Epilepsy

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Epilepsy is the collective term for a large group of anatomical and functional disorders of the brain, characterized by repeated seizures; brief episodes of involuntary movement that may involve a part of or the entire body. In Ireland 40,000 people are diagnosed with epilepsy. Globally over 50 million people are affected and an estimated 2.4 million people are diagnosed with epilepsy each year. The risk of premature death in people with epilepsy is up to three times higher than the general population, with highest rates found in low and middle-income countries and rural versus urban areas. (WHO, 2018, Epilepsy Ireland, 2018).

Seizures can vary from the briefest lapse of attention or muscle jerks to severe and prolonged convulsions accompanied by loss of consciousness and control of bladder and bowel function. They can also vary in frequency, from less than one per year to several per day. Up to 10% of people worldwide have one seizure during their lifetime. One seizure does not signify epilepsy which is defined as having two or more unprovoked seizures. Characteristics of seizures vary, depending on where in the brain the disturbance occurs, and how far it spreads. Temporary symptoms occur, such as loss of awareness or consciousness, disturbances of movement and sensation (including vision, hearing and taste), mood, or other cognitive functions. Certain triggers which make seizures more likely include missed medication, increased alcohol intake, sleep deprivation, stress, illnesses and fevers (WHO, 2018).

Idiopathic epilepsy is the most common type, and in over half of cases there is no known cause. Epilepsy with a known cause is called secondary or symptomatic epilepsy. The causes of secondary epilepsy include: Brain damage from prenatal or perinatal injuries: Congenital abnormalities or genetic conditions with associated brain malformations: Severe head injury: Stroke (CVA) that restricts the amount of oxygen to the brain: Infections of the brain such as meningitis, encephalitis, neurocysticercosis: Genetic syndromes and brain tumors.

The main treatment for epilepsy are Anti-Epileptic-Drugs (AEDs), although surgery may be required for severe cases. The potential for drug-drug interactions should always be considered when prescribing concomitant medication to a patient on AEDs and the NMIC provides up-to-date information on AED-related enquiries. Drug-drug interactions (DDIs) occurring in patients with epilepsy can have substantial effects on clinical outcome and may often be predicted by the pharmacokinetic (PK) and pharmacodynamic (PD) profiles of the AEDs. Many patients with epilepsy have co-morbid conditions which require non-AED concomitant medications. Drug interactions between AEDs and contraceptive hormones are clinically important and need to be considered due to risks including contraceptive failure, potential teratogenicity of AEDs and reduced seizure control. There are widespread concerns about the teratogenic risks posed by AEDs, and care must be taken with use in pregnancy. In view of the increased risk of neural tube defects and other major congenital malformations (MCM) associated with exposure to AEDs (particularly sodium valproate and carbamazepine), current guidelines recommend that a daily dose of 5mg folic acid is prescribed prior to conception and until at least the end of the first trimester for all women taking AEDs (NMIC, 2014). After 2 to 5 years of successful treatment and being seizure-free, AEDs can usually be withdrawn in about 70% of children and 60% of adults without subsequent relapse.

Anti-Epileptic-Drugs (AEDs). Uses and Side Effects.

https://www.epilepsy.ie/content/types-anti-epileptic-drugs-aeds

AED names	**Seizure type**	**Side effects**
Brand (generic)	***Used for***	***Possible side effects***
Ativan (Lorazepam)	Monotherapy/add-on for all seizure types.	Drowsiness, light-headedness.
Briviact (Brivaracetam)	Add-on for focal/partial seizures with or without secondary generalisation.	Sedation, dizziness, nausea, balance problems, depression.Changes in mood and behaviour.
Diacomit (Stiripentol)	Add-on for tonic clonic seizures in children with Severe Myoclonic Epilepsy of Infancy/Dravet Syndrome.	Reduced appetite, weight loss, insomnia, aggression, nausea, rash, fatigue.
Diamox (Acetazolamide)	Has a role in epilepsy linked to menstruation. It can also be used with other anti epileptic drugs for all seizure types.	Nausea, vomiting, headache, dizziness, increased urine output.
Epanutin (Phenytoin)	Monotherapy/add-on for all forms of seizure types except absence seizures. Blood level monitoring is important.	Gastro intestinal disturbance, skin rash, drowsiness, constipation, tremor, unsteadiness and slurred speech. Coarsening of facial features, overgrowth of gums and acne may be a problem with prolonged therapy.
Epilim Epilim chrono Epilim chronosphere (Sodium Valproate)	Monotherapy/add-on for all forms of seizure types.	Drowsiness and tremor are infrequent side effects. Hair loss occurs in some people and on occasions excessive weight gain may occur. However these effects are usually reversible if the dose is reduced. Should not be used in women of childbearing age unless no other drug is effective (see section on foetal anticonvulsant syndrome).
Epistatus/Buccolam (Buccal Midazolam)	For all seizure types that are prolonged or clustered.	Drowsiness.

Felbatol (Felbamate)	Add-on for all seizure types which have failed all other AEDs. Used under strict conditions.	Constipation, diarrhoea, difficulty sleeping, dizziness, headache, loss of appetite, nausea, vomiting. Liver failure is a rare risk.
Frisium (Clobazam)	Add-on for all seizure types.	Drowsiness, light-headedness, confusion, gastro-intestinal disturbances.
Fycompa (Perampanel)	Add-on treatment for focal/partial seizures with or without secondary generalisation.	Drowsiness, nausea, balance problems, back pain, dizziness, mood and behaviour changes, weight gain, headache, double vision.
Gabitril (Tiagabine)	Add-on treatment for focal/partial seizures with or without secondary generalisation.	Diarrhoea, dizziness, tiredness, nervousness, tremor, impaired concentration, low mood.
Inovelon (Rufinamide)	Add-on treatment of seizures in Lennox-Gastaut syndrome.	Nausea, vomiting, diarrhoea, weight loss, abdominal pain, drowsiness, insomnia, fatigue, rash.
Keppra (Levetiracetam)	Monotherapy and add-on treatment of all seizure types.	Nausea, vomiting, diarrhoea, abdominal pain, weight changes, cough, drowsiness, dizziness, headache, low mood.

Lamictal (Lamotrigine)	Monotherapy and add-on treatment of all seizure types.	Gastro intestinal disturbance, skin rash, drowsiness, double vision, dizziness and headache, insomnia.
Lyrica (Pregabalin)	Add-on therapy for focal/ partial seizures with or without secondary generalisation.	Dry mouth, constipation, nausea, vomiting, weight gain, drowsiness, dizziness, changes in mood, attention difficulties.
Mysoline (Primidone)	Monotherapy/add-on for all seizure types except absence seizures.	Nausea, visual disturbances, unsteadiness and drowsiness may occur initially but sedation and slowing of cognitive performance may persist.
Neurontin (Gabapentin)	Monotherapy and add-on treatment of focal/partial seizures with or without secondary generalisation.	Gastro intestinal disturbance, diarrhoea, dry mouth, drowsiness, dizziness headache, fatigue, weight gain.
Nitrazepam	Infantile Spasms.	Confusion, memory loss, muscle weakness, tremor.
Phenobarbitone (Phenobarbital)	Monotherapy/add-on for all forms of seizure types except absence seizures.	Nausea, unsteadiness and drowsiness may occur initially and sedation and slowing of cognitive performance may occur.

Rivotril (Clonazepam)	Add-on for all seizure types.	Drowsiness, fatigue, dizziness, restlessness.
Sabril (Vigabatrin)	Must be initiated and supervised by appropriate specialist, add-on treatment of partial seizures with or without secondary generalisation. Monotherapy in West syndrome.	Drowsiness, nausea, behaviour, mood changes. Visual field defects. Psychotic reactions have been reported.
Tegretol Tegretol SR (Carbamazepine)	Monotherapy/add-on for partial seizures and secondary generalised tonic-clonic seizures, generalised tonic- clonic seizures.	Nausea, vomiting, dizziness, drowsiness, skin rash, double vision, unsteadiness.
Topamax (Topiramate)	Monotherapy and add-on treatment of generalised tonic-clonic seizures, or of focal/partial seizures with or without secondary generalisation.	Nausea, abdominal pain, diarrhoea, dry mouth, taste disturbance, weight loss, headache, fatigue, dizziness, word finding difficulties, pins and needles in hands and feet, kidney stones.
Trileptal (Oxcarbazepine)	Monotherapy and add-on treatment of focal/partial seizures with or without secondary generalised tonic-clonic.	Nausea, vomiting, constipation, diarrhoea, abdominal pain, dizziness, headache and drowsiness, skin rash.
Valium/Stesolid (Rectal Diazepam)	Emergency rescue treatment for seizures that are prolonged or clustered.	Drowsiness, tolerance of drug.
Vimpat (Lacosamide)	Add-on therapy in the treatment of partial seizures with or without secondary generalisation.	Nausea, vomiting, dizziness, headache, constipation, depression, double vision, drowsiness.
Zarontin Emeside (Ethosuximide)	Typical absence seizures; it may also be used in atypical absence seizures.	Gastro intestinal disturbance, nausea, vomiting, headache, fatigue, dizziness, weight loss.
Zebinix (Eslicarbazepine Acetate)	Add-on treatment in adults with focal/partial seizures, with or without secondary generalisation.	Dizziness, sleepiness, nausea, headache. More serious side effects include rash and liver problems.
Zonegran (Zonisamide)	Add-on treatment for drug-resistant focal/partial seizures, with or without secondary generalisation.	Nausea, diarrhoea, abdominal pain, weight loss, drowsiness, kidney stones, dizziness, confusion, irritability, skin rash.

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First Aid Management for Epileptic Seizures (Epilepsy Ireland, 2018)

1) **Generalised Onset Seizure with Motor Features (Tonic-Clonic, Tonic, Clonic, Atonic)**
    - Stay calm and time the seizure
    - Protect and cushion the head
    - If possible turn the person on their side
    - Don't restrain the person - unless they are in danger
    - Let the seizure run its course
    - Do not put anything in the mouth (saliva can be wiped away)
    - Turn the person on their side after the seizure stops
    - Stay with the person until they recover and respond fully

2) **Focal Impaired/Complex Partial Seizures:**
    - Stay calm and time the seizure
    - Don't restrain the person - unless they are in danger
    - Let the seizure run its course
    - Guide the person away from danger
    - Do not agitate the person
    - Speak gently and reassure the person
    - Stay with the person until they recover and respond fully

3) **Absences, Minor Seizures, Focal Aware/Simple Partial:**
    - Stay calm and time the seizure
    - If they wander guide them gently away from danger
    - Stay with the person until they are fully recovered and responsive
    - Reassure them and explain what happened

4) **An ambulance should be called if;**
    - The person is not breathing, or if there are concerns about the breathing
    - It is the first known seizure
    - The seizure lasts longer than normal
    - The seizure lasts over 5 minutes (where normal duration is not known) for major seizures
    - More seizures follow without recovery
    - The person is injured, pregnant or has another medical condition
    - If there is any doubt

Epilepsy has significant social and economic implications in terms of health care needs, premature death and work place productivity. Nearly 80% of people with epilepsy live in low and middle-income countries. It accounts for 0.6%, of the global burden of disease. Diagnosis and treatment of most people with epilepsy occurs in Primary Care without the use of sophisticated equipment. In low and middle-income countries however, 75% of people with epilepsy may not receive the treatment they need. This is called the "treatment gap". A recent study (Megiddo *et al*, 2016) found the average availability of generic antiepileptic medicines in the public sector of low and middle-income countries to be less than 50%. This may act as a barrier to accessing treatment. WHO health development projects, indicate that training primary health-care professionals to diagnose and treat epilepsy effectively reduces the epilepsy treatment gap (WHO, 2018).

Although social effects vary from country to country, people living with epilepsy can be targets of prejudice. Discrimination and social stigma surrounding epilepsy worldwide are often more difficult to overcome than the seizures themselves. The stigma of the disorder can discourage people from seeking treatment for symptoms, so as to avoid becoming identified with the disorder.

Epilepsy Ireland carries out tremendous work to raise awareness, and offers a wide range of services and supports for people with epilepsy in Ireland and their families. Their aim is to 'achieve a society where no person's life is limited by epilepsy'. With headquarters in Dublin and regional offices in Cork, Dundalk, Galway, Kerry, Kilkenny, Letterkenny, Limerick, Sligo and Tullamore, the website also offers invaluable information and resources and is available at https://www.epilepsy.ie/.

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