available.

2.0 Bells Palsy

Origin is unknown. It is a disease of the 7th cranial nerve (the oculomotor). Causes weakness or paralysis on one side of the face. It occurs suddenly and within one to eight weeks and will usually spontaneously subside.

SYMPTOMS:

- Drooping of the mouth
- Drooling saliva
- Distorted sense of taste
- Inability to close affected eye

TREATMENT:

- Steroids aid in reduction of edema
- Moist heat to the face and jaw helps relieve pain

3.0 Cerebral Palsy

Is associated with birth and involves both nerves and muscles. It is the most commoncrippler of children. There are three forms of cerebral palsy: spastic, athetoid, and ataxic.

Characteristics of the Spastic type (affects 70%):

- Hyperactive tendon reflexes
- Rapid alteration between muscular contraction and relaxation.
- Permanent muscle shortening
- Underdevelopment of the affected extremities
- Mental retardation

CAUSES:

- Lack of O₂ to the brain
- Hemorrhage
- Brain damage

- Prenatal conditions such as rubella, toxemia, maternal diabetes, and malnutrition.
- At birth: difficulties such as forceps delivery, breech presentation, premature placental separation, premature birth and rapid or prolonged labor.

TREATMENT:

No cure

Supportive treatment such as:

- Physical therapy; speech therapy; braces or splints, occupational therapy; psychological assistance
- Surgery for severe contractures; control of convulsions or seizures.

4.0 Encephalitis

A severe brain inflammation. Onset is sudden and acute.

CAUSES:

- Virus-bearing mosquito or tick
- Virus that causes polio, herpes, or mumps
- Following measles, rubella, or a vaccination

SYMPTOMS:

Fever, headache, vomiting, stiff neck and back, drowsiness, and eventual coma.

TREATMENT:

Supportive drug therapy to control restlessness, convulsions, reduce edema, and headache.

5.0 Epilepsy

Associated with abnormal electrical impulses from the neurons of the brain.

CAUSES:

- Abnormal brain chemistry
- Brain trauma
- Anoxia (lack of O₂ to the brain)
- Meningitis
- Encephalitis
- Ingestion of toxins
- Brain tumor
- PKU
- Head injury

SYMPTOMS:

- Petit or grand mal seizures (are of short duration)
- Grand mal lasts up to 5 min. with convulsions, loss of control of bodily functions and unconsciousness. Diagnosis is made from evidence of seizures, a positive EEG, and various X-ray procedures.

TREATMENT:

Drug therapy to control seizures and psychological support.

6.0 Headache

Are classified as tensions (vascular, muscle contraction) or traction-inflammatory.

CAUSES:

- Emotional stress
- Fatigue
- Environmental conditions
- Inflammation of the sinuses
- Diseased teeth
- Muscle spasms of the neck and shoulders
- Vasodilators (i.e., nitrates, alcohol & histamine)
- Aged or fermented food or drink (i.e., red wine)
- Chocolate (vasoconstriction of the arteries)
- Aspartame (vasoconstriction)
- Hypoglycemia (low blood sugar - vasodilation)

7.0 Migraine:

Is characterized by prodromal (early) symptoms including:

- Fatigue
- Visual disturbances (zig-zag lines, bright lights)
- Sensory - tingling face and lips
- Motor - staggering

Migraines frequently occur in people with compulsive personalities and within families. Usually happens on weekends and holidays.

SYMPTOMS:

- Severe throbbing pain
- Sensitivity to light
- Nausea and vomiting
- Lasts from a few hours to a few days

TREATMENT:

- It cannot be prevented but medication can reduce frequency and intensity.
- Ergotamine with caffeine
- There is no cure for migraine headaches, only control:

Lie quietly in a darkened room. Analgesics, ice bag to head, beta blockers, and antidepressants appear to be effective.

8.0 Herpes Zoster

This is an acute inflammation of the dorsal root ganglion by a herpes that also causes chickenpox. Characterized by fluid filled vesicle lesions on the skin and severe pain from the affected nerves.

Onset is characterized by:

- Fever and discomfort
- Severe deep pain
- Itching
- Abnormal skin sensations. The vesicles erupt in about 2 weeks and spread around the thorax or vertically on the extremities. These vesicles last from 1 to 4 weeks.

TREATMENT:

- Narcotics to relieve pain and itching
- Systemic antibiotic if infection develops

9.0 Hydrocephalus

Excessive accumulation of cerebral spinal fluid (CSF) within the ventricles of the brain.

May result from:

- Overproduction of CSF
- Obstruction of the flow of the CSF or lack of absorption.

Increased fluid compresses the brain tissue resulting in brain damage characterized by:

- Abnormally enlarged head
- Distended scalp veins
- Fragile
- Shiny scalp skin
- High-pitched shrill cry
- Irritability
- Vomiting

TREATMENT:

Surgery is the only treatment for hydrocephalus

10.0 Meningitis

Inflammation of the meninges of the brain and spinal cord.

CAUSES:

Bacterial infection from the ears, sinuses or lungs or a brain abscess.

SYMPTOMS:

- High fever, chills, headache, and vomiting.
- A positive Brudzinski's and Kernig's signs (fig. 13-33)

TREATMENT:

- Antibiotics
- Medication to reduce cerebral edema
- Pain relievers for headaches
- Anticonvulsants

11.0 Multiple Sclerosis (MS)

Causes the demyelination of the white matter of the brain and the spinal cord. The results are double or blurred vision and sensations of tingling and numbness.

CAUSE: Unknown

Theories include:

- Slow-acting virus
- Allergic reaction to an infectious agent
- Trauma
- Lack of O₂

- Nutritional deficits

SYMPTOMS:

- Tremor
- Muscular weakness
- Paralysis
- Incontinence
- Emotional swings

TREATMENT:

- Adrenocorticotrophic hormone
- Steroids to relieve symptoms and hasten remission
- Medication for emotional swings, urinary problems and muscular spasticity.
- Bedrest to prevent fatigue during acute phases

12.0 Neuralgia

Term used to describe general nerve pain. Severe cutting pain along the course of a nerve.

CAUSES:

- Inflammation
- Pressure on the nerve
- Toxins
- Change in the root ganglia

13.0 Neuron and Spinal Cord Damage

Results in a loss of sensation and voluntary motion due to destruction of the neurons or nerve cells.

Hemiplegia is the paralysis on one side of the body due to damage of the opposite side of the brain.

CAUSES:

- Trauma
- Tumor
- Cerebro vascular accident.

SYMPTOMS:

Unilateral paralysis of the tongue, face, arm, and leg. causing muscular contractures.

Paraplegia is a motor or sensory loss in the lower extremities due to spinal cord injury from trauma, most frequently from automobile, motorcycle, or sports related accidents.

Quadriplegia is a paralysis of the arms, legs and body below the level of the injury to the spinal cord. Usually caused from auto, or a sporting accident.

14.0 Parkinson's disease

SYMPTOMS:

- Severe muscle rigidity
- Peculiar gait
- Drooling
- Progressive tremor
- Body becomes bent forward with head bowed
- Forward body inclination which often results in falling

TREATMENT:

- Surgical procedure to destroy a small area of the brain to prevent involuntary motions
- Drug therapy with Levodopa (serious side effects)

15.0 Reye's Syndrome

Usually follows an acute viral infection such as influenza, upper respiratory infection or chicken pox.

CAUSE:

Fatty infiltration of the liver and increased intracranial pressure. Also occurs in the kidneys and possibly the muscle of the heart.

SYMPTOMS (occurs in stages of severity):

- Vomiting
- Lethargy
- Liver dysfunction.
- Hyperventilation
- Delirium
- Hyperactive reflexes and coma.
- Rigidity
- Deepening coma
- Large fixed pupils
- Seizures
- Respiratory arrest

16.0 Sciatica

An inflammation and severe pain of the sciatic nerve.

CAUSES:

- Exposure to wet and cold
- Impingement on the nerve by the spinous process
- Uneven length of the legs

TREATMENT:

- Bed rest
- Heat
- Pain medication
- Traction

17.0 Spinal Cord Defects:

Spinal cord defects result from an improper closure of tissues during the first few months of birth. Occur most frequently in the lumbar sacral area.

- Spina Bifida Occulta - Incomplete closure of one or more vertebrae, but without protrusion of the spinal cord or meninges. There is usually a depression, a tuft of hair, a port wine nevi, or a combination of these signs over the defect.
- Meningocele - In spina bifida with meningocele the sac contains meninges and CSF.
- Myelomeningocele - The sac contains meninges, CSF, and a portion of the spinal cord or nerve roots.

SYMPTOMS:

- Weakness of the feet
- Bladder and bowel problems
- Permanent neurological dysfunction
- Paralysis
- Hydrocephalus
- Clubfoot
- Mental retardation

TREATMENT:

Depends on the extent of the defect: usually surgical closure if CSF and meninges are involved. A shunt implant is often used to relieve pressure.

18.0 Subarachnoid Hemorrhage

Subarachnoid hemorrhage (SAH) implies the presence of blood within the subarachnoid space from some pathologic process. The common medical use of the term SAH refers to the nontraumatic types of hemorrhages, usually from rupture of a berry aneurysm or arteriovenous malformation (AVM).

CAUSE:

Spontaneous rupture of a weakened blood vessel

SYMPTOMS:

- Deviations in sensory perception
- Sudden, severe headache
- Motor disturbances
- Seizures and nausea

19.0 Subdural Hematoma

The dura attaches to the brain, just beneath the skull bone. The dura normally protects the brain and keeps it nourished with blood and spinal fluid. A severe blow to the head causes the brain to bounce within the cavity and may cause shearing or tearing of the blood vessels surrounding the brain. When the blood vessels tear, blood accumulates within the space between the brain and the dura. This is known as a subdural hematoma (sub-door-ul hem-a-to-ma), or blood clot in the brain.

CAUSE:

Injury due to a fall or accident

SYMPTOMS:

- Motor disturbances
- Facial weakness on the side opposite of the hematoma
- Generalized seizures
- Decreasing level of consciousness

TREATMENT:

Surgical intervention to remove pressure

20.0 Transient Ischemic Attack (TIA)

A temporary condition resulting from a closing off of tiny arteries in the brain by clots. TIA is just a warning sign of near at hand stroke from a blood clot thrombotic CVA.

SYMPTOMS:

- Double vision
- Slurred speech
- Dizziness

- Staggering gait
- Falling

TREATMENT:

- Aspirin to reduce blood clot formation
- Anticoagulants

21.0 Trigeminal Neuralgia (Tic Douloureux)

A disorder of the fifth cranial nerve, on one side of the face. This disease is characterized by episodes of extreme pain on stimulation of a trigger zone.

CAUSE:

- Exposure to heat or cold
- Draft of air, smiling, drinking hot or cold liquids.

SYMPTOMS:

- Oral medication
- Injection of alcohol or phenol into the nerve branch
- Surgical procedure is indicated for frequent severe attacks

Nervous System Exam

Name _____

Date _____

PART ONE**Multiple Choice. Circle the letter with the best answer:**

1. The Nervous system is composed of all of the following except:
 - a) central system
 - b) peripheral system
 - c) autonomic system
 - d) plexus system

2. The basic unit of the nervous system is the _____.
 - a) ganglion
 - b) neuron
 - c) cerebrum
 - d) accessory

3. Nerve cells send and receive impulses from the _____ to the _____ and vice versa.
 - a) pia mater, dura mater
 - b) fissures, arachnoids
 - c) body, brain
 - d) pons, midbrain

4. The ____ is the part of the nerve cell that carries the impulses **toward** the cell body.

- a) axon
- b) dura mater
- c) pons
- d) dendrite

5. The ____ is the part of the nerve cell that carries the impulses **away** from the cell body.

- a) axon
- b) dura mater
- c) pons
- d) dendrite

6. All of the following are characteristics of myelin, except:

- a) whitish fatty material
- b) insulates and protects the axon
- c) slows down the impulses
- d) speeds up electrical conduction

7. Axons covered with myelin are called:

- a) whitish fatty axons
- b) insulated axons
- c) electrical axons
- d) myelinated axons

8. A neuron that transmits impulses **toward** the CNS is called

- a) electrical
- b) sensory
- c) motor
- d) automatic

9. A neuron that transmits impulses **away** from the CNS is called

- a) electrical
- b) sensory
- c) motor
- d) automatic

10. The cerebrum is the smallest part of the brain.

- a) True
- b) False

11. The meninges are _____ that cover the brain and the spinal cord.

- a) three membranes
- b) lateral ventricles
- c) four neurons
- d) large axons

12. A medical term for an inflammation of the meninges is:

- a) meningectomy
- b) meningitis
- c) meningotomy
- d) meningioma

13. Bell's Palsy is a disease that affects the 7th cranial nerve and causes:

- a) paralysis on one side of the face
- b) seizures
- c) infection of that nerve
- d) severe pain of the nerves

14. Parkinson's disease characterized by:

- a) severe muscle rigidity
- b) a peculiar gait
- c) drooling and progressive tremor
- d) all of the above are correct

PART TWO

Match the following abbreviations with the appropriate meaning:

No.	Abbr.	Write correct number here	Meaning
1	Para-		Pertaining to the head or skull
2	-otomy		Study of
3	CSF		Computerized Axial Tomography
4	MS		Incision, surgical cutting
5	cranium		Inflammation of
6	encephal/o		Cerebrospinal fluid
7	-ology		Multiple sclerosis
8	CNS		Along side of
9	-itis		Central Nervous System
10	CAT		Brain, inside the skull

PART THREE

Define the following medical terms:

- 1 Cerebrospinal _____
- 2 Neurology _____
- 3 Craniotomy _____
- 4 Cephalic _____
- 5 Encephalopathy _____
- 6 Encephalitis _____
- 7 Parasympathetic _____

PART FOUR

Fill in the missing word part, meaning, or example as appropriate:

WORD PART	MEANING	EXAMPLE
cepha/o	head	
cerebr/o		cerebrum
	head, skull	cranium
encephal/o	brain	
mening/o		Meningitis
	nerve	neuron, interneuron
-logy (-ology)	study of	
para-		parasympathetic
	inflammation of	encephalitis
-otomy		craniotomy

EXTRA CREDIT (1 point each):

1. The basic unit of the nervous system is the _____, meaning nerve cell.
2. Each nerve cell has two types of fibers extending from the cell body:

The _____, which carries the impulses toward the cell body and the _____, which carries the impulses away from the cell body.
3. Some axons are covered with _____, a whitish fatty material that insulates and protects the axon and speeds up electrical conduction.
4. Axons covered with _____ are called myelinated.
5. A neuron that transmits impulses **toward** the CNS is a _____ neuron; and a neuron that transmits impulses **away** from the CNS is a _____ neuron.
6. The cerebrum is the largest part of the brain. When we want to refer to the largest part of the brain we say the _____/um.
7. The meninges are three membranes that cover the brain and the spinal cord. An inflammation of the meninges would be called _____, and surgical cutting of the meninges is a _____.
8. A tumor (-oma) of the meninges is termed _____.
9. Encephal/o literally means inside the head or brain. An inflammation of the brain is therefore termed _____.
10. Any disease (-pathy) of the brain is medically called _____.