

Cognitive Dysfunction Syndrome:
Helping Dogs in their Golden Years
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- What is Canine Cognitive Dysfunction
 - Progressive, age-related behavioural condition associated with physical changes to brain neurochemistry and histopathology.
- What is old age?
 - Senior: “From the last 25% of estimated lifespan through end-of-life.”
 - AAHA Life Stages Guidelines 2019
- Overview
- What we are covering today...
 - Clinical Signs
 - Prevalence
 - Biological basis
 - Diagnosing
 - Treatment plan
- Clinical Signs
 - DISHAA
 - Disorientation / Confusion
 - Lost in the house
 - Hinge side of door
 - Staring into space or at walls
 - Less responsive to sensory stimuli (sight/sound)
 - Interactions
 - ↑ or ↓ interactions with family members or strangers
 - Changes in character of interactions
 - Sleep Habits
 - Difficulty falling asleep
 - Waking up during the night
 - Pacing/panting/ vocalization at night
- Housetraining, learning, cognition
 - Loss of previous housetraining
 - Difficulty performing previously known tasks
 - Difficulty learning new tasks
 - Loss of Cognitive Function
 - ↑ or ↓ in activity, play, exploration
 - ↑ aimless movement
 - ↑ repetitive behaviours
- Appearance of new anxieties
 - ↑ in preexisting or previously resolved anxiety disorders
 - ↑ reactivity to stimuli

- ↑ fear of new locations
- Cognitive dysfunction is a diagnosis of exclusion!

- Prevalence of CDS
 - Question:

What is the approximate prevalence of cognitive dysfunction signs in dogs aged 11-12 years old?

1. 10%
2. 20%
3. 30%
4. 40%

- Answer!

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- Prevalence

- 325 dogs over 9yo
- 22.5% prevalence
- Females and neutered dogs were significantly more affected than males and entire dogs
- Prevalence estimate: 14.2%
- Diagnosed by vet: 1.9%

Profoundly underdiagnosed

- Progressive

- Over the course of 12-18m
 - 48% dogs: 1 sign → 2+ signs
 - 22% dogs: 0 sign → 1 signs

Bain MJ, Hart BL, Cliff KD, et al. Predicting behavioral changes associated with age-related cognitive impairment in dogs. J Am Vet Med Assoc 2001;218:1792-1795.

- Biological Basis of CDS

- Decreased number of neurons
- Ventricular dilation
- Cortical atrophy
- Oxidative stress due to free radical
- Beta amyloid plaques
 - More diffuse than human
 - Hyperphosphorylated tau proteins
- Cognitive Dysfunction in Cats
- Vocalization

- Decreased grooming
- 11-14yo: 25% had ≥1 sign
- 15+yo: 50%
- Client Perspective
- May have had animal since puppy/kitten
- Slow onset of signs may not be recognized at first
 - “Getting Older!”
- Often: Frustration, anger, fear, guilt
- Euthanasia appointments
- Rule-Outs
- Medical Rule Outs

Cognitive Dysfunction is a Diagnosis of Exclusion

- Medical Rule Outs

DAMNIT-V

- Degenerative / Developmental
- Anomalous / Autoimmune
- Metabolic / Malformation
- Nutrition / Neoplasia
- Neoplasia
- Inflammatory
 - Infectious
 - Non-infectious
 - Immune
 - Iatrogenic
 - Inherited
 - Idiopathic
- Treatment Plan
 1. Pharmaceutical intervention
 2. Behavioural and environmental management
 3. Behaviour modification and training
- Pharmaceuticals – CDS
- Selegiline (0.5-1mg/kg/day)
 - Irreversible MAOI-B Inhibitor
 - MAO → ↓ Dopamine (B)
 - ↓ Serotonin (A)
 - ↓ Norepinephrine (A)
 - Selegiline → ↑ dopamine
 - FDA-Approved (Anipryl®)
 - Pharmaceuticals – CDS
- Selegiline
 - Do not combine with SSRIs, TCAs
 - Caution with serotonergic medications
 - Side effects

- Vomiting / Diarrhea
 - Inappetence
 - Lethargy
 - Restlessness
- Nutraceuticals – CDS
- Senilife
 - Antioxidants
 - Vitamin E , Vitamin C, carotenoids, flavonoids, long chain polyunsaturated fatty acids, Ginkgo biloba, and resveratrol (inc oxygenation)
 - Phosphatidylserine
 - Phospholipid associated with proteins that regulate neural membrane fluidity
 - Pyridoxine/vitamin B6
 - Cofactor in the synthesis of neurotransmitters, including serotonin
 - Nutraceuticals – CDS
- Novifit (no longer available)
 - SAM-e
 - Stabilizes cell membranes
 - Reduced levels assoc w/ Alscheimers
 - Denamarin® as an alternative?
 - Neutrix not available
- Pharmaceuticals – Adjunct
 - Benzodiazepine
 - Gabapentin
 - Trazodone
 - Clonidine (?)
- L-theonine
 - GABA Synthesis
- L-tryptophan
 - Serotonin precursor
- α - casozepine
 - Zylkene
 - Diets
- Purina Neurocare
 - 6.5% Medium Chain Triglycerides
- Hills b/d
 - Omega-3 Fatty Acids
- Purina Bright Minds
 - 5.5% Medium Chain Triglycerides
 - Environmental / Behavioural Management
- Environmental/Physical Management
 - Comfortable bed(s)
 - Non-slippery walking surface

- Mobility assistance
- Behavioural Management
 - Prevent access to those things that cause fear or distress
 - May need to prevent access to parts of the house
 - Safety precautions if needed
- Behaviour Modification
- Question:
 - Can old dogs learn new tricks (is it worth trying behaviour modification)?
 1. No, old dogs are unable to learn new skills
 2. Yes, old dogs can still learn new skills
 - Answer!
 - Can old dogs learn new tricks (is it worth trying behaviour modification)?
 1. No, old dogs are unable to learn new skills
 - 2. Yes, old dogs can still learn new skills**
- Behaviour Modification: Relationship
- Avoid verbal/physical corrections
 - Scolding / reprimands
 - Leash corrections
 - Physical manipulation
 - Alpha rolls
 - Muzzle grabs
 - (What about pain?)
- Behaviour Modification: Relationship
- Reinforce desired behaviours
 - This likely won't fully resolve the clinical signs but can help reduce them.
 - Pacing → Reinforce calm behaviour
 - House soiling → Reinforce outdoor elimination
- Behaviour Modification: Enrichment
- Food puzzle toys
- Chewing toys
 - Behaviour Modification: Enrichment
- Enrichment
 - Food/oral
 - Social
 - Physical
 - May need to learn
 - Behaviour Modification: Enrichment
 - Teaching tricks
 - Calm social interactions
 - Age- and ability-appropriate exercise
 - Enrichment during the day and late evening, especially for nighttime restlessness
- Behaviour Modification: DS/CC

- Desensitization and counter-conditioning
 - Exposing to fear-provoking stimulus but in a way that does not trigger a fear or stress response.
- For fears / phobias / aggression
 - Veterinary visits
 - Sounds
 - Handling by clients
 - Guarding of items
- Behaviour Modification Continued Education
 - Lifelong training may result in better cognitive abilities in dogs when they are older
 - 89 dogs > 8yo w/ and w/o CDS
 - Surveyed before and at end of class
 - Attending dogs: No change in CDS score at 3 vs 12 months
 - Non-attending dogs: Significant increase in CDS scores (progression of CDS)
- Conclusions
 - Cognitive Dysfunction is a diagnosis of exclusion
 - It can be treated to promote a better QOL for patients and clients
 - Often one part of multiple conditions that need to be treated.
- Resources
 - Video on Demand
 - www.synergybehaviour.com/videos-on-demand/
- Questions?
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