

COGNITIVE DYSFUNCTION SYNDROME

BASICS

OVERVIEW

- Syndrome associated with brain aging
- Leads to changes in the pet's awareness, decreased responsiveness to stimuli, and deficits in learning and memory
- Pet may have increasing signs of anxiety with advancing age
- Subtle signs are seen in early stages, referred to as "cognitive decline"

GENETICS

- Genetic correlation with respect to the distribution of beta-amyloid in the brain and the age at which it begins to accumulate

SIGNALMENT/DESCRIPTION of ANIMAL

- Dogs and cats
- More common with increasing age
- A decline in memory and learning can be seen in dogs as early as 6 years of age
- Clinical signs in cats may develop at a slightly older age
- Deficits may not be noticed by pet owners until several years later, except in dogs trained to perform more specialized tasks (such as hearing ear, seeing eye, drug detection, agility)

SIGNS/OBSERVED CHANGES in the ANIMAL

Historical Findings

Most clinical signs can be placed into 5 categories:

- Disorientation, including getting lost in familiar environments, confusion, or inability to navigate through familiar routes (such as going to the wrong side of door)
- Interactions with humans or other animals may be altered (possible decline in play, increased/decreased interest in affection, or an increase in irritability)
- Sleep-wake cycle alterations (temporal disorientation), including night waking or vocalization and perhaps an increase in sleep during the day
- Housetraining and other previously learned behaviors might deteriorate; house soiling, lack of response to previously learned commands, or becoming less adept at performing learned tasks (such as agility, working ability) may occur
- Activity may be altered—inactivity, less interest in exploration, self-care, or even eating; as the condition progresses, activity levels may increase with signs of restlessness, pacing, aimless wandering, or compulsive activity disorders (such as excessive licking)
- Anxiety and agitation may increase in pets with cognitive dysfunction

Physical Examination

- No specific abnormalities related to Cognitive Dysfunction Syndrome are seen; pet may have non-related physical changes or health concerns

CAUSES

- Exact cause is unknown and animals are variably affected
- Genetic factors may predispose pets to developing cognitive decline

RISK FACTORS

- Chronic or recurrent illness or stress might lead to increased accumulation of toxic free radicals in the brain
- Conditions that affect the blood supply to the brain (such as systemic high blood pressure [hypertension], low red blood cell count [anemia])

TREATMENT

HEALTH CARE

- Outpatient care
- Depends on the type and severity of the clinical signs of cognitive dysfunction

ACTIVITY

- Maintain as much exercise, play, training, work, and other daily routines as is practical for the pet's age and health
- Providing mental and physical stimulation has been shown to reduce the chance of cognitive decline

DIET

- Selected based on the pet's overall health assessment

- If the pet's overall health does not require a special therapeutic diet, then an antioxidant-fortified senior diet (e.g., Hill's Prescription Diet® b/d®) should be utilized
- Hill's Prescription Diet b/d has been shown to improve memory, learning ability, and clinical signs of Cognitive Dysfunction Syndrome
- Natural supplements with combinations of antioxidants, phosphatidylserine and DHA may be useful if diet cannot be changed; talk to your veterinarian before adding supplements to your pet's diet

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.

Selegiline

- Licensed for use in dogs in North America
- Monoamine oxidase (MAO) B inhibitor, in dogs, may contribute to improved transmission of brain chemicals, lead to a decrease in free radicals, and have a protective effect for nerve cells in the brain
- Reevaluate clinical signs for improvement after 1 to 2 months
- Side effects might include occasional gastrointestinal upset and restlessness, and repetitive behavior at higher doses

Nicergoline

- Not licensed for use in dogs in North America, but is licensed in other countries
- Used in elderly dogs with decreased activity, sleep disorders, decreased exercise tolerance, house soiling (including incontinence), reduced appetite, and decreased awareness
- May increase blood flow in the brain, may contribute to improved transmission of brain chemicals, and have a protective effect for nerve cells in the brain

Propentofylline

- Not licensed for use in dogs in North America, but is licensed in other countries
- Reported to inhibit platelet aggregation and clot (thrombus) formation and increase blood flow
- For use in the treatment of dullness and lethargy in old dogs
- May increase oxygen supply to the central nervous system without increasing glucose demand

General Comment Regarding Cats

- No drugs are approved by the FDA for the treatment of Cognitive Dysfunction Syndrome in cats; your veterinarian will discuss the risks and benefits of medical treatment
- **Selegiline** has been used and might be effective in cats with anxiety, decreased responsiveness to stimuli, nighttime activity and vocalization, and decreased grooming and appetite

Other Drugs

- Adrafinil or modafinil to improve alertness and exploration
- Anti-inflammatory medication, hormone replacement therapy, and ginkgo extract might be considered based on preliminary work in other species
- Medication used in humans for Alzheimer's disease might be considered in refractory cases; potential side effects include nausea, vomiting, diarrhea, and sleep-wake disturbances
- Anxiety-decreasing drugs (anxiolytics), such as buspirone; drugs to help induce sleep, such as benzodiazepines; or antidepressants, such as fluoxetine (but not in combination with selegiline) might be considered to treat anxiety and apathy
- Homeopathic and natural supplements might help to normalize sleep-wake cycles or reduce anxiety (e.g. DAP pheromone, melatonin, valerian, Bach's flower remedies)

FOLLOW-UP CARE

PATIENT MONITORING

- If a diet or medication is dispensed, then response to therapy should be evaluated after 30 to 60 days and the dose adjusted or treatment changed if the pet has insufficient improvement
- If the pet is stable, twice-yearly checkups are recommended for senior pets unless new problems arise before a reassessment is due

PREVENTIONS AND AVOIDANCE

- Maintaining a stimulating environment and as much activity as is practical for the pet's age and health may help to prevent or delay the onset of cognitive decline
- Early intervention is the best way to slow the progression of cognitive dysfunction

EXPECTED COURSE AND PROGNOSIS

- Diet and medication should control the clinical signs and slow progression in a majority of cases
- Cognitive decline may advance and other health problems are likely to arise despite medical intervention because of the pet's increasing age

KEY POINTS

- Realistic expectations must be understood; treatment is aimed at slowing the progression of the disease, not at curing the pet
- Signs are generally progressive
- Lifelong therapy is required
- Additional medications may be necessary if the pet has multiple health problems
- Any changes in the pet's health or behavior should be reported to your veterinarian immediately, as this may be due to cognitive dysfunction or the emergence of new health problems

