



Behavior is Medicine. Fear Free is Better Medicine

Lisa Radosta DVM, DACVB
Florida Veterinary Behavior Service
West Palm Beach, FL 33412

Studies on the effects of fear, anxiety and stress (FAS) in veterinary patients clearly demonstrate the scope and depth of the problems facing our patients, their owners and the veterinary team. These studies identify the extent of problems from home to clinic and home again, the negative consequences on the pets physical and emotional health, and the effect that FAS has on the level, frequency and quality of veterinary care that pets will receive. Thus, implementing a Fear Freesm approach can dramatically improve the health, well-being and safety of the pet, owner, and entire veterinary practice.

1. It's all about the stress – “white coat syndrome in cats”

Stress induced catecholamine and glucocorticoid release impact physiological measures as well as clinical pathology data including an increased in blood glucose and a stress leukogram. In human patients a white coat effect has been well-documented with blood pressure measures higher in the doctor's office than in the home. In studies comparing a veterinary examination at home to the veterinary clinic, a significant difference was found in blood pressure, heart rate, and respiratory rate, while temperature increased but not significantly.^{1,2}

Conclusion: Physiologic measures may be inaccurate in cats with FAS.

2. Diagnosis: Its all about the stress – “white coat syndrome in dogs”

In a study of 30 dogs comparing veterinary examination findings in the home to the veterinary clinic, stress related to transit and the veterinary environment resulted in significant increases in blood pressure, rectal temperature, pulse rate and panting.³ In another study, urine cortisol creatinine ratios (UCCR) were increased after vaccine visits, orthopaedic examination, and especially following overnight hospitalization with almost half persisting after 12 hours at home. Some of these results were in a range that would be consistent with a diagnosis of hyperadrenocorticism. ⁴

Conclusion: Accurate physiological measures cannot be obtained in the stressed dog. In fact, urine cortisol creatinine measures may be in a range consistent with hyperadrenocorticism.

3. Fear free works!

In a randomized cross-over study of 18 cats, 10 were assessed first in a clinic setting and then in the home and 8 in the reverse order. All cats were examined with low stress handling procedures including being taken directly into the exam room, allowing the cat to exit its cage voluntarily, gentle handling, Feliway, having the owner present, and staff restraint only during temperature taking. The only difference in measures was a significantly higher blood glucose (up to 30%) in the clinic. There was a significant decrease in cortisol at the second visit regardless of order or group.⁵

Conclusion: Fear free works. Physiologic measures are more accurate and stress reduced by fear free handling and familiarity with the examiner, although glucose may still be elevated.



4. Effects of stress – the good, the bad or the ugly

The stress response is a normal part of life and serves as an adaptive mechanism. In the acute response there is activation of the sympathetic medullary (SAM) with release of noradrenaline and adrenaline and of the hypothalamic-pituitary-adrenal (HPA) axis with release of cortisol and vasopressin, producing a state of readiness with cardiac output and glucose is increased and urine output decreased.⁶

The initial response to a stressor may be immune enhancing and pro-inflammatory if the stressor is acute and precedes the immune challenge.^{6,7} However, if the stressor is too intense, persists, or follows the immune challenge, the immune response is suppressed, leading to delayed wound healing, increased susceptibility to infection and further fear sensitization.^{4,6,8} In addition with chronic stress there may be deleterious effects on mental as well as cardiovascular, respiratory, renal, urinary, dermatologic, reproductive and gastrointestinal health and even a shortened lifespan.^{6,9,10} Exposure to stressors in colony cats, has been found to lead to gastrointestinal and behavior problems including avoidance and soiling.¹¹ Feline respiratory disease and weight loss is greater in shelter cats that are stressed, while cats provided with enriched housing and positive social interactions had lower stress and less illness (26% to 12%).^{12,13}

Conclusion: Stress is an adaptive mechanism to help cope with the event. If short, mild and preceding the challenge, immunity may be initially enhanced. However, stress that is intense, persistent or chronic, will suppress the immune system and have detrimental effects on physical and mental health.

5. FAS diminishes veterinary care

FAS are not only a health, welfare and safety issue, they negatively impact on the delivery of veterinary care to the patient. In one study, 40% of cats had not been to a veterinarian in the last year compared to 15% of dogs.¹⁴ As many as 58% of cat owners and 38% of dog owners report their pets hate going to the veterinarian. In fact, 38% of cat owners and 26% of dogs owners are stressed just thinking about it and 28% and 22% respectively would visit the veterinarian more often if wasn't so stressful for pet or owner, and 26% and 19% respectively would visit more frequently if pet didn't dislike it. Clients report reluctance to bring cats to the veterinarian due to the stress of placing the cat in the carrier, transit, dogs in the veterinary clinic, and examination and acted unfriendly for days on returning home.¹⁴

Conclusion: FAS associated with veterinary visits from departure to returning home, negatively impact on the pet's emotional health and the level and frequency of veterinary care that pets receive.

6. Almost 80% of dogs may be experiencing veterinary FAS!

In one study out of 45 dogs, approximately 60% of owners reported their dogs were stressed entering the veterinary clinic. In fact, 57.8% of owners reported that pets were aware that they were going to the veterinary clinic, 11.5% in the car and 3.8% before leaving home.¹⁵ In a previous study of over 450 dogs, 69.9% would not enter the veterinary clinic willingly.¹⁶

Owners reported that 28.9% of dogs were highly stressed in the waiting room. Similarly veterinary behaviorists scored 28.9% dogs as high stress. However, there was poor agreement as owners rated stress primarily on overt signs including attempts to hide or exit, while behaviorists identified more subtle signs including trembling, ear and tail position, as well as attempts to hide or exit. ¹⁵ In another study, 78.5% of dogs



were fearful on the examination table. Dogs under 2 years and males were significantly less fearful than female dogs, while dogs that had a previously positive veterinary experience were less fearful.¹⁷

A more recent study of the owners of 906 dogs at 35 veterinary clinics in Italy identified an even higher level of stress.¹⁸ 77.8% of dogs were stressed before arriving, 39.7% while in the car and 7.4% before leaving home. In the waiting room only 36.4% were calm. Entering the exam room was unpleasant for 45.6%, which rose to 73.2% on the exam table. For veterinary approach 63.2% were tense but not aggressive and 11.2% aggressive. Fear or stress at any point in the visit was a predictor of fear or stress at each subsequent step in the visit e.g. if fearful arriving also fearful in reception, entering exam, exam table and veterinary approach. Most veterinarians offered food (891/906) but 37.1% of dogs refused.

While most dogs accepted being touched all over by their owners (67.6%), the tail was the least tolerated (11.6%) followed by the ears (7.5%). If dogs did not tolerate being touched all over by owners, they were more stressed on the exam table. Dogs that were aggressive when scolded by the owners during treatments and those that were aggressive toward their owners during the visit (6.4%) were more likely to be aggressive to the veterinarian. During veterinary exam 33.6% tolerated all handling with most problems related to temperature 22.4%, blood collection 18.2%, injections 17.4% and ear exam 13.2%. A painful treatment resulted in fear of the veterinarian in 46.2% of cases. Most dogs showed no gender preference for the veterinarian (77.4%) but 14.7% preferred females and 7.9% males. Almost 1/3 of the clients had changed veterinarians, 18% due to the attitude to the pet and 24.5% due to competence.

If not checked by a vet from puppyhood, guardians less likely to be able to treat their dogs and dogs were more likely to have more problems in the veterinary clinic.¹⁸

Conclusion: Most dogs are fearful of one or more aspects of the veterinary visit. All team members must be able to recognize signs of FAS and educate pet owners to address pet welfare and help to insure safety with fear free strategies beginning at home and throughout the veterinary visit.

7. FAS – affecting 80% of cats or more!

In a recent study of over 1000 cats, 77.8% were aware they were going to the veterinary clinic, 51.5% before leaving home.¹⁹ Welfare was impaired in 73.2% in the reception area, 85% on the examination table, and 58% on returning home. 34% of cats subsequently became fearful of transport in other situations. During examination 55% were stressed but could be handled, 22.8% tried to escape and 8.8% were aggressive toward veterinarians. Cats most resisted touching the belly in over 30%, followed by the tail, mouth, claws, ears and head while 31.8% allowed the veterinarian to touch the body all over.¹⁹ In a study evaluating body handling in cats, gentle stroking of the head between the ears, cheeks or chin were best tolerated while caudal body handling was most fear evoking.²⁰ For procedures injections were least tolerated (34.2%), followed by temperature taking (32%), blood collection (23%), wound treatment (19.7%), ear exam (11.7%), eye exam (6.9%) and auscultation (4.1%). When offered food by the veterinarian, 23% of cats consumed it, 29.2% were suspicious and 47.4% refused. Food was less likely to be effective if the cat was stressed (46% to 19%).

Conclusion: Most cats are fearful of one or more aspects of the veterinary visit. All team members must be able to recognize signs of FAS and educate pet owners to address pet welfare and help to insure safety with fear free strategies from travel to the clinic to back home again. Food is effective for counterconditioning if offered before the cat is fearful or after it has an opportunity to settle. Gentle handling should begin where it is least fear evoking and proceed to locations are gradually more stressful.



8. Separation distress

Separation from the owners causes both behavioral and psychological stress whether left alone or with an unfamiliar person with responses that are more likely to be passive (inactivity) than active.^{21,22} Using a modified Ainsworth strange test where the owner leaves the dog in a room alone or with an unfamiliar person, dogs had a higher rate and engaged in fearful behaviors that were more likely to be static (less active) behavior when left alone or alone with toys.²² In a recent study that compared the response of dogs over 7 to those less than 7 in a strange situation test, dogs >7 sought more physical contact with owners at baseline (before separation) and displayed a more passive response when separated from owners (decrease play, increased standing by door), less interest in an unfamiliar people and a greater increase in cortisol than dogs <7.²³ Thus, the ability to cope with social distress decreases with age as demonstrated by an increase in passive behavior that is likely indicative of active suppression of behavioral signs.

Conclusion: A passive, inhibited response when separated from the owners is equally or more stressing than an active distress response and senior pets may be more susceptible to stress associated with social separation. Working to keep pets with their owners during veterinary procedures will often reduce stress.

9. Puppy and kitten socialization – to the veterinary clinic and beyond.

Socialization is the process by which pets develop social relationships with animals of their own and other species. The most critical period for socialization (sensitive period) in puppies is from 3 to 12 weeks of age while the most receptive period for kittens is from 2 to 7 weeks. The sensitive period is also a time for pets to form attachments to places (or localization) to reduce potential for environmental fears. Pets that are regularly exposed to a variety of people, pets, and complexity in the form of novel objects, experiences, toys, textures, sounds, and handling are likely to develop stable attachments with both the social and physical environment.

Socialization and training classes are an excellent way to socialize puppies and kittens to a wide variety of both social and inanimate (environmental) stimuli. By offering these classes in the veterinary hospital they also provide an opportunity to positively condition the pet to the hospital environment, handling, and procedures. Attending puppy classes prior to 12 weeks reduced the risk of aggression to unfamiliar people both in and out of the house, and led to less fear of unfamiliar people, dogs and environments, improved trainability and decrease risk of relinquishment.²⁴⁻²⁷ Puppies in these classes were better trained and had earlier and more effective behavior problem intervention.²⁸ In one study, dogs wearing dog-appeasing pheromone (Adaptil) collars were less fearful and anxious, had more positive interactions, and in follow-up surveys for 1 year were consistently more social and faster to adapt to new situations.²⁹ Early exposure to multiple unfamiliar men, women and children led to less fear.²⁴ Dogs that did not attend formal training were more likely to display aggression.²⁶

Conclusion: Puppy and kitten classes provide a valuable resource for socialization, while providing these classes in the veterinary hospital offers additional opportunity to insure appropriate guidance, positive exposure to the veterinary hospital and a focus on the handling and procedures that will provide for Fear Free veterinary care.

10. The evidence for natural



While natural products might aid in reducing FAS during travel and veterinary visits, only a few have any evidence of effect. Dog appeasing pheromone (Adaptil) and Feline F3 cheek gland pheromone (Feliway) can be used to reduce FAS by diffusing into the veterinary environment, and spraying or wiping surfaces such as the surfaces where the pet will be examined (blanket, table top) or in the carrier or hospital cages. A pheromone collar is also available for dogs.³⁰⁻³⁴ Beneficial effects might also be achieved with alpha-casozepine, L-theanine, an L-theanine supplement containing magnolia officinalis, phellodendron amurense and whey protein (Solliquin), therapeutic diets supplemented with alpha-casozepine and tryptophan, a Souroubea spp (betulinic acid) and Plantanus sp supplement (Zentrol).³⁵⁻⁴¹ In addition aromatherapy and pressure wraps might further help to calm.⁴²⁻⁴⁴

In shelter dogs classical music was effective at calming in comparison to heavy metal, species specific music or control.^{45,46} In one shelter study in dogs, audiobooks were more calming (more resting, less vigilant) than classical or species specific music.⁴⁷ In a recent study the authors identified reggae and soft rock as most calming in a shelter environment. ⁴⁸ In a veterinary clinic study, either classical or species specific might help to reduce aggression and anxiety in dogs, while for cats modified music might be equally or more effective.^{49,50} In addition, one study with classical music during general anesthesia led to lower respiratory rates and pupil diameter.⁵¹

Conclusion: Consider natural products that have evidence of efficacy to help reduce travel and veterinary clinic FAS either alone or adjunctively with medication.

Pre-visit medications

For mild fear and anxiety in dogs, the use of trazodone, benzodiazepines (such as alprazolam, diazepam or lorazepam) or gabapentin might be effective prior to the visit. Clonidine might also be considered. In cats, gabapentin, trazodone and benzodiazepines such as lorazepam or alprazolam might be effective. When using gabapentin an additional dose the night before the visit might also be considered. When additional sedation is needed phenobarbital or acepromazine might be combined with the benzodiazepine, trazodone or gabapentin. Transmucosal dexmedetomidine (.02 mg/kg) in combination with a narcotic e.g. buprenorphine (.03 mg/kg) is an option for home (previsit) use in cats for more intense fear and anxiety.⁵² In dogs, transmucosal dexmedetomidine might be used at 0.01-0.04 mg/kg.^{53,54} A recent study achieved satisfactory sedation with transmucosal use of dexmedetomidine in 4 aggressive dogs in the veterinary hospital at a mean dose of 32.6 micrograms per kg.⁵⁵ Most recently a dexmedetomidine oromucosal gel has been approved for noise phobias, given 30 minutes in advance of exposure. At the label dose of 125 micrograms per m², fear might be reduced with a minimum of sedation; however, this is a lower dose than that used for transmucosal sedation of aggressive dogs.

A home trial in advance of the visit is recommended to assess effect, side effects, dose, duration and onset. While these medications might provide sufficient calming or sedation to proceed with procedures when the pet is admitted into the veterinary hospital, they can also serve to facilitate the use of intramuscular sedation. Consider what medications the pet has received when selecting and dosing intramuscular drugs.

Injectable sedation

When using injectable sedation, consider that the greater the level of fear, anxiety or arousal at the time of administration, the sedative response may be more variable and potentially less effective. Therefore prompt and calm injections when the pet is minimally stressed are safest and most effective.



Optimal and balanced sedation can be achieved with intramuscular injections of low dose dexmedetomidine, combined with butorphanol (or an alternate narcotic), and perhaps midazolam (anxiolytic, muscle relaxant, amnesic). In more fractious patients dexmedetomidine can be increased or ketamine might be added.⁵⁶ Telazol at 5 mg/kg is another option for fractious dogs with a quick onset but longer duration of action. As ketamine and telazol are dissociative anesthetics, patients given these drugs require anesthesia monitoring. In addition, the drugs are not reversible and as ketamine causes pain on administration, it is best reserved for add-on therapy if the initial combinations are not sufficiently effective. In place of butorphanol, buprenorphine might provide more analgesia but less sedation and mu agonists such as hydromorphone and morphine offer greater pain control, greater sedation and are reversible. Opioids often cause emesis.

Dexmedetomidine is an alpha-2 agonist which provides fairly rapid analgesia and sedation (e.g. 20 minutes) and can be reversed with intramuscular injection of atipamazole if a more rapid recovery is indicated. It should be avoided in pets with cardiovascular compromise as it causes vasoconstriction and hypertension leading to increased cardiac work. Level of sedation may vary between individuals and pets that appear sedated may be suddenly responsive to stimuli including pain. Therefore, they are most commonly used in combination as described above. Reversal agents for midazolam (flumazenil at .001-.01 mg/kg iv) and for oxymorphone, morphine and hydromorphone (naloxone at .01 mg/kg) or partial reversal with butorphanol are also available if safety is a concern and faster recovery is required.

Acepromazine (.01-0.05 mg/kg) can be substituted into the combination in lieu of dexmedetomidine. Acepromazine has a longer duration of action, may provide less reliable and less profound sedation, has no anxiolytic or analgesic effect, and is not reversible.

Doses for oral pre-medication

Drug	Dogs	Cats
Trazodone	4-12 mg/kg	50-100 mg / cat (for travel)
Clonidine	0.01-.05 mg/kg	
Gabapentin	20 mg/kg	20 mg/kg (100 mg/cat)
Alprazolam	.02-0.1 mg/kg	.125 mg - .25 mg per cat
Diazepam	0.5-2.2 mg/kg	
Lorazepam	.05-0.5 mg/kg	.05-.25 mg/kg

Doses for intramuscular sedation⁵²⁻⁵⁴

Drug	Dogs	Cats
Butorphanol ^a	0.2 -0.4 mg/kg	0.2 -0.4 mg/kg
Dexmedetomidine ^b	0.003-.01 mg/kg	0.005-.01 mg/kg
Ketamine (if needed)	3 mg/kg	2 to 5 mg/kg
Midazolam ^c	.05-0.2 mg/kg	.05-0.2 mg/kg

^aCan substitute buprenorphine at 0.02-0.03 mg/kg, morphine at 0.2-1 mg/kg, or hydromorphone at .05-.2 mg/kg or oxymorphone .1 mg/kg for superior pain management and reversible

^bIncrease to .02 mg/kg in dogs and .03 mg/kg in cats if greater sedation required

^cMay provide anxiolytic, muscle relaxation and amnesic effect but may cause paradoxical excitation

Dog: Geriatric or ill: Butorphanol .2 -.4 mg/kg + midazolam .2 mg/kg⁵¹

Cat: Geriatric or ill: Butorphanol .2 -.4 mg/kg + midazolam .2 mg/kg⁵¹



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