Cognitive Dysfunction (Senility)

"Cognition" is the act of thinking and reasoning. For dogs and cats, cognitive behavior includes: spatial orientation (knowing where they are); problems with memory, learning, housetraining; and recognizing and reacting to human family members.

Pet owners have long been frustrated by age-related behavior changes. Progression of clinical signs is very gradual; most owners fail to recognize the early stages, because they come on so slowly. There are some of the most common symptoms of CD:

- Loss of house-training or failure to respond to their name or other familiar training cues. Working dogs might experience decline in performance.
- disorientation, confusion, staring, failure to recognize familiar people.
- Wandering aimlessly, pacing and whining, getting stuck in corners or behind furniture, and spending more time in unusual places.
- Can't find the door, get lost out in the yard.
- sleep disturbances: waking at the wrong time, sleeping unusually deeply, sleeping increased time during the day, failure to sleep and pacing at night.
- restlessness, barking, irritability, separation anxiety, new phobias, or new repetitive behaviors.
- Decreased general activity, less interaction with family and other pets, decreased desire for petting, no longer greets owners, lowered interest in favorite activities.
- panting, drooling, obsessive licking.

These changes are often written off as being due to normal aging, as most pets affected by CD are older than 11 years. In some pets, symptoms can be seen as young as 7 years – especially the giant breed dogs. A recent study at the University of California School of Veterinary Medicine demonstrates how common these observations are: out of 69 dogs participating, 32% of the 11-year old dogs were affected by this syndrome and 100% of the dogs 16 years of age older were affected.

Even though CD is common in older pets, it is still abnormal, and can often be treated. Other studies have shown that dogs affected by this syndrome show deposition of amyloid (a protein) in their brains in patterns very similar to the amyloid plaques found in the brains of human Alzheimer's patients. Other dogs have spaces in the brain tissue where it has atrophied and faded away.

In addition, cognitive dysfunction is often associated with the depletion of the chemical dopamine, a neurotransmitter.

Diagnosis

CD is often what we call a "diagnosis of exclusion." Basically, we need to rule out medical causes of brain dysfunction, and physical causes of pain and anxiety. Prescription drugs and supplements should be reviewed, to eliminate any that might be contributing. CD is what is mostly likely to be the remaining diagnosis. We usually recommend for older dogs with signs of CD routine bloodwork to include CBC (complete blood count) and general health profile, as well as urinalysis, complete neurologic exam, and measurement of blood pressure. Cats with CD should also have tests for feline leukemia, FIV and hyperthyroidism. Other tests might be indicated by any abnormal results we find on the initial health screen.

Treatments

While there is no cure for CD, numerous treatments may help improve cognitive dysfunction, including selegilene, dietary changes, and environmental enrichment.

Selegiline (L-Deprenyl®, Anipryl®)

Selegilene helps prolong dopamine activity. This may account for part of its efficacy in treating cognitive dysfunction. In addition, since dopamine breakdown results free radicals, Selegilene also helps reduce amounts of free radicals in the brain, which in turn damage brain tissue.

Of the 69 dogs mentioned in the above University of California study, approximately 76% showed improvement on selegilene after one month of therapy. Some dogs improved in the first few days or weeks; some dogs did not show improvement until the second month. Often dogs continued to improve during the first three months. Anecdotally, the earlier selegilene is started, the better the result.

When using selegilene to treat cognitive dysfunction, if no improvement is seen after the first month, your veterinarian may recommend doubling the dose for an additional month before deciding the drug may not be useful in that particular pet. For best results, Selegilene should be given first thing in the morning, especially for dogs who are experiencing abnormal sleep patterns.

Anti-anxiety Drugs

It is common for dogs to experience more anxiety as they get older, especially if they suffer from CD. If anxiety is a problem for you dog, numerous drugs can be prescribed that may help, including alprazolam, fluoxetine, trazadone and others. Some of these drugs must be given daily to have a positive effect, and others can be given as needed.

Dietary Changes

Some therapeutic diets contain antioxidants (mixed tocopherols, vitamin C, beta-carotene, carotenoids, and flavonoids), mitochondrial cofactors, and omega-3 fatty acids (EPA, DHA). These diets have been shown to improve the performance of a number of cognitive tasks, when compared to older dogs on a non-supplemented diet. Improvements have been seen as early as to 2 to 8 weeks after the onset of therapy. An example of such a diet is Hill's Prescription Diet B/D (Brain Diet), Purina Bright Mind, Purina Calming Care supplement, etc. These diets and supplements are available from our online pharmacy.

S-adenosylmethionine (SAMe) was found to be effective in improving clinical signs associated with CD in a double-blinded, placebo controlled trial. This supplement is available at pharmacies and health food stores. Your vet can prescribe the appropriate daily dose for your pet.

Some experimental evidence indicates that certain herbal supplements (e.g. curcumin, green tea catechins, resveratrol) may have therapeutic potential for CDS via their anti-oxidant activity and their ability to decrease amyloid in the brain. Other complementary therapies may calm the patient, reduce anxiety, and normalize the sleep-wake cycle but the evidence for efficacy of the following is largely anecdotal: melatonin, valerian root, dog-appeasing pheromone (DAP), phosphatidylserine, ginkgo biloba, L-theanine, etc.

Environmental Enrichment

Old dogs can learn new tricks! Use their intelligence to improve the quality of their lives. If your old dog's vision is still good, teach hand signals. This will serve as a back-up if hearing fails, which it often does. Hand signals are fun for dogs and are a more natural language for them than words.

Grooming (touch) will help your dog cope with vision and hearing loss. Your touch will help guide your dog.

In a laboratory study of older dogs over a 2-year period, environmental enrichment (e.g., housing with another dog, playing daily with toys) was shown to be effective tool for improving task learning. In fact, the combined effect of a special diet and enriched environment provided the greatest improvement in learning ability when compared to the dogs who did not have either dietary or environmental enrichment.

Drugs on the Horizon

Drugs that increase blood supply to the brain may have some benefit in CD:

a) Propentofylline (Karsivan®) is licensed for use in some European countries for treating dullness and lethargy in old dogs.
b) Nicergoline is available in the United Kingdom for age-related behavioral problems.
c) Adrafanil and modafinil may have some benefit in increasing alertness, memory, and learning but more research is needed.

With proper care, older pets can be helped to manage the cognitive changes they will encounter. Old age does not always have to be accepted as "nature taking its course." Often, CD can be managed and improved. Dogs with CDS seem to have a good chance of living a full lifespan, if supported by the veterinarian and the owner.

References:

Wendy Blount, DVM – PracticalVetMed.com
HomeCare Client Information Handouts
Linda Shell ACVIM (neurology) and Ann Katherman ACVIM (Neurology) – VIN Cyclopedia – *Cognitive Dysfunction*
Dewey CW: *Cognitive Dysfunction Syndrome: The Canine Version of Human Alzheimer's Disease*. ACVIM 2012
Reme CA, Dramard V, Kern L, et al: *Effect of S-adenosylmethionine tablets on the reduction of age-related mental decline in dogs: a double-blinded, placebo-controlled trial* . Vet Ther 2008 Vol 9 (2) pp. 69-82.