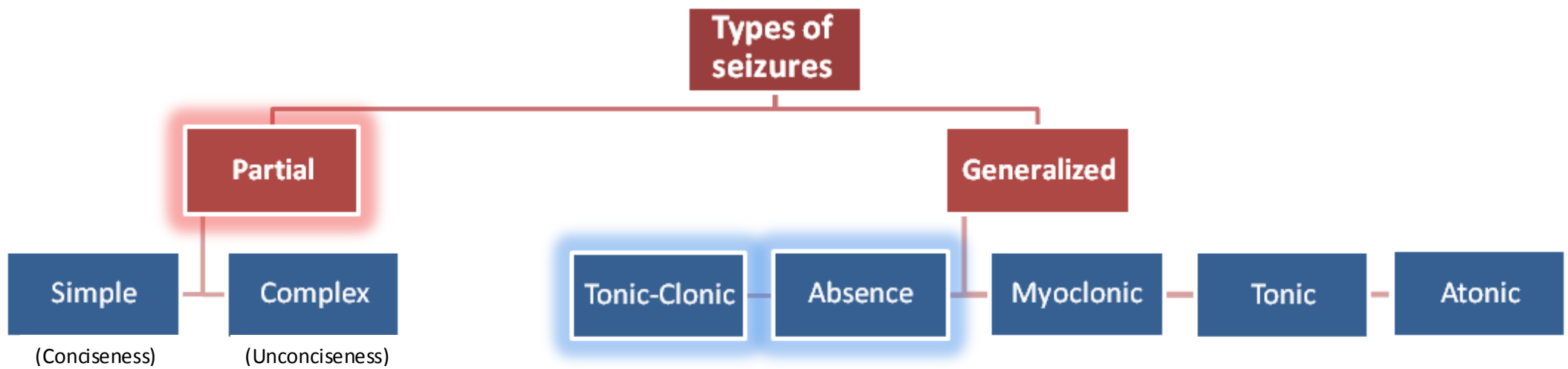


**Mohannad Sharifi**  
**Group B - 430**  
**CNS-block**

الجدول لا يغنى عن المحاضرة



### Important notes **BEFORE** studying:

- The highlighted types of seizures are those discussed in the lecture (ignore the others ^^).
- We have two types of treatments:
  1. Anti-seizure drugs (which we are discussing)
  2. Vagal nerve stimulation.
- Tonic-Clonic seizures: Due to opening of  $\text{Na}^+$  channels & many others (that's why it involves motor activity).
- Absence seizures: Due to opening of  $\text{Ca}^{2+}$  channels (no motor action is involved).

	Carbamazepine	Phenytoin	Valproic Acid	Ethosuximide	Lamotigine	Topiramate
<b>PK</b>	<ul style="list-style-type: none"> <li>Orally</li> <li>Enzyme inducer</li> </ul>	<ul style="list-style-type: none"> <li>Orally, IV (<u>Fosphenytoin</u>)</li> <li>Enzyme inducer</li> </ul>	<ul style="list-style-type: none"> <li>Orally, IV</li> <li>Enzyme <b>inhibitor</b></li> </ul>	-----	-----	-----
<b>MOA</b>	<ul style="list-style-type: none"> <li><b>↓Na+</b></li> <li>↓Glu (<b>action &amp; release</b>)</li> </ul>	<ul style="list-style-type: none"> <li><b>↓Na+</b></li> <li>↑GABA (<b>action</b>)</li> </ul>	<ul style="list-style-type: none"> <li><b>↓Na+</b></li> <li>↑GABA (<b>synthesis</b>)</li> <li>↓Glu (<b>action</b>)</li> <li>↓Ca<sup>2+</sup></li> </ul>	<ul style="list-style-type: none"> <li>↓Ca<sup>2+</sup></li> <li>(<b>perfect &amp; selective for Absence seizures</b>)</li> </ul>	<ul style="list-style-type: none"> <li><b>↓Na+</b></li> <li>↓Glu, Asp (<b>synthesis</b>)</li> </ul>	<ul style="list-style-type: none"> <li><b>↓Na+</b></li> <li>↑GABA (<b>action</b>)</li> </ul>
<b>Uses</b>	<ul style="list-style-type: none"> <li>Partial seizures (<b>mainly</b>)</li> <li>Tonic-Clonic seizures</li> <li><b><u>Trigeminal neuralgia</u></b></li> <li>Bipolar depression (<b>mood stabilizer</b>)</li> </ul>	<ul style="list-style-type: none"> <li>Partial seizures</li> <li>Tonic-Clonic seizures (<b>mainly</b>)</li> <li><b><u>Status epilepticus (IV)</u></b></li> <li><b>Cardiac arrhythmias</b></li> </ul>	<ul style="list-style-type: none"> <li><b><u>All epilepsies</u></b></li> <li>Mania</li> <li>Lennox-Gastaut syndrome</li> <li>Bipolar disorder</li> <li>Migraine prophylaxis</li> </ul>	<ul style="list-style-type: none"> <li><b><u>Absence seizures</u></b></li> </ul>	<ul style="list-style-type: none"> <li><b><u>Add-on!!</u></b></li> <li>Partial (<b>mono</b>)</li> <li>Lennox-Gastaut syndrome</li> </ul>	<ul style="list-style-type: none"> <li><b><u>Add-on for:</u></b></li> <li>✓ Refractory partial</li> <li>✓ generalized</li> </ul>
<b>ADRs</b>	<ul style="list-style-type: none"> <li>GIT upset</li> <li>Teratogenicity</li> <li>CNS toxicity: <b>Diplopia, Ataxia, Confusion</b></li> <li>Hyponatremia</li> <li>Skin rashes</li> <li>Leucopenia</li> <li>Aplastic anemia</li> <li>Agranulocytosis</li> </ul>	<ul style="list-style-type: none"> <li>GIT upset</li> <li>Teratogenicity</li> <li>CNS toxicity: <b>Diplopia, Vertigo</b></li> <li><b>Cardiac arrhythmias</b></li> <li><b><u>gum hyperplasia</u></b></li> <li>osteomalacia</li> <li>megaloblastic anemia</li> </ul>	<ul style="list-style-type: none"> <li>↑Appetite</li> <li>Teratogenicity</li> <li>hair loss</li> <li><b><u>Thrombocytopenia</u></b></li> <li><b><u>Hepatotoxicity</u></b></li> </ul>	<ul style="list-style-type: none"> <li>GIT upset</li> <li>Gastric distress</li> <li>Pain</li> </ul>	<ul style="list-style-type: none"> <li>Influenza-like symptoms</li> <li>CNS toxicity: <b>Diplopia, Ataxia, Blurred vision, Somnolence</b></li> <li>Skin rashes</li> </ul>	<ul style="list-style-type: none"> <li>↓Weight</li> <li><b><u>Renal stones</u></b></li> <li>CNS toxicity: <b>Ataxia, Dizziness, Somnolence</b></li> </ul>

## Summary for therapeutic uses:

- Partial: Valproic acid, Phenytoin, Carbamazipine
- Tonic -Clonic: Valproic acid, Phenytoin, Carbamazipine
- Absence: Valproic acid, Ethosuximide, Clonazepam
- Myclonic: Valproic acid, Clonazepam
- Status epilepticus: Fosphenytoin, lorezapam, Diazepam, Midozalam, Phenobarbitone

(Ignore the "pam" family ^^)

## Important notes **AFTER** studying:

- Absence seizures → think about  $\text{Ca}^{2+}$  → **Ethosuximide, Valproic acid**
- Status epilepticus → think about IV → **Fosphenytoin**
- Anything other than the main 3 types of seizures → think about broadspectrum → **Valproic acid**
- **Topiramate** & **Phenytoin** have the same MOA
- No need to focus on the specific MOA in brackets (i.e. *action, release, synthesis...etc*)