

House Soiling and Cognitive Dysfunction Syndrome

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A client's senior dog asks to go outside and then eliminates in the house upon its return indoors. Is there something I can do for the client and her pet other than just chalking up the behavior to old age?

For elderly pets to display signs of deteriorating memory and learning ability, such as house soiling in a previously house-trained pet, is relatively common. Identifying that a problem exists is the first step in making a diagnosis, as many owners incorrectly assume the behavior problems are an untreatable aspect of aging and do not discuss the changes with their

veterinarian. A client questionnaire can help screen geriatric patients for such problems; then it is necessary to determine whether the cause of the problem is behavioral or medical. For example, a dog may house soil because of a variety of medical problems that cause increased frequency of urination or defecation and decreased bowel or bladder control, or both. Dogs that

have sensory decline, pain, or reduced mobility may no longer signal their need to eliminate or may be reluctant or unable to access the elimination area.

A presumptive diagnosis of cognitive dysfunction syndrome (CDS) is made when clinical signs consistent with the condition are present and any underlying medical causes or primary behavior problems have been ruled out. The acronym DISHA has been used as a convenient way of remembering the signs of CDS: Disorientation; Interactions may be altered with family members or other pets; Sleep-wake cycle alterations; House soiling; and Activity changes, including an increase in restless or repetitive activity. Pets with concurrent medical and cognitive disorders may be better able to respond to behavior therapy after the medical and cognitive problems have been treated.

Cognitive Dysfunction Syndrome

CDS is a progressive neurodegenerative disorder of senior dogs that is characterized by gradual cognitive decline over a prolonged period (18 to 24 months or longer). The typical age of onset is 11 years or older in clinical cases but has been identified as early as 7 years in a laboratory setting.¹⁻⁴ The degree of impairment varies from individual to individual and clinical signs often go unnoticed by owners until they become more apparent later in the disease process.

As dogs age, many anatomical and functional changes take place in the brain that may play a role in CDS. The accumulation of beta-amyloid plaques is one such change. While its exact role in CDS is unknown, beta-amyloid is neurotoxic and can lead to compromised neuronal

function, degeneration of synapses, cell loss, and depletion of neurotransmitters. Disease severity is correlated with the amount of beta-amyloid accumulation.

Formation of reactive oxygen species (free radicals) is another source of damage. If the body's normal antioxidant defenses cannot respond sufficiently, as might be the case with increasing age, the excess free radicals lead to cell damage, dysfunction, mutation, neoplasia, and apoptosis. The brain is particularly susceptible to the effects of free radicals. Other factors, such as altered neurotransmitter and receptor function (e.g., altered cholinergic or catecholamine transmission) and cerebral vascular circulatory changes, may also be responsible for some of the clinical signs.

Treating Cognitive Dysfunction Syndrome

Although behavioral modification and environmental adjustments may be needed to control specific behavioral problems, the best method to slow or even counteract cognitive decline is through a combination of nutritional therapy, drugs, and mental enrichment. Maintaining a regular schedule of training, play sessions, and exercise as well as providing novel toys and chews for manipulation can help to keep the brain and body active. Even if the dog's mobility or ability to interact is reduced, alternative methods of play (e.g., long walks instead of running), alternative toys (e.g., less rigid chew toys), stimulating the pet with new toys, providing new areas to explore, or teaching a new trick (or at least reviewing old tricks) can be beneficial.

One newer treatment strategy involves supplementing the diet with antioxidants (such as vitamins E and C). The goal of this therapy is to improve antioxidant defenses and reduce the toxic effects of free radicals. A new senior diet (Hill's Prescription Diet b/d—Hill's Pet Nutrition, Inc., Topeka, KS) supplemented with antioxidants, mitochondrial cofactors, and essential fatty acids has been shown to improve

WHAT TO DO

- Determine whether problem is behavioral or medical; address medical problems first
- Maintain regular schedule of training, play sessions, and exercise
- Try an antioxidant diet
- Evaluate pharmacologic options, such as selegiline
- Consider other psychotropic drugs/natural supplements/ homeopathic remedies if other treatments are insufficient

performance in several cognitive tasks in older dogs as compared with older dogs on a non-supplemented diet. Improvement begins as early as 2 to 8 weeks after beginning therapy.⁵ The combination of antioxidants and mitochondrial cofactors may work synergistically to improve mitochondrial efficiency, which decreases damage related to free radical production.⁶

The Role of Drugs

In addition to diet, the drug selegiline may be used to treat CDS. Selegiline is a selective and irreversible inhibitor of monoamine oxidase B—the enzyme that catalyzes the breakdown of dopamine and, to a lesser extent, other catecholamines. Although the mechanisms by which selegiline elicits clinical improvement in dogs are not clearly understood, enhancement of dopamine and possibly other catecholamines in the cortex and hippocampus is presumed to be an important factor.⁷ Selegiline is currently the only drug licensed for treatment of CDS in North America. In Europe, nicergoline and propentofylline, which are purported to help improve cerebral blood flow and oxygenation, are also available.

Antidepressants (e.g., selective serotonin-reuptake inhibitors), anxiolytics (e.g., benzodiazepines or buspirone), natural supplements (e.g., valerian, melatonin), or homeopathic remedies and Bach's flower remedies (www.bachcentre.com) might also be considered for pets that show signs of increased irritability, decreased responsiveness to stimuli, fear, agitation, and altered sleep-wake cycles.

Tricyclic antidepressants and selective serotonin-reuptake inhibitors cannot be used in combination with selegiline.

Antiinflammatory drugs, hormone therapy, and natural supplements might also be considered in the treatment of pets with CDS. In fact, a supplement combining ginkgo biloba, phosphatidylserine, and vitamin E has recently been released for the treatment of CDS in Italy (Senilife--Innovet, Milan). There are no published clinical trials assessing the efficacy of these natural or herbal medications.

Once the cognitive dysfunction and medical problems are under control, behavior therapy may then need to be instituted to reestablish proper elimination location and schedule. The owner should go outdoors with the dog, ensuring elimination and immediately rewarding the pet. The dog may require increased supervision for a short time as well as more frequent and regular trips outdoors.

Conclusion

Thorough evaluation of elderly patients may uncover a variety of problems. Owners may believe that these undesirable behaviors are simply unfortunate by-products of old age. However, many of them, including CDS, can be treated. Cases such as the one described here illustrate how the practitioner can approach such patients with viable treatment options. ■

See Aids & Resources, back page, for references, further reading, and contacts.