



Feline Ischemic Encephalopathy

(Brain Disorder in Cats)

Basics

OVERVIEW

- “Feline” refers to cat; “ischemic” refers to ischemia; “ischemia” is the loss of blood or blood flow to a tissue or organ, usually due to some type of blockage of the blood vessels; “encephalopathy” is a disorder of the brain
- “Feline ischemic encephalopathy” is a seasonal nervous system disease that occurs in outdoor cats or cats with access to the outdoors in North America during the summer months; usually results in sudden (acute) onset of seizures, circling, altered mentation and/or blindness
- Abnormal migration of a *Cuterebra* larva in the brain of a cat that often causes a blood clot in a blood vessel (known as “thrombosis”) or contraction or narrowing (known as “vasospasm”) of the middle cerebral artery with resulting loss of blood flow and death of nerve tissues in part of the brain (condition known as “ischemic necrosis”); also may involve loss of function (known as “degeneration”) of the brain as well as nerve tissue destruction associated with the actual physical migration of the *Cuterebra* larva in the brain tissue
- Must be differentiated from other causes of blood vessel (known as “vascular”) diseases affecting the brain of cats, as well as other nervous system diseases of the cat

SIGNALMENT/DESCRIPTION OF PET

Species

- Cats

Mean Age and Range

- Mean, 2 years of age
- Range, 1–7 years of age

SIGNS/OBSERVED CHANGES IN THE PET

- Sudden (acute) onset of nervous system signs
- Often preceded by upper respiratory signs 1–3 weeks prior to the nervous system signs (due to the migration of the parasite [*Cuterebra*] in the nasal passage)
- Most common signs—seizures, circling, altered mentation, blindness
- Sometimes nervous system signs can originate from multiple locations in the nervous system; rarely see spinal cord signs (such as weakness or paralysis)

CAUSES

- *Cuterebra* larvae; *Cuterebra* is a large fly, which lays eggs in the ground at the opening of rodent burrows; the eggs hatch and the larvae attach to the hair and skin of a host (such as a rabbit); they enter the nose and penetrate the moist lining, from which they migrate and eventually reach a location under the skin, where they

continue to develop; the cat may become a host as it hunts or moves in the area where the larvae are located—in most cases, the larvae migrate to locations under the skin (especially around the head) of the cat, but if they follow an abnormal migration pattern in the cat's body, they may end up in the brain

RISK FACTORS

- Outdoor cats; access to the outdoors
- July, August, and September in the northeast United States and southeast Canada
- Hunting cats

Treatment

HEALTH CARE

- Padded cage may be necessary if the cat is having numerous seizures

SURGERY

- Surgical removal of the parasite from the brain or spinal cord has not been reported in cats, but may be possible if nervous system imaging techniques are available early after onset of clinical signs

Medications

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

- Supportive care and appropriate fluid supplementation, which may include thiamine (a B vitamin) and additional potassium (administered intravenously), depending on the nutritional status of the pet
- Medications to control seizures (known as “antiepileptic drugs”), such as phenobarbital or diazepam to stop cluster seizures or repeated or prolonged seizure activity (known as “status epilepticus”)
- A “cocktail treatment” has been proposed for recently affected cats, which includes diphenhydramine administered by intramuscular (IM) injection before giving ivermectin administered by subcutaneous (SC; under the skin) injection and prednisolone sodium succinate administered by intravenous (IV) injection; in addition pets receive prednisone and an antibiotic, enrofloxacin, administered by mouth (PO); ivermectin is not approved for use against *Cuterebra* larvae, so your veterinarian will discuss the use of this medication with you prior to treating your cat
- The previously described “cocktail treatment” for feline ischemic encephalopathy is not necessary in a cat not recently showing clinical signs (that is, more than a week since having clinical signs) as the parasite likely is dead already
- Can administer dexamethasone instead of prednisone

Follow-Up Care

PATIENT MONITORING

- Sequential nervous system evaluations

PREVENTIONS AND AVOIDANCE

- Keep cats indoors
- Monthly treatment with fipronil, imidacloprid, selamectin, or ivermectin has been suggested to prevent *Cuterebra* infestation

POSSIBLE COMPLICATIONS

- May continue to have uncontrolled seizures
- May continue to circle compulsively
- May have behavioral changes, such as aggression

EXPECTED COURSE AND PROGNOSIS

- After initial onset of clinical signs, many patients improve and become acceptable pets; however, persistent nervous system deficits, seizures, circling and undesirable behavior (such as aggression) may continue
- Persistent clinical signs depend on damage caused by loss of blood flow to the brain (ischemia) and the actual

parasitic migration through the nervous tissue

Key Points

- Only occurs in outdoor cats and cats with access to the outdoors; strictly indoor cats do not develop feline ischemic encephalopathy
- Only occurs in summer months with the majority of pets seen during July, August, and September in the northeast United States and southeast Canada
- May not occur in major metropolitan areas that do not have the normal appropriate hosts (such as the cottontail rabbit) for *Cuterebra*

Notes

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