

Walk the Dog

Hanne Grice

In association with Dog Listener

As a dog grows older both mental and physical changes take place; an outline of the changes that take place and the actions dog owners can take to ensure our dog's continuing comfort as well as mental and physical stimulation

The life span of a dog changes depending on breeds. Typically the larger the dog, the shorter the life span. For example, the Irish Wolfhound is the tallest breed and has a life expectancy of around seven years. However, a Jack Russell typically lives to around fourteen years. The degree to physical and mental ageing will differ depending on the stimulation that dog has had over the years and continues to receive.¹ Therefore, the ageing process has similar effects on a dog as it does a human. As we grow older we begin to show signs of ageing, yet how the ageing process effects a dog can differ from one to the next, as its environment and way in which the dog has been cared for, will have an impact on this. As the dog grows older changes take place both mentally and physically from the effectiveness of its senses, joints and organs to the efficiency of its nervous system. Consequently, old age can affect the dog's behaviour, thinking and personality.

The **physical signs** of ageing in the dog are outwardly obvious in some cases; grey hairs may start to appear and the dog begins to move more slowly, grunting as he rises or lies down due to the onset of arthritis, a painful inflammation and stiffness of the joints.² Typical symptoms of arthritis include slowed movements, limping, or the dog reacts to being touched around certain joints. Furthermore, dogs suffering from any discomfort or pain such as in the hip area, will also alter the way in which they stand or walk. Many dogs develop mobility problems and although all breeds and sizes of dogs are susceptible to this, typically the effect is much greater on larger dogs such as Saint Bernard's because of the weight they have to carry. This loss of mobility due to changes in the dog's joints and muscles can cause the dog to seemingly change in its temperament. The reduced mobility and existence of pain can make the older dog irritable particularly if disturbed or touched in the sensitive area, as the natural response for the dog to move away from a stressful situation is no longer an option.³

Ageing can also affect the dog's organs, digestion, heart and lungs as they become less efficient and some dogs will even suffer from incontinence. For others, they begin to lose one or more of its senses; hearing, sight and even taste can be affected due to the onslaught of tooth decay and gum disease. Most dogs

¹ Book: Fogle, Bruce (1990) *The Dog's Mind*, Pelham Books, chapter 13, page 181.

² Book: Edited by Hawker, Sara and Waite (2007) *Maurice*, Oxford Paperback Dictionary & Thesaurus, Oxford University Press page 46.

³ Book: Coren, Stanley (2005) *How Dog's Think*, Pocket Books, chapter 'How old is your dog', page 352.

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between the age of twelve to fifteen years will show some evidence of hearing loss. The loss of hearing is fairly common in older dogs as little bones in the ear (the ossicles) that transmit sound from the eardrum to the inner ear begin to grind at their joints and lose their mobility in a similar way to arthritis. Additionally, in the inner ear (the cochlea) there are tiny hair cells that flex to register sounds but over the years repeated flexing causes a weakness in the connective tissue and the cells can break.

These hair cells do not regenerate, so for every hair cell that is damaged, the dog loses a bit of its hearing ability. Hair cell damage is commonly caused in dogs that have been exposed to gun shots

in hunting or for dogs living in the city as they have been exposed to high levels of urban noise. As a dog's hearing begins to impair, like humans, they will become less sensitive to higher pitched notes. A dog losing its ability to hear will often appear to sleep through the sounds of a door bell ringing, loud bangs or may awake with a growl or snap if touched while sleeping.⁴

As a dog grows old, it may begin to lose its clarity of sight. This is caused by a loss of retinal cells and elasticity in the dog's lenses which hardens the tissue fibre resulting in a fogginess on the eye and blurring the dog's eye sight.⁵ As the eye takes longer to focus, owners may see a change in the speed at which the dog takes to recognise individuals or objects. Visibly, some dogs will have a haziness or film over the eye (nuclear sclerosis) as they grew older, unless this film becomes too dense the dog's vision is not impaired. However, there are several conditions that can cause blindness such as glaucoma and cataracts. Cataracts look outwardly similar to nuclear sclerosis, they come about when cells within the lens become dark and opaque over time. This can be hereditary or can come about as a result of diabetes, injuries, poor diet, certain toxins and even exposure to ultraviolet light, for example too much sunlight.⁶ Similarly to humans, dogs can have some of their vision restored through surgery, typically where the cataractous lens is removed and replaced with a plastic lens which stays in the eye permanently.⁷

The ageing process not only affects the dog's sensory perception but it also causes changes **mentally**. Changes in the dog's nervous system and in its hormone production can lead to a dramatic change in the dog's behaviour. As the

⁴ Book: Coren, Stanley (2005) *How Dog's Think*, Pocket Books, chapter 'How old is your dog', page 358.

⁵ Book: Fogle, Bruce (1990) *The Dog's Mind*, Pelham Books, chapter 13, page 184.

⁶ Book: Coren, Stanley (2005) *How Dog's Think*, Pocket Books, chapter 'How old is your dog', page 354.

⁷ Internet: Wikipedia, online encyclopedia, search under cataract and cataract surgery.

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dog grows older the structure of the nerve cells in the brain start to break down, losing the dendrites and axon filaments that help transmit the flow of information from cell to cell. This affect is known as “pruning”. As a result the transmission of information from one place in the nervous system to another becomes slower. In a healthy, young, dog neural information transfers from cell to cell at 225 plus miles an hour. In an elderly dog this can be reduced to 50 miles an hour.⁸ This pruning along with a reduction in the volume of blood flowing to the brain causes the brain to decrease in size and weight (up to a 24 per cent reduction in size/weight).⁹ The brain typically takes 20 per cent of the blood that the heart pumps out. Blood vessels in the brain begin to lose their elasticity and the lungs begin to become less efficient. Consequently, the blood flow to the brain reduces, which starves it of oxygen, this affects the long term memory of the dog. In addition, the ageing process causes a thickening of the membrane surrounding the brain, called the meninges. This membrane can become brittle, leading to tiny haemorrhages around the blood vessels. These haemorrhages destroy the nerve cells which affect the mind and behaviour of the dog, owners may notice the dog becoming irritable when disturbed, it is slow to obey commands and has problems with its balance and learning.

Another change in the nervous system occurs in the nucleus of the nerve cells that can also affect behaviour, memory and learning. The strand-like structures in the nucleus of cells, called mitochondria, are responsible for converting nutrients into energy. They release chemicals known as radicals that oxidize the ingredients essential for the formation of normal healthy cells. Like humans, as dogs age the efficiency of the mitochondria decreases and they begin to act as if they are “leaky”.

As a result the cell tissue damages and causes protein deposits to accumulate on the brain, called amyloids. The result of amyloids along with the decaying tissue means the dog will have a poorer memory and have difficulty in learning, for example new commands or problem solving.¹⁰

Fortunately, there are actions owners can take to ensure the continuing comfort of their dog and slow down the ageing process, by providing **mental and physical stimulation** suitable to its age. However, to maximise effectiveness many of these activities should start early in a dog’s life to promote physical and mental fitness into old age. For example, providing daily walks and playing with the dog

⁸ Book: Fogle, Bruce (1990) *The Dog’s Mind*, Pelham Books, chapter 13, page 183.

⁹ Book: Coren, Stanley (2005) *How Dog’s Think*, Pocket Books, chapter ‘How old is your dog’, page 337.

¹⁰ Book: Coren, Stanley (2005) *How Dog’s Think*, Pocket Books, chapter ‘The Wrinkled Mind’, page 340.

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throughout its life with help the dog to stay fit and mobilised. However, as the dog grows older walks should become slower and at smaller distances to avoid any excessive strains on the dog's joints, bones and muscles.

Once a dog reaches adulthood, owners by now have typically trained their dogs in the key commands such as "sit", "stay", "come", "down" and so on, and they may feel there is no longer a need for reward. However, in order to give the dog continual stimulation and psychological comfort, owners should reward and look for ways in which to stimulate their dog through physical and mental activities. It is also sensible to teach the dog to recognise hand signals as well as voice commands, so if it loses either sense of hearing or sight, the dog and owner can still communicate.

Dogs use their senses to explore and by enabling these senses to be stimulated owners can off-set age related changes and increase a dog's problem solving ability. Research suggests that individual nerve cells are capable of growing new filaments in old age if stimulated and the brain exercised. This was highlighted in studies made by William Greenough from the University of Illinois, who took a group of over weight, elderly rats living in standard laboratory cages and placed them an exciting new environment; to us the rodent equivalent of Alton Towers! The environment had swings, slides, toys, ramps and objects hanging from the ceiling. When their brains were examined these rats had more neural connections than their counterparts who remained in the isolation of a standard laboratory cage. The number of neurons ranged from an increase of 25 per cent to 200 per cent. This research proved that individual nerve cells are capable of growing new connections even in an older animal, and this growth is triggered by exercising and stimulating the brain.¹¹ This illustrates how dogs are similar to humans in the sense that those humans who engage in mental exercises such as completing cross word puzzles will slow down the ageing process of their brain. Advertisers have grabbed hold of this theory, demonstrated with the recent advertising campaign for the launch of the Nintendo DS Sudoku game. Advertisers used the slogan "train your brain in minutes a day" and featured in their adverts an array of celebrities of varying ages to highlight the variety of puzzles in this software that are designed specifically to keep certain parts of the human brain active. Therefore, by stimulating the dog's brain through game play and exposing it new environments or situations, we can alter the inevitable decay of its brain. So, the saying "you can't teach an old dog new tricks" is inaccurate. Rather you can teach an old dog new tricks but it just takes longer!

¹¹ Book: Fogle, Bruce (1990) *The Dog's Mind*, Pelham Books, chapter 13, page 185.

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Other ways in which a dog can keep fit and healthy is through regular exercise such as swimming as this will help keep its joints supple and mobilised. However, with an older dog the cold water of a river for example, will do little to aid its ageing joints. Work with human physiotherapy has demonstrated the benefits of hydrotherapy for older dogs, particularly those suffering with joint problems or for dogs who are recovering from a muscular injury.

Other physiotherapy techniques such as canine massage and gentle stretching also help relax tense muscles and improve blood flow to any problem related areas, or to help keep the dog supple.¹² Other ways in which owners can ensure their dog's continuing comfort is to keep the dog on a healthy diet. Often mobility problems are caused by the dog being overweight, as it puts more strain on the dog's joints. Using low fat dog treats, or supplementing meat strips or fatty cheese treats for raw vegetables are a healthier alternative for the dog. In addition, owners can purchase dietary supplements to help slow down the onset arthritis such as Arthriti-UM Plus.

In addition, if we improve the dog's diet and increase the intake of antioxidants by adding certain fruits and vegetables in its diet that are rich in vitamin C and vitamin E (for example, green peppers, broccoli, raw cabbage and fish-liver oil, whole grains and seeds), this will help provide the dog's body with the tools to neutralise the harmful free radicals "leaked" from the mitochondria in the nucleus of cells.¹³

One of the typical effects of ageing in dogs is a loss of hearing ability. Owners can help retain their dog's hearing for longer by not exposing it to high levels of noise which damages the hair cells that register sound. Dog's ear canals are longer than humans, this means debris can collect easily, from dirt and ear wax to hair can build up and create a plug that keeps sound from reaching the eardrum. Regular trimming and maintaining the ear area with cleaning drops will help discourage ear mites that fester in dirty ear canals and can cause ear infections.¹⁴ Typically dogs with long floppy ears such as Springer Spaniels and Basset Hounds are more susceptible to ear mites as the ears tend to trap moisture and limit air circulation, creating an ideal environment for these unwelcome visitors. Furthermore, regular grooming such as brushing the dog's teeth will also help delay the effects of gum disease and tooth decay which can cause discomfort, bad breath and may result in the removal of teeth as the dog grows older.

¹² Book: Whittaker, Sara (2005) *Think PET!* WitsEnd UK Ltd, chapter 5, page 111.

¹³ Book: Coren, Stanley (2005) *How Dog's Think*, Pocket Books, chapter 'The Wrinkled Mind', page 340.

¹⁴ Book: Coren, Stanley (2005) *How Dog's Think*, Pocket Books, chapter 'How old is your dog', page 358.

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In conclusion, the ageing process effects man and dog alike; a dog that has a healthy diet, is grooming regularly, not exposed to loud noise on a regular basis and is given a good balance of mental and physical activity, is likely to have fewer or slower senile changes to the body and brain compared to an overweight, inactive dog. The consequence of a life rich in reward and stimulation is that it should prolong the life span of our four-legged friend.