

Your Guide to

Understanding and Managing Canine Cognitive Dysfunction

AQUACANINE
HYDRO & VETERINARY PHYSIO

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Contents

Why dogs develop CCD and what happens in their brain **4**

Signs and symptoms of CCD 5

Diagnosing CCD 7

CCD in conjunction with osteoarthritis 7

Managing CCD **8**

Environmental modifications and mental stimulation **9**

Flooring and slipping 9

Stairways 12

Doorways 13

Furniture 14

Toileting 15

Social interaction 16

Avoid change 17

Implement a routine and predictability 18

Games for mental stimulation 19

Nutritional support **22**

One: Reduce inflammation in the brain 23

Two: Provide an alternative source of energy 23

Three: Reduce free radicals and oxidative stress 24

Four: Clear out the waste 24

Pharmacological support and treatment **25**

Additional strategies of support **26**

You are not alone! Get in touch **27**

The DISHAA tool **28**

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Why dogs develop CCD and what happens in their brain

Cognitive dysfunction occurs as a result of a series of changes that take place in the brain as the brain ages.

The brain is very sensitive to degeneration, which can be triggered by oxidative stress and a lack of certain nutrients in the diet. We see many changes in the canine brain that are similar to human Alzheimer's disease. These include:

- oxidative stress and damage to cells in the brain;
- a reduction in the number of neurons;
- deterioration in the neurons' ability to transmit signals quickly and without interference;
- a build-up of waste products in the brain that interfere with healthy function;
- a reduced ability to metabolise glucose, resulting in a lack of usable energy;
- an increase in inflammatory compounds in the brain, resulting in increased inflammation;
- a reduction in the size of blood vessels in the brain, which reduces blood flow to the brain.

Underlying diseases such as chronic inflammation, diabetes, hypothyroidism, dental disease, chronic liver or kidney disease can all increase the risk of developing CCD.

Environmental factors that also increase the risk of developing CCD include chronic stress and anxiety, poor nutrition, and exposure to environmental toxins such as heavy metals and pesticides.

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Signs and symptoms of CCD

Common symptoms include

- **disorientation and confusion** in familiar surroundings – your dog may become stuck, get lost, or fail to recognise people;
- changes in **social interactions**, such as an increase in fearful behaviour or irritability, or a lack of interest in social interactions, even with well-known dogs and people;
- changes in **sleeping patterns**, which lead to an increased wakefulness or restlessness at night, with more sleeping or lethargy during the day;
- changes in **normal activity**, such as restlessness, a decrease in play or exploration, and the appearance of repetitive behaviours like pacing;
- an increase in **anxiety**, including separation anxiety, fear of new environments, and a heightened sensitivity to light, colour, smells and sounds;
- **movement disorders** and changes such as an increase in wobbliness, tremors, a loss of balance or an increase in falling. This can predispose your dog to secondary injuries and will increase their anxiety;
- a regression in **housetraining**, resulting in occasional soiling.

All of the above may be accompanied by loss of hearing, eyesight or smell.

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One symptom will usually develop and progress first, and all of them may be signs of other conditions, making diagnosis difficult. It is important to remember that none of these changes are intentional on the part of your dog, and they cannot control their behaviour.
Reprimanding or punishing our dogs in these situations can make the situation worse, simply increasing their anxiety and disorientation.

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Diagnosing CCD

A comprehensive diagnosis requires a clinical examination that includes patient history, the use of the canine dementia scale (CADES) questionnaire or DISHAA questionnaire, a pain assessment, and blood serum tests.
It is important to rule out or identify any concurrent conditions such as arthritis.

> We have included the DISHAA tool at the end of this PDF for you to fill out. You can use it at regular intervals to assess your dog's progression and response to treatment interventions.

CCD in conjunction with osteoarthritis

Osteoarthritis affects one in four dogs over the age of eight. In elderly dogs, many of the signs of arthritis can look similar to the signs of CCD, including changes to their normal way of moving and in their social interactions. These two conditions will often occur alongside one another, and each one can complicate the management of the other. For this reason, it is really important to identify whether both conditions are present, and the extent to which each one is causing the observable symptoms. This will enable your veterinarian and rehabilitation team to develop a treatment approach that has a greater chance of successfully managing the symptoms and, hopefully, slowing down the degeneration of each condition.

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Managing CCD

In managing CCD we want to target four distinct areas:

1 environmental modifications	2 mental stimulation and support
3 nutritional support	4 pharmacological support and treatment

Improvements in each of these four areas can make a huge difference to your dog, and when we combine them, we hope to be able to make your life and your dog's life much easier.

As you read through the tips below, you may start to feel overwhelmed – so many aspects to think about, so many changes recommended! If you feel this way, the best approach is to implement just one small tip from each area, and slowly build up from there. This way, you are assured of at least touching upon each of the four areas.



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Environmental modifications and mental stimulation

For dogs suffering from CCD and arthritis, simple adaptations to our home environment can help to reduce anxiety, prevent injuries, and slow the progression of their disease.

This process should start with an intentional observation of your dog within your home environment. Take note of how they navigate through the space and whether they seem anxious or afraid at any point. Can you identify any areas that might increase the risk of injury, such as doorways where they tend to turn too quickly, floors where they slip, obstacles they tend to trip over or get stuck under, or corners that they get stuck in? Once you have identified some of these areas in your home, you can start to make simple changes that protect your dog from injury, anxiety and confusion.

Let's discuss some of the most common environmental challenges and how each may be overcome.

Flooring and slipping

Our most common flooring types today are also those that cause endless difficulties to our dogs. These include laminated, tiled and wooden floors. These surfaces provide little or no traction for the dog, and can cause them to slip.

Repetitive slipping on floors can inflame painful joints and cause injury to the soft tissues that surround those joints, further worsening arthritis or causing muscle tears and strains.

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If you are not sure whether your floors bother your dog, watch how they walk in the house – are they hesitant or afraid, is there a change in their posture on slippery floors, such as a more crouched and stilted gait? Have you seen them slip on the floor before, and if so, where? You can reduce slipping by paying attention to both aspects.

Two aspects determine whether your dog slips on the floor – the flooring material itself and their paws.

Strategies for preventing slipping

Trim excess fur between the paw pads: The hair between the paw pads can interfere with the ground contact of the paw. When hair gets between the paw pads and the floor, it is like wearing a slippery sock, especially in poodles and dogs with long coats.

Trim long nails: Your dog's nails should be just above the ground when they are standing. Any longer, and they will interfere with the way the dog walks, making slippery floors especially challenging.

Put down mats or rugs: In smaller areas of tiled or wooden floors, add mats to provide a non-slip surface. Also add a mat in areas where your dog likes to lie down, or beneath dog beds in the house. Make sure that at any point where your dog needs to stand up, they can put their paws on a non-slip surface. Add a non-slip mat at feeding and water bowls to prevent slipping while eating, anywhere your dog needs to round corners, or where they need to navigate between furniture or climb on and off furniture.

Nonslip flooring tape: Self-adhesive non-slip flooring tape can be a simple and effective solution for steps or on a ramp. These are available as clear tape from many hardware stores, making them an easy option that will not change the aesthetics of your home.

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Products to prevent slipping

If slippage continues with all of the above modifications, or if you are unable to make the modifications required, consider purchasing one of the following products.

Toe Grips

These are small rings that fit over the dog's nails. They increase the grip zone and can effectively help dogs to gain better traction in a very natural way. These rings don't need to be removed, and can be replaced as they fall off or on a monthly basis.

Sticky Paws

These are like sticky socks that are placed over your dog's paws. They are thin and easy to walk in, and are a great tool for dogs that have degenerative neurological conditions. The disadvantage of these is that dogs cannot keep them on for extended periods of time – they need to be removed during periods of inactivity to ensure that the paws can breathe and do not swell.

PawFriction

This product involves gluing a pulverised, non-toxic rubber film onto the pads of the paws, creating a high-friction layer on the bottom of the paw pad, which works very well. This is a very good option for dogs who don't like their paws handled, making the first two options difficult to use. PawFriction will need to be reapplied every two weeks or so.

If you'd like further advice on products and tools you can use in your home, please contact us for a consultation – we will help you find the best products for you and your pet.

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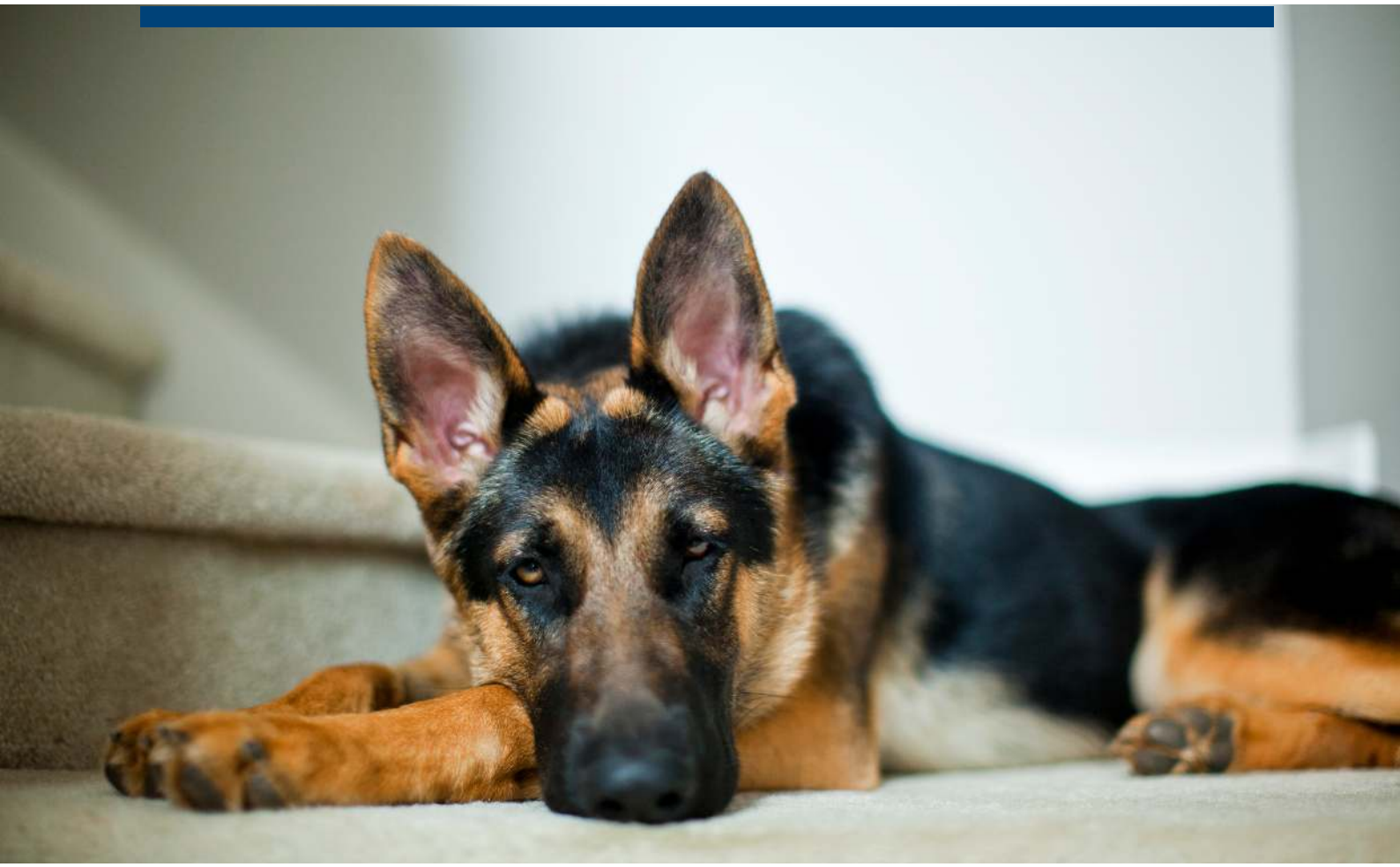
Stairways



Stairways should be avoided or access controlled if they cannot be avoided. If stairways are a must, they should have a non-slip surface – for wooden, laminated or tiled stairways, add non-slip flooring tape to each step. This is important, even if you are using some of the other options shared above, to prevent slipping. Small dogs should be carried up and down stairs, while large dogs should be supported as they navigate the stairway with a harness such as the Help 'Em Up harness or an alternative.

Control access to the stairway with a baby gate, and minimise the amount of times your dog needs to travel up and down the stairs as much as possible.

Navigating stairs should always be slow, controlled, and supported.

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Doorways



Doorways can pose a challenge when they require turning a sharp corner over a slippery surface, or if they are narrow, especially when your dog wants to move through them at speed. Consider when your dog rushes to get outside, or to the front door when the doorbell rings – which doorways are the biggest challenge?

Thresholds that include a step up or down across different indoor and outdoor surfaces can be just as challenging. Ensure that surfaces are non-slip, and that height differences are minimised as much as possible with an in-between step or a ramp.

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Furniture



Many of us love having our dogs lie on our bed or snuggle on the couch with us – and they love it, too. Sharing a cosy space is an important part of the bond we enjoy with our dogs, so we want keep up this aspect for as long as possible. However, dogs with arthritis or CCD should not be allowed to jump on and off furniture, as the impact of jumping can cause additional damage to their joints.

Furniture ramps or steps are easily accessible and should be used in these cases. To be really proactive, teach smaller dogs from a young age not to jump on and off furniture, but to be picked up or to use their access ramps instead.

Access to furniture should be restricted when your dog is alone. As they start to struggle more to get on and off furniture, try to provide them with assistance to prevent falls, slipping and injury.

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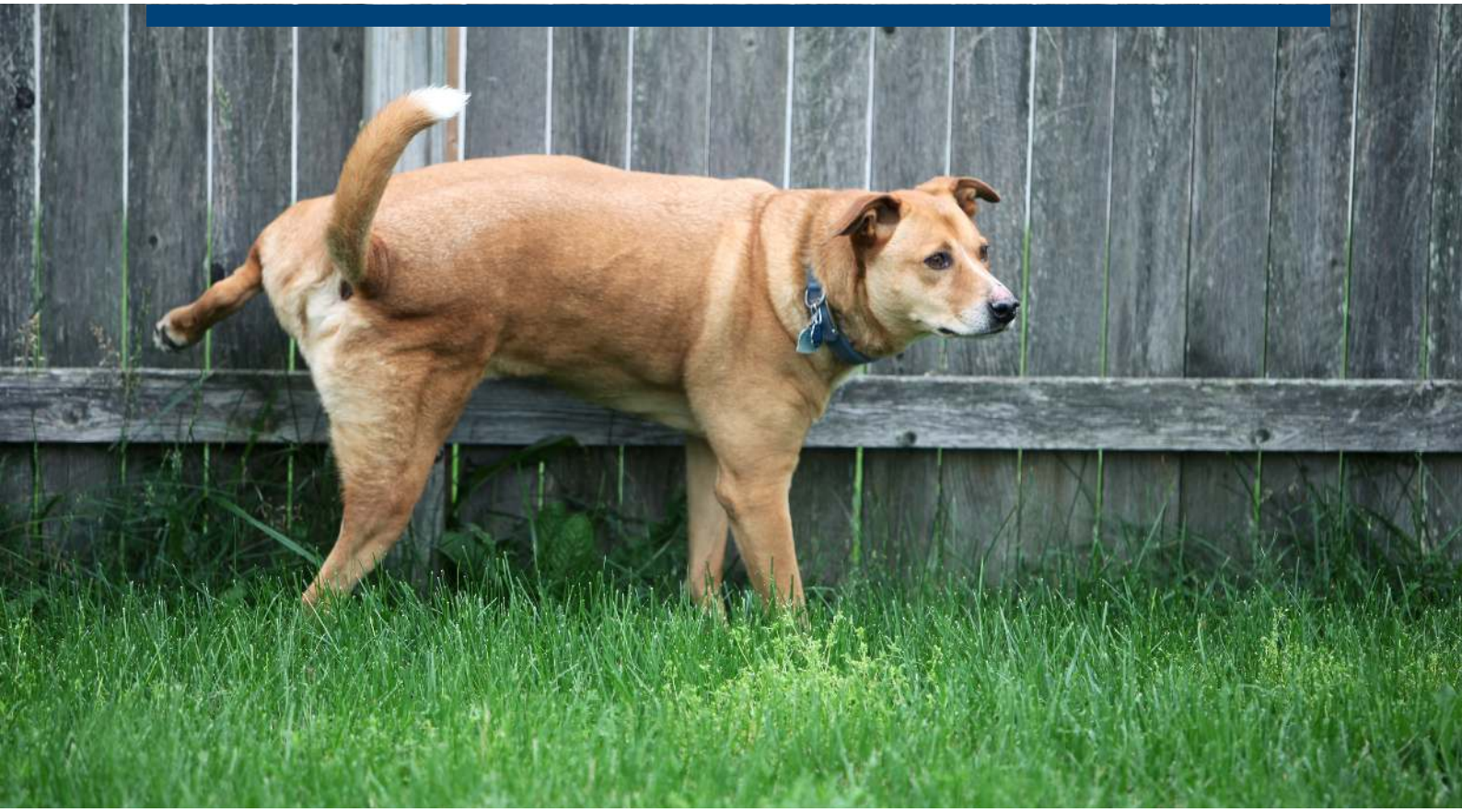
Toileting



Many factors about toileting need to be considered, some of which are specific to your dog's condition. As dogs age or their CCD progresses, they may experience increasing stress or discomfort around this. You can minimise their anxiety by ensuring that they have easy and direct access to a toileting area that provides good traction, allowing them to posture themselves as comfortably and easily as possible.

Adaptation could include ensuring that there is as short a pathway as possible from their bed to the outdoors, with no steps or sharp corners on the way that makes navigation difficult or can trigger confusion and anxiety. The outside area can have grass or sand, providing a soft surface with maximum traction.

At night, you can provide your dog with additional opportunities to toilet before bedtime and early in the mornings to minimise nighttime interruptions or accidents.

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Social interaction

Social interaction is hugely important for your dog, but if they have either CCD or arthritis, normal interactions may become difficult. You may find that they become anxious and afraid, and potentially more reactive around other dogs.

You can help them to continue to interact with other dogs in the home and outside the home in a positive way, without isolating them completely. Here are two things you can do:

1

Feed them separately

Feeding time can be stressful in multi-dog households. Offer your compromised dog food in a separate room or space, away from other dogs so that they can eat at their own pace, without the feeling of competition or resource guarding.

2

Protect play times

If you have dogs of different ages, their energy levels and play styles may be dramatically different. Your young dog will probably want to play roughly, while the older dog is unable to do so. Try to meet each of their play needs separately, instead of requiring that they play only with one another. Engage in each of their favourite games separately. This will allow your younger dog/s to expend their playful energy without aggravating your older dog. Supervise play times and help them to regulate around one another if they have trouble doing so on their own.

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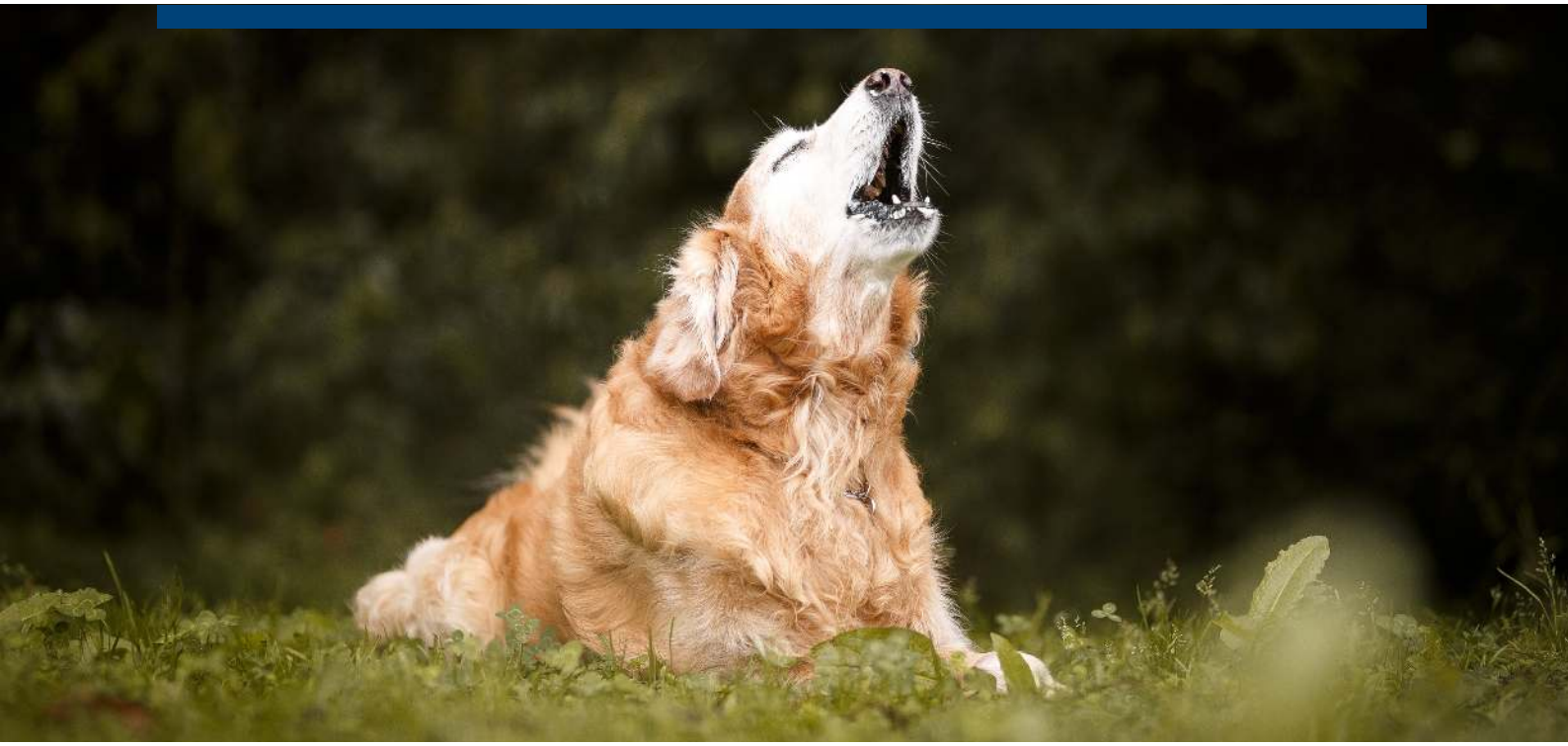
Avoid change



For CCD dogs, changes in their environment and routine can trigger confusion and anxiety, especially if they are also experiencing a loss of sight, hearing or smell. You will want to maintain a home environment and routine that are as consistent and predictable as possible. Remember, this condition in dogs is like dementia in older adults. We would not rush or become impatient with an adult with dementia, being ever cognisant of their limitations. We need to adopt the same attitude with our CCD pet.

When changes do need to be made, try to implement them slowly. Give your dog the time and support they need to identify a change and gradually adapt to it before you introduce the next one. This includes moving furniture around the house, changing the décor in the home, or moving to a new home. Of course, moving to a new home can be a positive experience for your dog, especially if the move provides them with a safer environment that is easier to navigate and manage. Take things slowly, be intentional and pay attention to where your dog is, mentally and emotionally, so that you can provide them with the support they need.

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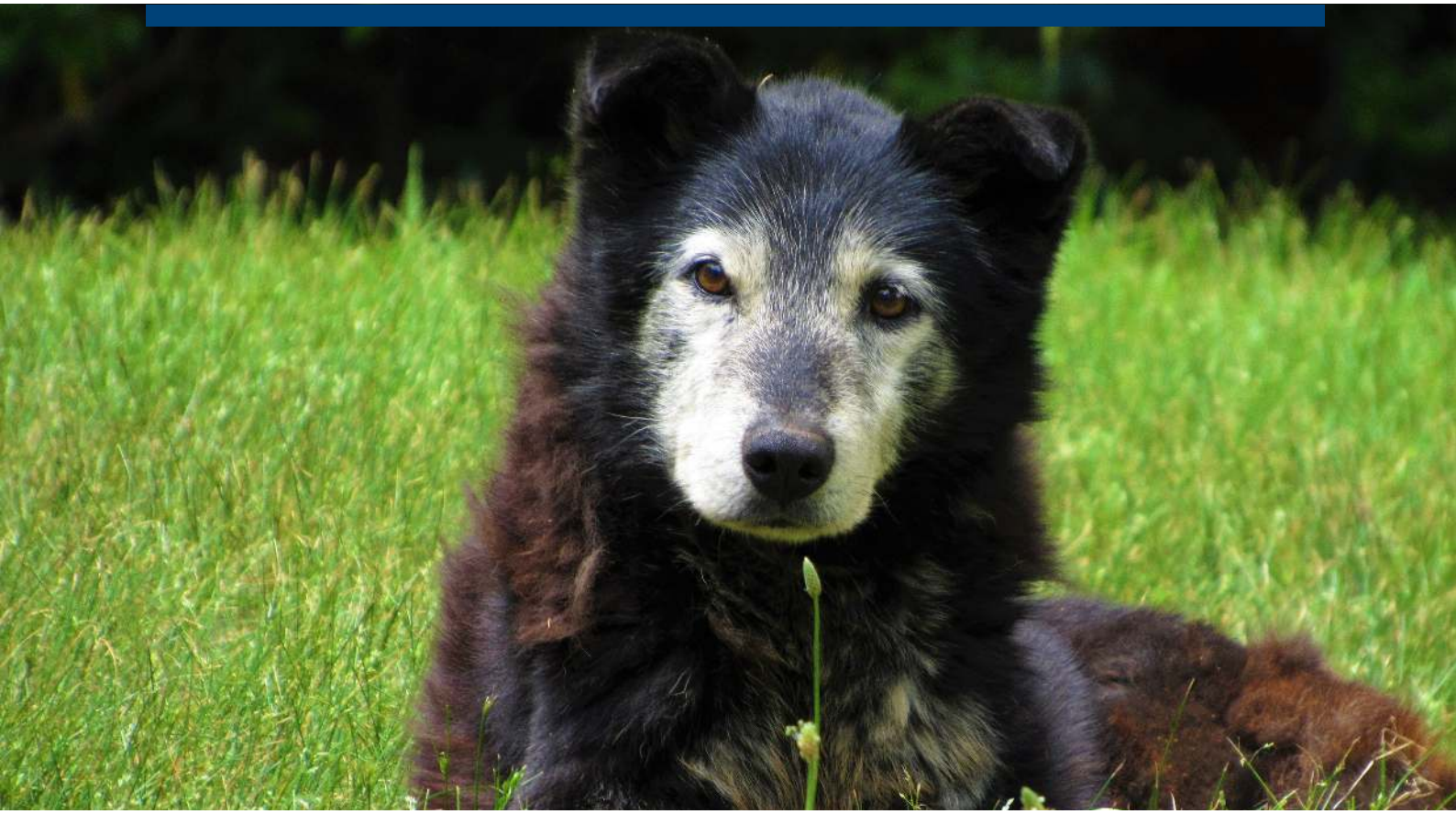
Implement a routine and predictability



As with adults suffering dementia, routine can be highly beneficial for dogs with CCD, helping to reduce anxiety and fear. Predictability in their day-to-day lives will help them to transition mentally and emotionally throughout the day. A bedtime routine can improve their sleep cycle. A predictable routine of daily exercise or walks can reduce their anxiety around these activities. Any outside appointments like rehabilitation or vet check-ups should be kept to the same time of day every time, with a repeatable lead-up of events to help them to mentally prepare for what lies ahead.

The other side of the argument when it comes to change is that variety and novelty can stimulate the mind and help improve mental capacity and function. Therefore, once a basic routine is in place, we want to add in a little variety and mental stimulation to the mix. We should do this gently, without causing an increase in anxiety or fear, which are natural responses to unpredictability or the unknown.

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Here are some ways that you can balance predictability and routine with some novelty and mental stimulation:

Predictable mealtimes

Keep mealtimes at the same time every day, and in the same place at every meal. You can mentally prepare your dog for mealtimes by verbally letting them know you are getting their food ready, and by preparing their feeding station – which is like laying the table for the family, letting them know that food is coming.

You can provide **mental stimulation** by including a new food to meals occasionally. Pay attention to how your dog responds to the novel food – if it causes confusion or anxiety, slow down the pace of change. Start with a small quantity of the new food and slowly increase how much of it is in their bowl with each meal. Stick to the same new food for three to five days, depending on response, and then move onto some other new food. This is a simple yet surprisingly effective way to keep your dog interested and curious.

Predictable daily walks

Walks should occur at the same time every day. Again, let your dog mentally prepare for their walk by verbally letting them know that it's time for a walk, putting on your walking shoes, and putting on their harness – all in the same order daily. This little routine of preparation lets them know what is coming next, creating predictability and certainty in their minds. Depending on your dog and how seriously they are affected, you will either want to keep the walking route the same every day, or include slight variations in the route. Bring mental stimulation and novelty into the walk by including a little training, if possible, such as heel work, 'sit', 'stand' and 'stay'. Work on cues and exercises that are easy for your dog to perform.



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Predictable vet checks or rehab appointments

Visits to the vet or rehabilitation therapist should be made at the same time of day and day of the week, where possible, to provide predictability.

Your preparation routine might include letting your dog know verbally that today is therapy day, preparing the car for the ride by putting their bed in the back of the car, and adapting the car for their journey (putting down seats, adding a seat hammock, etc.). These simple activities are important cues for your dog. Instead of seeing them as unimportant and quick things, done by you, see them as part of the process. Do them slowly and deliberately, and let your dog see you doing them, chatting to your dog as you do so, so that they know something is about to happen that includes them.

Games for mental stimulation

While dogs with CCD will have a reduced capacity to learn new things, stimulating learning can help to slow down the degeneration of their mind. There are many mind games and simple training exercises that we can practice with our CCD dogs to help them to keep learning and engaging with their environments and us, and to hopefully slow down the degeneration that occurs as we support them through diet and more.



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Here are some simple ways that you can incorporate mind games and training into your daily lives and routines.

Practice and retrain what they already know. Do you remember the training you did with your dog when they were a puppy? Revisit those training activities and start again. Retrain a sit, stand and stay and practise these simple behaviours with them regularly. You can add variety and interest to your walks with your dog by engaging them, training them and practising these behaviours with them throughout your walk.

Food and food puzzles. Mealtimes can offer a wonderful opportunity for stimulation for your dog. Meals can be split into several smaller meals through the course of the day, presented in a food puzzle, a snuffle mat, a slow-release food toy, or as part of a simple training exercise. You could vary the ways in which you feed your dog – for instance, food portions can be frozen in ice balls or blocks during hot weather, requiring your dog to slowly lick the food out of the ice. There are many home-made puzzle options available, such as an egg carton or muffin tray containing small portions of food, with tennis balls blocking the openings. Your dog will have to figure out how to remove the blockage and reach the food, and will find the stimulation enjoyable. There are also many food puzzles on the market that range from easy to challenging. Food puzzles may become a favourite in your household!

Play times. Stimulate your dog during play times with their favourite games from the past, as well as new games. You can teach them simple games that involve their sense of smell, such as finding a treat placed under a cup – place two cups upside down on a table, with a tasty treat under one of them. Can they identify where the treat is by using their sense of smell? You can teach them simple targeting exercises, such as touching a target with their nose or paw when you cue them in exchange for a treat. Targeting exercises can be a lot of fun to teach, and can be adapted and progressed to include strengthening and proprioceptive exercises that can help to improve your dogs physical function as well.

For more great game ideas and how to teach them, please get in touch with us for a consultation – we will help you to develop games and teaching strategies that will work for your dog!

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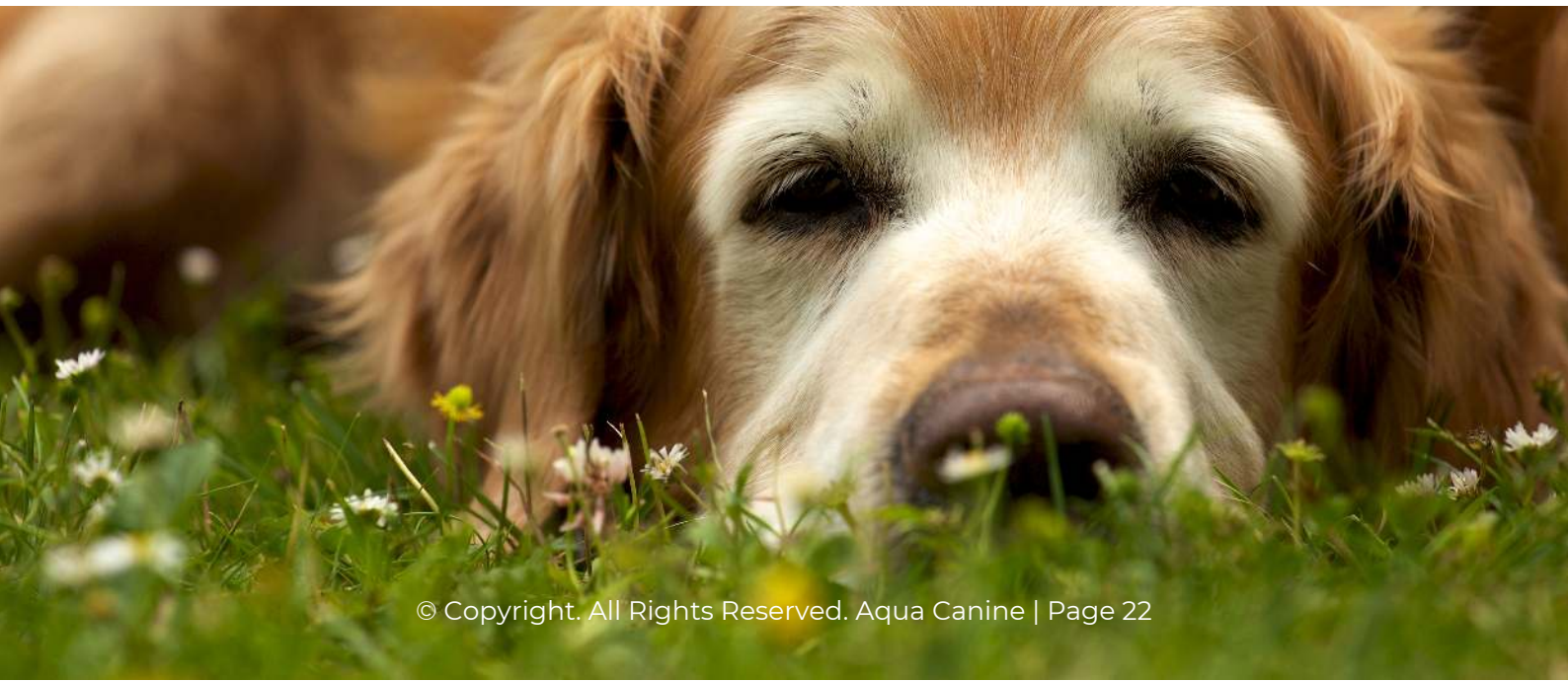
Nutritional support

Nutritional support targets four areas:

1 reduce inflammation in the brain	2 provide the brain with alternative fuel sources
3 reduce free radicals and oxidative stress damaging the brain	4 clear out accumulating waste products in the brain

Incorporating dietary changes can be one of the most effective ways to slow down the progression of CCD and should form a part of its management. While we hope that the information below will guide you to better understand how we can support the brain through nutrition, we strongly advise that you discuss dietary changes with a veterinary nutritionist. CCD often occurs in conjunction with other conditions such as liver and kidney disease, and osteoarthritis. Medications for these conditions, as well as the specific nutritional requirements for each of these conditions can become complex as they interact with one another. Consulting with and working with a nutritionist will allow you to develop the best possible nutritional support strategy for your dog.



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1 Reduce inflammation in the brain

Introduce anti-inflammatory foods into the diet such as bone broth, berries, colourful veggies, egg yolk, papaya, fish, carrots and orange or yellow peppers. Lean meats and wild-caught fish are a phenomenal source of Omega 3s. Fresh, raw and whole foods are best when we are working to limit inflammation. Foods that have a high content of Omega 3 fatty acids in the form of EPA and DHA are essential for reducing inflammation.

If your dog has eaten a diet of kibble throughout their lives, making a transition to a raw food diet can be challenging. Instead of switching in one go, add small amounts of whole foods to their familiar diet to help them adjust. Blending, juicing or mincing the ingredients can also make them easier for your dog to ingest if they are finding the additions strange.



2 Provide an alternative source of energy

Glucose is the body's normal form of energy, but it takes a lot of work to convert it into a useable form. Ketones can provide an alternative, easy to metabolise form of energy to the brain.

B Vitamins are involved in every step of energy metabolism and should also be added to the diet. They are available in foods like sardines, herring, salmon, tuna and organ meats.

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3 Reduce free radicals and oxidative stress

Free radicals are a normal byproduct of metabolism, and are removed from the body by antioxidants. When they are not removed, they start to build up and can damage the cells in the brain.

Selenium and Vitamins E and C are all antioxidants that will add value to the diet. You'll find them in foods such as spinach, carrots and berries. It is beneficial to supplement Vitamin E and selenium in tablet form, as these can be difficult to get in high enough quantities from food alone.



4 Clear out the waste

Lastly, we want to support the body in removing waste products from the brain. We can do this by supplementing turmeric extract, green tea extract, black pepper extract, or lion's mane mushrooms into the diet.

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Pharmacological support and treatment

There are many pharmacological interventions that help to alleviate the symptoms that your dog may be experiencing because of CCD, as well as treatments that reduce inflammation and pain in dogs suffering from arthritis.

Please consult with your veterinarian for the best pharmaceutical support for your individual dog.

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Additional strategies of support

Additional treatment strategies such as transcranial Photobiomodulation have shown promise in early research studies as effective strategies for reducing the symptoms of canine cognitive dysfunction. Early studies show that treatment 3x a week for one month, followed by 2x treatments a week for another month can improve DISHAA scores by 40%. DISHAA scores evaluate their disorientation, social interaction, sleep wake cycles, housetraining, activity and anxiety levels.

While these studies are very early levels of evidence, pursuing this treatment approach for your dog may be worthwhile. Please speak to your rehabilitation therapist and veterinarian about including transcranial Photobiomodulation into your dogs treatment programme.



Fig. 1. Illustration depicting tPBMT delivery to a dog's brain.

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You are not alone!
Get in touch

Our dogs, like our children or elderly parents, need our support in every season of their lives. Our dogs go all out for us and we, as their human guardians, have the opportunity to reciprocate with the same level of love and devotion. The interventions shared in this document can make a huge difference to your CCD dog's quality of life as they age.

If you feel you need assistance and a partner on this journey, we'd love to help. We can do a home assessment, identifying the environmental, nutritional and mental stimulation aspects that will hugely support any pharmacological treatments recommended by your vet. The best treatment for a condition such as for CCD will always be comprehensive and multi-pronged, with each aspect supporting and multiplying the benefits of each other aspect.

Book an appointment

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The DISHAA tool

The DISHAA tool can be used to monitor the progression of symptoms in your dog, and to help you identify which areas are the most challenging for your individual dog. DISHAA stands for **D**isorientation, **I**nteractions, **S**leep/wake cycle, **H**ousetraining, learning and memory, **A**ctivity and **A**nxiety.

You can use this tool once to help you understand how your dog is affected, or you can use it regularly to monitor your dog's progress and to help you continue to adjust and improve your interventions.

Your vet or rehabilitation therapist may want to use this tool with you to help you monitor treatment and progression. If you are using it, feel free to share it with them as well.

Date:
Owner's name:
Pet's name:
Age:
Breed:
Weight:
Current diet:
Current medications and dosage:

Identify signs that have arisen or progressed since your dog was eight years of age.

Score as 0 = none, 1 = mild, 2 = moderate, 3 = severe

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	Score
Disorientation	
Gets stuck, difficulty getting around objects, goes to hinge side of door	
Stares blankly at walls, floor, or into space	
Does not recognise familiar people/familiar pets	
Gets lost in home or yard	
Less reactive to visual (sights) or auditory (sounds) stimuli	
Social interactions	
More irritable/fearful/aggressive with visitors, family or other animals	
Decreased interest in approaching, greeting or affection/petting	
Sleep/wake cycle	
Pacing/restless/sleeps less/waking at night	
Vocalisation at night	
Housetraining, learning and memory	
Less able to learn new tasks or respond to previously learned commands/name/work	
Indoor soiling of urine ___ or stool ___ / decreased signalling to go out	
Difficulty getting dog's attention/increased distraction/ decreased focus	
Activity	
Decrease in exploration or play with toys, family members, other pets	
Increased activity including aimless pacing or wandering	
Repetitive behaviours, e.g., circling ___ chewing ___ licking ___ stargazing ___	
Anxiety	
Increased anxiety when separated from owners	
More reactive/fearful to visual (sights) or auditory (sounds) stimuli	
Increased fear of places/locations (e.g., new environments/going outdoors)	
Total:	

A score of 4–15 is consistent with mild CDS.
A score of 16–33 is consistent with moderate CDS.
A score of >33 is consistent with severe CDS.

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Committed to providing the highest standard of care, respect, and dignity for every patient. We work closely with your primary and specialist veterinary teams to ensure a seamless, professional approach to your dog's treatment and ongoing wellbeing.

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