

History records that something remarkable happened to Marie Antoinette (1755–1793), the ill-fated queen of France.

The night before her jailers walked her to the guillotine, her hair allegedly turned white. She is not the only person whose hair lost its color because of a major

stressful event. More modern accounts tell of survivors of bombing attacks in World War II whose hair turned white as a result of the anxiety they had experienced.

Furthermore an examination of “before and after” photographs of United States presidents shows a highly visible increase in the amount of gray hair by the end of a four-year term. Some scientists suggest that this is a consequence of the stresses experienced in that office.

With or without stress, we can expect our hair to begin to turn gray as we age. At the age of 45 or 50 years it is likely that many of us—including our dogs—will have visible graying. This lighter hair appears first on the dog’s muzzle and face, and it’s usually quite noticeable by the time the dog is 7 or 8 years old. But of course there is a lot of variability in the age when a person’s hair begins to turn gray, and the same is true for dogs. Some dogs can show graying on their muzzle as early as 1 or 2 years of age. Genetics clearly play a role, but other factors—including stress—contribute as well.

Hair color comes from

melanin, a pigment that is produced in each hair follicle. There are two hypotheses as to how graying happens. The first is that aging wears down your DNA, somehow inhibiting the production of cells called melanocytes, which produce melanin. The second hypothesis says that your hair gets bleached from within because hydrogen peroxide is also produced in small amounts in the follicles. Normally this bleaching compound is kept in check by another enzyme called catalase, but eventually the body stops producing this enzyme.

Scientists are still not clear how stress might prematurely trigger either of these processes, but in 2011 a team led by Nobel prize winner Robert Lefkowitz offered a clue. It has to do with exposure to stress-related hormones, specifically ones called catecholamines. Prolonged exposure to these hormones has many negative effects, and these can reach all the

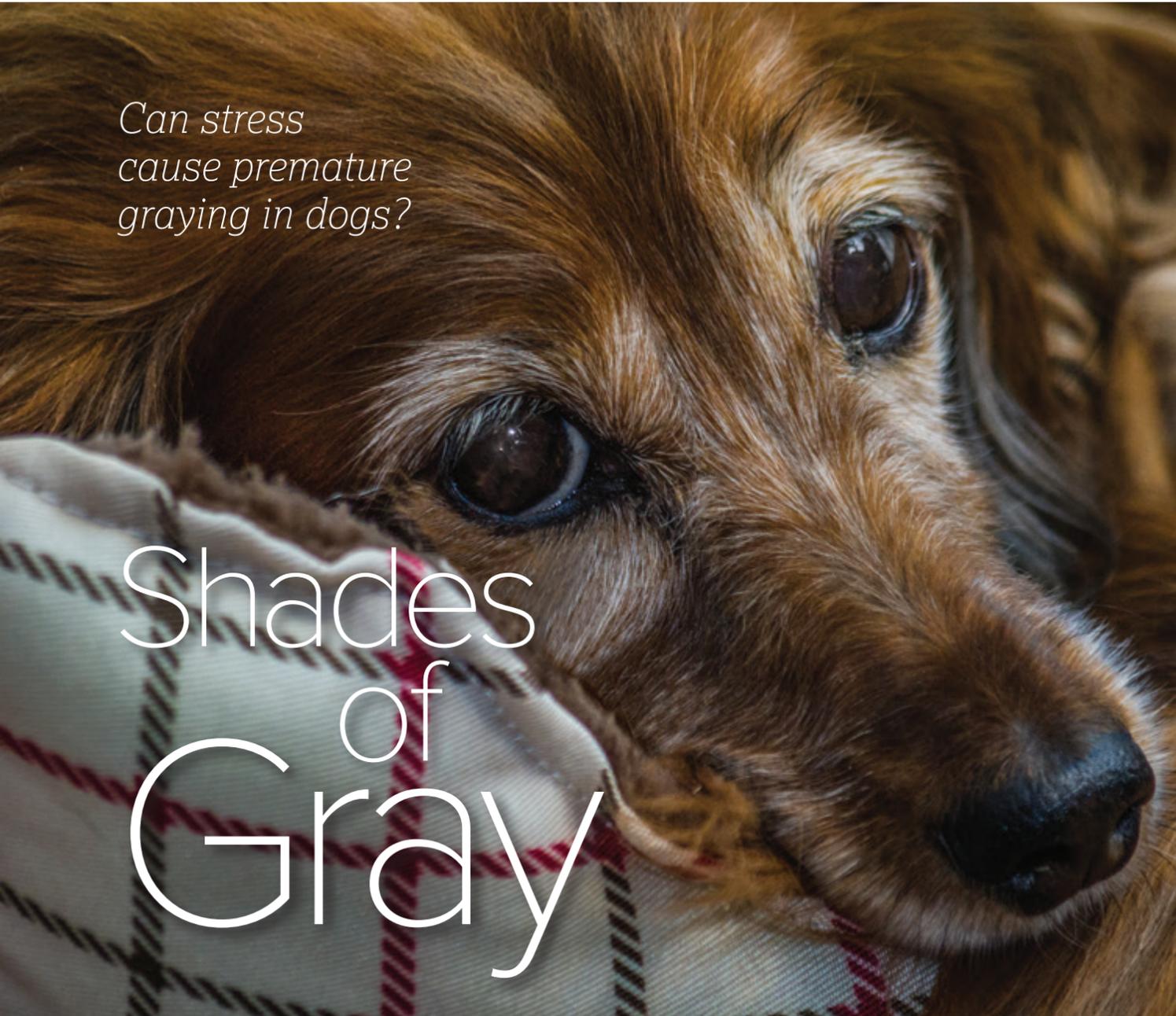
way into your DNA and affect the genes that control hair pigment. This can cause premature graying in people, and some new data suggests that the same stress factors can also cause your dog to gray earlier.

Recent research by a team headed by Camille King of the Canine Education Center in Aurora, Colorado, found that anxiety and a personality factor called “impulsivity” can predict premature graying in dogs. This was a fairly large study involving 400 dogs one to four years of age. Although the study included a variety of different breeds, the researchers had to exclude dogs whose hair color was too light to allow them to see the presence or absence of gray muzzle hair.

Photographs were taken of the head of each dog and later independent scorers determined how much graying had occurred on the dog’s face, and how far the gray hair crept along the muzzle line. The dog’s owners were

Can stress cause premature graying in dogs?

Shades of Gray





given a questionnaire which included a set of items to determine the typical anxiety and impulsivity levels in their dogs. Anxiety was defined as a reaction to a possible or imagined danger and its symptoms include restlessness, fearfulness, stress whining, cringing to avoid being touched, and submissive urination. Impulsivity is a personality trait which looks a lot like hyper-

activity in dogs. Dogs with this trait are distractible, hard to calm, have difficulty maintaining a stay position, and are endlessly barking, jumping up on people, chasing, and so forth.

Although the researchers used some high-powered statistical regression analyses on the data, the basic findings are quite clear. To begin with, as you might expect, older animals were more likely to

show graying of the hair on the face. One little surprise here was the fact that female dogs tended to show more graying than males.

When the researchers turned to the critical variables, they found that the more anxious and impulsive a dog is, the more likely it is to show premature graying of the hair on the face. The most graying was found on dogs who were fearful of loud noises and unfamiliar people or unfamiliar animals.

The neat thing about these findings is that a dog who is showing premature graying is essentially hanging out a flag that indicates he is under stress and may have impulse control problems. In other words, if a young dog is already beginning to show graying on its muzzle, then it may be time to start thinking about teaching the dog some coping skills and behavior control. **FD**

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