Glossary of descriptive terminology for veterinary ictal semiology

Modified from the ILAE Task Force on Classification and Terminology (Blume et al., 2001) with permission, John Wiley & Sons, Inc.

The International League Against Epilepsy published the Glossary of Descriptive Terminology for Ictal Semiology in 2001 to provide a standard terminology for healthcare workers in order to create a common language used between clinicians, researchers, and educators. Because of a wide number of parallels between epileptic seizures recognized in humans and dogs and cats, the framework has been preserved, with the addition of certain veterinary specific terms and the subtraction of human elements, which at this time are not recognized in veterinary medicine.

General terms

1. Semiology: The study of signs and symptoms.
2. Epileptic seizure: The manifestation(s) of excessive and/or hypersynchronous (epileptic) activity of brain neurons, which is usually self-limiting.
3. Ictus: The epileptic seizure itself as determined clinically or electrophysiologically (i.e., EEG).
4. Epilepsy:
   a. Epileptic disorder: A chronic neurologic condition characterized by recurrent epileptic seizures from an intracranial origin.
   b. Epilepsies: Because there are many disorders causing epilepsy, they are referred to as those conditions involving chronic recurrent epileptic seizures considered to be epileptic disorders.
5. Focal seizure (aka partial): A seizure whose initial semiology indicates, or is consistent with, initial activation of only part of one cerebral hemisphere (i.e., the seizure has a focal origin within the brain).
6. Generalized seizure (aka bilateral): A seizure whose initial semiology indicates involvement of both cerebral hemispheres.
7. Convulsion: Primarily a lay term. Episodes of excessive, abnormal muscle contractions, usually bilateral, which may be sustained or interrupted. Not necessarily a seizure or an epileptic seizure.

Descriptive terms of epileptic seizures

Motor

The musculature of the patient is involved to create either an increase (positive) or decrease (negative) in muscle contraction resulting in a motor event.

The following terms are adjectives used to modify “motor seizure” or “seizure” (e.g., “tonic motor seizure or dystonic seizure”):

- Elementary motor: A single type of contraction of a muscle or group of muscles that is usually stereotyped.
  - Tonic: A sustained increase in muscle contraction, which may last a few seconds to minutes.
  - Epileptic spasm (noun): A sudden flexion, extension, or mixed extension–flexion of predominantly proximal and truncal muscles that is usually more sustained than a myoclonic movement but not so sustained as a tonic seizure (i.e., ~1 s). Limited forms may occur: facial contraction or head bobbing.
  - Postural: A posture that may be bilaterally symmetric or asymmetric is present.
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(a) Versive: A sustained, forced conjugate (i.e., joined) eye, head, and/or truncal rotation or lateral deviation from the midline.

(b) Dystonic: Sustained contractions of both agonist and antagonist muscles producing athetoid (i.e., slow, involuntary, writhing movements) or twisting movements, which, when prolonged, may produce abnormal postures.

- Myoclonic: Sudden, brief (<100 ms) involuntary single or multiple contraction(s) of muscle(s) or muscle groups of variable topography (axial, proximal limb, distal limb, facial). Appears “shock-like.”
- Negative myoclonic: Interruption of tonic muscular activity for <500 ms without evidence of preceding myoclonia.
- Clonic: Myoclonus, which is regularly repetitive, involving the same muscle groups, at a frequency of ~2–3 cycles/s and is prolonged (aka rhythmic myoclonus).

(a) Jacksonian march (noun): A traditional term used to describe a focal seizure, which spreads from a distal aspect of the body (i.e., a limb) toward the ipsilateral face. It is a representation of a seizure spreading (or “marching”) from one area of the brain to another.

- Tonic-clonic: A sequence consisting of a tonic phase (sustained contraction) followed by a clonic phase (myoclonus or repetitive contraction/relaxation). Variants such as clonic–tonic–clonic may be seen.
- Generalized tonic–clonic seizure (aka bilateral tonic–clonic seizure): Formerly known as a “grand mal” seizure. Bilateral symmetric tonic contraction and then bilateral clonic contractions of somatic muscles, usually associated with autonomic phenomena (e.g., urination/defecation, ptalism).
- Atonic: Sudden loss or attenuation of muscle tone without preceding myoclonic or tonic event lasting 1–2 s, involving the head, trunk, jaw, or limb musculature.
- Astatic (aka “drop attack”): Loss of erect posture resulting from an atonic, myoclonic, or tonic mechanism.
- Synchronous/asynchronous: Motor events that occur at the same time at the same rate in sets of body parts (synchronous) or not at the same time or rate (asynchronous).

- Automatism: Tends to be a coordinated, repetitive (i.e., stereotypical) motor activity usually occurring when cognition is impaired. They often resemble a voluntary movement such as extension of a limb or continuation of a preictal movement but in an abnormal and involuntary manner.
- Oroalimentary: Lip smacking (aka “chewing-gum fits”), chewing, excessive licking, bruxism, or swallowing.
- Mimetic: Facial expression suggesting an emotional state, such as fear, panic, or aggression.
- Hyperkinetic: Involves mainly proximal limb or axial muscles producing irregular sequential ballistic movements, such as pedaling, pelvic thrusting, thrashing, whole-body sway, or rocking movement. Aimless, back-and-forth pacing, circling, or running.
- Hypokinetic: A reduction in the amplitude and/or rate or cessation of ongoing motor activity.
- Dyspraxic: Inability to perform learned movements or tasks spontaneously or on command despite seemingly intact relevant motor and sensory systems and adequate comprehension and cooperation (may appear “confused”).
- Vocal: Single or repetitive vocal utterances such as growling, mewing, meowing, barking, grunting, groaning, whining, or crying.
- Spontaneous: A stereotypical behavior involving only the patient virtually independent of surrounding environmental influences.
- Interactive: A behavior, which is not stereotypical, involves the patient and others and is influenced by the environment.

**Nonmotor**

- Aura: Typically referred to as a “warning” of an impending seizure although considered the beginning of the ictal event. If they occur alone, they are considered a sensory seizure.
- Sensory: A behavior not caused by appropriate stimuli in the external world. Modifies “seizure” or “aura.”
- Elementary: A single, unformed phenomenon involving one primary sensory modality (e.g., somatosensory, visual, auditory, olfactory, gustatory, epigastric, or cephalic).
Somatosensory: Tingling, numbness, electric-shock sensation, pain, sense of movement, or desire to move. The dog or cat may excessively lick a body part in a stereotypical manner, rub its face on carpet, cry out for no apparent reason, stumble or fall without cause, or pace or run frantically.

Visual: Flashing or flickering lights, spots, simple patterns, scotomata, or amaurosis. The dog or cat may bite at objects not present (i.e., “fly-biting”), look at objects not present, growl or hiss at nothing, or appear to be “staring into space.”

Auditory: The patient may cock its head as if “listening”; whip around to look at something not there; act scared, frantic, or panicked; hide; or become withdrawn.

Olfactory: Odor, usually disagreeable. The patient may sniff the air incessantly, cower, avoid certain areas, or make unusual facial expressions (e.g., “crinkle” the nose).

Gustatory: Taste sensations. Typically disagreeable, which may lead to lip smacking, chewing-gum fits, excessive licking, excessive swallowing, etc.

Epigastric: Abdominal discomfort including nausea, tightness, malaise, pain, and hunger; sensation may rise to throat. Some phenomena may reflect ictal autonomic dysfunction. Patient may vomit, regurgitate, eructate excessively, foam at the mouth, etc.

Cephalic: Sensation in the head such as headache. The patient may hold its head and neck in a “neutral” position, look out of the corners of its eyes (i.e., “guilty” look), or seem reluctant to lie down. May mimic neck pain.

Experiential: Emotional or composite perceptual phenomena including illusory or hallucinatory events; these may appear alone or in combination. These may be difficult to distinguish in animals as most accounts of the “feeling” are made through the verbal description of a human.

Affective (i.e., emotional): Components include fear, depression, joy, and aggression. The dog or cat may seem excessively friendly, aggressive toward individuals or other pets for no apparent reason, reclusive, anxious, or panicked.

Mnemonic: Components that reflect ictal dysmnesia (i.e., lack of learned retention) such as feelings of unfamiliarity (jamais vu) toward an individual or another pet. The dog or cat may seem scared or aggressive toward an individual or other pet with no provocation.

Dyscognitive: Events in which a disturbance of cognition is the predominant or most apparent feature. In dogs and cats, this may appear as a patient who suddenly stops what they are doing and “stares into space.” They typically do not respond to external cues in the environment, such as calling their name. Occasionally referred to as a “behavioral arrest.”

Components of cognition include (but may be difficult to recognize in pets):
- Perception: Symbolic conception of sensory information. The appropriate reaction to environmental cues.
- Attention: Appropriate recognition to environmental cues or the environment in general.
- Emotion: Appropriate emotional significance of a perception or to an individual or another pet.
- Memory: Ability to recall learned tasks. In pets, this typically means “on cue.” For instance, a dog who is asked “to sit.”
- Executive function: The ability to analyze an environmental situation and react appropriately.

**Autonomic events**

- Autonomic seizure: An objectively documented and distinct alteration of autonomic nervous system function involving cardiovascular, pupillary, gastrointestinal, vasomotor (collapse (hypotension) or panic (hypertension)), and thermoregularity functions.

**Somatotopic modifiers**

- Laterality
  - Unilateral: Exclusive or virtually exclusive involvement of one side of the body as a motor, sensory, or autonomic behavior.
  - Hemi: Prefix to other descriptors (e.g., hemiclonic).
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- Generalized (aka “bilateral”): More than minimal involvement of each side of the body as a motor, sensory, or autonomic behavior. The motor component is further modified as:
  - Asymmetric: A clear distinction in the quantity and/or distribution of behavior on the two sides of the body.
  - Symmetric: Virtually bilateral representation in both sides of the body.
- Body part: Refers to area involved (i.e., arm, leg, face, trunk, and other).
- Centricity: Modifier describing the proximity to the body axis.
  - Axial: Involves the trunk, including the neck.
  - Proximal limb: Signifies involvement from the shoulders to carpus and hip to tarsus.
  - Distal limb: Indicates involvement of the paw, metacarpals, metatarsals, and phalanges.

Modifiers and descriptors of seizure timing

- Incidence: Refers to the number of epileptic seizures within a time period or the number of seizure days per unit of time.
  - Regular and irregular: Consistent (inconsistent) or predictable (unpredictable, chaotic) intervals between such events.
  - Cluster: Incidence of seizures within a given period (usually one or a few days), which exceeds the average incidence over a longer period for the patient.
  - Provocative factor (aka “stressor”): Transient and sporadic endogenous or exogenous element capable of augmenting seizure incidence in animals with chronic epilepsy and evoking seizures in susceptible individuals without epilepsy. May include fireworks, trips in the car, etc.
    - Reactive: Occurring in association with transient systemic perturbation such as a metabolic disturbance (e.g., portosystemic shunt) or toxin (e.g., metaldehyde).
    - Reflex: Objectively and consistently demonstrated to be evoked by a specific afferent stimulus or by activity of the animal. Afferent stimuli can be elementary [i.e., unstructured (light flashes, startle, rubbing or petting, a sound)] or elaborate [i.e., structured, (a song)]. Activity may be elementary [e.g., motor (a movement)] or elaborate [e.g., cognitive function (performing a learned task)].
  - State dependent: Occurring exclusively or primarily in the various stages of drowsiness, sleep, or arousal.
  - Catamenial: Seizures occurring principally or exclusively in any one phase of the female heat (i.e., estrous) cycle.

Duration

The time between the beginning of the initial seizure manifestations, such as the aura, and the cessation of experienced or observed seizure activity. Does not include the postictal states.

- Status epilepticus: A seizure that shows no clinical signs of stopping after a duration encompassing the great majority of seizures of that type in most patients or recurrent seizures without interictal resumption of baseline central nervous system function.

Severity

A multicomponent objective assessment of a seizure by observers of the patient. Components primarily of observer assessment include duration, extent of motor involvement, impairment of cognitive interaction with environment intraictally, and maximal number of seizures per unit of time. May include the length of postictal affect and body temperature.

Prodrome:

A preictal phenomenon. An objective clinical alteration (e.g., a stereotypical behavior) that indicates the onset of an epileptic seizure but does not form part of it.

Postictal phenomenon

A transient clinical abnormality of central nervous system function that appears or becomes accentuated when clinical signs of the ictus have ended (e.g., anxiety, polyphagia, polydipsia, “clinginess,” hiding behavior, etc.).