



# **LUCENT NCLEX REVIEW**

**Neurosensory System  
Dr. Daniel Ampomah**

# Glasgow Coma Scale



- The Glasgow Coma Scale is used to assess a client's level of consciousness.
- It was designed to help predict a client's survival and recovery after a head injury. The scale scores three observations:

**eye opening response (E) - 4**

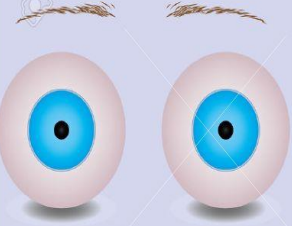
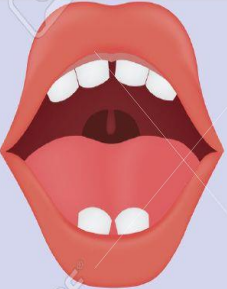

**Best verbal response (V) - 5**

**Best motor response (M) - 6**

# Glasgow Coma Scale



- If the client is alert, can follow simple commands, and is completely oriented to person, place, and time, his score will total 15 points.
- If the client is comatose, his score will total 7 or less.
- A score of 3, the lowest possible score, indicates brain death.
- Rule: We like a high number ranging from 13 – 15 for the GCS.

Behaviour	Response
 <p>Eye Opening Response</p>	<ol style="list-style-type: none"> <li>4. Spontaneously</li> <li>3. To speech</li> <li>2. To pain</li> <li>1. No response</li> </ol>
 <p>Verbal Response</p>	<ol style="list-style-type: none"> <li>5. Oriented to time, person and place</li> <li>4. Confused</li> <li>3. Inappropriate words</li> <li>2. Incomprehensible sounds</li> <li>1. No response</li> </ol>
 <p>Motor Response</p>	<ol style="list-style-type: none"> <li>6. Obeys command</li> <li>5. Moves to localised pain</li> <li>4. Flex to withdraw from pain</li> <li>3. Abnormal flexion</li> <li>2. Abnormal extension</li> <li>1. No response</li> </ol>

## Critical Thinking Exercise: Assessment data

- Opens eyes when talked to but goes back to sleep:  
\_\_\_\_\_
- Answers with mumbles and moans and gives no reliable data  
\_\_\_\_\_
- Slaps your hands away with  
pressure on nail beds  
\_\_\_\_\_

Total Score: \_\_\_\_\_

# Neuro Assessments



- **Pupillary changes** (normal pupil size is 2-6 mm) PERRLA
- **Babinski Reflex**



- Normal in a child up to 1 yr
- It is abnormal in the adult
- The adult or child greater than one yr should have a PLANTAR reflex or CURLING of the toes when the bottom of the foot is stroked

# General Diagnostic Test



- **CT Scan**

- With/without contrast dye. Client to sign a consent form prior to the test when using dye
- Keep head still
- No talking when procedure is in motion

- **Cerebral Angiography**

- Patient will need to sign a consent form. Why??
- Go through the femoral artery
- If an iodine dye is used check for allergies to???
- Hold metformin (Glucophage) prior to procedure??
- After procedure bed rest for 4-6 hrs. Hydrate pt!!

# General Diagnostic Test



- **EEG (Electroencephalography)**
  - Records electrical activities in the brain
  - Helps to diagnose seizures disorders
  - Evaluates LOC and dementia
  - Screening procedure for COMA
  - Indicator of BRAIN death
  - Used to diagnose sleep disorders like narcolepsy, cerebral infarct, brain tumors or abscesses
- **Pre-procedure**
  - Hold sedatives, No caffeine,
  - Not NPO (drops blood pressure)

# General Diagnostic Test

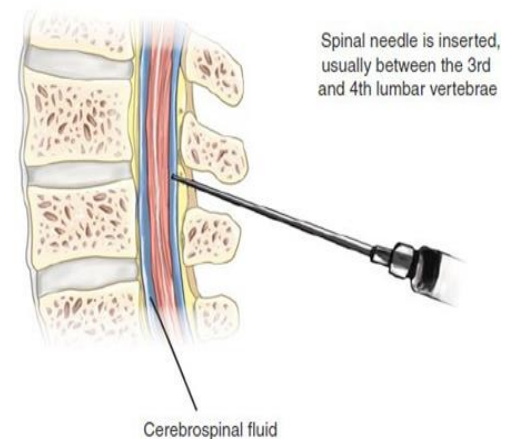


## • Lumbar Puncture

- Secure informed consent and explain procedure
- Puncture site: lumbar subarachnoid space between L3-L4 to L5
- Purpose is to obtain spinal fluid to analyze for blood, infection, and tumor cells
- Patient is position with their back arched
- CSF should be clear and colorless (crystal clear)

## • Post procedure

- Lie flat or prone for 2-3 hrs
- Increase fluids to replace the lost spinal fluids
- Most common complication is HEADACHE & ICP
- This pain is treated by: Bed rest, fluids, pain med, blood patch
- With known increased ICP, a lumbar puncture is contraindicated. Infection at the site can lead to MENINGITIS.





# Care of Patients with ICP

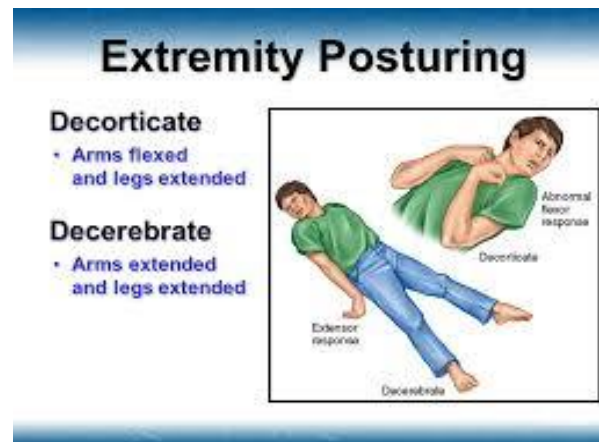


- Normal lab value: 0-15 mm/Hg
- Signs and symptoms of increased ICP
- **Early signs:** LOC, slurred speech, drowsiness, restlessness, confusion
- **Late signs:** Marked changes in LOC, stupor, Coma, vital signs changes called **Cushings Triad** requires immediate intervention to prevent brain ischemia.
- **Cushings Triad**
  - Systolic hypertention with widening pulse pressure
  - Slow, full and bounding pulse
  - Irregular respirations

# Care of Patients with ICP



- Monitor for Posturing
- Avoid restraints/bowel/bladder distention/valsalvas/isometric/no sneezing and no nose blowing
- Limit suctioning and coughing
- If the Glasgow Coma Scale score is below 8, think intubate



# Acute Head Injury



- Acute head injury results from a trauma to the head, leading to brain injury or bleeding within the brain.
- Effects of injury may include edema and hypoxia.
- **Causes:**
  - Assault,
  - Automobile Accidents,
  - Blunt trauma,
  - fall, Penetrating Object

## Head Trauma



©ADAM

# Assessment Findings



- Decreased level of consciousness (LOC)
- **Disorientation to time, place, or person**
- Otorrhea, rhinorrhea, frequent swallowing  
(if a CSF leak occurs)
- Paresthesia
- **Unequal pupil size, loss of pupillary reaction  
(if edema is present)**
- Pain at site of impact
- Wound at site of impact

# Diagnostics



- CT scan shows hemorrhage, cerebral edema, or shift of midline structures.
- EEG may reveal seizure activity.
- ICP monitoring shows increased ICP.
- MRI shows hemorrhage, cerebral edema, or shift of midline structures.

# Treatment



- **Cervical collar** (until neck injury is ruled out)
- **Anticonvulsant:** phenytoin (Dilantin)
- **Barbiturate:** pentobarbital (Nembutal) if unable to control intracranial pressure (ICP) with diuresis
- **Diuretics:** mannitol, furosemide (Lasix) to combat cerebral edema

# Treatment



- **Dopamine** to maintain cerebral perfusion pressure
- **Glucocorticoid:** dexamethasone to reduce cerebral edema
- **Histamine<sub>2</sub> (H<sub>2</sub>)-receptor antagonists:** ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
- **Mucosal barrier fortifier:** sucralfate (Carafate)
- **Posterior pituitary hormone:** vasopressin if client develops diabetes insipidus

# Key Interventions



- Assess neurologic and respiratory status.
- Observe for signs of increasing ICP
- Monitor and record vital signs,
- Intake and output,
- **Cerebral Perfusion Pressure:  $CPP = MAP - ICP$** 
  - **CPP of  $<70$  mm/Hg is associated with poor brain injury**
- Specific gravity, BUN, Creatinine, and pulse-ox
- Monitor for signs of Diabetes Insipidus
  - (low urine specific gravity, high urine output).



# Bell's Palsy



Bell's palsy is inflammation around the seventh cranial (facial) nerve that produces unilateral facial weakness or paralysis. *Because nerves can't communicate with facial muscles.*

- Onset is rapid; affects all age groups

## Key Signs & Symptoms

- Inability to close eye completely on the affected side
- Pain around the jaw or ear of affected side
- Unilateral facial weakness

Diagnostics: EMG

# Bell's Palsy



Headache or pain  
behind the ears

Difficult to blink or  
raise eyebrows

Facial numbness  
Puffy cheeks

Drooping mouth  
Difficulty drinking



# Interventions



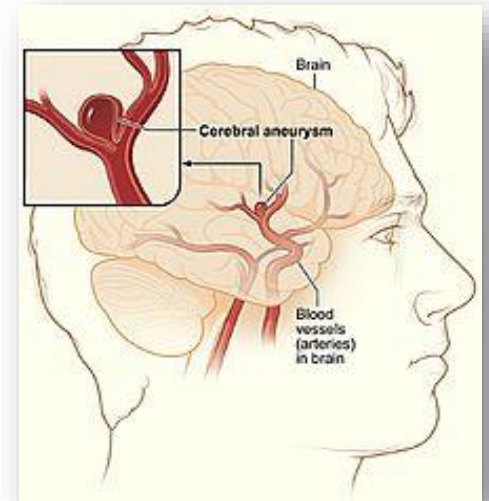
- Corticosteroid: prednisone to reduce facial nerve edema
- Monitor for adverse reactions to prednisone, especially GI distress, fluid retention, and hyperglycemia.
- Apply moist heat to the affected side of the face, taking care not to burn the skin.
- Massage the client's face with a gentle upward motion two to three times daily for 5 to 10 minutes.
- Teach him to exercise by grimacing in front of a mirror.

# CEREBRAL ANEURYSM



Cerebral aneurysm is an outpouching of a cerebral artery that results from weakness of the middle layer of an artery.

It usually results from a congenital weakness in the structure of the artery and remains asymptomatic until it ruptures.



# Signs & Symptoms



- Headache (commonly described by the client as the worst he has ever had)
- Altered level of consciousness

## Diagnostics

- Cerebral angiogram identifies the aneurysm.
- Spiral CT angiography shows a shift of intracranial midline structures, blood in subarachnoid space.

# Treatment/Meds



- Aneurysm clipping
- **Anticonvulsant:** phenytoin (Dilantin)
- **Calcium channel blocker:** nimodipine preferred to prevent cerebral vasospasm
- **Glucocorticoid:** dexamethasone
- **H2-receptor antagonists:** cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
- **Stool softener:** docusate sodium (Colace)

# Interventions



- Monitor neurologic status.
- Administer crystalloid solutions after aneurysm clipping.
- Monitor vital signs every 1 to 2 hours initially and then every 4 hours when the client becomes stable.
- Provide rest periods between nursing activities.

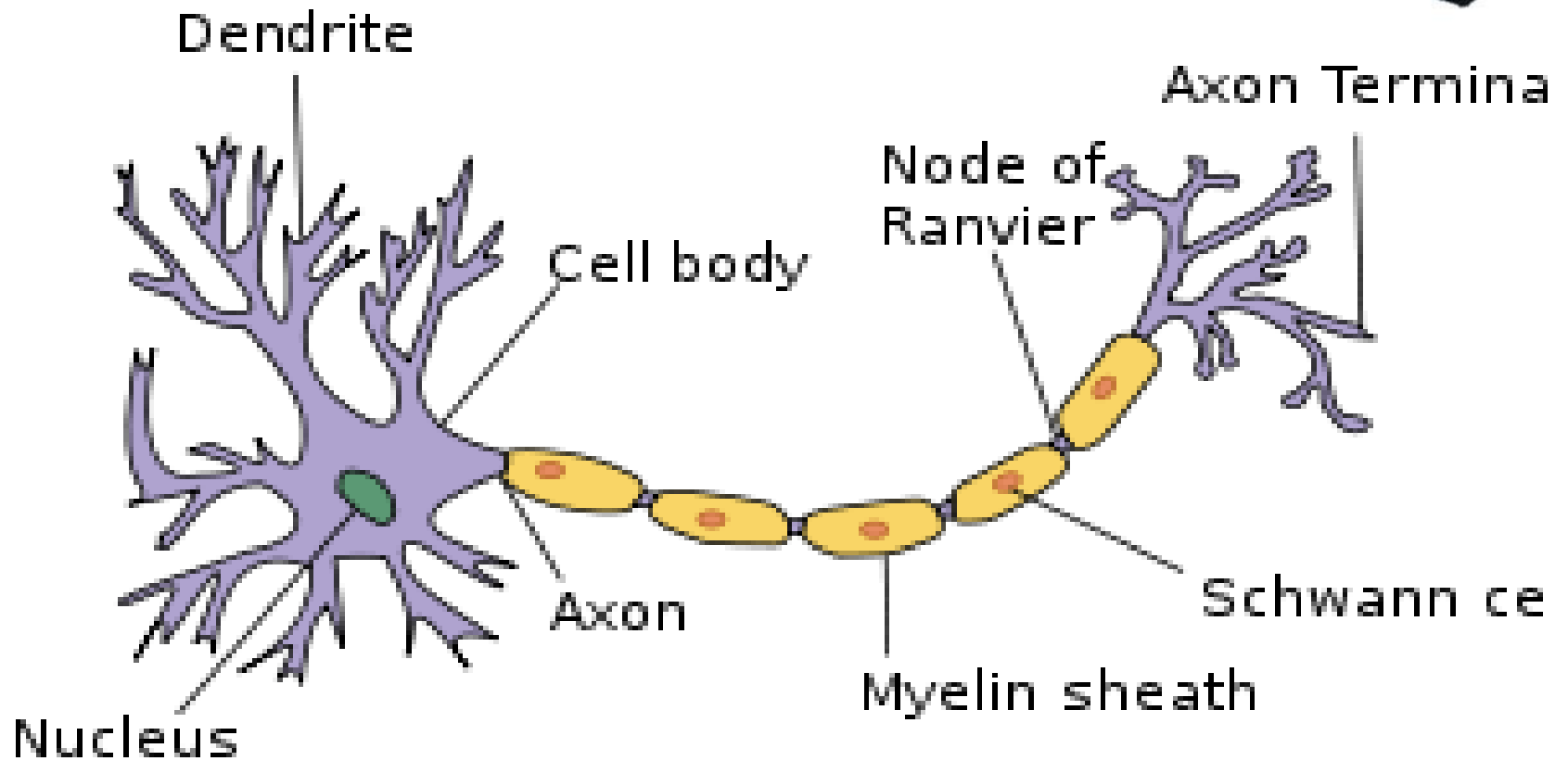
# GUILLAIN-BARRE SYNDROME



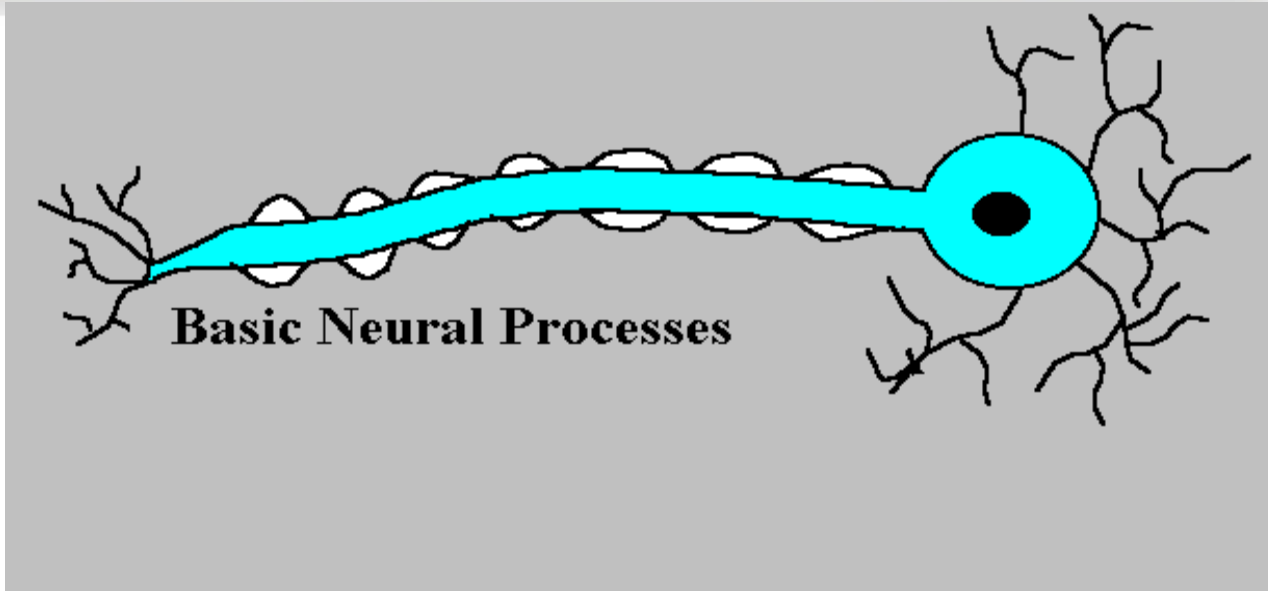
- Guillain-Barré Syndrome (GBS) is
  - An acute, rapidly, progressive, and potentially fatal form of polyneuritis (inflammation of several peripheral nerves at once)
  - That causes muscle weakness and mild distal sensory loss.
  - This disorder is also known as
    - infectious polyneuritis,
    - Landry-Guillain-Barré syndrome,
    - and acute idiopathic polyneuritis.



# Neuron



# Neuron



# Causes



- Cell-mediated immune response with and attack on peripheral nerves in response to a virus
- Demyelination of the peripheral nerves
- Respiratory infection

## Assessment Findings

- Dysphagia (difficulty swallowing) or
- Dysarthria (poor speech).
- Facial diplegia
- Muscle weakness (ascending from the legs to arms and facial muscles)

# GUILLAIN-BARRE' SYNDROME

## RISK FACTORS:

- POSSIBLY AUTOIMMUNE
- MORE COMMON: 20 to 50-YEAR-OLDS
- ? ASSOCIATION WITH SWINE FLU IMMUNIZATIONS
- FREQUENTLY PRECEDED BY MILD RESPIRATORY OR INTESTINAL INFECTION

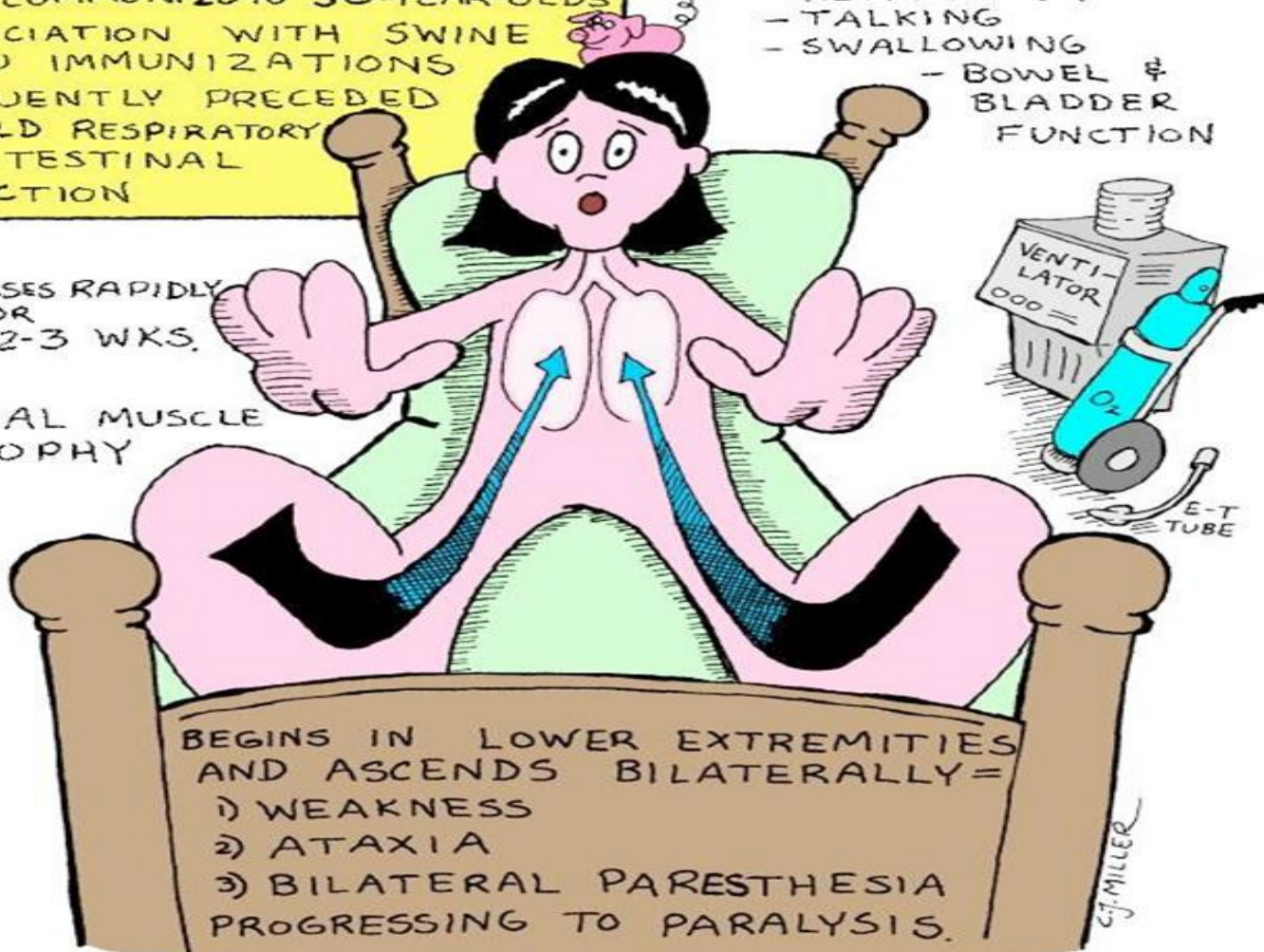
## SYMMETRICAL PARALYSIS

CAUSES PROBLEMS WITH:

- RESPIRATION
- TALKING
- SWALLOWING
- BOWEL & BLADDER FUNCTION

- PROGRESSES RAPIDLY  
OR  
OVER 2-3 WKS.

- MINIMAL MUSCLE  
ATROPHY



BEGINS IN LOWER EXTREMITIES  
AND ASCENDS BILATERALLY =  
1) WEAKNESS  
2) ATAXIA  
3) BILATERAL PARESTHESIA  
PROGRESSING TO PARALYSIS.

# Diagnositics



- CSF analysis reveals increase in IgG and protein
- CSF protein level begins to rise, peaking in 4 to 6 weeks.
- The CSF white blood cell count remains normal but, in severe disease, CSF pressure may rise above normal.

# Treatment



- Immune globulin I.V.
- Corticosteroid: prednisone
- Endotracheal intubation or tracheotomy if the client has difficulty clearing secretions; possibly mechanical ventilation
- I.V. fluid therapy
- Nasogastric tube feedings or parenteral nutrition
- Plasmapheresis
- Prophylaxis for deep vein thrombosis (DVT)

# Interventions

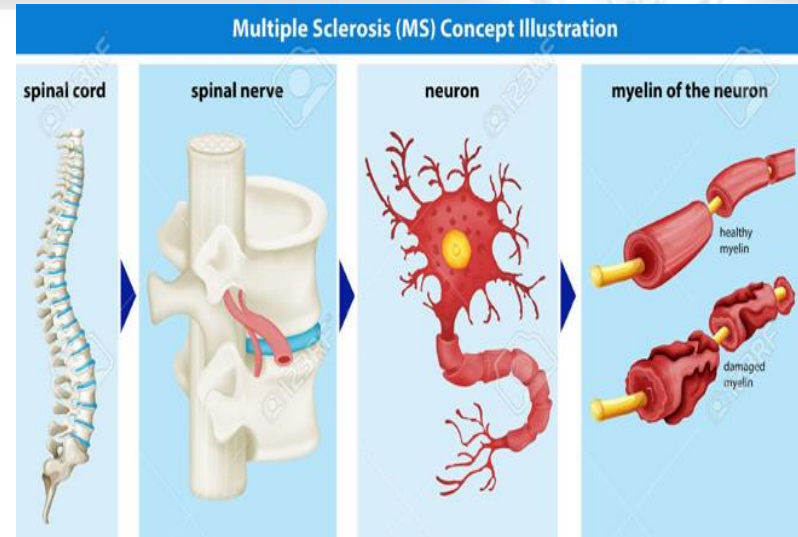


- Monitor for ascending sensory loss, which precedes motor loss.
- Monitor vital signs, LOC, Intake & output
- Assess and treat respiratory dysfunction.
- Assist with endotracheal tube insertion, if respiratory failure occurs.
- Reposition the client every 2 hours and provide skin care.
- Provide NG feedings or parenteral nutrition as ordered.
- Monitor for signs of DVT; provide prophylactic care

# MULTIPLE SCLEROSIS

Multiple sclerosis is a neurodegenerative disease caused by degeneration of the myelin sheath in neurons of the brain and spinal cord.

It results in patches of sclerotic tissue that impair the ability of the nervous system to conduct motor nerve impulses. **MS affects involuntary muscles.**



- CT scan eliminates other diagnoses such as brain or spinal cord tumors.
- MRI of the brain and spine shows scarring or lesions.



# MS signs and symptoms



- Weakness, parasthesias
- Visual disturbances (nystagmus, blurred vision, blindness) (optic neuritis)
- Slurred, hesitating speech.
- Intention tremor.
- Abnormal reflexes (absent or hyperactive).
- Ataxia, Paraplegia.
- Urinary and bowel incontinence/retention.
- Emotional lability; (depressed, euphoric).
- Paralysis

# Treatment



- **Plasmapheresis** (for antibody removal)
- **Cholinergic**: bethanechol (Urecholine)
- **Glucocorticoids**: prednisone, dexamethasone, corticotropin (ACTH)
- **Immunosuppressants**: interferon beta-1b (Betaseron), cyclophosphamide (Cytosan), methotrexate (Trexall)
- **Skeletal muscle relaxants**: dantrolene (Dantrium), baclofen (Lioresal)

# MS: Nursing Management



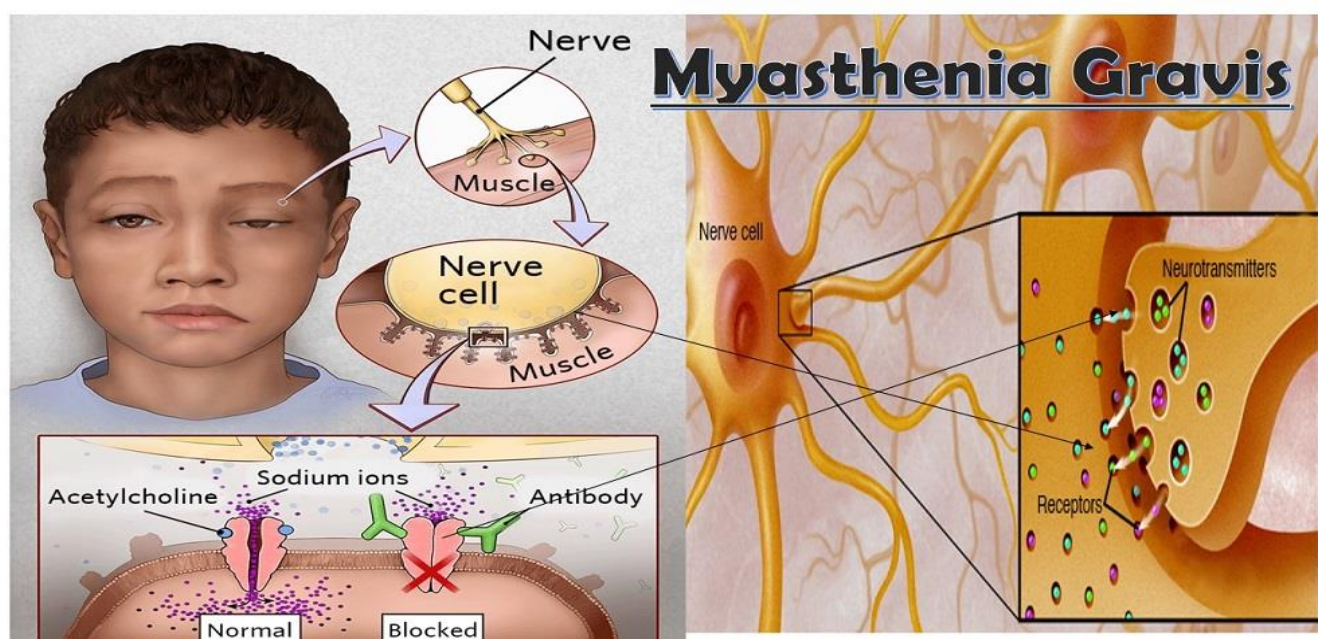
- Muscle stretching exercises to minimize joint **contractures**.
- Instruct family about **passive range of motion exercises** for patients with severe spasticity.
- Advise patient to prevent muscle fatigue with frequent **rest periods**.
- Instruct patient to participate in **walking exercises** to improve gait affected by loss of position sense in legs.
- Administer **muscle relaxants** as ordered.
- Utilize braces, canes, crutches, walkers when necessary to keep patient ambulatory.
- Establish a **bowel and bladder program**.
- Patient may need to be taught **self-catheterization**

# MYASTHENIA GRAVIS



- A neuromuscular disorder, myasthenia gravis is marked by weakness of voluntary muscles.
- The client experiences sporadic, progressive weakness and abnormal fatigue of voluntary skeletal muscles.
- In myasthenia gravis, one of three physiological abnormalities may exist:
  - There may be too much cholinesterase present, and acetylcholine is destroyed too quickly.
  - There may be too little acetylcholine released from the nerve fiber, resulting in inadequate depolarization of the motor end plate.
  - The motor end plate is not sensitive to the action of acetylcholine.

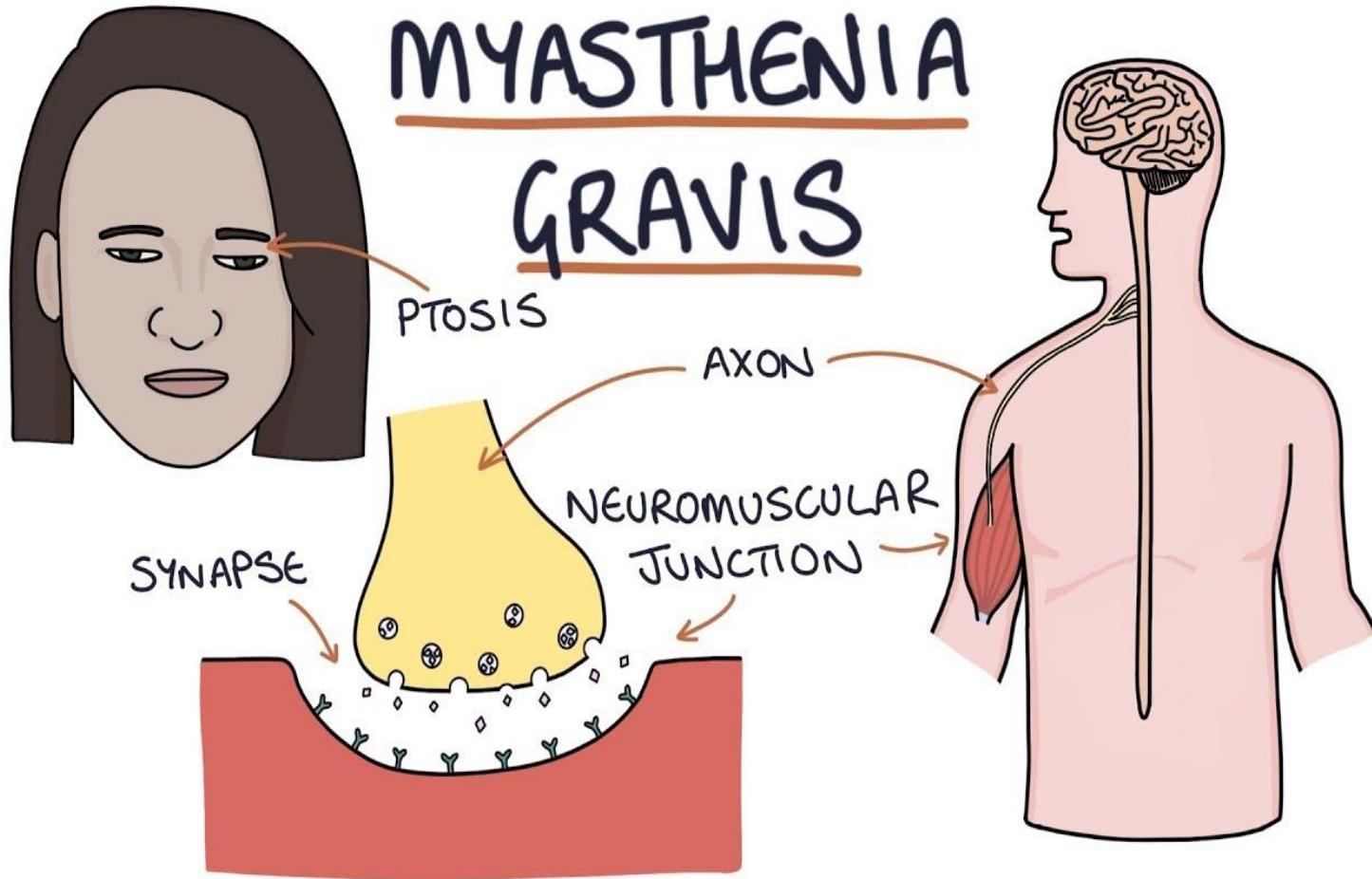
# Diagnosics



- EMG
- Neostigmine (Prostigmin) or edrophonium (Tensilon) test relieves symptoms after medication administration—a positive indication of the disease



# MYASTHENIA GRAVIS



# Myasthenia Gravis – Signs & Symptoms



- Diplopia (double vision).
- Ptosis (dropping of one or both eyelids).
- Abnormal muscle weakness; characteristically worse after effort and improved by rest. *(typically, muscles are strongest in the morning but weaken throughout the day, especially after exercise)*
- Sleepy, mask-like facial expression with difficulty smiling.
- Speech weakness (high-pitched nasal voice).
- Difficulty swallowing.
- Choking, aspiration of food.
- Profuse sweating

# Treatment



- **Anticholinesterase inhibitors:** neostigmine (Prostigmin), pyridostigmine (Mestinon), ambenonium (Mytelase)
- **Glucocorticoids:** prednisone, dexamethasone, corticotropin (ACTH)
- **Immunosuppressants:** azathioprine (Imuran), cyclophosphamide (Cytosan)
- Monitor neurologic and respiratory status.
- Assess swallow and gag reflexes.
- Monitor client for choking while eating.



# Myasthenia Gravis Nursing Management



- Drug must be given exactly on time to control symptoms.
- Have mealtimes coincide with peak effect of anticholinergics, when ability to swallow is best.
- Obtain medic alert bracelet
- Wear an eyepatch over one eye (alternating from side to side) if diplopia occurs.
- Instruct patient to inform dentist of myasthenia condition since Novocaine is usually poorly tolerated.
- Instruct patient to rest at frequent intervals and avoid fatigue.
- Avoiding contact with individuals with colds or respiratory infections

# Myasthenic & Cholinergic Crises.



## Myasthenic Crises

- Myasthenic crisis may result from natural deterioration of the disease, emotional upset, upper respiratory infection, surgery, or steroid therapy.
- Patient may be temporarily resistant to anticholinesterase drugs or need increased dosage.

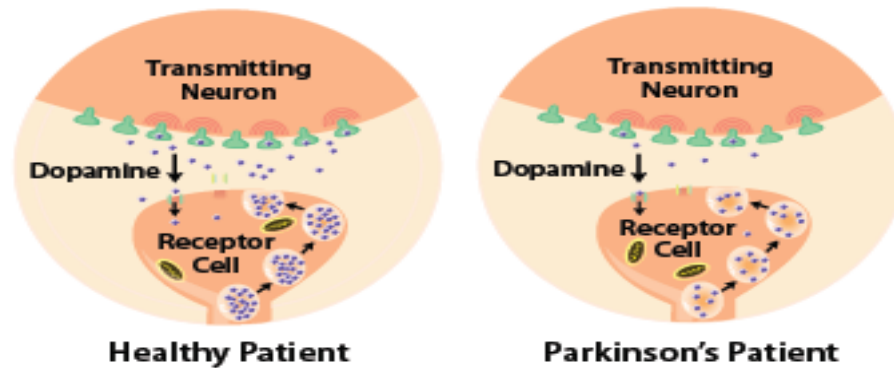
## Cholinergic Crises

- Cholinergic crisis may result from overmedication with anticholinergic drugs.
- Patient must be placed in an intensive care unit for continuous monitoring of the patient's respiratory status.
- Provide ventilatory assistance, endotracheal intubation, mechanical ventilation, if required.
- Administer appropriate meds as ordered.
- Support patient's fluid and nutritional needs, as ordered and indicated by patient's condition.

# PARKINSONS DISEASE



- Parkinson's disease is a progressive, degenerative disorder of the CNS associated with dopamine deficiency.
- This lack of dopamine impairs the area of the brain responsible for control of voluntary movement. As a result, most symptoms relate to problems with posture and movement.



# Causes

- Cerebral vascular disease
- Dopamine deficiency
- Drug-induced effect
- Imbalance of dopamine and acetylcholine in basal ganglia
- Repeated head trauma
- Unknown



# Assessment finding



- Pill-rolling tremors, tremors at rest
- Difficulty in initiating voluntary activity
- Dysphagia, drooling
- Fatigue
- Masklike facial expression
- Shuffling gait, stiff joints, dyskinesia, cogwheel rigidity, stooped posture
- Small handwriting

# Nursing Diagnosis

- Activity intolerance
- Impaired physical mobility
- Imbalanced nutrition: Less than body requirements
- Disturbed body image / Fear /Anxiety

# Treatment

- A high-residue, high-calorie, high-protein diet composed primarily of soft foods
- Physical therapy
- Stereotactic neurosurgery: thalamotomy or pallidotomy
- Deep brain stimulation



# Treatment



- **Anticholinergic:** trihexyphenidyl (Artane)
- Antidepressant: amitriptyline (Elavil)
- **Antiparkinsonian agents:** carbidopalevodopa (Sinemet), benz tropine (Cogentin)
- **Antispasmodic:** dantrolene (Dantrium)
- **Antiviral agent:** amantadine (Symmetrel)  
(used early on to reduce tremors and rigidity)
- **Dopamine receptor agonist:** bromocriptine (Parlodel)
- Enzyme inhibiting agent: selegiline (Eldepryl)

# Interventions



- Monitor neurologic and respiratory status
- Provide oral hygiene to promote self-care and improve nutritional intake.
- Reinforce gait training to improve mobility.
- Reinforce independence in care to maintain self-esteem.
- Promote daily ambulation to promote independence.



# MENINGITIS



- **Meningitis** is an inflammation of the brain and the spinal cord meninges.
- Inflammation may involve all three meningeal membranes:
  - dura mater, arachnoid, and pia mater.
- **Causes:** usually resulting from a viral or bacterial infection. Bacterial is transmitted thro the respiratory system
- **Diagnostics:**
  - Lumbar puncture shows cloudy/milky CSF/proteins
  - Xpert EV Test (used to differentiate bacterial/viral)

# SIGNS & SYMPTOMS



- Chills, fever, severe headache, malaise, nausea & vomiting, nuchal rigidity (stiff neck), photophobia
- **Positive Brudzinski's sign/ Positive Kernig's sign**

## Brudzinski Sign of Meningitis:

• **Brudzinski sign:** is positive if the patient's hips and knees flex automatically when the examiner flexes the patient's neck while the patient is supine.



## Physical Examination

### Kernig's Sign

- It is assessed with the patient lying in a supine position with the hip joint and knee joint flexed to 90 degrees. In a patient with a positive Kernig's sign, pain limits the passive extension of the knee.



# Treatment



- **Analgesics:** acetaminophen (Tylenol)
- **Antibiotics:** if bacterial - **Steroids**
- **Bed rest:** Maintain quiet environment/darken room
- **Diuretics:** mannitol
- Hypothermia blanket
- **Droplet precautions** for bacterial meningitis.
- Meningitis immunizations recommended for college grads
- Viral meningitis is transmitted by feces and required contact precautions (seen mostly in infants/children)

# SEIZURE DISORDER



- Seizure disorder is a condition of the brain marked by a susceptibility to recurrent seizures
- paroxysmal events associated with abnormal electrical discharges of neurons in the brain.
- Seizures are not considered epilepsy if they discontinue when the disease has gone away
- **Status epilepticus** is continuous seizure without returning to consciousness between seizures. It's a medical emergency

# Types of Seizures



- **Partial Seizures**
  - An aura may be the only manifestation
  - Called focal seizure
  - Symptoms can range from simple (without LOC) to complex (impaired LOC, confused, unable to respond)
- **Generalized Seizures**
  - Involves the entire brain
  - Called non-focal seizures
  - LOC is the initial manifestation
- **Tonic-Clonic** – formally known as grand mal
- **Myoclonic** - sudden brief contracture of muscles
- **Absence** - formerly called petit mal – brief loss of consciousness

# Causes

- alcohol withdrawal,
- anoxia after respiratory or cardiac arrest;
- birth trauma (inadequate oxygen supply to the brain);
- brain tumor; hypoglycemia;
- infectious disease, such as meningitis; encephalitis, or brain abscess;
- ingestion of toxins; stroke.

## Diagnosics

- EEG , Serum glucose,
- LP, and Cerebral angiography.



# Nursing Diagnosis



- Disturbed body image
- Risk for injury
- Risk for impaired gas exchange
- Anxiety

## Treatment

- Surgical removal of demonstrated focal lesion
- Strict ketogenic diet: can help with remission for some clients who don't respond to other treatment

# Drug Therapy



- **Anticonvulsants**
  - Can be long or short term therapy
  - Rapid acting: lorazepam (Ativan), diazepam (Valium)
  - Long acting: phenytoin (Dilantin), phenobarbital
- **For generalized tonic-clonic seizures:**
  - Phenytoin (Dilantin), carbamazepine (Tegretol), gabapentin (Neurontin)
  - Thiamine I.V. in chronic alcoholism or withdrawal
  - Valproic acid and clonazepam (Klonopin) generally used for absence seizures



# Interventions



- Keep the client safe during seizure activity.
- The client is at an increased risk for injury during a seizure.
- Don't restrain the client during a seizure; instead, place the client in a flat, side-lying position. This helps prevent aspiration during the seizure.
- Maintain a patent airway, but don't force anything into the client's mouth because this can injure the client.
- Monitor the client's medication levels for toxicity
- When administering phenytoin I.V., use a large vein and monitor vital signs because it can have serious cardiovascular effects.

# SPINAL CORD INJURY



# SPINAL CORD INJURY



- Spinal cord injuries usually result from traumatic force on the vertebral column.
- Damage to the spinal cord results in sensory and motor deficits.
- The client may experience partial or full loss of function of any or all extremities and bodily functions.

## **Causes:**

- Congenital anomalies, Tumors, Falls
- Trauma, MVA

## Complete Spinal Cord Injury



Paraplegia



Tetraplegia/  
Quadriplegia

## Incomplete Spinal Cord Injury



Paraplegia



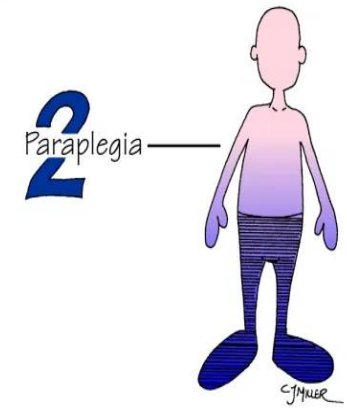
Tetraplegia/  
Quadriplegia



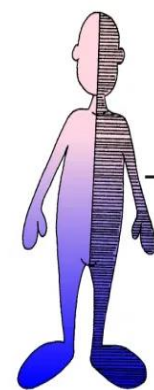
## PARALYSIS



4  
4  
Quadriplegia (Tetraplegia)

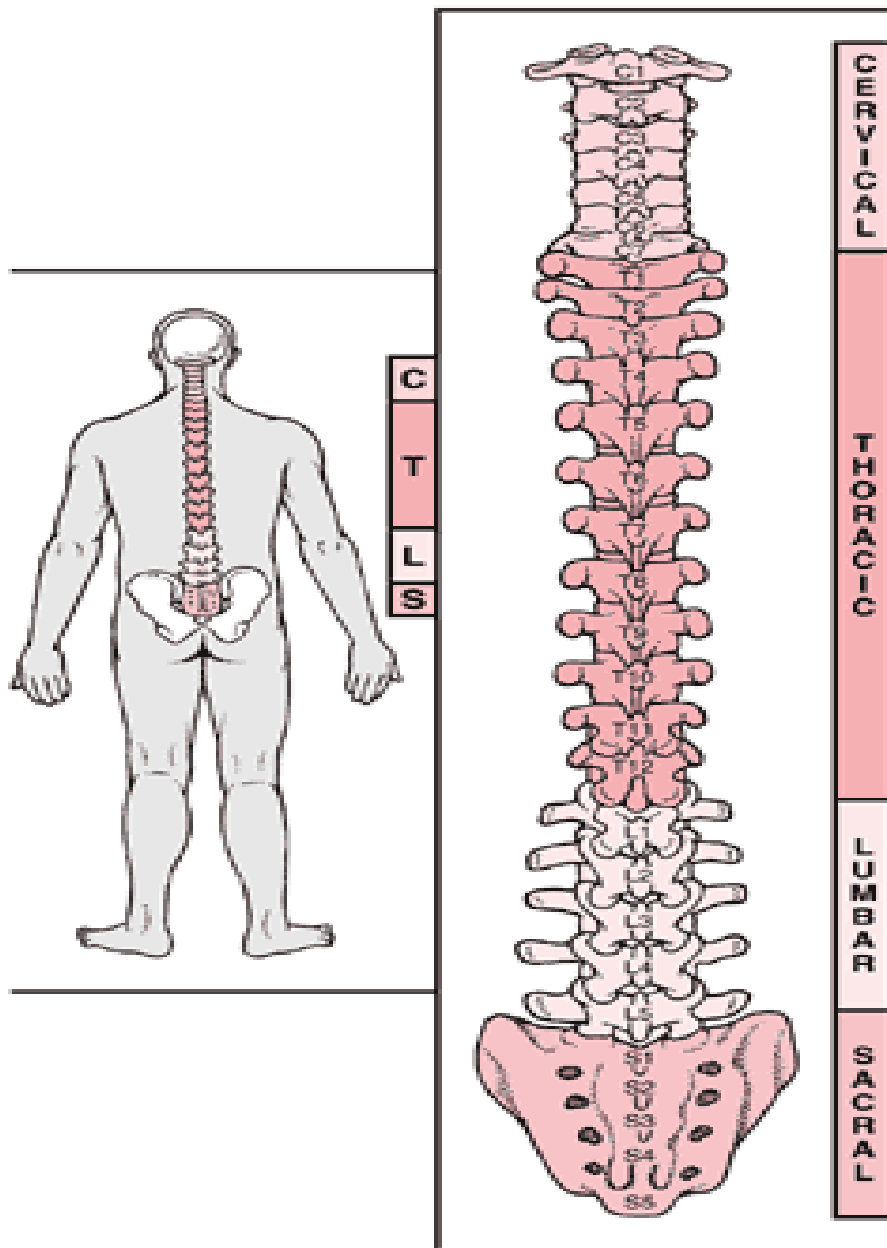


2  
2  
Paraplegia



1/  
2  
Hemiplegia

## Effects of Spinal Injury



Level of Injury	Effect*
<b>CERVICAL</b>	
C1 to C5	Paralysis of muscles used for breathing and of all arm and leg muscles; usually fatal.
C5 to C6	Legs paralyzed; slight ability to flex arms
C6 to C7	Paralysis of legs and part of wrists and hands; shoulder movement and elbow bending relatively preserved
C8 to T1	Legs and trunk paralyzed; eyelids droop; loss of sweating on the forehead (Homer's syndrome); arms relatively normal; hands paralyzed
<b>THORACIC</b>	
T2 to T4	Legs and trunk paralyzed; loss of feeling below the nipples
T5 to T8	Legs and lower trunk paralyzed; loss of feeling below the rib cage
T9 to T11	Legs paralyzed; loss of feeling below the umbilicus
T12 to L1	Paralysis and loss of feeling below the groin
<b>LUMBAR</b>	
L2 to L5	Different patterns of leg weakness and numbness
S1 to S2	Different patterns of leg weakness and numbness
S3 to S5	Loss of bladder and bowel control; numbness in the perineum
<b>SACRAL</b>	
*Loss of bladder and bowel control can occur with severe injury anywhere along the spinal column	

# Assessment findings



- Absence of reflexes below the level of the injury
- Flaccid muscle
- Loss of bowel and bladder control
- Neck pain
- Numbness and tingling
- Paralysis below the level of the injury
- Paresthesia below the level of the injury
- Respiratory distress

# Treatment



- Flat position, with neck immobilized in a cervical collar
- Maintenance of vertebral alignment through skull tongs, Halo vest
- Specialized rotation bed
- Surgery for stabilization of the upper spine such as insertion of Harrington rods

# Drug Therapy



- **Antianxiety agent:** lorazepam (Ativan)
- **Glucocorticoid:** methylprednisolone infusion immediately following injury
- **H2-receptor antagonists:** cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid)
- **Laxative:** bisacodyl (Dulcolax)
- **Mucosal barrier fortifier:** sucralfate (Carafate)
- **Muscle relaxant:** dantrolene (Dantrium)



# Interventions



- Monitor neurologic and respiratory status.
- Assess for spinal shock and initiate prompt treatment
- In spinal shock, patient loses sensory functions
- Monitor and record vital signs / I & Os,
- laboratory studies, and pulse oximetry.
- Administer medications, as prescribed, to maintain or improve the client's condition.

# Interventions



- Monitor for **autonomic dysreflexia** (sudden extreme rise in blood pressure) in clients with spinal injury at level T6 or higher to prevent life-threatening complications.
- Administer fluids to maintain hydration
- Administer oxygen, as needed, to maintain oxygenation to cells
- Provide suctioning, if necessary, and encourage coughing and deep breathing to maintain patent airway.

# Interventions



- Encourage verbalization of feelings about changes in body image, changes in sexual expression and function, and altered mobility to reduce anxiety and depression.
- Reposition the client every 2 hours using the logrolling technique (only if the client is stabilized and not in a specialty bed) to prevent pressure ulcers.
- Provide sexual counseling to encourage questions and avoid misunderstandings.
- Provide emotional support to decrease anxiety and fear.

# Interventions



- Provide skin care to maintain skin integrity.
- Keep the tool available to open Halo vest in the case of cardiac arrest to maintain client safety.
- Maintain body alignment to maintain joint function and prevent musculoskeletal degeneration.
- Initiate bowel and bladder retraining to avoid stimuli that could trigger dysreflexia
- Provide passive ROM exercises to maintain joint mobility and muscle tone.
- Apply antiembolism stockings to maintain venous circulation and prevent thromboembolism.

# Autonomic Dysreflexia



With upper spinal cord injury above T6, the major complication is autonomic dysreflexia or hyperreflexia.

**S/S:** severe hypertension, headache, bradycardia, flushing, sweating, blurred vision and anxiety.

▪ It is a neurological emergency, if not treated promptly a hypertensive stroke can occur

**Cause:** distended bladder, constipation, painful stimuli.

**Treatment:**

1. First sit the client up to lower blood pressure,
2. Treat the cause. Put in catheter, remove impaction, look for skin pressure or painful stimuli

# STROKE



- A stroke, results from a sudden impairment of cerebral circulation in one or more of the blood vessels supplying the brain.
- A stroke interrupts or diminishes oxygen supply and commonly causes serious damage or necrosis in brain tissues.

## **Causes:**

- Cerebral arteriosclerosis, Embolism, Hemorrhage
- Hypertension, Thrombosis, Vasospasm

# Generalized Symptoms



- Sudden numbness or weakness of the arm or leg on one side of the body
- Sudden change in mental status
- Difficulty speaking or understanding
- Sudden vision disturbances
- Sudden difficulty walking,
- Maintaining balance or dizziness
- Sudden severe headache

# Diagnosics



- CT scan reveals intracranial bleeding, infarct (shows up 24 hours after the initial symptoms), or shift of midline structures.
- Digital subtraction angiography reveals occlusion or narrowing of vessels.
- EEG shows focal slowing in area of lesion.
- MRI shows intracranial bleeding, infarct, or shift of midline structures.



# Nursing Diagnosis



- Ineffective tissue perfusion: Cerebral
- Risk for aspiration; Risk for injury
- Disturbed body image; Anxiety
- Fear

## Treatment

- Active and passive ROM and isometric exercises
- Bed rest until blood pressure stabilizes
- Low-sodium diet; Physical therapy

# Drug Therapy



- **Analgesic:** codeine sulfate or codeine phosphate
- **Anticoagulants:** heparin, warfarin (Coumadin), ticlopidine (Ticlid)
- **Anticonvulsant:** phenytoin (Dilantin)
- **Diuretics:** mannitol, furosemide (Lasix)
- **Glucocorticoid:** dexamethasone
- **H2-receptor antagonists:** cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), nizatidine (Axid)
- **Thrombolytic therapy:** tissue plasminogen activator given within the first 3 hours of the ischemic stroke

# Interventions



- Monitor neurologic status every 1 to 2 hours initially and then every 4 hours when the client becomes stable **to screen for changes in LOC and neurologic status.**
- Monitor vital signs every 1 to 2 hours initially and then every 4 hours when the client becomes stable **to detect early signs of decreased cerebral perfusion pressure or increased ICP.**
- Elevate the head of bed 30 degrees to facilitate venous drainage and reduce cellular edema.
- Take client's temperature at least every 4 hours

# Interventions



- Provide oral suction, as needed, to keep the client's airway clear.
- Administer oxygen to promote cerebral tissue oxygenation.
- Assist the client with coughing and deep breathing to mobilize secretions.
- Administer enteral nutrition or TPN depending on the client's condition to facilitate tissue healing and meet metabolic needs.

# Interventions



- Maintain seizure precautions and administer anticonvulsants as ordered.
- Provide passive ROM exercises to prevent venous thrombosis and contracture
- Maintain routine bowel and bladder function
- Administer diuretics, as ordered

# Trigeminal Neuralgia



- Trigeminal neuralgia is a painful disorder of one or more branches of the **fifth cranial (trigeminal) nerve** that produces paroxysmal attacks of excruciating facial pain.
- Attacks are precipitated by stimulation of a trigger zone, a hypersensitive area of the face.

## **Causes:**

- The exact cause is not known. Or may be caused by related to compression of the nerve root by posterior fossa tumors, middle fossa tumors, or vascular lesions

# Triggers



- Light touch to a sensitive area of the face (trigger zone)
- Exposure to hot or cold
- Eating, smiling, or talking
- Drinking hot or cold beverages

## Assessment Findings

- Searing pain in the facial area
- Splinting of the affected area
- Holding the face immobile when talking
- Unwashed, unshaven face on the affected Side

# Treatment



- Percutaneous radio frequency procedure, which causes partial root destruction and relieves pain
- Microsurgery for vascular decompression
- Percutaneous electrocoagulation of nerve Rootlets, under local anesthesia
- Anticonvulsant: carbamazepine (Tegretol) or phenytoin (Dilantin) may temporarily relieve or prevent pain



# Interventions



- Observe and record the characteristics and triggers of each attack,
- Provide adequate nutrition in small, frequent meals at room temperature to ensure nutritional needs are met.
- Temperature extremes may cause an attack.
- Reinforce natural avoidance of stimulation (air, heat, cold) of trigger zones (lips, cheeks, gums) to prevent further episodes.

# Interventions



- Watch for adverse reactions to **phenytoin**, including **ataxia, skin eruptions, gingival hyperplasia, and nystagmus.**
- Early detection of adverse reactions limits complications with early intervention
- Advise the client to place food in the unaffected side of his mouth when chewing, to brush his teeth often, and to see a dentist twice per year to detect cavities.

# Ménière's Disease



Ménière's disease is a dysfunction in the labyrinth (the part of the ear that produces balance) that produces severe vertigo, sensorineural hearing loss, and tinnitus.

After multiple attacks over several years, this disorder

leads to residual tinnitus and hearing loss.

# Causes



- Autonomic nervous system dysfunction that produces a temporary constriction of blood vessels supplying the inner ear.
- Overproduction or decreased absorption of endolymph, which causes endolymphatic hydrops or endolymphatic hypertension, with consequent degeneration of the vestibular and cochlear hair cells.

# Assessment findings



- Sensorineural hearing loss
- Severe vertigo
- Tinnitus
- Feeling of fullness or blockage in the ear
- Severe nausea
- Vomiting
- Sweating
- Giddiness (a sensation of whirling and a tendency to fall or stagger; dizziness)
- Nystagmus (eyes make repetitive, uncontrolled movements)

# Treatment



- Restriction of sodium intake to less than 2 g/day
- Surgery to destroy the affected labyrinth:
- Anticholinergic: atropine (may stop an attack in 20 to 30 minutes)
- Cardiac stimulant: epinephrine
- Diuretic to prevent excess fluid in the labyrinth (long-term management)
- Antihistamine: diphenhydramine (Benadryl) for severe attack
- Antihistamines: melizine (Antivert), dimenhydrinate (Dramamine)
- Sedatives: phenobarbital, diazepam (Valium)

# Interventions



- Advise the client against reading and exposure to glaring lights to reduce dizziness.
- Provide assistance when getting out of bed or walking to prevent injury.
- Instruct the client to avoid sudden position changes and any tasks that vertigo makes hazardous because an attack can begin quite rapidly.

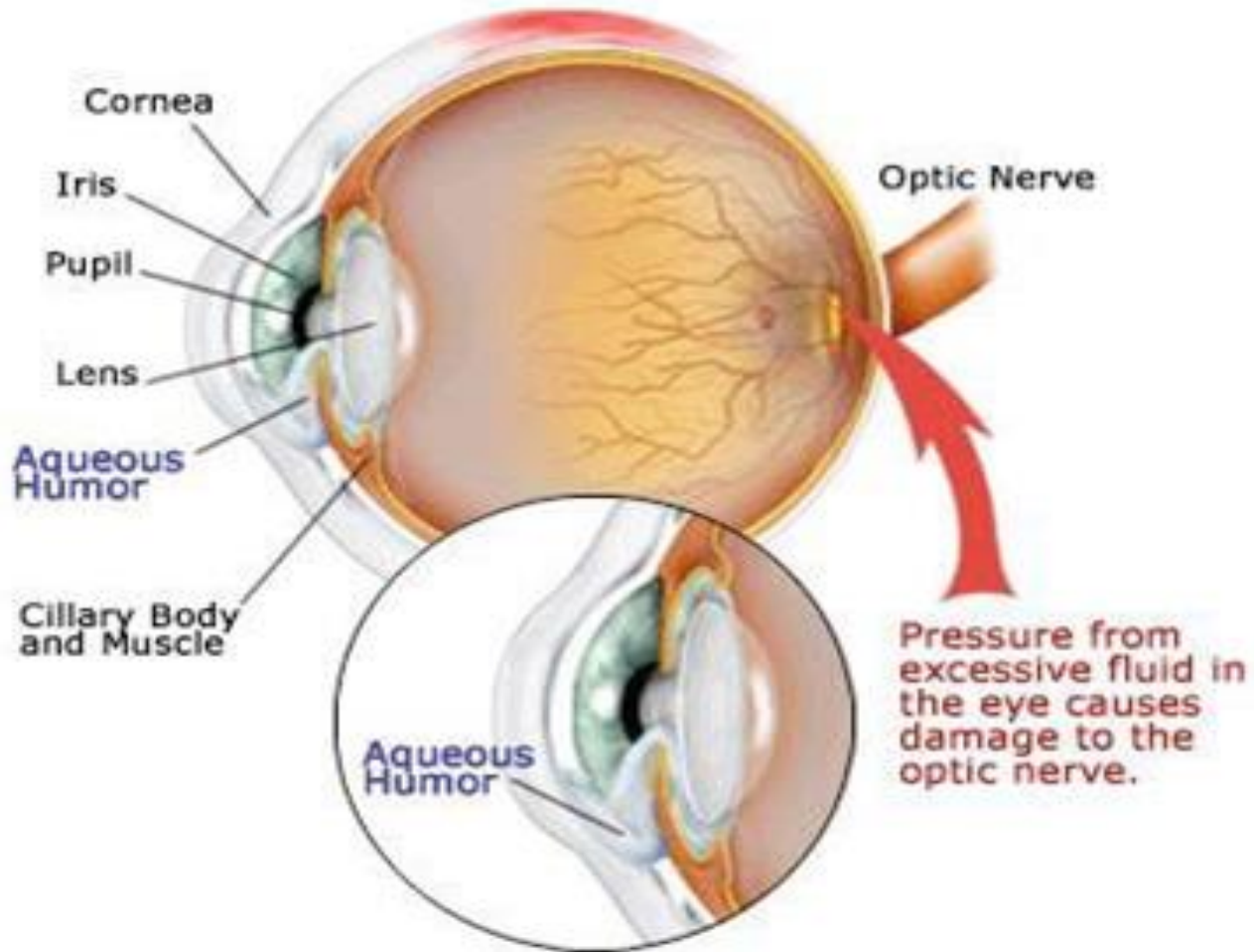
# Glaucoma



- Glaucoma is increased intraocular pressure that causes damage to the optic nerve. It can result in visual field loss and, if left untreated, can lead to blindness.
- **Glaucoma is either open-angle or angle closure.**
- **In open-angle glaucoma**, increased intraocular pressure is caused by overproduction of, or obstructed outflow of, aqueous humor (a fluid in the front of the eye).
- **In angle-closure glaucoma**, there's an obstructed outflow of aqueous humor due to anatomically narrow angles.
- **IOP normal values are 12-22 mm/hg**



# Glaucoma



# Causes



- Diabetes mellitus
- Long-term steroid treatment
- Previous eye trauma or surgery
- Uveitis
- Risk factors
- Family history of glaucoma
- Race (higher incidence in Blacks)

# Assessment findings



## **Acute angle-closure glaucoma**

- Acute ocular pain
- Blurred vision
- Dilated pupil
- Halo vision
- Increased intraocular pressure
- Nausea and vomiting

# Assessment findings



## **Chronic open-angle glaucoma**

- Atrophy and cupping of optic nerve head
- Increased intraocular pressure
- Initially asymptomatic
- Narrowed field of vision
- Possible asymmetrical involvement

# Diagnosics

- Gonioscopy reveals if angle is open or closed.
- Ophthalmoscopy shows atrophy and cupping of optic nerve head.
- Perimetry shows decreased field of vision.
- Tonometry shows increased intraocular pressure.



## Treatment

### **Acute angle-closure glaucoma**

- Immediate treatment to lower intraocular pressure
- Laser iridectomy or surgical iridectomy if pressure doesn't decrease with drug therapy

# Drug Therapy



## **Acute angle-closure glaucoma**

- Cholinergic: pilocarpine

## **Chronic open-angle glaucoma**

- Alpha-adrenergic agonist: brimonidine (Alphagan-P)
- Beta-adrenergic antagonist: timolol (Timoptic)

# Interventions

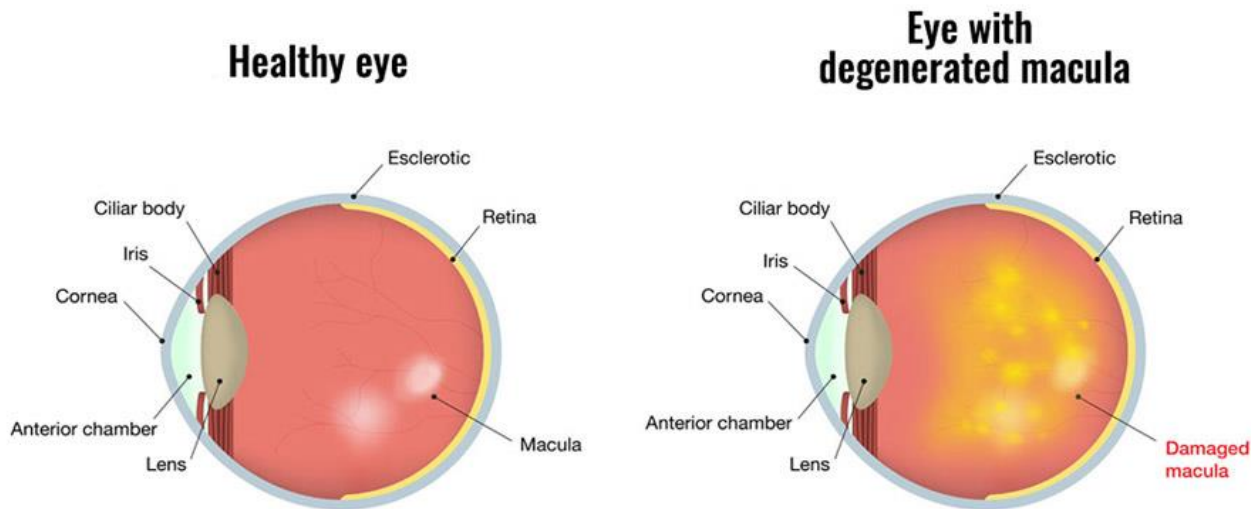


- Assess eye pain and administer medication as prescribed to promote comfort.
- Provide a safe environment. Orient the client to his surroundings to reduce the risk of injury.
- Modify the environment for safety to meet the client's self-care needs.
- Limit activities that increase intraocular pressure to help reduce complications.
- Encourage verbalization of feelings about changes in body image to aid acceptance of visual loss.

# MACULAR DEGENERATION



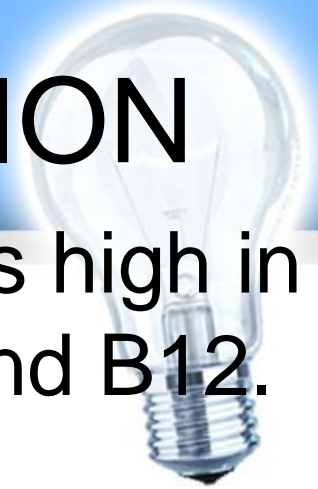
- Degeneration of the center of retina
- Age related leading cause of loss of vision >age 60y
- Treatment can be laser photocoagulation





# MACULAR DEGENERATION

- Encourage clients to consume foods high in antioxidants, carotene, vitamin E, and B12.
- The provider may prescribe a daily supplement high in carotene and vitamin E.
- Monthly eye exams are essential in managing this disease.
- As loss of vision progresses, clients will be challenged with the ability to eat, drive, write, and read, as well as other activities of daily living.



# RETINAL DETACHMENT



- Separation of the retina from the choroid & its blood flow, resulting in loss of retinal nourishment & vision impairment

Clear Vision

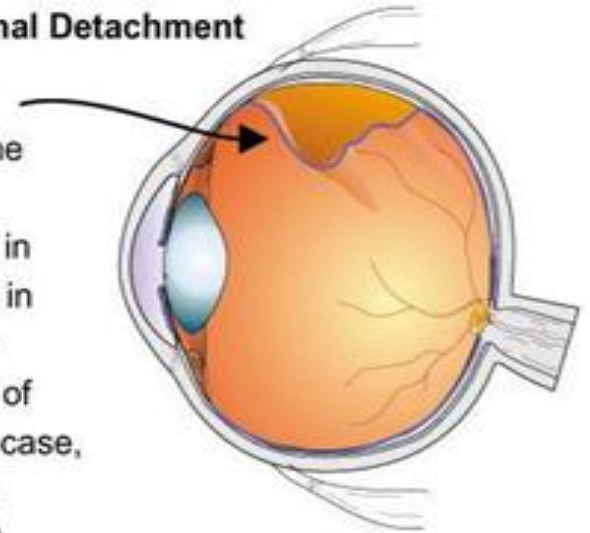


Vision with Retinal Detachment / Retinal Tears



## Retinal Detachment

If the retina is pulled loose the result will be hemorrhaging in the eye, spots in ones vision or complete loss of vision. In this case, it also causes flashes of light.



# RETINAL DETACHMENT



## SIGNS & SYMPTOMS

- SUDDEN / SLOW ONSET
- FLASHING LIGHTS
- FLOATING SPOTS
- LOSS OF VISION IN ONE AREA
- “CURTAIN”
- SOOTY VISION
- MAIN CAUSE
  - TRAUMA
- BELL’S PALSY patients at risk

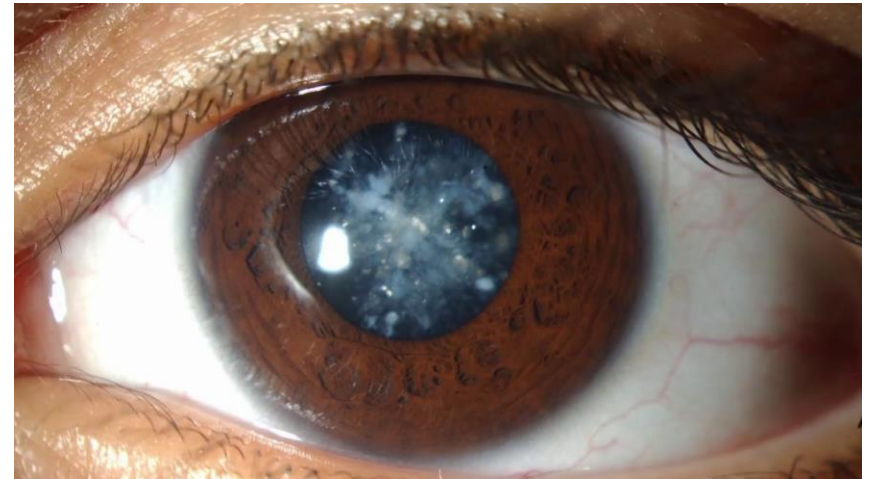
## NURSING INTERVENTIONS

- EYE PATCH
- ANTIBIOTIC DROPS
- AVOID VALSALVA
- HEAVY LIFTING
- HIGH RISK FOR INFECTION
- BEDREST
- AVOID COUGHING, SNEEZING, VOMITING, BENDING AT THE WAIST
- Position the client as prescribed

# CATARACTS



- **Clouding or Opacity of Lens**
- **RISK FACTORS**
  - AGE
  - AFRICAN AMERICAN
  - FAMILY HX
  - DM
  - SMOKING
  - MYOPIA
  - HIGH DOSE/LONG TERM STEROIDS
  - TRAUMA
- **Glare in bright lights\*\***



# TREATMENT



- **TREATMENT**

- SURGERY
- Position on back or unaffected side\*
- 95% SUCCESS RATE
- CADAVER LENS
- ARTIFICIAL LENS

- Protect eye from injury
- Topical antibiotics
- Analgesics
- Observe for  $\uparrow$ IOP

