PARTNERS AGAINST MORTALITY IN EPILEPSY

Glossary of Terms by Category

SEIZURE & EPILEPSY RELATED TERMS

Absence seizure: Characterized by lack of awareness/impairment of consciousness due to abnormal electrical activity on both sides of the brain. Usually brief with immediate recovery.

Adjunctive therapy (syn.: add-on therapy): Treatment administered in addition to another therapy, as when one medication is taken with another.

AED: See antiepileptic drug

Anticonvulsant: See antiepileptic drug

Antiepileptic drug (AED): A medication used to control both convulsive and non-convulsive seizures; sometimes called an anticonvulsant or anti-seizure medicine.

Atonic seizure (syn. drop attack): A generalized seizure in which a sudden and complete loss of muscle control results in loss of balance and a sudden fall. These are brief but may lead to injuries.

Atypical absence seizure: A staring spell characterized by partial impairment of consciousness; and sometimes associated with intellectual disability. These often occur in children with Lennox-Gastaut syndrome; the EEG shows slow (less than 3 per second) spike-and-wave discharges. The use of the term ‘atypical’ is used to distinguish from ‘typical’ absence seizures most commonly associated with childhood absence epilepsy (petit mal) and which have 3 per second discharges.

Aura: A sensation recognized by a patient that immediately precedes or signals the beginning of a typical seizure (e.g. staring or shaking). May include uneasiness, déjà vu, sensory illusions (odors, visual illusions or misconceptions, sounds), stomach discomfort, and dizziness. Auras are simple partial seizures with sensory symptoms (no movement or unresponsiveness).

Automatism: Involuntary, undirected movements during complex partial seizures and atypical absence seizures. These include automatic movements commonly seen in normal people such as chewing (oral automatisms), lip smacking, picking at blankets/clothes (manual automatisms).

Benign: Favorable prognosis for recovery. For epilepsy, benign implies that a person’s seizures will be self-limited or go away over time and/or it will be easy to achieve complete control with medication.

Benign rolandic epilepsy: An epilepsy syndrome of childhood characterized by partial seizures occurring at night and often involving the face and tongue; the seizures may progress to tonic-clonic seizures, have a characteristic EEG pattern, are easily controlled with medications and are outgrown by age 16 years. Also known as Benign Epilepsy of Childhood with Centrotemporal Spikes.

Breakthrough seizures: Seizures that occur despite drug therapy.

Clonic seizure: An epileptic seizure characterized by rhythmic jerking movements.

Clustering/Seizure Cluster: Repeated seizures that follow shortly after each other or which happen within hours of each other following periods without seizure activity. These seizures may be treated with rescue medications, such as Diastat, nasal midazolam, lorazepam, etc.

Complex partial seizure: An epileptic seizure that involves only part of the brain and impairs consciousness; often preceded by a simple partial seizure (aura, or warning); may spread and become a secondarily generalized tonic-clonic seizure ("grand mal"). A newer proposed term for complex partial seizures is 'focal dyscognitive seizures'.

Convulsion: Medical "slang" or lay term for generalized tonic-clonic seizure; also known as grand mal. During a convulsion, a person has generalized involuntary muscle contractions and loss of awareness.

Dose-related effects: Adverse effects that are more likely to occur at times of peak blood levels of a drug.

Dravet Syndrome: An epilepsy syndrome that begins in infancy and is usually associated with a specific genetic mutation. Seizures typically are difficult to control and associated with developmental delays. Initial seizures are most often prolonged seizures with fever and in the second year of life other seizure types begin to emerge.

Epilepsia partialis continua: A continuous or prolonged partial seizure that causes contraction of the muscles; usually restricted to the muscles of the face, arm, or leg and not associated with impairment of consciousness. Also known as simple partial motor status epilepticus.

Epilepsy: A chronic neurological disorder defined by the occurrence of two or more unprovoked seizures. Epilepsy is estimated to affect nearly 3 million Americans, or just under 1% of the population.

Epilepsy syndrome: A disorder defined by seizure type, age of onset, clinical and EEG findings, family history, response to therapy, and prognosis. Examples of epilepsy syndromes are Juvenile myoclonic epilepsy and Lennox-Gastaut syndrome.

Febrile seizure: Seizure related to high fever in babies and children, usually under age five. Most children who have a febrile seizure do not develop epilepsy.

Focal seizure: An epileptic seizure that involves only one part of the brain. A focal seizure is the same as a partial seizure.

Frontal lobe seizure: A partial (focal) seizure arising in the frontal lobe area of the brain.

Generalized seizure: An epileptic seizure that involves both sides of the brain at the same time. (See also: types of generalized seizures: tonic-clonic and absence.) These can be primary generalized (absence, atonic, etc.) or secondarily generalized (start focally and spread).

Grand mal seizure: See tonic-clonic seizure

Hemispherectomy: Surgical removal or permanent disconnection of one hemisphere of the brain; with epilepsy, performed almost exclusively in children for whom severely damaged tissue spanning one hemisphere produces uncontrollable seizures. (See Also: surgery for epilepsy.)

Idiopathic: Of unknown origin or cause. Often presumed to be genetic.

Idiopathic generalized epilepsies: Epilepsy syndromes characterized by seizure onset from both hemispheres of the brain simultaneously; often genetic. Also known as primary generalized epilepsies or genetic generalized epilepsies.

Infantile spasms: Generalized seizures consisting of clusters of brief body contractions/postures in an infant. Seen in West syndrome. EEG typically shows hypsarrhythmia.

Interictal: The period of time between seizures (non-ictal).

Interictal epileptiform: very brief (fractions of a second) abnormal discharges seen on the EEG seen in most people with epilepsy.

Interictal hypometabolism: Decreased metabolism of glucose or oxygen in a brain region measured between seizures; measured via a Positron emission tomography (PET) scan.

Intractable: Not responding to treatment.

Juvenile myoclonic epilepsy (JME): A primary (also known as idiopathic or genetic) generalized epilepsy syndrome, usually beginning between ages 5 to 17 years, characterized by myoclonic (muscle-jerk) seizures, especially in the morning, and possibly also absence and tonic-clonic seizures. There are typical EEG findings, and this syndrome is usually easy to treat.

Landau-Kleffner syndrome: A rare, childhood condition producing progressive loss of the ability to speak due to frequent or continuous abnormal electrical activity; infrequent clinical seizures usually occur as well.

Lennox-Gastaut syndrome: A debilitating epileptic syndrome in children characterized by a severe intellectual disability (previously called mental retardation) and severe seizures including tonic, atypical absence, and tonic-clonic seizures.

Monotherapy: Treatment with a single drug.

Multifocal epilepsy: Epilepsy in which the seizures come from a number of locations in the brain.

Myoclonic seizure: A brief muscle-jerk resulting from an abnormal discharge of brain electrical activity; usually involves muscles on both sides of the body, most often the shoulders or upper arms.

Nocturnal seizures: Seizures that occur while a person is asleep. Note that increased seizure susceptibility can occur as people are going to & waking up from sleep as well as in the first hour after awakening.

Partial seizure: Seizure involving only one part of the brain, categorized as either simple partial or complex partial. (Same as focal seizure.)

Petit mal: Historic lay term or slang for absence seizure.

Photosensitivity: A reflex epilepsy in which seizures are triggered by flashing lights or patterns (e.g., strobe lights, video games, or flipping and rolling of a television screen). An estimated 3 in 100 people with epilepsy are photosensitive.

Pharmacotherapy: Medication therapy.

Polytherapy (syn.: polypharmacy): The use of two or more antiepileptic medications simultaneously for control of seizures

Reflex epilepsy: Rare epilepsy which occurs in response to specific sensory stimulus, including flickering light or patterns, sounds, tastes, smells, movements or sensations of touch.

Post-ictal confusion: Temporary incoherence, inability to respond to contact or unfamiliarity with environment which commonly follows tonic-clonic and complex partial seizures.

Postictal Generalized EEG Supression (PGES): a pattern seen on EEG immediately following a seizure. The EEG shows a suppression or flattening of the brain waves. PGES has been found in cases of SUDEP

Refractory: Difficult to treat, unresponsive, or of limited response to medication.

Seizure: The result of abnormal electrical discharge in the brain. Seizures can be related to injury, high fever, substance abuse, metabolic disorders, and other health conditions such as diabetes. Two or more unprovoked seizures are necessary and sufficient for a formal diagnosis of epilepsy.

Semiology: The clinical symptoms of a seizure.

Simple partial seizure: Seizure activity in one part of the brain resulting in symptoms but with retained awareness May include: a) jerking in one area of the body, arm, leg or face; b) experience of distorted environments, sensory illusion or gastric discomfort. The motor or sensory activity may progress to involve both sides of the brain and result in a convulsive seizure.

Status epilepticus: Severe, potentially life-threatening non-stop seizures in which the brain is in a constant state of seizure. Typically defined as one continuous, unremitting seizure lasting longer than 5 minutes, or back-to-back seizures without full recovery in between. Its occurrence is not always related to epilepsy. A variety of causes can spark status epilepticus, including an acute brain injury.

Symptomatic: Referring to a disorder with an identifiable cause; for example, severe head trauma or a brain tumor or brain malformation can cause symptomatic epilepsy.

Syndrome: A set of symptoms characterizing a disease, disorder, or condition. An epilepsy syndrome is the complete set of seizure types and symptoms experienced by a patient. The International Classification of the Epilepsies and Epileptic Syndromes (1989) identifies more than 11 widely accepted epileptic syndromes.

SUDEP: Sudden Unexpected Death in Epilepsy. The unexpected death of a person with epilepsy, when no cause of death is found on autopsy. When an autopsy is not performed, the death may be classified as possible or probable SUDEP. Characteristics of a SUDEP include: the person died unexpectedly while in a reasonable state of health; the death occurred suddenly and during normal activity (often during sleep); an obvious medical cause of death could not be determined at autopsy; the death was not the direct result of status epilepticus (prolonged seizures).

Temporal lobe seizure: A partial seizure involving the temporal lobe. Symptoms vary but may include funny sensations in the stomach, déjà vu, feelings of detachment from surroundings and automatisms. Consciousness may be impaired or lost.

Therapeutic blood level: The amount of drug circulating in the bloodstream that brings about seizure control without troublesome adverse effects in most patients. “Subtherapeutic” (lower) levels are effective in some patients, and “supratherapeutic” or “toxic” (higher) levels are tolerated by others.

Tonic-clonic/Generalized tonic-Clonic (GTC): Most noticeable type of seizure; generalized seizures which usually begin with a sudden cry, fall and rigidity (tonic phase) followed by muscle jerks, shallow breathing or temporarily suspended breathing and change in skin color (clonic phase), possible loss of bladder or bowel control; seizure usually lasts a couple of minutes, followed by a confusion and fatigue.

Tuberous sclerosis: A disease in which benign tumors affect the brain, eyes, skin, and internal organs; may be associated with developmental delays, cognitive impairment and seizures; may be inherited as an autosomal dominant trait, which means that a gene from only one parent is needed to acquire the disease; also may occur spontaneously, without an affected parent.

Vagus nerve stimulator (VNS): A device to reduce severity of seizures through electrical stimulation of the vagus nerve, a nerve in the neck that connects to the brain. Device is implanted in the upper left chest with electrodes encircling the vagus nerve. Electrical impulses are sent at set intervals to the brain.

West syndrome: An epileptic syndrome characterized by infantile spasms, mental retardation, and an abnormal EEG pattern (hypsarrhythmia); begins before 1 year of age.

EVALUATION RELATED TERMS

Ambulatory EEG Monitoring: A system for recording the electroencephalogram (EEG) for a prolonged period (typically 18 to 24 hours) in an outpatient (at home); the electrodes are connected to a small computerized recorder.

CAT scan (computerized axial tomography; CT scan; syn.): See computed tomography

Cerebellum: A brain structure involved in the control and coordination of voluntary muscle movements.

Comprehensive epilepsy centers: Clinics staffed by epileptologists and a multidisciplinary team of experts in epilepsy treatment. They are valuable resources for anyone who has unresolved problems related to definite or suspected epilepsy. Patients may be referred to a comprehensive epilepsy center for a single outpatient visit to assess their diagnosis and therapy, or they may receive long-term, ongoing treatment.

Computed tomography (CT; "CAT scan"): A scanning technique that uses x-rays and computers to create pictures of the inside of the body; shows the structure of the brain; not as sensitive as magnetic resonance imaging (MRI). Often used in emergencies, including after head trauma.

Depth electrodes: Thin wires placed deep in the brain to detect seizure activity that cannot be recorded from the surface of the brain.

Electroencephalogram (EEG): A diagnostic test of brain electrical activity; helpful in diagnosing epilepsy. When a camera is running at the same time that the EEG is being recorded, it is called a 'video-EEG'.

Epilepsy Monitoring Unit (EMU): A specialized inpatient hospital unit designed to evaluate, diagnose, and treat seizures. It is where a video-EEG is performed continuously, typically for days, to better characterize seizures or events mimicking seizures.

Epileptiform: Resembling epilepsy or its symptoms; may refer to a pattern on the EEG associated with an increased risk of seizures.

Epileptologist: A physician (neurologist) that is an expert in the diagnosis and treatment of epilepsy.

Hyperventilation: Rapid, deep breathing. Used in EEG testing, may produce abnormalities or even a seizure.

Hypsarrhythmia: An abnormal EEG pattern in infants of excessive high voltage slow activity and multiple areas of epileptiform activity; associated with infantile spasms.

Inhibitory: Shutting off or decreasing brain electrical activity; causing nerve cells to stop firing. Often mediated by GABA, a chemical neurotransmitter in the brain.

Magnetic resonance imaging (MRI): An imaging method using magnets instead of X-rays. Produces very detailed pictures of the internal structure of the brain and crucial for detection of small lesions, cortical dysplasia, hippocampal sclerosis and other causes of epilepsy.

Magnetic resonance spectroscopy (MRS): A scanning technique done via an MRI scan that examines the atoms hydrogen and phosphorus to glean information about chemical activity in small areas of the brain.

Magnetoencephalography (MEG): Records magnetic activity generated by the brain's electrical activity; helps identify brain areas where seizures begin.

Neurologist: A specialist in the diagnosis and treatment of nervous system diseases and disorders such as epilepsy. An epileptologists is one type of neurologist, sub-specialized in epilepsy.

Positron emission tomography (PET) scan: Imaging test that uses a radioactive substance called a tracer to look for disease in the body. A PET scan shows how organs and tissues are working. This is different than MRI and CT, which show the structure of and blood flow to and from organs,

Sharp wave: An EEG wave (<1 second long) indicating the potential for epilepsy; "benign" sharp waves are not associated with seizures. Has the same significance as spikes or spike-waves.

Slowing: When used to describe an EEG pattern, describes a group of brain waves on the EEG that have a lower frequency than expected for the subject's age and level of alertness and the area of the brain recorded. Slow waves can result from drowsiness or sleep, drugs, or brain injuries and occur during or after seizures.

Spikes, or spike-and-wave discharges: The brainwave pattern on an EEG tracing that describes a fast (spike) wave followed by a slower wave. This finding can occur during or between clinical seizures. Seen mostly in people with epilepsy.

Video EEG monitoring: Simultaneous video (TV) monitoring and EEG recording of brain waves to help identify the type of seizure that is taking place.

SCIENCE RELATED TERMS

Adenosine: a molecule that is present in cells of the body. Involved with heart and brain function.

Biomarker: a measurable indicator of the severity or presence of disease.

Controlled study: An experiment in which two groups are the same except that only one receives the treatment being tested and the other does not.

Epidemiology: the study of the patterns, causes, and effects of health and disease. Often focused on identifying risk factors for disease, it is important in the study of public health, often used to shape policy decisions and evidence-based health care practices.

GABA: The main inhibitory neurotransmitter in the brain. Blocking GABA causes seizures and enhancing GABA ("GABAergic" meds such as benzodiazepines and barbiturates) prevents seizures.

Glutamate: The main excitatory neurotransmitter in the brain. Too much glutamate causes seizures and brain injury.

Incidence: The frequency at which a disorder newly develops over time; approximately 150,000 new epilepsy cases develop in the United States each year. Usually expressed as the number of

cases per 100,000 people per year. The overall annual incidence in the Unites States is estimated at about 2.5 per 1000.

Ion Channel: proteins that are present in cell membranes, allowing ions such as sodium and calcium to flow in and out of the cell; critical for cell function.

Pulmonary Edema: accumulation of fluid in the lungs.

GENERAL TERMS

Adherence: the degree to which a patient follows the medical advice or prescription.

Affective: Concerning mood.

Aneurysm: A bulge in a blood vessel caused by a weakness in the vessel wall; sometimes a cause of seizures when it occurs in the brain, mainly after it ruptures (bleeds).

Angelman syndrome: A genetic disorder marked by mental retardation, speaking difficulties, inappropriate laughter and hyperactivity; most children with this syndrome also have epilepsy.

Aphasia: Defect in or loss of language abilities.

Apnea: Cessation of breathing.

Asystole: Cessation of heart beat.

Autoimmune disease: a disease that results from an aberrant response of the immune system, in which the immune system targets its own cells or tissues.

Autoinduction (of metabolism): A process in which continued administration of a drug leads to an increase in the rate at which the drug is metabolized.

Autonomic: Pertaining to the autonomic nervous system, which controls bodily functions that are not under conscious control (e.g., heartbeat, breathing, sweating); some partial seizures may cause only autonomic symptoms; changes in autonomic functions are common during many seizures.

Bioavailability: The amount of a drug in a capsule or tablet that actually reaches the patient's bloodstream.

Bioequivalency: Equal performance of two or more substances used as therapy.

Blood drug level: The concentration, or amount, of circulating drug in the bloodstream, measured in micrograms (µg) or nanograms (ng) per milliliter (mL). The concentration may be measured as the free or total level because some of the drug is bound to the protein in the blood and some is not; the free level is the amount of drug that is "free" (unbound); the total level is the amount of drug that is both bound and unbound to the blood protein; the drug that is free (unbound) is the portion that reaches the brain and exerts an effect on the disorder.

Blood level monitoring: Monitoring of levels of antiepileptic drugs in the bloodstream. Blood samples are taken to ensure that a proper amount of the drug is being metabolized.

Bradycardia: Slow heart beat

Cardiac: Relating to the heart.

Cerebral hemisphere: One side of the cerebrum (upper brain); each hemisphere contains four lobes (frontal, parietal, occipital, and temporal).

Chronic: Affecting a person for a long period of time; a slowly progressing and continuing disorder.

Comorbid: A disorder that is present in association with another. For example, ADHD is frequently a co-morbid condition that exists with childhood epilepsy.

Compliance: Refers to patient adherence to physician directions for taking antiepileptic drugs.

Cortex (cerebral cortex): The thin outer layer of the brain that controls movement and the senses and which can generate seizures; made up of gray matter.

Cortical dysplasia: Abnormal development of the cortex, a condition that can cause seizures. Usually occurs prior to birth.

Craniotomy: An opening made into the skull for brain mapping and epilepsy surgery.

Cryptogenic: Of unknown origin.

Epileptogenesis: The process(es) that lead to the development of epilepsy.

Epileptogenic: That which causes or induces epilepsy.

Focus: Identified area of the brain from which partial seizures arise.

Frontal lobe: Located in upper region of the head, behind the forehead; the frontal lobe controls decision-making, problem-solving or planning, motor movement, and on one side (usually the left), expressive language.

Generic drug: A drug that is not sold under a brand name; for example, carbamazepine can be obtained as a generic drug or as the brand name forms of Tegretol or Carbatrol. Most medications that are not very new are available as generics, and many different companies make the same generic medication.

Half-life: The time required for the amount of a drug in the blood to decline to half its original value, measured in hours; a drug with a longer half-life lasts longer in the body and, therefore, generally needs to be taken less often than a drug with a shorter half-life.

Hippocampus: A structure in the deep temporal lobes that is the most common focus for seizures in adults. With the amygdala, the septum, and parts of the cortex, comprises the brain's limbic system; hippocampus is partly responsible for memory.

Interictal psychosis: Thought disorder, often with delusions, hallucinations or emotional changes that are not only seen right after seizures (in which case it would be postictal psychosis) Most commonly lasts 3-6 months.

Limbic system: The group of brain structures that influence the body's unconscious movement and hormonal activity. Includes the hippocampus.

Lobe: Any rounded, projecting part of the anatomy; components of the brain. (See also: frontal lobe, parietal lobe, temporal lobe, and occipital lobe.)

Mortality: Death rate; often given as rate of deaths per 100,000 people/year.

Muscle tone: The level of muscle contraction present during the resting state; with increased tone there is stiffness and rigidity; with decreased tone there is looseness or floppiness of the limbs and trunk.

Occipital lobe: Brain lobe at the rear of the head associated with vision.

Parietal lobe: Brain lobe that interprets sensory input and the body’s relation to space.

Pathophysiology: the functional abnormality or abnormal processes associated with disease or injury.

Respiration/respiratory: Relating to breathing.

Ring Chromosome 20 Syndrome: Ring chromosome 20 syndrome (RC20) is one of a number of chromosomal disorders associated with refractory epilepsy. A ring chromosome is formed by the fusion of two arms of a chromosome during pre-natal development. Epilepsy appears to be the first and major clinical symptom of this syndrome, is a constant feature, and is often drug resistant.

Seizure threshold: The point at which a person can no longer tolerate a seizure-provoking stimulus (e.g., babies have a lower seizure threshold for high body temperature than do adults. High fever can trigger febrile [fever-related] seizures in babies.

Selective Serotonin Reuptake Inhibitor (SSRI): A type of antidepressant drug that blocks the removal of serotonin, a neurotransmitter, from the synapse, thereby prolonging and increasing the effects of serotonin.

Structural lesion: Physical or structural abnormality in the brain.

Subdural: Referring to the area beneath the tough membrane (dura) which forms the outer envelope of the brain; subdural strips or grids are small plastic devices containing electrodes which are placed directly on the brain surface to record brain wave activity.

Tachycardia: Rapid heartbeat.

Temporal lobes: The areas of the brain that lie at the side of the head behind the temples and ears and which are involved in hearing, memory, emotion, receptive language (comprehension), illusions, tastes, and smells.