

# 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

