Nervous System Disorders

When wiring short circuits!
Diseases and Abnormal Conditions

- Amyotrophic lateral sclerosis (ALS)
- Carpal tunnel syndrome
- Cerebral palsy
- Cerebrovascular accident (CVA)
- Encephalitis
- Epilepsy or seizure syndrome
Diseases and Abnormal Conditions

- Hydrocephalus
- Meningitis
- Multiple sclerosis (MS)
- Neuralgia
- Paralysis
- Parkinson’s disease
- Shingles or herpes zoster
Amyotrophic lateral sclerosis (ALS)

- Also known as Lou Gherig’s Disease
- Chronic degenerative neuromuscular disease
- Cause is unknown:
  - But is genetic
  - Or- viral immune factors are suspected

Nerves cells in the CNS that control voluntary movement, degenerate, resulting in weakening (atrophy) or wasting away of the muscles they control.
ALS

- Initial symptoms include:
  - Muscle weakness
  - Abnormal reflexes
  - Tripping and falling
  - Impaired hand and arm movement
  - Difficulty speaking or swallowing

- As the disease progresses, more muscles are affected, resulting in total body paralysis
ALS

Later stages:
- Patient loses all ability to communicate, eat, breathe, and move
- Mental acuity is unaffected so an active mind is trapped in a paralyzed body
- There is no treatment however, there are drugs to slow progress
- It is usually fatal in 4-6 years
Carpal Tunnel Syndrome

Is a condition that occurs when medial nerve and tendons that pass through the canal or “tunnel” are pinched on their way from the forearm to hands and fingers.
Carpal Tunnel Syndrome

- Repetitive movement of wrist causes swelling around this tunnel, which puts pressure on nerves and tendons

- Symptoms include:
  - Pain
  - Muscle weakness in hands
  - Impaired movement

- Classic chief complaint of pt: Pain and numbness and tingling in the thumb, ring finger, and middle finger
Carpal Tunnel Syndrome

- **Treatment:**
  - Anti-inflammatory drugs
  - Analgesics for pain
  - Splinting wrist to immobilize the joint
  - Severe cases require surgery to enlarge the tunnel to allow more space for the tendons and nerve
Cerebral Palsy

- Disturbance in voluntary muscle action
- Caused by brain damage:
  - Lack of oxygen to the brain or birth injuries
  - Prenatal rubella (German measles)
  - Infections
Cerebral Palsy

- Three forms: Spastic, athetoid, and atactic
- Spastic is the most common
- Symptoms:
  - Exaggerated reflexes and seizures
  - Tense muscles and development of contracture
  - Speech impairment
  - Spasms and tremors
  - Mental retardation in some cases
Cerebral Palsy

Treatment: No cure

- Physical, occupational, and speech therapy
- Muscle relaxants and anticonvulsive drugs
- Casts or braces
- Orthopedic surgery for severe contracture
Cerebrovascular Accident
CVA

- Also known as a stroke or apoplexy
- Blood flow to the brain is impaired resulting in a lack of oxygen and destruction of brain tissue
CVA

Causes:
- Cerebral hemorrhage resulting from hypertension, aneurysm, or a weak blood vessel
- Occlusion or blockage caused by atherosclerosis or a blood clot
CVA: Factors that cause strokes

- Smoking
- High fat diet
- Obesity
- Sedentary lifestyle
CVA: Symptoms

- Symptoms vary depending on the area of the brain affected and brain tissue damaged
  - Loss of consciousness
  - Weakness or vertigo
  - Paralysis on one side of body (hemiplegia)
  - Dysphagia or difficulty swallowing
  - Visual disturbances
  - Mental confusion
  - Aphasia (speech or language impairment)
  - Incontinence
FACE DROOPING — Does one side of the face droop or is it numb? Ask the person to smile. Is the person’s smile uneven?

ARM WEAKNESS — Is one arm weak or numb? Ask the person to raise both arms. Does one arm drift downward?

SPEECH DIFFICULTY — Is speech slurred? Is the person unable to speak or hard to understand? Ask the person to repeat a simple sentence, like “The sky is blue.” Is the sentence repeated correctly?

TIME TO CALL 9-1-1 — If someone shows any of these symptoms, even if the symptoms go away, call 9-1-1 and get the person to the hospital immediately. Check the time so you’ll know when the first symptoms appeared.

CVA
Quick Guide to Symptoms
Treatment

- Care during the first 3 hours can prevent brain damage
- Thrombolytic or “clot bursting” drugs such as TPA or tissue plasminogen activator
- Angioplasty of cerebral arteries
- CT Scan
- Dependant on damage:
  - Physical, occupational, and speech therapy
  - Help person adapt to life after
Encephalitis
Inflammation of the brain caused by virus, bacteria or chemical agent
OR
Complications from chicken pox, measles, or mumps
Encephalitis

- Virus is commonly contacted from mosquito bite
- Symptoms vary but may include:
  - Fever
  - Extreme weakness
  - Visual disturbances
  - Headache
  - Vomiting
  - Stiff neck
  - Disorientation
  - Seizures
  - Coma
Encephalitis: Treatment

- Antiviral Drugs
- Antiseizure Medications
- Maintenance of fluid/electrolyte balance
- Monitoring respiratory and kidney function
Epilepsy or Seizure Syndrome

Brain disorder associated with abnormal electrical impulses in neurons of the brain

Causes can include:
- Birth trauma
- Tumors
- Toxins such as lead or carbon monoxide
- Infections

Many cases are idiopathic
Epilepsy/Seizures: Types

- Two Types:

- Absence or Petit Mal Seizure
  - Milder
  - Characterized by a loss of consciousness lasting only a few seconds
  - Common in Children and typically disappear by late adolescence
Epilepsy/Seizure: Types

- Generalized tonic-clonic or Grand Mal Seizure
  - Most Severe
  - Loss of consciousness lasting several minutes
  - Convulsions are violent shaking and thrashing movements
  - Hypersalivation, which causes foaming of the mouth
  - Loss of body functions
Epilepsy/Seizure

- Some people experience an aura
- Examples include:
  - A particular smell
  - Ringing in the ears
  - Visual disturbances
  - Tingling in fingers or toes
- Treatment includes anticonvulsant drugs
Hydrocephalus

- Excessive accumulation of cerebrospinal fluid in the ventricles and, in some cases, the subarchnoid space
- Usually caused by a congenital defect, infection, or a tumor that obstructs the CSP
- Symptoms:
  - Abnormally enlarged head, prominent forehead, with bulging eyes
  - Irritability
  - Distended scalp veins
  - Retardations when pressure prevents proper brain development
Hydroencephalus Treatment

Surgical implantation of a shunt (tube) between the ventricles and the veins, heart, or abdominal peritoneal cavity to drain excess fluid.
Meningitis

- Inflammation of the meninges of the brain and/or spinal cord

- Causes:
  - Bacteria
  - Virus or Fungus
  - Toxins such as lead or aresenic
Meningitis
Symptoms may also include:
- Delirium
- Convulsions
- Coma or Death if not treated
Meningitis: treatment

- Antibiotics
- Antipyretics
- Anticonvulsants
- Medications for Pain and Cerebral edema
Multiple Sclerosis: MS

- Chronic, progressive disabling condition resulting from degeneration of myelin sheath in the CNS
- Usually occurs in ages 20-40
- Cause is unknown, but can be:
  - Viral infection of the immune system
MS: progression

- Progresses at different rates and has periods of remission
- Early symptoms include visual disturbances such as diplopia (double vision)
- Weakness
- Tingling and Numbness
- Fatigue
- Poor circulation
MS: Progression
Later Symptoms include:
- Tremor
- Spasticity of muscles
- Paralysis
- Speech impairment
- Emotional swings
- Incontinence
MS: Treatment

- Treatments include:
  - Physical Therapy
  - Muscle relaxants
  - Steroids
  - Psychological counseling
Neuralgia

- Nerve pain
- Caused by inflammation, pressure, toxins, and other diseases
- Treatment is directed towards eliminating the cause
Brain or spinal cord injury destroys neurons and results in loss of function and sensation below level of injury

There is no cure, but there is much research directed towards repairing the spinal cord
Types of Paralysis

- **Hemiplegia**: Paralysis on one side of the body caused by a tumor, an injury, or a CVA
- **Paraplegia**: Paralysis on lower half of body caused by spinal cord injury
- **Quadriplegia**: Paralysis from the neck down
Parkinson’s Disease

Chronic progressive condition involving degeneration of brain cells, usually in people over 50 years old.
Parkinson’s Disease:
Symptoms
- Difficulty of stopping while walking
- Loss of facial expression and drooling
- Mood swings and frequent depressions
- Behavioral changes
Parkinson’s Disease: Treatment

- There is no cure but a few treatments
- Levodopa is used to relieve the symptoms
- In selected cases, surgery to selectively destroy a small area of the brain to control the involuntary movements
- PT
Shingles or Herpes Zoster

- Acute inflammation of nerve cells
- Usually occurs in the thoracic area on one side of body and follows the pathway of the affected nerve
- Caused by the herpes virus, which also causes chicken pox
Shingles: Symptoms

- Fluid filled vesicles
- Severe pain
- Redness

    Itching
    Fever
    Abnormal skin sensation
Shingles: Treatment

- Aimed at relieving pain and itching
- Also inflammation
- Subsides in 1-4 weeks usually