Care for patients with Neurological disorders
Outline:

- EEG Overview.
- Nursing Interventions;
  - Patient Preparation.
  - Patient and Family Teaching.
- Complications.
- Medications;
  - Phenytoin (Dilantin)
  - Mannitol

Objectives:

At the end of this seminar the student will be able to

- Understand EEG procedure.
- Discusses nursing management.
- Identify classifications, action, side effect and nursing intervention of Phenytoin and Mannitol.
Neurological Disorders

- Neurological disorders are diseases of the central and peripheral nervous system. In other words, the brain, spinal cord, cranial nerves, peripheral nerves.

- These disorders include epilepsy, Alzheimer disease and cerebrovascular diseases including stroke, migraine and other headache disorders, multiple sclerosis, Parkinson's disease, brain tumors, traumatic disorders of the nervous system such as brain trauma.

- Hundreds of millions of people worldwide are affected by neurological disorders. Approximately 6.2 million people die because of stroke each year.

- More than 50 million people have epilepsy worldwide.

- It is estimated that there are globally 35.6 million people with dementia with 7.7 million new cases every year.

- Alzheimer's disease is the most common cause of dementia and may contribute to 60–70% of cases.

- Brain scans, Cerebrospinal fluid analysis, Computed tomography (CT scan), Echocardiogram and Electroencephalography (EEG) are the common diagnostic tests used to determine the specific nature of a suspected neurological disorder or injury.

The Electroencephalogram (EEG)

- **Definition:**

  Is a medical test used to measure the electrical activity of the brain, via electrodes applied to scalp.

- **General overview:**

  - Electrodes are attached to multiple sites on the scalp to provide a recording of electrical activity that is generated in the cerebral cortex.

  - Electrical impulses are transmitted to an electroencephalograph, which magnifies and records these impulses as brain waves on a strip of paper.
- Usually performed in a room designed to eliminate electrical interference; however, in the case of a comatose patient, may be performed at bedside using a portable unit.
- This procedure is completely painless and can be performed without shaving any of hair.
- EEG can help diagnose a number of conditions, including; epilepsy, coma, sleep disorders, confirmation of brain death and Provides information about the timing of events.
- **For a baseline recording,** the patient is instructed to lie quietly with both eyes closed. After a baseline recording in a resting phase, the patient may be asked to hyperventilate for 3 to 4 minutes and then look at a bright, flashing light for stimulation. These activation procedures are performed to evoke abnormal electrical discharges, such as seizure potentials.
- A sleep EEG may be recorded after sedation because some abnormal brain waves are seen only when the patient is asleep.

✔ **Nursing Interventions**

**A- Patient Preparation:**

1) Explain the procedure to the patients, emphasizing the importance of cooperation.
2) Antiseizure agents, tranquilizers, stimulants, and depressants medications should be withheld 24 to 48 hours before an EEG because these medications can alter the EEG wave patterns or mask the abnormal wave patterns of seizure disorders.
3) The patient is instructed to omit / avoid coffee, tea, chocolate, and cola drinks in the meal before the test because of their stimulating effect.
4) The patient is instructed to eat a regular meal before the EEG. The meal is not omitted, to avoid alternation of blood glucose level. Low blood sugar can cause changes in the brain wave patterns and change the EEG result.
5) The patient is assured that the procedure does not cause an electric shock and that the EEG is a diagnostic test, not a form of treatment.
6) Patients with seizures do not stop taking their antiseizure medication prior to testing.
7) Assist the patient to wash the hair before and after the test.
B- Patient and Family Teaching

1) The test takes about 1 to 2 hours.
2) The test is painless and will be performed while sitting in a comfortable chair or lying on a stretcher.
3) The electrodes are applied to the scalp with a thick paste.
4) During the test, you will first be asked to breathe in and out deeply for a few minutes. Then, you will close your eyes while a light is flashed on them and, finally, you will lie quietly with your eyes closed.
5) After the test, the nurse will help you wash the paste out of your hair.

✓ Complications

EEG is a safe test with no side effects. However, a person with epilepsy may experience a seizure, triggered by the various stimuli used in the procedure, including the flashing lights.

This is not seen as a 'complication' by medical staff, because a seizure during an EEG can greatly help in diagnosis.

✓ Medications:

Dilantin/Phenytoin is anti-seizure, who limits the spread of seizure activity and the start of new seizures by inhibiting calcium movement across neuronal membranes.

Mannitol is used for preventing or treating excess body water in certain kidney conditions or reducing swelling of the brain.
<table>
<thead>
<tr>
<th>trade name</th>
<th>Dilantin</th>
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<tr>
<td>Classification:</td>
<td>anti-seizure</td>
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<tr>
<td>Action:</td>
<td>Has antiepileptic activity without causing general CNS depression; Limits the spread of seizure activity and the start of new seizures by inhibiting calcium movement across neuronal membranes.</td>
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| Indications | ✓ Prevention and treatment of seizures occurring during or following neurosurgery  
✓ as prophylactic to prevent early posttraumatic seizures in severe traumatic brain injuries |
| contraindications | ✓ Hypersensitivity to phenytoin or its components.  
✓ second- or third-degree heart block,  
✓ Sinus bradycardia  
✓ hypotension, severe myocardial insufficiency |
| Side Effects: | ✓ CNS: confusion, depression, dizziness, drowsiness.  
✓ CV: Cardiac arrest, hypotension  
✓ GI: Abdominal pain, anorexia, constipation, diarrhea, toxic hepatitis, liver damage  
✓ RESP: Apnea, asthma, bronchitis, cough, dyspnea, hypoxia |
| Nursing Considerations: | 1) Administer IV slowly to prevent severe hypotension; Continually monitor patient's cardiac rhythm and check BP frequently and regularly during IV infusion.  
2) Monitor injection sites carefully; drug solutions are very alkaline and irritating  
3) Give oral drug with food to enhance absorption and to reduce GI upset.  
4) Discontinue drug if rash, depression of blood count, enlarged lymph nodes, hypersensitivity reaction occurs. Institute another antiepileptic drug promptly. (abrupt discontinuation may precipitate status epilepticus.). |
| Patient Teaching | 1) Take this drug exactly as prescribed, with food to enhance absorption and reduce GI upset;  
2) Take the missed dose as soon as you remember it. However, if it is almost time for the next dose, skip the missed dose and continue your regular dosing schedule. Do not take a double dose to make up for a missed one  
3) Do not discontinue this drug abruptly or change dosage, except on the advice of your prescriber.  
4) Maintain good oral hygiene (regular brushing and flossing) to prevent gum disease  
5) Arrange for frequent checkups to monitor your response to this drug.  
6) These side effects may occur: Drowsiness, dizziness, confusion, blurred vision (avoid driving or performing other tasks requiring alertness or visual acuity);
## Mannitol

<table>
<thead>
<tr>
<th><strong>Classification:</strong></th>
<th>Diuretic</th>
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<td><strong>Action:</strong></td>
<td>Elevates plasma osmolality, causing water to flow from tissues, such as brain and eyes, and from CSF, into extracellular fluid, thereby decreasing intracranial and intraocular pressure. This leads to increased excretion of water, sodium, chloride, and toxic substances.</td>
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| **Indications**     | To reduce intracranial or intraocular pressure  
                      To treat oliguria  
                      To prevent acute renal failure |
| **Contraindications** | - Active intracranial bleeding  
                          - anuria, hepatic failure,  
                          - hypersensitivity to mannitol or its components,  
                          - pulmonary edema, severe dehydration, |
| **Side Effects:**   | **CNS:** Chills, dizziness, fever, headache, seizures  
                      **CV:** Chest pain, heart failure, hypertension, tachycardia,  
                      **EENT:** Blurred vision, dry mouth, rhinitis  
                      **GI:** Diarrhea, nausea, thirst, vomiting  
                      **GU:** Polyuria, urine retention  
                      **RESP:** Pulmonary edema  
                      **Other:** Dehydration, hypokalemia, hyponatremia. |
| **Nursing considerations:** | 1) During I.V. infusion of mannitol, monitor vital signs, central venous pressure, and fluid intake and output every hour.  
                                      2) Measure urine output with indwelling urinary catheter, as appropriate.  
                                      3) Check weight and monitor BUN and serum creatinine electrolyte levels daily.  
                                      4) Provide frequent mouth care to relieve thirst and dry mouth. |
| **Patient teaching:** | ✔ Inform patient that he may experience dry mouth and thirst during mannitol therapy.  
                                ✔ Instruct patient to report chest pain, difficulty breathing, or pain at I.V. site |
**Things to remember**

- The electroencephalogram (EEG) is a medical test used to measure the electrical activity of the brain.
- EEG can help diagnose a number of conditions including epilepsy, sleep disorders and brain tumors.
- EEG is a safe test with no side effects. However, a person with epilepsy may experience a seizure.
- Withhold fluids, foods, and medications (as prescribed) that may stimulate or depress brain waves.
- Medications are usually withheld for 24 to 48 hours before the test.
- **Dilantin/Phenytoin** is an anti-seizure, who limits the spread of seizure activity and the start of new seizures by inhibiting calcium movement across neuronal membranes.
- Mannitol is used for preventing or treating excess body water in certain kidney conditions or reducing swelling of the brain.